VOB Part C: General Technical Contract Conditions for Construction Services (ATV) General Regulations for Construction Work of All Kinds — DIN 18299

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Content

0 Notes for the preparation of the service description

These instructions for the preparation of the specifications apply to construction work of any kind; they are supplemented by the information relating to the individual service areas in ATV DIN 18300 to ATV DIN 18459, Section 0, as well as the Annex Definitions. Compliance with these instructions and the appendix is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. and §§ 7 VS ff. VOB/A.

The following shall be included in the preliminary remarks to the tender specifications:

'To the extent that reference is made in the tender specifications to technical specifications, e.g. national standards transposing European standards, European technical assessments, common technical specifications, international standards, reference shall always be made to equivalent technical specifications even without the express addition of 'or equivalent'.'

The information does not become part of the contract. According to the requirements of the individual case, the specifications must state in particular:

1. Information on the construction site

0.1.1 Location of the construction site, environmental conditions, access possibilities and condition of the access road as well as any restrictions on its use.

0.1.2 Special pollution from immissions as well as special climatic or operational conditions.

0.1.3 Type and location of the structural facilities, e.g. also number and height of the storeys.

0.1.4 Traffic conditions on the construction site, in particular traffic restrictions.

0.1.5 Areas to be kept free for traffic.

0.1.6. Type, location, dimensions and usability of transport equipment and transport routes, e.g. mounting openings.

0.1.7 Location, type, connected load and conditions for the provision of connections for water, energy and sewage.

0.1.8 Location and extent of the areas and rooms made available to the Contractor for use or shared use for the performance of its services.

0.1.9 Soil conditions, subsoil and its load-bearing capacity. Results of soil investigations.

0.1.10 Hydrological values of groundwater and water bodies. type, location, runoff, discharge capacity and flood conditions of receiving waters. Results of water analyses.

0.1.11 Special environmental regulations.

0.1.12 Special requirements for disposal, e.g. restrictions on the disposal of waste water and waste.

0.1.13 Protected areas or periods of protection in the area of the construction site, e.g. due to requirements for water, soil, nature, landscape or immission protection; existing expert reports or the like.

0.1.14 The nature and extent of the protection of trees, vegetation, vegetation areas, traffic areas, components, structures, boundary stones and the like in the area of the construction site.

0.1.15 Type and scope of regulation and safeguarding of public transport.

0.1.16 Existing installations in the area of the construction site, in particular sewage and supply lines.

0.1.17 Known or suspected obstacles in the area of the construction site, e.g. pipes, cables, drains, sewers, structural remains and, if known, their owners.

0.1.18 Confirmation that the requirements applicable in the respective federal state for reconnaissance and, if necessary, clearance measures with regard to explosive ordnance have been met.

0.1.19 Measures taken in accordance with the Construction Site Ordinance

0.1.20 Special orders, regulations and measures of the owners (or other authorized persons) of lines, cables, drains, canals, roads, paths, waters, tracks, fences and the like in the area of the construction site.

0.1.21 the nature and extent of pollutant loads, e.g. soil, water, air, substances and components; existing expert reports or the like.

0.1.22 Type and time of the preparatory work initiated by the Client.

0.1.23 Work of other contractors on the construction site.

0.2 Information on the execution

0.2.1 Planned work periods, work interruptions and work restrictions according to type, place and time as well as dependence on the performance of others.

0.2.2 Special difficulties during execution, e.g. work in rooms where operations continue, work in the area of traffic routes or in the event of unusual external influences.

0.2.3 Requirements resulting from the health and safety plan in accordance with the Construction Site Ordinance.

0.2.4 Type and scope of accident prevention and health protection services for employees of other companies, e.g. non-slip covers.

0.2.5 Special requirements for work in contaminated areas, including special protective and safety measures.

0.2.6 Special requirements for construction site equipment and disposal facilities, e.g. containers for separate collection.

0.2.7 Special requirements for the erection and dismantling as well as the provision of scaffolding.

0.2.8 Requirements resulting from the health and safety plan in accordance with the Construction Site Ordinance.

0.2.9 For how long, for what work and, if applicable, for what use the Contractor shall maintain scaffolding, hoists, lifts, recreation and storage rooms, facilities and the like for other contractors.

0.2.10 Use or co-use of reprocessed (recycled) materials.

0.2.11 Requirements for reprocessed (recycled) materials and for non-standardised materials and components.

0.2.12 Special requirements for the type, quality and environmental compatibility of materials and components, including, for example, the rapid biodegradability of auxiliary materials.

0.2.13 Type and scope of the proof of suitability and quality required by the Client.

0.2.14 Under what conditions materials obtained on the construction site may or must be used or recycled for other purposes.

0.2.15 the type, composition and quantity of soils, substances and components to be disposed of from the client's area; the type of recovery or, in the case of waste, the disposal facility; Requirements for proof of transport, disposal and disposal costs to be borne by the client.

0.2.16 the type, number, quantity or mass of the materials and components provided by the Client, as well as the type, exact designation of the place and time of their delivery.

0.2.17 To what extent the Client undertakes the unloading, storage and transport of materials and components or provides the Contractor with equipment or manpower for this purpose.

19 Measures taken in accordance with the Construction Site Ordinance

0.1.20 Special orders, regulations and measures of the owners (or other authorized persons) of lines, cables, drains, canals, roads, paths, waters, tracks, fences and the like in the area of the construction site.

0.1.21 the nature and extent of pollutant loads, e.g. soil, water, air, substances and components; existing expert reports or the like.

0.1.22 Type and time of the preparatory work initiated by the Client.

0.1.23 Work of other contractors on the construction site.

) . This is particularly important for setting up and clearing the construction site.

0.4.2 Special services

If special services (section 4.2 of all ATVs) are required, this must be stated in the service description; where appropriate, special ordinal numbers (headings) shall be provided for this purpose.

0.5 Billing Units

The bill of quantities shall indicate the billing units for the partial services (items) in accordance with Section 0.5 of the relevant ATV

1 Scope of application

ATV DIN 18299 "General regulations for construction work of any kind" applies to all construction work, even for those for which there are no ATVs in VOB/C — ATV DIN 18300 to ATV DIN 18459.

Deviating regulations in ATV DIN 18300 to ATV DIN 18459 have priority.

2 Fabrics, components

2.1 General

2.1.1 The services also include the delivery of the associated materials and components, including unloading and storage on the construction site.

2.1.2 The Contractor shall request materials and components provided by the Client from the Client in good time.

2.1.3 Substances and components must be suitable for the respective purpose and must be coordinated with each other.

2.2 Retention

Materials and components which the Contractor is only required to retain, i.e. which do not enter the building, may be used or unused at the Contractor's discretion.

2.3 Deliver

2.3.1 Materials and components used by theagnehmer, i.e. which are incorporated into the building, must be unused. Remanufactured (recycling)Substances are considered unused if they comply with the conditions set out in section 2.1.3.

2.3.2 Substances and components for which DIN standards exist must comply with the DIN quality and DIN dimensional specifications.

2.3.3 Substances and components that require approval according to the official regulations must be officially approved and comply with the provisions of their approval

2.3.4 Substances and components for which certain technical specifications are not specified in the specifications may also be used if they comply with standards, technical regulations or other provisions of other countries, provided that the required level of protection in terms of safety, health and usability is equally achieved on a permanent basis.

If substances and components are subject to a monitoring or test mark obligation or proof of usability, e.g. by means of general building authority approval, equivalence can only be assumed if the substances and components bear a monitoring or test mark or if the aforementioned proof of usability has been provided for them.

3 Execution

3.1 If traffic, supply and disposal facilities are located in the area of the construction site, the regulations and orders of the competent authorities must be observed. If the location of these facilities cannot be specified, it must be explored. Services for the exploration of such facilities are special services (see section 4.2.1).

3.2 The areas designated for the maintenance of traffic must be kept clear. Access to facilities of the supply and disposal companies, the fire brigade, the post office and railway, to surveying points and the like may not be obstructed more than unavoidably by the execution.

3.3 If pollutants are found, e.g. in soil, water, substances or components, the Client must be informed immediately. In the event of imminent danger, the Contractor shall immediately carry out the necessary safety measures. The further measures are to be determined jointly. The services provided and the other services are special services (see section 4.2.1).

4 Ancillary services, special services

4.1 Ancillary services

Ancillary services are services that are part of the contractual service even without being mentioned in the contract (Section 2 (1) VOB/B).

Accordingly, fringe benefits are in particular:

4.1.1 Setting up and clearing the construction site, including equipment and the like.

4.1.2 Provision of the construction site equipment including equipment and the like.

4.1.3 Measurements for the execution and invoicing of the work, including the provision of measuring instruments, gauges, stake-outs and the like, the receipt of gauges and stake-out marks during construction and the provision of workers, but not services pursuant to Section 3 (2) VOB/B.

4.1.4 Protective and safety measures in accordance with the state and employers' liability insurance association regulations on occupational health and safety, with the exception of benefits in accordance with sections 4.2.4 and 4.2.5.

4.1.5 Lighting, heating and cleaning of the common rooms and sanitary facilities for the Contractor's employees.

4.1.6 Bringing water and energy from the connection points provided by the Client on the construction site to the points of use.

4.1.7 Supply of Supplies.

4.1.8 Provision of small equipment and tools.

4.1.9 Transport of all materials and components, even if they are provided by the Client, from the storage points on the construction site or from the transfer points specified in the service description to the points of use and any return transport.

4.1.10 Securing the work against rainwater, which is normally to be expected, and removing it if necessary.

4.1.11 Disposing of waste from the Contractor's area and removing the contamination resulting from the Contractor's work.

4.1.12 Disposal of waste from the Client's area up to a quantity of 1 m3, provided that the waste is not contaminated.

4.2 Special services

Special services are services that are not ancillary services according to section 4.1 and are only part of the contractual service if they are specifically mentioned in the service description. Special services are, for example: 4.2.1 Services according to sections 3.1 and 3.3.

4.2.2 Supervising the services of other entrepreneurs.

4.2.3 Fulfilment of tasks of the Client (Client) with regard to the planning, execution of the construction project or coordination in accordance with the Construction Site Ordinance.

4.2.4 Accident prevention and health protection benefits for employees of other companies.

4.2.5 Special protective and safety measures when working in contaminated areas, e.g. metrological monitoring, specific additional equipment for construction machinery and equipment, sealed off work areas.

4.2.6 Benefits for special protective measures against weather damage, flooding and groundwater, except for services under section 4.1.10.

4.2.7 Insurance of the service until acceptance in favour of the Client or insurance of an extraordinary liability risk.

4.2.8 Special testing of materials and components supplied by the Client

4.2.9 Erecting, maintaining, operating and removing facilities to secure and maintain traffic on the construction site, e.g. construction fences, protective scaffolding, auxiliary structures, lighting, guidance equipment.

4.2.10 Making parts of the construction site equipment available to other contractors or the Client.

4.2.11 Benefits for special measures for reasons of environmental protection as well as the preservation of land and monuments.

4.2.12 Disposal of waste beyond the services provided in Sections 4.1.11 and 4.1.12.

4.2.13 Protection of the service if the Client demands early use.

4.2.14 Removing obstacles.

4.2.15 Additional services for continued work in frost and snow, insofar as they are not already the responsibility of the Contractor.

4.2.16 Benefits for special measures to protect and secure endangered structures and neighbouring properties.

4.2.17 Securing lines, cables, drains, canals, boundary stones, trees, plants and the like.

5 Billing

The service is to be determined from drawings, insofar as the service performed corresponds to these drawings. If such drawings are not available, the power must be measured.

Appendix A

Definitions of the General Technical Terms and Conditions of Contract for Construction Services

Recesses are cross-sectional weakenings in components, the depth of which can be less than or equal to the component depth. Recesses are parts of surfaces that cannot be treated or cannot be manufactured. Gaps are created, e.g. through openings (even floor-to-ceiling), openings, penetrations, niches, slots, cavities, pipes, ducts.

Interruptions are sections that separate, cannot be treated or cannot be produced when determining the length measurements. Interruptions by components are separating, untreated or non-constructible sub-areas of small width, e.g. trusses, templates, pilaster strips, cornices, drainage channels, fixtures.

Working: Introduction to limiting components without adapting or connecting.

Adapting: Introducing bounding components by processing the building material to be brought in so that it follows the geometry of the bounding component.

Connection: Introduction to limiting components and ensuring a defined technical function, e.g. windproof, watertightness, adhesion.

The smallest circumscribed rectangle: The smallest circumscribed rectangle results from the smallest rectangle enclosing a surface of any shape.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV) Earthworks — DIN 18300

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Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 Type and condition of the areas to be worked.

0.1.2 Foundation depths, types of foundations, loads and construction of adjacent structures and their hazards.

0.1.3 Type and nature of existing edging or shoring structures

0.1.4 Type, location and dimensions as well as owners of natural and artificial cavities as well as obstacles, e.g. anchors, soil stabilisation bodies, waterproofing bodies, grouting material, geosynthetics, vibratory tamping columns, grouting hoses, sleeve pipes and borehole fillings.

0.1.5 Indication of the geotechnical category according to DIN 4020 "Geotechnical investigations for structural purposes — Supplementary regulations to DIN EN 1997-2".

0.2 Information on the execution

0.2.1 Number, type, location, dimensions and design of earthworks.

0.2.2 Number, type, location, dimensions, design and purpose of excavations and trenches, including the minimum dimensions for working spaces, if necessary staggered according to depth, heights of the floors.

0.2.3 Slope of embankments and formation of berms.

0.2.4 Permissible deviations from the target dimension for removal and coating profiles; especially in the grade and layer thicknesses.

0.2.5 Securing of construction pits, ditches, embankments and slopes.

0.2.6 Services in connection with the installation or dismantling of excavation, trench, embankment and slope stabilisation.

0.2.7 Leaving a protective layer over the foundation base, thickness of the protective layer and time of its removal.

0.2.8 Description and classification of soil, rock and other substances according to Section 2.

0.2.9 Results of soundings to determine storage densities.

0.2.10 Significant changes in the properties and conditions of soil, rock and other substances after dissolving.

0.2.11 Restrictions on the use of fabrics, especially recycled materials.

0.2.12 Use, preparation and treatment of soil, rock and other substances as well as the type of installation or other recycling, taking into account the environmentally relevant ingredients.

0.2.13 Naming of possible environmentally relevant ingredients insofar as they are important for the disposal of dissolved soil and rock by the contractor.

0.2.14 Type, location, length and condition of conveying routes, restrictions on use. Conveying routes over 50 m, if necessary staggered according to length or according to quantity distribution plan.

0.2.15 Type and possibilities of interim storage, especially in the construction of trenches.

0.2.16 Use of soil for vegetation purposes in accordance with DIN 18915 "Vegetation technology in landscaping — Soil work".

0.2.17 Type and scope of the required proof of suitability and quality for the materials to be supplied by the contractor.

0.2.18 Requirements and Evidence for Compaction.

0.2.19 Specifications resulting from expert reports, in particular from geotechnical reports in accordance with DIN 4020, DIN EN 1997-2 "Eurocode 7: Design, calculation and design in geotechnics — Part 2: Exploration and investigation of the subsoil

and DIN EN 1997-2/NA "National Annex — Nationally determined parameters — Eurocode 7: Design, calculation and design in geotechnics — Part 2: Exploration and investigation of the subsoil" as well as on hydrogeology, and to what extent these specifications are to be observed during execution.

0.2.20 Requirements resulting from water law permits.

0.2.21 Collecting and draining surface water from adjacent areas as well as groundwater, strata water, spring water and leachate water.

0.2.22 Forming the connections of earthworks to structures.

0.2.23 Installation of geosynthetics.

0.2.24 Number, type, location, dimensions and masses of built-in parts, e.g. subsidence levels, shaft rings, pipes.

0.2.25 Specifications from geotechnical calculations.

0.2.26 Cleaning exposed components.

0.2.27 Protective and security measures for installations at risk.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 3.1.1 if the construction method, the construction process, the conveyor routes or the type and use of the equipment are to be specified to the Contractor,

Section 3.1.7 if other surface deviations from the target dimensions are to apply.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units, separated according to type, substances, homogeneous areas and dimensions, are to be provided as follows:

Loosening, loading, conveying and installation according to room dimensions (m3), area dimensions (m2) or mass (t), staggered according to the lengths of the conveying paths, insofar as the conveying distance exceeds 50 m,

Stone packs, stone throwing, soil deliveries and the like according to volume (m3), area (m2) or mass (t),

Compacting according to volume (m3) or area (m2),

Establishing and restoring the planned height, inclination, flatness according to area (m2),

Manufacture of assembly and drawing pits, head holes, search slots and digging according to room dimensions (m3) or number (St),

Loosening, loading and conveying of building remains, large blocks and the like according to volume (m3), number (St) or mass (t),

Cleaning according to surface area (m2).

1 Scope of application

1.1 ATV DIN 18300 "Earthworks" applies to the loosening, loading, conveying, installation and compaction of soil, rock and other materials.

It also applies to earthworks in connection with

Shoring work (see ATV DIN 18303 "Shoring work"),

drainage canal work (see ATV DIN 18306 "Drainage canal work"),

Pressure pipeline work outside buildings (see ATV DIN 18307 "Pressure pipeline work outside buildings"),

drainage and infiltration work (see ATV DIN 18308 "Drainage and infiltration work") and

Cable line civil engineering work (see ATV DIN 18322 "Cable line civil engineering work").

1.2 ATV DIN 18300 does not apply to

topsoil work and clearing work as well as the protection of trees, plant populations and vegetation areas (see ATV DIN 18320 "Landscape construction work"),

the removal of the soil between the front and rear of infill elements during shoring work (see ATV DIN 18303 "Shoring work"),

Services for backfilling the pipeline zone (see ATV DIN 18306 "Drainage sewer work", ATV DIN 18307 "Pressure pipeline work outside buildings" and ATV DIN 18322 "Cable line civil engineering work"),

the earthworks to be carried out during dredging work (see ATV DIN 18311 "Dredging work") and

the earthworks to be carried out during underground mining work (see ATV DIN 18312 "Underground construction work").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18300 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

2.1 General

2.1.1 The services do not include the supply of soil, rock and other materials.

2.1.2 If soil, rock and other materials are to be delivered by the Contractor, the delivery shall also include unloading and storage on the construction site.

2.1.3 Pipes within the meaning of ATV DIN 18300 are drainage, drainage, seepage and pipelines, cables and protective pipes as well as corresponding sewers.

2.2 Description of soil and rock

The following apply to the investigation, naming and description of soil and rock:

DIN 4020 Geotechnical investigations for structural purposes — Supplementary regulations to DIN EN 1997-2

DIN 4094-4 Subsoil — Field investigations — Part 4: Wing shear tests

DIN 18125-2 Subsoil, Examination of Soil Samples — Determination of Soil Density — Part 2: Field Tests

DIN 18126 Subsoil, Examination of Soil Samples — Determination of the Density of Non-Cohesive Soils with Loosest and Densest Storage

DIN 18128 Subsoil — Examination of soil samples — Determination of ignition loss

DIN 18141-1 Subsoil — Examination of rock specimens — Part 1: Determination of uniaxial compressive strength

DIN 18196 Earthworks and foundation engineering — Soil classification for structural purposes

DIN EN 1997-2 Eurocode 7: Design, calculation and design in geotechnics — Part 2: Exploration and investigation of the subsoil

DIN EN 1997-2/NA National Annex — Nationally defined parameters — Eurocode 7: Design, calculation and design in geotechnical engineering — Part 2: Exploration and investigation of the subsoil

DIN EN ISO 14688-1 Geotechnical exploration and investigation — Designation, description and classification of soil — Part 1: Designation and description

DIN EN ISO 14688-2 Geotechnical exploration and investigation — Designation, description and classification of soil — Part 2: Principles for soil classifications

DIN EN ISO 14689 Geotechnical Exploration and Investigation — Naming, Description and Classification of Rock

DIN EN ISO 17892-1 Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 1: Determination of water content

DIN EN ISO 17892-2 Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 2: Determination of soil density

DIN EN ISO 17892-4 Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 4: Determination of grain size distribution

DIN EN ISO 17892-7 Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 7: Uniaxial pressure test

DIN EN ISO 17892-8 Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 8: Unconsolidated undrained triaxial test

DIN EN ISO 17892-12 Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 12: Determination of flow and roll-out limits

DIN EN ISO 22475-1 Geotechnical Exploration and Investigation — Sampling Methods and Groundwater Measurements — Part 1: Technical Principles of Execution

2.3 Classification of soil and rock into homogeneous areas

Soil and rock are homogeneous according to their condition before dissolving areas. The homogeneous range is a limited range, consisting of of single or several layers of soil or rock, which is used for earthworks. has comparable properties.

If environmentally relevant ingredients are to be taken into account, these must be used in the classification in homogeneous areas.

For the homogeneous ranges, the following properties and characteristic values as well as their determined bandwidth. Below are the standards or Recommendations are given with which these parameters are to be checked if necessary. If several methods of determination are possible, a standard or recommendation.

For soil:

- local designation,
- Grain size distribution with grain strips according to DIN EN ISO 17892-4,
- Mass fraction of stones, blocks and large blocks according to DIN EN ISO 14688-1;
- Determination by sorting out and measuring or sieving, then
- weigh and then refer to the corresponding excavated mass,
- Moisture density according to DIN EN ISO 17892-2 or DIN 18125-2,
- Undrained shear strength according to DIN 4094-4 or DIN EN ISO 17892-7
- oder DIN EN ISO 17892-8,
- Water content according to DIN EN ISO 17892-1,
- Plasticity coefficient according to DIN EN ISO 17892-12,
- consistency number according to DIN EN ISO 17892-12,
- Associated storage density: Designation according to DIN EN ISO 14688-2,
- Determination according to DIN 18126,
- organic content according to DIN 18128 and
- Floor assemblies according to DIN 18196.

For construction measures in geotechnical category GK 1 according to DIN 4020, the following information is sufficient: soil assemblies according to DIN 18196, mass fraction of stones, blocks and large blocks according to DIN EN ISO 14688-1, consistency and plasticity according to DIN EN ISO 14688-1, storage density.

For rock:

- Local name
- Naming of Fels according to DIN EN ISO 14689,
- Moisture density according to DIN EN ISO 17892-2,
- Weathering and changes, variability according to DIN EN ISO 14689,

- uniaxial compressive strength of the rock according to DIN 18141-1 and
- Separation surface direction, separation surface distance, rock body shape according to DIN EN ISO 14689.

For construction measures in geotechnical category GK 1 according to DIN 4020, the following information is sufficient: designation of rock, weathering and changes, variability as well as direction of the separation surface, separation surface distance, rock body shape, in each case according to DIN EN ISO 14689.

2.4 Description and classification of artificial floors and other materials

As far as possible, artificial soils, e.g. backfills and other substances, e.g. components, recycled materials, industrial by-products, waste and soils with foreign components are described in accordance with Section 2.2 and classified in accordance with Section 2.3. If this is not possible, they are specifically described with regard to their properties for earthworks.

3 Execution
In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General
3.1.1 The choice of the construction method, the construction process and the conveyor routes as well as the selection and use of the equipment are the responsibility of the Contractor.
3.1.2 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- deviations of soil, rock and water conditions from the specifications,
- Deviations of the stock from the specifications.

3.1.3 Endangered structures must be secured; DIN 4123 "Excavations, foundations and underpinnings in the area of existing buildings" must be observed. In the case of protective and security measures, the regulations of the owners or other authorised to issue instructions. The required services are special services (see section 4.2.1).

3.1.4 DIN 4124 "Excavations and ditches — embankments, shoring, working space widths" must be observed.

3.1.5 If the location of pipes, markings, obstacles and structures cannot be specified before the work is carried out, they must be explored. The services for such explorations are Special Services (see Section 4.2.1).

3.1.6 If cavities or obstacles are unexpectedly encountered, e.g. pipes, sewers, markings, building remains, the Client must be informed immediately. The required benefits must be determined jointly. These services are special services (see section 4.2.1).

If it is to be suspected that the obstacles are explosive ordnance, the work must be stopped immediately and the responsible authority and the client must be notified werden. Die

notwendigen Sicherungsleistungen hat der Auftragnehmer unverzüglich durchzuführen. Die as well as the other services to be determined jointly are special services (see section 4.2.1).

3.1.7 Deviations of the surface from the target dimensions may not be allowed in the case of floors on
no more than 10 cm in any place and no more than 50 cm in the case of rock
amount to.

The minimum dimensions for workspace widths must not be undercut.

3.2 Preparing, operating and securing the construction site

3.2.1 Before the start of the work, a joint inspection with the
client. The condition of the existing upper
surfaces, fortifications and borders as well as the adjacent buildings
(see § 3 para. 4 VOB/B).

3.2.2 Boundary stones and official landmarks may only be erected with the consent of the client. Client's fixed points for the construction dimension
the contractor must secure the removal of the property.

3.2.3 Damage from weather events with which the Contractor
does not normally have to reckon with, the contracting authority shall be informed immediately of the
allocate. The benefits for the measures to be taken are common
and, insofar as the Contractor is not responsible for any special
benefits (see section 4.2.1).

3.3 Loosening rock
The loosening of rock must be carried out in such a way that the remaining rock outside the target profile is loosened as little as possible. Loosened stones and Blocks are to be removed at steeper slopes of 1:1.5.

3.4 Installation and compaction

3.4.1 Are fillings necessary for the planned construction of the foundation level these must be compacted in such a way that the storage density is at least corresponds to that of the existing soil. The required services are,
insofar as the contractor is not responsible, special services (see
Section 4.2.1).

3.4.2 If specified requirements are met despite suitable compaction
equipment, working methods and layer thicknesses, this is not the order without delay. The benefits for the measures to be taken
shall be determined jointly and, unless agreed by the contractor, shall be Special achievements (see section 4.2.1).

3.4.3 Mineral seals must be protected against the effects of the weather,
especially against dehydration.

3.4.4 Sludge from soil for backfilling is only permitted with the consent of the client.

3.4.5 Frozen soils may not be installed.

3.4.6 Frozen layers must not be compacted and must only be filled over if no damage can occur.

3.5 Making embankments

3.5.1 If embankments are to be fortified, the fortifications must be immediately after the embankments have been constructed, also in sections.
Embankments remain for reasons for which the contractor is not responsible unpaved, are services for backup or restoration
Special services (see section 4.2.1).

3.5.2 If, during the construction of embankments, there is a risk of: landslides or erosion, the Contractor shall immediately remove the necessary measures to prevent harm and to ensure that the Client without delay. The provided as well as the other
To the extent that the Contractor is not responsible for services, special services are benefits (see section 4.2.1).

3.6 Construction pits and trenches

3.6.1 Foundation and ditch bottoms must not be loosened.

3.6.2 In the case of excavation pits, the foundation level must be covered by the client.

4 Ancillary services, special services

4.1 In addition to ATV DIN 18299, Section 4.1, especially:

4.1.1 Determination of the condition of the road and terrain surfaces, the receiving waters and the like in accordance with § 3 para. 4 VOB/B.

4.1.2 Construction of temporary accesses, driveways and the like, except for services according to section 4.2.16.

4.1.3 Tests including sampling for the agreed proof of suitability and quality, including proof of environmentally relevant requirements for substances, mixtures of substances as well as soil and rock to be supplied by the Contractor.

4.1.4 Conveying soil and rock ≤ 50 m.

4.1.5 Construction of inclined excavation levels for the harmless drainage of rainwater from soil and rock, which can change its properties unfavourably when water enters.

4.2 Special services are in addition to ATV DIN 18299,
Section 4.2, e.g.:

4.2.1 The information provided for in Sections 3.1.3, 3.1.5, 3.1.6, 3.2.3, 3.4.1, 3.4.2, 3.5.1 and 3.5.2.

4.2.2 Services for determining the condition of the structural facilities
including roads and supply and disposal facilities
Start of earthworks beyond the services referred to in section 4.1.1.

4.2.3 Loosening, loading, separating, transporting and disposing of structures
anchors, geosynthetics, injection bodies and other substances.

4.2.4 Disposing of loosened soil and rock.

4.2.5 Loosening, loading, transporting and disposing of blocks and large
blocks in walls or bottoms of excavations and trenches as well as backfilling
of the resulting cavities.

4.2.6 Services for the maintenance of watercourses and receiving watercourses.

4.2.7 Breaking up and restoring paved surfaces.

4.2.8 Excavation and backfilling of working spaces for cable connections.

4.2.9 Soil and water investigations as well as water level measurements

except for studies referred to in section 4.1.3.
4.2.10 Installation of geosynthetics.

4.2.11 Securing embankments, areas and slag heaps.

4.2.12 Proof of stability, insofar as the necessity for this is not caused by the Contractor.

4.2.13 Restoration of the planned height, inclination, flatness and compaction, insofar as the Contractor is not responsible.

4.2.14 Additional services on steep sections or in the case of a ditch bottom with little load-bearing capacity or a high level of water.

4.2.15 Cleaning of exposed components from soil adhesions.

4.2.16 Construction, maintenance and dismantling of barriers and fortifications to maintain public transport and local traffic, in particular on the basis of official orders.

4.2.17 Testing of the foundation base for suitability.

4.2.18 Removal of foreign bodies before backfilling or backfilling structures and ditches.

4.2.19 Treatment, improvement or preparation of soil and rock for reconstruction.

4.2.20 Services to prove the suitability and quality of the materials, insofar as they are required by the Client beyond Section 4.1.3.

4.2.21 Collecting and draining surface water from adjacent areas as well as groundwater, strata water, spring water and seepage water.

4.2.22 Steps or other securing measures in the case of inclined surfaces, except for the Contractor's own purposes.

4.2.23 Removal of agreed protective layers on the foundation floor.

5 Billing
In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General
The determination of the performance — regardless of whether it is carried out according to drawings or measurements — shall be based on the dimensions of the earthworks.

5.2 Determination of dimensions/quantities

5.2.1 Approximation methods are permissible for quantity determination.

5.2.2 The quantities withdrawn are to be determined by means of the ablation.

5.2.3 The installed quantities are to be determined in the finished state in the order.

5.2.4 The length of the conveyor path shall be the shortest reasonable distance between the focal points of the removal and coating bodies.

5.2.5 If there are no specifications, a slope angle of 45° shall apply to sloped excavations and ditches for the determination of the dimensions of the embankment space, 60° for fine-grained soils with a stiff consistency of at least and 80° for rock. Necessary berms must be taken into account when determining the embankment area.

5.2.6 The dimensions of the excavation pit base are based on the external dimensions of the building plus the minimum widths of accessible work spaces in accordance with DIN 4124 and the dimensions required for formwork structures.

5.2.7 If shoring is to be installed in the course of the excavation, the dimensions of the shoring structure must be taken into account in addition. In the case of sheet piling, the middle axis is used as the external dimension.

5.2.8 The width of the bottom of the ditch is determined by the minimum width

1. of ditches for drainage sewers and drainage pipes in accordance with DIN EN 1610 "Installation and testing of sewers and sewers" and
2. of other trenches in accordance with DIN 4124, in each case plus the required dimensions for formwork and shoring structures.

5.2.9 The billing for the cleaning of exposed components or the exposed shoring is based on the area worked in the processing.

5.2.10 In the case of billing by mass, this is to be determined by weighing, in the case of shiploads by ship's oak.

5.3 Overmeasurement rules

5.3.1 In the case of billing according to room dimensions, the following are measured: Buildings ≤ 1 m3 individual size and Pipes, seepage bodies, stone packs and the like with an external cross-section ≤ 0.1 m2.

5.3.2 In the case of billing according to area measurements, penetrations and fixtures are measured ≤ 1 m2 individual size.

5.4 Individual provisions

No regulations

VOB Part C:
General Technical Terms and Conditions of Contract for Construction Work (ATV) Drilling Work — DIN 18301
Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 Information on surface and underground waters, e.g. current velocities, water levels, artesian groundwater, runoffs, waves, tidal movements, storm surges, as well as wind conditions.

0.1.2 Information on existing and planned groundwater lowering or groundwater impoundment.

0.1.3 Limit values, requirements, conditions and fees for the disposal of process water.

0.1.4 Type and extent of growth, in particular shrubs and trees, on the areas to be cleared.

0.1.5 Type, location and dimensions as well as owners of natural and artificial cavities as well as known obstacles, e.g. anchors, injection bodies from previous construction measures.

0.1.6 Foundation depths, types of foundations, loads and constructions of adjacent structures.

0.1.7 Type, location, dimensions, accessibility, nature and load-bearing capacity of the work plan or the subsoil for the work plan, in particular restrictions on the working height.

0.1.8 Possibilities for arranging supply and return pipes to be laid above or below ground as well as the mixing and regeneration system for the support fluids or drilling fluids to be used, especially in the area of traffic areas.

0.1.9 Possibilities for intermediate storage of the drilling material.

0.2 Information on the execution

0.2.1 In the case of drilling for geotechnical exploration and investigation, all available information on the geological and hydrogeological situation, on existing boreholes and the like and, as far as possible, description and classification of soil, rock and other substances in accordance with Section 2.

0.2.2 Description and classification of soil, rock and other substances according to Section 2.

0.2.3 Results of soundings to determine storage densities.

0.2.4 Significant changes in the properties and conditions of soil, rock and other substances after dissolving.

0.2.5 Specifications resulting from expert opinions.

0.2.6 Type of drilling method.

0.2.7 Sampling categories and sampling equipment according to DIN EN ISO 22475-1 "Geotechnical exploration and investigation — Sampling methods and groundwater measurements — Part 1: Technical basics of execution" as well as sampling depths. Number and recipients of samples.

0.2.8 Requirements for the handling, transport and storage of samples according to DIN EN ISO 22475-1.

0.2.9 Type and number of measurements and investigations in the borehole.

0.2.10 End diameter and drilling length for each hole.

0.2.11 Location and height of the drill starting point in the site plan and permissible deviations.

0.2.12 Direction and inclination of the drilling axis and permissible deviations. Specification of measurement methods.

0.2.13 Measures for drilling in swelling or swelling soils and rock, e.g. in anhydrite-bearing subsoil.

0.2.14 Measures for drilling in the area of influence of drinking and mineral water extraction areas as well as in gas-bearing subsoil.

0.2.15 Water pressure levels and flow velocities in the affected aquifers and soil permeability coefficients.

0.2.16 Effects of the subsoil on support fluids or drilling fluids used in connection with drilling work.

0.2.17 Risk of sudden loss of the support fluids or drilling fluids used due to pathways in the subsoil and resulting services, e.g. maintaining a minimum stock.

0.2.18 Excavation treatment services.

0.2.19 Use, type and disposal of support fluids and drilling fluids used as well as the required verifications.

0.2.20 The nature, dimensions, nature and load-bearing capacity of the work planum or the subsoil for the work plan.

0.2.21 Requirements for Drilling Templates.

0.2.22 Requirements for borehole backfilling.

0.2.23 Measures for drilling in rock with a uniaxial compressive strength of 120 N/mm2 or more, e.g. pre-drilling with small hole drilling, chiseling, blasting.

0.2.24 Documentation Requirements.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 3.1.1, if the choice of the construction process, the equipment to be used or the support fluids or drilling fluids used and their removal are to be specified to the Contractor,

Section 3.1.4, if drilling is not to be carried out in accordance with the standards specified in Section 3.1.4,

Section 3.3 if drill pipes are not to be pulled.

0.4 Individual information on fringe benefits and special benefits

As an ancillary service, for which a special atomic number (position) is to be provided under the conditions of ATV DIN 18299, Section 0.4.1, the relocation of the drilling equipment from drill approach point to drill approach point in drilling for geotechnical exploration and investigation (see Section 4.1.3) is particularly considered.

0.5 Billing Units

In the bill of quantities, the billing units are to be provided as follows:

- drilling according to length (m), separated according to the final diameters of the boreholes, depths (from the top of the work planum to the final depth), homogeneous areas or artificial soils (fillings) and other materials, e.g. concrete, reinforced concrete, steel, masonry, as well as separately according to drilling method,
- Manufacture and removal of drilling templates for individual holes by number (st),

- Additives for support fluids and drilling fluids by mass (kg, t),
- Relocation of the drilling equipment, separated according to the distances between the drilling attachment points, by number (pcs),
- Conversion of the drilling equipment according to number (St),
- Collection, handling, transport and storage of samples, separately by species, by number (St),
- Pipes remaining in the ground, including pipe joints, separated according to outer diameters, wall thicknesses and overall lengths, according to length (m),
- Removal of obstacles by working hours (h),
- materials for filling and sealing boreholes according to length (m), Volume (m3) or mass (kg, t),
- Assistance and waiting times for measurements and investigations at the open Borehole by Working Time (h),
- Replacement of the loss of the supporting fluids or drilling fluids used after Dimensions (m3),
- Filling of bores according to length (m), separated by diameter, Dimensional dimension (m3) or mass (kg, t).

1 Scope of application

1.1 ATV DIN 18301 "Drilling work" applies to boreholes of any type, inclination and depth, in particular

- for geotechnical exploration and investigation of subsoil and groundwater, for water extraction and water discharge, for groundwater lowering, for drainage, degassing and for the extraction of geothermal energy,
- for press-fit work, jet blasting work, bored and grouted piles as well as for bored pile, shoring and sealing walls,
- for the installation of load-bearing elements, anchors, geothermal probes and measuring devices, for overdrilling, e.g. for the maintenance, repair and dismantling of wells, groundwater measuring points and geothermal probes, as well as for the backfilling of boreholes that are no longer used, and
- for loosening, obstacle removal and soil replacement drilling.

1.2 ATV DIN 18301 does not apply to

- the expansion of boreholes (see ATV DIN 18302 "Work on the expansion of boreholes"),
- pipe jacking work (see ATV DIN 18319 "Pipe jacking work") and
- Drilling work in buildings (see ATV DIN 18459 "Demolition and demolition work").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18301 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

2.1 Description of the subsoil

The following apply to the investigation, naming and description of the subsoil:

DIN 4020	Geotechnical investigations for structural purposes — Supplementary regulations to DIN EN 1997-2
DIN 4023	Geotechnical exploration and investigation — Graphic representation of the results of drilling and other direct outcrops
DIN 4030-1	Assessment of concrete-attacking waters, soils and gases — Part 1: Principles and limit values
DIN 4094-4	Subsoil — Field investigations — Part 4: Wing shear tests
DIN 18126	Subsoil, Examination of Soil Samples — Determination of the Density of Non-Cohesive Soils with Loosest and Densest Storage
DIN 18196	Earthworks and foundation engineering — Soil classification for structural purposes
DIN EN 1997-2	Eurocode 7: Design, calculation and design in geotechnics — Part 2: Exploration and investigation of the subsoil
DIN EN 1997-2/NA	National Annex — Nationally defined parameters — Eurocode 7: Design, calculation and design in geotechnical engineering — Part 2: Exploration and investigation of the subsoil
DIN EN ISO 14688-1	Geotechnical exploration and investigation — Designation, description and classification of soil — Part 1: Designation and description
DIN EN ISO 14688-2	Geotechnical exploration and investigation — Designation, description and classification of soil — Part 2: Principles for soil classifications
DIN EN ISO 14689	Geotechnical Exploration and Investigation — Naming, Description and Classification of Rock
DIN EN ISO 17892-1	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 1: Determination of water content
DIN EN ISO 17892-4	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 4: Determination of grain size distribution
DIN EN ISO 17892-7	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 7: Uniaxial pressure test
DIN EN ISO 17892-8	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 8: Unconsolidated undrained triaxial test
DIN EN ISO 17892-9	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 9: Consolidated triaxial compression tests on water-saturated soils
DIN EN ISO 17892-10	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 10: Direct shear tests

DIN EN ISO 17892-12	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 12: Determination of flow and roll-out limits
DIN EN ISO 22475-1	Geotechnical Exploration and Investigation — Sampling Methods and Groundwater Measurements — Part 1: Technical Principles of Execution
NF P18-579	Aggregates — Determination of the coefficients of abrasiveness and grindability1) .

2.2 Classification of soil and rock into homogeneous areas

2.2.1 General

Soil and rock are to be divided into homogeneous areas according to their condition before release. The homogeneous area is a limited area, consisting of single or several layers of soil or rock, which has comparable properties for drilling work.

If environmentally relevant ingredients are to be taken into account, they must be taken into account when dividing them into homogeneous areas.

For the homogeneous ranges, the following properties and characteristic values as well as their determined bandwidth must be given. Below are the standards or recommendations with which these parameters may have to be verified. If several methods of determination are possible, a standard or recommendation must be established.

For soil:

- local designation,
- Grain size distribution with grain strips according to DIN EN ISO 17892-4,
- Mass fraction of stones, blocks and large blocks according to DIN EN ISO 14688-1; Determination by sorting and measuring or sieving, then weighing and then relating to the corresponding excavated mass,
- Cohesion according to DIN EN ISO 17892-9 and DIN EN ISO 17892-10,
- undrained shear strength according to DIN 4094-4 or DIN EN ISO 17892-7 or DIN EN ISO 17892-8,
- Water content according to DIN EN ISO 17892-1,
- plasticity number according to DIN EN ISO 17892-12, □ consistency number according to DIN EN ISO 17892-12,
- Associated storage density: Designation according to DIN EN ISO 14688-2, Determination according to DIN 18126,
- Abrasiveness according to NF P18-579 and
- Floor assembly according to DIN 18196.

For rock:

- local designation,
- Naming of Fels according to DIN EN ISO 14689,
- Weathering and changes, variability according to DIN EN ISO 14689,

- uniaxial compressive strength of rock according to DIN 18141-1, subsoil — Examination of rock samples — Part 1: Determination of uniaxial compressive strength,
- Separation surface direction, separation surface distance and rock body shape according to DIN EN ISO 14689 and
- Abrasiveness according to DGGT Recommendation No. 23: "Determination of the Abrasiveness of Rocks with the CERCHAR Test" of AK 3.3 "Rock Experimental Technology"2) .

2.2.2 Homogeneous areas for drilling for geotechnical exploration and investigation

Homogeneous areas are to be defined according to the available information about the subsoil. These are to be derived from geological maps or old documents. In this context, it must be stated whether the

- cohesive, non-cohesive or organic soils,
- Rock or Steps of Weathered Rock

Is.

2.3 Description and classification of artificial floors and other materials

As far as possible, artificial soils, e.g. backfills, and other substances, e.g. components, recycled materials, industrial by-products, waste and soils with foreign components, e.g. tree roots, are described in accordance with Section 2.1 and classified in accordance with Section 2.2. If this is not possible, they are specifically described with regard to their properties for drilling work.

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 The choice of the construction process, the equipment to be used as well as the support fluids or drilling fluids used and their disposal are the responsibility of the Contractor. The drilling must be carried out in such a way as to avoid soil extraction outside the drilling diameter.

3.1.2 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- deviations of the work plan from the specifications,
- Deviations of the subsoil from the specifications.

3.1.3 Endangered structures must be secured; DIN 4123 "Excavations, foundations and underpinnings in the area of existing buildings" must be observed. In the case of protective and security measures, the regulations of the owners or other persons authorised to issue instructions must be observed. The required services are special services (see section 4.2.1).

3.1.4 The following shall apply to the execution of boreholes:

- for drilling for geotechnical exploration and investigation: DIN EN ISO 22475-1
- for bored piles: DIN EN 1536 "Execution of work in special civil engineering — Bored piles"
- for grouted anchors: DIN EN 1537 "Execution of work in special civil engineering — grouted anchors"
- for jet blasting methods: DIN EN 12716 "Execution of work in special civil engineering — Jet blasting method"
- for micropiles: DIN EN 14199 "Execution of works in special civil engineering — Micropiles" for soil nailing: DIN EN 14490 "Execution of work in special civil engineering — Soil nailing"
- for deep soil stabilization: DIN EN 14679 "Execution of special geotechnical works (special civil engineering) — Deep soil stabilization"
- for displacement piles: DIN EN 12699 "Execution of work in special civil engineering — Displacement piles"
- DVGW W 121 "Construction and expansion of groundwater measuring points"3)
- DVGW W 123 "Construction and expansion of vertical filter wells"3) .

3.1.5 Before the start of the drilling work, the Contractor shall assume the position and height of the drilling starting points specified by the Client. The location of the drilling starting point and its height must be measured by the contractor and entered in the site plan specified by the client.

3.1.6 The selected drilling tools as well as support fluids and drilling fluids shall be named to the Client upon request.

3.1.7 If cavities or obstacles are unexpectedly encountered, or if drill pipes, drill pipes or drilling tools can no longer be moved for reasons for which the Contractor is not responsible, if no drilling progress can be achieved or if the drilling axis deviates from the agreed direction, the Client shall be informed of this immediately. The required benefits must be determined jointly. These services are special services (see section 4.2.1). If it is to be assumed that the obstacles are explosive ordnance, the work must be stopped immediately and the responsible authority and the client must be notified. The Contractor must carry out the necessary security services without delay. The required benefits must be determined jointly. The services provided and the other services are special services (see section 4.2.1).

3.1.8 Exceptional findings, e.g. in the nature and colour of the subsoil, in the smell or colour of the water, water or soil upwelling, water leakage over the terrain, strong subsidence of the water surface, gas deposits, cavities in the subsoil, must be observed, reported to the Client immediately and documented. The Contractor must carry out the necessary security services without delay. The other services are common

Set. The services provided as well as the other services are special services (see section 4.2.1).

3.2 Production and documentation

3.2.1 Drilling for geotechnical exploration and investigation must be documented in accordance with DIN EN ISO 22475-1

In the case of drilling for piles, grouted anchors, jet blasting work, soil nailing and the like, drilling protocols must be kept that meet the requirements of the respective standard for execution. For all boreholes, at least the following information is required erforderlich: □ Designation and final depth, □ Date and time of start and end, □ Type and composition of the support fluids or drilling fluids.

3.2.2 The service includes the conveying of the drilling material up to a maximum distance of 50 m from the drilling starting point.

3.3 Dismantling of drill pipes, drill pipes and drilling tools

Drill pipes, drill pipes and drilling tools must be pulled after the drilling purpose has been reached. If they cannot be drawn, the contractor must notify the client immediately. The required services and the replacement of the parts remaining in the borehole in whole or in part are special services, unless the Contractor is responsible for the cause (see Section 4.2.1). The replacement of parts remaining in the borehole is based on the current value.

3.3 Dismantling of drill pipes, drill pipes and drilling tools

Drill pipes, drill pipes and drilling tools must be pulled after the drilling purpose has been reached. If they cannot be drawn, the contractor must notify the client immediately. The required services and the replacement of the parts remaining in the borehole in whole or in part are special services, unless the Contractor is responsible for the cause (see Section 4.2.1). The replacement of parts remaining in the borehole is based on the current value.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Maintaining the work plan.

4.1.2 Determination of the condition of the road and terrain surfaces, the receiving waters and the like in accordance with Section 3 (4) VOB/B.

4.1.3 Relocation of the drilling equipment from drill collar to drill collar, except for services according to section 4.2.6.

4.1.4 Disposing of the support fluids or drilling fluids, unless these are required by the Client. Proof of disposal must be provided to the client.

4.1.5 Additional consumption of support fluids or drilling fluids up to 10% of the respective theoretical volume.

4.1.6 When using support fluids, the production, provision and removal of splash guards up to a height of 2 m from the top of the work planum.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 The Special Benefits listed in Sections 3.1.3, 3.1.7, 3.1.8, 3.2.3, 3.2.5 and 3.3.

4.2.2 Services for special measures to determine the condition of the structural facilities, including the roads, as well as the supply and disposal facilities before the start of drilling work, e.g. expert opinions, camera inspections, load-bearing capacity tests.

4.2.3 Construction, fastening, strengthening and removal of the work plan, parking and storage areas as well as access roads, bridges and the like on areas provided by the Client.

4.2.4 Removal of growth, stones, blocks and building remains.

4.2.5 Reconnaissance and security measures with regard to suspected or known explosive ordnance.

4.2.6 Relocation of the drilling equipment from drill collar to drill attachment point and conversion of the drilling rig for reasons for which the Contractor is not responsible.

4.2.7 Manufacture, provision and removal of splash protection or noise protection devices, except for services in accordance with section 4.1.6.

4.2.8 Taking of gas samples and determination of the type of gas, the amount of gas and the gas pressure.

4.2.9 Supply, filling, labeling and holding containers for soil, rock, water and gas samples.

4.2.10 Collection, handling, transport and storage of samples

4.2.11 Water level measurements in existing wells, groundwater measuring points and bodies of water.

4.2.12 Conveying the drilling material and the supporting fluids or drilling fluids used to an interim storage facility over a distance of 50 m.

4.2.13 Disposing of the drilling material. Proof of disposal must be provided to the client.

4.2.14 Disposing of the support fluid or the drilling fluid provided with flushing additives, insofar as the support fluid or the additives are required by the Client. Proof of disposal must be provided to the client.

4.2.15 Adjustment of the rinsing additives in the event of subsoil conditions deviating from the specification.

4.2.16 Services at the open borehole for carrying out measurements and investigations.

4.2.17 Carrying out measurements in the borehole, e.g. inclination, course of the borehole, condition of the borehole wall.

4.2.18 Measurement of the bore according to position and height. Creation of a site or as-built plan.

4.2.19 Provision of drill pipes in the subsoil for observations as well as structural or geotechnical investigations.

4.2.20 Graphic representation of the drill results.

4.2.21 Filling of the boreholes in accordance with DIN EN ISO 22475-1.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

No regulations.

5.2 Determination of dimensions/quantities

5.2.1 If the drill collar is at the same height as the work planum, the drill length is calculated from the work planum to the agreed final depth. In the case of inclined boreholes, the drilling length is calculated from the respective drilling starting point.

5.2.2 The length of support casing shall be calculated from the top of the work planum to the drilling attachment point plus the penetration depth of the casing under its own weight for the diameter used. The length of pre-casing is calculated from the upper edge of the work planum to the drilling attachment point for the diameter used.

5.3 Overmeasurement rules

No regulations.

5.4 Individual provisions

Boreholes that have to be abandoned will be billed up to the depth reached, unless the contractor is responsible for the cause.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Work on the Expansion of Boreholes — DIN 18302

Edition September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 Limit values, requirements, conditions and fees for the disposal of pumped water and process water.

0.1.2 Dimensions, accessibility and load-bearing capacity of the work areas, in particular restriction of working height.

0.1.3 Dimensions of the bore.

0.2 Information on the execution

0.2.1 Purpose of the borehole drilled.

0.2.2 Construction method, type of expansion and dismantling for

- wells, groundwater measuring points and landfill degassing wells, e.g. by
  - filter and solid wall pipes,
  - casing pipes,
  - filter fabric,

    - filter gravel,
- other purposes, e.g. by
    - support elements,
    - filling materials
    - Probes and measuring pipes
    - geothermal elements
    - Injection pipes

0.2.3 Measures to protect neighboring structures.

0.2.4 Type and design of terminal structures and well heads.

0.2.5 Planned well capacity, geothermal extraction capacity and intended conveying facility according to type, pumping capacity and installation location.

0.2.6 Intended loads, in particular impacts, tensile, compressive and bending loads.

0.2.7 Intended useful life.

0.2.8 Disinfecting filter gravel before installation.

0.2.9 Specifications for the introduction of fillers, e.g. with or without a bulk pipe.

0.2.10 Specifications for the introduction of fillers, e.g. with or without a bulk pipe. 0.2.10 Length, materials and methods of insertion of annular space filling outside the filter sections, including the sealing sections

0.2.11 Properties of the fillers:

- in the case of bulk materials, in particular sinking, swelling and physical properties, shape and size,
- In the case of suspensions, in particular requirements for swelling and physical properties, e.g. thermal conductivity, freeze-thaw resistance, minimum density, W/Z value, cement type and cement quality as well as setting heat.

0.2.12 Sealing of borehole sections against water-bearing layers and surface water.

0.2.13 Intended measuring devices

0.2.14 Duration and staggering of the pumping capacity and the pumping head at pump.

0.2.15 Type and extent of development and desanding of wells and groundwater measuring points.

0.2.16 Permissible residual sand content.

0.2.17 Number and type of samples required, e.g. water samples, reserve samples.

0.2.18 Number and type of geophysical and other studies required**.**

0.2.19 Special requirements for the design of pile foot extensions and pile heads as well as their reinforcements.

0.2.20 Special physical and chemical stresses to which substances and components are exposed after installation.

0.2.21 Data

- to yield,
- for a certain lowering of the groundwater surface,
- on the hydraulic, chemical and bacteriological properties of groundwater,
- on physical properties, e.g. thermal conductivity of subsoil and groundwater.

0.3 Details of deviations from the ATVs

If regulations other than those provided for in this ATV are to be made, these must be clearly and individually stated in the service description.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulations to ATV DIN 18299, Section 0.4.

0.5 Billing Units

- In the bill of quantities, the billing units are to be provided as follows:
- Pipes with joints and seals, separated by materials, diameters and wall thicknesses, by installation length (m),
- Filter tubes, separated according to types and substances, diameters, wall thicknesses and gap and slot widths, according to installation length (m),
- Centering and spacers, separated by type and measurement, by number (St),
- Filter sand, filter gravel and other bulk materials, separated according to grades and grain sizes, according to bulk height (m), volume (m3) or mass (kg, t),
- sealants, e.g. clay, suspensions, according to the height of the sealing layers (m), volume (m3) or mass (kg, t),
- gravel fill baskets, separated by diameter, by installation length (m),
- Well heads, valves, gate valves, water measuring devices, separated by types and dimensions, by number (St),
- Installation and removal of pumps for desanding and capacity pumping staggered according to delivery capacities in m3/h and delivery head in m, according to number (St)
- Provision of desanding and capacity pumps, staggered according to delivery capacities in m3/h and delivery head in m, according to duration (h, d, wo, mt),
- Operation of desanding and capacity pumps, staggered according to delivery capacities in m3/h and delivery head in m, according to duration (h, d, wo, mt),
- Taking of gas and water samples, separated by species, by number (St),
- geotechnical measuring equipment, separated by type, number (st) or length (m),
- geophysical measurements, separated by species, by length (m) or number (st) or by duration (h, d),
- Evaluation of geophysical measurements, separated by species, by number (St),
- Geothermal elements, staggered according to length in m, according to number (St),
- Concrete by room (m3),
- Concrete piles, graded according to diameter in mm, according to length (m),
- Preparation of pile heads, removal of foot extensions staggered according to diameter in mm, according to number (St),
- Steel beams, steel reinforcement by mass (kg, t)

- Load-bearing element, separated by type, staggered according to length in m, according to number (St).

Scope

1.1 Die ATV DIN 18302 'On work for the expansion of boreholes' shall apply to the lining of boreholes with

- Support elements
- Filling and sealing materials
- Probes, measuring pipes
- Well construction materials
- Geothermal elements
- Injection pipes

1.2 ATV DIN 18302 does not apply to:

- Press-fit work (see ATV DIN 18309 "Press-fit work"),
- horizontal directional drilling work (see ATV DIN 18324 "Horizontal directional drilling work") and
- Pipe jacking work (see ATV DIN 18319 "Pipe jacking work").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18302 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:
For the most common standardized materials and components, the DIN standards are listed below.

2.1 Tubes

DIN 4900-1	Steel filter and solid wall pipes for wells — Part 1: Solid wall pipes and slotted bridge filters
DIN 4900-2	Filter and solid wall pipes of steel for wells — Part 2: Winding wire filter pipes of stainless steel
DIN 4925 (all parts)	Filter and solid wall pipes made of plasticizer-free polyvinyl chloride (PVC-U) for wells
DIN 8061	Pipes made of plasticizer-free polyvinyl chloride (PVC-U) — General quality requirements, testing
DIN 8062	Plasticizer-free polyvinyl chloride (PVC-U) pipes — Dimensions
DIN 8074	Pipes made of polyethylene (PE) — PE 80, PE 100 — Metrics
DIN 8075	Polyethylene (PE) pipes — PE 80, PE 100 — General quality requirements, tests

DIN EN 10220	Seamless and welded steel tubes — General tables for dimensions and length-related masses
DIN EN 10255	Non-alloy steel ears suitable for welding and tapping — Technical terms of delivery
DIN EN 12201 (all parts)	Plastic piping systems for water supply and for drainage and sewage pressure pipelines — Polyethylene (PE)
DIN EN ISO 1452 (all parts)	Plastic piping systems for water supply and for underground and non-buried drainage and sewage pressure pipes — Plasticizer-free polyvinyl chloride (PVC-U)

2.2 Sands and gravel

2.2.1 Filter sands and filter gravel

DIN 4924 Sands and gravel for well construction — Requirements and test methods

2.2.2 Filling sands and filling gravel

DIN EN 12620	Aggregates for concrete
DIN EN 12904	Products for the treatment of water for human consumption — quartz sand and quartz gravel

2.3 Concrete, mortar

DIN 1045-2:2008-08	Structures of concrete, reinforced concrete and prestressed concrete — Part 2: Concrete — Specification, properties, manufacture and conformity — Rules of application of DIN EN 206-1
DIN EN 206-1:2001-07	Concrete — Part 1: Specification, properties, manufacture and conformity; German version EN 206-1:2000
DIN EN 934-2	Admixtures for concrete, mortar and grout — Part 2: Concrete admixtures — Definitions, requirements, conformity, marking and labelling
DIN EN 1008	Addition water for concrete — Specifications for sampling, testing and assessment of the suitability of water, including water produced during concrete production, as an addition of water for concrete
DIN EN 12794	Precast concrete elements — Foundation piles
DIN EN 13670	Execution of concrete structures

2.4 Steel products

DIN 4926	Steel well heads — DN 300 to DN 1200
DIN 4927	Steel flange risers for water conveyance — DN 50 to DN 200
DIN 4942	Steel threaded risers for water supply — DN 50 to DN 200

DIN 4945 (all parts) Riser pipes with tensile push-in connection for water delivery

DIN EN 10025-2 Hot-rolled structural steel products — Part 2: Non-alloy technical structural steels

DIN EN 10080 Steel for Reinforcement of Concrete — Reinforcing Steel Suitable for Welding — General

DIN EN 10210 (all parts) Hot-finished hollow sections for steel construction made of unalloyed structural steels and fine-grained structural steels

DIN EN 10219 (all parts) Cold-finished welded hollow sections for steel construction made of unalloyed structural steels and fine-grained structural steels

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 The Client shall determine the final depth of expansion in consultation with the Contractor.

3.1.2 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- unsuitable borehole for the planned expansion,
- unsuitable construction of the support, e.g. in the case of multiple groundwater measuring points in a borehole,
- insufficient specifications for desanding and development processes for wells and measuring points.

3.1.3 Boreholes must be drilled in such a way that a hydraulic connection of different aquifers is excluded.

3.1.4 Undeveloped sections of boreholes and annular spaces must be backfilled, in the case of cased boreholes in advance by pulling the pipes.

3.1.5 All installed materials and components remain in the subsoil. If these are to be dismantled, these are special services (see section 4.2.1).

3.1.6 In the event of unsuitable weather conditions, e.g. frozen ground, temperatures below 5 °C during concrete work and when inserting suspense, special precautions must be taken in consultation with the client. The services required for this are special services (see section 4.2.1).

3.1.7 The water levels in the borehole must be measured in height every day before the start of work, after the end of work and in the event of work interruptions, unless the borehole is removed immediately after sinking. The results must be documented and handed over to the client on a working day.

3.2 Installation of load-bearing elements

Load-bearing tendons, e.g. anchors, steel girders, precast concrete elements and the like, must be protected from damage during installation in the borehole.

3.3 Installation of fillers and sealants

3.3.1 The installation of materials and components is carried out in accordance with DIN EN 1536 "Execution of work in special civil engineering — Bored piles" for bored piles, according to DIN EN 14199 "Execution of work in special civil engineering — Micropiles" for micropiles or DIN EN 12699 "Execution of work in special civil engineering — Displacement piles" for displacement piles**.**

3.3.2 The specified top of the pile head must be constructed up to a height of the empty bore of 3 m with a permissible deviation of −7 cm to +50 cm, and if the height of the empty borehole is greater, the top of the pile head may be a further 10 cm higher for each m of additional height of the empty borehole.

3.3.3 In the case of reinforcement cages that do not reach the bottom of the borehole (floating reinforcement), the permissible deviations according to DIN EN 1536:2015-10, 8.1.2 are doubled.

3.3.4 Sealants which may endanger soil or water or which may have a detrimental effect on well structures shall not be used in sealing work.

3.3.5 The contractor must ensure that the sealants meet the requirements. Corresponding product data sheets shall be submitted to the contracting authority on request. Inspections and examinations that go beyond this are special services (see section 4.2.1).

3.3.6 Filler to be installed in sections must be installed with a position deviation of ± 50 cm per section up to a maximum dump height of 30 m; above +10 cm for each additional 10 m dumping height.

3.4 Installation of measuring equipment

3.4.1 When installing geotechnical measuring equipment, DIN 4107-4 "Geotechnical measurements — Part 4: Pressure pad measurements" as well as DIN EN ISO 18674-1 "Geotechnical exploration and investigation — Geotechnical measurements — Part 1: General rules", DIN EN ISO 18674-2 "Geotechnical exploration and investigation — Geotechnical measurements — Part 2: Displacement measurements along a measuring line: Extensometer" and DIN EN ISO 18674-3 "Geotechnical exploration and investigation — Geotechnical measurements — Part 3: Displacement measurements across a measuring line: Inclinometers"**.**

3.4.2 For groundwater measuring points, the use of drilling material for backfilling is not permitted.

3.4.3 Depending on the nature of the subsoil and the existing groundwater conditions, the contractor must determine the length and position of the filter and solid wall pipes as well as the waterproofing in consultation with the client**.**

3.4.4 The inner diameter of the solid wall pipes must not be smaller than the filter tube diameter. If watertight or airtight connections of the solid wall pipes are necessary, these services are special services (see section 4.2.1).

3.4.5 Solid wall pipes must be routed over the work plan. If solid wall pipes are not to be routed above the work plan, measures must be taken to prevent the entry of solid or liquid substances. The required services are special services (see section 4.2.1).

3.4.6 The expansion of boreholes must be documented in accordance with DIN 4943 "Graphic representation and documentation of wells and groundwater measuring points".

3.5 Installation of well lining materials

3.5.1 For drinking water wells, the use of drilling material for backfilling is not permitted.

3.5.2 Depending on the nature of the subsoil, the contractor must determine the length and position of the filter and solid wall pipes as well as the waterproofing in consultation with the client

3.5.3 The inner diameter of the solid wall pipes must not be smaller than the filter tube diameter. If watertight or airtight connections of the solid wall pipes are necessary, these services are special services (see section 4.2.1).

3.5.4 Solid wall pipes must be routed over the work plan. If solid wall pipes are not to be routed above the work plan, measures must be taken to prevent the entry of solid or liquid substances. The required services are special services (see section 4.2.1).

3.5.5 Barrier pipes and their connections must be watertight. The annular space between the barrier pipe and the borehole wall must be permanently sealed.

3.5.6 Well heads must seal wells watertight.

3.5.7 Der Expansion of boreholes must be documented in accordance with DIN 4943.

3.6 Installation of geothermal elements

3.6.1 Depending on the nature of the subsoil and the existing groundwater conditions, the contractor must determine the specifications for geothermal elements in consultation with the client. The basis for this is the "Recommendation Near-Surface Geothermal Energy — Planning, Construction, Operation and Monitoring — EA Geothermal Energy"1).

3.6.2 After installation of the geothermal elements, the borehole must be filled from bottom to top with a suspension adapted to the local subsoil and groundwater conditions as well as the operation of the geothermal plant.

3.6.3 The expansion of boreholes with geothermal elements must be documented.

4 Ancillary services, special services

4.1 In addition to ATV DIN 18299, Section 4.1**, ancillary services** are in particular:

4.1.1 Maintaining the work plan.

4.1.2 Provision of the product data sheets necessary for well construction and finishing work.

4.1.3 Removal and storage of retained samples of fillers in the case of supports for geothermal purposes.

4.1.4 Additional consumption of fillers up to 10% of the respective theoretical volume.

4.1.5 Septic pumps, if the well lining is carried out in connection with the construction of the borehole.

4.2 In addition to ATV DIN 18299, Section 4.2, **special services** include:

4.2.1 The Special Benefits listed in Sections 3.1.5, 3.1.6, 3.3.5, 3.4.4, 3.4.5, 3.5.3 and 3.5.4.

4.2.2 Taking water samples, gas samples, determining the type of gas, the amount of gas and the gas pressure.

4.2.3 Delivery, filling, labeling and storage of containers for water and gas samples.

4.2.4 Handling, transporting, analysing and storing water and gas samples.

4.2.5 Water level measurements in neighbouring wells, groundwater measuring points or bodies of water.

4.2.6 Services for the integration of developed boreholes into structures.

4.2.7 Installation of gravel fill baskets.

4.2.8 Laying as well as maintaining and dismantling drain pipes

4.2.9 Desanding and performance pumps.

4.2.10 Cleaning of deposits from the bottom of the well after discharge, clarification and capacity pumping.

4.2.11 Disinfection of wells.

4.2.12 Measurement of the wells drilled and preparation of as-built plans according to location and height.

4.2.13 Services on developed boreholes for the purpose of carrying out measurements and investigations.

4.2.14 Protective and safety measures for entering or driving on boreholes for reasons beyond the Contractor's control.

4.2.15 Carrying out measurements and investigations in developed boreholes.

4.2.16 Cleaning of the bottom of the borehole when removing boreholes and removing the substances produced as well as displaced drilling fluids or support fluids, if the removal of the borehole is not carried out in connection with the construction of the borehole.

4.2.17 Removal and removal of the required overconcrete of the pile head to the planned height, including preparation of the connecting reinforcement.

4.2.18 Removal and removal of excess concrete on the pile shafts.

4.2.19 Construction, fastening, strengthening and removal of the work plan, parking and storage areas as well as access roads, bridges and the like on areas provided by the client.

4.2.20 Manufacture, maintenance and removal of splash protection or noise protection devices.

4.2.21 Services for the expansion of the borehole in swelling or settlement-sensitive soils and rocks.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

No regulations.

5.2 Determination of dimensions/quantities

5.2.1 The length of installed components is determined in the axis.

5.2.2 Geothermal elements are calculated from the base of the probe to the upper edge of the work planum.

5.2.3 Precast concrete piles and in-situ concrete piles are calculated from the planned pile head height to the prescribed underside of the pile base or pile top.

5.2.4 The mass of the steel reinforcement is calculated according to the steel lists. Reinforcement also includes structural reinforcement, e.g. spacers, bases, base plates, stiffening rings.

5.2.5 The calculated mass is decisive. For standardised steels, the information in the DIN standards applies, for other steels the information in the manufacturer's profile book.

5.2.6 Binding wire, rolling tolerances and offcuts are not taken into account when determining the billing mass.

5.3 Overmeasurement rules

Tgeothermal elements and reinforcement are measured when determining the theoretical volume.

5.4 Individual regulations

5.4.1 Partial days are counted as full days, hours or part thereof as full hours.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Shoring Work — DIN 18303

September 2016 Edition

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The notices do not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 the type, location, dimensions, accessibility, nature and load-bearing capacity of the work plan or the subsoil for the work plan, in particular restrictions on working height

0.1.2 Foundation depths, foundation types, constructions and loads of adjacent structures.

0.1.3 Type, location and dimensions as well as owners of natural and artificial cavities as well as known obstacles, e.g. anchors, soil consolidation and geotextiles from previous construction measures.

0.1.4 Type, scope and time of execution of measures for the preservation of evidence.

0.1.5 Permissible deformations of the shoring and neighbouring structures.

0.1.6 Hydrogeological conditions.

0.2 Information on the execution

0.2.1 the number, type, location and dimensions of the excavations, ditches and the like to be built.

0.2.2 Planned excavation pit or ditch floor including drainage measures**.**

0.2.3 Type and purpose of the construction. Elevation of the shoring in relation to the existing and planned topography.

0.2.4 Construction stages and final state.

0.2.5 Shoring to be left in place, to be completely or partially dismantled.

0.2.6 Section-by-section installation or expansion of the shoring.

0.2.7 Information on the use of used materials and components, even if they remain.

0.2.8 Special requirements for the backfill material when installing the shoring.

0.2.9 Number, type, position and dimensions of vertical and horizontal load-bearing elements as well as infills and drainage layers.

0.2.10 Location and distance of the attachment points, embedding depth and height of the top of the shoring.

0.2.11 Permissible tolerances during production.

0.2.12 Description of soil, rock and other substances in the subsoil with regard to the properties and conditions according to section 2.3.

0.2.13 Special physical and chemical stresses to which substances and components are exposed after installation.

0.2.14 Special requirements for the water permeability of the shoring.

0.2.15 Services for the removal of blocks, building remains and other obstacles.

0.2.16 Protection of components and equipment.

0.2.17 Number, type, location, dimensions and design of closures and connections to adjacent structures.

0.2.18 Use of other people's land through shoring and anchoring.

0.2.19 Possibility of bracing against neighbouring structures, e.g. prohibition due to existing or planned waterproofing.

0.2.20 Number, type, location and dimensions of recesses and penetrations of the shoring surfaces.

0.2.21 Number, type, location and dimensions of crossings, pedestrian and temporary bridges.

0.2.22 Type and scope of fall protection, impact protection, barrier and traffic safety measures.

0.2.23 Specifications resulting from expert reports

0.2.24 Provision of materials and components.

0.2.25 Holding time for the shoring.

0.2.26 Scope and timing of the removal of building elements. Working area at the time of dismantling.

0.2.27 Number, type, timing and procedure of examinations.

0.2.28 Number and type of measuring equipment, measurements and documentation, e.g. of anchor forces, deformations.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this ATV are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Sections 2 and 3	if, in the case of temporary construction aids, the materials, the components, the type of shoring or the construction method are not to be specified,
Section 3.1.2,	if the construction schedule is to be specified,
Section 3.2.1	if tolerances other than those specified in the said standards are to apply,
Section 3.2.4.2,	if the type of anchor head construction is to be specified.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

- In the bill of quantities, the billing units, separated by design, materials and dimensions, are to be provided as follows:
- Area (m2) for the installation, maintenance and removal of shoring, trench shoring equipment, infills and the like,
- Length measure (m) for beams, terminations and connections to adjacent structures, bracing, bracing, steel tension bands, bracing and the like,
- Structures, bracing, bracing, steel tension bands, bracing and the like, □ Number (St) for anchor head constructions, recesses, crossings, pedestrian and temporary bridges, measurements, documentation and the like,
- Mass (kg, t) for beams, bracing, strapping, steel tension bands, bandages and the like.

1 Scope of application

1.1 ATV DIN 18303 "Shoring work" applies to the temporary or permanent securing of terrain jumps and banks as well as construction pits, ditches and the like with shoring.

1.2 ATV DIN 18303 does not apply to

- the earthworks to be carried out during shoring work (see ATV DIN 18300 "Earthworks"),
- the drilling, piling, vibrating or pressing work to be carried out on girder plank, pile and sheet piling walls (see ATV DIN 18301 "Drilling work" and ATV DIN 18304 "Pile

driving, vibrating and pressing work") and the concrete work required for pile walls (see ATV DIN 18302 "Work on the expansion of boreholes" and ATV DIN 18331 "Concrete work"),

- the drilling and grouting work to be carried out on anchorages (see ATV DIN 18301 "Drilling work" and ATV DIN 18309 "Press-fit work"),
- shoring in underground cavities (see ATV DIN 18312 "Underground mining work"),
- the production of liquid-supported slots (see ATV DIN 18313 "Diaphragm wall work with supporting fluids"),
- the production of components from concrete that is applied by spraying (see ATV DIN 18314 "Shotcrete work"),
- engineering biological safety construction methods (see ATV DIN 18320 "Landscape construction work"),
- Soil consolidation using the jet blasting method (see ATV DIN 18321 "Jet blasting") and
- the creation of soil consolidation by icing or by deep soil stabilization.

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18303 take precedence.

2 Fabrics, components

Ergänzend zur ATV DIN 18299, Abschnitt 2, gilt:

2.1 For the most common standardized materials and components, the DIN standards are listed below.

DIN 1054	Subsoil — Safety verifications in earthworks and foundation engineering — Supplementary regulations to DIN EN 1997-1
DIN EN 1536	Execution of works in special civil engineering — Bored piles
DIN EN 1537	Execution of works in special civil engineering — grouted anchors
DIN EN 1538	Execution of works in special civil engineering — diaphragm walls
DIN EN 1997-1	Eurocode 7: Design, calculation and design in geotechnical engineering — Part 1: General rules
DIN EN 1997-1/NA	National Annex — Nationally determined parameters — Eurocode 7: Design, calculation and design in geotechnics — Part 1: General rules
DIN EN 10248 (all parts)	Hot-rolled sheet piles made of unalloyed steels
DIN EN 10249 (all parts)	Cold-formed sheet piles made of unalloyed steels
DIN EN 12063	Execution of special geotechnical works (special civil engineering) structures — sheet piling
DIN EN 12715	Execution of special geotechnical works (special civil engineering) — injections

DIN EN 12716	Execution of special geotechnical works (special civil engineering) — jet blasting (high-pressure injection, high-pressure soil mortification, jetting)
DIN EN 13331 (all parts)	Trench shoring equipment
DIN EN 14199	Execution of works in special civil engineering — micropiles
DIN EN 14490	Execution of works in special civil engineering — Soil nailing

2.2 Materials and components must be

- for excavations and ditches, complies with the requirements of DIN 4124 "Excavations and ditches — embankments, shoring, working space widths",
- for bank protection, meet the requirements of the recommendations of the Working Committee on Bank Edging — Ports and Waterways (EAU 20121).

2.3 Description and classification of soil and rock

the regulations of ATV DIN 18300 apply to the description of soil, rock and other substances.

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 DIN 4124 applies to the execution of the shoring, and EAU 20121 applies to bank protection).

3.1.2 The choice of the construction process is the responsibility of the contractor.

3.1.3 Shoring work may only be commenced if there is confirmation that the requirements applicable in the respective federal state for exploratory and, if necessary, clearance measures with regard to explosive ordnance have been met.

3.1.4 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- Deviations of the existing building and existing shoring elements from the specifications,
- Deviations of the subsoil from the specifications,
- Deviations from water permeability specifications
- Deviations of the work plan from the specifications, both for the installation and for the removal of the shoring elements,
- non-standard and technically necessary working space,
- lack of reference points,
- Damage to shoring elements,
- Lack of consideration of tolerances and deformations in the implementation planning.

3.1.5 If cavities or obstacles are unexpectedly encountered, e.g. pipes, cables, drains, sewers, markings, building remains, blocks, roots, the Client must be informed immediately. The

required benefits must be determined jointly. These services are special services (see section 4.2.1).

If it is to be assumed that the obstacles are explosive ordnance, the work must be stopped immediately and the responsible authority and the client must be notified. The Contractor must carry out the necessary security services without delay. The services provided and the other services to be determined jointly are special services (see section 4.2.1).

3.2 Crafting

3.2.1 Tolerances

3.2.1.1 Insofar as the standards DIN EN 1536, DIN EN 1537, DIN EN 1538, DIN EN 12063 and DIN EN 12716 do not make any other statements — even for individual elements — the perpendicular deviation of the shoring may not exceed 1 %. In addition to this tolerance, a position deviation of 50 mm at the attachment point is permitted. The specified top may be deviated from by 20 cm upwards.

3.2.1.2 Die in Abschnitt 3.2.1.1 genannten Toleranzen gelten nicht für Grabenverbau nach DIN 4124:2012-01, Abschnitte 5 bis 7.

3.2.1.3 Dimensional deviations due to load and system-dependent changes in shape and shape tolerances of the components are not included in the tolerance values according to Section 3.2.1.1.

3.2.2 Bored pile walls

3.2.2.1 DIN EN 1536 applies to the construction of bored pile walls in conjunction with ATV DIN 18302 and ATV DIN 18331.

3.2.2.2 Bored pile walls To make overlaps to be removed after drilling. are equipped with drilling templates

3.2.2.3 If the contractor chooses a suspension support, he must dispose of the supporting fluid and submit proof of this to the client.

3.2.3 Beam plank walls and dissolved walls

The installation of an infill between vertical load-bearing elements includes the removal between the front and rear of the infill elements and, if necessary, the force-fit backfilling and compaction behind the infill elements.

3.2.4 Anchorages

3.2.4.1 DIN EN 1537 applies to the production and testing of grouted anchors.

3.2.4.2 The choice of the anchor head design and installation is the responsibility of the contractor.

3.2.4.3 DIN EN 1997-1/NA and DIN EN 14199 apply to the production and testing of grouted piles.

3.2.5 Bracing and strapping

Stiffeners and straps must be installed in a force-fit manner.

3.3 Retention

3.3.1 If the shoring is to be provided, the components to be kept by the contractor remain the property of the contractor.

3.3.2 Damage to the shoring must be repaired by the contractor during the maintenance period. The benefits for measures to be taken shall be determined jointly.

3.4 Dismantling

3.4.1 Anchors and concreted components remain in the subsoil. If the anchors are to be unlocked or removed, these are special services (see section 4.2.1).

3.4.2 The removal of infill elements must be carried out in the course of the backfilling of the working area and is a special service (see section 4.2.1).

3.4.3 If the shoring cannot be dismantled in accordance with the specifications, the client must be informed of this immediately. The services rendered as well as the other services are, insofar as the Contractor is not responsible for special services (see Section 4.2.1).

4 Ancillary services, special services

4.1 In addition to ATV DIN 18299, Section 4.1, **ancillary services** are in particular:

4.1.1 Determination of the condition of the road and terrain surfaces, the receiving waters and the like in accordance with § 3 para. 4 VOB/B.

4.1.2 Maintaining the Work Planum

4.1.3 Stiffening for the Contractor's own purposes.

4.1.4 Initial tensioning and fixing of anchors, including acceptance tests for grouted anchors.

4.2 In addition to ATV DIN 18299, Section 4.2, **special services** include:

4.2.1 The Special Benefits listed in Sections 3.1.5, 3.4.1, 3.4.2 and 3.4.3.

4.2.2 Services for determining the condition of the structural facilities, including the roads as well as the supply and disposal facilities and the like beyond the services according to section 4.1.1, e.g. preparation of expert opinions, camera inspections, load-bearing capacity investigations.

4.2.3 Production, fastening, strengthening and removal of the work plan, storage and storage areas, access roads, bridges, stiffening of ceilings and the like on areas provided by the client.

4.2.4 Making connections to adjacent components.

4.2.5 Retensioning of anchors.

4.2.6 Adjust the shoring in case of obstacles.

4.2.7 Making and closing recesses and anchor holes.

4.2.8 Re-stiffening, except for the Contractor's own purposes (see section 4.1.3).

4.2.9 Pre-tensioning of bracing.

4.2.10 Control of the shoring during the holding period.

4.2.11 Measurements and tests, e.g. for deformations, forces, settlements, water volumes, including documentation.

4.2.12 Filling of cavities caused by the removal of infill elements or the pulling of planks, piles, beams, pipes and the like.

4.2.13 Providing mathematical proof of stability and execution drawings.

4.2.14 Preparation of as-built documentation.

4.2.15 Suitability tests for grouted anchors and test loads for grouted piles.

4.2.16 Anchors against pressing water.

4.2.17 Special requirements for the surface of shoring elements.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

No regulations.

5.2 Determination of dimensions/quantities

5.2.1 In the case of billing according to area measurements, the area is determined from the length and depths of the shoring. The length of the shoring is based on the length in the axis of the shoring.

The height of ditch shoring according to DIN 4124:2012-01, sections 5, 6 and 7 is calculated from the planned ditch bottom at the shoring, in the case of partial ditch shoring from its underside, to the specified upper side of the shoring.

Integrating duct plank shoring is calculated up to the statically required embedding depth.

The height of sheet piling walls as well as overlapping and tangent bored pile walls is calculated from the underside of the statically required or specified embedding depth to the specified upper side of the shoring.

The height of the infills of girder pile walls, dissolved pile walls and nail walls is calculated from the specified excavation pit floor to the specified upper side of the shoring. The lowest point of the floor within the respective shoring field is used to determine the height.

If there is no specification for the height of the upper side, the specification for the upper edge according to DIN 4124 is decisive.

5.2.2 If the vertical individual elements are billed according to the length measure, the height of girder pile walls and dissolved pile walls is calculated from the underside of the statically required or specified embedding depth to the specified upper side of the shoring. If

there is no specification for the height of the upper side, the specification for the upper edge according to DIN 4124:2012-01, Section 4.3.1, is decisive.

The lengths of the bracing and bracing are calculated in the respective axis.

The length of shoring anchors and pegs is calculated from their ends on the ground side to the respective lower surface of the anchor or nail plate.

5.2.3 Billing by mass is based on the calculated mass of the steel components. For standardised profiles, the information in the DIN standards applies, for other profiles the information in the manufacturer's profile book.

5.2.4 In the case of billing by time, the provision of the shoring for a construction phase is calculated from the day after the installation of the last vertical load-bearing element. The retention period of trench shoring equipment begins on the day after they are installed.

For bracing and bracing, it begins with their completion for the respective level in the respective construction phase.

The retention period shall end at the time specified by the Client for dismantling, but no earlier than three working days after receipt of the notification of release by the Contractor.

5.3 Overmeasurement rules

Recesses for pipes and the like up to 1 m2 will be overmeasured in the case of billing according to the area dimension. Beams, piles and the like are measured in the axis of the shoring when determining the length.

5.4 Individual provisions

No regulations.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Pile driving, vibrating and pressing work — DIN 18304

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 Foundation depths, foundation types and loads as well as construction of adjacent structures.

0.1.2 Type, location and dimensions as well as design of existing construction pits.

0.1.3 Type, location and dimensions as well as owners of natural and artificial cavities as well as known obstacles, e.g. anchors and injection bodies from previous construction measures.

0.1.4 Type, location and nature of pipes and vibration-sensitive installations in the area of influence of the construction project and their owners.

0.1.5 Type, location, dimensions, accessibility, nature and load-bearing capacity of the work planum and storage areas, as well as restrictions on working height, broken down by construction phase.

0.1.6 Restrictions on transport routes, separated by construction phases.

0.1.7 Neighbourly approvals or proof of easements in the land register in the case of use of neighbouring properties.

0.1.8 Confirmation that the requirements applicable in the respective federal state for reconnaissance and, if necessary, clearance measures with regard to explosive ordnance have been met.

0.1.9 Type, scope and execution time of measures to preserve evidence.

0.1.10 Circumstances that may affect the execution of the construction work and the existence of the construction elements, e.g. harmful water and soil, rot limits, sand grinding, increased corrosion.

0.1.11 Significant changes in the properties and conditions of soils and other substances during pile driving, shaking or pressing, e.g. liquefaction.

0.1.12 Description of hydrogeological conditions.

0.2 Information on the execution

0.2.1 Number, type, location, dimensions, materials and design of the components and components to be inserted or drawn.

0.2.2 Profiles and special profiles and quality of the components.

0.2.3 Purpose and useful life of the components and components.

0.2.4 Requirements regarding the durability of the components.

0.2.5 Use of used or unused building elements and their retention in the ground.

0.2.6 Type and scope of services to minimise water penetration.

0.2.7 Position and height of the attachment points, planned top, insertion depth, inclination of the axis of the components and permissible tolerances.

0.2.8 Number, type, dimensions and design of closures and connections to adjacent structures.

0.2.9 Number, type, dimensions and design of attachments, e.g. brackets, plates.

0.2.10 Special test equipment, e.g. signal transmitters, lock explosion indicators, inclinometer tubes.

0.2.11 Description of soil, rock and other substances in the subsoil with regard to their properties and conditions in accordance with section 2.2 and classification into homogeneous areas in accordance with section 2.3.

0.2.12 Results of soundings to determine storage densities.

0.2.13 Type and scope of insertion aids and their documentation.

0.2.14 Number, type, location and scope of required test insertions and test loads.

0.2.15 Specifications resulting from expert opinions.

0.2.16 Requirements, conditions and fees arising from approval procedures.

0.2.17 Protection of neighbouring properties and structures.

0.2.18 Type and scope of noise protection devices.

0.2.19 Type and scope of vibration and noise measurements as well as settlement measurements.

0.2.20 Type and scope of the stability verifications and execution drawings to be supplied.

0.2.21 Early or subsequent production of parts of the service.

0.2.22 Number, type and scope of audits and documentation.

0.2.23 Scope and time of pulling components.

0.2.24 Information on the condition of the components to be pulled.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 3.1.2	if the construction process or the type and use of the equipment is to be specified to the Contractor,
Section 3.6.6	if a different remuneration scheme is to be provided.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units, separated according to design, quality, profiles and dimensions as well as insertion depths, are to be provided as follows:

0.5.1 Setup, relocation and conversion of the insertion or drawing equipment according to number (St).

0.5.2 Insertion of planks, piles, girders, pipes, lances and the like

- as individual components according to number (St), length (m) or mass (kg, t),
- for walls by area (m2) or mass (kg, t).

0.5.3 Pulling of planks, piles, beams, pipes, lances and the like

- as individual components according to number (St), length (m) or mass (kg, t),

- for walls by area (m2) or mass (kg, t).

0.5.4 Joints for planks, piles, beams, pipes, lances and the like by number (St).

0.5.5 Connection, corner and branch profiles according to length (m).

0.5.6 Add-on parts by number (pcs).

0.5.7 Shims by number (St).

0.5.8 Insertion aids, separated by method, e.g. pre-drilling, flushing aids, by length (m) or area (m2).

0.5.9 Separated, non-reusable or remaining components by mass (kg, t).

1 Scope of application

1.1 ATV DIN 18304 "Pile driving, vibrating and pressing work" applies to the insertion and pulling of planks, piles, girders, pipes, lances and the like by pile driving, vibrating or pressing.

1.2 ATV DIN 18304 does not apply to

- the introduction of substances into cavities which are created or remain as a result of the insertion or pulling of planks, piles, beams, pipes, lances and the like,
- the installation of reinforcement,
- the insertion and pulling of deep vibrators,
- Drilling work (see ATV DIN 18301 "Drilling work"),
- the provision of installed components (see ATV DIN 18303 "Shoring work") and
- Pipe jacking work (see ATV DIN 18319 "Pipe jacking work").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18304 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

2.1 Bauelemente

2.1.1 Building elements within the meaning of ATV DIN 18304 are planks, piles, girders, pipes, lances and the like.

2.1.2 The most common standardised materials and components are subject to the requirements of DIN EN 12063 'Execution of special geotechnical work (special civil engineering) — Sheet pile constructions' and DIN EN 12699 'Execution of work in special civil engineering — Displacement piles'.

2.2 Description of the subsoil The following apply in particular to the investigation, naming and description of the subsoil:

DIN 4020	Geotechnical investigations for structural purposes — Supplementary regulations to DIN EN 1997-2
DIN 4023	Geotechnical exploration and investigation — Graphic representation of the results of drilling and other direct outcrops
DIN 4030 (all parts)	Assessment of concrete-attacking waters, soils and gases
DIN 4094-2	Subsoil — Field investigations — Part 2: Borehole ramming sounding
DIN 4094-4	Subsoil — Field investigations — Part 4: Wing shear tests
DIN 18126	Subsoil — Examination of soil samples — Determination of the density of non-cohesive soils with loosest and densest storage
DIN 18141-1	Subsoil — Examination of rock specimens — Part 1: Determination of uniaxial compressive strength
DIN 18196	Earthworks and foundation engineering — Soil classification for structural purposes
DIN EN 1997-2	Eurocode 7: Design, calculation and design in geotechnics — Part 2: Exploration and investigation of the subsoil
DIN EN 1997-2/NA	National Annex — Nationally defined parameters — Eurocode 7: Design, calculation and design in geotechnical engineering — Part 2: Exploration and investigation of the subsoil
DIN EN ISO 14688-1	Geotechnical exploration and investigation — Designation, description and classification of soil — Part 1: Designation and description
DIN EN ISO 14688-2	Geotechnical exploration and investigation — Designation, description and classification of soil — Part 2: Principles for soil classifications
DIN EN ISO 14689	Geotechnical Exploration and Investigation — Naming, Description and Classification of Rock
DIN EN ISO 17892-1	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 1: Determination of water content
DIN EN ISO 17892-4	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 4: Determination of grain size distribution
DIN EN ISO 17892-7	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 7: Uniaxial pressure test
DIN EN ISO 17892-8	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 8: Unconsolidated undrained triaxial test
DIN EN ISO 17892-12	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 12: Determination of flow and roll-out limits

DIN EN ISO 22475-1 Geotechnical exploration and investigation — Sampling methods and groundwater measurements — Part 1: Technical basis of execution

2.3 Classification of soil and rock into homogeneous areas

Soil and rock are to be divided into homogeneous areas according to their condition before the pile driving, vibrating or pressing work. The homogeneous area is a limited area, consisting of single or several layers of soil or rock, which has comparable properties for pile driving, vibrating or pressing work.

If environmentally relevant ingredients are to be taken into account, they must be taken into account when dividing them into homogeneous areas.

For the homogeneous ranges, the following properties and characteristic values as well as their determined bandwidth must be given. Below are the standards or recommendations with which these parameters may have to be verified. If several methods of determination are possible, a standard or recommendation must be established.

For soil:

- local designation,
- Grain size distribution with grain strips according to DIN EN ISO 17892-4,
- Mass fraction of stones, blocks and large blocks according to DIN EN ISO 14688-1; Determination by sorting and measuring or sieving, then weighing and then relating to the corresponding excavated mass,
- Water content according to DIN EN ISO 17892-1,
- Plasticity coefficient according to DIN EN ISO 17892-12,
- consistency number according to DIN EN ISO 17892-12,
- Associated storage density: designation according to DIN EN ISO 14688-2, determination according to DIN 18126 and
- Floor assembly according to DIN 18196.

For rock:

- local designation,
- Designation according to DIN EN ISO 14689 and
- uniaxial compressive strength of the rock according to DIN 18141-1.

2.4 Description and classification of artificial floors and other materials

As far as possible, artificial soils, e.g. backfills, and other substances, e.g. components, recycled materials, industrial by-products, waste and soils with foreign components, e.g. tree roots, are described in accordance with Section 2.2 and classified in accordance with Section 2.3. If this is not possible, they are specifically described with regard to their properties for inserting and pulling components

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 DIN EN 12063 must be observed for the execution of sheet pile constructions, and DIN EN 12699 for displacement piles.

3.1.2 The choice of the construction process as well as the selection and use of the equipment are the responsibility of the Contractor.

3.1.3 Construction elements to be brought in which are only to be kept available and removed by the Contractor at a later date shall not become the property of the Client.

3.1.4 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- Deviations of the work plan from the specifications, both for the insertion and for the drawing of the components,
- Deviations of the subsoil from the specifications.

3.1.5 Pile driving, shaking and pressing work may only be commenced if there is confirmation that the requirements applicable in the respective federal state for reconnaissance and, if necessary, clearance measures with regard to explosive ordnance have been met.

3.1.6 Endangered structures must be secured; DIN 4123 "Excavations, foundations and underpinnings in the area of existing buildings" must be observed. In the case of protective and security measures, the regulations of the owners or other persons authorised to issue instructions must be observed. The required services are special services (see section 4.2.1).

3.1.7 If cavities or obstacles are unexpectedly encountered, e.g. pipes, markings, building remains, blocks, roots, the Client must be informed immediately. The required benefits must be determined jointly. The services provided and the other services are special services (see section 4.2.1). If it is to be assumed that the obstacles are explosive ordnance, the work must be stopped immediately and the responsible authority and the client must be notified. The Contractor must carry out the necessary security services without delay. The other benefits are to be determined jointly. The services provided as well as the other services are special services (see section 4.2.1)

3.1.8 Effects of the insertion or pulling of building elements on the surrounding buildings, the soil and the building elements must be observed. Damage that may be the result of the insertion or pulling must be reported to the Client immediately. The Contractor shall carry out the necessary services without delay. The other benefits are to be determined jointly. The services rendered as well as the other services are, insofar as the Contractor is not responsible for special services (see Section 4.2.1).

3.1.9 Where low-vibration work is to be carried out, hydraulic hammers shall be used for pile driving and variable torque vibrators shall be used for vibratory work.

3.1.10 If vibration-free work is to be carried out, presses must be used.

3.2 Insertion of the components

3.2.1 If it turns out during execution that the specified lengths of the construction elements are too short or too long, the Client must be informed of this immediately. The required benefits must be determined jointly. The services rendered as well as the other services are, insofar as the Contractor is not responsible for special services (see Section 4.2.1).

3.2.2 Any impairment of the service, e.g. due to significant deviation from the specified position or installation depth, damage to the building elements or walls, must be reported to the Client immediately. The required services are common Set. The services rendered as well as the other services are, insofar as the Contractor is not responsible for special services (see Section 4.2.1).

3.2.3 If , contrary to expectations, the building elements cannot be installed to the intended depth, or can only be installed to the intended depth with considerable impairment of the environment or with considerable damage, the Client must be informed of this immediately. The required services must be determined jointly, e.g. determination of a new insertion depth, shortening of the components, application of insertion aids. To the extent that the Contractor is not responsible for these services, these services are special services (see Section 4.2.1).

3.3 Tolerances

3.3.1 The values specified in DIN EN 12063 and DIN EN 12699 apply to the installation tolerances.

3.3.2 For the insertion of beams, pipes, lances and the like, the tolerances based on DIN EN 12063 shall be used.

3.3.3 Dimensional deviations due to load and system-dependent changes in shape as well as shape tolerances of the components are not included in the tolerance values according to Sections 3.3.1 and **3.3.2** .

3.3.4 Dimensional deviations in the longitudinal direction of sheet piling due to deformation of the building elements during insertion or by lock play are permissible and must be taken into account. The required benefits must be determined jointly. These services are special services (see section 4.2.7).

3.4 Records

3.4.1 When ramming components, reports must be kept in accordance with DIN EN 12699.

3.4.2 When shaking components, the frequency and power consumption or oil pressure shall be recorded as a function of depth and time.

3.4.3 When pressing components, the press-in pressure must be recorded as a function of depth and time.

3.5 Preparation of the heads of components

3.5.1 Components whose heads are deformed or destroyed during insertion may be reintroduced with the consent of the Client after the heads have been prepared.

3.5.2 The heads of reinforced concrete elements must be prepared in accordance with DIN EN 12699. 3.6 Pulling of the construction elements 3.6.1 If the pulling device cannot be positioned and used directly in front of the component to be pulled, the client must be informed of this immediately. The required benefits must be determined jointly. To the

extent that the Contractor is not responsible for these services, these services are special services (see Section 4.2.1).

3.6.2 Building elements that are to be removed must be pulled out in such a way that they do not endanger the building and neighbouring buildings as well as pipes or other installations.

3.6.3 The attempt to pull a component must be aborted at the latest if no drawing progress can be achieved within a quarter of an hour.

3.6.4 If components cannot be pulled as specified, the Client must be informed of this immediately. The required benefits must be determined jointly. The services rendered as well as the other services are, insofar as the Contractor is not responsible for special services (see Section 4.2.1).

3.6.5 The location of the building elements that cannot be removed or can only be partially removed must be documented.

3.6.6 Building elements that cannot be removed and therefore remain wholly or partially in the ground shall be remunerated at current value. The scrap proceeds of the removed parts must be taken into account.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Determination of the condition of the road and terrain surfaces, the receiving waters and the like in accordance with § 3 para. 4 VOB/B.

4.1.2 Maintaining the work plan.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 The Special Benefits listed in clauses 3.1.6, 3.1.7, 3.1.8, 3.2.1, 3.2.2, 3.2.3, 3.6.1 and 3.6.4.

4.2.2 Services for determining the condition of the structural facilities, including the roads as well as the supply and disposal facilities and the like beyond the services referred to in section 4.1.1, e.g. preparation of expert opinions, camera inspections, load-bearing capacity investigations.

4.2.3 Breaking up and restoring paved surfaces.

4.2.4 Production, fastening, strengthening and removal of the work plan, parking and storage areas, access roads, bridges, ceilings and the like on areas provided by the Client.

4.2.5 Removal or laying of cables.

4.2.6 Manufacture and installation of shims, insofar as they are not necessary as a result of improper insertion of the components, as well as connection, corner and branch profiles.

4.2.7 Meeting increased dimensional accuracy requirements beyond the tolerances specified in Section 3.3.

4.2.8 Abschneiden, Kappen und Bearbeiten der Köpfe von Bauelementen nach dem Einbringen, soweit nicht vom Auftragnehmer zu vertreten.

4.2.9 Probeeinbringungen.

4.2.10 Trial loads.

4.2.11 Repair of damaged heads of the components and removal of damage caused by the insertion, insofar as the Contractor is not responsible for these damages.

4.2.12 Manufacture, maintain and remove noise protection equipment.

4.2.13 Installation and provision of testing and measuring equipment, e.g. lock blast indicators, inclinometer tubes.

4.2.14 Measurements and tests, e.g. vibration, noise, settlement, inclination and geodetic measurements, including documentation.

4.2.15 Sealing of sheet piling.

4.2.16 Welding of locks and openings.

4.2.17 Shortening and lengthening of components, e.g. in the event of obstacles, premature reaching of the embedding depth, insufficient embedding depth.

4.2.18 Attachment of attachments to the components.

4.2.19 Interruption of work in the installation or removal of components, insofar as the Contractor is not responsible.

4.2.20 Re-establishing, relocating and retooling the insertion or drawing equipment for reasons beyond the Contractor's control.

4.2.21 Filling of subsidences caused by the insertion or pulling of components.

4.2.22 Filling of cavities caused by the pulling of planks, piles, beams, pipes and the like.

4.2.23 Provide mathematical proof of stability and design drawings.

4.2.24 Preparation of as-built documentation.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

No regulations.

5.2 Determination of dimensions/quantities

5.2.1 In the case of billing according to area measurements, the area is determined from the lengths and heights of the walls produced. The length of the wall is the length in the axis of

the wall zugrunde gelegt. Die Höhe von Wänden wird von der vorgegebenen Unterseite bis zur vorgegebenen Oberseite der Wand gerechnet.

5.2.2 In the case of billing according to the length measure, the specified length of the individual components is calculated.

5.2.3 In the case of billing according to mass, the calculated mass of the specified components shall be taken as a basis. This is used for

- standardised profiles according to DIN standards,
- for other profiles, calculated according to information in the manufacturer's profile book.

5.3 Overmeasurement rules

No regulations.

5.4 Individual provisions

Components that cannot be removed as specified and therefore remain in the ground in whole or in part are calculated without reducing the billing quantity during drawing.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Dewatering work — DIN 18305

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. The observance of these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 Foundation depths, foundation areas and foundation types of structures in the area of influence of dewatering.

0.1.2 Services planned and already carried out to determine the condition of the structures and other facilities affected by dewatering before the start of dewatering.

0.1.3 Number, type and location of groundwater extraction points, facilities for the geothermal use of groundwater, other dewatering facilities and the like in the area of influence of dewatering.

0.1.4 Number, type, location, dimensions and formation of wells, drainages, groundwater measuring points and the like.

0.1.5 Number, type and location of discharge points.

0.1.6 Type, location, dimensions and design of excavations.

0.1.7 Geological and hydrogeological conditions in the sphere of influence of the Dewatering. Condition of the water.

0.2 Information on the execution

0.2.1 Type, purpose, scope, reduction targets and range of dewatering.

0.2.2 Relevant groundwater levels, lowering depths and pumping capacities as well as maximum permissible flow rates.

0.2.3 Maximum permissible groundwater levels in the event of infiltration.

0.2.4 Requirements from water permits, other permits
and permits as well as expert reports and the extent to which these are to be observed during execution.

0.2.5 Beginning and end of maintenance and operation.

0.2.6 Number, type, power and installation locations of the pumps and, if applicable, pressure booster systems.

0.2.7 Number, type, location and dimensions of pipelines, well heads, pump sumps and the like.

0.2.8 Type and volume of sedimentation basins, e.g. sand traps.

0.2.9 Inclusion of stratified, spring, seepage and surface water in the Dewatering or other services to be provided, e.g.

- Gathering and deriving sources,
- Sealing of terrain surfaces,
- Drainage of above-ground water.

0.2.10 Adaptation of the dewatering system to the construction progress.

0.2.11 Arrangements for expansions of the dewatering system.

0.2.12 Type and scope of reserve and emergency power systems, e.g. emergency power generators,

Replacement pumps.

0.2.13 Preparation of the receiving water for the pumped water, drainage into channels or closed pipelines, if necessary over special structures, e.g. pipe bridges, pipe crossings, ditches.

0.2.14 Discharge or infiltration of pumped water.

0.2.15 Nature and scope of tests and controls of the pumped water.

0.2.16 Installation of water quantity and water quality measuring devices and data acquisition systems.

0.2.17 Extraction points at the individual well or at the receiving water pipes, e.g. to determine the residual sand content.

0.2.18 Type, number, installation location of the necessary groundwater measuring points.

0.2.19 Protection of the structure against floating in the event of unintentional, premature rise of the water, e.g. flood openings.

0.2.20 Special precautions for the protection of land, buildings, plant populations and the like in the area of influence of dewatering.

0.2.21 Special safety and protective measures, e.g. establishment of an on-call service, frost protection measures.

0.2.22 Closure and dismantling of dewatering systems.

0.2.23 Type and extent of water treatment.

0.2.24 Type and scope of documentation, measurement of pipelines, preparation of as-built plans, marking of pipeline routes.

0.3 Details of deviations from the ATVs
If regulations other than those provided for in this ATV are to be made, these must be clearly and individually stated in the service description.

0.4 Individual information on fringe benefits and special benefits
No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units
In the bill of quantities, the billing units are to be provided as follows:

- for open dewatering

    - Installation, removal and conversion of dewatering systems, separated by conveying capacity, by number (St),
    - Provision of dewatering facilities, separated by pumping capacity, by duration (h, d, wo),
    - Operation of dewatering systems, separated by pumping capacity, by duration (h, d, wo);
- for closed dewatering
    - Installation, removal and relocation of pumps and measuring devices, separated by well, by number (St),
    - Installation, removal and relocation of vacuum lances according to number (St),
    - Installation and filling of deep drains according to length (m),
    - Assembly, dismantling and relocation of vacuum pumps by number (St),
    - Provision of pumps, vacuum pumps, vacuum lances and measuring devices, separated by number and duration (Sth, Std, StWo),
    - Operation of pumps, vacuum pumps and measuring devices, separated by number and duration (Sth, Std, StWo),
    - Construction and dismantling of connecting pipes from the well to the collector pipeline according to length (m),
    - Provision of connecting pipes from the well to the collector pipeline according to length and duration (md, mWo),
    - Supply, installation and closing of well pots by number (St);
- for open and closed dewatering
    - Construction, dismantling and relocation of emergency power systems according to number (St),
    - Provision of emergency power systems according to duration (d, wo),
    - Operation of emergency power systems according to duration (h),
    - Construction and dismantling of pipelines with accessories, separated according to nominal diameters and method of installation (on the ground surface, on elevations, in pipe trenches), and of channels with accessories according to length (m),
    - Provision of pipelines with accessories, separated according to nominal diameters and type of installation (on the ground surface, on elevations, in pipe trenches) and of channels with accessories according to length and duration (md, mWo),
    - Construction and dismantling of crossings/ramps and pipe bridges by number (St),
    - Provision of crossings/drive-over ramps and pipe bridges according to number and duration (hours, StWo),
    - Flow rate according to volume (m3).

1 Scope of application

1.1 ATV DIN 18305 "Dewatering work" applies to the construction, conversion and dismantling as well as the provision and operation of facilities for open and closed dewatering systems as an auxiliary structure for the temporary lowering of groundwater.

1.2 ATV DIN 18305 does not apply to

- earthworks to be carried out during dewatering work (see ATV DIN 18300 "Earthworks"),
- the drilling work to be carried out during dewatering work (see ATV DIN 18301 "Drilling work"),
- the expansion of boreholes into wells (see ATV DIN 18302 "Work on the lining of boreholes") and
- the drainage work to be carried out during dewatering work (see ATV DIN 18308 "Drainage and infiltration work").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18305 take precedence.

2 Fabrics, components

2.1 Filter sands and filter gravel

DIN 4924	Sands and gravel for well construction — Requirements and tests
DIN EN 12620	Aggregates for Concrete
DIN EN 12904	Products for the treatment of water for human consumption — Silica sand and quartz gravel

2.2 Other components

DIN 4926	Steel well heads — DN 300 to DN 1200

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 Concerns under Section 4 (3) VOB/B may include, in particular:

- unsuitable location and insufficient performance of the wells,
- risk of hydraulic fracture or floating,
- risk of uplift or settlement,
- risk of draining parts of structures, e.g. wooden pile foundations, existing groundwater facilities.

3.1.2 Soil or water conditions that deviate from the information in the service description as well as unforeseen water inflows are to be reported to the Auftraggeber unverzüglich mitzuteilen. Erforderliche Leistungen sind gemeinsam festzulegen. Diese Leistungen sind Besondere Leistungen (siehe Abschnitt 4.2.1).

3.1.3 If there is a risk of a harmful rise in the groundwater or a hydraulic fracture, the Contractor must immediately carry out the necessary services to prevent damage and inform the Client. The other benefits for the prevention or elimination of damage shall be determined jointly. The services rendered as well as the other services are, insofar as the Contractor is not responsible for special services (see Section 4.2.1).

3.1.4 The pipes for water drainage must be laid on the surface of the site.

3.1.5 Damage that may have been caused by dewatering must be reported to the Client immediately

3.2 Maintenance, operation, control

3.2.1 Retention

The dewatering system must be kept ready for operation for the entire contractually agreed period. The readiness for operation must be notified and documented by the contractor.

3.2.2 Operation

The operation of the dewatering system during the contractually agreed maintenance period begins and ends at the order of the client and includes the commissioning and control of the system, including the energy supply.

3.2.3 Control

Checks must be carried out once a day during the operation of the system. The time, scope and result of the inspections must be documented.

During the inspection, the contractually prescribed function of the dewatering system must be checked.

Additional services for control are special services (see section 4.2.1).

3.3 Dewatering system

3.3.1 Open dewatering

The Contractor shall carry out the dewatering system, e.g. with pump sumps or drainage, in accordance with the intended purpose in accordance with the information provided by the Client on the quantity of water produced as well as on the hydrogeological and

geological conditions. The contractor must assemble, maintain, operate, control and dismantle the plant components. The contractor must provide information on the arrangement and technical design of the plant on request.

3.3.2 Closed dewatering

The Contractor shall erect, maintain, operate, control and dismantle the dewatering system, e.g. with wells, in accordance with the Client's specifications.

If specified requirements are not met, the Client must be informed of this immediately. The contractor must provide information on the lowering system used. Required services are to be determined jointly and, insofar as the Contractor is not responsible, are Special Services (see Section 4.2.1).

3.3.3 Netzersatzanlagen

If an emergency power system has been agreed, it must be connected to the main system in such a way that dewatering continues without harmful interruptions.

3.4 Documentation

3.4.1 Documentation of the groundwater level

The contractor must document the groundwater level below the bottom of the excavation pit at a measuring point on a weekly basis.

3.4.2 Additional Documentation

The contractor must document on a weekly basis:

- the total amount of water extracted;
- the content of settleable substances;
- organoleptic abnormalities.

If approved or agreed values are exceeded, the Client must be informed immediately. The resulting benefits are to be determined jointly. To the extent that the Contractor is not responsible for these services, these services are special services (see Section 4.2.1).

3.5 Modification of the reduction target

A change in the agreed reduction target, the shutdown of the system or parts of the system may only take place on the instructions of the customer.

3.6 Dismantling of the dewatering system

3.6.1 The dismantling of parts or the entire dewatering system may only be carried out with the consent of the Client. If parts of the dewatering system cannot be dismantled,

the contractor must notify the client of this immediately. The resulting further provision or replacement of the wholly or partially remaining parts of the dewatering system are special services (see section 4.2.1), unless the Contractor is responsible for the cause. The replacement of remaining parts is based on the current value. Pump sumps, drains and wells (except for built-in components, e.g. pumps) remain in the subsoil.

3.6.2 The Contractor shall inform the Client of any remaining hazards prior to the commencement of dismantling. The contracting authority must determine the necessary safety measures. The services required for this are, insofar as the Contractor is not responsible for special services (see Section 4.2.1).

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Determination of the condition of the road and terrain surfaces, the receiving waters and the like in accordance with § 3 para. 4 VOB/B.

4.1.2 Installation, provision and dismantling of a water sampling point prior to discharge into the receiving water.

4.1.3 Installation, maintenance, operation and dismantling of a fault alarm system for the remote reporting of critical water levels and interruption of the energy supply.

4.1.4 Discharge of water from the open dewatering system to the discharge point specified by the client within the construction site.

4.1.5 Providing technical data on the installed parts of the plant with regard to the requirements of the permits for the operation of the plant and the discharge of the pumped water.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 The Special Benefits listed in Sections 3.1.2, 3.1.3, 3.2.3, 3.3.2, 3.4.2, 3.6.1 and 3.6.2.

4.2.2 Soil and water analysis, laboratory and field trials.

4.2.3 Installation, maintenance, operation and dismantling of automatic data acquisition systems as well as the documentation of these measurement data.

4.2.4 Remote transmission of operating data and measurement data from automatic data acquisition systems, with the exception of services referred to in section 4.1.3.

4.2.5 Construction, maintenance and dismantling of groundwater measuring points.

4.2.6 Construction, maintenance and dismantling of the discharge point into the receiving waters and infiltration facilities.

4.2.7 Conversion or relocation of parts of the dewatering system for reasons for which the Contractor is not responsible.

4.2.8 Obtaining public law permits and permits before and during the work; Assumption of fees.

4.2.9 Assumption of the fees and charges for the extraction and discharge as well as the discharge of the water.

4.2.10 Implementation of a test lowering.

4.2.11 Dismantling and backfilling of pump sumps, drains and wells.

4.2.12 Dismantling of well lining materials. Filling and grouting of e.g. boreholes.

4.2.13 Construction, maintenance, maintenance and dismantling of elevations, overpasses/pipe bridges and crossings.

4.2.14 Water treatment to achieve required discharge criteria.

4.2.15 Construction, maintenance, operation and dismantling of emergency power systems.

4.2.16 Installation and sealing of components for building penetrations.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General No regulations. 5.2 Determination of dimensions/quantities

5.2.1 The length of pipelines, including their bends and fittings, fittings and connectors, shall be determined in the central axis.

5.2.2 Elevated pipelines are billed including risers and downstreams.

5.3 Overmeasurement rules

Pipe connections, fittings and fittings are measured.

5.4 Individual provisions

Partial hours are counted as full hours, and partial days are counted as full days. When billed by weeks, days or part thereof of an additional week are counted as 1/7 week

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Drainage canal works — DIN 18306

Issue September 2016

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

The specifications shall specify in particular, in accordance with the requirements of the individual case:

0.1 Information on the construction site

0.1.1 Foundation depths, foundation types, loads and construction of adjacent structures**.**

0.1.2 Special features of the operation of the sewer network.

0.2 Information on the execution

0.2.1 Type, location, dimensions, materials and design of drainage channels and drainage pipes to be constructed.

0.2.2 Load and installation conditions, also taking into account the bedding of the sewers and pipes as well as the dismantling of the shoring.

0.2.3 Permissible deviations for direction and altitude.

0.2.4 The design and execution of pipe connections, movement joints, protective and sealing coatings or coatings as well as the number, type, location, dimensions and design of connections to structures.

0.2.5 Type and design of the bedding.

0.2.6 Number, type, location, dimensions and design of the shaft structures.

0.2.7 Support and anchoring of ducts, pipes, elbows, bends and the like.

0.2.8 Technical regulations to be applied.

0.2.9 Specifications for crossing traffic areas, bodies of water, railway tracks, dams, canals, pipelines and the like.

0.2.10 Services for the preservation of the receiving water in existing drainage channels and drainage pipes.

0.2.11 Type, scope and implementation of in-house and third-party monitoring.

0.2.12 Type and scope of as-built documentation.

0.2.13 Dimensions of the pipe zone, consisting of bedding, side filling and cover. Requirements for the execution and securing of the line zone. Minimum coverage of pipes, working space and laying depth.

0.2.14 Type, number, location and dimensions of the working spaces for cable connections.

0.2.15 Type, requirements and quantities of soils or building materials, e.g. for supports, for the backfilling of pipe zones.

0.2.16 degree of compaction and its verification.

0.2.17 Specifications derived from expert reports, in particular from geotechnical reports in accordance with DIN 4020 "Geotechnical investigations for structural purposes — Supplementary regulations to DIN EN 1997-2", DIN EN 1997-2 "Eurocode 7: Design, calculation and design in geotechnics — Part 2: Exploration and investigation of the subsoil" and DIN EN 1997-2/NA "National Annex — Nationally determined parameters — Eurocode 7: Design, calculation and design in geotechnics — Part 2: Exploration and investigation of the subsoil" as well as hydrogeology, and to what extent these are to be taken into account during execution.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this ATV are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in Section 3.2.1 if other regulations are to be laid down for examinations.

0.4 Individual information on fringe benefits and special benefits

In particular, the production of pipe connections (see section 4.1.6) can be considered as an ancillary service for which a special ordinal number (heading) is to be provided under the conditions of ATV DIN 18299, Section 0.4.1.

0.5 Billing Units

In the bill of quantities, the billing units, separated by type, substances and dimensions, are to be provided as follows:

- drainage canals and drainage pipes according to length (m),

- protective and sealing coatings as well as coatings according to area (m2),
- Fittings by number (St),
- Prefabricated shaft elements and shaft equipment by number (St),
- Shafts according to length (m) or number (St),
- base shells and slabs according to length (m) or area (m2),
- Line zone according to room dimension (m3), area dimension (m2) or length measure (m),
- Extended line zone for line connections by number (St).

1 Scope

1.1 ATV DIN 18306 "Drainage canal work" applies to the construction of closed drainage channels and drainage pipes in the ground, including under buildings, including the associated shafts. It also applies to services for backfilling the pipeline zone.

1.2 ATV DIN 18306 does not apply to

- the earthworks to be carried out during the construction of drainage channels and drainage pipes as well as shafts (see ATV DIN 18300 "Earthworks"),
- Shoring work (see ATV DIN 18303 "Shoring work"),
- Work on pressure pipelines (see ATV DIN 18307 "Pressure pipeline work outside buildings"),
- Pipe jacking work (see ATV DIN 18319 "Pipe jacking work")
- the production of in-situ concrete structures (see ATV DIN 18331 "Concrete work"),
- the construction of drainage pipes within buildings (see ATV DIN 18381 "Gas, water and drainage systems within buildings") and
- the construction of pipelines in protective pipes and pipe ducts.

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18306 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

For substances and components, the requirements are laid down in DIN EN 1610 "Laying and testing of sewers and sewers".

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- Lack of suitability for laying the pipes, e.g. if the depth, width and securing of the pipe trench are incorrect, unsuitable condition of the trench bottom or the bedding.

3.1.2 Damage to existing supply and disposal lines must be reported to the client and the operator immediately. Suspended or supported supply and disposal lines must not be stepped on or loaded.

3.1.3 Existing drainage systems may not be walked on without the consent of the operator.

3.2 Construction and testing of drainage channels and drainage pipes as well as shafts

3.2.1 Drainage channels and drainage pipes as well as shafts must be designed and tested in accordance with DIN EN 1610.

3.2.2 Drainage channels and drainage pipes as well as manhole shafts must be constructed with sewer clinker bricks and fully grouted on the inside.

3.2.3 Channels must be designed with a smooth inner surface.

3.3 Establishing the line zone

3.3.1 The pipe zone of drainage sewers and drainage pipes must be constructed in accordance with DIN EN 1610.

3.3.2 If specified requirements are not met despite suitable compaction equipment, working methods and layer thicknesses, the client must be informed of this immediately. The services rendered as well as the other services are, insofar as the Contractor is not responsible for special services (see Section 4.2.1).

3.3.3 Frozen layers must not be compacted.

3.3.4 Before the line zone is established, foreign bodies that can cause damage must be removed.

3.3.5 Sludge is only permitted with the consent of the client.

3.3.6 In the pipeline zone, the soil or the mixture of building materials must be installed evenly in layers on both sides of the pipeline and carefully compacted. The dump height, soil or building material mixture and the compaction device used must be coordinated.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Determination of the condition of the road and terrain surfaces, the receiving waters and the like in accordance with § 3 para. 4 VOB/B.

4.1.2 Cleaning of the materials and components supplied by the contractor before their installation.

4.1.3 Supply of climbing aids if they are part of prefabricated elements.

4.1.4 Making socket holes in the pipe support.

4.1.5 Cleaning of connection points on existing drainage canals, drainage pipes and manholes.

4.1.6 Making pipe connections, except for services referred to in section 4.2.10.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 The Special Benefits listed in Section 3.3.2.

4.2.2 Providing static calculations for drainage channels, drainage pipes and shafts, including formwork and reinforcement plans for special structures, e.g. stormwater overflows, culverts, basins.

4.2.3 Special services for the production of the bedding.

4.2.4 Cleaning of soiled substances and components provided by the Client, provided that the soiling was not caused by the Contractor. 4.2.5 Installing G

4.2.5 Installation of joints and fittings, e.g. branches, bends, manifolds.

4.2.6 Installation of special components, manhole covers and climbing aids, except for services in accordance with section 4.1.3.

4.2.7 Soil and water investigations.

4.2.8 Testing for watertightness, including making and removing the anchorages and pipe closures required for watertightness testing.

4.2.9 Supply and discharge of the filler necessary for the watertightness test.

4.2.10 Installation of sleeve seals, insofar as their use is not attributable to the contractor.

4.2.11 Services for the preservation of receiving water in existing drainage channels and drainage pipes.

4.2.12 External monitoring of execution.

4.2.13 Preparation of as-built documentation.

4.2.14 Establishing the line zone for extended workspaces for line connections.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

The determination of the performance – regardless of whether it is carried out according to drawings or measurements – shall be based on the dimensions of the individual parts of the drainage system.

5.2 Determination of dimensions/quantities

5.2.1 Approximation methods are permissible for quantity determination.

5.2.2 In the case of billing according to the length measure, the axle lengths of the drainage channels and drainage pipes are taken as a basis.

5.2.3 The depth of the shaft is calculated from the support surface of the manhole cover to the lowest point of the channel bottom.

5.2.4 The installed quantities of the pipe zone are to be determined in the finished state.

5.2.5 If there are no specifications, an angle of slope of 45° applies to sloped excavations and ditches for determining the dimensions of the embankment space, 60° for fine-grained soils with at least a stiff consistency and 80° for rock. Necessary berms are taken into account when determining the embankment area.

5.2.6 The width of the pipeline zones in excavation pits for sewer system components such as shafts results from the external dimensions of the building structure plus the minimum widths of accessible work spaces in accordance with DIN 4124 "Construction pits and ditches — embankments, shoring, working area widths" as well as the required dimensions for formwork and shoring structures. In the case of sheet piling, the middle axis is used as the external dimension.

5.2.7 The width of the trench bottom results from the minimum width of trenches according to DIN EN 1610 plus the required dimensions for formwork and shoring structures. In the case of sheet piling, the middle axis is used as the external dimension.

5.3 Overmeasurement rules

5.3.1 In the case of billing according to the length measure, the clear widths of shafts are subtracted if prefabricated pipes without a shaft attachment are used.

5.3.2 In the case of billing according to the length measure, the following are overmeasured:

- the clear widths of the shafts, where prefabricated pipes with shaft attachments are used, and in the case of masonry and concrete drainage canals,
- Fittings.

5.3.3 When billing by room size, the following are measured:

- Structure ≤ 1 m3 individual size and
- Pipes, seepage bodies, stone packings and the like with an external cross-section ≤ 0.1 m2

5.3.4 In the case of billing according to area measurements, penetrations and installations are exceeded ≤ 1 m2 individual size.

5.4 Individual provisions

No regulations.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Pressure pipeline work outside buildings — DIN 18307

Issue September 2016

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 Foundation depths, types of foundations, loads and construction of adjacent structures.

0.1.2 Condition and drainage of the excavation pit floor.

0.1.3 Type of trench and excavation pit protection.

0.1.4 Type and nature of supports, e.g. supports, suspensions.

0.1.5 Construction methods and working space, e.g. for open or trenchless installation.

0.1.6 Crossing traffic areas, bodies of water, railway tracks, dams, canals, pipelines and the like.

0.2 Information on the execution

0.2.1 Special services at intersections.

0.2.2 Type of internal and external protection of pipes, pipeline parts and pipe joints.

0.2.3 Type and scope of testing of pipe joints.

0.2.4 Type, procedure and duration of pressure tests, level of test pressure, classification and length of test sections.

0.2.5 Type and dimensions of pipe trench depressions (head holes and socket holes) at the pipe joints.

0.2.6 Dimensions of the pipeline zone, consisting of bedding, side backfilling and covering, requirements for the design of the pipeline zone, minimum coverage of pipes, working space and laying depth.

0.2.7 Type, requirements and quantities of soils or building materials, e.g. for supports, for the backfilling of pipe zones.

0.2.8 Specifications resulting from expert opinions, in particular from geotechnical reports in accordance with DIN EN 1997-2 "Eurocode 7: Design, calculation and design in geotechnics — Part 2: Exploration and investigation of the subsoil" and DIN EN 1997-2/NA "National Annex — Nationally determined parameters — Eurocode 7: Design, calculation and design in geotechnics — Part 2: Exploration and investigation of the subsoil" and DIN 4020 "Geotechnical investigations for Structural purposes — Supplementary regulations to DIN EN 1997-2" and to hydrogeology, and to what extent these are to be observed during execution.

0.2.9 Securing the position of manifolds, branches, reducers and terminations by means of abutments or longitudinally restrained pipe connections.

0.2.10 Special services for the dissipation of forces in steep sections.

0.2.11 Measurement of pipeline parts, preparation of as-built plans, documentation, installation of information signs and marking of the pipeline.

0.2.12 Special services for the unloading and storage of pipes and pipeline parts.

0.2.13 Training of connections to structures.

0.2.14 Materials or components supplied by the Client: type, material, nominal diameter, maximum permissible operating pressure, type of pipe connections and accessories, in the case of pipes separately according to pipe lengths.

0.2.15 Quality requirements for custom-made fittings, sealants.

0.2.16 Type and Scope of In-House and Third-Party Monitoring.

0.2.17 Special permits and acceptances.

0.2.18 Type and scope of temporary measures.

0.2.19 Type, procedure and scope of rinsing, cleaning and disinfection.

0.2.20 Determining the condition of existing pipelines.

0.2.21 Type of pipeline construction work, e.g. in sections.

0.2.22 Method of converting and connecting new pipelines to pipelines in operation.

0.2.23 Type of separation of pipelines remaining in operation, e.g. sealing, emptying, equipotential bonding if necessary, cutting, as well as type of sealing of pipelines to be decommissioned.

0.2.24 Method of treatment and storage of decommissioned pipeline sections.

0.2.25 Use of pipe residual lengths.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating provisions may be considered in particular in Section 2.1 if water pipelines are to be designed for a maximum permissible operating pressure other than at least 10 bar.

0.4 Individual information on fringe benefits and special benefits

As an ancillary service, for which a special atomic number (heading) is to be provided under the conditions of ATV DIN 18299, Section 0.4.1, the making of pipe connections is particularly possible (see Section 4.1.4).

0.5 Billing Units

In the bill of quantities, the billing units, separated according to design, materials, nominal diameters and other dimensions and, if applicable, maximum permissible operating pressure, are to be provided as follows:

- Pipelines by length (m),
- Pipe cuts by number (St),
- Pipe connections by number (St),
- Fittings by number (St),
- Fittings and accessories by number (St),
- Drilling according to number (St), additionally separated according to pipe types of pipes to be drilled and connected,

- Connections and connections to pipelines according to number (St), additionally separated according to pipe types of the pipes and fittings to be installed,
- Inspection of welds by number (pcs),
- Establishment of internal and external protection of welded and other pipe joints according to number (St),

- Head holes for pipe connections according to number (St) or volume (m3),
- Separation of pipelines remaining in operation and type of sealing for decommissioned pipelines by quantity (pcs)
- Modification and connection of new pipelines to existing pipelines in operation by quantity (pcs)
- Supports or hangers by quantity (pcs) or pipe length (m)
- Pipeline zone by volume (m^3), area (m^2), or length (m)
- Extended pipeline zone for pipeline connections by volume (m^3), area (m^2), length (m), or quantity (pcs)

1 Scope of application

1.1 ATV DIN 18307 "Pressure pipeline work outside buildings" applies to work on pressure pipelines for the transport of gaseous and liquid substances outside buildings, including in protective pipes and pipe ducts. It also applies to the backfilling of the pipeline zone.

1.2 ATV DIN 18307 does not apply to

- the earthworks to be carried out in the construction of penstocks (see ATV DIN 18300 "Earthworks"),
- Shoring work (see ATV DIN 18303 "Shoring work") and
- the construction of pipelines within buildings (see ATV DIN 18381 "Gas, water and drainage systems within buildings").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18307 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

For the most common substances and components, the requirements are listed below.

2.1 For gas pipelines of the public supply and water pipelines, the product-specific regulations of the DVGW (German Technical and Scientific Association for Gas and Water1) apply.

2.2 For gas pipelines of non-public supply, the publication of the Technical Rule for Pipelines pursuant to Section 9 (5) of the Pipeline Ordinance (TRFL)2) shall apply.

2.3 The Technical Rules for Flammable Liquids TRbF of the German Committee for Flammable Liquids (DAbF)2) apply to pipelines for flammable liquids.

2.4 The product-specific regulations of the Energy Efficiency Association for Heating, Cooling and CHP (AGFW)3) apply to district heating pipelines.

2.5 The product-specific regulations of the German Association for Water, Wastewater and Waste (DWA)2),4) apply to wastewater pressure pipelines.

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 The rules listed in Section 2 shall apply to the execution.

3.1.2 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- Lack of suitability for laying the pipes, e.g. depth and width of the pipe trench, shoring and embankment in deviation from DIN 4124 "Construction pits and trenches — embankments, shoring, working space widths", condition of the trench bottom or the pipe support.

3.1.3 Suspended or supported pipelines, cables, drains or sewers must not be walked on or loaded. Damage must be reported to the client and the owner or, if another person is authorised to give instructions, to the owner immediately.

3.1.4 Deviations from specifications must be reported to the Client immediately. The required benefits must be determined jointly. To the extent that the Contractor is not responsible for these services, these services are special services (see Section 4.2.1).

3.2 Establishing the Line Zone

3.2.1 Before the line zone is established, foreign bodies that may cause damage must be removed.

3.2.2 The pipeline zone must be filled in immediately after the pressure pipe has been laid.

3.2.3 The pipeline zone must be built in layers on both sides of the pipeline with stone- and frost-free soil and carefully compacted. The dump height, soil or building material mixture and the compaction device used must be coordinated.

3.2.4 If specified requirements are not met despite suitable compaction equipment, working methods and layer thicknesses, the Client must be informed immediately. The required benefits must be determined jointly. To the extent that the Contractor is not responsible for these services, these services are special services (see Section 4.2.1).

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Determination of the condition of the road and terrain surfaces, the receiving waters and the like in accordance with § 3 para. 4 VOB/B.

4.1.2 Cleaning of materials and components prior to installation, provided that they are supplied by the Contractor.

4.1.3 Making socket holes for non-welded pipe joints.

4.1.4 Making pipe joints, other than welded joints (see section 4.2.8).

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 The Special Benefits listed in Sections 3.1.4 and 3.2.4.

4.2.2 Making the bedding.

4.2.3 Pressure tests in accordance with the regulations listed in Section 2.1.

4.2.4 Testing of welded joints in accordance with the regulations listed in Section 2.1.

4.2.5 Cleaning, rinsing, disinfecting in accordance with the regulations listed in section 2.1.

4.2.6 Establishment of the line zone for extended workspaces in line connections.

4.2.7 Installation of fittings, fittings and accessories.

4.2.8 Manufacture of welded, flange and other longitudinally force-fit pipe connections, pipe cuts, drilling, connections and connections.

4.2.9 Disconnection of pipelines remaining in operation or to be decommissioned, including sealing of the pipe ends.

4.2.10 Establishing internal and external protection on pipe connections.

4.2.11 Soil and water investigations.

4.2.12 Cleaning of soiled substances and components provided by the Client, insofar as the soiling was not caused by the Contractor.

4.2.13 Rust removal, refurbishment and repair of the interior and exterior protection of materials and components, insofar as they have been provided by the Client and the defects are not the responsibility of the Contractor.

4.2.14 Maintaining water drainage and receiving water during work on operating pipes.

4.2.15 Special services against effects damaging the pipe.

4.2.16 Special services on steep sections.

4.2.17 Establish and remove the anchorages and pipe closures required only for the pressure test.

4.2.18 Supply and discharge of the filler necessary for the pressure test.

4.2.19 Integration of pipelines in operation.

4.2.20 Third-party monitoring of execution.

4.2.21 Measuring the pipeline parts, preparing as-built drawings, attaching information signs and marking the pipelines.

4.2.22 Subsequent adjustment of road caps and installation sets.

4.2.23 Fees for Permits.

4.2.24 Removal of weld beads from PE butt welded joints inside or outside. Flush grinding of weld seams on the outside of steel pipe joints.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General The performance is determined on the basis of measurements.

5.2 Determination of dimensions/quantities

5.2.1 The installed quantities of the pipeline zone and the extended pipeline zone shall be determined in the finished state.

5.2.2 In the case of billing according to the length measure, pipelines including bends and pipeline parts are calculated in the central axis.

5.3 Overmeasurement rules

Pipe connections, fittings and fittings are measured.

5.4 Individual provisions

No regulations.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Drainage and infiltration work — DIN 18308

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 Type and condition of the substrate.

0.1.2 Location, foundation depths, types of foundations, loads and construction of adjacent structures.

0.1.3 Construction of excavations and trenches.

0.2 Information on the execution

0.2.1 Number, type, location, dimensions and design of drainage and infiltration systems

0.2.2 Type and nature of the materials and components.

0.2.3 Method of securing the pipe layer.

0.2.4 Loads and hydraulic power.

0.2.5 Measures against occlusion.

0.2.6 Number, type, dimensions and formation of fittings, pipe joints and manholes. Location of the shafts.

0.2.7 Number, type, dimensions and design of closures and connections to shafts and structures.

0.2.8 Dimensions of overlaps in geosynthetics and geotextiles.

0.2.9 Requirements to be observed from expert reports.

0.2.10 Type and Scope of Required Documentation.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 3.1.1	if the construction method, the construction process or the type and use of the construction equipment are to be specified to the Contractor.
Sections 3.2, 3.3 and 3.4	if tolerances other than those specified in the aforementioned standards are to apply.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units, separated by design, materials and dimensions as well as depth, are to be provided as follows

- Volume (m3) for storage and infiltration elements as well as drainage packs,
- Area measure (m2) for geosynthetics and geotextiles as well as filter and drainage layers,
- Length measure (m) for ducts and pipes as well as pipeless drainage,
- Number (St) for manholes and fittings.

1 Scope of application

1.1 ATV DIN 18308 "Drainage and infiltration work" applies to drainage with pipes and pipeless drainage as well as to the construction of infiltration systems with and without water retention, including the installation of associated, permeable and filter-stable substances and components.

1.2 ATV DIN 18308 does not apply to

- earthworks to be carried out during drainage and infiltration work (see ATV DIN 18300 "Earthworks"),
- closed drainage channels and drainage pipes, including the associated shafts (see ATV DIN 18306 "Drainage canal work") and
- vertical deep drainage and infiltration via wells.

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18308 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

For the most common substances and components, the DIN standards are listed below.

2.1 Requirements

No decomposable substances and components may be used for drainage and infiltration systems, except for drainage for agricultural land and for measures limited in time.

DIN 1187	Drainage pipes made of plasticizer-free polyvinyl chloride (rigid PVC) — Dimensions, requirements, tests
DIN 4034-1	Manholes made of concrete, steel fibre concrete and precast reinforced concrete elements — Part 1: Requirements, testing and marking for sewers and sewers in addition to DIN EN 1917:2003-04
DIN 4034-2	Manholes made of concrete, steel fibre concrete and precast reinforced concrete elements — Part 2: Manholes for well and seepage systems
DIN 4262-1	Pipes and fittings for underground drainage in road and civil engineering — Part 1: Pipes, fittings and their joints made of PVC-U, PP and PE
DIN 4262-3	Pipes and fittings for underground drainage in traffic infrastructure and civil engineering — Part 3: Pipes and fittings of concrete and their joints
DIN 4266-1	Seepage pipes for landfills — Part 1: PE and PP seepage pipes
DIN 4266-3	Seepage pipes for landfills — Part 3: Concrete seepage pipes and fittings and their joints
DIN 19666	Infiltration and infiltration pipelines — General requirements

DIN EN 295-1	Stoneware pipe systems for sewers and sewers — Part 1: Requirements for pipes, fittings and connections
DIN EN 295-5	Stoneware pipe systems for sewers and sewers — Part 5: Requirements for perforated pipes and fittings
DIN EN 1401-1	Plastic Piping Systems for Underground Non-Pressurized Sewer and Pipeline — Plasticizer-Free Polyvinyl Chloride (PVC-U) — Part 1: Requirements for Pipes, Fittings and the Piping System
DIN EN 1916	Pipes and fittings made of concrete, steel fibre concrete and reinforced concrete
DIN EN 12666-1	Plastic piping systems for buried sewers and pipes — Polyethylene (PE) — Part 1: Requirements for pipes, fittings and the piping system
DIN EN 13252	Geotextiles and geotextile-related products — Required properties for use in drainage systems
DIN EN 13476 (all parts)	Plastic piping systems for buried pressureless sewers and sewers — Piping systems with profiled walls made of plasticizer-free polyvinyl chloride (PVC-U), polypropylene (PP) and polyethylene (PE)
DIN EN 13598 (all parts)	Plastic piping systems for buried pressureless sewers and sewers — Plasticizer-free polyvinyl chloride (PVC-U), polypropylene (PP) and polyethylene (PE)

2.2 Testing of mixtures of substances

2.2.1 Aggregates

The following standards apply to the testing of aggregates.

DIN EN 932-3	Test methods for general properties of aggregates — Part 3: Implementation and terminology of a simplified petrographic description
DIN EN 933-1	Test methods for geometric properties of aggregates — Part 1: Determination of grain size distribution — Sieving method
DIN EN 933-4	Test methods for geometric properties of aggregates — Part 4: Determination of grain shape — Grain shape index
DIN EN 1367-1	Test methods for thermal properties and weathering resistance of aggregates — Part 1: Determination of resistance to freeze-thaw cycles

2.2.2 Mixtures of substances for drainage work

For the testing of the water permeability of substance mixtures for drainage work in accordance with Sections 3.2, 3.3 and 3.4, DIN 18035-5 "Sports Fields — Part 5: Clay Surfaces" applies.

2.2.3 Mixtures of substances for infiltration work

For the testing of the water permeability of substance mixtures for infiltration work in accordance with Section 3.5, DIN 18130-1 "Subsoil — Examination of soil samples — Determination of the water permeability coefficient — Part 1: Laboratory tests" applies.

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 The choice of the construction method and construction process as well as the selection and use of the construction equipment are the responsibility of the Contractor.

3.1.2 Work must be carried out with the necessary caution in the vicinity of structures, pipes, cables, drains and sewers.

3.1.3 Endangered structures must be secured; DIN 4123 "Excavations, foundations and underpinnings in the area of existing buildings" must be observed. In the case of protective and security measures, the regulations of the owners or other persons authorised to issue instructions must be observed. The required services are special services (see section 4.2.1).

3.1.4 If the location of existing pipes, cables, drains, sewers, markings, obstacles and other structural installations has not been determined before the work is carried out,

can be indicated, it is to be explored. The required services are special services (see section 4.2.1).

3.1.5 If cavities or obstacles are unexpectedly encountered, e.g. pipes, cables, drains, sewers, markings, building remains, the Client must be informed immediately. The required benefits must be determined jointly. These services are special services (see section 4.2.1). If it is to be assumed that the obstacles are explosive ordnance, the work must be stopped immediately and the responsible authority and the client must be notified. The Contractor must carry out the necessary security services without delay. The services provided and the other services to be determined jointly are special services (see section 4.2.1).

3.1.6 Boundary stones and official fixed points may only be removed with the consent of the Client. The contractor must secure the client's fixed points for the construction measure before removal.

3.1.7 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- Deviations of the portfolio from the specifications,
- deviating soil and groundwater conditions,
- inadequate or inappropriate specifications for work in the vicinity of buildings, trees and shrubs,
- insufficient receiving water or risk of backwater.

3.2 Protection of Structures

Drainage work for the protection of structural facilities must be carried out in accordance with DIN 4095 "Building ground - Drainage for the protection of structural facilities - Planning, design and execution".

3.3 Regulation of the soil water balance

Drainage work to regulate the soil water balance must be carried out

- for agricultural land in accordance with DIN 1185-3 "Drainage — Regulation of the soil water balance by pipe drainage and subsoil improvement — Part 3: Execution and documentation",
- for vegetation areas in accordance with DIN 18915 "Vegetation technology in landscaping — Ground work" and
- for sports fields according to DIN 18035-3 "Sports fields — Part 3: Drainage".

3.4 Lowering of the groundwater

Drainage work to lower the groundwater must be carried out in accordance with DIN 1185-3.

3.5 Infiltration systems

Infiltration systems are to be carried out in accordance with worksheet DWA-A 138: "Planning, construction and operation of systems for the infiltration of rainwater"1).

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Determination of the condition of the road and terrain surfaces, the receiving waters and the like in accordance with § 3 para. 4 VOB/B.

4.1.2 Determination of the moisture content of the soil during the construction period in accordance with DIN 1185-3.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 The Special Benefits listed in Sections 3.1.3, 3.1.4 and 3.1.5.

4.2.2 Soil and water investigations and water level measurements, except for findings in accordance with section 4.1.2.

4.2.3 Services for the maintenance of the existing watercourses and the receiving water.

4.2.4 Services for securing and restoring existing drainage and infiltration facilities.

4.2.5 Benefits for water treatment and purification measures.

4.2.6 Benefits for measures in the event of encountering sources.

4.2.7 Services for drainage and infiltration work in the root area of trees and shrubs.

4.2.8 Connection of drainage and infiltration systems to existing shafts.

4.2.9 Manufacture of flushing and control equipment for the maintenance of drainage and infiltration systems.

4.2.10 Preparation of execution plans and as-built documentation.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies: 5.1 General No regulations.

5.2 Determination of dimensions/quantities

In the case of billing according to length measurements, the length is determined in the central axis of the components. Fittings are overmeasured and calculated separately.

5.3 Overmeasurement rules

The following are measured:

5.3.1 When billed according to room dimensions Pipes and components with an average cross-sectional area ≤ 0.1 m2.

5.3.2 If billed according to area Recesses due to fixtures and the like ≤ 1 m2 individual size.

5.3.3 In the case of billing according to length Shafts with a nominal diameter ≤ 1 m.

5.4 Individual regulations

No regulations.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Press-fit work — DIN 18309

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 Purpose of the construction measure and the injections, e.g. auxiliary construction measure or final structure and service life.

0.1.2 Results of planning and injection tests.

0.1.3 Limit values, requirements, conditions and fees for the discharge of process water into receiving waters or drainage systems.

0.1.4 Location of artificial cavities, earlier auxiliary construction measures, anchors, injections and their owners.

0.1.5 Information about the structure to be injected.

0.1.6 Foundation depths, types of foundations, encumbrances and use of neighbouring structures and their owners.

0.1.7 Type, location, dimensions, accessibility, nature and load-bearing capacity of the work planum and storage areas, as well as restrictions on working height, separated by construction phase.

0.1.8 Requirements from permits.

0.2 Information on the execution

0.2.1 Type of injection (injecting, grouting or backfilling).

0.2.2 Type, number and position of grouting sections and grouting points and sequence of execution in accordance with DIN EN 1536 "Execution of work in special civil engineering — Bored piles", DIN EN 1537 "Execution of work in special civil engineering — Grouting anchors", DIN EN 12699 "Execution of work in special civil engineering — Displacement piles", DIN EN 12715 "Execution of special geotechnical work (special civil engineering) — Injections", DIN EN 14199 "Execution of work in special civil engineering — Micropiles" or DIN EN 14490 "Execution of work in special civil engineering — Soil nailing".

0.2.3 Properties, type and composition of the press-fit material.

0.2.4 Required and permissible press-in pressures and press-in quantities, demolition criteria if applicable.

0.2.5 Scope and accuracy of measurement and documentation of press-fit parameters.

0.2.6 Type, number and scope of samples and tests.

0.2.7 Requirements for the evidence referred to in Sections 2.1 and 3.1.2.

0.2.8 Requirements for strength, permeability, durability, frost resistance and chemical resistance as well as chemical properties of the press-fit material.

0.2.9 Particular difficulties when working underground or in enclosed spaces as well as in the event of water influx.

0.2.10 Special requirements and services for the protection of soil, groundwater, neighbouring properties and structures.

0.2.11 Limits of permissible deformations of the subsoil and structures, monitoring measures.

0.2.12 Requirements for backfilling of boreholes or injected pipes after press-fitting.

0.2.13 Scope of the information contained in the minutes of injection operations, tests and controls.

0.2.14 Information on grouting of anchors, nails, diaphragm walls and piles.

0.2.15 Information on downtimes.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 3.2.1,	if the construction process or the type and use of the equipment is to be specified to the Contractor,
Section 3.2.2,	if the press-fit parameters are to be left up to the contractor,
Section 4.1.5	if backfill or grouting quantities greater than 1.7 times the theoretical volume of the borehole are to be taken into account.

0.4 Individual information on fringe benefits and special benefits

As an ancillary service, for which a special atomic number (item) is to be provided under the conditions of ATV DIN 18299, Section 0.4.1, the relocation of all equipment for the preparation of the injection material and for press-fitting (see Section 4.1.4) can be considered.

0.5 Billing Units

In the bill of quantities, the billing units are to be provided as follows, taking into account billing rules if necessary:

- Press-fit per pump according to press-in time (h),
- Provision of equipment and personnel in the event of downtime by time (h, d),
- Supply of solids for the production of press-fit by mass (kg), separated by type,
- Supplying solutions and liquid additives by volume (l), separated by type,
- Preparation, mixing of press-fit material according to mass (kg) or volume (l), separated by type,
- Insertion of packers into a pipe or borehole by number (St),
- Moving packers within a pipe or the borehole from injection point to injection point by number (St),
- Connection of the pipes to a press-fit pipe according to number (St),
- Taking samples and carrying out tests by number (St), separated by test method,
- grouting of the floor during waterproofing and consolidation works according to room dimensions (m3),
- Elimination of the overprofile by visible area (m2) or room dimension (m3),
- Grouting and backfilling of grouted anchors, soil nails, micropiles according to number (St) or length (m), separated according to types and dimensions
- Pressing, separated into pre-, initial and post-grouting and backfilling in the case of bored piles, displacement piles and diaphragm walls, according to mass (kg) of the grouting material or number (St), per component or grouting point,
- Press-ins according to the volume (l) or mass (kg) of the press-fit material,
- Flushing and backfilling of boreholes and pipes according to lengths (m), separated according to types and dimensions.

1 Scope of application

1.1 ATV DIN 18309 "Press-fit work" applies to injection work for sealing, consolidating, improving soil, rock and structures, filling cavities and displacing soil. It also applies to grouting work on grouted anchors, soil nails, bored piles, micropiles, diaphragm walls and displacement piles.

1.2 ATV DIN 18309 does not apply to:

- the drilling work for the press-fit work (see ATV DIN 18301 "Drilling work"),
- the execution of jet blasting work (see ATV DIN 18321 "Jet blasting work"),
- the pressing of tension channels in structural engineering (see ATV DIN 18331 "Concrete work"),
- the filling of cracks and cavities in concrete (see ATV DIN 18349 "Concrete maintenance work").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18309 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

2.1 General

The Contractor shall ensure and, upon request, prove to the Client that the raw materials and the injection material meet the requirements of the following standards applicable to the work.

DIN EN 1537	Execution of works in special civil engineering — grouted anchors,
DIN EN 12699	Execution of work in special civil engineering — Displacement piles,
DIN EN 12715	Execution of special geotechnical works (special civil engineering) — injections; also for grouting work on diaphragm walls and bored piles,
DIN EN 14199	Execution of works in special civil engineering — Micropiles,
DIN EN 14490	Execution of works in special civil engineering — Soil nailing

2.2 Description of the subsoil

The following apply to the investigation, naming and description of soil and rock:

DIN 4020	Geotechnical investigations for structural purposes — Supplementary regulations to DIN EN 1997-2

DIN 18196	Earthworks and foundations — Soil classification for construction purposes
DIN EN 1997-2	Eurocode 7: Design, calculation and design in geotechnics — Part 2: Exploration and investigation of the subsoil
DIN EN 1997-2/NA	National Annex — Nationally defined parameters — Eurocode 7: Design, calculation and design in geotechnical engineering — Part 2: Exploration and investigation of the subsoil
DIN EN ISO 14688-1	Geotechnical exploration and investigation — Designation, description and classification of soil — Part 1: Designation and description
DIN EN ISO 14689	Geotechnical Exploration and Investigation — Naming, Description and Classification of Rock
DIN EN ISO 22475-1	Geotechnical Exploration and Investigation — Sampling Methods and Groundwater Measurements — Part 1: Technical Principles of Execution

Soil and rock and the cavities to be grouted must be specifically described with regard to their properties for injection work in accordance with the specifications of the standards DIN EN 1536 and DIN EN 1538 "Execution of work in special civil engineering — Diaphragm walls" as well as DIN EN 1537, DIN EN 12699, DIN EN 12715, DIN EN 14199, DIN EN 14490.

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 Bei der Ausführung der Einpressarbeiten sind zu beachten: DIN EN 1536, DIN EN 1537, DIN EN 1538, DIN EN 12699, DIN EN 12715, DIN EN 14199 und DIN EN 14490.

3.1.2 The Contractor shall ascertain and, upon request, prove to the Client that the press-fit process and the equipment meet the requirements.

3.1.3 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- Deviations of the subsoil from the specifications,
- Deviations from the results of press-fit tests, test tests and test loads,
- inappropriate arrangement of the press-in points,
- unsuitable press-fit sequence,
- unsuitable press-in material,
- Lack of sufficient resistance to press-in pressure,
- unsuitable press-in pressures, press-in quantities and demolition criteria.

3.1.4 If damage to structural facilities, supply and disposal facilities, waters, biotopes and other objects to be protected is to be caused by the injection work.erwarten, so ist

inform the Client of this without delay. The benefits for measures to be taken must be agreed.

3.1.5 Rinsing mud and residues of the injecting agent must be directed to designated areas.

3.1.6 Rinsing sludge and residues of the injected substance must be disposed of.

3.1.7 If the Client has requested additives for the injection material, disposal is a special service (see section 4.2.1).

3.2 Press-fit

3.2.1 Equipment The choice of the construction process as well as the selection and use of the equipment are the responsibility of the Contractor.

3.2.2 Performing the press-fit

It must be pressed in until the agreed press-in parameters, such as press-in quantity, press-in pressure or other termination criteria, are reached. If the specifications cannot be achieved, the necessary services must be agreed with the client.

3.3 Quality assurance

For quality assurance, the following must be recorded and handed over to the client:

3.3.1 Description, inclination, direction and final depth of each borehole or pipe based on the records made during the drilling (see ATV DIN 18301 "Drilling work").

3.3.2 For each press-fit process

- Date and, in the case of injections in accordance with DIN EN 12715, also the time of the start and end,
- Press-fit point and grouting or borehole depth,
- in the case of section-by-section press-fitting, the position and length of the section,
- special incidents, e.g. leakage of press-fit material, broken press-fittings,
- the timing of the print and quantity through automatic recording (data collection). For grouting work for anchors, soil nails, diaphragm walls and piles, manual recording of the amount of grouting material and the pressure achieved is sufficient.

3.3.3 For any mixing plant

- Type of press-fit material and density determination once per work shift and mixer,
- Strength development of the press-fit material by manual testing or, in the case of injections, by the tilting test once per work shift,
- for injection processes according to DIN EN 12715, settling rate of suspensions once per work shift.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Determination of the condition of the road and terrain surfaces, the receiving waters and the like in accordance with § 3 para. 4 VOB/B.

4.1.2 Maintaining the work plan.

4.1.3 Preparation and mixing of the press-in material, even if the Client provides the materials. 4.1.4 Relocation of all equipment for the preparation and mixing of the injection material and for press-fitting, insofar as this is not the responsibility of the Client. 4.1.5 Backfilling and grouting quantities up to 1.7 times the theoretical volume of the borehole.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 The Special Benefits listed in Section 3.1.7.

4.2.2 Services for determining the condition of the structural facilities, including the roads as well as the supply and disposal facilities, before the start of the injection work in addition to the services referred to in section 4.1.1, e.g. preparation of expert reports on evidence and camera inspections.

4.2.3 Soil and water investigations.

4.2.4 Injection tests according to DIN EN 12715.

4.2.5 Elimination of the overprofile in the case of solidification.

4.2.6 Flushing or backfilling of the boreholes or injection pipes after grouting in accordance with DIN EN 12715.

4.2.7 Statistical evaluations and graphical representations.

4.2.8 Permeability tests, pumping tests, taking samples by core drilling or in prospecting, compressive strength tests.

4.2.9 Construction, fastening, strengthening and removal of the work plan, parking and storage areas as well as access roads, bridges and the like on areas provided by the Client.

4.2.10 Backfill and grouting quantities in excess of 1,7 times the theoretical volume of the borehole.

4.2.11 Downtimes for which the Contractor is not responsible.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

The determination of the performance – regardless of whether it is carried out according to drawings or measurements – is to be based on the dimensions, time and quantities of the press-ins.

5.2 Determination of dimensions, time and quantities

5.2.1 The injection time per pump begins when a flow rate or an increase in pressure is measured. It ends when the agreed final pressure, the agreed injection quantity or other agreed termination criteria are reached.

5.2.2 The press-fit quantity is calculated according to the quantity pressed (kg or l).

5.2.3 The theoretical borehole volume is determined from the outer diameter of the drill bit and the backfilled borehole length. The volume of built-in parts is not subtracted.

5.3 Overmeasurement rules

Interruptions in press-in that were necessary to eliminate malfunctions or blockages are not deducted from the calculation of the press-in time per pump up to a duration of 15 minutes each. Interruptions beyond this, insofar as these are attributable to the contractor, will not be taken into account.

5.4 Individual provisions

No regulations.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Dredging work — DIN 18311

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 Location and extent of the quays, handling facilities, berths and anchorages made available by the Contractor for use or shared use for the performance of his service.

0.1.2 Type and nature of work and transport areas.

0.1.3 Statistical information on surface and underground waters, e.g. flow velocities, water levels, runoffs, waves, tidal movements, storm surges, as well as wind conditions, fog and ice conditions. Information on morphology.

0.1.4 Dimensions of passage openings, useful dimensions of locks, fairway conditions, military and civilian restricted areas.

0.1.5 Type and nature of the subsoil of deposition areas and, if applicable, their groundwater conditions.

0.1.6 Type, discharge capacity and load-bearing capacity of the receiving water for flushing fields.

0.1.7 Type and extent of existing growth on the areas to be cleared.

0.1.8 Special dike regulations.

0.1.9 Foundation depths, types of foundations, loads and construction of adjacent structures.

0.2 Information on the execution

0.2.1 Description and classification of soil and rock into homogeneous areas. Shell content (mussels, snails).

0.2.2 Results of soundings to determine storage densities.

0.2.3 Actual and target dimensions, if applicable, depth and elevation plans, dredging sections, dredging tolerances, loosening factors.

0.2.4 Removal of loosened rock resulting from the loosening of rock beyond the removal cross-section.

0.2.5 Use of dredged material and type of deposit. Layout and dimensions of deposition areas and conveying routes, depending on the soil types, if necessary.

0.2.6 Specifications resulting from expert reports.

0.2.7 In the case of compaction of soil and rock, the degree of compaction and its verification.

0.2.8 Type and number of samples required.

0.2.9 Services for the permanent protection of embankments and flushing areas.

0.2.10 Flood-free or storm-surge-proof arrangement of the construction site equipment.

0.2.11 Special requirements for equipment and equipment for equipment and vehicles for the electronic measurement of nautical, dredging and mechanical operations and their documentation.

0.2.12 Taking out insurance for used floating equipment and the like.

0.2.13 Special features for regulating and safeguarding shipping traffic, e.g. right-of-way vessels, laying, erecting or setting navigation signs and signs, plummeting services, insofar as they do not result from the maritime police regulations, and, if necessary, also to what extent the contracting authority takes over the implementation of the necessary measures

0.2.14 Special requirements for the nautical and radio equipment of floating vessels and equipment, as well as their lighting and guarding. Information on mandatory skipper's licenses.

0.2.15 Release of a dredging section for shipping before acceptance. Information on the expected scope of maintenance until acceptance.

0.2.16 Training of connections to structures.

0.2.17 Acceptance of equipment, vehicles, scaffolding or parts of the construction site equipment by the Client after completion of the construction project.

0.2.18 Provision of manpower and equipment by the Client for the Contractor's work.

0.2.19 Requirements for flushing operation, e.g. deposition of dredged material, layer thicknesses, flush water flow, use of process rinsing water, solids/water ratio, effluent values at the flushing field outlet.

0.2.20 Limit values for ingredients and, if necessary, quality-improving measures for the direct use of dredged material, e.g. for dredges.

0.2.21 Use, preparation and treatment of dredged material that does not meet the requirements for the intended installation.

0.2.22 Measures for the preparation and diking of flush field areas.

0.2.23 Preparation of stability verifications for flushing dikes.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 3.1.1,	if the construction method, the construction process or the type and use of the construction equipment are to be specified to the Contractor,
Section 3.2.2,	if the choice of the cross-sections and longitudinal sections is not to be left to the contractor,
Section 3.3,	if the choice of funding routes and procedures is not to be left to the Contractor,
Section 3.4.1	if the soil is to be deposited in the water body during the transfer of soil with additional measures, e.g. levelling, resumption of displaced soil,
Section 3.4.4,	if certain embankments are to be observed when dumping or flushing soil or levelling or compacting is necessary,
Section 5.1.2	if the usual approximation methods are not permitted for quantity determination.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units are to be provided as follows:

- Removal, application according to volume (m3), according to area (m2) or according to mass (t), staggered according to the length of the conveying routes,
- Conveying according to volume (m3) or mass (t), staggered according to the length of the conveying paths,
- Removal of obstacles by mass (t), number (St) or volume (m3),
- Removal of individual trees by number (St),
- Removal of individual stones and blocks according to number (St) or volume (m3).

1 Scope of application

1.1 ATV DIN 18311 "Dredging work" applies to the loosening of soil and rock under water, including loading, conveying and depositing of the loosened soil and rock under and above water. It also applies to the loosening of soil and rock above water in the shore area, if this work is carried out in connection with the loosening of soil and rock under water.

1.2 ATV DIN 18311 does not apply to

- Earthworks on land (see ATV DIN 18300 "Earthworks"),
- Production of drainage in the state cultural building (see ATV DIN 18308 "Drainage and infiltration work"),
- Topsoil work according to the principles of landscaping (see ATV DIN 18320 "Landscaping work").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18311 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

2.1 Description of soil and rock

The following apply to the investigation, naming and description of soil and rock:

DIN 4020	Geotechnical investigations for structural purposes — Supplementary regulations to DIN EN 1997-2

DIN 4023	Geotechnical exploration and investigation — Graphic representation of the results of drilling and other direct outcrops
DIN 4094-4	Subsoil — Field investigations — Part 4: Wing shear tests
DIN 18126	Subsoil, Examination of Soil Samples — Determination of the Density of Non-Cohesive Soils with Loosest and Densest Storage
DIN 18128	Subsoil — Examination of soil samples — Determination of ignition loss
DIN 18129	Subsoil, Examination of Soil Samples — Determination of Lime Content
DIN 18196	Earthworks and foundation engineering — Soil classification for structural purposes
DIN EN 1997-2	Eurocode 7: Design, calculation and design in geotechnics — Part 2: Exploration and investigation of the subsoil
DIN EN 1997-2/NA	National Annex — Nationally defined parameters — Eurocode 7: Design, calculation and design in geotechnical engineering — Part 2: Exploration and investigation of the subsoil
DIN EN ISO 14688-1	Geotechnical exploration and investigation — Designation, description and classification of soil — Part 1: Designation and description
DIN EN ISO 14688-2	Geotechnical exploration and investigation — Designation, description and classification of soil — Part 2: Basic classes for soil classification
DIN EN ISO 14689	Geotechnical Exploration and Investigation — Naming, Description and Classification of Rock
DIN EN ISO 17892-1	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 1: Determination of water content
DIN EN ISO 17892-2	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 2: Determination of soil density
DIN EN ISO 17892-4	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 4: Determination of grain size distribution

DIN EN ISO 17892-7	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 7: Uniaxial pressure test
DIN EN ISO 17892-8	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 8: Unconsolidated undrained triaxial test
DIN EN ISO 22475-1	Geotechnical Exploration and Investigation — Sampling Methods and Groundwater Measurements — Part 1: Technical Principles of Execution

2.2 Classification of soil and rock into homogeneous areas

Soil and rock are to be divided into homogeneous areas according to their condition before release. The homogeneous area is a limited area, consisting of one or more soil or rock layers, which has comparable properties for dredging work.

If environmentally relevant ingredients are to be taken into account, they must be taken into account when dividing them into homogeneous areas.

For the homogeneous ranges, the following properties and characteristic values as well as their determined bandwidth must be given. Below are the standards or recommendations with which these parameters may have to be verified. If several methods of determination are possible, a standard or recommendation must be established.

For soil:

- local designation,
- Grain size distribution with grain strips according to DIN EN ISO 17892-4,
- Mass fraction of stones, blocks and large blocks according to DIN EN ISO 14688-1; Determination by sorting and measuring or sieving, then weighing and then relating to the corresponding excavated mass,
- undrained shear strength according to DIN 4094-4 or DIN EN ISO 17892-7 or DIN EN ISO 17892-8,
- Water content according to DIN EN ISO 17892-1,
- Consistency according to DIN EN ISO 14688-1,
- Associated storage density: Designation according to DIN EN ISO 14688-2, Determination according to DIN 18126,
- Lime content according to DIN 18129,
- organic content according to DIN 18128,
- Naming and description of organic soils according to DIN EN ISO 14688-1 and
- Floor assembly according to DIN 18196.

For the description of mobile soils (e.g. for maintenance dredging work), it is sufficient to specify the grain size distribution according to DIN EN ISO 17892-4 with grain bands and the consistency according to DIN EN ISO 14688-1.

For rock:

- local designation,
- Naming of Fels according to DIN EN ISO 14689,
- Moisture density according to DIN EN ISO 17892-2,
- Weathering and changes, variability according to DIN EN ISO 14689,
- uniaxial compressive strength of rock in accordance with DIN 18141-1 "Subsoil — Examination of rock samples — Part 1: Determination of uniaxial compressive strength" and
- Separation surface direction, separation surface distance and rock body shape according to DIN EN ISO 14689.

2.3 Description and classification of artificial floors and other materials

As far as possible, artificial floors, e.g. backfills, and other substances, e.g. components, recycled materials, industrial by-products, waste and soils with foreign components, are described in accordance with Section 2.1 and classified in accordance with Section 2.2. If this is not possible, they are specifically described with regard to their properties for dredging work.

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 The choice of the construction method and construction process as well as the selection and use of the construction equipment are the responsibility of the Contractor.

3.1.2 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- incorrect information about the subsoil,
- incorrect information on morphological and hydrological influences,
- insufficient work and transport areas,
- Risk of landslides, soil runoff, terrain or ground fractures,
- inadequate description of soil and rock.

3.1.3 If the location of existing pipes, cables, culverts and other structural installations or obstacles that cannot be dredged, such as wreckage, remains of structures and the like, cannot be specified before the work is carried out, this must be ascertained. The required services are special services (see section 4.2.1).

3.1.4 If obstacles are unexpectedly encountered, e.g. lines, cables, culverts, building remains, wreckage, ground monuments, logs, stumps, the Client must be informed immediately. The required benefits must be determined jointly. These services are special services (see section 4.2.1). If it is to be assumed that the obstacles are explosive ordnance, the work must be stopped immediately and the responsible authority and the client must be notified. The Contractor must carry out the necessary security services without delay. The required services are common festzulegen. Die as well as the other services are special services (see section 4.2.1).

3.1.5 If there is a risk of landslides, soil runoff, terrain or ground fractures during the execution, the Contractor must immediately carry out the necessary services to prevent damage and inform the Client. Damage that has already occurred must be reported to the Client immediately. The other benefits are to be determined jointly. The services rendered as well as the other services are, insofar as the Contractor is not responsible for special services (see Section 4.2.1).

3.1.6 Work must be carried out with the necessary caution in the vicinity of structures, pipes, cables, culverts and wrecks; for example, large equipment must only be used to the extent necessary and dredging and blasting must only be carried out in such a way that existing installations are not endangered.

3.1.7 In the case of protective and security measures, the regulations of the owners or other persons authorised to issue instructions must be observed. The required services are special services (see section 4.2.1).

3.1.8 Gauges and official markers, e.g. boundary stones, height markers, may only be removed with the consent of the Client. The contractor must secure the client's fixed points for the construction measure.

3.1.9 Growth in excess of the agreed scope may only be removed with the consent of the Client.

3.1.10 During flushing work, care must be taken to ensure that the rinse water can drain off freely and does not cause damage. The driving of washware into receiving waters and in front of outlets must be avoided.

3.1.11 If the agreed services are not sufficient for the removal of leachate, groundwater, backwater and the like, the necessary additional services shall be determined jointly. These services are special services (see section 4.2.1).

3.1.12 The Contractor must carry out all necessary drainage measures in good time.

3.2 Detach and load

3.2.1 Deviations from the agreed removal cross-sections, excavator cuts and excavator tolerances may only be made with the consent of the Client.

3.2.2 If removal cross-sections and longitudinal sections have not been agreed, the choice of dimensions in the removal section shall be left to the contractor.

3.2.3 If ground conditions deviating from the specifications are encountered or circumstances arise as a result of which the agreed dimensions cannot be met, the required services shall be determined jointly. To the extent that the Contractor is not responsible for these services, these services are special services (see Section 4.2.1).

3.3 Promote

The choice of funding routes and funding procedures is left to the contractor.

3.4 Depositing

3.4.1 When relocating in the water, the soil must be deposited without additional measures, e.g. dumping or flushing under water.

3.4.2 When flushing on land, the soil must be stored as densely as possible by appropriate arrangement and control of the flushing field outlet, e.g. flushing field overflow (Mönch), flushing field dimensions, secondary clarifiers.

3.4.3 If certain quality requirements are placed on the material to be deposited in the direct use of dredged material, e.g. for further use for beach filling, scour shoring,, dams or construction sites, only suitable soil and rock must be used.

3.4.4 When dumping or rinsing, the floor is installed with the embankments that occur.

3.4.5 Measuring equipment installed in deposit areas for the purpose of observing settlement and the like must not be damaged or changed in position.

3.5 Creation of embankments and flushing field surfaces

If the contractor has to secure embankments and flushing areas, the fastening must be carried out in sections immediately after construction or in connection with the progress of the work.

3.6 Working during and after frosty weather

Frozen layers of earthworks, backfills and backfills may only be flooded or otherwise covered with soil if no damage can occur.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Determination of the condition of the road and terrain surfaces, the receiving waters and the like in accordance with § 3 para. 4 VOB/B.

4.1.2 Removal of individual shrubs and individual trees up to 10 cm in diameter, measured 1 m above the ground, the associated roots and tree stumps.

4.1.3 Construction, maintenance and removal of the stairs and paths in the embankments required for the performance of the service.

4.1.4 Removal of damage that occurs to floating or other equipment during the performance of the contractual service, and the resulting downtime and idle times of the contractor's affected equipment.

4.1.5 Securing the flushing pipes, including those provided by the client.

4.1.6 Water level measurements for the execution and accounting of the work, measurement and ongoing control of the positions of the floating equipment, including provision of navigational equipment and places of manpower.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 The Special Benefits listed in Sections 3.1.3, 3.1.4, 3.1.5, 3.1.7, 3.1.11 and 3.2.3.

4.2.2 Erecting, maintaining and removing gauges, observation wells and the like.

4.2.3 Removal of growth including clearing, except for services according to section 4.1.2.

4.2.4 Relocation of dredging equipment in the event of encounters of obstacles that cannot be dredged, such as wrecks or wreckage, remains of structures, explosive ordnance and the like, which prevent the continuation of dredging work at the site.

4.2.5 Services to improve soil mechanical properties, e.g. compaction and drainage as well as soil replacement.

4.2.6 Breaking up and restoring paved surfaces.

4.2.7 Services when encountering geotextiles.

4.2.8 Soil, water and soil mechanics investigations.

4.2.9 Services for determining the condition of the waters and the structural facilities, including supply and disposal facilities, before the start of the work, which go beyond the findings in accordance with Section 4.1.1.

4.2.10 Removal of damage to floating or other equipment and consequent downtime and idle times of the affected equipment of the Contractor caused by obstacles that were not disclosed to the Contractor.

4.2.11 Disposing of dredged material.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

5.1.1 Cargo space excavators and barges and their holds must be officially measured.

5.1.2 The usual approximation methods are permissible for quantity determination.

5.2 Determination of dimensions/quantities

5.2.1 The length of the conveying route shall be the shortest navigable distance from the centre of the area of an excavator section to the centre of the deposit area.

5.2.2 When measuring in the order, settlement of the substrate must be taken into account; any flushing losses are not taken into account.

5.2.3 If the mass is to be accounted for, this is to be determined by weighing, in the case of shiploads by ship's oak.

5.2.4 In the case of settlement by mass, the unloading according to ship's oak is determined before and after loading. If the cargo space is not tightly closed at the bottom,

e.g. folding barges, the buoyancy, in the case of cargo holds closed at the bottom, e.g. in the case of flushing barges, the water content must be taken into account.

5.2.5 When determining quantities according to the dimensions of the cargo space, the average filling level of the cargo space shall be determined in accordance with the usual procedures and the load capacity shall be calculated from the officially certified filling scale. If suitable load space indicators are available on cargo area excavators, these can also be used to determine performance. Residues of dredged material remaining in the vessel after barges or hold dredgers have been emptied are measured and deducted.

5.3 Overmeasurement rules

No regulations.

5.4 Individual provisions

No regulations

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Underground mining work — DIN 18312

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 Foundation depths, types of foundations, loads and construction of adjacent and overlying structures.

0.1.2 Type, location and dimensions as well as owners of natural and artificial cavities as well as known obstacles, e.g. from previous construction measures such as anchors and injection bodies.

0.1.3 Fire protection, escape and rescue concept as well as structures of the local emergency and rescue forces

0.1.4 Requirements and restrictions resulting from the building permit procedure.

0.1.5 Use of land and structures of third parties for the production of anchorages, injections, groundwater lowering and the like.

0.2 Information on the execution

0.2.1 Number, type, location, dimensions and design of tunnels, tunnels, caverns, shafts and the like to be constructed, as well as their connections to structures.

0.2.2 Number, dimensions and location of the attack points, approach and target shafts as well as window studs.

0.2.3 Restrictions on the construction process.

0.2.4 Downtime.

0.2.5 Specifications resulting from expert opinions.

0.2.6 Services for the protection of groundwater, water, soil, flora and fauna that lie within the sphere of influence of the construction project.

0.2.7 Services for the protection of land, buildings and water extraction facilities that are within the sphere of influence of the construction project.

0.2.8 Services for the limitation of subsidence and vibrations.

0.2.9 Naming and description of soil and rock and other substances in accordance with Section 2 as well as representations in longitudinal and cross-sections.

0.2.10 Information on the swelling behaviour of soil and rock.

0.2.11 Results of soundings for the determination of storage densities.

0.2.12 Information on the tunnelling class, excavation and securing of the cavity.

0.2.13 Information from the tunnelling expert report.

0.2.14 Conventional excavation, separated into tunnelling classes in accordance with Section 3.2 and in connection with the homogeneous areas, subdivided or grouped together where appropriate, e.g. according to the type and extent of the stabilisation measures.

0.2.15 Specifications for excavation and stabilisation for the respective tunnelling class in accordance with the tunnelling planning: construction method, type of excavation, e.g. full or partial excavation and chipping depth, type and extent of stabilisation (soffit, tunnel face, anticipating and the like), the securing materials and securing components/elements, e.g. shotcrete, reinforcement, anchors, spikes, pipe umbrellas, arches.

0.2.16 Excavation when tunnel boring machines or shield machines are used according to heading classes according to Section 3.2 and separated by homogeneous areas.

0.2.17 Shape and dimensions of the cavity cross-section, cut-out profile and tolerances inwards (ta 1) (see Sections 3.3.4 and 3.3.5).

0.2.18 LTW line for the inner structural boundary with the construction tolerance tb of the inner shell. Deformation tolerance of the outer shell td . Planned thickness of the inner shell di .

0.2.19 Thickness of anchor heads and sealing dak – where necessary.

0.2.20 Planned thickness of the outer shell.

0.2.21 Foreseeable superelevation ü in problem areas, e.g. to compensate for unavoidable deformations in the case of highly compressive or swelling rock.

0.2.22 Significant change in the properties and conditions of soil and rock during and after loosening, in particular in combination with air, water, support fluid or other conditioning agents.

0.2.23 Possible water ingress and possible water influx.

0.2.24 Limit water volume for groundwater or mountain water with determination of the area to be taken into account. Specifications for the measurement of the water produced.

0.2.25 Type and scope of services for the collection, drainage, treatment and discharge of water that accumulates, in particular with regard to the protection of the excavated bed.

0.2.26 Use of conditioning agents and support fluids.

0.2.27 Special methods for carrying out tunnelling, e.g. compressed air operation, groundwater lowering, injections, freezing work.

0.2.28 Dismantling parts of the fuse.

0.2.29 Filling of cavities and substances to be used.

0.2.30 Type of backfilling of annular spaces and substances to be used.

0.2.31 Maximum edge length of blocks that need to be crushed by a stone crusher.

0.2.32 Obstacle removal services.

0.2.33 Use of the excavated masses and their transport above ground.

0.2.34 Type and scope of measurements and their documentation

0.2.35 Type of equipment for aeration and dedusting.

0.2.36 Special services relating to ventilation, dust extraction, lighting and the like.

0.2.37 Type of emergency power supply.

0.2.38 Type and scope of installations for fire protection and for firefighting, self-rescue, rescue of persons and the like for all underground

persons present, e.g. electronic access control systems with tracking aid for the rescue forces, redundant communication equipment, escape chambers (rescue/protective containers) with a safe breathing air and energy supply, recirculation breathing apparatus, on-board extinguishing systems on work and transport equipment, extinguishing agent equipment for water, foam, powder or CO2, stationary fire extinguishing systems, fire control of the ventilation, devices for the containment of the Smoke spread (water curtains), thermal imaging cameras for locating people, lifting and recovery systems.

0.2.39 Establishment and provision of a rescue brigade if necessary firefighting and rescue services cannot be ensured by local emergency services.

0.2.40 Nature and scope of fire and rescue exercises.

0.2.41 Special evidence of the suitability and quality of materials and components.

0.2.42 Type and scope of self-monitoring and third-party monitoring.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 3.1.2 if the construction process and the use of the construction equipment within the tunnelling classes are to be specified to the contractor.

0.4 Individual information on fringe benefits and special benefits

In particular, the following can be considered as ancillary services for which special ordinal numbers (items) are to be provided under the conditions of ATV DIN 18299, Section 0.4.1:

- Provision of the tunnelling equipment and
- Installation, maintenance, operation and removal of facilities for the protection of persons working underground (see section 4.1.9).

0.5 Billing Units

In the bill of quantities, the billing units, separated by type, substances and dimensions, are to be provided as follows:

- Excavation, separated according to tunnelling classes, taking into account the homogeneous areas, according to volume (m3) or length (m),
- Additional quantities of excavation by volume (m3),
- Removal of obstacles according to room size (m3) or number (St),
- Removal of water by volume (l, m3),
- Securing with concrete according to area (m2),
- Filling of cavities according to room dimensions (m3),
- Wire nets, reinforcing steel mesh, warping or gear planks according to area (m2), mass (kg, t) or number (St),

- lattice girders and route arcs according to mass (kg, t) or number (st),
- Rock nails and anchors by number (St),
- segment lining by length (m) or segment rings by number (St),
- Downtime by time (h, d).

1 Scope of application

1.1 ATV DIN 18312 "Underground mining work" applies to the excavation and mining of soil and rock in closed construction as well as in cut-and-cover construction, for the construction of tunnels, tunnels, caverns, shafts and the like that are not directly used for the extraction of mineral resources.

It includes the loosening, loading and pumping of soil and rock, securing the cavity underground as well as collecting, treating and draining the water to the assigned discharge point. It also applies to securing work if it also serves as the final lining.

1.2 ATV DIN 18312 does not apply to

- well construction work (see ATV DIN 18302 "Work on the expansion of boreholes") and
- Pipe jacking work (see ATV DIN 18319 "Pipe jacking work").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18312 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

2.1 Description of soil and rock

The following apply to the naming and describing of soil and rock:

DIN 4020	Geotechnical investigations for structural purposes — Supplementary regulations to DIN EN 1997-2
DIN 4023	Geotechnical exploration and investigation — Graphic representation of the results of drilling and other direct outcrops
DIN 4094-4	Subsoil — Field investigations — Part 4: Wing shear tests
DIN 18125-2	Subsoil — Examination of soil samples — Determination of soil density — Part 2: Field tests
DIN 18126	Subsoil — Examination of soil samples — Determination of the density of non-cohesive soils with loosest and densest storage
DIN 18128	Subsoil — Examination of soil samples — Determination of ignition loss

DIN 18196	Earthworks and foundations — Soil classification for construction purposes
DIN EN 1997-2	Eurocode 7: Design, calculation and design in geotechnics — Part 2: Exploration and investigation of the subsoil
DIN EN 1997-2/NA	National Annex — Nationally defined parameters — Eurocode 7: Design, calculation and design in geotechnical engineering — Part 2: Exploration and investigation of the subsoil
DIN EN ISO 14688-1	Geotechnical exploration and investigation — Designation, description and classification of soil — Part 1: Designation and Description
DIN EN ISO 14688-2	Geotechnical exploration and investigation — Designation, description and classification of soil — Part 2: Fundamentals of soil classifications
DIN EN ISO 14689	Geotechnical Exploration and Investigation — Naming, Description and Classification of Rock
DIN EN ISO 17892-1	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 1: Determination of water content
DIN EN ISO 17892-2	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 2: Determination of soil density
DIN EN ISO 17892-4	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 4: Determination of grain size distribution
DIN EN ISO 17892-7	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 7: Uniaxial pressure test
DIN EN ISO 17892-8	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 8: Unconsolidated undrained triaxial test
DIN EN ISO 17892-9	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 9: Consolidated triaxial compression tests on water-saturated soils
DIN EN ISO 17892-10	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 10: Direct shear tests
DIN EN ISO 17892-12	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 12: Determination of flow and roll-out limits
DIN EN ISO 22475-1	Geotechnical Exploration and Investigation — Sampling Methods and Groundwater Measurements — Part 1: Technical Principles of Execution
NF P18-579	Aggregates — Determination of Abrasiveness and Grindability Coefficients(2)

DGGT Recommendation No. 23: "Determination of the Abrasiveness of Rocks with the CERCHAR Test" of Working Group 3.3 "Rock Experimental Technology"3)

2.2 Classification of soil and rock into homogeneous areas

Soil and rock are to be divided into homogeneous areas according to their condition before release. The homogeneous area is a limited area, consisting of single or several layers of soil or rock, which has comparable properties for underground mining work.

If environmentally relevant ingredients are to be taken into account, they must be taken into account when dividing them into homogeneous areas.

For the homogeneous ranges, the following properties and characteristic values as well as their determined bandwidth must be given. Below are the standards or recommendations with which these parameters may have to be verified. If several methods of determination are possible, a standard or recommendation must be established.

For soil:

- local designation,
- Grain size distribution with grain strips according to DIN EN ISO 17892-4,
- Mass fraction of stones, blocks and large blocks according to DIN EN ISO 14688-1; Determination by sorting and measuring or sieving, then weighing and then relating to the corresponding excavated mass,
- Moisture density according to DIN EN ISO 17892-2 or DIN 18125-2,
- undrained shear strength according to DIN 4094-4 or DIN EN ISO 17892-7 or DIN EN ISO 17892-8,
- Water content according to DIN EN ISO 17892-1,
- Plasticity coefficient according to DIN EN ISO 17892-12,
- consistency number according to DIN EN ISO 17892-12,
- Associated storage density: Designation according to DIN EN ISO 14688-2, Determination according to DIN 18126,
- abrasiveness according to NF P18-5792) and
- Floor assembly according to DIN 18196.

For tunnelling with shield machines, the following must be indicated:

- organic content according to DIN 18128,
- mineralogical composition of the stones and blocks according to DIN EN ISO 14689,
- Cohesion according to DIN EN ISO 17892-9 and DIN EN ISO 17892-10 as well as
- Sensitivity according to DIN 4094-4.

- For rock:

- local designation,
- Naming of Fels according to DIN EN ISO 14689,
- Moisture density according to DIN EN ISO 17892-2,
- Weathering and changes, variability according to DIN EN ISO 14689,
- uniaxial compressive strength of rock according to DIN 18141-1, subsoil — Examination of rock samples — Part 1: Determination of uniaxial compressive strength,
- Separation surface direction, separation surface distance, rock body shape according to DIN EN ISO 14689,
- Opening width and fissure filling of separation surfaces in accordance with DIN EN ISO 14689 and
- Abrasiveness according to DGGT Recommendation No. 23: "Determination of the Abrasiveness of Rocks with the CERCHAR Test" of AK 3.3 "Rock Experimental Technology"3) .

2.3 Description and classification of artificial floors and other materials

To the extent possible, artificial soils, e.g. backfills, and other substances, e.g. components, recycled materials, industrial by-products, waste and soils with foreign components, are described in accordance with Section 2.1 and classified in accordance with Section 2.2. If this is not possible, they are specifically described in terms of their properties for underground mining.

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 Excavation includes excavation and securing of the cavity. With the tunnelling classes, the client specifies the construction method for the construction of the cavity.

3.1.2 The choice of the construction process as well as the selection and use of the construction equipment within the tunnelling classes are the responsibility of the Contractor.

3.1.3 Endangered structural facilities must be secured. In the case of protective and security measures, the regulations of the owners or other persons authorised to issue instructions must be observed. The required services are special services (see section 4.2.1).

3.1.4 Underground mining work may only be commenced if the safety and health protection plan in accordance with the Construction Site Ordinance is available.

3.1.5 If cavities or obstacles are unexpectedly encountered, e.g. pipes, cables, drains, sewers, markings, building remains, the Client must be informed immediately. The required benefits must be determined jointly. These services are special services (see section 4.2.1).

If it is to be assumed that the obstacles are explosive ordnance, the work must be stopped immediately and the competent authority and the client must benachrichtigt become. The Contractor must carry out the necessary security services without delay. The required benefits must be determined jointly. The services provided and the other services are special services (see section 4.2.1).

3.1.6 If there is a risk of collapses, soil leakage, loss of support fluid, bottom lifting, water intrusion, damage to structural facilities and the like during execution, the Contractor shall immediately take the necessary measures to prevent damage and inform the Client. The services rendered as well as the other services are, insofar as the Contractor is not responsible for special services (see Section 4.2.1). Damage that has already occurred must be reported to the Client immediately.

3.1.7 In the case of the cut-and-cover method, the additional excavation during the construction of the floor must not exceed 10 cm at any point in the case of soils and more than 50 cm in the case of rock. The minimum dimensions for workspace widths must not be undercut.

3.2 Tunnelling classes

3.2.1 Tunnelling using conventional methods

3.2.1.1 General Excavation is carried out using the following methods: blasting, dredging, chiseling, jet blasting, milling or in combination of these processes in full or partial cross-sections and with subsequent conveyance.

3.2.1.2 Tunnelling class 1

Breakout without fuse.

3.2.1.3 Tunnelling class 2

Excavation with a fuse, which must be installed in accordance with the construction method in such a way that loosening and loading are not obstructed.

3.2.1.4 Tunnelling class 3

Excavation with a safety device at a defined distance from the tunnel face, for the installation of which the release and loading must be interrupted.

3.2.1.5 Tunnelling classes 4 and 4 A

Breakout with immediately following backup. In the case of tunnelling class 4 A, the excavated cross-section must also be subdivided for reasons of stability.

3.2.1.6 Tunnelling classes 5 and 5 A

Excavation with immediately following securing including securing the tunnel face. In the case of tunnelling class 5 A, the excavated cross-section must also be subdivided for reasons of stability.

3.2.1.7 Tunnelling classes 6 and 6 A

Eruption with immediately following and premature protection. In the case of tunnelling class 6 A, the excavated cross-section must also be subdivided for reasons of stability.

3.2.1.8 Tunnelling classes 7 and 7 A

Excavation with immediately following securing including securing the tunnel face and premature securing. In the case of tunnelling class 7 A, the excavated cross-section must also be subdivided for reasons of stability.

3.2.2 Excavation with tunnel boring machines

3.2.2.1 General

Excavation by means of a drill head with simultaneous extraction.

3.2.2.2 Tunnelling class TBM 1

Propulsion without protection.

3.2.2.3 Tunnelling class TBM 2

Breakout with a fuse, the installation of which does not hinder loosening.

3.2.2.4 Tunnelling class TBM 3

Breakout with a fuse, the installation of which hinders loosening.

3.2.2.5 Tunnelling class TBM 4

Breakout with a fuse, for the installation of which the loosening must be interrupted.

3.2.3 Excavation with shield machines in full-face mining

3.2.3.1 General

Excavation by means of a cutting wheel with simultaneous conveying. The fuse is installed inside the shield machine. The support of the tunnel face must be carried out in accordance with the specified procedure.

3.2.3.2 Tunnelling class VS 1

Eruption without support of the face face.

3.2.3.3 Tunnelling class VS 2

Outbreak with fluid-assisted tunnel breast

3.2.3.4 Tunnelling class VS 3

Eruption with earth pressure-supported tunnel face.

3.2.4 Tunnelling with shield machines in partial cutting

3.2.4.1 General

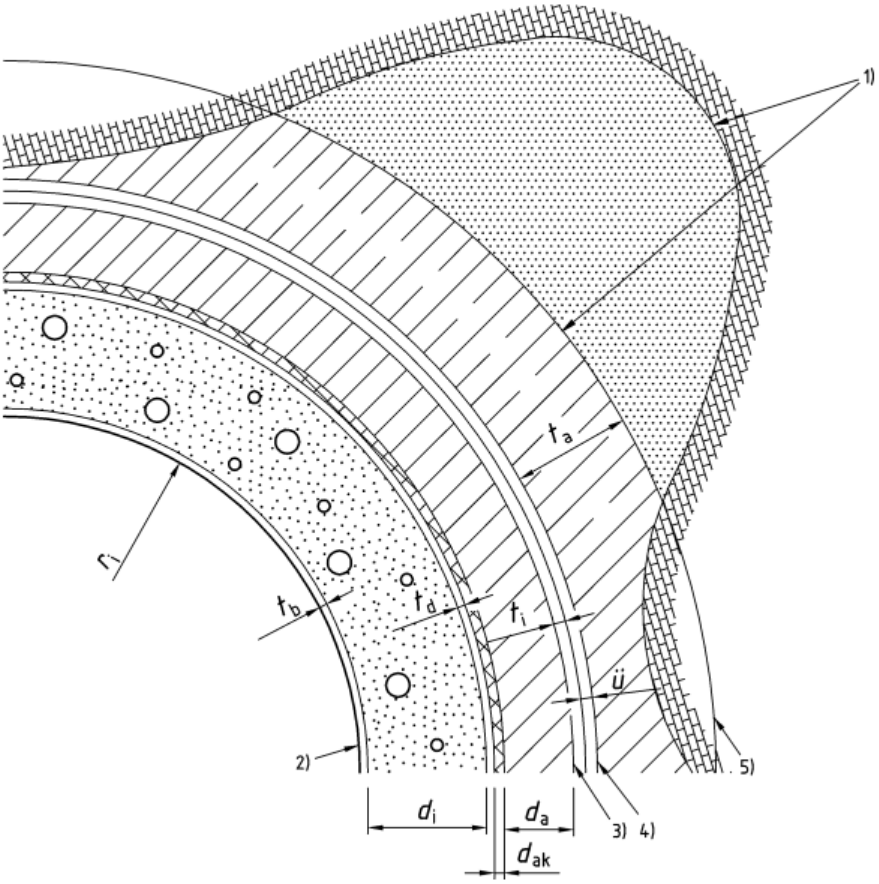
Excavation by excavator, milling machine, drill head, nozzle jet or in combination of these processes in partial cross-sections. The soffit must be secured within the shield machine and the tunnel face must be secured in accordance with the specified tunnelling planning.

3.2.4.2 Tunnelling class TS 1

Excavation without securing the tunnel face.

3.2.4.3 Tunnelling class TS 2

Excavation with a protection of the tunnel face



Legend

r i	Planned radius of the inner structure boundary
di	Planned thickness of the inner shell
dak	Thickness of anchor heads and sealing
since	planned thickness of the outer shell
t b	Construction tolerance of the inner shell
t d	Deformation tolerance of the outer shell
t in	Innentoleranz
t a	External tolerance
ü	Exaggeration to compensate for unavoidable deformations in problem areas
Las	= LTW + TB+ K + TD + Post + K + TI + ü
LI	= LAS − t i − ü
LA	= LAS + t a
1)	Boundary lines of the geologically determined, unforeseeable, unavoidable additional eruption
2)	LTW line (inner structure boundary line)
3)	LI line
4)	LAS line (breakout target profile)
5)	LA line (outer breakout tolerance)

Figure 1 — Representation of shell thicknesses, tolerances and over-breakage

3.3 Eruption

3.3.1 Excavation involves the loosening, the division of the excavated cross-section, taking into account the homogeneous areas and, in the case of conventional tunnelling, the associated cut length.

3.3.2 The loosening of soil and rock must be carried out in such a way that the remaining soil and rock are loosened as little as possible. Loosened soil must be compacted. Loose rock must be removed.

3.3.3 The excavation target profile defined by the LAS line may only be changed with the consent of the client.

3.3.4 Exceeding the agreed tolerance inwards, as specified by the LI line, is not permitted.

3.3.5 Exceeding the agreed tolerance externally, specified by the LA line, due to overbreakage caused by the Contractor's way of working, is to be avoided.

3.3.6 If an unavoidable additional eruption occurs due to the geological conditions, which exceeds the external outbreak tolerance ta and thus the specified LA line, the Client must be informed immediately. The required services are special services (see section 4.2.1).

3.3.7 If, during the excavation, subsoil conditions deviating from the specification of services are found and the performance of the service is no longer possible in the intended manner or circumstances arise as a result of which the agreed excavation target profile cannot be complied with, the Client shall be informed of this immediately. The required services are special services (see section 4.2.1).

3.3.8 If circumstances arise that require a change in the agreed cut length or a different distribution of the excavated cross-section, the Contractor must inform the Client.

3.4 Backup

3.4.1 The securing equipment includes the type, sequence of installation, location, number and dimension of the securing equipment.

3.4.2 The type and extent of the stabilisation must be carried out in accordance with the agreed tunnelling classes. Otherwise, their choice is left to the contractor. Safety measures must be carried out in such a way that the specified external tolerance ta (avoidable additional outbreak) is avoided.

3.4.3 If circumstances arise that require a change in the agreed security, the Contractor shall immediately perform the necessary services to prevent damage and inform the Client in the event of danger in delay. The other benefits are to be determined jointly. The and the other services are, to the extent not attributable to the Contractor, special services (see section 4.2.1).

3.5 Promote

3.5.1 The choice of funding routes and funding procedures shall be left to the Contractor. The service includes the conveying of dissolved soil and rock within the tunnel construction site. Loading and disposing of dissolved soil and rock, including system-related admixtures, are special services (see 4.2.1).

3.5.2 The conveyor equipment must be selected in such a way that no harmful change in the subsoil occurs.

3.6 Collecting and draining water

3.6.1 The service includes the collection and treatment as well as the drainage of the water to the assigned discharge point.

3.6.2 The collection and drainage of water must be carried out in such a way as to avoid damage, e.g. harmful softening of soil and rock.

3.6.3 If the agreed limit water volume is exceeded, the Client shall be informed of this immediately. The required benefits must be determined jointly. These services are special services (see section 4.2.1).

3.7 Filling of cavities

3.7.1 Construction-related cavities between the subsoil and the securing or lining must be filled in a force-fit manner and in sufficient time to avoid harmful effects.

3.7.2 Cavities between the excavation target profile according to the LAS line and the LA line as well as cavities created by avoidable additional excavation must be filled in a force-fit manner.

3.7.3 Cavities encountered during excavation, e.g. fissures, karst caves, as well as cavities caused by unavoidable overbursts exceeding the specified external tolerance ta, shall be filled in as far as necessary. These services are special services (see section 4.2.1).

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Determination of the condition of the road and terrain surfaces, the receiving waters and the like in accordance with § 3 para. 4 VOB/B.

4.1.2 Disposal of service water.

4.1.3 Services for the excavation and stabilization work required by the ingress of mountain water up to the boundary water volume.

4.1.4 Removal of face protections.

4.1.5 Loading and conveying the excess breakout between the LAS line and the LA line and the avoidable excess breakout.

4.1.6 Installation of all connecting and sealing elements for segments.

4.1.7 Installation of all connecting elements and base plates for expansion arches.

4.1.8 Provision of scaffolding for the construction of the tunnel.

4.1.9 Erecting, maintaining, operating and removing facilities for the protection of the Contractor's employees working underground:

- Physical access control
- Emergency call system for all underground workplaces,
- Fire alarm system with alarm,
- emergency lighting and escape route marking,
- posting of alarm and rescue plans,
- ventilation, dust removal,
- Fire extinguisher
- Oxygen self-rescuer.

4.1.10 Delivery of verified evidence and execution drawings, insofar as these are necessary for auxiliary constructions.

4.1.11 Measurements and investigations as well as their documentation in the context of self-monitoring.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 The Special Benefits listed in clauses 3.1.3, 3.1.5, 3.1.6, 3.3.6, 3.3.7, 3.4.3, 3.5.1, 3.6.3 and 3.7.3.

4.2.2 Safety and health protection plan in accordance with the Construction Site Ordinance.

4.2.3 Provision of mathematical proof of stability and of execution documents and as-built documentation, with the exception of services in accordance with section 4.1.10.

4.2.4 Measurements and investigations as well as their documentation that go beyond the services in section 4.1.11.

4.2.5 Services for excavation and stabilisation work that is required by the ingress of mountain water in excess of the specified boundary water volume (see section 4.1.3).

4.2.6 Establishing, maintaining, operating and removing facilities that go beyond the scope of the services under Section 4.1.9.

4.2.7 Safety equipment for the Client's personnel and visitors.

4.2.8 Services for determining the condition of the structural facilities, including the roads as well as the supply and disposal facilities and the like beyond the services under section 4.1.1, e.g. preservation of evidence.

4.2.9 Removal of blocks for which the stone crusher of the tunnel boring machine is not designed for the edge length.

4.2.10 Loading, transporting and disposing of the loosened soil and rock, including system-related admixtures.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

5.1.1 Approximation procedures are permissible for quantity determination.

5.1.2 In the case of invoicing of steel components according to mass, the calculated mass shall be decisive. For standardised profiles, the information in the DIN standards applies, for other profiles the information in the manufacturer's profile book.

5.2 Determination of dimensions/quantities

5.2.1 Water drainage The quantities of water to be billed are determined from the quantities of water discharged from the cavity minus the quantities of service water supplied.

5.2.2 Outbreak

5.2.2.1 Excavation quantities are to be determined according to theoretical excavation cross-sections according to the LAS line, see Figure 1, and axle lengths.

Additional breakout between the target breakout profile according to the LAS line and the outer breakout tolerance according to the LA line (see Figure 1) as well as avoidable over-breakage are not taken into account. The external breakout tolerance according to the LA line is determined from the cutout target profile according to the LAS line and the external tolerance ta (see Figure 1).

5.2.2.2 Unavoidable excess excavation, see section 3.3.6, is determined by measuring the resulting cavity.

5.2.2.3 The length of the cavity of the respective junction is calculated up to the intersection of its longitudinal axis with the LAS line of the main cross-section.

5.2.3 Backup

5.2.3.1 Concrete fuses are calculated in the settlement according to the area dimension in the handling of the inner surface.

5.2.3.2 In the case of settlement on the basis of area dimensions, areas of wire mesh, reinforcing steel mesh and warping and gear planks shall be calculated according to the nominal dimensions of the covered areas without taking into account overlaps, corrugations, ribs, bends and the like.

5.2.3.3 In the case of billing according to the dimensions of lattice girders and steel arches, connecting elements, base plates, longitudinal bracing and overlaps are not calculated.

5.2.3.4 In the case of billing according to the length measure, the length of the securing is measured with segments in the longitudinal axis of the structure.

5.2.4 Backfilling

The filling of cavities is determined by measurement.

5.3 Overmeasurement rules

The following are measured:

5.3.1 When determining the excavation quantities, natural cavities in the rock that lie within the excavation target profile.

5.3.2 If billed according to area size: recesses, e.g. openings, niches, ≤ 1 m2 individual size.

5.4 Individual provisions

No regulations.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Diaphragm wall work with supporting fluids — DIN 18313

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 Foundation depths, foundation types and loads as well as construction of adjacent structures.

0.1.2 Type and nature of existing borders.

0.1.3 Formation of existing construction pits.

0.1.4 Type, location and dimensions as well as owners of natural and artificial cavities as well as known obstacles, e.g. anchors and injection bodies from previous construction measures.

0.1.5 Type, location, dimensions, accessibility, nature and load-bearing capacity of the work plan or the subsoil for the work plan, in particular restrictions on working height.

0.1.6 Restrictions on dimensions and masses for the transport of components.

0.1.7 Possibilities of above- and below-ground arrangement of supply and return pipes for the supporting fluid, especially in the area of traffic areas.

0.1.8 Possibilities for intermediate storage of the diaphragm wall excavation.

0.1.9 Neighbourly approvals or proof of easements in the land register when using neighbouring properties.

0.1.10 Confirmation that the requirements applicable in the respective federal state for reconnaissance and, if necessary, clearance measures with regard to explosive ordnance have been met.

0.1.11 Type, scope and execution time of measures for the preservation of evidence.

0.1.12 Information on existing and planned groundwater lowering.

0.2 Information on the execution

0.2.1 Type, location and dimensions of diaphragm walls to be manufactured.

0.2.2 Floor plan shape of the diaphragm wall elements.

0.2.3 Restrictions on the length of diaphragm wall elements depending on the stability of the open, liquid-supported slot or a limitation of deformations.

0.2.4 Permissible deformations and stability of the structures and components within the sphere of influence of the diaphragm walls.

0.2.5 Type and design of diaphragm wall joints.

0.2.6 Execution Tolerances.

0.2.7 Number, type, dimensions and design of closures, branches and connections of the diaphragm wall to adjacent structures.

0.2.8 Number, type, dimensions and design of the diaphragm wall for connections, recesses, built-in parts and the like.

0.2.9 Manufacture and, if necessary, removal of double or one-sided guide walls.

0.2.10 Soil and rock formations in the area of the slots; List of layers, representation in longitudinal sections and cross-sections.

0.2.11 Description and classification of soil and rock with regard to their properties and conditions in accordance with Section 2.

0.2.12 Results of soundings to determine storage densities.

0.2.13 Description of soils that tend to liquefy when supported by suspension.

0.2.14 Indications of particularly sharp minerals, e.g. quartz and feldspar.

0.2.15 Water pressure heights and flow velocities in all groundwater levels and soil permeability coefficients.

0.2.16 Adverse effects of soil and water on diaphragm wall materials and supporting fluids.

0.2.17 Disposing of excavated conductive wall and diaphragm wall excavation and their mixing with supporting fluids.

0.2.18 Risk of sudden loss of support fluid and consequent performance.

0.2.19 Type and properties of concrete, required compressive strength class and exposure class.

0.2.20 Quantities, grades, diameters and corrosion protection of reinforcing steel. Use of special reinforcements, e.g. plastic reinforcements.

0.2.21 Enlargement of the concrete cover of the steel inserts.

0.2.22 Special features of reinforcement guidance, e.g. in the area of horizontal joints.

0.2.23 Type and properties of the cut-off wall building materials, e.g. processing time, permeability, compressive strength, stress deformation behaviour.

0.2.24 Services to minimise water penetration in the wall and joint area.

0.2.25 Type, location and dimensions of the components to be adjusted, use of used or unused components and their whereabouts in the slot.

0.2.26 Specifications for the processing and installation of sealing or support elements.

0.2.27 Specifications resulting from expert opinions.

0.2.28 Number, type, location and dimensions of test slots or sample boxes, e.g. to test the stability of the liquid-filled slot, to check the feasibility of the process.

0.2.29 Number, type and scope of tests and documentation.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 3.1.2,	if the excavation method, the construction process or the type and use of the construction equipment are to be specified to the Contractor,
Section 3.2.1,	if the type and materials of guide walls or the necessary earthworks are to be specified,
Section 3.2.2	if the removal or leaving of guide walls is not to be left to the Contractor,
Section 3.3.2,	if it is not to be left to the contractor how to produce the supporting fluid,

Section 3.4.1, if it is not to be left to the contractor to decide how to achieve the required quality of the wall,

Section 3.4.4 if the machining of the diaphragm wall head is to be determined.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units are to be provided as follows:

0.5.1 Construction and removal of the guide walls, including necessary earthworks, separated into double-sided or one-sided guide walls, type and dimensions, according to length (m).

0.5.2 Manufacture of diaphragm walls, separated according to the floor plan shapes of the elements and according to type and dimensions: □ Excavated diaphragm walls, concrete and other diaphragm wall materials according to room dimensions (m3), □ Reinforcement according to mass (kg, t).

0.5.3 Filling of the empty slot according to room dimensions (m3).

0.5.4 Replacement of loss of supporting fluid by volume (m3).

0.5.5 Connections, recesses, built-in parts such as anchor channels, cables, dowels, anchor sleeves and the like, as well as shoring beams, separated by type and dimensions, by number (St).

0.5.6 Sealing and construction elements, e.g. waterproofing membranes, steel sheet piling, separated by type and dimensions, by area (m2).

0.5.7 Removal of known obstacles, separated by type and dimensions, by volume (m3) or number (St).

0.5.8 Manufacture of movement joints and joint seals, separated by type, position and dimensions, by length (m).

1 Scope of application

1.1 ATV DIN 18313 "Diaphragm wall work with supporting fluids" applies to the construction of retaining walls, sealing walls, barrettes and other building components in liquid-supported earth slots. This includes excavation under supporting fluid, reinforcement and concreting as well as the installation of construction elements in the slots.

It also applies to the construction and removal of guide walls and the earthworks required for this.

1.2 ATV DIN 18313 does not apply to

- suspension-supported drilling (see ATV DIN 18301 "Drilling work") and
- the production of narrow walls in which soil is displaced with the help of rammed, pressed or vibrated components (see ATV DIN 18304 "Pile driving, vibrating and pressing work").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18313 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

2.1 Description of the subsoil

The following apply to the investigation, naming and description of the subsoil:

DIN 4020	Geotechnical investigations for structural purposes — Supplementary regulations to DIN EN 1997-2
DIN 4023	Geotechnical exploration and investigation — Graphic representation of the results of drilling and other direct outcrops
DIN 4030 (all parts)	Assessment of concrete-attacking waters, soils and gases
DIN 4094-4	Subsoil — Field investigations — Part 4: Wing shear tests
DIN 18125-2	Subsoil — Examination of soil samples — Determination of soil density — Part 2: Field tests
DIN 18126	Subsoil — Examination of soil samples — Determination of the density of non-cohesive soils with loosest and densest storage
DIN 18128	Subsoil — Examination of soil samples — Determination of ignition loss
DIN 18129	Subsoil — Examination of soil samples — Determination of lime content DIN 18196 Earthworks and foundations — Soil classification for structural purposes

DIN EN 1997-2	Eurocode 7: Design, calculation and design in geotechnical engineering — Part 2: Exploration and investigation of the subsoil
DIN EN 1997-2/NA	National Annex — Nationally defined parameters — Eurocode 7: Design, calculation and design in geotechnical engineering — Part 2: Exploration and investigation of the subsoil
DIN EN ISO 14688-1	Geotechnical exploration and investigation — Designation, description and classification of soil — Part 1: Designation and description
DIN EN ISO 14688-2	Geotechnical exploration and investigation — Designation, description and classification of soil — Part 2: Principles for soil classifications
DIN EN ISO 14689	Geotechnical Exploration and Investigation — Naming, Description and Classification of Rock
DIN EN ISO 17892-1	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 1: Determination of water content
DIN EN ISO 17892-2	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 2: Determination of soil density
DIN EN ISO 17892-4	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 4: Determination of grain size distribution
DIN EN ISO 17892-7	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 7: Uniaxial pressure test
DIN EN ISO 17892-8	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 8: Unconsolidated undrained triaxial test
DIN EN ISO 17892-12	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 12: Determination of flow and roll-out limits
DIN EN ISO 22475-1	Geotechnical Exploration and Investigation — Sampling Methods and Groundwater Measurements — Part 1: Technical Principles of Execution

2.2 Classification of soil and rock into homogeneous areas

Soil and rock are to be divided into homogeneous areas according to their condition before release. The homogeneous area is a limited area, consisting of one or more soil or rock layers, which has comparable properties for diaphragm wall work with supporting fluids.

If environmentally relevant ingredients are to be taken into account, they must be taken into account when dividing them into homogeneous areas.

For the homogeneous ranges, the following properties and characteristic values as well as their determined bandwidth must be given. Below are the standards or

recommendations with which these parameters may have to be verified. If several methods of determination are possible, a standard or recommendation must be established.

For soil:

- local designation,
- Grain size distribution with grain strips according to DIN EN ISO 17892-4,
- Mass fraction of stones, blocks and large blocks according to DIN EN ISO 14688-1, determination by sorting and measuring or sieving, then weighing and then relating to the corresponding excavated mass,
- Moisture density according to DIN EN ISO 17892-2 or DIN 18125-2,
- undrained shear strength according to DIN 4094-4 or DIN EN ISO 17892-7 or DIN EN ISO 17892-8,
- Water content according to DIN EN ISO 17892-1,
- Plasticity coefficient according to DIN EN ISO 17892-12,
- consistency number according to DIN EN ISO 17892-12,
- Associated storage density: Designation according to DIN EN ISO 14688-2, Determination according to DIN 18126,
- Lime content according to DIN 18129,
- organic content according to DIN 18128 and
- Floor assembly according to DIN 18196.

For rock:

- local designation,
- Naming of Fels according to DIN EN ISO 14689,
- Moisture density according to DIN EN ISO 17892-2,
- Weathering and changes, variability according to DIN EN ISO 14689,
- Lime content according to DIN 18129,
- uniaxial compressive strength of rock according to DIN 18141-1, subsoil — Examination of rock samples — Part 1: Determination of uniaxial compressive strength,
- Split tensile strength according to DGGT recommendation No. 10: "Indirect tensile test on rock specimens — Splitting tensile test" of AK 3.3 "Rock test technology"1) ,
- Separation surface direction, separation surface distance, rock body shape according to DIN EN ISO 14689 and
- Opening width and gap filling of parting surfaces according to DIN EN ISO 14689

2.3 Description and classification of artificial floors and other materials

As far as possible, artificial soils, e.g. backfills, and other substances, e.g. components, recycled materials, industrial by-products, waste and soils with foreign components are described in accordance with Section 2.1 and classified in accordance with Section 2.2. If this is not possible, they are specifically described with regard to their properties for diaphragm wall work.

2.4 Materials and components for diaphragm walls

For the most common standardised materials and components, the DIN standards are listed as well as for other substances the quality specifications in DIN EN 1538 "Execution of work in special civil engineering - diaphragm walls".

Furthermore, the following applies:

DIN 4127	Earthworks and foundation engineering — Test methods for support fluids in diaphragm wall construction and for their starting materials

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 Diaphragm wall work with supporting fluids must be carried out in accordance with DIN EN 1538.

3.1.2 The choice of the excavation method and construction process as well as the selection and use of the construction equipment are the responsibility of the Contractor.

3.1.3 Diaphragm wall work may only be commenced if there is confirmation that the requirements applicable in the respective federal state for exploratory and, if necessary, clearance measures with regard to explosive ordnance have been met.

3.1.4 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- deviations of the work plan from the specifications;
- deviations of the subsoil from the specifications;
- insufficient stability of the diaphragm walls in relation to the specified diaphragm wall element length.

3.1.5 Endangered structures must be secured; DIN 4123 "Excavations, foundations and underpinnings in the area of existing buildings" must be observed. In the case of protective and security measures, the regulations of the owners or other persons authorised to issue instructions must be observed. The required services are special services (see section 4.2.1).

3.1.6 If cavities or obstacles are unexpectedly encountered, e.g. pipes, cables, drains, sewers, markings, building remains, blocks, the Client must be informed immediately. The required benefits must be determined jointly. These services are special services (see section 4.2.1).

If it is to be assumed that the obstacles are explosive ordnance, the work must be stopped immediately and the responsible authority and the client must be notified. The Contractor must carry out the necessary security services without delay. The required benefits must be determined jointly. The services provided and the other services are special services (see section 4.2.1).

3.1.7 If soil or water conditions are found that deviate from the information in the service description, the Client shall be informed of this immediately. The required benefits must be determined jointly. These services are special services (see section 4.2.1).

3.1.6 If cavities or obstacles are unexpectedly encountered, e.g. pipes, cables, drains, sewers, markings, building remains, blocks, the Client must be informed immediately. The required benefits must be determined jointly. These services are special services (see section 4.2.1).

If it is to be assumed that the obstacles are explosive ordnance, the work must be stopped immediately and the responsible authority and the client must be notified. The Contractor must carry out the necessary security services without delay. The required benefits must be determined jointly. The services provided and the other services are special services (see section 4.2.1).

3.1.7 If soil or water conditions are found that deviate from the information in the service description, the Client shall be informed of this immediately. The required benefits must be determined jointly. These services are special services (see section 4.2.1).

3.4 Herstellen von Wänden

3.4.1 It is up to the Contractor to decide how to achieve the required quality of the wall, e.g. the choice of building materials, components and building elements as well as the workmanship. This also applies to the permissible water penetration rate. However, joints only need to be as resistant to the penetration of water and water flow as can be achieved without special measures when the walls are made. Further benefits are special services (see section 4.2.1).

3.4.2 In the event of unsuitable weather conditions, e.g. frozen ground, temperatures below +5 °C during concrete work and during the installation of suspensions, special precautions must be taken in consultation with the Client. The required services are special services (see section 4.2.15).

3.4.3 The specified diaphragm wall top must be constructed up to a height of the empty slots of 3 m with a permissible deviation of −10 cm to +50 cm, if the empty slots are at a higher height, the top of the diaphragm wall may be a further 10 cm higher for each m of additional height of the empty slot.

3.4.4 Concrete bodies formed above the specified diaphragm wall top, some of which are mixed with soil and supporting liquid, remain unprocessed.

3.4.5 Empty slots must be filled with diaphragm wall excavation

3.5 Supervision of the execution nd documents to be supplied

3.5.1 The execution must be monitored in accordance with DIN EN 1538:2015-10, Section 9.

3.5.2 The Contractor shall draw up protocols in accordance with DIN EN 1538:2015-10, Section 10 and hand them over to the Client on a weekly basis, at the latest upon acceptance.

4 Ancill□ry services, speci□l services

4.1 Ancill□ry services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Determination of the condition of the road and terrain surfaces, the receiving waters and the like in accordance with § 3 para. 4 VOB/B.

4.1.2 Maintaining the work plan.

4.1.3 Services to prove the quality of the materials, components and diaphragm walls in accordance with Section 3.5.

4.1.4 Setting up and running a construction site laboratory.

4.1.5 Checking the level of the supporting fluid in the slot in accordance with section 3.5.

4.1.6 Additional consumption of support fluid, concrete and other materials up to 10 % of the respective theoretical volume, in the case of self-hardening support fluids up to 40 %.

4.1.7 Production, provision and removal of splash guards up to a height of 2 m from the surface of the ground.

4.2 Speci□l services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 The Special Benefits listed in Sections 3.1.5, 3.1.6, 3.1.7, 3.3.3, 3.3.5, 3.3.6, 3.3.7, 3.4.1.

4.2.2 Services for determining the condition of the structural facilities, including the roads as well as the supply and disposal facilities before the start of the diaphragm wall work, in addition to the services according to section 4.1.1, e.g. preparation of expert opinions, camera inspections, load-bearing capacity investigations.

4.2.3 Construction, fastening, strengthening and removal of the work plan, parking and storage areas as well as access roads, bridges and the like on areas provided by the Client.

4.2.4 Preservation of existing watercourses and the receiving water.

4.2.5 Breaking up and restoring paved surfaces.

4.2.6 Conveying of the diaphragm wall excavation mixed with support fluid on the construction site for a conveying distance of more than 50 m.

4.2.7 Loading and disposing of the diaphragm wall excavation mixed with support fluid.

4.2.8 Loading and disposing of the excavated material required for the construction of guide walls.

4.2.9 Manufacture of movement joints and joint seals.

4.2.10 Making recesses.

4.2.11 Insertion of built-in components.

4.2.12 Arranged test slots and test boxes for testing the stability of the slot filled with supporting fluid or for checking the feasibility of the process.

4.2.13 Provision of static calculations, proof of stability and execution drawings.

4.2.14 Soil and water investigations as well as water level measurements.

4.2.15 Protection against unsuitable climatic conditions (see section 3.4.2).

4.2.16 Protection against concrete-damaging effects.

4.2.17 Supervision of the installation of concrete of monitoring classes 2 and 3 by recognised monitoring bodies.

4.2.18 Services to prove the quality of the materials and components, beyond the services referred to in section 4.1.3.

4.2.19 Filling of empty slots with materials other than diaphragm wall excavation.

4.2.20 Removal of concrete bodies formed above the specified diaphragm wall top and preparation of the connecting reinforcement.

4.2.21 Processing of exposed diaphragm wall surfaces and exposure of recess bodies, connection reinforcements and the like.

4.2.22 Delivering as-built plans.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

The determination of the performance – regardless of whether it is carried out according to drawings or measurements – must be based on the dimensions of the components manufactured.

5.2 Determination of dimensions/quantities

5.2.1 The length of the guide walls, the excavated slots and the diaphragm wall results from the length of the diaphragm wall axis in the floor plan.

5.2.2 The thickness of the excavated slots and the diaphragm wall is determined by the specified nominal thickness.

5.2.3 The depth of the excavated slots is determined by the dimension from the top of the guide wall, in the case of design without guide walls from the surface of the existing floor, to the specified depth of the diaphragm wall.

5.2.4 The depth of the diaphragm wall is determined by the dimension from the specified diaphragm wall underside to the specified diaphragm wall top, in the case of self-hardening support fluids in the case of the design with conductive walls up to the top of the diaphragm wall, in the case of the design without conductive walls up to the surface of the existing floor.

5.2.5 The height of the empty slot results from the dimension from the specified diaphragm wall top to the surface of the floor in front of it.

5.2.6 The mass of the steel reinforcement shall be calculated according to the steel lists. The mass of other reinforcement is billed according to plan. The reinforcement also includes the Supports, e.g. foot brackets, steel trestles, steel spacers, suspension brackets, bracing, replacements, mounting irons.

5.2.7 In the case of reinforcement, the calculated mass shall be decisive. For standardised steels, the information in the DIN standards applies, for other steels the information in the manufacturer's profile book.

5.3 Overmeasurement rules

5.3.1 Recesses, cables and built-in parts are measured.

5.3.2 Quantities displaced by reinforcement and built-in parts shall not be deducted.

5.4 Individual provisions

Binding wire, rolling tolerances and offcuts are not taken into account when determining the settlement mass of the reinforcement.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Shotcrete work — DIN 18314

Issue September 2016

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 Type, properties and properties of the application surfaces, e.g. strength, weather resistance, frost resistance, soiling.

0.1.2 Type and amount of water ingress or moisture penetration on the back.

0.1.3 Foundation depths, foundation types, loads and construction of adjacent structures.

0.1.4 Formation of construction pits.

0.1.5 Number, type, location, dimensions and design of the components to which shotcrete is to be applied, e.g. construction, geometry.

0.1.6 Type, location, dimensions and design as well as dates for the erection and dismantling of scaffolding on site.

0.1.7 On-site installations, equipment and machinery, e.g. systems for supply and disposal, ventilation, dust extraction.

0.1.8 Type of dewatering, high and low water levels and their probabilities.

0.2 Information on the execution

0.2.1 Number, type, location, dimensions and design of components to be manufactured from shotcrete.

0.2.2 Pre-treatment of the application surfaces, e.g. high-pressure water jets with indication of the pressure level and flow rate, blasting with solid blasting media, milling, chiseling.

0.2.3 Requirements for the coating surfaces with regard to composite and surface tensile strength.

0.2.4 Production of the application surfaces without requirements for the composite, e.g. on components made of wood, plastic, steel, subsoil.

0.2.5 Spraying method, type and properties of shotcrete and the components made from it, e.g. dry or wet spraying process, exposure class, maximum grain size of the supply mixture, compressive and early strength, water penetration resistance, leachability.

0.2.6 Use of concrete admixtures and concrete admixtures.

0.2.7 Use of fibers.

0.2.8 Shotcrete with or without formwork.

0.2.9 Type of formwork, built-in parts in the formwork, e.g. for profiling or structuring surfaces.

0.2.10 Injection of e.g. reinforcement, support elbows and installation parts.

0.2.11 Grades and dimensions of reinforcing steel and the degree of reinforcement. Special features of reinforcement guidance, reinforcement joints and fastenings, welded and bolted connections, special requirements for spacers.

0.2.12 Requirements for the concrete coverage of the reinforcement, e.g. in the event of alternating moisture penetration, increased mechanical stress.

0.2.13 Requirements for the shotcrete surface as well as flatness, dimensional accuracy and permissible tolerances.

0.2.14 Number, type, location, dimensions, shape and mass of components to be installed and present.

0.2.15 Number, type, position and dimensions of recesses to be made or closed.

0.2.16 Number, type, location, dimensions and formation of working, movement, building and component joints.

0.2.17 Number, type, dimensions and design of terminations and connections to adjacent components.

0.2.18 Requirements for after-treatment.

0.2.19 Regulation for the collection, separation and disposal of excavated or excavated material mixed with rebound.

0.2.20 Requirements for systems for supply and disposal, ventilation, dust removal, dedusting taking into account local conditions.

0.2.21 Ventilation measures to comply with occupational health and safety depending on the spraying method selected in section 0.2.5.

0.2.22 Special measures for the protection of persons, e.g. residents, personnel of other companies, as well as for the protection of components and installations, e.g. windows, railings, technical installations.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 3.1.3,	if details of the composition, mixing method, processing and post-treatment of the shotcrete/mortar are to be prescribed,
Section 3.1.4,	if the agreed order thicknesses are not to be minimum dimensions,
Section 3.2	if the shotcrete/mortar surfaces are not to be made splash-rough and the formed surfaces are not to be rough-formed.

0.4 Individual information on fringe benefits and special benefits

As ancillary services, for which special ordinal numbers (items) are to be provided under the conditions of ATV DIN 18299, Section 0.4.1, the protection of the young shotcrete/mortar by means of post-treatment against the effects of the weather and against drying out (see Section 4.1.5) can be considered.

0.5 Billing Units

In the bill of quantities, the billing units, separated by types and dimensions, are to be provided as follows:

- Shotcrete/mortar according to volume (m3), area (m2), length (m) or mass (t),
- Schalung nach Flächenmaß (m2),
- Seitenschalung von Unterzügen, Stützen und dergleichen nach Längenmaß (m),
- Bewehrung nach Masse (kg, t),

- Components made of shotcrete, number (St),
- Creation of recesses, e.g. openings, niches, cavities, slits, channels, number (st),
- Anchorages, number (st),
- Installation, relocation and dismantling of systems for supply and disposal, ventilation and dust removal, number (pcs),
- Provision of systems for supply and disposal, ventilation and dust removal, according to duration (d, week, month),
- Operation of systems for supply and disposal, ventilation and dust removal, according to duration (h).

1 Scope of application

1.1 ATV DIN 18314 "Shotcrete work" applies to the production and processing of reinforced and unreinforced concretes and mortars of all kinds, which are applied and compacted in the spraying process.

1.2 ATV DIN 18314 does not apply to

- the maintenance and repair of structures and components made of reinforced or unreinforced concrete (see ATV DIN 18349 "Concrete maintenance work"),
- the application of plaster mortar by spraying (see ATV DIN 18350 "Plastering and stucco work").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18314 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

For the most common standardized materials and components, the DIN standards are listed below.

DIN 1045-2:2008-08	Structures made of concrete, reinforced concrete and prestressed concrete — Part 2: Concrete — Specification, properties, manufacture and conformity — Rules of application of DIN EN 206-1
DIN 18551	Shotcrete — National application rules for the DIN EN 14487 series and rules for the design of shotcrete structures
DIN EN 206-1: 2001-07	Concrete — Part 1: Specification, properties, manufacture and conformity; German version EN 206-1:2000

DIN EN 934 (all parts)	Admixtures for concrete, mortar and grout
DIN EN 14487 (alle Teile)	Spritz concrete

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 DIN 18551 and DIN EN 14487 (all parts) and DIN 1045-3 "Structures made of concrete, reinforced concrete and prestressed concrete — Part 3: Construction — Rules of application for DIN EN 13670" and DIN EN 13670 "Execution of concrete structures" apply to the execution.

3.1.2 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- unsuitable condition of the application surfaces,
- Circumstances that affect the bonding, hardening and quality of the concrete.

3.1.3 It is up to the Contractor how he composes, mixes, processes and post-treats the shotcrete/mortar to achieve the required properties.

3.1.4 Agreed application thicknesses are minimum dimensions above the existing substrate profile.

3.1.5 If the target position of the surface is specified, deviations may not exceed 5 cm. Services to compensate for the difference between the coating thickness and the target position of the surface are special services (see section 4.2.1).

3.1.6 For work in accordance with ATV DIN 18312 "Underground mining work", the tolerances formulated there apply.

3.1.7 For the manufacture of clad components by spraying, the tolerances according to DIN 18202 "Tolerances in building construction — Buildings" apply.

3.2 Surfaces

The surfaces of the shotcrete must be left splash rough. Formed surfaces remain rough in formwork.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Determination of the condition of the road and terrain surfaces, the receiving waters and the like in accordance with Section 3 (4) VOB/B.

4.1.2 Services to prove the quality of the materials and components as well as the conformity of the shotcrete in accordance with DIN 18551 and DIN EN 14487 (all parts).

4.1.3 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on is not higher than 3.5 m above the standing area of the scaffolding required for this purpose.

4.1.4 Compensation of stepped or inclined surfaces of scaffolding ≤ 40 cm difference in height, e.g. via stairs or ramps.

4.1.5 After-treatment to protect the young shotcrete from the effects of the weather and against drying out, except for services referred to in section 4.2.7.

4.1.6 Picking up and disposing of rebound not mixed with excavation or excavation.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 The Special Benefits listed in Section 3.1.5.

4.2.2 Services for the protection of persons, components and installations, e.g. protective walls, enclosures, barriers.

4.2.3 Assembly, conversion and dismantling as well as provision of scaffolding for the services of other contractors.

4.2.4 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on is higher than 3.5 m above the standing area of the scaffolding required for this purpose.

4.2.5 Erection, conversion and dismantling as well as provision of scaffolding with a stepped or inclined footprint, e.g. via stairs or ramps, if compensation of more than 40 cm is required.

4.2.6 Soil and water investigations.

4.2.7 Services for precautionary and protective measures for young shotcrete against harmful influences, e.g. chemical attacks, extraneous vibrations, unsuitable temperatures of the application surface (see DIN 1045-3 and DIN EN 13670).

4.2.8 Providing building physics verifications as well as static calculations for buildings, repairs and planned construction stages and the drawings required for these verifications.

4.2.9 Making anchorages for the composite.

4.2.10 Supply and insertion of built-in components.

4.2.11 Cleaning of the application surfaces from coarse soiling, e.g. plaster residues, mortar residues, paint residues, oil, insofar as this was not caused by the Contractor.

4.2.12 Pre-treatment of the application surfaces.

4.2.13 Services to prove the quality of the materials and components as well as the conformity of the shotcrete, insofar as these certificates go beyond the services referred to in section 4.1.2.

4.2.14 Special services for water collection and water drainage from the application surfaces, e.g. hose drainage or dimpled film.

4.2.15 Services in connection with unforeseen breakouts or cavities.

4.2.16 Additional expenses due to the shotcrete application on built-in parts, e.g. dimpled film, hoses.

4.2.17 Erecting, maintaining, operating and removing facilities for ventilation and dusting.

4.2.18 Separation of the excavated material mixed with rebound as a result of the process. Excavated material.

4.2.19 Protection against process-related mixing of excavated or excavated material with rebound.

4.2.20 Increased requirements for the tolerances specified in Section 3.1.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

No regulations.

5.2 Determination of dimensions/quantities

5.2.1 The coating thickness is determined by comparing the profiles before and after the order.

5.2.2 Formwork for components, boundaries and recesses, e.g. for edges, openings, niches, cavities, slots, channels, is measured in the settlement of the formed concrete surface during billing according to the area measure.

5.2.3 The mass of the reinforcement shall be calculated according to the steel lists. Reinforcement also includes anchors, supports, replacements, assembly irons and the like.

The calculated mass is decisive. For standardised steels, the information in the DIN standards applies, for other steels the information in the manufacturer's profile book.

Binding wire and rolling tolerances are not taken into account when determining the billing masses.

5.2.4 In the settlement of reinforcing steel mesh, a waste for which the Contractor is not responsible, the mass of which is more than 10% of the mass of the installed reinforcing steel mesh, shall be additionally calculated.

5.2.5 In the case of settlement according to area dimensions, the overlap of reinforcing steel mesh and overlapping lengths for bar steel shall be remunerated.

5.3 Overmeasurement rules

The following are measured:

5.3.1 The quantities of shotcrete displaced by the reinforcement.

5.3.2 When billing according to area

1. Recesses, e.g. openings, niches and integrating components ≤ 1 m2.

5.3.3 When billing according to room dimensions

2. Recesses ≤ 0.25 m3 single size.

5.4 Individual provisions

No regulations.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Road construction work — superstructure layers without binders DIN 18315

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 Type and nature of the underlay.

0.1.2 Foundation depths, types of foundations, loads and construction of adjacent structures.

0.1.3 Type and condition of existing edgings and fixtures.

0.1.4 Track occupancy and maximum speeds in the adjacent track.

0.2 Information on the execution

0.2.1 Construction of the superstructure.

0.2.2 Intended use, special use and climatic influences.

0.2.3 Load, traffic load and local peculiarities.

0.2.4 Number, type, dimensions and design of connections to structures, components and superstructure layers.

0.2.5 Number, type, position and dimensions of recesses to be made or closed.

0.2.6 Number, type, location, dimensions and masses of fixtures.

0.2.7 Design and division of areas. Surface properties.

0.2.8 Type and scope of barrier and traffic safety measures, e.g. safety measures for work next to busy tracks.

0.2.9 Type and extent of protection of track bedding, switching equipment, wire cables, cable ducts, cable distributors and the like.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 2.1.2,	if the composition of the building material mixtures and soils is not to be left to the Contractor,
Section 3.3.1	if other values are to be specified for the permissible deviations from flatness, thickness, target height and profile-correct position for the base courses,
Section 3.3.2	if other values are to be specified for the surface courses for the permissible deviations from flatness, thickness, target height and position in accordance with the profile.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units, separated by type, substances and dimensions, are to be provided as follows:

- Redensification of the base according to area (m2),
- Establishment of the planned height, inclination and fixed flatness of the underlays according to the area (m2),
- Planum protection layers for track systems according to area (m2), volume (m3) or mass (t),
- Base courses according to area (m2), volume (m3) or mass (t),
- surface courses according to surface area (m2),

- superstructure layers of unsorted building material mixtures and soils according to area (m2), volume (m3) or mass (t),
- Sampling for control tests by number (pc)

1 Scope of application

1.1 ATV DIN 18315 "Traffic route construction work — Superstructure layers without binders" applies to the paving of roads and paths of all kinds, squares, courtyards, airfields, platforms and tracks with base and surface courses in road construction as well as with frost protection and grade protection layers for railway tracks.

1.2 ATV DIN 18315 does not apply to the improvement and consolidation of the substructure and the subsoil as well as the construction of track bedding (see ATV DIN 18325 "Track construction work").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18315 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

For the most common standardised materials as well as for soil and rock, the DIN standards and technical delivery conditions are listed below.

2.1 Requirements

2.1.1 Aggregates

DIN 4301 Iron and steel slag and metallurgical slag in the construction industry

The Technical Delivery Conditions for Aggregates in Road Construction (TL Gestein-StB) apply.

Only aggregates with labelling according to TL Gestein-StB may be used. This does not apply to unsorted building material mixtures and soils (see section 2.1.3).

2.1.2 Building material mixtures and soils

The composition of building material mixtures and soils is left to the contractor. In doing so, he must take into account the information on the intended use, traffic volumes and types of traffic, climatic influences and local conditions.

The mixtures must be even, frost-proof, filter-stable against the layers adjacent to the top and bottom.nd ausreichend dicht sein.

Building material mixtures for grade protection coatings consist of

- gravel-sand mixtures or sand-gravel mixtures, possibly with the addition of crushed aggregates,
- Ballast-chippings-sand mixtures or chippings-sand mixtures.

The Technical Terms and Conditions of Delivery for Building Material Mixtures and Soils for the Production of Coatings without Binders in Road Construction (TL SoB-StB) apply.

2.1.3 Unsorted building material mixtures

The building material mixtures must have a suitable grain size distribution.

2.2 Examinations

2.2.1 Suitability test The Contractor shall ascertain itself before the commencement of the execution and, upon request, prove to the Client that substances and mixtures of substances as well as soil and rock are suitable for the intended purpose.

2.2.2 Self-monitoring test The Contractor shall ascertain during the execution and, upon request, prove to the Client that substances and mixtures of substances as well as soil and rock comply with the contractual requirements.

2.2.3 Performing the Checks

DIN 4301	Iron and steel slag and metallurgical slag in the construction industry
DIN 52106	Testing of aggregates — Test methods for assessing weathering resistance
DIN EN 932-1	Test methods for general properties of aggregates — Part 1: Sampling methods
DIN EN 1926	Test Methods of Natural Stone — Determination of Uniaxial Compressive Strength
DIN EN 12370	Test Methods for Natural Stone — Determination of Resistance to Crystallization of Salts
DIN EN 13286-2	Unbound and Hydraulically Bound Mixtures — Part 2: Laboratory Test Methods for Determination of Reference Dry Density and Water Content — Proctor Test
DIN EN ISO 17892-4	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 4: Determination of grain size distribution
DIN EN ISO 17892-11	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 11: Determination of water permeability

The TL Gestein-StB1)

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 In the event of unsuitable weather conditions, e.g. frost, superstructure layers without binders may only be carried out if it is ensured that the quality of the performance is not impaired.

3.1.2 If the location of existing pipes, cables, drains, sewers, markings, obstacles and other structural installations cannot be specified before the work is carried out, this must be investigated. These services are special services (see section 4.2.1).

3.2 Rootstock

In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- insufficient load-bearing capacity or condition of the subsoil,
- deviations from the planned altitude, inclination or flatness,
- harmful soiling,
- lack of necessary drainage facilities,
- unsuitable weather conditions (see section 3.1.1);
- lack of reference points.

At the request of the Contractor, the Client shall provide existing evidence.

3.3 Manufacturing, requirements

3.3.1 Base courses, frost protection layers, grade protection layers

3.3.1.1 Installing

The building material mixture or soil must be evenly distributed in such a way that no segregation occurs.

3.3.1.2 Densification

Each layer or layer must be compacted evenly over the entire area with a favourable water content and according to the intended use.

3.3.1.3 Interface

The surface of the individual layers must be uniform and have a transverse slope sufficient for drainage. If a shift is driven on immediately or is left over the winter, additional services must be carried out if necessary. To the extent that the Contractor is not responsible for these services, these services are special services (see Section 4.2.1).

3.3.1.4 Profile-appropriate location

The layers must be produced at the appropriate height and in the agreed longitudinal and transverse profile. Deviations of the surface from the target height must not exceed 4 cm at any point.

3.3.1.5 Flatness

Unevenness of the surface of a layer within a 4 m long measuring section must not be greater than 3 cm.

3.3.1.6 Thickness

The minimum paving thickness of each layer or layer must be determined in the compacted state depending on the maximum grain size of the building material mixture or soil.

- ≤ 32 mm 12 cm,

- ≤ 45 mm 15 cm,
- ≤ 56 mm 18 cm,
- ≤ 63 mm 20 cm

amount to. The thickness of the built-in layer must not exceed 30 cm.

3.3.2 Surface Layers

3.3.2.1 Installing

The building material mixture or soil must be evenly distributed in such a way that no segregation occurs.

3.3.2.2 Densification

The surface course must be compacted evenly over the entire area with a favourable water content and in accordance with the intended use.

3.3.2.3 Surface

The surface of the surface course must be closed and uniform and have a transverse slope sufficient for drainage. Fine-grained components of the building material mixture or soil can also be used to close the surface.

3.3.2.4 Profile-appropriate location

Surface courses must be made at the appropriate height and in the agreed longitudinal and transverse profile. Deviations of the surface from the target height must not exceed 3 cm at any point.

3.3.2.5 Flatness

Unevenness of the surface of a layer within a 4 m long measuring section must not be greater than 2 cm.

3.3.2.6 Thickness

The minimum paving thickness of each layer or layer must be determined in the compacted state depending on the maximum grain size of the building material mixture or soil.

- ≤ 11 mm 3 cm,
- ≤ 16 mm 5 cm,
- ≤ 22 mm 7 cm

amount to.

3.3.3 Superstructure layers made of unsorted building material mixtures, soil and rock

The materials to be installed must be introduced evenly with a favourable water content and compacted according to the intended use.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Determination of the condition of the road and terrain surfaces, the receiving waters and the like in accordance with § 3 para. 4 VOB/B.

4.1.2 Construction of temporary accesses, driveways and the like, except for services in accordance with Section 4.2.4.

4.1.3 Tests, including sampling, to demonstrate the suitability and quality of substances and mixtures of substances as well as soil and rock in accordance with Sections 2.2.1 and 2.2.2, insofar as they are supplied or manufactured by the Contractor.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 The Special Benefits listed in Sections 3.1.2 and 3.3.1.3.

4.2.2 Soil and water tests, except for the services referred to in section 4.1.3.

4.2.3 Preparation of the substrate, e.g. recompaction, restoration of the planned altitude, removal of harmful soiling, insofar as the necessity of such services is not caused by the Contractor.

4.2.4 Construction, maintenance and removal of traffic safety equipment and fortifications for the maintenance of public and local traffic, in particular on the basis of official orders.

4.2.5 Making recesses that are not specified in the service description in terms of number, type and dimensions.

4.2.6 Closing of recesses and insertion of built-in components.

4.2.7 Services for control audits of the Client.

4.2.8 Clearing snow and blunting in icy conditions to maintain traffic.

4.2.9 Protection against unsuitable weather conditions in accordance with Section 3.1.1.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

No regulations.

5.2 Determination of dimensions/quantities

In the case of billing according to room or area dimensions, the width is measured up to the middle of the embankment line of the installed building material mixture, soil or rock.

5.3 Overmeasurement rules

The following are measured:

5.3.1 When billing according to room dimensions

- the space occupied by pipes and recesses or fixtures with an average penetration area ≤ 1 m2.

5.3.2 When billing according to area

- recesses or fixtures ≤ 1 m2 individual size, and
- Rails.

5.4 Individual provisions

No regulations.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Road construction work — Superstructure layers with hydraulic binders — DIN 18316

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 Type and nature of the underlay.

0.1.2 Foundation depths, types of foundations, loads and construction of adjacent structures.

0.1.3 Type and nature of existing borders.

0.2 Information on the execution

0.2.1 Construction of the superstructure.

0.2.2 Intended use, special use and climatic influences.

0.2.3 Load, traffic load and local peculiarities.

0.2.4 Number, type, dimensions and design of connections to structures, components and superstructure layers.

0.2.5 Number, type, position and dimensions of recesses to be made or closed.

0.2.6 Number, type, location, dimensions and masses of fixtures.

0.2.7 Number, type, location, dimensions and design of movement joints.

0.2.8 Special requirements for the resistance of aggregates to frost and freeze-thawing agents.

0.2.9 Exposure classes.

0.2.10 Installation of reinforcement in concrete slabs.

0.2.11 Type, position and execution of joints.

0.2.12 Number and type of dowels and anchors.

0.2.13 Design and division of areas. Surface properties, e.g. roughness.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 2.1.1,	if requirements other than those in TL Gestein-StB 04 "Technical delivery conditions for aggregates in road construction"1) are to be permitted for aggregates,
Section 2.1.2,	if instead of hydraulic binders in accordance with DIN EN 197 (all parts) "Cement", DIN 1164-10 "Cement with special properties — Part 10: Composition, requirements and proof of conformity of cement with low effective alkali content", DIN EN 13282-1 "Hydraulic base course trusses — Part 1: Fast-hardening hydraulic base course trusses — Composition, requirements and conformity criteria", DIN EN 13282-3 "Hydraulic base course trusses — Part 3: Conformity assessment", other hydraulic binders approved by the building authorities and equivalent are to be approved,
Section 2.1.3,	if instead of admixtures in accordance with DIN EN 934-2 'Admixtures for concrete, mortar and grout — Part 2: Concrete admixtures — Definitions, requirements, conformity, marking and labelling", other additives approved by the building authorities and equivalent are to be approved,

Section 2.1.6 if,	in the case of consolidation as base courses and in the case of hydraulically bound base courses, the choice of binders is not to be left to the contractor,
Section 2.1.6.2,	
Section 2.1.6.3 and	
Section 2.1.6.4 if	recycled aggregates are not to be authorised,
Section 3.3.1 and	
Section 3.3.2 if,	in the case of consolidation as base courses and in the case of hydraulically bound base courses, other values are to be specified for compressive strength, thickness, position and flatness,
Section 3.3.1.2 if	the amount of binder is not to be selected from the 7-day strength,
Section 3.3.2.2 if	the amount of binder is also to be selected from the 7-day strength,
Section 3.3.3 if,	in the case of concrete base layers, other values are to be specified for the concrete compressive strength classes, for the thickness, for the position appropriate to the profile or for the flatness, or if a specific grid is to be defined for the notches,
Section 3.3.4.1,	if different values are to be specified for the concrete requirements for concrete slabs,
Section 3.3.4.2,	if the concrete slab is not to be made of layers of different compositions,
Section 3.3.4.3 if	other values are to be set for the quantity or quality of reinforcing steel,
Section 3.3.4.5 and	
Section 3.3.4.6	if different dimensions are to be specified for concrete slabs for dowels and anchors,
Section 3.3.4.7,	if the type of post-treatment is not to be left to the contractor in the case of concrete slabs,
Section 3.3.4.8,	if the minimum thickness is to be undercut for concrete slabs,
Section 3.3.4.9 if	other values are to be specified for the profile-appropriate position,
Section 3.3.4.10 if	you want to set different values for flatness.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units, separated by type, substances and dimensions, are to be provided as follows:

- Redensification of the base according to area (m2),
- Establishment of the planned height, inclination and specified flatness of the base according to the area (m2),
- Cleaning according to area (m2),
- Layers for equalizing or compensating for the height according to mass (t) or volume (m3),
- Base courses and concrete slabs by area (m2),
- Reinforcement according to area (m2) or mass (t) according to the steel lists,
- Joint production and grouting including anchoring and anchoring, separated according to the different types of joint formation, according to length (m),
- Dowels and anchorages, if they are to be billed separately, according to the length (m) of the dowelled or anchored joints or according to the number (St),
- Post-treatment of the surface of concrete slabs according to surface area (m2),
- Sampling of control tests by number (St).

1 Scope of application

1.1 ATV DIN 18316 "Traffic route construction work — Superstructure layers with hydraulic binders" applies to the paving of roads and paths of all kinds, squares, yards, airfield areas, platforms and tracks with base courses and ceilings.

1.2 ATV DIN 18316 does not apply to the improvement and consolidation of the substructure and the subsoil.

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18316 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

For the most common substances, the DIN standards and other requirements are listed below.

2.1 Requirements

2.1.1 Aggregates

DIN 1045-2:2008-08	Structures made of concrete, reinforced concrete and prestressed concrete — Part 2: Concrete — Specification, properties, manufacture and conformity — Rules of application of DIN EN 206-1
DIN 4301	Iron and steel slag and metallurgical slag in the construction industry
DIN EN 206-1:2001-07	Concrete — Part 1: Specification, properties, manufacture and conformity; German version EN 206-1:2000
DIN EN 12620	Aggregates for Concrete
DIN EN 13055	Light aggregates
DIN EN 13242	Aggregates for Unbound and Hydraulically Bound Mixtures for Civil Engineering and Road Construction
DAfStb Alkali Directive	DAfStb Directive — Preventive measures against damaging alkali reaction in concrete (Alkali Directive)2)
TL Rock StB 04	Technical Delivery Conditions for Aggregates in Road Construction1)

2.1.2 Binders

DIN 1164-10	Cement with special properties — Part 10: Composition, requirements and proof of conformity of cement with low effective alkali content D
IN EN 13282-1	Hydraulic base course trusses — Part 1: Fast-hardening hydraulic base course trusses — Composition, requirements and conformity criteria
DIN EN 13282-3	Hydraulic base course trusses — Part 3: Conformity assessment
DIN EN 197-1	Cement — Part 1: Composition, requirements and conformity criteria of normal cement

2.1.3 Additives

DIN 1045-2:2008-08	Structures made of concrete, reinforced concrete and prestressed concrete — Part 2: Concrete — Specification, properties, manufacture and conformity — Rules of application of DIN EN 206-1

DIN EN 934-2	Admixtures for concrete, mortar and grout — Part 2: Concrete admixtures — Definitions, requirements, conformity, marking and marking

2.1.4 Additives

Concrete additives must comply with the requirements of DIN EN 206-1:2001-07 and DIN 1045-2:2008-08.

2.1.5 Addition water

DIN EN 1008	Addition Water for Concrete — Specification for Sampling, Testing and Assessment of the Suitability of Water, Including Water Produced in Concrete Production, as Addition Water for Concrete

The use of residual water is not permitted for air-aerated concrete.

2.1.6 Building material mixtures, concrete

2.1.6.1 General

DIN EN 14227-1	Hydraulically bound mixtures — Requirements — Part 1: Cement-bound mixtures
DIN EN 14227-5	Hydraulically bound mixtures — Requirements — Part 5: Base course binder bound mixtures

The composition of the building material mixtures and the concrete is left to the contractor. In doing so, he must take into account the information on the intended use, traffic volumes and types of traffic, climatic influences and local conditions.

2.1.6.2 Consolidation as base courses

Solidifications are to be made from building materials by mixing in hydraulic binders. Road lining materials containing pitch may be used if the solidifications produced with them meet the structural and environmental requirements.

2.1.6.3 Hydraulically bound base courses

Hydraulically bound base courses are base courses made of hydraulically bound mixtures in accordance with DIN EN 14227-1 and DIN EN 14227-5.

Hydraulically bound base courses are to be produced from grain-graded mixtures of aggregates (TL Gestein-StB 04:20181), Annex G) and hydraulic binders.

2.1.6.4 Concrete base courses

Concrete base courses are to be made of concrete in accordance with DIN EN 206-1:2001-07 and DIN 1045-2:2008-08 with grain-graded mixtures of aggregates in accordance with TL Gestein-StB 04:2018, Annex G.

Only coarsely recycled aggregates made of road surface concrete may be used for the concrete base course.

2.1.6.5 Concrete Slabs

Concrete must be produced in accordance with DIN EN 206-1:2001-07 and DIN 1045-2:2008-08.

Only coarsely recycled aggregates made of road surface concrete may be used for the lower layer of the concrete surface.

2.1.7 Steel

DIN 488-1	Reinforcing steel — Part 1: Steel grades, properties, marking
DIN EN 10025-1	Hot-rolled products of structural steels — Part 1: General technical delivery conditions
DIN EN 10060	Hot-rolled steel round bars — Dimensions, shape tolerances and limit dimensions
DIN EN 13877-1	Concrete road pavements — Part 1: Building materials
DIN EN 13877-3	Concrete pavement pavements — Part 3: Requirements for dowels for concrete pavement pavements

2.1.8 Joint fillers and joint inserts

2.1.8.1 Joint fillers

Materials used to seal the joint gap must have sufficient deformation and adhesion properties. If waterproofing profiles are used, the contact pressure must prevent moisture from penetrating even at low temperatures.

2.1.8.2 Joint inserts

Permanent joint inserts in room joints must allow the concrete slabs to expand and be so stiff that they are not deformed during concrete compaction. They must be water and alkali resistant and must not suck the water out of the fresh concrete.

Permanent inserts in the case of false joints must not be compressible in the lower part of the ceiling.

2.2 Examinations

2.2.1 Factory production control, initial inspection

The Contractor shall ascertain itself before the commencement of the execution and, upon request, prove to the Client that the substances and mixtures of substances are suitable for the intended purpose.

2.2.2 Self-monitoring audit

The Contractor shall ensure during the execution and, upon request, prove to the Client that the substances and mixtures of substances used comply with the contractual requirements.

If a certain air void content is prescribed, the air void content of the fresh concrete must be checked during concreting at the installation site in accordance with DIN EN 12350-7, Testing of fresh concrete — Part 7: Air content-pressure method.

2.2.3 Control check

The Contractor's obligation under Section 2.2.1 and Section 2.2.2 shall not be restricted by the Client's control checks.

2.2.4 Performing the Checks

2.2.4.1 Aggregates

DIN EN 932-1	Test methods for general properties of aggregates — Part 1: Sampling methods
DIN EN 932-2	Test methods for general properties of aggregates — Part 2: Methods for constricting laboratory specimens
DIN EN 932-3	Test methods for general properties of aggregates — Part 3: Implementation and terminology of a simplified petrographic description
DIN EN 933-1	Test methods for geometric properties of aggregates — Part 1: Determination of grain size distribution — Sieving method
DIN EN 933-3	Test methods for geometric properties of aggregates — Part 3: Determination of grain shape — Flatness index
DIN EN 933-4	Test methods for geometric properties of aggregates — Part 4: Determination of grain shape — Grain shape index
DIN EN 933-5	Test methods for geometric properties of aggregates — Part 5: Determination of the proportion of crushed grains in coarse aggregates
DIN EN 933-7	Test methods for geometric properties of aggregates — Part 7: Determination of mussel shell content — Percentage of mussel shells in coarse aggregates
DIN EN 933-10	Test methods for geometric properties of aggregates — Part 10: Assessment of fines — Particle distribution of filler (air jet screening)

DIN EN 1097-1	Test methods for mechanical and physical properties of aggregates — Part 1: Determination of resistance to wear (Micro-Deval)
DIN EN 1097-6	Test methods for mechanical and physical properties of aggregates — Part 6: Determination of bulk density and water absorption
DIN EN 1097-7	Test methods for mechanical and physical properties of aggregates — Part 7: Determination of density of filler — Pyclonometer method
DIN EN 1097-8	Test methods for mechanical and physical properties of aggregates — Part 8: Determination of polishing value
DIN EN 1367-1	Test Methods for Thermal Properties and Weathering Resistance of Aggregates — Part 1: Determination of Resistance to Freeze-Thaw Cycling
DIN EN 1367-2	Test methods for thermal properties and weathering resistance of aggregates — Part 2: Magnesium sulphate process
DIN EN 1367-3	Test Methods for Thermal Properties and Weathering Resistance of Aggregates — Part 3: Boiling Test for Sunburn Basalt
DIN EN 1744-1	Test methods for chemical properties of aggregates — Part 1: Chemical analysis
DIN V 18004	Applications of construction products in buildings — Test methods for aggregates according to DIN V 20000-103 and DIN V 20000-104

The test methods specified in TL Gestein-StB 041) apply.

Furthermore, the Technical Test Regulations for Aggregates in Road Construction (TP Gestein-StB)1) apply.

2.2.4.2 Binders

DIN EN 196 (all parts)	Test methods for cement

2.2.4.3 Building material mixtures, concrete

DIN EN 12350 (all parts)	Testing of fresh concrete
DIN EN 12390 (all parts)	Testing of hardened concrete
DIN EN 12504 (all parts)	Testing of concrete in buildings

Furthermore, the Technical Test Regulations for Base Courses with Hydraulic Binders and Road Surfaces made of Concrete (TP Beton-StB 10) apply.

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

In the event of unsuitable weather conditions, e.g. frost, superstructure layers with hydraulic binders may only be carried out if special measures are taken to ensure that the quality of the performance is not impaired.

3.2 Rootstock

In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- insufficient load-bearing capacity or condition of the subsoil,
- harmful cracking,
- deviations from the planned altitude, inclination or flatness,
- harmful soiling,
- lack of necessary drainage facilities,
- unsuitable weather conditions (see section 3.1);
- lack of reference points.

3.3 Manufacturing, requirements

3.3.1 Consolidation as base courses

3.3.1.1 Processing and post-treatment

The building materials must be mixed with the binder in such a way that the binder is evenly distributed. The building material mixture must be distributed in accordance with the profile and compacted evenly.

The dry density of the compacted consolidation must not be less than 98% proctor density.

Solidifications must be kept moist for at least 3 days after production or protected against drying out by other suitable measures.

3.3.1.2 Amount of binder

The amount of binder must be selected so that the compressive strength does not fall below 5 N/mm2 after 28 days during the initial test.

The 28-day strength may be calculated from the 7-day strength in the ratio of the standard compressive strengths of the hydraulic binder after 28 days and 7 days.

3.3.1.3 Notches

3.3.1.3.1 Consolidation under asphalt layers

Solidifications are equipped with notches

- at a distance of no more than 5 m if the compressive strength during the initial test exceeds 7 N/mm2 or the paving thicknesses exceed 20 cm,
- at intervals of no more than 2.5 m in the case of layers of asphalt with a total paving thickness of 14 cm and less.

3.3.1.3.2 Consolidation under concrete slabs

Under concrete ceilings, the position of the notches must correspond to the position of the joints in the concrete ceiling. If a fleece is arranged under the concrete ceiling, notching can be omitted.

3.3.1.4 Thickness

Solidifications must not be less than 10 cm thick at any point.

3.3.1.5 Profile-appropriate location

The base courses must be produced at the appropriate height and in the agreed longitudinal and transverse profile. Deviations of the surface from the target height must not exceed 3 cm at any point.

3.3.1.6 Flatness

Unevenness of the surface of solidifications within a 4 m long measuring section must not be greater than 3 cm.

3.3.2 Hydraulically bound base courses

3.3.2.1 Processing and post-treatment

The mixture of aggregates must be thoroughly mixed with the binder and water. The building material mixture must be distributed evenly and without segregation on a clean substrate, installed in accordance with the profile and compacted evenly.

Hydraulically bound base courses must be kept moist for at least 3 days after production or protected against drying out by other suitable measures.

3.3.2.2 Amount of binder

The amount of binder must be selected so that the compressive strength does not fall below 5 N/mm2 after 28 days during the initial test.

The 28-day strength may be calculated from the 7-day strength in the ratio of the standard compressive strengths of the hydraulic binder after 28 days and 7 days.

3.3.2.3 Notches

3.3.2.3.1 Hydraulically bound base course under asphalt layers

- at a distance of no more than 5 m if the compressive strength during the initial test exceeds 7 N/mm2 or the paving thicknesses exceed 20 cm,

- at intervals of no more than 2.5 m in the case of layers of asphalt with a total paving thickness of 14 cm and less.

3.3.2.3.2 Hydraulically bound base courses under concrete slabs

Under concrete ceilings, the position of the notches must correspond to the position of the joints in the concrete ceiling. If a fleece is arranged under the concrete ceiling, notching can be omitted.

3.3.2.4 Thickness

Hydraulically bound base courses must not be less than 9 cm thick at any point.

3.3.2.5 Profile-appropriate position

Section 3.3.1.5 applies to the profile-appropriate position.

3.3.2.6 Flatness

Unevenness of the surface must not be larger than 2 cm within a 4 m long measuring section.

3.3.3 Concrete base courses

3.3.3.1 Processing and post-treatment

The concrete must be installed according to the profile and compacted evenly. For post-treatment, DIN 1045-3 "Structures made of concrete, reinforced concrete and prestressed concrete — Part 3: Construction — Application rules for DIN EN 13670" in conjunction with DIN EN 13670 "Execution of concrete structures" applies.

3.3.3.2 Concrete compressive strength classes

The concrete compressive strength class must comply with at least C 12/15 according to DIN EN 206-1:2001-07 and DIN 1045-2:2008-08.

3.3.3.3 Notches

Concrete base layers are to be produced with notches. Under concrete ceilings, the position of the notches must correspond to the position of the joints in the concrete ceiling.

If a fleece is arranged under the concrete ceiling, notching can be omitted.

3.3.3.4 Thickness

Concrete base courses must not be less than 6 cm thick at any point.

3.3.3.5 Profile-appropriate location

Section 3.3.1.5 applies to the profile-appropriate position.

3.3.3.6 Flatness

Section 3.3.2.6 applies to flatness.

3.3.4 Concrete Ceilings

3.3.4.1 Requirements for the concrete

The concrete must comply with exposure class XF3 in the case of high water saturation without de-icing agent, and in accordance with exposure class XF4 in accordance with DIN EN 206-1:2001-07 and DIN 1045-2:2008-08 in the case of high water saturation with de-icing agent.

3.3.4.2 Transport and installation of the concrete

The fresh concrete must not come into contact with aluminium surfaces during transport.

The concrete must be installed in the full width of the ceiling or in strips resulting from the position of the longitudinal joints. Work interruptions are only permitted at transverse joints.

The concrete ceiling must have vertical side surfaces. The concrete slab may consist of layers of different compositions in compliance with the agreed requirements for the concrete. Concrete of the same composition may be placed in one or more layers werden. Die Dicke der Lage muss mindestens dem dreifachen Durchmesser des Größtkorns entsprechen. Bei mehrschichtiger Betondecke muss die obere Schicht mindestens 4 cm dick ausgeführt werden.

3.3.4.3 Reinforcement

If a surface reinforcement has been agreed, it must be installed with at least 3 kg/m2 of reinforcing steel B500A or B500B in accordance with DIN 488-1. The reinforcement must not impair the effectiveness of the joints. The concrete cover must be at least cmin = 40 mm and Δc = 15 mm. A concrete cover of cnom = 55 mm must be observed.

3.3.4.4 Joints

3.3.4.4.1 General

Concrete ceilings are to be made with joints. Joints must have a joint gap in the upper part, which is matched in width and depth to the intended joint filler. The construction of the joints must not impair the strength of the concrete and the surface quality of the concrete ceiling. The joints must be made in good time so that no cracks occur.

3.3.4.4.2 False joints

False joints must be created by cutting a joint gap with a depth of at least 25% of the ceiling thickness into the hardened concrete.

If inserts have been agreed in the lower part of the concrete slab to weaken the concrete cross-section, they must be secured against displacement.

3.3.4.4.3 Raumfugen

Room joints must be made in such a way that they separate the concrete slabs from each other in their entire thickness. The joint inserts must allow the slabs to expand;

they must be secured against postponement. The room joints must be made at least 12 mm wide.

3.3.4.4.4 Pressfugen

Press joints must be made without release agents.

3.3.4.4.5 Sealing the joints

The joint gap must be sealed with suitable joint fillers. Before applying bituminous grouts, the joint gap must be dry and clean.

3.3.4.5 Dowels

If dowels are agreed to transmit shear forces and to secure the height of the plates, anchors made of smooth round steel with a diameter of 25 mm and a length of 500 mm protected against corrosion must be used. They must be laid in the middle of the slab thickness in such a way that they do not obstruct the expansion of the slabs.

3.3.4.6 Anchors

If anchors are agreed to prevent concrete slabs from moving apart, they shall be made of reinforcing steel with a diameter of at least 16 mm and a length of at least 600 mm. They must be protected against corrosion in the joint area. The anchors are to be laid in the middle of the slab thickness.

3.3.4.7 Follow-up treatment

The young concrete must be protected against weather influences and drying out in such a way that the required properties are achieved.

3.3.4.8 Thickness

Concrete slabs must not be less than 100 mm thick at any point.

3.3.4.9 Location appropriate to the profile

Section 3.3.1.5 shall apply mutatis mutandis to the position of concrete slabs in accordance with the profile.

3.3.4.10 Flatness

Unevenness of the surface of concrete slabs must not be greater than 10 mm within a 4 m long measuring distance.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Determination of the condition of the road and terrain surfaces, the receiving waters and the like in accordance with § 3 para. 4 VOB/B.

4.1.2 Construction of temporary accesses, driveways and the like, except for services in accordance with Section 4.2.4.

4.1.3 Tests including sampling to prove the suitability and quality of building materials, building material mixtures and concrete in accordance with Sections 2.2.1 and 2.2.2, insofar as these are supplied by the Contractor.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 Soil and water investigations, except for the services referred to in section 4.1.3.

4.2.2 Protective measures for the installation of building material mixtures and concrete if work is to be carried out in unfavourable weather conditions on the orders of the client.

4.2.3 Preparation of the base, e.g. recompacting, notching, unloading of base courses, establishment of the planned altitude, removal of harmful soiling, insofar as the necessity of such services is not caused by the contractor.

4.2.4 Construction, maintenance and removal of traffic safety units and fortifications to maintain public and local traffic, in particular on the basis of official orders.

4.2.5 Manufacture of joints and recesses that are not specified in the service description in terms of number, type and dimensions.

4.2.6 Closing of recesses and insertion of built-in components.

4.2.7 Environmentally relevant investigations in the case of initial testing and self-monitoring tests, insofar as these services are required beyond those set out in Section 4.1.3 or the substances are provided or prescribed by the Client.

4.2.8 Control tests including sampling and related services.

4.2.9 Clearing snow and blunting in icy conditions to maintain traffic.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

No regulations.

5.2 Determination of dimensions/quantities

No regulations.

5.3 Overmeasurement rules

The following are measured:

5.3.1 When billed according to area

- recesses or fixtures ≤ 1 m2 individual size,
- Joints and
- Rails.

5.3.2 When billing reinforcement according to area

- Masks.

5.3.3 When invoicing joints according to length

- Interruptions of the joints.

5.4 Individual provisions

No regulations.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Road construction work — asphalt superstructure layers DIN 18317

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 Type and nature of the underlay.

0.1.2 Foundation depths, types of foundations, loads and construction of adjacent structures.

0.1.3 Type and nature of existing borders.

0.2 Information on the execution

0.2.1 Construction of the superstructure.

0.2.2 Intended use, special use and climatic influences

0.2.3 Load, traffic load and local peculiarities.

0.2.4 Number, type, dimensions and design of connections to structures, components and superstructure layers.

0.2.5 Number, type, position and dimensions of recesses to be made or closed.

0.2.6 Number, type, location, dimensions and masses of fixtures.

0.2.7 Number, type, location, dimensions and design of movement joints.

0.2.8 Design and division of areas. Surface properties.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 2.1.1	if the use of certain aggregates is to be restricted,
Section 2.1.3,	if the use of asphalt granules is to be restricted,
Section 2.1.4.1,	if the composition of the asphalt is not to be left to the contractor,
Section 3.3.1	if, in the case of asphalt base courses, asphalt base courses, asphalt binder courses, surface courses or protective layers made of rolled asphalt, other values are specified for the profile-correct position, for the flatness or for the thickness, or if other requirements are to be taken into account in the case of slab track in track construction,
Section 3.3.2	if other values are to be specified for flatness or thickness for surface courses or protective layers of mastic asphalt,
Section 3.3.3	if a different design is to be specified for the filling of the paving joints in the case of surface treatments,
Section 3.3.4,	if the underlay is to be sprayed with a binder in the case of thin asphalt surface courses in cold construction,
Section 3.3.5	if a different paving mass is to be specified for thin asphalt surface courses in hot construction.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units, separated by type, substances and dimensions, are to be provided as follows:

- Redensification of the base according to area (m2),
- Establishing the planned altitude, inclination and the specified flatness of the asphalt base according to mass (t),
- Cleaning according to area (m2),
- Spraying with bituminous binder according to area (m2) or mass (t),
- Layers for equalizing or compensating for the altitude according to mass (t),

- Asphalt base courses, asphalt base courses, asphalt binder courses, asphalt surface courses and protective layers, surface treatments according to area (m2), mass (t) or volume (m3),
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- Processing of surfaces of asphalt surface courses according to surface area (m2),
- Joint production and joint grouting according to length (m),
- Sampling for control tests by number (pcs).

1 Scope of application

1.1 ATV DIN 18317 "Traffic infrastructure construction work — Asphalt superstructure layers" applies to the paving of roads and paths of all kinds, squares, courtyards, airfields, platforms and tracks with

- asphalt base courses,
- asphalt base courses,
- asphalt binder courses and
- Asphalt surface courses

as well as for surface treatments, protective layers and surface courses of asphalt on bridges.

1.2 ATV DIN 18317 does not apply to

- the production of layers with tar or pitch-containing finishing materials,
- the production of protective coatings on building waterproofing, waterproofing, sealing surfaces and screeds made of mastic asphalt (see ATV DIN 18354 "Mastic asphalt work").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18317 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

For the most common substances, the requirements are listed in the following regulations.

2.1 Requirements

2.1.1 Aggregates

The Technical Terms and Conditions of Delivery for Aggregates in Road Construction (TL Gestein-StB)1) apply.

Household waste incineration ash (HMVA), recycled building materials (RC) with ingredients according to TL Gestein-StB1), Annex B, and lava slag may not be used for the production of asphalt.

Foundry residual sand (GRS) and foundry cupola piece slag (GKOS) may not be used for the production of asphalt binder courses and asphalt surface courses.

2.1.2 Binders

The following apply:

- Technical Terms and Conditions of Delivery for Road Construction Bitumen and Ready-to-Use Polymer-Modified Bitumen (TL Bitumen-StB)1) ,
- Technical Terms and Conditions of Delivery for Bitumen Emulsions (TL BE-StB)1) .

Binders according to TL Bitumen-StB1) and TL BE-StB1) suitable additives and natural asphalt according to DIN EN 13108-4 "Asphalt mixes — Mix requirements — Part 4: Hot Rolled Asphalt" may be added.

2.1.3 Reclaimed asphalt

The Technical Terms and Conditions of Delivery for Asphalt Granulate (TL AG-StB)1) apply. The binder mixture of the asphalt produced with asphalt granules must be suitable.

2.1.4 Asphalt

2.1.4.1 General

DIN EN 12273	Thin Asphalt Surface Courses in Cold Construction — Requirements
DIN EN 13108 (all parts)	Asphalt mix — Mix requirements

The composition of the asphalt is left to the contractor. In doing so, he must take into account the information on the intended use, traffic volumes and types of traffic, climatic influences and local conditions.

In asphalt, the binder must completely envelop the rock grains and adhere permanently.

The temperatures of the aggregates and the binders must be selected in such a way that the quality is not adversely affected and the asphalt can be processed perfectly.

The following can be considered for

2.1.4.2 Asphalt base courses

aggregates according to the TL Gestein-StB1), Annex F, for asphalt base course mixes.

Binder: road construction bitumen.

2.1.4.3 Asphalt base courses

aggregates according to the TL Gestein-StB1), Annex F, for asphalt surface course mixes.

Binder: road construction bitumen.

2.1.4.4 Asphalt binder courses

aggregates according to the TL Gestein-StB1), Annex F, for asphalt binders.

Binders: road construction bitumen, polymer-modified bitumen.

2.1.4.5 Asphalt surface courses made of asphalt concrete

Aggregates according to TL Gestein-StB1), Annex F, for asphalt concrete for asphalt surface courses.

Binders: road construction bitumen, polymer-modified bitumen.

2.1.4.6 Asphalt surface courses and protective layers of stone mastic asphalt

aggregates according to the TL Gestein-StB1), Annex F, for stone mastic asphalt.

Binders: road construction bitumen, polymer-modified bitumen. Stabilizing additives.

2.1.4.7 Asphalt surface courses and protective layers made of mastic asphalt

Aggregates according to TL Gestein-StB1), Annex F, for mastic asphalt.

Binders: road construction bitumen, mixture of road construction bitumen and natural asphalt, polymer-modified bitumen. Viscosity-altering additives.

2.1.4.8 Asphalt surface courses made of porous asphalt

aggregates according to TL Gestein-StB1), Appendix F, for porous asphalt.

Binders: polymer-modified bitumen. Stabilizing additives.

2.1.4.9 Thin asphalt surface courses in cold construction

aggregates according to TL Gestein-StB1), Annex F, for asphalt mixes for thin asphalt surface courses in cold construction.

Binder: polymer-modified bitumen emulsion. Additives to control the crushing process.

2.1.4.10 Thin asphalt surface courses in hot construction on sealing

aggregates according to the TL Gestein-StB1), Annex F, for thin asphalt surface courses in hot construction on sealing.

Binders: road construction bitumen, polymer-modified bitumen.

2.1.5 Surface treatments

aggregates according to the TL Gestein-StB1), Annex F, for surface treatments.

Binders: bitumen emulsions, polymer-modified bitumen emulsions

2.2 Examinations

2.2.1 Proof of suitability

The Contractor shall ascertain itself before the commencement of the execution and, upon request, prove to the Client that the substances and mixtures of substances are suitable for the intended purpose.

2.2.2 Self-monitoring audit

The Contractor shall ensure during the execution and, upon request, prove to the Client that the substances and mixtures of substances used comply with the contractual requirements.

2.2.3 Control check

The Contractor's obligation under Sections 2.2.1 and 2.2.2 shall not be limited by the Client's control audits.

2.2.4 Performing the Checks

2.2.4.1 Aggregates Technical Test Specifications for Asphalt (TP Asphalt-StB)1)

- Part 0 Statistical Basis for the Evaluation of Investigations, Arbitration Investigations, General Information on the Audit Report
- Part 2 Grain Size Distribution
- Part 27 Sampling The test methods specified in the TL Gestein-StB1) continue to apply.

2.2.4.2 Binders

The test methods specified in the respective Technical Terms and Conditions of Delivery in accordance with Section 2.1.2 shall apply to the testing of binders.

2.2.4.3 Asphalt

DIN EN 13108-20	Asphalt mix — Mix requirements — Part 20: Type test
DIN EN 13108-21	Asphalt mix — Mix requirements — Part 21: Factory production control

Furthermore, the following apply:

- Technical Test Specifications for Asphalt (TP Asphalt-StB)1)
- Technical delivery conditions for the structural maintenance of pavements — Part: Quality control — Part: Execution of thin asphalt surface courses in cold construction (TL G DSK-StB)1)
- Technical delivery conditions for the structural maintenance of traffic surface pavements — Part: Quality monitoring — Part: Execution of surface treatments (TL G OB-StB)
- Technical delivery conditions for the structural maintenance of traffic surface pavements — Part: Quality monitoring — Part: Execution of thin asphalt surface courses in hot construction on sealing (TL G DSH-V-StB)

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

Asphalt surface layers and surface treatments may only be applied in unsuitable weather conditions, e.g. wet or low air temperature, if it is ensured that the quality of the performance is not impaired.

3.2 Rootstock

In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- insufficient load-bearing capacity or condition of the subsoil,

- deviations from the planned altitude, inclination or flatness,
- harmful soiling,
- lack of necessary drainage facilities,
- unsuitable weather conditions (see section 3.1);
- lack of reference points.

3.3 Manufacturing, requirements

3.3.1 Asphalt base courses, asphalt base courses, asphalt binder courses, asphalt surface courses made of asphalt concrete, stone mastic asphalt and porous asphalt as well as protective layers made of rolled asphalt

3.3.1.1 Installing

The asphalt must be evenly distributed on the clean surface and in such a way that it does not separate.

Sufficient bonding must be achieved between the layers or layers.

The individual layers or layers may only be installed when the underlay is sufficiently stable and load-bearing.

3.3.1.2 Densification

The layers or layers must be compacted evenly and sufficiently over the entire surface.

3.3.1.3 Interface

The surface of the individual layers must have a uniform texture. The surface of the asphalt base course and the asphalt surface courses must have a texture and roughness appropriate to the intended use. The surface of the asphalt base course, the asphalt surface courses made of asphalt concrete and stone mastic asphalt and the protective layers of rolled asphalt must be evenly closed.

3.3.1.4 Profile-appropriate location

The layers must be produced at the appropriate height and in the agreed longitudinal and transverse profile. Deviations of the surface from the target height must not exceed 3 cm at any point.

3.3.1.5 Flatness

Unevenness of the surface of the layers within a 4 m long measuring section must not be greater than 2 cm for asphalt base courses, not greater than 1.5 cm for asphalt base courses and not greater than 1 cm for asphalt binder courses and asphalt surface courses.

3.3.1.6 Thickness

The following layer thicknesses must be carried out:

- Asphalt base courses: average 6 cm, nowhere less than 4 cm,
- Asphalt base courses: on average 7 cm, at no point less than 5 cm,
- Asphalt binder courses: on average 4 cm, nowhere less than 3 cm,

- asphalt surface courses: on average 2.5 cm, at no point less than 1.5 cm, but at least 2.5 times the maximum grain size,
- Protective layers of rolled asphalt: on average 2.5 cm, at no point less than 1.5 cm, but at least 2.5 times the largest grain size.

3.3.2 Surface courses and protective layers made of mastic asphalt

3.3.2.1 Installing

Section 3.3.1.1 shall apply mutatis mutandis. The connections to cold mastic asphalt are to be formed as joints.

3.3.2.2 Surface

The surface of the layers of mastic asphalt must have a uniform texture. The surface course of mastic asphalt must be roughened or blunted during installation.

3.3.2.3 Flatness

Unevenness of the surface of the layers of mastic asphalt within a 4 m long measuring section must not be greater than 1 cm.

3.3.2.4 Thickness

Layers of mastic asphalt must be 2.5 cm thick on average, and not less than 1.5 cm thick at any point.

3.3.3 Surface treatments

Surface treatments must be carried out in such a way that they cover the entire surface of the clean substrate and have a uniform texture. Before the surface treatment is carried out, paving joints must be filled with coarse aggregates up to the height of the upper edges of the paving stones. Immediately after the binder has been sprayed on, the spreading material must be evenly distributed and pressed down by rollers.

3.3.4 Thin asphalt surface courses in cold construction

The mix for thin asphalt surface courses in cold construction must be produced by machine and paved in one or more layers or in several layers. For thin asphalt surface courses in cold construction, sections 3.3.1.1 and 3.3.1.3 shall apply mutatis mutandis.

3.3.5 Thin asphalt surface courses in hot construction

For thin asphalt surface courses in hot construction, consisting of asphalt concrete for asphalt surface courses, stone mastic asphalt and asphalt mix for thin asphalt surface courses in hot construction on sealing, sections 3.3.1.1, 3.3.1.2 and 3.3.1.3 shall apply mutatis mutandis.

Sections 3.3.2.1 and 3.3.2.2 shall apply mutatis mutandis to thin asphalt surface courses made of mastic asphalt.

3.3.6 Backforming of asphalt layers

The existing layers and, if necessary, additional aggregates, binders or asphalt must be suitable for the intended use. The heating of the existing layers must be carried out gently.

Sections 3.3.1.1 to 3.3.1.5 shall apply mutatis mutandis to reverse forming.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Determination of the condition of the road and terrain surfaces, the receiving waters and the like **in accordance with § 3 para. 4 VOB/B.**

4.1.2 Construction of temporary accesses, driveways and the like, except for services in accordance with Section 4.2.2.

4.1.3 Tests, including sampling, to demonstrate the suitability and quality of substances and mixtures of substances in accordance with Sections 2.2.1 and 2.2.2, insofar as the substances are supplied or manufactured by the Contractor.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 Preparation of the substrate, e.g. recompaction, restoration of the planned altitude, removal of harmful soiling, spraying with binders, insofar as the necessity of such services is not caused by the Contractor.

4.2.2 Construction, maintenance and removal of traffic safety equipment and fortifications for the maintenance of public and local traffic, in particular on the basis of official orders.

4.2.3 Measures for bonding the layers and special execution and pre-treatment of the longitudinal seams, insofar as the necessity of such services is not caused by the Contractor.

4.2.4 Measures for roughening or blunting asphalt surface courses, insofar as the necessity of such services is not caused by the Contractor.

4.2.5 Making recesses that are not specified in the service description in terms of number, type and dimensions.

4.2.6 Closing of recesses and insertion of built-in components.

4.2.7 Making connections to existing components and superstructure layers by cutting, milling, forming joints or other special constructions and designs.

4.2.8 Environmentally relevant investigations to prove suitability and self-monitoring tests, insofar as they are required in addition to the services referred to in section 4.1.3 or if the substances are provided or prescribed by the client.

4.2.9 Control tests including sampling and related services.

4.2.10 Clearing snow and blunting in icy conditions to maintain traffic.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

No regulations.

5.2 Determination of dimensions/quantities

No regulations.

5.3 Overmeasurement rules

The following are measured: If billed according to area or room dimensions:

- recesses or fixtures ≤ 1 m2 individual size,
- Joints and
- Rails.

5.4 Individual provisions

No regulations.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Paving and slab coverings, edging — DIN 18318

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 Type and nature of the substrate, thickness, transverse and longitudinal inclination.

0.1.2 Type and condition of existing borders, drainage facilities and fixtures.

0.2 Information on the execution

0.2.1 Intended use, use, delimitation of use of the areas according to the greatest traffic load, e.g. pedestrians, cyclists, vehicles up to or over 3.5 t total weight, load class according to RStO (Guidelines for the Standardization of the Superstructure of Traffic Areas).

0.2.2 Planned cleaning of surfaces in use.

0.2.3 Local characteristics, e.g. design in non-weathered areas.

0.2.4 Elevation reference points, e.g. coordinate system.

0.2.5 Design and division of surfaces, laying method, grid and joint formation.

0.2.6 Requirements for the superstructure for covered and partially covered areas, e.g. to reduce capillary rising damp.

0.2.7 Characteristics of the surface to be produced, e.g. transverse and longitudinal inclination, flatness, slip resistance, skid resistance, tactile recognisability.

0.2.8 Type of construction, e.g. bound, unbound.

0.2.9 Number, type, colour and dimensions of the slabs, paving stones, edging, e.g. concrete block, clinker, brick, natural stone, their properties, e.g. resistance to frost and de-icing salt, compressive, splitting tensile and flexural tensile strength as well as their properties, e.g. flamed, bush-hammered, hydrophobic, calibrated, peeled.

0.2.10 Stone type according to petrographic family and geographical origin, local name, basic colour, permissible dimensional tolerances, e.g. class of boundary dimensions according to DIN EN 1342 "Paving stones made of natural stone for outdoor use — Requirements and test methods".

0.2.11 Special features of the reuse of used paving stones, slabs, edgings, e.g. proportion of stones to be sorted out, removal of impurities.

0.2.12 Number, type, dimensions and design of paving stones and slabs for working on e.g. fastenings, arches, fixtures, edgings, structures, recesses.

0.2.13 Number, type, dimensions and design of paving stones and slabs for adaptation, e.g. breaking, cutting, barring on e.g. fasteners, arches, fixtures, borders, structures, recesses.

0.2.14 Number, type, position and dimensions of recesses to be made or closed.

0.2.15 Dimensions and design as well as nature of the bedding and joints and their materials, e.g. bedding thickness and joint width, impact shattering value, flow coefficient, proportion of broken surfaces, maximum fine content.

0.2.16 Requirements for the Freeze-De-Icing Salt Resistance of Bonded Joint Materials.

0.2.17 Number, type, location, dimensions and design of movement joints.

0.2.18 Protective measures for bonded construction methods and measures for post-treatment.

0.2.19 Number, type, location and dimensions of fixtures.

0.2.20 Load and longitudinal slope of drainage channels.

0.2.21 Number, type, location, dimensions of drainage channels, borders, foundations and back supports, formation of joints.

0.2.22 Number, type, location, dimensions, edge formation, corrosion protection, surface finish, type of connection and anchoring of plastic or metal edging elements.

0.2.23 Number, type and dimensions of samples, e.g. to assess colour and texture fluctuations and possible colour changes due to joint materials. Place of creation.

0.2.24 Number, type, dimensions of shaped stones, e.g. curve stones, lowering stones, bishop's caps.

0.2.25 Voraussetzungen für die Anerkennung der Ergebnisse von Eigenüberwachungsprüfungen als Kontrollprüfungen.

0.2.26 Anzahl und Art geforderter Proben und Nachweise.

0.2.27 Requirements regarding the type and scope of the services to be offered by the Contractor for the maintenance and repair of the paved surfaces and slab coverings, e.g. joint care, re-sanding during the period of limitation for claims for defects, maintenance contract.

0.2.28 Creating installation plans.

0.2.29 Requirements for the uniformity of the joint pattern and for the permissible alignment deviation, e.g. according to DIN 18202 "Tolerances in building construction".

0.2.30 Requirements for the formation of joints in edging, e.g. backward closing by trowel strike.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 2,	if other requirements for substances and components are to be agreed,
Section 3.1.1	if the construction method, the construction process or the type and use of the equipment are to be specified to the Contractor,
Section 3.1.7,	if contiguous surfaces are to be constructed with paving stones, slabs and combinations of paving stones and slabs of different nominal thicknesses,
Section 3.1.8	if laying or moving is to be carried out in another bond, or if paving bricks or clinker bricks are to be laid or moved upright, e.g. as a rolling course,
Section 3.1.9,	if smaller shims are to be used,
Section 3.1.12	if other inclinations or other flatness are to be performed,
Section 3.2.3,	if other joint widths are to be carried out,
Section 3.6	if edgings, drainage channels and foundations and back supports are to be manufactured with different building materials, requirements and dimensions, e.g. without back support

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units are to be provided as follows:

0.5.1 Area (m2), separated by type and dimensions, for

- Compacting of the rootstock,

- Establishing the planned height, inclination and the specified flatness of the base,
- Paving ceilings and slab coverings separately according to types of execution, e.g. in an arch, by pattern,
- Cleaning of stones and slabs of paving and slab coverings separately according to types of joint and bedding materials,
- Joint grouting or joint filling for paving ceilings and slab coverings.

0.5.2 Dimensions of length (m), separated by type and dimensions, for

- Adaptation of paving stones and slabs to edges and borders, fixtures and recesses,
- Moulded parts and special formats Laying and relocating to edges and borders,
- Joint grouting or joint filling of movement joints,
- Bezels
- drainage channels,
- Foundations with or without back support,
- Reworking of the line edge, reworking or reconditioning of an existing inrun (chamfer) or the treads on kerbstones and edging stones.

0.5.3 Number (pcs), separated by type and dimensions, for

- Moulded parts and special formats for laying and relocating to fixtures and recesses,
- Joint grouting or joint filling of movement joints,
- Machining of heads of the edging stones,
- Matching panels to edges and borders, fixtures and recesses.

1 Scope of application

1.1 ATV DIN 18318 "Paving surfaces and slab coverings, edging" applies
for fixing surfaces with paving stones and slabs on underlays
from

- Base courses without binders (see ATV DIN 18315 "Traffic route construction work — Superstructure layers without binders"),
- Base courses of drained concrete (see ATV DIN 18316 "Traffic infrastructure construction work — Superstructure layers with hydraulic binders"),
- water-permeable asphalt base courses (see ATV DIN 18317 'Transport infrastructure construction works — asphalt superstructure layers').

It also applies to the construction of drainage channels from paving stones
and plates and edging.

1.2 ATV DIN 18318 does not apply to installation, installation and relocation
of natural and cast concrete blocks on a water-impermeable
Underlay above ceilings and structures on mortar bedding in thick or thick
Thin-bed method, bedding on drainage mats or on pedestals (see
ATV DIN 18332 "Natural stone work" and ATV DIN 18333 "Cast stone work").

It also does not apply to the installation and laying of tiles, slabs and
Mosaic (see ATV DIN 18352 "Tile and slab work").

1.3 In addition, ATV DIN 18299 "General Regulations for Construction Work
of every kind", sections 1 to 5. In the event of contradictions, the regulations of the

ATV DIN 18318 vor.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

2.1 For the most common substances and components, the DIN standards and other regulations listed below.

DIN 482	Natural stone curbs
DIN 483	Concrete kerbstones — shapes, dimensions, marking
DIN 1045-2:2008-08	Structures made of concrete, reinforced concrete and prestressed concrete — Part 2: Concrete — Specification, Properties, Production and compliance — Rules of application to DIN EN 206-1
DIN 18158	Floor Clinker Tiles
DIN 18503	Pavers — Requirements and Test Methods
DIN EN 206-1	Concrete — Part 1: Specification, properties, manufacture and conformity; German version DIN EN 206-1:2000
DIN EN 933-1	Test methods for geometric properties of aggregates — Part 1: Determination of grain size distribution — Sieving method
DIN EN 933-5	Test methods for geometric properties of aggregates — Part 5: Determination of the proportion of crushed grains in coarse aggregates
DIN EN 933-6	Test methods for geometric properties of aggregates — Part 6: Assessment of surface properties — Flow coefficients of aggregates
DIN EN 1097-2	Test methods for mechanical and physical properties of aggregates — Part 2: Method for determining resistance to shattering
DIN EN 1338	Concrete paving stones — Requirements and test methods
DIN EN 1339	Concrete Slabs — Requirements and Test Methods
DIN EN 1340	Concrete kerbstones — Requirements and test methods
DIN EN 1341	Natural stone slabs for outdoor use — Requirements and test methods
DIN EN 1342	Natural stone paving stones for outdoor use — Requirements and test methods
DIN EN 1343	Natural stone kerbstones for outdoor use — Requirements and test methods
DIN EN 1344	Paving Bricks — Requirements and Test Methods
DIN EN 12390-3	Testing of hardened concrete — Part 3: Compressive strength of test specimens
DIN EN 12808-3	Adhesives and grouts for tiles and slabs — Part 3: Determination of flexural and compressive strength
DIN EN 13242	Aggregates for Unbound and Hydraulically Bound Building Materials for Civil Engineering and Road Construction
DIN EN 13748-2	Terrazzo slabs — Part 2: Terrazzo slabs for the Outdoor use

The following apply to the fabrics of bonded bedding

DIN 1164-10	Cement with special properties — Part 10: Composition, requirements and proof of conformity of cement with low effective alkali content
DIN 1164-11	Cement with special properties — Part 11: Composition, requirements and proof of conformity of cement with abbreviated solidification
DIN 1164-12	Cement with special properties — Part 12: composition, requirements and proof of conformity of cement with an increased Percentage of organic components
DIN 4226-101	Recycled aggregates for concrete according to DIN EN 12620 — Part 101: Types and regulated hazardous substances
DIN 4226-102	Recycled aggregates for concrete according to DIN EN 12620 — Part 102: Type testing and in-house production control
DIN 18507	Paving stones made of porous concrete — Definitions, requirements, tests, monitoring
DIN EN 197-1	Cement — Part 1: Composition, requirements and conformity criteria of normal cement
DIN EN 12616	Sports Flooring — Determination of Water Infiltration Rate
DIN EN 12620	Aggregates for Concrete

The following apply to cementitious mortar bonding bridges:

DIN 51043	Trass — Requirements, Testing
DIN EN 1015-12	Test methods for mortars for masonry — Part 12: Determination of adhesion strength between plaster and substrate
DIN EN 12004-1	Mortars and adhesives for ceramic tiles and slabs — Part 1: Requirements, assessment and verification of constancy of performance, classification and marking

Ergänzend gelten

TL Gestein-StB Straßenbau1)	Technische Lieferbedingungen für Gesteinskörnungen im
TL Pflaster-StB	Technical terms and conditions of delivery for construction products for the production of paving surfaces, slab coverings and edging1)
TL Fug-StB areas1)	Technical terms and conditions of delivery for joint fillers in traffic

2.2 The following can be used as unbound and bonded bedding and joint materials:

2.2.1 Unbound bedding materials: Aggregates and aggregate mixtures 0/2 mm, 0/4 mm, 0/5 mm, 0/8 mm, 0/11 mm, 1/3 mm, 1/5 mm, 1/8 mm, 2/5 mm, 2/8 mm, 4/8 mm, 5/11 mm can be used as unbound bedding materials.

2.2.2 Ungebundene Fugenstoffe: Als ungebundene Fugenstoffe können Gesteinskörnungen und Gesteinskörnungsgemische 0/2 mm, 0/4 mm, 0/5 mm, 0/8 mm, 0/11 mm, 1/3 mm, 1/5 mm, 1/8 mm, 2/5 mm, 2/8 mm verwendet werden.

2.2.3 Bonded bedding materials: Bonded bedding materials must have a water permeability coefficient of kf ≥ 5 × 10-5 m/s in accordance with DIN 18507.

The requirements of Table 1 apply to the compressive strength of bonded bedding materials. Compliance with the requirements regarding water permeability and compressive strength must be demonstrated on the same test specimen.

Table 1 — Requirements for the compressive strength of bonded bedding materials

Delimitation of use. according to the greatest traffic load	**Compressive strength** Mpa	**Testing according to**
accessible	≥ 10.0	DIN EN 12390-3
drivable, vehicles up to 3.5 t	≥ 20.0	
drivable, vehicles over 3.5 t	≥ 30.0	

The requirements of Table 2 apply to the adhesive tensile strength between the underside of the stone and slab and the bonded bedding.

Table 2 — Requirements for the adhesive tensile strength between the underside of the stone, slab and bonded bedding

Delimitation of use according to the greatest traffic load	**Adhesive tensile strength, tested with adhesive bridge** Mpa	**Testing according to**
Accessible	≥ 0.4	ALP Pgeb, Working Instructions for Carrying Out Tests for Paving Surfaces and Slab Coverings in Bonded Design*
Accessible, vehicles up to 3.5 t	≥ 0.8	
Traffic-free, vehicles over 3.5 t	≥ 1.0	
*Author: FGSV Research Society for Roads and Transportation e. V., An Lyskirchen 14, 50676 Cologne, www.fgsv.de. Available from: FGSV Verlag GmbH, Verlag der Research Society for Roads- and Transportation e.V., Wesselinger Street 15–17, 50999 Cologne, www.fgsv-verlag.de		

2.2.4 Bonded joint materials: Bonded joint materials must flow or trickle solely under the influence of gravity without the effect of additional compaction energy, vent and be of such a nature that a complete joint filling is possible.

The following binders can be used for bonded joints:

- Cement, if necessary plastic-modified,
- Reaction resin based on epoxy resin,
- polyurethane-based reactive resin and
- Polybutadien.

Depending on the binder, bonded joint materials must meet the requirements of Table 3 or Table 4.Wesselinge

Table 3 — Requirements for bonded joint materials, binders, cement

Properties	**Requirements**	**Testing according to**
Compressive strength	Walkable ≥ 10.0 MPa drivable, vehicles up to 3.5 t ≥ 20.0 MPa drivable, vehicles over 3.5 t ≥ 30.0 MPa	DIN EN 12808-3
Adhesive tensile strength	Walkable ≥ 0,4 MPa drivable, vehicles up 3,5 t ≥ 0,8 MPa drivable, vehicles over 3,5 t ≥ 1,0 MPa	ALP Pgeb, Working Instructions for Carrying Out Tests for Paving Surfaces and Slab Coverings in Bonded Design*
Freeze-thaw resistance Sn	≤ 800 g/m2	CF-Test method according to DIN CEN/TS 12390-9, Testing of hardened concrete — Part 9: Frost and freeze-de-icing salt resistance — Weathering
Frost- Tausalz- Widerstand Sn	≤ 500 g/m2	CDF test method according to DIN CEN/TS 12390-9
* Author: FGSV Research Society für Straßen- und Verkehrswesen e. V., An Lyskirchen 14, 50676 Cologne, www.fgsv.de. Available from: FGSV Verlag GmbH, Verlag der Research Society for Road und Verkehrswesen e.V., Wesselinger Straße 15–17, 50999 Cologne, www.fgsv-verlag.de.		

Table 4 — Requirements for bonded joint materials, binders, epoxy resin, polyurethane-based reactive resins and polybutadiene		
Properties	Requirements	Testing according to
Compressive strength	Walkable ≥ 5.0 MPa drivable, vehicles up to 3.5 t ≥ 15.0 MPa drivable, vehicles over 3.5 t ≥ 25.0 MPa	DIN EN 12808-3
Adhesive tensile strength	Walkable ≥ 0.4 MPa drivable, vehicles up to 3.5 t ≥ 0.8 MPa drivable, vehicles over 3.5 t ≥ 1.0 MPa	ALP Pgeb, Working Instructions for Carrying Out Tests for Paving Surfaces and Slab Coverings in Bonded Design*
* Author: FGSV Research Society for Roads- and Transportation e. V., An Lyskirchen 14, 50676 Cologne, www.fgsv.de. Available from: FGSV Verlag GmbH, Verlag der Research Society for Roads- und Transportation e.V., Wesselinger Street 15–17, 50999 Cologne, www.fgsv-verlag.de		

If bonded joints are to be made water-permeable, reaction resin or polybutadiene must be used as a binder.

2.3 The requirements of the FLL "Guidelines for Planning, Construction and Maintenance of Greenable Surface Pavements" apply to joint and bedding materials for greenable paving surfaces and slab coverings.

2.4 The requirements of the "Leaflet for permeable traffic areas" (FGSV M VV) apply to joint and bedding materials for permeable paving surfaces and slab coverings

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 The choice of the construction method and construction process as well as the selection and use of the construction equipment are the responsibility of the Contractor.

3.1.2 In particular, the following may be considered as concerns pursuant to § 4, para. 3 VOB/B:

- insufficient load-bearing capacity or condition of the substrate,
- insufficient water permeability of the underlay,
- deviations of the base from the planned altitude, inclination or evenness,
- insufficient planned inclination,

- lack of drainage facilities,
- missing or insufficient information for the arrangement of movement joints in bonded paving and slab coverings, in edging and drainage channels.

3.1.3 In the event of unsuitable conditions resulting from the weather, e.g. temperatures below 5 °C and temperatures above 25 °C in the case of bonded paving surfaces, slab coverings, edging or drainage channels, special precautions must be taken in consultation with the Client. The required services are special services (see section 4.2.13).

3.1.4 Endangered structural facilities must be secured. In the case of protective and security measures, the regulations of the owners or other persons authorised to issue instructions must be observed. The required services are special services (see section 4.2.1).

3.1.5 If obstacles are unexpectedly encountered, e.g. lines, cables, drains, sewers, markings, roots, building remains, the Client must be informed immediately. The required benefits must be determined jointly. These services are special services (see section 4.2.1).

If it is to be assumed that the obstacles are explosive ordnance, the work must be stopped immediately and the responsible authority and the client must be notified. The Contractor must carry out the necessary security services without delay. The required benefits must be determined jointly. The services provided and the other services are special services (see section 4.2.1).

3.1.6 Endangered trees, plant populations and vegetation areas must be protected; DIN 18920 "Vegetation technology in landscaping — Protection of trees, plant populations and vegetation areas during construction measures" must be observed. The benefits for measures to be taken are special services (see section 4.2.1).

3.1.7 Contiguous areas shall be constructed with paving stones or slabs of the same nominal thickness. The same applies to the combination of paving stones and slabs.

3.1.8 Paving ceilings and slab coverings shall be constructed with a uniform joint pattern in a row bond with staggered joints. The offset of the stones must be ≥ 1/4 of the length of the stones and slabs. Paving bricks and paving bricks must be laid flat.

3.1.9 In the case of approximately right-angled connections, the shortened side of fittings should be ≥ 1/3 of the greatest edge length and ≥ 1/2 of the thickness of the unworked stone or slab.

3.1.10 For walkable areas, the minimum slope is

- 1.5 % if concrete paving stones, concrete slabs, paving bricks, paving bricks or worked paving stones or slabs of natural stone and
- 2% if unprocessed or rough paving stones made of natural stones are used.

3.1.11 In the case of drivable areas, the minimum slope is

- 2 % if concrete paving stones, concrete slabs, paving bricks, paving bricks, worked paving stones or slabs of natural stone and
- 3% if unprocessed or rough paving stones made of natural stone are used.

3.1.12 Where gradients are specified, deviations of ± 0.4 % shall be permitted; the minimum gradients specified in Sections 3.1.10 and 3.1.11 may not be undercut.

3.1.13 Edging with kerbstones or other stones must be made in a height and alignment manner. Deviations of the surface from the target height and from the reference axis must not exceed 20 mm at any point.

3.1.14 Deviations from the alignment in tread and front surfaces at the butt joints of edging with a flat surface shall not exceed 2 mm, and with a rough surface not more than 5 mm.

3.1.15 Paving surfaces and slab coverings must be constructed at the same level, ledges and height differences of up to 2 mm between adjacent stones or slabs are permitted, and up to 5 mm in the case of unprocessed, rough splitting and roughly worked stones or slabs.

3.1.16 Pavements and pavements shall be 7 mm ± 3 mm above the surface of adjacent fixtures, edgings, drains and drainage channels.

3.1.17 The flatness requirements for paving and pavements set out in Table 5 shall be complied with.

Table 5 — Flatness requirements

Delimitation of use according to the greatest traffic load	**Paving ceilings, slab coverings made of**	**Slope %**	**Flatness requirementsa pitch [mm] under the**		
			1-m-Latte	2-m-Latte	4-m-Latte
begehbar	Paving stones, concrete slabs, paving bricks, paving bricks, processed natural stone	≥ 1,5 < 2,0	≤ 3	≤ 5	≤ 8
		≥ 2,0 < 2,5	≤ 4	≤ 6	≤ 10
		≥ 2,5	≤ 8	≤ 10	≤ 12
	unprocessed and rough-split natural stone	≥ 2,0 < 2,5	≤ 5	≤ 7	≤ 10
		≥ 2,5	≤ 10	≤ 12	≤ 20
passable	Paving stones, concrete slabs, clinker bricks, bricks, worked natural stone	≥ 2,0 < 2,5	≤ 3	≤ 5	≤ 8
		≥ 2,5	≤ 4	≤ 6	≤ 10
	unprocessed and rough-split natural stone	≥ 3,0	≤ 10	≤ 12	≤ 15
Deviations from evenness are calculated in accordance with TP Eben — Touching Measurements, Technical Test Regulations for Flatness Measurements on Road Surfaces in Longitudinal and Transverse Direction, Part: Touching Measurements (Author: FGSV Forschungsgesellschaft für Straßen- und Verkehrswesen e. V., An Lyskirchen 14, 50676 Cologne, www.fgsv.de. Available from: FGSV Verlag GmbH, Verlag der Forschungsgesellschaft für Straßen- und Verkehrswesen e. V., Wesselinger Straße 15–17, 50999 Cologne, www.fgsv-verlag.de.) with the guideline bar and a 30 cm measuring wedge.					

3.2 Unbound paving and pavements

3.2.1 General

In the case of unbound paving and slab coverings, bedding and joint filling must be carried out without the addition of binders. The bedding material must be matched to the underlay and must be filter-stable. Joint and bedding materials must be coordinated with each other and stable in terms of filters.

3.2.2 Bedding

The thickness of the bedding must be 40 mm ± 10 mm when compacted, and 50 mm ± 15 mm when using rough paving stones or slabs made of natural stone.

A 0/5 mm aggregate or aggregate mixture shall be used.

For drivable surfaces, the aggregate or aggregate mixture must meet the following requirements:

- Impact shattering value SZ22 or Los Angeles coefficient LA25 according to DIN EN 13242,
- Flow coefficient ECS 35 according to E DIN EN 13242:2015-07,
- Proportion of crushed surface C90/3 according to DIN EN 13242.

3.2.3 Joints

3.2.3.1 The joints of paving ceilings and slab coverings are

- with a width of 4 mm ± 2 mm, if paving stones or slabs are used ≤ 100 mm nominal thickness,
- with a width of 6 mm ± 3 mm, when using paving stones or slabs > 100 mm nominal thickness,

.

3.2.3.2 The joints of paving ceilings and slab coverings made of natural stone with non-sawn side surfaces are

- with a width of 10 mm ± 5 mm, when using paving stones or slabs ≤ a nominal thickness of 120 mm,
- with a width of 15 mm ± 5 mm, when using paving stones or slabs > a nominal thickness of 120 mm

.

In the case of natural stones with rough splits, individual punctual contact points are permitted.

3.2.3.3 The joints must be swept in and slurried in the case of accessible surfaces with a aggregate size of 0/2 mm, and in the case of drivable surfaces with a aggregate or a mixture of aggregates of 0/5 mm. For drivable surfaces, the aggregate or aggregate mixture must meet the following requirements:

- Impact shattering value SZ22 or Los Angeles coefficient LA25 according to DIN EN 13242,
- Flow coefficient ECS 35 according to E DIN EN 13242:2015-07,
- Proportion of crushed surface C90/3 according to DIN EN 13242.

3.2.3.4 After filling the joints, paving ceilings and slab coverings must be freed from excess joint material and compacted, e.g. by shaking or ramming. Their surface must be protected, with the exception of the use of rough-split paving stones or slabs made of natural stone, e.g. with a plastic apron.

After compaction, the joints must be completely filled to the upper edge of the paving stones and slabs or to the lower edge of any chamfers, curves or the like.

3.2.3.5 If the upper area of the joints is also to be poured with paving joint compound in accordance with TL Fug-StB1), these must be designed with widths of 12 mm ± 4 mm. The joint grouting must be at least 30 mm deep, but not more than 1/3 of the thickness of the stone or slab, up to 5 mm below the upper edge.

3.3 Bonded pavements and pavements

3.3.1 General

In the case of bonded paving and slab coverings, bedding and joint filling must be carried out with the addition of binders.

Paving stones and slabs must be free of adhesion-reducing substances, e.g. rock dust and other impurities.

In the case of bonded paving surfaces and slab coverings, isolated crack formations, e.g. due to shrinkage and creep processes, are permissible ≤ a width of 0.8 mm.

3.3.2 Bedding

When paving the paving stones and slabs are installed, the bedding material must not rise in the joint more than 1/3 of the paving stone or slab thickness.

The requirements set out in Table 6 apply.

Table 6 — Requirements and tests for bonded bedding

<table>
<tr><th rowspan="2">Properties</th><th colspan="3">Requirements</th><th rowspan="2">Testing according to</th></tr>
<tr><th>begehbar</th><th>drivable, vehicles up to 3.5 t</th><th>drivable, vehicles over 3.5 t</th></tr>
<tr><td rowspan="2">Thickness</td><td colspan="3">50 mm ± 10 mm</td><td rowspan="2">Leveling</td></tr>
<tr><td></td><td colspan="2">on drainage concrete base course or on water-permeable asphalt base course</td></tr>
<tr><td>Compressive strength fc,cube,28</td><td>≥ 4 MPa</td><td>≥ 10 MPa</td><td>≥ 15 MPa</td><td>DIN EN 12390-3</td></tr>
<tr><td>InshoreSrate IA</td><td colspan="3">≥ 180 mm/h (2 litres of test fluid must be drained in no more than 10 minutes)</td><td>DIN EN 12616, Method A, Measurement with the single-ring filtometer, diameter 300 mm, mounted and sealed; Limit deviation of 10 %.</td></tr>
</table>

3.3.3 Adhesive bridges

Stones and slabs must be placed in the bedding with an adhesive bridge made of cementitious mortar. The adhesive bridge must not impair the water permeability of the bedding in the area of the joints. For adhesive tensile strength between the underside of the stone or slab and the bonded bedding, the requirements of Table 7 apply.

3.3.4 Joints

The joint width must be 10 mm ± 5 mm, 15 mm ± 5 mm for rough small paving made of natural stone and for coverings with slab lengths ≥ 600 mm. In the case of large paving made of natural stone with rough splitting and natural stone slabs, joint widths of up to 30 mm are permissible, depending on their dimensional tolerances.

The joints shall be filled with joint material that meets the requirements of Table 3 up to at least 5 mm and not more than 1 mm below the upper edges of the paving stones and slabs or up to the lower edge of any chamfers, curves and the like.

If movement joints are to be constructed, they must be formed continuously in all hydraulically bound layers of the superstructure.

The requirements of Table 7 apply to the adhesive tensile strength between the paving stone or slab and the joint material on the finished service:

Table 7 — Adhesive tensile strength requirements

Delimitation of use according to the greatest traffic load	**Adhesive tensile strength** MPa	**Testing according to**
accessible	without bond loss	Extraction by drill core 100 mm
drivable, vehicles bis 3,5 t	≥ 0,4	ALP Pgeb, Working Instructions for Carrying Out Tests for Pavements and Slab Coverings in Bonded Type* but with 100 mm Drill Core
passable, vehicles over 3,5 t	≥ 0,5	
* Autor: FGSV Research Society fBom Roads and Transportation e. V., An Lyskirchen 14, 50676 Cologne, www.fgsv.de. Available from: FGSV Verlag GmbH, Verlag der Research Society for Road and Road Management Verkehrswesen e.V., Wesselinger Straße 15–17, 50999 Cologne, www.fgsv-verlag.de.		

3.4 Greenable paving surfaces and slab coverings

Greenable paving surfaces and slab coverings must be produced in accordance with the FLL "Guidelines for Planning, Construction and Maintenance of Greenable Surface Pavements"2).

3.5 Permeable paving surfaces and pavements

Permeable paving surfaces and pavements must be constructed in accordance with the "Leaflet for permeable traffic areas" (FGSV M VV)1).

3.6 Edging, drainage channels

3.6.1 Foundations and back supports

For foundations and back supports on drivable surfaces, concrete with a composition corresponding to a C 20/25 must be used, and for accessible surfaces, concrete with a composition corresponding to a C 16/20 must be used.

The back support must be made in formwork. The concrete for the foundation and back support must be compacted. The back support must be made up to 2/3 of the height of the edging. In the case of adjacent surface fastenings, the height of the back support depends on the type of surface reinforcement. The surface of the back support must be bevelled outwards.

The thickness of the foundation must be ≥ 200 mm for drivable surfaces and ≥ 80 mm for accessible surfaces. The width of the backrest must be 150 mm ± 20 mm for drivable surfaces, 80 mm ± 20 mm for walkable surfaces.

3.6.2 Edging

Kerb and edging stones must be moved with 4 mm ± 2 mm wide joints that are not jointed. Curb edging with radii < 12 m must be made of curve stones. For radii ≥ 12 m and < 20 m, straight kerbstones with a length of 0.50 m are to be used, for radii ≥ 20 m, straight kerbstones with a length of 1 m are to be used.

3.6.3 Drainage channels

The longitudinal gradient of drainage channels must be ≥ 0.5%. The deviation of the flatness of drainage channels shall not exceed 5 mm when measured in accordance with TP Level — Ancillating Measurements1) with the 4 m guideline. Drainage channels, e.g. made of paving stones, slabs, trough stones, kerb gutter stones, must be constructed with joint widths of 10 mm ± 5 mm, or 15 mm ± 5 mm when using rough paving made of natural stone.

The joints shall be filled to a minimum of 4 mm and a maximum of 1 mm below the upper edge of the elements of the drainage channel or to the lower edge of any chamfers, curves or the like with joint material that meets the requirements of Table 3. B

In the adjacent edging, these shall be made with joint widths of 10 mm ± 2 mm and filled with materials which meet the requirements of Table 3.

In the case of drainage channels, movement joints must be made at intervals ≤ 12 m, and in the case of trafficked drainage channels at intervals of 4 m to 6 m, through the channel and foundation, including any back support.

In the case of an adjacent edging, the movement joints of the drainage channel must be formed at the same point in the edging, including its foundation and back support.

Movement joints must be at least 8 mm wide and no more than 15 mm wide and must be resettable.

If drainage channels are also used as edge edging, they must be constructed with a back support in accordance with section 3.6.1.

If road drains are placed in the gutter, a movement joint must also be created in front of and behind each street drain.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Determination of the condition of the road and terrain surfaces, the receiving waters and the like in accordance with § 3 para. 4 VOB/B.

4.1.2 Creation of makeshift accesses, driveways and the like.

4.1.3 Cleaning of paving stones and slabs from dust and rock dust for laying in bonded construction.

4.1.4 Protection of components and equipment from contamination and damage caused by loose covering, wrapping, except for protective measures in accordance with section 4.2.16.

4.1.5 Supply of up to 6 sample slabs or bricks per type of covering, single size up to 400 mm × 400 mm.

4.1.6 Post-treatment of edging and drainage channels as well as paving surfaces and slab coverings in bonded construction, e.g. covering with geotextile, keep moist.

4.1.7 Self-monitoring tests, including sampling, to demonstrate the suitability or quality of the substances supplied by the Contractor.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 The Special Benefits listed in Sections 3.1.4, 3.1.5 and 3.1.6.

4.2.2 Preparation of the underlay, e.g. re-compacting of the base course, establishment of the planned altitude, height compensation in the underlay for different paving stone or slab thicknesses. Removal of harmful soiling, insofar as the necessity of such services is not caused by the Contractor.

4.2.3 Adaptation of paving stones, slabs, borders, e.g. by cutting, cutting.

4.2.4 Fittings and fittings, including fittings.

4.2.5 Sorting out (e.g. unusable stones or slabs), loading, transporting and disposing of substances and components provided by the Client.

4.2.6 Unloading of materials and components provided by the Client.

4.2.7 Manufacture of paving surfaces, slab coverings, edging of kerbstones with radii ≤ 20 m.

4.2.8 Manufacture of paving surfaces and slab coverings in a special laying pattern.

4.2.9 Making recesses, e.g. by cutting or drilling.

4.2.10 Closing of recesses and insertion of built-in components.

4.2.11 Clearing snow and blunting in icy conditions to maintain traffic.

4.2.12 Production of sample surfaces, insofar as these are not included in the service.

4.2.13 Special protective measures in case of unsuitable weather conditions, e.g. protection against precipitation or frost, enclosure, shading.

4.2.14 Manufacture of movement joints, joint inserts, joint sealants.

4.2.15 Cleaning of paving stones and slabs provided from coarse soiling, e.g. clay, mortar residues, paint residues, oil, bitumen, insofar as these have not been caused by the Contractor.

4.2.16 Special protection of building and plant components, e.g. masking or sealing of drainage systems, facades, finished surface parts, laying of hardboard or protective fleece.

4.2.17 Performance for meeting higher requirements for flatness and dimensional accuracy than required in sections 3.1.10, 3.1.11 and 3.1.12.

4.2.18 Completion of surfaces, borders, drainage channels in several work steps, insofar as the company's own services cannot be provided continuously in the course of similar work, e.g. to enable work by other contractors.

4.2.19 Services for control tests including sampling.

4.2.20 Preparation of static verifications and the drawings required for them.

4.2.21 Preparation of installation plans, as-built drawings and special documentation.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

No regulations.

5.2 Determination of dimensions/quantities

5.2.1 Preparation, cutting or cutting of paving stones and slabs shall be calculated according to the length of the processing along the joint between the covering or ceiling and adjacent surfaces, components or edgings.

5.2.2 Joint grouting and joint filling of paving ceilings and slab coverings shall be calculated according to the surface area of the ceiling or pavement.

5.2.3 The length of the edging shall be measured at the front of the kerb or edging stones. This also applies to the billing of foundations with and without back support according to length measurements.

5.2.4 Reworking of the edge of the cord, reworking or reconditioning of an existing inrun (chamfer) or the treads of kerbstones or edging stones shall be measured according to the length of processing.

5.3 Overmeasurement rules

The following are measured:

5.3.1 When billed according to area

5.3.1.1 Joints

- between paving surface or pavement and edging, e.g. curb and rail,

- within the pavement or pavement and between the individual kerbstones or edging stones.

5.3.1.2 Recesses

- recesses or fixtures of 1 m2 individual size ≤that lie in the paved area or protrude proportionately into it, e.g. shafts, slides, masts, steps,
- Rails if a similar fastening is attached to the rails on both sides.

5.3.1.3 Interruptions, e.g. gutters, paving tapes, with individual widths ≤ 30 cm.

When determining the individual quantity, the smallest dimensions of the interruption are to be taken as a basis.

5.3.2 When billing according to length

- joints between the individual kerbstones or edging stones,
- Interruptions, recesses or fixtures with a single length ≤ 1 m.

5.4 Individual provisions

Individual areas under 0.5 m2 are calculated at 0.5 m2.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Pipe jacking work — DIN 18319

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 Load-bearing capacity of receiving waters; Requirements and fees for the discharge of water.

0.1.2 Type, location, dimensions, materials and design of existing pipes as well as their connections, house connections, fixtures and fittings and the like.

0.1.3 Type and quantity of runoff in the existing pipelines, if it is intended to be driven over or displaced.

0.1.4 Type, location, dimensions and ownership of existing excavations, artificial cavities, previous auxiliary construction measures, anchors, injection bodies and other obstacles.

0.1.5 Foundation depths, types of foundations, loads and construction of adjacent structures.

0.1.6 Type, location, dimensions, accessibility, nature and load-bearing capacity of the work areas or the subsoil for the work areas, in particular restrictions on working height.

0.1.7 Restrictions on the dimensions and masses for the transport of machinery, jacking pipes and other building materials.

0.1.8 Possibilities of arranging supply and return pipes to be installed above or below ground for the mixing and processing plants of the lubricants and proppantants or support fluids used, especially in the area of traffic areas.

0.1.9 Possibilities for temporary storage of the extracted soil and rock.

0.1.10 Information on existing and planned groundwater lowering, provided that the construction project is within their sphere of influence.

0.1.11 Restrictions on removing or recovering obstacles.

0.2 Information on the execution

0.2.1 Applicable Technical Regulations.

0.2.2 Soil and rock formations in the area of influence of the tunnelling as well as the start, intermediate and finish pits. Representations in longitudinal and cross-sections.

0.2.3 Description of soil and rock with regard to their properties and conditions according to section 2.2 and classification into homogeneous areas according to section 2.3. According to the requirements of the individual case, further information on subsoil and groundwater conditions according to Table 8 of the worksheet DWA-A 1251)/DVGW GW 3042) "Pipe jacking and related processes" (2008-12).

0.2.4 Results of soundings to determine storage densities.

0.2.5 Information on the swelling behaviour of soil and rock.

0.2.6 Characteristic values of the subsoil parameters relevant for designs in the relevant subsoil layers.

0.2.7 Description and classification of other substances in accordance with Section 2.4.

0.2.8 Significant changes in the properties and conditions of soil and rock after loosening and in contact with air, water or support fluid.

0.2.9 Intended use of the lines and regulations to be observed.

0.2.10 Specifications from expert reports and the extent to which they are to be observed during execution.

0.2.11 Type and materials of pipes and pipe joints. Special requirements. Rules to be observed for static calculations.

0.2.12 Type of grouting of the annular and cavity spaces and properties of the materials to be used after completion of the tunnelling work.

0.2.13 Aggressive effect of soil and groundwater on pipes, lubricants, propping agents or support fluid.

0.2.14 Depth, direction and inclination of the pipe axis.

0.2.15 Type and scope of required stability verifications.

0.2.16 Type, location and, if applicable, dimensions of the start, intermediate and target pits or other relevant points.

0.2.17 Requirements for the handling of groundwater, strata water, spring water, seepage water and surface water

0.2.18 Type and extent of contamination of pipes to be cleaned when existing pipelines are driven over or displaced. 0.2.19 Protection and securing of adjacent properties and structures to be driven underneath. Permissible settlements/elevations.

0.2.20 Soil improvement measures in the case of unstable or unstable subsoil.

0.2.21 Special procedures for carrying out tunnelling, e.g. compressed air operation.

0.2.22 Measures against soil and groundwater intrusion during entry and exit processes (groundwater lowering, injections, freezing work and the like).

0.2.23 Type, scope and timing of measures to preserve evidence.

0.2.24 Nature, scope and procedure of examinations.

0.2.25 Type, scope and implementation of in-house and third-party monitoring.

0.2.26 Number, type, location, dimensions and design of connections.

0.2.27 Measuring distances for non-controllable methods in accordance with Section 3.2.1.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 3.1.2,	if the choice of the pipe jacking method and the construction process, the securing of the tunnel face during pipe jacking, the securing of the tunnel face during scheduled shutdowns and the choice and use of the construction equipment are to be specified to the contractor,
Section 3.1.4	if the permissible deviations are to be modified (see Table 1);
Section 3.2	if the specifications for recording and logging tunnelling parameters are to be deviated.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units, separated according to type and dimensions as well as homogeneous areas, are to be provided as follows:

- Drives according to length (m),
- Driving over or displacing existing pipelines according to length (m),

as well as separately according to design and dimensions, as follows:

- Relocation of the tunnelling equipment, separated by relocation from pit to pit and within a pit, by number (St),
- Removal of obstacles from the tunnelling cross-section by means of the tunnelling device by time (h), Standstill of the tunnelling device by time (h),
- Installations for maintaining the receiving water, staggered according to pumping capacity, assembly and dismantling according to number (St), operation according to time (h),
- Optical inspection of pipelines and cleaning, separated by type and degree of contamination in % of cross-section, by length (m),
- Insertion of press-in material, separated by ingredients, by volume (m3) or mass (kg, t).

1 Scope of application

1.1 ATV DIN 18319 "Pipe jacking work" applies to the underground installation of prefabricated pipes and comparable structures of any profile by pressing, driving or pulling.

It also applies to pipe jacking work using the displacement method, driving over existing pipes and displacing existing pipelines, as well as to loosening soil and rock during jacking and conveying from the pipe and the immediate work area.

1.2 ATV DIN 18319 does not apply to

- the construction of start, finish, intermediate, recovery and other excavation pits (see ATV DIN 18300 "Earthworks" and ATV DIN 18303 "Shoring work"),
- Drilling work (see ATV DIN 18301 "Drilling work"),
- Drainage canal work (see ATV DIN 18306 "Drainage canal work"),
- Pressure pipeline work in the ground (see ATV DIN 18307 "Pressure pipeline work outside buildings"),
- Underground construction work within the meaning of ATV DIN 18312 "Underground construction work",
- the insertion of pipes into jacking pipes or existing pipes, and
- Horizontal directional drilling work (see ATV DIN 18324 "Horizontal directional drilling work").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18319 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

2.1 General

For the most common substances and components, the requirements are listed in DIN EN 14457 "General requirements for components used in trenchless installation of sewer pipes and sewers" and the corresponding product standards.

2.2 Description of the subsoil The following apply to the investigation, naming and description of the subsoil:

DIN 4020	Geotechnical investigations for structural purposes — Supplementary regulations to DIN EN 1997-2
DIN 4094-4	Subsoil — Field investigations — Part 4: Wing shear tests
DIN 18125-2	Subsoil — Examination of soil samples — Determination of soil density — Part 2: Field tests
DIN 18126	Subsoil — Examination of soil samples — Determination of the density of non-cohesive soils with loosest and densest storage
DIN 18128	Subsoil — Examination of soil samples — Determination of ignition loss
DIN 18196	Earthworks and foundation engineering — Soil classification for structural purposes
DIN EN 1997-2	Eurocode 7: Design, calculation and design in geotechnics — Part 2: Exploration and investigation of the subsoil
DIN EN 1997-2/NA	National Annex — Nationally defined parameters — Eurocode 7: Design, calculation and design in geotechnical engineering — Part 2: Exploration and investigation of the subsoil
DIN EN ISO 14688-1	Geotechnical exploration and investigation — Designation, description and classification of soil — Part 1: Designation and description
DIN EN ISO 14688-2	Geotechnical exploration and investigation — Designation, description and classification of soil — Part 2: Principles for soil classifications
DIN EN ISO 14689	Geotechnical Exploration and Investigation — Naming, Description and Classification of Rock
DIN EN ISO 17892-1	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 1: Determination of water content
DIN EN ISO 17892-2	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 2: Determination of soil density

DIN EN ISO 17892-4	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 4: Determination of grain size distribution
DIN EN ISO 17892-7	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 7: Uniaxial pressure test
DIN EN ISO 17892-8	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 8: Unconsolidated undrained triaxial test
DIN EN ISO 17892-11	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 11: Determination of water permeability
DIN EN ISO 17892-12	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 12: Determination of flow and roll-out limits
DIN EN ISO 22282-4	Geotechnical exploration and investigation — Geohydraulic tests — Part 4: Pumping tests
DIN EN ISO 22475-1	Geotechnical Exploration and Investigation — Sampling Methods and Groundwater Measurements — Part 1: Technical Principles of Execution
NF P18-579	Aggregates — Determination of coefficients of abrasiveness and grindability

DGGT Recommendation No. 23: "Determination of the Abrasiveness of Rocks with the CERCHAR Test" of Working Group 3.3 "Rock Testing Technology"

2.3 Classification of soil and rock into homogeneous areas

Soil and rock are to be divided into homogeneous areas according to their condition before release. The homogeneous area is a limited area, consisting of single or several soil or rock layers, which has comparable properties for pipe jacking methods.

If environmentally relevant ingredients are to be taken into account, they must be taken into account when dividing them into homogeneous areas.

For the homogeneous ranges, the following properties and characteristic values as well as their determined bandwidth must be given. Below are the standards or recommendations with which these parameters may have to be verified. If several methods of determination are possible, a standard or recommendation must be established.

For soil:

- local designation,
- Grain size distribution with grain strips according to DIN EN ISO 17892-4,
- Mass fraction of stones, blocks and large blocks according to DIN EN ISO 14688-1; Determination by sorting and measuring or sieving, then weighing and then relating to the corresponding excavated mass,

- mineralogical composition of the stones and blocks according to DIN EN ISO 14689,
- Moisture density according to DIN EN ISO 17892-2 or DIN 18125-2,
- undrained shear strength according to DIN 4094-4 or DIN EN ISO 17892-7 or DIN EN ISO 17892-8,
- Sensitivity according to DIN 4094-4,
- Water content according to DIN EN ISO 17892-1,
- Plasticity coefficient according to DIN EN ISO 17892-12,
- consistency number according to DIN EN ISO 17892-12,
- Permeability according to DIN EN ISO 17892-11,
- Associated storage density: Designation according to DIN EN ISO 14688-2, Determination according to DIN 18126,
- Organic content according to DIN 18128,
- Naming and description of organic soils according to DIN EN ISO 14688-1,
- Abrasiveness according to NF P18-579 and
- Floor assembly according to DIN 18196.

For rock:

- local designation,
- Naming of Fels according to DIN EN ISO 14689,
- Moisture density according to DIN EN ISO 17892-2,
- Weathering and changes, variability according to DIN EN ISO 14689,
- uniaxial compressive strength of rock according to DIN 18141-1, subsoil — Examination of rock samples — Part 1: Determination of uniaxial compressive strength,
- Separation surface direction, separation surface distance, rock body shape according to DIN EN ISO 14689,
- Rock permeability according to DIN EN ISO 14689 and DIN EN ISO 22282-4 as well as
- Abrasiveness according to DGGT Recommendation No. 23: "Determination of the Abrasiveness of Rocks with the CERCHAR Test" of AK 3.3 "Rock Experimental Technology".

2.4 Description and classification of artificial floors and other materials

As far as possible, artificial soils, e.g. backfills, and other substances, e.g. components, recycled materials, industrial by-products, waste and soils with foreign components, are described in accordance with Section 2.2 and classified in accordance with Section 2.3. If this is not possible, they are specifically described with regard to their properties for pipe jacking work.

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 Pipe jacking work must be carried out in accordance with DIN EN 12889 "Trenchless laying and testing of sewer pipes and sewers".

3.1.2 The choice of the pipe jacking method and the construction process, the securing of the tunnel face during pipe jacking, the securing of the tunnel face during scheduled

shutdowns as well as the selection and use of the construction equipment are the responsibility of the Contractor.

3.1.3 If soil, rock and water conditions deviating from the service description are encountered or if the agreed measures are not sufficient for the removal of water, the Client shall be informed of this immediately. The required benefits are to be determined jointly. These services are special services (see section 4.2.1).

3.1.4 Permissible deviations from the tunnelling axis are given in Table 1. Major deviations must be reported to the Client immediately. The measures to be taken shall be determined jointly.

Nominal diameter DN	**permissible deviation mm**	
	vertical	**horizontal**
DN < 600	± 20	± 25
600 ≤ DN ≤ 1 000	± 25	± 40
1 000 < DN < 1 400	± 30	± 100
1 400 ≤ DN	± 50	± 200

3.1.5 If, during the execution of the work, there is a risk of breakdowns, soil leakage, water ingress, compressed air blowers, loss or leakage of support fluid or lubricants and propping agents, jacking lifts, damage to jacking pipes, structural installations, tunnelling machines or mining tools, the Contractor shall immediately carry out the necessary services to prevent damage and report the hazard as well as any damage that has already occurred to the Client. immediately. The other benefits are to be determined jointly. The services rendered as well as the other services are, insofar as the Contractor is not responsible for special services (see Section 4.2.1).

3.1.6 Endangered structures must be secured. The required services are special services (see section 4.2.1).

3.1.7 If cavities or obstacles are unexpectedly encountered, e.g. pipes, cables, drainage, markings, building remains, wood, natural grain sizes according to Table 2, the Client must be informed immediately. The required benefits must be determined jointly. These services are special services (see section 4.2.1).

If it is to be assumed that the obstacles are explosive ordnance, the work must be stopped immediately and the responsible authority and the client must be notified. The Contractor must carry out the necessary security services without delay. The required benefits must be determined jointly. The services provided and the other services are special services (see section 4.2.1).

3.1.8 In the event of unsuitable weather conditions, e.g. temperatures below 0 °C when working with lubricants, propping agents or support fluids, special precautions must be taken in consultation with the Client. The required services are special services (see section 4.2.1).

3.2 Recording and logging of tunnelling parameters

3.2.1 In the case of non-controllable processes, the position of the pipe string must be measured and documented at specified intervals.

3.2.2 In the case of controllable methods, the following tunnelling parameters must be continuously measured and automatically recorded at tunnelling intervals of no more than 100 mm in length or a maximum duration of 90 s:

- Date and time;
- Tunnelling length;
- Deviations by height and side;
- Rolling (not for pilot pipe jacking);
- Machine inclination and machine direction (not for pilot pipe jacking);
- Pre-pressing forces, separate for main and intermediate pressing stations;
- Cutting wheel torque for full-face machines;
- Timing cylinder strokes (not for pilot pipe jacking);
- for Da > 1 940 mm support or earth pressure for liquid or earth pressure support;
- air pressure and compressed air consumption when compressed air is pressurized on the tunnel face;
- penetration of the shield hood in the case of open shields and unstable tunnel face; as well as
- Pressure and quantity of support and lubricants.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Determination of the condition of the road and terrain surfaces, the receiving waters and the like in accordance with § 3 para. 4 VOB/B.

4.1.2 Additional expenses for the disposal of the loosened soil and rock as a result of process-related mixing with supporting liquids or conditioning agents, insofar as the Contractor has chosen the pipe jacking method as well as the supporting liquids or conditioning agents.

4.1.3 Disposal of service water.

4.1.4 Relocation of the tunnelling equipment and other equipment from excavation pit to excavation pit and within the excavation pit or conversion of the tunnelling and soil excavation equipment, except for the services referred to in section 4.2.4.

4.1.5 Process-related injection of lubricants and propping agents into the annular space during tunnelling, including installation and closure of the injection nozzles.

4.1.6 Conveying dissolved soil and rock from the pipe to an interim storage facility or to a processing plant up to 50 m conveying distance.

4.1.7 Permanent and corrosion-proof sealing of the anchor troughs.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 The Special Benefits listed in clauses 3.1.3, 3.1.5, 3.1.6, 3.1.7 and 3.1.8.

4.2.2 Removal from the heading cross-section of natural grains whose edge length is greater than that given in Table 2.

Table 2 — Definition of natural grains as an obstacle **Nominal diameter** **DN**	**Maximum edge length** **Mm**
DN < 1 200	0,2 × DN
DN ≥ 1 200	0,25 × DN

4.2.3 Supply of stability certificates and drawings for press abutments and jacking pipes.

4.2.4 Relocation of the tunnelling equipment and other equipment from excavation pit to excavation pit and within the excavation pit as well as conversion of the tunnelling and soil excavation equipment for reasons for which the Contractor is not responsible in each case.

4.2.5 Construction, securing, maintaining, dismantling and backfilling of the start and target pits as well as specified intermediate pits.

4.2.6 Installation, provision and removal of splash guards.

4.2.7 Noise and vibration measurements.

4.2.8 Leak tests and visual inspections.

4.2.9 Services for the maintenance of the receiving water when driving over or displacing existing pipelines.

4.2.10 Preparation of existing pipes, e.g. cleaning, backfilling.

4.2.11 Making connections to the jacking pipe.

4.2.12 Installation of shims and cutting of jacking pipes to length.

4.2.13 Setting up and dismantling as well as maintaining and operating emergency power systems.

4.2.14 Measuring of cable components, preparation of as-built documentation, installation of information signs and marking of cables.

4.2.15 Grouting of annular spaces and cavities with hydraulically setting materials after completion of the tunnelling work.

4.2.16 Benefits for measures against soil and groundwater intrusion during entry and exit operations.

4.2.17 Making an Inner Joint Seal

4.2.18 Facilities and measures with regard to personal rescue, fire protection, ventilation, dust removal, dust extraction as well as lighting and the like due to special circumstances and specifications.

4.2.19 Loading at the interim storage facility or at the processing plant, transport and disposal of the loosened soil and rock, except for services according to section 4.1.2.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

No regulations.

5.2 Determination of dimensions/quantities

The length of the jacking is determined in the pipe axis as the total length of the driven pipes. Intermediate shafts are measured.

5.3 Overmeasurement rules

No regulations.

5.4 Individual provisions

Drives that have to be abandoned are calculated according to the tunnelling distances achieved, unless the cause is the responsibility of the contractor.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Landscaping work — DIN 18320

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 Results of preliminary investigations.

0.1.2 Type and extent of existing growth on the areas to be cultivated.

0.1.3 Type , condition and condition of vegetation and vegetation areas for care and maintenance work.

0.2 Information on the execution

0.2.1 Type, quantity, dimensions, layer thicknesses and nature of the soils, substrates, substances, components, plants and plant parts to be used, if applicable, their origin, labelling, grouping and sorting.

0.2.2 Number and type of samples required.

0.2.3 Requirements for the recognition of the results of self-monitoring audits as control audits.

0.2.4 Staggered surface inclinations if the slope of the surfaces to be worked is steeper than 1 : 4, e.g. 1 : 1.5; 1 : 2; 1 : 3.

0.2.5 Number, dimensions and size of individual areas.

0.2.6 Type, location, length and condition of the conveying routes, restrictions on use. Conveying distances ≥ 50 m, if necessary staggered according to length or mass distribution plan.

0.2.7 Type and possibilities of temporary storage of soil, plants and other substances.

0.2.8 The number, species, width, height and genus of trees to be felled or cleared; in the case of trees, the circumference of the trunk at a height of 1.0 m.

0.2.9 Number, type and extent of removal of roots and rhizomes.

0.2.10 Number, type, scope and duration of protective measures for plants or vegetation areas against pests, game, grazing livestock and the like.

0.2.11 Number, type, extent and duration of protective measures for plants or vegetation areas until acceptance, if adjacent areas are previously used.

0.2.12 Description and classification of soil, rock and other substances according to section 2.1.4.

0.2.13 Information on plant distribution, e.g. number per m2, in row, planting plan if necessary.

0.2.14 Number, type and nature of the anchorage of trees and other woody plants.

0.2.15 Special working methods, e.g. aerial platforms, rope climbing techniques and difficulties in felling and clearing work, as well as trunk lengths and crushing sizes of the plant parts to be produced.

0.2.16 Type, scope and period of the individual services for completion maintenance as well as for development and maintenance maintenance, if necessary stating the time and interval of the services.

0.2.17 Number, type, location, dimensions, design and characteristics of fences and their components (see Figure A.1).

0.2.17.1 Metal fences

Covering: mesh size and diameter of the wires. Posts: Cross-section or diameter, wall thickness and material of fasteners, brackets and cover caps.

0.2.17.2 Wooden fences

Covering: Batten/transom cross-section, type of wood, type of processing of the wood surface, number of transoms, spacing of the slats. Posts: cross-section, type of wood, type of processing of the wood surface and material of fasteners and brackets. Wood preservation: Type of impregnation or surface treatment to protect against weather or rot.

0.2.17.3 Fences in combined construction (e.g. browsing fence, wildlife protection fence).

Covering: mesh size and diameter of the wires. Posts: Diameter, type of wood, type of processing of the wood surface and material of fasteners and brackets.

0.2.17.4 All-stop fences

Covering: mesh size and diameter of the wires. Posts: Cross-section, wall thickness and material of fasteners, brackets and cover caps. Specifications for the formation of the foundations and posts resulting from the static calculation.

0.2.18 Number, type and formation of corners and interruptions in the course of the fence.

0.2.19 Area slope in the course of the fence staggered if the slope is > 4 %.

0.2.20 Number, type, location, dimensions, design and condition of gate and door systems for fences (see Figure A.2 in the Annex).

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 2.1.2,	if the supply of the soil is to be part of the service in the case of ground work,
Section 2.2,	if plants and plant parts do not have to come from cultivated stands, but e.g. from wild stands,
Section 3.2 if	other requirements are imposed during felling and clearing work, e.g. cutting height, circumference of the roots to be removed,
Section 3.2,	if trees and shrubs are not to be felled and stored as a whole, but are to be deposited piecemeal,
Section 3.7,	if other layers, layer thicknesses and other sports and protective functional requirements are to be imposed on sports fields,
Section 3.11.5	if fences and gates are to be constructed with climb-over protection or with overhangs.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units are to be provided as follows:

0.5.1 Volume dimensions (m3, l), separated by type and dimensions, for

- Delivery, removal, removal and storage of soil, substrate and vegetation base layers,
- liquid fertilizer,
- application of soil improvers,
- Bewässerung,

- Tree and plant pits, cleaning the construction site of disturbing substances.

0.5.2 Area (m2), separated by type and dimensions, for

- Stub
- Picking up plant ground covers,
- Securing floor surfaces and surfaces of soil bearings,
- Removal and removal of soil, substrate and vegetation base layers,
- Soil cultivation, e.g. loosening, leveling, compacting,
- Application and incorporation of fertilisers and soil improvers,
- Creation of lawns and meadow-like areas,
- Production of wet and dry seeding,
- deck construction methods of live shoring,
- Preparation of filter, drainage, base and surface courses,
- Protective devices for planting areas,
- maintenance services, e.g. lawn clippings, pruning, pruning hedges, irrigation, soil loosening, plant protection, winter protection measures,
- Cleaning the construction site of interfering substances.

0.5.3 Measure of length (m), separated by type and dimensions, for

- fascine shoring, wickerwork, bushes, hedges, planting ditches, planting ridges,
- fences, linear markings,
- Cutting hedges.

0.5.4 Number (pcs), separated by type and dimensions, for

- felling and clearing of trees,
- Clearing or removing plants, vegetation pieces,
- Felling of plants, planting work, setting of cuttings and stakes, anchoring of woody plants,
- Tree and plant pits,
- Planting holes,
- Caring for individual plants, planters,
- Protections for plants,
- Equipment, e.g. benches, tables, waste bins, play and sports equipment,
- Markers, point markers,
- Gates, corner formations, end posts, height ledges,
- Pruning of woody plants.

0.5.5 Mass (kg, t), separated by type, for

- seeds for wet and dry sowing,
- Fertilizer
- soil, substrate, vegetation base layers,
- Supply of building material mixtures for filter, drainage, base and surface courses,

- Soil improvers,
- Cleaning the construction site of interfering substances.

1 Scope of application

1.1 ATV DIN 18320 "Landscaping work" applies to

- Felling and clearing work,
- Protective measures for trees, plant populations and vegetation areas,
- topsoil work,

vegetation construction, care and maintenance work

- Construction, care and maintenance work for sports and play facilities,
- engineering biological safety construction methods,
- Securing waters, dikes and coastal dunes as well as
- Fence construction work.

1.2 ATV DIN 18320 does not apply to earthworks that serve purposes other than vegetation (see ATV DIN 18300 "Earthworks").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18320 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

For the most common substances and components, the DIN standards and other requirements are listed below.

2.1 General

2.1.1 Dissolved topsoil and substances produced, in particular from felling and clearing work, shall not become the property of the Contractor.

2.1.2 The services do not include the delivery of topsoil.

2.1.3 If topsoil and other materials are to be supplied by the Contractor, the delivery shall also include unloading and storage on the construction site.

2.1.4 Topsoil is a homogeneous area in its own right, regardless of its state before dissolving. The following applies to the classification:

- Soil groups in accordance with DIN 18196 "Earthworks and foundation engineering — Soil classification for structural purposes", if applicable, additional designation customary in the area,
- Floor assemblies according to DIN 18915,
- Mass fraction of stones, blocks and large blocks according to DIN EN ISO 14688-1 "Geotechnical exploration and investigation — Designation, description and classification of soil — Part 1: Naming and description"; Determination by sorting

and measuring or screening, then weighing and then relating to the corresponding excavated mass.

2.2 Vegetation areas

DIN 18915	Vegetation technology in landscaping — Ground work
DIN 18916	Vegetation technology in landscaping — Planting and planting work
DIN 18917	Landscaping Vegetation Technology — Lawn and Sowing Work
DIN 18918	Vegetation technology in landscaping — Engineering biological safety construction methods — Safeguarding by seeding, Plantings Construction methods with living and non-living materials and components, combined construction methods
DIN 18919	Vegetation technology in landscaping — maintenance services for the development and maintenance of vegetation (development and maintenance maintenance)
DIN 18920	Vegetation technology in landscaping — Protection of trees, plant populations and vegetation areas during construction measures
DIN 19657	Securing of waters, dikes and coastal dunes; Guidelines

In addition, the following shall apply:

FLL Nursery Plants, Quality Specifications for Nursery Plants,

FLL perennials, quality specifications for perennials,

FLL RSM, Regular Seed Mixtures Lawn,

FLL Greening, Recommendations for Greening with Native Seeds — Regional Seeds — Regional Seed Mixtures, RSM Regio; Seeds that are true to nature — transfer of mown material, threshing material, seed, vegetation sods, topsoil2) .

2.3 Sports fields

DIN 18035-4	Sports fields — Part 4: Lawns
DIN 18035-5	Sports fields — Part 5: Clay pitches
DIN 18035-6	Sports fields — Part 6: Plastic surfaces
DIN 18035-7	Sports fields — Part 7: Synthetic turf systems
DIN EN 14877	Plastic surfaces on outdoor sports facilities — Requirements
DIN EN 15330-1	Sports Surfaces — Synthetic turf surfaces and needle felts manufactured primarily for outdoor use — Part 1: Specifications for synthetic turf surfaces for football, hockey, rugby training, tennis and multifunctional synthetic turf surfaces

In addition, the following shall apply:

FLL RSM, Regular Seed Mixtures Lawn,

TL Asphalt-StB, Technical Delivery Conditions for Asphalt Mix for the Construction of Traffic Surface Reinforcements,

TL SoB-StB, Technical Delivery Conditions for Building Material Mixtures and Soils for the Production of Coatings without Binder in Road Construction

2.4 Playgrounds

DIN EN 1176 (all parts)	Playground equipment and playground floors
DIN EN 1177	Shock-absorbing playground flooring — Test method for determining shock absorption

2.5 Fences

DIN 1025-5	Hot-rolled I-beams — Mid-width I-beams, IPE series — Dimensions, mass, static values
DIN 1045-2:2008-08	Structures made of concrete, reinforced concrete and prestressed concrete — Part 2: Concrete — Specification, properties, manufacture and conformity — Rules of application of DIN EN 206-1
DIN 4074-2	Construction timber for timber components — Quality conditions for construction logs (softwood)
DIN 55633	Coating materials — Corrosion protection of steel structures by powder coating systems — Evaluation of powder coating systems and execution of the coating
DIN 68365	Sawn timber for carpentry work — Sorting by appearance — Softwood
DIN EN 206-1:2001-07	Concrete — Part 1: Specification, properties, manufacture and conformity; German version EN 206-1:2000
DIN EN 350	Durability of wood and wood products — Testing and classification of durability of wood and wood products against biological attack
DIN EN 1991-1-4	Eurocode 1: Actions on structures — Part 1-4: General actions — Wind loads
DIN EN 1991-1-4/NA	National Annex — Nationally defined parameters — Eurocode 1: Actions on structures — Part 1-4: General actions — Wind loads
DIN EN 10219-2	Cold-Finished Welded Hollow Sections for Steel Construction of Unalloyed Structural Steels and Fine-Grained Structural Steels — Part 2: Limit Dimensions, Dimensions and Static Values

DIN EN 10223 (all parts)	Steel wire and wire products for fences and wire mesh
DIN EN 10244-2	Steel wire and wire products — Non-ferrous metal coatings on steel wire — Part 2: Coatings of zinc or zinc alloys
DIN EN 12453	Doors and gates — Safety of use of power-operated doors — Requirements and test methods DIN EN 12604 Doors and gates — Mechanical aspects — Requirements and test methods
DIN EN 12635	Doors and gates — Installation and use DIN EN 12978 Doors and gates — Protective devices for power-operated doors and gates — Requirements and test methods
DIN EN 13241	Gates — Product Standard, Performance Characteristics
DIN EN 15773	Industrial powder coating of hot-dip galvanized and sherardized steel articles [DuplexSystems] — Specifications, recommendations and guidelines
DIN EN ISO 1461	Zinc coatings applied to steel by hot-dip galvanizing — Requirements and tests
DIN EN ISO 2081	Metallic and other inorganic coatings — Galvanic zinc coatings on ferrous materials with additional treatment
DIN EN ISO 12944-5	Coating materials — Corrosion protection of steel structures by coating systems — Part 5: Coating systems

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 The choice of the construction method, the construction process and the conveyor routes as well as the selection and use of the equipment are the responsibility of the Contractor.

3.1.2 In the case of measures to protect the structures, lines, cables, sewers, drains, paths, tracks and the like in the area of the construction site, the regulations of the owners or other persons authorised to issue instructions must be observed.

3.1.3 If the location of existing pipes, cables, drains, sewers, markings, obstacles and other structural facilities cannot be specified before the work is carried out, this must be investigated. Reconnaissance services are special services (see section 4.2.1).

3.1.4 If unspecified lines, cables, drains, sewers, building remains, markings, obstacles and the like are encountered, the Client must be informed immediately. Benefits for measures to be taken are special services (see section 4.2.1).

3.1.5 If it is to be assumed that the obstacles are explosive ordnance, the work must be stopped immediately and the competent authority and the client must be notified. The

Contractor must carry out the necessary safety measures without delay. The required services are special services (see section 4.2.1).

3.1.6 During the execution of maintenance operations, the vegetation and the services performed must be monitored for danger from drought or wetness, heat or frost, diseases, pests, unwanted growth, invasive or allergenic plants, game or grazing livestock. The Client shall be informed immediately of any endangerment unterrichten. Die Leistungen für zu treffende Measures sind Besondere Leistungen (see section 4.2.1).

3.1.7 During the execution of soil, planting and sowing work, the workability of the soil must be monitored and the Client must be informed immediately if the work at this point has to be temporarily stopped in order to avert irreversible damage to the soil and this may lead to postponements.

3.1.8 When loosening and loading soil and removing plants, vegetation and turf sod, pumping ≤ 50 m is part of the service.

3.1.9 In addition to Section 3 (4) VOB/B, the condition of the vegetation and the vegetation areas must be recorded in a record before the start of the work, if necessary, which must be approved by the Client and the Contractor.

3.1.10 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- Deviations of the portfolio from the specifications,
- disturbing, endangering or endangering traffic and supply facilities,
- unsuitable construction schedules, e.g. for ground work, sowing and planting work,
- unsuitable site conditions, e.g. soil, climate, water, immissions,
- contaminated terrain, e.g. by construction waste, building residues, chemicals, mineral oils,
- plants and areas endangered by construction operations,
- growth and lawn that are not suitable for reuse,
- existing roots, growth or other conditions that endanger the intended vegetation or any other use of the area,
- insufficiently or inappropriately prescribed soil improvement or fertilisation,
- defects in soils, substrates, plants or plant parts provided or prescribed by the client,
- insufficiently prescribed measures for soil care and the protection of vegetation areas up to sowing or planting,
- insufficient scope or inappropriate nature of the prescribed services for the construction and maintenance of vegetation areas,
- insufficient scope or inappropriate nature of the prescribed services for the development and maintenance of green spaces and for maintenance work.

3.2 Felling and clearing work

3.2.1 Felling work When felling trees and shrubs, the above-ground parts of the plant must be separated and stored at a height of between 10 cm and 30 cm above the ground.

3.2.2 Clearing work When clearing the stumps of felled trees and shrubs, their rhizomes up to 20 cm outside the root start and strong roots with diameters of more than 10 cm up to a depth of 30 cm must be removed and stored.

3.3 Protection of trees, plant populations and vegetation areas during construction measures

Measures for the protection of trees, plant populations and vegetation areas during construction measures must be carried out in accordance with DIN 18920.

3.4 Ground work

Ground work for vegetation purposes and surface protection by layer structure for green roofs must be carried out in accordance with DIN 18915.

3.5 Planting work

3.5.1 Planting work must be carried out in accordance with DIN 18916.

3.5.2 For the removal of area plantings, e.g. from ground-covering perennials and shrubs, light shrubs and heathers, losses of up to 5 % of the total number of units are tolerated and do not have to be replanted if a closed impression has been created despite the failure of individual plants.

3.5.3 If individual areas have a failure rate of more than 25 % in the case of area planting, the Contractor shall be obliged to replant all failed plants even if the average value of all failures does not exceed 5 %.

3.6 Lawn and seeding work in landscaping

Lawn and seeding work in landscaping must be carried out in accordance with DIN 18917.

3.7 Sports field construction work

3.7.1 Lawns

3.7.1.1 General lawns for sports fields must be designed in accordance with DIN 18035-4.

3.7.1.2 Turf base course

For the turf base course for sports fields, the requirements according to Table 1 apply.

Table 1 — Requirements for turf base courses for sports fields

Property	Request	Testing according to
Water Infiltration Rate IB	≥ 60 mm/h	DIN EN 12616 „Sports Surfaces — Determination of the Water Infiltration Rate', Method B
Strength	> 12 kPa	DIN 18035-4:2012-01, Section 6.2.4
Slope	0,5 % bis 1,0 %	Levelling
Altitude	Limit dimension from the nominal height ± 20 mm	Levelling
Evenness	Stichmaß als Grenzwert bei Measuring point distance 4 m ≤ 20 mm	DIN 18202, with the guideline according to DIN EN 13036-7:2003-12 „Surface properties of roads and airfields — Test methods — Part 7: Measurement of individual unevenness of traffic areas' Annex B (A deviations)
Thickness	≥ 100 mm	Measurement

3.7.1.3 Lawn cover

The turf cover is to be made with a standard seed mixture RSM 3.1 for sports turf by sowing. It must have a uniform stand in growth and distribution, which, when mowed, has a projective ground cover of 90% with plants of the required seed mixture at 70% of the estimated values according to DIN EN 12231 "Sports surfaces — Test methods — Determination of ground cover for natural grass". The last cut before acceptance must not have been made more than three days ago.

3.7.2 Clay surfaces

3.7.2.1 General

Clay surfaces for sports fields must be designed in accordance with DIN 18035-5.

The superstructure of threshing floor areas must be constructed with the following layers:

- Base course without binder, see Table 2;
- dynamic layer, see Table 3;
- Clay surface, see Table 4.

3.7.2.2 Base courses without binders

Table 2 — Requirements for base courses without binders

Property	Request	Testing according to
Verdichtungsgrad DPr	≥ 0,97	DIN 18125-2 "Subsoil — Examination of soil samples — Determination of soil density — Part 2: Field tests"
Deformation modulus Ev2	≥ 45 N/mm2	DIN 18134 "Subsoil — Experiments and Experimental Equipment — Plate Compression Test"
Ratio Ev2 : Ev1	≤ 2,5	DIN 18134
Water infiltration rate IC	≥ 720 mm/h	DIN EN 12616, Verfahren C
Slope	0,8 % bis 1 %	Levelling
Altitude	Limit dimensions from the nominal height: ± 15 mm	Levelling
Evenness	Pitch as a limit value for measuring point distance 1 m ≤ 4 mm 2 m ≤ 6 mm 4 m ≤ 10 mm	DIN 18202, with the guideline according to DIN EN 13036-7:2013-12, Annex B (A deviations)
Thickness	≥ 150 mm	Measurement

3.7.2.3 Dynamic Layers

Table 3 — Requirements for dynamic layers

Property	Request	Testing according to
Verdichtungsgrad DPr	≥ 0,95	DIN 18125-2
Surface Shear Strength τ	≥ 50 kN/m2	DIN 18035-5:2007-08, 6.7
Water infiltration rate IC	≥ 72 mm/h	DIN EN 12616, Verfahren C
Slope	0,8 % bis 1 %	Levelling
Altitude	Limit dimensions from the nominal height ± 10 mm	Levelling
Ebenheit	Pitch as a limit value for measuring point distance 1 m ≤ 4 mm 2 m ≤ 6 mm 4 m ≤ 10 mm	DIN 18202, with the guideline according to DIN EN 13036-7:2003-12, Annex B (A deviations)
Thickness	≥ 60 mm	Measurement

3.7.2.4. Tennen location

Table 4 — Requirements for clay flooring

Property	**Request**	**Testing according to**
Verdichtungsgrad DPr	≥ 0,95	DIN 18125-2
Surface shear strength τ	≥ 50 kN/m2	DIN 18035-5:2007-08, Section 6.7
Water infiltration rate IC	≥ 3,6 mm/h	DIN EN 12616, Procedure C
Slope	0,8 % bis 1 %	Levelling
Altitude	Limit dimensions of the nominal height ± 10 mm	Levelling
Evenness	Pitch as a limit value for measuring point distance 1 m ≤ 4 mm 2 m ≤ 6 mm 4 m ≤ 10 mm	DIN 18202, with the guideline according to DIN EN 13036-7:2003-12, Annex B (A deviations)
Thickness	≥ 40 mm	Measurement

3.7.3 Plastic surfaces

3.7.3.1 General plastic surfaces for sports fields must be designed in accordance with DIN 18035-6.

The superstructure of plastic surfaces must be made with the following layers:

- Base course without binder, see Table 5;
- Asphalt base course, open-pored, see Table 6;
- Plastic surface.

3.7.3.2 Base course without binder

Table 5 — Requirements for base courses without binders

Property	**Request**	**Testing according to**
Degree of compaction DPr	≥ 1,0	DIN 18125-2
Modulus of deformation Ev2	≥ 60 kN/m2	DIN 18134
Ratio Ev2 : Ev1	≤ 2,2	DIN 18134
Water infiltration rate IC	≥ 720 mm/h	DIN EN 12616, Procedure C
Slope	0,5 % bis 1 %	Levelling
Altitude	Limit dimensions from the nominal height ± 20 mm	Levelling
Evenness	Pitch as a limit value for measuring point distance 1 m ≤ 15 mm 2 m ≤ 17 mm 4 m ≤ 20 mm	DIN 18202, mit der Guideline according to DIN EN 13036-7:2003-12, Annex B (A deviations)
Thickness	≥ 200 mm	Measurement

3.7.3.3 Asphalt base course, open-pore

Table 6 — Requirements for open-pore asphalt base courses

Property	**Request**	**Testing according to**
Asphalt type	PA 11	TP Asphalt-StB*
Degree of compaction DPr	≥ 0,97	TP Asphalt-StB*
Water infiltration rate IC	≥ 360 mm/h	DIN EN 12616, Procedure A
Slope	0,5 % bis 1 %	Levelling
Altitude	Limit dimensions from the nominal height ± 15 mm	Levelling
Evenness	Pitch as a limit value for measuring point distance 1 m ≤ 3 mm 2 m ≤ 5 mm 4 m ≤ 8 mm	DIN 18202, with the guideline according to DIN EN 13036-7:2003-12, Annex B (A-deviations)
Thickness	≥ 50 mm	Measurement
* Autor: FGSV Research Society for Roads- and Transportation e. V., An Lyskirchen 14, 50676 Cologne, www.fgsv.de. To be obtained from: FGSV Publisher GmbH, Verlag der Research Society for Roads- and Transportation e. V., Wesselinger Street 15–17, 50999 Cologne www.fgsv-verlag.de		

3.7.3.4 Plastic surface

The plastic surface is a cast-coated surface type D poured on site in accordance with DIN EN 14877. The layer thickness of the synthetic surface is at least 13 mm, with a base layer of at least 10 mm and a top layer of at least 3 mm, test of the layer thickness according to DIN EN 1969 "Sports surfaces — Determination of the thickness of synthetic surfaces". The top layer is to be made in red. The synthetic surface must be manufactured with force reduction in accordance with class SA 45 to SA 70 in accordance with DIN EN 14877.

3.7.3.5 Synthetic turf surfaces

Synthetic turf surfaces for sports fields must be designed in accordance with DIN 18035-7.

The superstructure of synthetic turf surfaces must be made with the following layers:

- Base course without binder, see Table 7;
- bonded elastic base course, see Table 8;
- synthetic turf surface, see 3.7.3.8.

3.7.3.6 Base courses without binders

Table 7 — Requirements for base courses without binders

Property	Request	Testing according to
Degree of compaction DPr	≥ 1,0	DIN 18125-2
Modulus of deformation Ev2	≥ 60 kN/m2	DIN 18134
Ratio Ev2 : Ev1	≤ 2,2	DIN 18134
Water infiltration rate IC	≥ 720 mm/h	DIN EN 12616, Procedure C
Slope	0,5 % bis 1 %	Levelling
Altitude	Limit dimensions from the nominal height ± 15 mm	Levelling
Evenness	Pitch as a limit value for measuring point distance 1 m ≤ 4 mm 2 m ≤ 6 mm 4 m ≤ 10 mm	DIN 18202, with the guideline according to DIN EN 13036-7:2003-12, Annex B (A deviations)
Thickness	≥ 200 mm	Measurement

3.7.3.7 Bonded elastic base course

A bonded elastic base layer is to be used as an elasticating layer.

Table 8 — Requirements for elastic base courses

Property	Requirementsg	Testing according to
Force Reduction	SA 5 nach DIN EN 15330-1	DIN EN 14808 „Sports Flooring — Determination of force reduction"
Water infiltration rate IC	≥ 340 mm/h	DIN EN 12616, Verfahren A
Slope	0,5 % bis 1 %	Levelling
Altitude	Limit dimensions from the nominal height ± 15 mm	Levelling
Evenness	Pitch as a limit value for measuring point distance 1 m ≤ 4 mm 2 m ≤ 6 mm 4 m ≤ 10 mm	DIN 18202, with the guideline according to DIN EN 13036-7:2003-12, Annex B (A deviations)
Thickness	≥ 35 mm	Measurement

3.7.3.8 Synthetic turf surface

The surface must be a synthetic turf type 4 according to DIN EN 15330-1 with crimped/textured fibre. The tuft lane spacing must not exceed 3/8" (inches). The number of studs in the row must not be less than 14 pcs/dm.

Tracks and pitch markings, insofar as they are not indented, must be glued together at the seams on a seam securing tape at least 30 cm wide. The width of the joints at the seams must not be greater than one tuft aisle width.

Table 8 applies to the flatness of the synthetic turf.

3.8 Playground construction work

Work for playgrounds and open spaces for play must be carried out in accordance with DIN 18034 "Playgrounds and open spaces for play — Requirements for planning, construction and operation" and in accordance with DIN EN 1176 (all parts) for shock-absorbing playground floors in accordance with DIN EN 1177.

3.9 Safety construction methods

Engineering biological safety construction methods as well as the protection of waters, dikes and coastal dunes must be carried out in accordance with DIN 18918.

3.10 Care and maintenance work

Completion maintenance services for planting work, lawn and seed work in landscaping, engineering biological safety construction methods and sports field construction work must be carried out in accordance with the standards specified in sections 3.5 to 3.7.

Development and maintenance services are to be carried out in accordance with DIN 18919.

3.11 Fence construction work

3.11.1 Metal fences

Metal fences must be designed as follows:

- Covering: welded mesh made of steel wire in accordance with DIN EN 10223-7 "Steel wire and wire products for fences and wire mesh — Part 7: Welded mesh mats for fences",
- Posts: steel profile tube S235 according to DIN EN 10219-2, hot-dip galvanized,
- Individual foundations: Concrete C 12/15.

The limit values for alignment deviations of posts are DIN 18202:2013-04, 5.5, "Tolerances in building construction — Structures".

3.11.2 Wooden fences

Wooden fences must be designed as follows:

- Covering: horizontal beams and vertical battens made of sawn timber in accordance with DIN 68365,
- Posts: Square wooden posts in hot-dip galvanized H-beams,
- Individual foundations: Concrete C 12/15.

3.11.3 Fences in combined construction (e.g. browsing fence, wildlife protection fence)

Fences in combined construction must be designed as follows:

- Covering: Knotted mesh of steel wire in accordance with DIN EN 10223-5 "Steel wire and wire products for fences and wire mesh — Part 5: Joint and knotted mesh of steel wire for fences",
- each cross wire must be tensioned at least once per fence alignment, but no later than every 50 m with wire tensioners,
- Posts: Round timber, grade I according to DIN 4074-2, rammed.

3.11.4 All-stop fences

Ball stop fences must be designed according to the respective wind load zone according to DIN EN 1991-1-4 and DIN EN 1991-1-4/NA as follows:

- Covering: welded panels according to DIN EN 10223-7 without upper and lower overhangs,
- Posts: steel profile tube S235 according to DIN EN 10219-2,
- Individual foundations: Concrete C 20/25.

The limit values for alignment deviations of posts are DIN 18202:2013-04, Section 5.5.

3.11.5 Fence overhangs, climb-over protection

No climb-over protection may be used on publicly accessible fences up to a standing height of 180 cm. Posts, covering and battens must not have any sharp-edged or pointed protrusions.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Determination of the condition of the roads, the terrain surface, the receiving waters and the like in accordance with § 3 para. 4 VOB/B.

4.1.2 Working on adjacent components.

4.1.3 Watering after planting and after laying ready-made turf.

4.1.4 When grubbing up extensive stands, rootstocks with a diameter ≤ 10 cm, measured at the interface, are part of the performance. In the case of multi-stemmed trees, the diameter is the sum of the diameters of the individual trunks.

4.1.5 Loosening, loading and disposing of individual stones and wall remnants with individual sizes up to 0.01 m3 volume4) in the production of fine grading of vegetation areas up to a quantity of 1 m3.

4.1.6 Creation of the necessary gradient in the surface formation of vegetation areas, pavements and safety structures for water drainage.

4.1.7 Creation of height ledges ≤ 10 cm per post in the course of the fence.

4.1.8 Tests, including sampling, to prove the suitability or quality of substances, mixtures of substances and soils supplied by the Contractor.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 Benefits for measures according to sections 3.1.3 to 3.1.6.

4.2.2 Soil, water and water level investigations as well as special test methods.

4.2.3 Suitability tests, including sampling of substances, components, plants and plant parts provided by the Client or the origin of which is prescribed by the Client.

4.2.4 Services for the drainage of water from adjacent areas.

4.2.5 Unloading and storage of materials, components, plants and plant parts provided by the Client.

4.2.6 Loosening, loading, separating and disposing of blocks, gravel and stones, building remains, geosynthetics and other substances as well as the filling of the resulting cavities, except for services according to section 4.1.5.

4.2.7 Protective measures for plants after the expiry of the storage period on the construction site as well as services for felling or training plants and plant parts that are required by the Client or if these become necessary for reasons for which the Contractor is not responsible.

4.2.8 Supply of water for completion maintenance as well as development and maintenance maintenance.

4.2.9 Services to eliminate premature growth if these become necessary for reasons for which the Contractor is not responsible.

4.2.10 Loosening of the subsoil before applying topsoil, substrates and vegetation base layers.

4.2.11 Protective measures for vegetation areas against game and grazing livestock or if adjacent areas are used before the vegetation areas are approved.

4.2.12 Piecemeal setting down when felling trees and shrubs and special working methods, e.g. with aerial platforms and rope climbing technology.

4.2.13 Services for control tests including sampling.

4.2.14 Special measurements beyond ATV DIN 18299:2016-09, section 4.1.3, e.g. measurements for certificates in accordance with the competition regulations of the sports associations.

4.2.15 Preparation of static verifications and the drawings required for them.

4.2.16 Producing as-built drawings.

4.2.17 Additional posts due to interruptions, changes of direction and topographical conditions.

4.2.18 Creation of height heels > 10 cm per post in the course of the fence.

4.2.19 Fabrication of and work on surfaces with gradients steeper than 1:4.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

5.1.1 The determination of the service – regardless of whether it is carried out according to drawings or measurements – is to be based on the dimensions of the processed or manufactured surfaces. The simplifying rules, such as over-measurement rules and individual regulations, are to be used to determine performance.

5.2 Determination of dimensions/quantities

5.2.1 The dimensions are determined on the basis of the largest component dimension, if any, that has been completed.

5.2.2 Approximation methods are permissible for quantity determination

5.2.3 When invoicing maintenance services for green roofs, the dimensions are to be determined on the basis of the vegetation area, including any existing verges.

5.2.4 The quantities withdrawn shall be determined at the point of withdrawal.

5.2.5 Soil bearings shall be measured immediately after they have been manufactured.

5.2.6 The quantities installed shall be determined in the finished state.

5.2.7 In the case of billing by mass, this is to be determined by weighing, in the case of shiploads by ship's oak.

5.2.8 Woody plants to be cleared are identified before clearing, woody plants to be felled before felling. Shrubs are determined separately according to height, trees separately

according to trunk diameter at a height of 1 m above the ground. In the case of multi-stemmed trees, the diameter is the sum of the diameters of the individual trunks.

5.2.9 Pruning of hedges is determined according to the area worked.

5.3 Overmeasurement rules

The following are measured:

5.3.1 When billing according to room dimensions

1. Spatial bodies with a single size ≤ 0.5 m3, e.g. root ball, light well.

5.3.2 When billing according to area

1. Recesses with a single size ≤ 100 m2 for wet and dry seeding according to DIN 18918, e.g. rock surfaces, buildings.
2. Recesses with a single size ≤ 2.5 m2 for other surfaces, e.g. trees, tree slices, supports, drains, step plates.
3. rails if a similar surface is approached on both sides of the rails.

5.3.3 When billing according to length

1. Interruptions with a single length ≤ 1 m.

5.3.4 When Billing by Unit

1. Losses ≤ 5% for area plantings, e.g. from ground-covering perennials and woody plants, light shrubs and heathers.

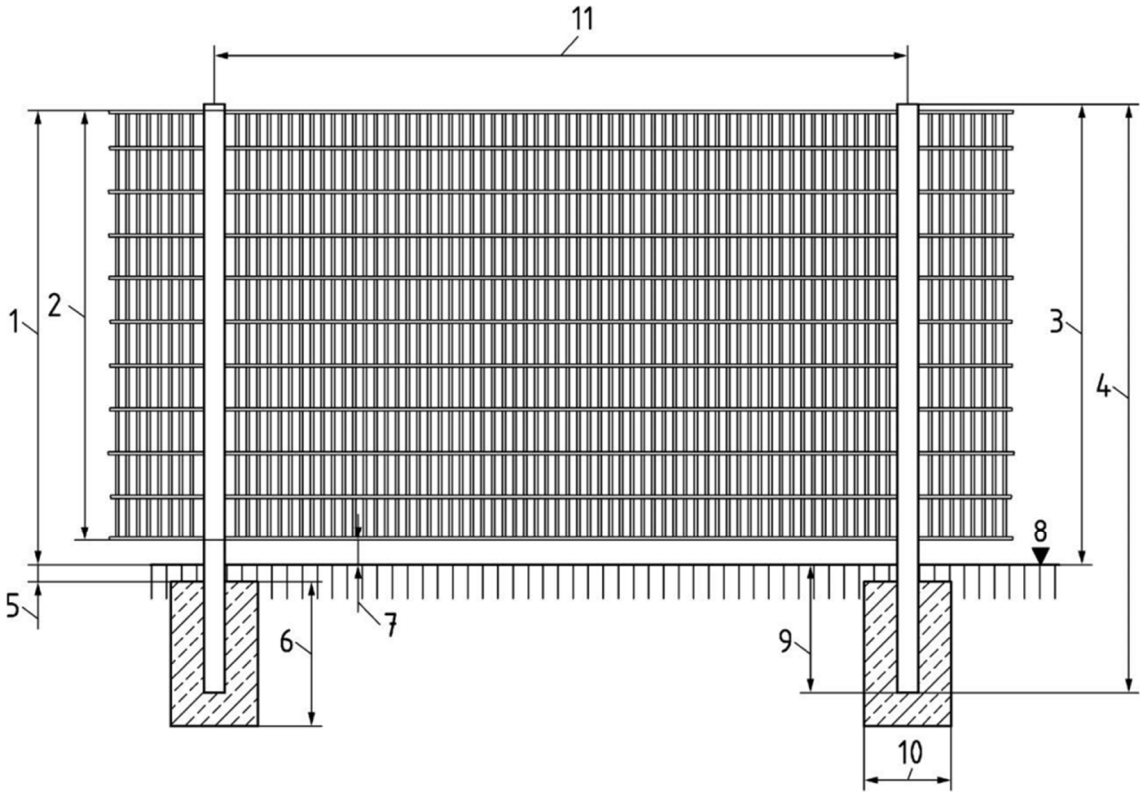
5.4 Individual provisions

No regulations.

Appendix A

(informative)

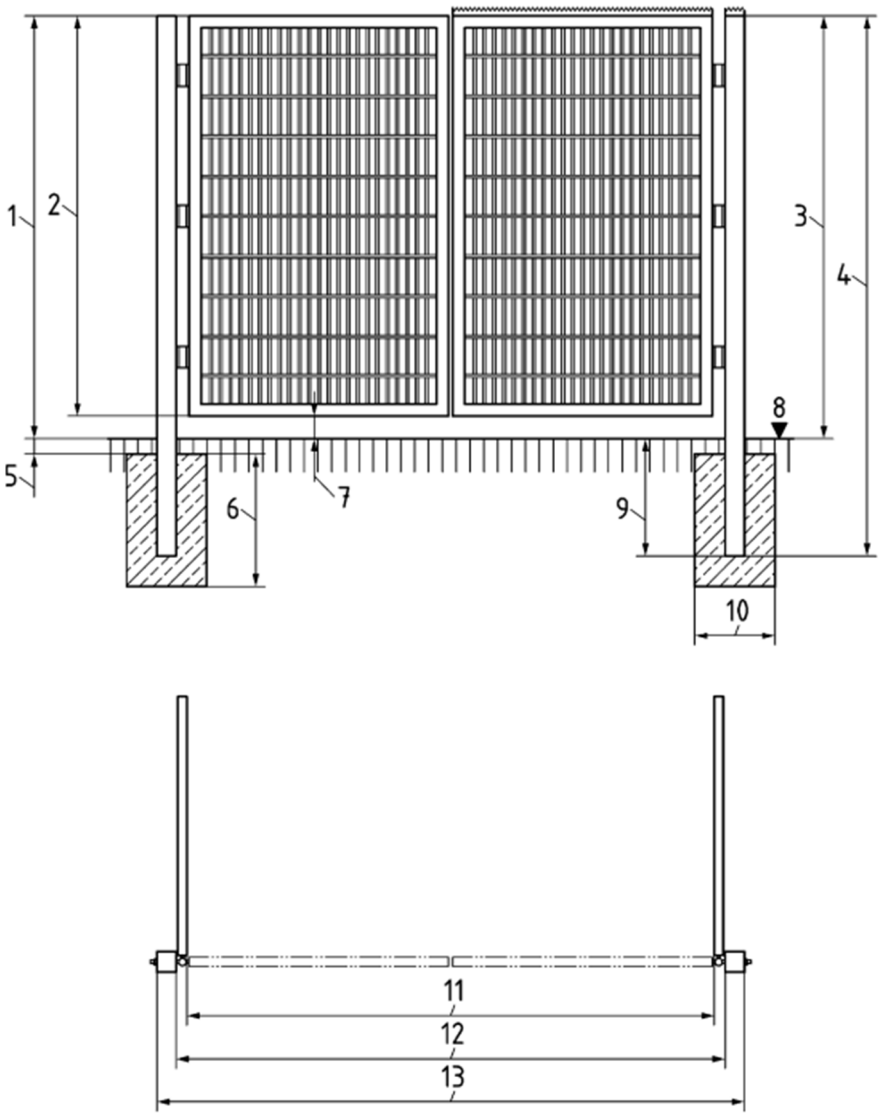
Definitions fence



Legend

1	Stand height	7	Ground clearance
2	Fence Height/Covering Height	8	Terrain Surface
3	Post height	9	Post recess
4	Post length	10	Foundation width/diameter
5	Foundation cover	11	Single span length (grid length)
6	Fundamentals		

Figure A.1 — Fence panel including foundation



Legend

1	Stand height	8	Terrain surface
2	Goal height/wing height	9	Post recess
3	Post height	10	Foundation width/diameter
4	Post length	11	Opening width
5	Foundation cover	12	Clear width
6	Foundation height	13	Overall width
7	Ground clearance		

Figure A.2 — Gate and door system including foundation

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Jet blasting work — DIN 18321

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

In accordance with the requirements of the individual case, the specifications shall state in particular

0.1 Information on the construction site

0.1.1 Purpose of the construction measure, period of use.

0.1.2 Requirements and conditions arising from the approval procedure.

0.1.3 Subsoil conditions, in particular information in accordance with DIN EN 12716:2019-03 "Execution of work in special civil engineering — jet blasting method", section 5, and components, e.g. earlier auxiliary construction measures in the subsoil.

0.1.4 Foundation depths, foundation types, loads and construction of adjacent structures.

0.1.5 Working space and accessibility for jet blasting equipment as well as work surfaces for the treatment of backflow.

0.2 Details of the execution

0.2.1 Description and classification of soil, rock and other substances according to Section 2.

0.2.2 Results of soundings to determine storage densities.

0.2.3 Type, location and dimensions of jet jet elements. Permissible deviations. If necessary, production sequence.

0.2.4 Requirements for strength development, strength, permeability and chemical resistance of the jet beam.

0.2.5 Schutz benachbarter Grundstücke und baulicher Anlagen während des Düsvorgangs.

0.2.6 Strength, permissible deformations and stability of the structures and components within the sphere of influence of the boreholes and nozzles.

0.2.7 Permissible deformation of the subsoil and permissible movements of the structures. Measures for surveillance.

0.2.8 Special requirements for drilling sections outside the jet jets, provided that they must not remain filled with hardened suspension (nozzle plugs).

0.2.9 Requirements for the final shape of the jet beam and permissible deviations.

0.2.10 Type and nature of the working planes.

0.2.11 Specifications on deadlines for the submission of minutes and other documents.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this ATV are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 3.1.2,	if the construction schedule is to be specified by the Contractor, and
Abschnitt 3.2.1,	if the choice of the jet blasting system, the jet jet parameters or the production sequence are to be specified to the contractor.

0.4 Individual information on fringe benefits and special benefits

As an ancillary service, for which a special atomic number (item) is to be provided under the conditions of ATV DIN 18299, Section 0.4.1, the relocation of all equipment for the preparation and introduction of the jet jet suspension is particularly suitable (see Section 4.1.5).

0.5 Billing Units

In the bill of quantities, the billing units, separated according to homogeneous areas and design, as well as the mixture of the jet suspension, shall be provided as follows:

- Jet jet elements according to nozzle length (m),
- Tests by number (St), separated by test method,

- Removal of the overprofile by area (m2),
- Disposing of the backflow according to the volume (m3) or mass (kg, t),
- Removal of the soil consolidated with backflow from the working planes, separated by work areas, by number (St),
- Relocation of facilities, separated by distance, by number (St) and
- test elements and their tests according to number (St).

1 Scope

1.1 ATV DIN 18321 "Jet blasting work" applies to the sealing or consolidation of soil, rock and fillings by jet blasting.

1.2 ATV DIN 18321 does not apply to

- the drilling work to be carried out for jet blasting work (see ATV DIN 18301 "Drilling work"),
- Press-fit work (see ATV DIN 18309 "Press-fit work").

1.2 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18321 take precedence.

2. Fabrics, components

2.1 In addition to ATV DIN 18299, Section 2, the following applies: 2.1 General Information DIN EN 12716 "Execution of work in special civil engineering — jet blasting process" applies to jet blasting work.

2.2 Starting materials and jet suspensions The contractor must ensure and prove to the client on demand that the starting materials and jet suspensions meet the requirements of DIN EN 12716:2019-03, clause 6.

2.3 Description of soil and rock The following apply to the naming and describing of soil and rock:

DIN 4020	Geotechnical investigations for structural purposes — Supplementary regulations to DIN EN 1997-2
DIN 4023	Geotechnical exploration and investigation — Graphic representation of the results of drilling and other direct outcrops
DIN 4094-4	Subsoil — Field investigations — Part 4: Wing shear tests
DIN 18126	Subsoil — Examination of soil samples — Determination of the density of non-cohesive soils with loosest and densest storage

DIN 18128	Subsoil — Examination of soil samples — Determination of loss on ignition
DIN 18196	Earthworks and foundations — Soil classification for structural purposes
DIN EN 1997-2	Eurocode 7: Design, calculation and design in geotechnical engineering — Part 2: Exploration and investigation of the subsoil
DIN EN 1997-2/NA	National Annex — Nationally determined parameters — Eurocode 7: Design, calculation and design in geotechnical engineering — Part 2: Exploration and investigation of the subsoil
DIN EN ISO 14688-1	Geotechnical exploration and investigation — Designation, description and classification of soil — Part 1: Designation and description
DIN EN ISO 14688-2	Geotechnical exploration and investigation — Designation, description and classification of soil — Part 2: Principles for soil classifications
DIN EN ISO 14689	Geotechnical Exploration and Investigation — Naming, Description and Classification of Rock
DIN EN ISO 17892-1	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 1: Determination of water content
DIN EN ISO 17892-4	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 4: Determination of grain size distribution
DIN EN ISO 17892-7	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 7: Uniaxial pressure test
DIN EN ISO 17892-8	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 8: Unconsolidated undrained triaxial test
DIN EN ISO 17892-12	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 12: Determination of flow and roll-out limits

2.4 Classification of soil and rock into homogeneous areas

Soil and rock must be divided into homogeneous areas according to their condition before jetting. The homogeneous area is a limited area, consisting of single or several soil or rock layers, which has comparable properties for jetting.

If environmentally relevant ingredients are to be taken into account, they must be taken into account when dividing them into homogeneous areas.

For the homogeneous ranges, the following properties and characteristic values as well as their determined bandwidth must be given. Below are the standards or recommendations with which these parameters may have to be verified. If several methods of determination are possible, a standard or recommendation must be established.

For soil:

- Customary local designation, □ Grain size distribution with grain bands according to DIN EN ISO 17892-4,
- Massenanteil Steine, Blöcke und große Blöcke nach DIN EN ISO 14688-1; Bestimmung durch Aussortieren und Vermessen bzw. Sieben, anschließend Wiegen und dann auf die zugehörige Aushubmasse beziehen,
- Undrained shear strength according to DIN 4094-4 or DIN EN ISO 17892-7 or DIN EN ISO 17892-8, □ Water content according to DIN EN ISO 17892-1, □
- Plasticity number according to DIN EN ISO 17892-12,
- Consistency number according to DIN EN ISO 17892-12,
- Associated storage density: Designation according to DIN EN ISO 14688-2, determination according to DIN 18126,
- organic content according to DIN 18128 and
- Floor assemblies according to DIN 18196.

Für Fels:

- local designation,
- Naming of Fels according to DIN EN ISO 14689 and
- Weathering and changes, variability according to DIN EN ISO 14689.

2.5 Description and classification of artificial floors and other materials

As far as possible, artificial soils, e.g. backfills, and other substances, e.g. components, recycled materials, industrial by-products, waste and soils with foreign components, are described in accordance with Section 2.3 and classified in accordance with Section 2.4. If this is not possible, they are specifically described with regard to their properties for jet blasting work.

3. Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 In the execution of the jet blasting work, in particular,

DIN 4123	Excavations, foundations and underpinnings in the area of existing buildings and
DIN EN 12716	Execution of work in special civil engineering — jet blasting method to be observed.

3.1.2 The choice of the construction process as well as the selection and use of the equipment are the responsibility of the Contractor.

3.1.3 Before the start of the jet blasting work, a joint inspection must be carried out with the client. The condition of the structural facilities, supply and disposal facilities must be determined and documented (see § 3 para. 4 VOB/B).

3.1.4 The Contractor shall ensure that the backflow of jet suspension nozzles can be picked up and transported.

3.1.5 The proper disposal of the residues from reflux and overprofile must be proven and submitted to the Client on request.

3.2 Nozzles

3.2.1 The choice of the jet blasting system, the jet blasting parameters and the manufacturing sequence is the responsibility of the Contractor. If nozzle jet parameters from successful test nozzles (test elements) are available, these must be observed.

3.2.2 If the target values of the nozzle operation are not achieved, the contracting authority shall be informed immediately. The required benefits must be determined jointly. To the extent that the Contractor is not responsible, these are special services (see Section 4.2.1).

3.2.3 Will there be danger
e.g. for the stability of structural installations, this must be communicated to the client immediately. In the event of imminent danger, the Contractor shall immediately perform the necessary services. The other benefits are to be determined jointly. The services rendered and the other services are special services (see section 4.2.1), insofar as the Contractor is not responsible for them.

3.2.4 Once the injection process has been completed, the required suspension level shall be maintained until hardening. If unexpected losses of suspension occur, e.g. as a result of leakage into underground cavities, the necessary services must be carried out immediately. The required benefits must be determined jointly. The services rendered as well as the other services are, insofar as the Contractor is not responsible for special services (see Section 4.2.1).

3.3 Quality Control

3.3.1 The Contractor shall keep minutes of the jet blasting work and hand them over to the Client in a timely manner. The following information must be recorded in the minutes:

a) Results from standard exams:
   - Density measurement of the fresh suspension twice per working shift and mixer,
   - Density measurement of the reflux twice per work shift and device, which must be stored as reserve samples at least until the end of the nozzle jet work,
   - Observation of strength development on reflux samples.

For each nozzle operation

- the designation, intended inclination, direction and final depth of the nozzle pipe per borehole
- Date and time of the start and end of the jet,
- Location of the starting point,
- the type and composition of the jet suspension,Temporal and depth-dependent progression of drawing and rotation speed through continuous recording,
- temporal and depth-dependent progression of pressure and quantity of media used during nozzleing through continuous recording,
- Measured altitude and length of the nozzle and
- Special incidents, e.g. leaks of buoyant materials such as coal or wood, unsteady backflow, any production disruptions.

3.3.2 Further control measures, e.g.

- Measurement of the attachment point of the nozzle boom,
- Measurements of the course of the nozzle rod,
- Determination of the diameter of the jet nozzles,
- Taking samples from the nozzle nozzles,
- Examination of specimens for statically stressed nozzle bodies, e.g. for underpinnings, anchored sealing pads and
- Soundings, test loads and digging are special services (see section 4.2.1).

4 Ancillary services, special services

4.1 In addition to ATV DIN 18299, Section 4.1, **ancillary services** are in particular:

4.1.1 Determination of the condition of the road and terrain surfaces, the receiving waters and the like in accordance with § 3 para. 4 VOB/B.

4.1.2 Penetration of your own nozzle jets that have already been manufactured

4.1.3 Picking up and disposing of pollutant-free backflow.

4.1.4 Maintenance of the working levels, insofar as necessary for proper construction site operation.

4.1.5 Relocation of all equipment for the preparation and insertion of the jet suspension, except for the services referred to in section 4.2.6.

4.1.6 Subsidence and uplift controls on adjacent buildings by leveling during jetting.

4.2 In addition to ATV DIN 18299, Section 4.2, **special services** are for example.:

4.2.1 The Special Benefits listed in Sections 3.2.2, 3.2.3, 3.2.4 and 3.3.2.

4.2.2 Preparation of stability verifications and execution drawings.

4.2.3 Soil and water investigations.

4.2.4 Preparation of test elements including exploration and sampling.

4.2.5 Test loads.

4.2.6 Relocation of all facilities for the preparation and introduction of jet jet suspension for reasons beyond the control of the Contractor.

4.2.7 Disposal of the backflow if pollutants from soil or groundwater change the classification in the classification class.

4.2.8 Permeability tests, e.g. pumping tests and geophysical investigations.

4.2.9 Elimination of the over-profile due to the procedure.

4.2.10 Removal of solidified residues in the soil, e.g. nozzle candles.

4.2.11 Removal of the soil from the working plane that has been consolidated with backflow.

4.2.12 Measurements other than those described in Section 4.1.6.

4.2.13 Measures for the assessment of dimensions according to DIN EN 12716.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General No Regulations.

5.2 Determination of dimensions/quantities

5.2.1 The nozzle length is determined from the planned nozzle section.

5.2.2 The area for removing the overprofile is determined from the projection of the planned visible surface.

5.3 Overmeasurement rules

No regulations.

5.4 Individual Regulations

No Regulations

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Civil engineering work on cable lines — DIN 18322

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 Type and extent of existing growth on the areas to be cleared.

0.1.2 Type, dimensions, location and condition of the surfaces to be broken up and restored, e.g. vegetation areas, roads, paths, squares.

0.1.3 Construction of the superstructure. Type and thickness of all layers and fixings.

0.1.4 Type and condition of existing borders, design of the connections, e.g. to existing fastenings, fixtures, structures, shafts, recesses.

0.1.5 Number and type of fixtures and recesses in the superstructure

0.1.6 Foundation depths, types of foundations and loads of neighbouring structures.

0.1.7 Planned elevation of the excavation pit and trench bottoms.

0.1.8 Type, location and dimensions as well as owners of natural and artificial cavities as well as obstacles, e.g. anchors, soil stabilisation bodies, waterproofing bodies, grouted material, geosynthetics, piped streams, grouting hoses, sleeve pipes and borehole backfilling.

0.1.9 Nature and Scope of Evidence Preservation Measures.

0.1.10 Type and location of the crossings and crossings to be provided for traffic.

0.1.11 Formation, condition and drainage of ditches and excavations.

0.1.12 Minimum requirements for civil engineering contractors.

0.1.13 Minimum requirements for cable laying contractors.

0.2 Information on the execution

0.2.1 Special services for the protection of neighbouring properties and structures, trees and vegetation.

0.2.2 Type and condition of the floor for the formation of supports and the embedding of cables, conduits, cable ducts and the like.

0.2.3 Interim storage of substances and components received and provided.

0.2.4 Type and scope of services for the recycling of removed materials and components that cannot be reused on the construction site and the designation of their environmentally relevant ingredients.

0.2.5 Formation of connections to adjacent components and surfaces.

0.2.6 Services for the removal of groundwater, spring water and seepage water from shafts, cable duct systems and structures. Type and extent of securing drainage, seepage and drainage systems.

0.2.7 Number, type, length and dimensions of cables, cable accessories, protective conduits or cable duct half-pipes, cable duct fittings, cable ducts, earthing conductors, earthing conductors and the like to be accommodated and installed.

0.2.8 Method of installation of thermowells in casing pipes.

0.2.9 Cable design of low, medium, high voltage, fiber optic and coaxial cables. Cable marking, smallest permissible bending radius, permissible tensile forces, laying depth. Rules to be observed.

0.2.10 Specifications from the use of the cables, e.g. distance, type of laying.

0.2.11 Laying of cables and the like over bridges, in tunnels, in subsidence areas, in flood-prone areas and through bodies of water. Construction methods for crossing supply and disposal facilities, protected areas

Traffic routes and traffic areas, railway tracks, dams, canals, pipelines and the like.

0.2.12 Number, type, dimensions and location of cable ducts, cable boxes, cable distributors, junction boxes, multifunctional housings, socket troughs, building entries, wall entry components, cable entry plates, connection and distribution equipment, accessories and installation parts and the like to be removed, moved, manufactured or installed.

0.2.13 Type, number, dimensions and location of distribution cabinets, posts, lighting poles and the like to be removed, moved or erected.

0.2.14 Services for the transport, unloading and storage of materials and components.

0.2.15 Requirements for custom-made components.

0.2.16 Cleaning and repair measures.

0.2.17 Required seals on existing and new components.

0.2.18 Cable laying method, e.g. pulling in cable, pulling in by hand or by machine, ploughing in or milling cables, blowing in.

0.2.19 The insertion of traction aids into pipe hoists.

0.2.20 Type and content of the recording of the blowing process.

0.2.21 Type of dismantling of pipes, e.g. pulling out or dismantling.

0.2.22 Number, location and dimensions of construction and assembly pits for cable connections, socket troughs, shafts and the like.

0.2.23 Dimensions of the pipe zone, consisting of bedding, side filling and covering. Requirements for the execution and securing of the line zone. Minimum coverage of pipes. Working space and installation depth. Aggregate requirements.

0.2.24 Specifications derived from expert reports, in particular from geotechnical reports in accordance with DIN 4020 "Geotechnical investigations for structural purposes — Supplementary regulations to DIN EN 1997-2", DIN EN 1997-2 "Eurocode 7: Design, calculation and design in geotechnics — Part 2: Exploration and investigation of the subsoil" and DIN EN 1997-2/NA "National Annex — Nationally determined parameters — Eurocode 7: Design, calculation and design in geotechnics — Part 2: Exploration and investigation of the subsoil" as well as on hydrogeology and to what extent these are to be taken into account during execution.

0.2.25 Number, type, dimensions and design of cable conduit connections, connections, fastenings and the like.

0.2.26 Number, type and design of capping, seals and terminations for occupied and unoccupied pipes and cables as well as at interfaces of cables.

0.2.27 Type and design of route warning devices, e.g. cable protection covers, cable cover plates, protective pipes, provided that no route warning tapes are used.

0.2.28 Securing exposed pipes, cables, pipes, cable ducts, joints and the like.

0.2.29 Type and scope of barrier and traffic safety measures. Safety measures for work next to busy tracks. Type and extent of protection of track bedding, switching equipment, wire cables, cable ducts, cable distributors and the like.

0.2.30 Scope of tree and root protection measures.

0.2.31 Number, type, location and dimensions of pedestrian and temporary bridges.

0.2.32 Type and scope of temporary measures.

0.2.33 Uncovering measuring points, measuring pipes, preparing as-built plans, delivering and attaching signs, marking the pipeline route.

0.2.34 Services for the support of cables and the like on steep sections, on rocky or stony ground, on ditch bottoms with little load-bearing capacity or with a high water content.

0.2.35 Special permits, tests and findings.

0.2.36 Condition checks and calibrations of existing conduits, cable ducts and the like.

0.2.37 Number and type of wall openings, boreholes and pipe entries.

0.2.38 Special services for the protection of neighbouring electrical installations and cables.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 3.1.1,	if the construction method, the construction process or the type and use of the construction equipment are to be specified to the Contractor,
Section 5.2.1	if the usual approximation methods are not to be permissible for the determination of quantities or a specific method is to be chosen.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units, separated according to design, materials and dimensions, e.g. cable or pipe diameter, and, if necessary, additionally staggered according to the length of the conveying routes, shall be provided as follows:

- Erecting, maintaining, relocating and dismantling barriers according to length (m),
- Erecting, maintaining, relocating and dismantling temporary bridges, additionally separated according to bridge classes, according to number (St) or area (m2),

- Provision of barriers, temporary bridges, line fuses with combined billing units (md, mWo, mMt, m2d, m2Wo, m2Mt, Std (pieces × days), StWo, StMt),
- Removal and re-erection of enclosures and the like according to length (m) or number (St),
- Removal of obstacles according to room size (m3), e.g. remains of walls, or number (St), e.g. tree stumps,
- Excavation by area (m2),
- Securing cables according to length (m) or number (St),
- Disposing of dismantled and non-reusable, uncontaminated materials and components according to volume (m3), area (m2), length (m), number (st) or mass (kg, t),
- Line zone according to room dimension (m3), area dimension (m2) or length measure (m),
- Supply of fillers, filling of pipes, cavities and the like according to volume (m3) or mass (kg, t),
- laying and dismantling of cables, pipes, cable ducts, earthing conductors as well as cable protection and the like according to length (m),
- Adjustment and cuts of cable ducts made of prefabricated elements according to length (m) or number (St),
- Installation of fittings, e.g. branches, manifolds, pipe adapters, according to number (St),
- Manufacture and installation of manholes according to number (St),
- Installation of prefabricated and individual parts, e.g. prefabricated cable shafts, shaft bases, shaft rings, transition rings, plates, shaft shafts, manhole covers, mud flaps, climbing aids, by number (St),
- Installation of accessories by number (pcs),
- Installation or installation and dismantling of distribution cabinets, posts, masts and the like by number (St),
- Installation of connection and distribution equipment by number (St),
- Manufacture of connections, fastenings, connections, connections and the like, as well as pipe cuts by number (St),
- Wall Breakthroughs, Drilling, and Core Drilling by Number (St),
- Cleaning of pipes and cable ducts according to length (m),
- Capping of cables, sealing of pipes and cable ducts according to number (St),
- Separation cuts for bonded base and surface layers, joint cutting and joint grouting e.g. of movement and edge joints according to length (m),
- Cleaning of components picked up and provided, e.g. plasters, slabs, according to area (m2) or number (St),
- Documentation by number (St) or documentation of cables by length (m).

1 Scope of application

1.1 ATV DIN 18322 "Cable line civil engineering work" applies to the laying of cables, protective pipes, microducts and microduct assemblies as well as to the construction

and repair of cable ducts, including the associated shafts, masts, distribution cabinets and the like. It also applies to the demolition of paved surfaces for underground cable construction work and to services for the construction of the line zone.

1.2 ATV DIN 18322 does not apply to

- the earthworks to be carried out in the case of underground cable construction work (see ATV DIN 18300 "Earthworks"),
- Shoring work (see ATV DIN 18303 "Shoring work"),
- Traffic infrastructure construction work (see ATV DIN 18315 "Traffic infrastructure construction work — Superstructure layers without binders", ATV DIN 18316 "Traffic infrastructure construction work — Superstructure layers with hydraulic binders" and ATV DIN 18317 "Traffic infrastructure construction work — Asphalt superstructure layers"),
- Paving work (see ATV DIN 18318 "Paving surfaces and slab coverings, edgings"),
- Pipe jacking work (see ATV DIN 18319 "Pipe jacking work"),
- Horizontal directional drilling work (see ATV DIN 18324 "Horizontal directional drilling work") and
- Electrical cable and wire systems that are part of the buildings as non-independent outdoor facilities (see ATV DIN 18382 "Electrical, safety and information technology systems"),
- Earthing and lightning protection systems (see ATV DIN 18384 "Lightning protection, surge protection and earthing systems").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18322 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

For the most common substances and components, the DIN standards and other requirements are listed below.

2.1 General

2.1.1 The services do not include the delivery of cables, conduits, microducts, microduct assemblies, route warning devices including the associated shafts, masts, distribution cabinets and the like.

2.1.2 The materials and components provided by the Client shall be provided free of charge at the point of use, except in the case of rail-bound provision.

2.2 Pipes

DIN 8061	Plasticizer-free polyvinyl chloride (PVC-U) pipes — General quality requirements, test

DIN 8062	Plasticizer-free polyvinyl chloride (PVC-U) pipes — Dimensions
DIN 8074	Rohre aus Polyethylen (PE) — PE 80, PE 100 — Maße
DIN 8075	Polyethylene (PE) pipes — PE 80, PE 100 — General quality requirements, tests
DIN 16873	Pipes and fittings made of plasticizer-free polyvinyl chloride (PVC-U) for cable protection — Dimensions and technical conditions of delivery
DIN 16874	High-density polyethylene (HDPE) pipes for underground telecommunications — Dimensions and technical delivery conditions
DIN 16876	Pipes and fittings of high-density polyethylene (HDPE) for buried cable protection pipelines — Dimensions and technical delivery conditions
DIN 16878	Polypropylene (PP) pipes and fittings for buried cable protection pipelines — Dimensions and technical conditions of delivery

2.3 Accessories

DIN 43629-2	Cable Distribution Cabinet — Base, Mounting Dimensions
DIN 54841-3	Plastic warning device for buried cables and pipelines — Part 3: Detectable route tape
DIN 54841-5	Plastic warning device for buried cables and pipelines — Part 5: Cable covers
DIN EN 12613	Plastic Warning Devices with Visual Properties for Underground Cables and Pipelines

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 The choice of the construction method and the construction process as well as the selection and use of the construction equipment are the responsibility of the Contractor.

3.1.2 In particular, the following may be considered as concerns (pursuant to Section 4 (3) VOB/B):

- Deviations of the portfolio from the specifications,

- Lack of suitability of the trench for laying cables, protective pipes, microducts, microducts and cable ducts, e.g. insufficient condition of the bottom of the trench or the support of the pipeline system,
- Lack of suitability of built-in parts and accessories, e.g. cable and pipe entries in buildings,
- a planned type of execution.

3.1.3 If obstacles are unexpectedly encountered, e.g. lines, cables, drains, sewers, markings, building remains, parts of buildings, the Client must be informed immediately. The required benefits must be determined jointly. These services are special services (see section 4.2.1).

If it is to be assumed that the obstacles are explosive ordnance, the work must be stopped immediately and the responsible authority and the client must be notified. The Contractor must carry out the necessary security services without delay. The required benefits must be determined jointly. The services provided and the other services are special services (see section 4.2.1).

3.1.4 Trees, plant populations, vegetation areas and their root areas to be preserved must be protected. The necessary safety measures are special services (see section 4.2.1).

3.1.5 If existing installations unexpectedly jeopardise the progress of construction, special safety measures must be provided for unless these installations can be decommissioned or removed from the area of the construction site. The Client shall be informed of this immediately. The required services are to be determined jointly and are special services (see section 4.2.1).

3.1.6 Secured or supported pipes, cables, drains or sewers must not be entered or loaded. Damage must be reported to the client and the owner or, if another person is authorised to give instructions, to the owner immediately.

3.1.7 Deviations from agreed dimensions must be reported to the Client immediately. The required benefits must be determined jointly. To the extent that the Contractor is not responsible for these services, these services are special services (see Section 4.2.1).

3.1.8 If there is a risk of collapses, soil leakage, water intrusion, damage to structural facilities and the like during the execution, the Contractor must immediately carry out the necessary services to prevent damage and inform the Client. Damage that has already occurred must be reported to the Client immediately. The other benefits are to be determined jointly. The services provided and the other services are special services (see section 4.2.1), insofar as the Contractor is not responsible.

3.2 Preparing, operating and securing the construction site

3.2.1 Before the start of construction, a joint inspection must be carried out with the client. The condition of the existing surfaces, fastenings and Einfassungen sowie der angrenzenden Bebauung festzustellen und zu dokumentieren (siehe § 3 Abs. 4 VOB/B).

3.2.2 Boundary stones and official fixed points may only be removed with the consent of the Client. The contractor must secure the client's fixed points for the construction measure before removal.

3.3 Departure

3.3.1 Edge borders, kerbstones and gutters that are crossed must be removed and stored.

3.3.2 When breaking up the bonded base and surface courses, parallel straight vertical separating cuts must be made in trench width on pipeline routes. In suitable cases, the surface can be milled into trench width. The adjacent areas must not be damaged.

3.3.3 In the case of punctual excavations, bound base and surface courses in pit length and width must be separated using suitable equipment.

3.3.4 Substances and components produced during the break-in process must be stored separately if they can be reused.

3.3.5 Bonded base and surface courses as well as paving surfaces and slab coverings shall be cut back or reduced after the installation of the unbound base course by the degree of loosening of the edge zones of the unbound layers, but at least by the additional widths specified in Table 1.

Table 1 — Multi-widths for take-back and residual strip widths

Nr.	Superstructure	Multi-widths to trenches/pits per edge zone for the removal of the slabs and bonded base courses		Residual strip widths**
		Depth < 2 m	Depth ≥ 2 m	
	1	2	3	4
1	Asphalt layers	15 cm	20 cm	< 35 cm
2	Concrete slabs, hydraulically bound base courses	15 cm	20 cm	< 120 cm
3	Panels on unbound layer			
3.1	Carriageway	Format width, min. 15 cm	Format width, min. 20 cm	< 40 cm
3.2	Sidewalk			< 20 cm
4	Pflaster auf ungebundener Schicht			
4.1	Carriageway	Format width, min. 15 cm	Format width, min. 20 cm	< 40 cm or < ½ Sheet width
4.2	Sidewalk	-	-	< 20 cm
5	Plates on gEbundener Layer			
5.1	Ceiling (panels on bonded bedding layer) Roadway	15 cm + 15 cm*	20 cm + 15 cm*	< 40 cm
5.2	Ceiling (panels on bonded bedding layer) Walkway	15 cm + 15 cm*	20 cm + 15 cm*	< 20 cm
5.3	Bound base course of roadway	15 cm	15 cm	-
5.4	Bound Base course Sidewalk			
6	Patch on bonded layer			
6.1	Pavement (pavement on bonded bedding layer) Roadway	15 cm + 15 cm*	20 cm + 15 cm*	< 40 cm or < 1/2 sheet width
6.2	Blanket (plaster on Bound bedding layer) Walkway			< 20 cm
6.3	Bound base course of roadway	15 cm	15 cm	-
6.4	Bonded base course of pavement			

* Do the slabs or paving stones protrude into these additional take-back strips in, so are to take it up and re-lay it.
**The remaining strips connect directly to the 15 cm/20 cm wide take-back strips without taking into account the format widths

Subsequently, the loosened edge zones of the unbound base courses are to be compacted.

3.3.6 Remaining residual strips between the pruning or removal and a border, edge, other type of fastening or nearest joint or seam with residual strip widths as specified in Table 1 shall be removed and restored.

3.3.7 If loosened residual strips with a wider residual strip width than indicated in Table 1 are detected, the required services shall be determined jointly. To the extent that the Contractor is not responsible for these services, these services are special services (see Section 4.2.1).

3.4 Construction pits and trenches

3.4.1 The minimum clear width of the trenches without an accessible working area is 30 cm. DIN 4124 "Construction pits and ditches — embankments, shoring, working area widths" must be observed. Ditches for multi-stage systems must have a working area.

3.4.2 Ditch and excavation pit bottoms must not be loosened.

3.4.3 Before installing cables, protective conduits, cable ducts, microducts, microduct assemblies and the like, the foundation floor must be checked for suitability (see Section 4 (3) VOB/B). If unsuitable conditions are found, the client must be informed of this. The required services, e.g. the deepening of the floor, the creation of additional supports or additional anti-slip devices, shall be determined jointly. These services are special services (see section 4.2.1).

3.5 Laying of cables and protective conduits as well as construction of cable duct systems

3.5.1 General

The following apply in particular to the laying of cables and protective conduits and the manufacture of cable duct systems:

DIN EN 50174-3 (VDE 0800-174-3)	Information technology — Installation of communication cabling — Part 3: Outdoor installation planning and practices
DIN VDE 0276 (VDE 0276) (all parts)	Power cables
DIN VDE 0298-3 (VDE 0298-3)	Use of cables and insulated wires for power installations — Part 3: Guide to the use of non-harmonised power lines

3.5.2 Inserting Cables

3.5.2.1 Manual cable laying in the trench must be carried out without grinding from the ground and without scoring.

3.5.2.2 Cable pulling is carried out in compliance with permissible tensile forces and bending radii. For this purpose, smooth-running cable rollers and corner rollers in curve

areas must be used. In the case of mechanical pulling, the tensile forces must be documented.

3.5.2.3 Cable overlaps must be made in joint areas, and cables with corresponding reserve lengths at connection points according to the customer's specifications.

3.5.2.4 Cable interfaces must be closed.

3.5.2.5 If cable ploughs are used, the depth of the cables must also be checked by means of appropriate measuring equipment. Any device vibrations must not be transmitted to cables or the environment in a damaging manner.

3.5.2.6 A route warning tape must be installed or ploughed in at the same time as the cable.

3.5.3 Insertion of protective pipes, microducts and microduct assemblies as well as production of cable ducts

3.5.3.1 Tubes from the ring coil or transport coils shall be inserted in accordance with Section 3.5.2.

3.5.3.2 Individual pipes shall be connected to each other in such a way that no sand can penetrate the pipes.

3.5.3.3 If the blowing of cables is envisaged for pipe trains, these must be manufactured in such a way that the technical requirements for blowing are met.

3.5.3.4 In the case of parallel laying of pipes and pipe assemblies and in the case of several pipe layers, spacers shall be used, which shall be placed at intervals of no more than 1.5 m in the direction of the pipe axis. The construction of the pipe package, the backfilling and the compaction must be carried out in layers.

3.5.3.5 The pipe ends must also be closed in the event of work interruptions.

3.5.3.6 Cable ducts made of prefabricated elements, e.g. cable troughs, cable duct moulded bricks, must be laid flush and without offset. Adaptation work, insofar as the Contractor is not responsible, is special services (see Section 4.2.1).

3.5.3.7 After completion, pipe systems must be handed over in a calibrated manner in accordance with their intended use, without contamination that hinders the purpose.

3.5.4 Pulling in and blowing in cables, microducts and microduct assemblies

3.5.4.1 If planned trains cannot be documented, the Client shall be informed of this.

3.5.4.2 Pulling in is carried out in compliance with permissible tensile forces. Damage must be prevented by protective measures, e.g. the use of cable pulling funnels, sliding rollers. Only approved lubricants are to be used.

3.5.4.3 Mechanical pulling must be documented by means of a traction monitoring protocol. Blowing in must be recorded with regard to its course.

3.5.4.4 The pipe pulls must be closed after being pulled in or blown in.

3.6 Dismantling of cables, microducts and microduct assemblies

3.6.1 Only de-energized and appropriately marked cables may be dismantled.

3.6.2 If the cable is to be reused, sections 3.5.2.2 and 3.5.4.2 shall apply mutatis mutandis.

3.6.3 Pipe pulls must be closed after the cables have been dismantled.

3.7 Cable and pipe entries in buildings

3.7.1 Predefined entry openings must be used for cable and pipe entries.

3.7.2 Cable and pipe entries in buildings must be made watertight and gas-tight within the entry opening.

3.8 Establishing the Line Zone

3.8.1 Before the line zone is established, foreign bodies that may cause damage must be removed.

3.8.2 The pipeline zone must be established immediately if pipeline and pipe connections and their supports can be loaded by earth pressure and other forces occurring during backfilling.

3.8.3 Backfilling and compaction must be carried out in layers. For cables, microducts and microduct assemblies, aggregates of 0/2 mm must be used, for protective pipes, aggregates of up to 0/8 mm. Damage and impairment of the pipes must be prevented by a suitable compaction process.

3.8.4 Hydraulically setting materials may only be installed if they do not exceed a strength of 0.5 MPa after 56 days.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Determination of the condition of the road and terrain surfaces, the receiving waters and the like in accordance with § 3 para. 4 VOB/B.

4.1.2 Cleaning of connection points, e.g. on existing cables, protective pipes and cable ducts as well as shafts.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 The Special Benefits listed in Sections 3.1.3, 3.1.4, 3.1.5, 3.1.7, 3.1.8, 3.3.7, 3.4.3 and 3.5.3.6.

4.2.2 Maintenance of access and access roads to properties for the duration of the construction period by means of suitable measures, e.g. temporary bridges.

4.2.3 Securing of exposed pipes, joints, pipes and the like.

4.2.4 Securing measures for cable laying at inclined trench bottoms, e.g. anti-slip devices.

4.2.5 Laying out or pulling in earthing and shielding conductors as well as the installation of earth rods.

4.2.6 Insulation of pipes after the installation of pipes.

4.2.7 Condition checks beyond those described in Section 4.1.1.

4.2.8 Disposal of materials and components not intended for reinstallation.

4.2.9 Dismantling and restoration of fences, street, square and platform furniture as well as other transport facilities and the resulting safety measures.

4.2.10 Loading and return transport of materials and components of the Client that are not required on site and removed.

4.2.11 Securing embankments and surfaces, e.g. with tarpaulins.

4.2.12 Cleaning of soiled substances and components provided by the Client, provided that the soiling was not caused by the Contractor.

4.2.13 Assumption of fees for official approvals and prescribed acceptance tests.

4.2.14 Construction, maintenance and removal of traffic facilities and fortifications for the maintenance of public and local traffic on the basis of official orders.

4.2.15 Calibrating and cleaning existing pipe sections.

4.2.16 Measurement of the pipe parts, preparation of as-built drawings, installation of information signs and marking of cables.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

The performance is determined according to measurements

5.2 Determination of dimensions/quantities

5.2.1 The usual approximation methods are permissible for quantity determination.

5.2.2 The quantities of the excavation shall be determined at the point of excavation in the ablation.

5.2.3 The quantities of installation shall be determined in the finished state.

5.2.4 If there are no specifications, a slope angle of 45° shall apply to sloped excavations and ditches for the determination of the dimensions of the embankment

space, 60° for fine-grained soils with at least a stiff consistency and 80° for rock. Required berms are taken into account when determining the embankment area.

5.2.5 In the case of billing according to the length measure, the length in the central axis of the components is calculated. Lengths are rounded up to the nearest full 10 cm.

5.2.6 Each cable, including the specified supply lengths, each thermowell, microduct and microduct assembly shall be calculated in its total length in accordance with clause 5.2.5.

5.3 Overmeasurement rules

The following are measured:

5.3.1 When billed according to area

- Fugues
- Recesses, fixtures, rails with a single size ≤ 1 m2.

If a recess is proportionately integrated into adjacent, separately calculated surfaces with different fastenings, the respective proportional recess area is calculated to determine the overmeasurement variable.

5.3.2 When billing according to length

- Fugues
- interruptions ≤ 1 m,
- Pipe joints, fittings and the like.

5.4 Individual provisions

5.4.1 Individual areas < 0.5 m2 are calculated at 0.5 m2.

5.4.2 If the amount is to be invoiced, this is to be determined by weighing

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV) Explosive Ordnance Clearance Work — DIN 18323

Issue September 2016

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 the type, location, dimensions, nature and load-bearing capacity as well as the accessibility and navigability of the area to be searched or cleared or the bottom of the water. Georeferenced location coordinates or site plans.

0.1.2 Location conditions with regard to the history of military or civilian previous use. Known contamination by explosive ordnance as well as previous explosive ordnance clearance and its results, e.g. explosive ordnance inventory, number of finds, location of sites and suspected objects, known burials, results of test field soundings and test field clearances.

0.1.3 Type, dimensions, location and condition of surfaces to be broken up, e.g. vegetation areas, roads, paths, squares. Construction of the substructure and superstructure. Type and thickness of all layers and fixings. Type and nature of existing borders.

0.1.4 Type and extent of vegetation on the areas to be cleared, including on and under water.

0.1.5 Description of soil and rock, depending on the required services in accordance with ATV DIN 18300 "Earthworks", ATV DIN 18301 "Drilling work" or ATV DIN 18311 "Dredging work".

0.1.6 Construction pit formation.

0.1.7 Foundation depths and types of foundations of neighbouring structures.

0.1.8 Type, location and dimensions of natural and artificial cavities.

0.1.9 Type and scope of services for the preservation of evidence.

0.1.10 Ongoing operations in the area of the construction site, traffic loads and local peculiarities.

0.1.11 Existing protective equipment with regard to possible effects of the explosive ordnance, e.g. earth walls to protect against average etonations.

0.2 Information on the execution

0.2.1 Specifications for the exploratory procedure, in particular with regard to the reliable detection of the expected explosive ordnance and, if necessary, with regard to track spacing, borehole spacing and use of equipment. Search depth for borehole, soil and sediment soundings.

0.2.2 Scope of test field soundings and test field clearances.

0.2.3 Specifications for the clearing method and, if necessary, for the use of equipment. For single-point clearance: depth of the interfering body or maximum clearing depth. In the case of volume clearance: Clearing depth and permissible layer thicknesses of the removal.

0.2.4 Requirements for separation.

0.2.5 Specifications of the competent authority and documentation required by it. Requirements for proof of freedom from explosive ordnance.

0.2.6 Guidelines for the rescue chain.

0.2.7 Type, location and scope of protective devices to be manufactured against possible effects of explosive ordnance.

0.2.8 Required facilities for the construction site and the staging warehouse. Storage and storage of scrap. Protective measures and measures for security and guarding. Specifications for the transport containers and for their marking for removal.

0.2.9 Type and scope of barrier and safety measures

0.2.10 Uncovering measuring points, measuring lines and the like, preparing as-built plans or other documentation, marking pipeline routes.

0.2.11 Securing wires, cables and the like.

0.2.12 Type, location, dimensions, classification, measurement and marking of test fields and clearing areas as well as of the individual clearing plots and clearing sections.

0.2.13 Type and scope of the services to ensure freedom from exploratory and clearance, e.g. clearing, clearing, removal of obstacles.

0.2.14 Removal of groundwater, spring water and seepage water. Type and scope of services to secure drainage, seepage and drainage systems.

0.2.15 Specifications for necessary civil engineering work, e.g. for the insertion of sheet piles or shaft rings, for drilling work.

0.2.16 Specifications resulting from expert opinions.

0.2.17 Special permits, acceptances, tests and findings.

0.2.18 Type, content and scope of required documentation as well as required parameters for detected anomalies and explosive ordnance found.

0.2.19 Services for safety in the event of explosive ordnance soundings during construction.

0.2.20 Authorisation of a person authorised to issue instructions for explosive ordnance soundings during construction.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 3.1.1,	if the construction process or the type and use of the equipment is to be specified to the Contractor,
Section 3.2.3.1	if the staging warehouse is to be secured or guarded differently,
Section 3.3.5	if test fields and clearing areas are to be divided into clearing parcels of other sizes or marked differently.

0.4 Individual information on fringe benefits and special benefits

As an ancillary service, for which a special ordinal number (item) is to be provided under the conditions of ATV DIN 18299, Section 0.4.1, the construction of temporary accesses, driveways and the like can be considered in particular (see Section 4.1.3).

0.5 Billing Units

Im Leistungsverzeichnis sind die Abrechnungseinheiten, getrennt nach Art, Stoffen und Maßen, wie folgt vorzusehen:

0.5.1 Volume dimension (m3) for

- Removal, transport and storage of soil on the construction site,
- Separation of the excavated material,
- Collecting, transporting and storing construction waste, building remains and the like.

0.5.2 Area dimension (m2), additionally separated according to clearing depths or layer thicknesses as well as inclinations of the surfaces up to 1 : 4 and above 1 : 4, for

- Clearing and clearing vegetation,
- breaking up surface pavements,
- Probe
- Evacuate.

0.5.3 Length measurement (m) for

- borehole soundings,
- Relocation and securing of cables.

0.5.4 Number (pcs) for

- felling of trees, clearing of tree stumps,
- uncovering and recovering explosive ordnance and interfering bodies,
- Transport of explosive ordnance, staggered according to the length of the transport routes,
- Filling and marking of transport containers.

0.5.5 Mass (kg, t), separated by type and staggered by transport route, for the transport of scrap and other interfering bodies on the construction site.

0.5.6 hours(h) for

- Removing obstacles,
- Deployment of personnel, machines and equipment,
- probing during construction.

1 Scope of application

1.1 ATV DIN 18323 "Explosive ordnance clearance work" applies to the probing and recovery of explosive ordnance that has been taken out of custody as well as to preparatory work, such as clearing, demolition and dismantling work, where there may be a risk of explosive ordnance. It also applies to the removal of soils contaminated with explosive ordnance and to the transport of this excavated material to the processing areas or separation plants on the construction site.

1.2 ATV DIN 18323 does not apply to the handling of explosive ordnance with chemical and biological warfare agents or radioactive components.

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions with ATV DIN 18299, the regulations of ATV DIN 18323 shall take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

2.1 General

Explosive ordnance within the meaning of ATV DIN 18323 is substances intended for warfare, ammunition and weapons as well as ammunition and weapon parts that contain or may contain explosives, incendiary substances or smoke substances.

2.2 Auxiliary constructions for probe guidance and shoring elements

Auxiliary constructions for probe guidance and shoring elements for the recovery of suspected objects must not contain any substances and components that can impair probe deployment and influence measurement results.

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 The choice of the course of exploratory and explosive ordnance clearance work as well as the selection and use of the equipment are the responsibility of the Contractor.

3.1.2 Prior to the commencement of the work, the Client shall be provided with evidence of the registration of the work with the competent authority and of the establishment of the rescue chain, and the responsible person shall be named to the competent authority and the Client. In addition, a construction site plan must be submitted, in which in particular the boundaries of the construction site, the escape routes, the staging warehouse and all safety and protective devices must be entered. In doing so, it must be proven that all persons working on the construction site have been familiarized with this construction site plan.

3.1.3 Explosive ordnance must be kept under lock and key or under constant guard. Before explosive ordnance is recovered, it must be proven that it is safely stored in a staging warehouse.

3.1.4 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- deviations of the stock from the specifications;
- unsuitable specification of the exploratory or clearing method to be used;
- insufficient load-bearing capacity or condition of the areas to be cleared;

- unsuitable weather conditions.

3.1.5 If explosive ordnance is not transportable or if explosive ordnance containing chemical or biological warfare agents or radioactive components is found, this must be reported to the competent authority and the Client without delay. The site of the find must be cordoned off and guarded immediately. The required services are special services (see section 4.2.8).

3.1.6 Exploratory and clearing services must be documented in the respective plot plan on a working day.

3.2 Preparing, securing and operating the construction site and the staging warehouse

3.2.1 General

3.2.1.1 Before the start of the exploratory and explosive ordnance clearance work, a joint inspection must be carried out with the client. The condition of the existing surfaces, fixtures and borders as well as the adjacent buildings must be determined and documented (see § 3 para. 4 VOB/B).

3.2.1.2 Boundary stones and official fixed points may only be removed with the consent of the Client. The contractor must secure the client's fixed points for the construction measure before removal.

3.2.1.3 Endangered structural facilities must be secured; DIN 4123 "Excavations, foundations and underpinnings in the area of existing buildings" must be observed. In the case of protective and security measures, the regulations of the owners or other persons authorised to issue instructions must be observed. The required services are special services (see section 4.2.6).

3.2.1.4 If unexpectedly encountered obstacles, e.g. unspecified lines, cables, drains, sewers, markings, building remains, the Client must be informed immediately. The required benefits must be determined jointly. These services are special services (see section 4.2.6).

3.2.2 Construction site safety and other protective measures

3.2.2.1 The responsible person must check the barriers and protective devices determined together with the competent authority on a daily basis.

3.2.2.2 When exposing large-caliber explosive ordnance, the use of equipment to remove overlying layers is only permissible if the depth is known.

3.2.3 Staging Camps

3.2.3.1 The staging camp must be set up and secured in accordance with the specifications of the competent authority.

3.2.3.2 Before work begins, it must be ensured that there is safe access and connection to escape routes, that approved containers are kept available for the various explosive ordnance and that specified signage, signalling and safety systems and lightning

protection devices have been created, as well as a separate sorting area equipped with splinter protection and separate storage areas for explosive ordnance and scrap.

3.2.3.3 The collection of explosive ordnance by the competent authority must be prepared in such a way that this can take place on a daily basis. The collection must be documented.

3.2.3.4 Insofar as explosive ordnance has to be stored in the staging camp beyond working hours, the storage facility must be permanently guarded and a person appointed to guard it must be appointed to the client and the competent authority, who must be available at all times. The required services are special services (see section 4.2.6).

3.3 Measuring and dividing the test fields as well as exploratory and clearing areas

3.3.1 Measurement is carried out on the basis of specified fixed points and an associated georeferenced plan basis, whereby all measuring points must be connected to the respective national network and determined with an accuracy of ± 10 cm.

3.3.2 The key points must be documented in parcel plans with a scale not smaller than 1:500 and marked with metal-free, clearly visible and durable stakes. In this case, the direction to the next vertex must be marked by additional pegs at a distance of 1 m from these vertices.

3.3.3 The corner pegs must be marked with numbers or letters in a clockwise direction, clearly, legibly and weatherproof.

3.3.4 Test fields on vegetated areas must be marked with appropriate, clearly visible metal-free signs at least 20 cm × 30 cm in size, on which the name of the test field must be noted.

3.3.5 Test fields and exploratory and clearing areas shall be divided into plots of 50 m × 50 m, which shall be marked by route strips and metal-free, clearly visible and durable stakes. The parcels are to be entered in the parcel plans numbered consecutively.

In the case of water surfaces, base weights, poles, buoys or buoys must be set accordingly and lines must be tensioned to mark the position on the bottom of the water.

3.4 Probing before and after explosive ordnance clearance

3.4.1 Anomalies suspected of explosive ordnance must be entered with their location coordinates, including depth, to an accuracy of ± 50 cm in the associated plot plan if no immediately subsequent clearance takes place.

If there is an immediately subsequent identification and evacuation, only the explosive ordnance encountered must be documented as described above.

3.4.2 After each object has been recovered, the absence of explosive ordnance must be confirmed by means of an inspection survey and document.

3.5 Full-area sounding with selective ground-penetrating explosive ordnance clearance

3.5.1 Before explosive ordnance clearance, the entire area of the plot must be examined with active and then with passive probes to determine interference bodies starting from the ground surface. The location of localized interfering bodies must be marked unless their exposure and identification is initiated immediately.

3.5.2 Localised interfering bodies must be exposed manually to such an extent that they can be identified and assessed by a responsible person. DIN 4123 and DIN 4124 "Construction pits and trenches - embankments, shoring, working area widths" must be observed.

3.5.3 If, during clearances with an agreed depth limitation, interfering bodies below the specified clearing depth are probed, the Client must be informed of this immediately. The other benefits are to be determined jointly. These services are special services (see section 4.2.6).

3.5.4 Explosive ordnance and other interfering devices identified by the responsible person and approved as manageable must be recovered immediately. These ordnances are to be transported to the staging camp, where they are sorted, documented and sealed.

3.5.5 In the case of unmanageable explosive ordnance, work at the site must be stopped immediately and the site must be secured.

The competent authority and the client must be informed immediately of the encountering of such explosive ordnance. The further procedure will be determined by the competent authority. The required services are special services (see section 4.2.6).

3.6 Single point clearance

3.6.1 If the location coordinates of individual interfering devices and ordnance are known, a single-point clearance shall be carried out.

3.6.2 Low-vibration methods must be used for shoring and dewatering work. These services are special services (see section 4.2.6).

3.7 Explosive ordnance clearance by soil removal and separation

3.7.1 The layer to be removed shall be probed in advance for interfering bodies of a size of at least 50 mm calibre. The interfering bodies of this magnitude are to be recovered in accordance with Section 3.6.

3.7.2 Volume clearance is carried out by removing soil layer by layer in a specified layer thickness and transporting this excavated material to the processing areas or separation plants on the construction site.

3.7.3 If the responsible person considers a reduction in the thickness of the coating to be necessary, the Client shall be informed of this without delay and the further procedure shall be agreed with him.

3.7.4 The separation device must be equipped in such a way that explosive ordnance and interfering devices with a minimum size of 12.7 mm calibre or a volume of 20 mm × 20 mm × 40 mm are separated from the material to be conveyed.

3.7.5 The absence of explosive ordnance of the separated soil must be checked and documented.

3.7.6 After completion of the soil removal to the specified depth, the exposed floor, including the embankments, must be re-probed.

3.8 Explosive ordnance detection during construction

3.8.1 Explosive ordnance detection during construction may only be carried out if structural remnants, artificial fillings with high ferromagnetic components, dense pipeline networks or the like obstruct sounding.

3.8.2 The responsible person must draw up a work and safety instruction agreed with all companies involved and the Client, which must take into account all work to be done on the construction site during the exploratory work.

3.8.3 The responsible person must supervise all persons working on the construction site in such a way that a hazard from explosive ordnance is avoided.

3.8.4 In the case of soundings during construction, at least one pair of clearers per work site must be used.

3.8.5 The ablation must be examined with probes before release. In addition, the masses must be visually checked during release, loading and unloading on the construction site and examined with probes.

3.8.6 If explosive ordnance is found, the Client and the competent authority must be informed of this immediately. In the event of imminent danger, the Contractor shall carry out the necessary precautionary measures prior to this notification. The other benefits are to be determined jointly. The services provided and the other services are special services (see section 4.2.6).

3.9 Transports and preparation for transport

3.9.1 Exposed explosive ordnance may only be transported for transport securing after it has been clearly identified and determined by the person responsible for transport and in accordance with his or her specifications.

3.9.2 Transportation is limited to the area of the construction site.

3.9.3 The collected ordnance must be packed and labelled before being removed from the construction site.

3.10 Documentation

3.10.1 Documentation must be prepared showing the construction process, the services provided, arrangements and special events, each with a time mark. All documents must be handed over to the client on a working day.

3.10.2 The final documentation of the explosive ordnance clearance must contain the following documents:

- Identification of the procedures and equipment used for sounding and clearance,
- georeferenced site and parcel plans with registered sites or summarised finds in the case of a high density of explosive ordnance,
- Lists of explosive ordnance finds and
- Georeferenced site and parcel plans with remaining disturbance points.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Determination of the condition of the road and terrain surface, the receiving waters and the like in accordance with Section 3 (4) VOB/B.

4.1.2 Picking up and laterally storing individual stones, blocks and building remains up to 0.01 m3 in volume1) during explosive ordnance clearance work, except for services according to section 4.2.5.

4.1.3 Construction of temporary accesses, driveways and the like, except for services according to section 4.2.7.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 Provision of recreation and storage rooms if the Client does not provide rooms that can be easily locked.

4.2.2 Preparation of parking and storage spaces on third-party land.

4.2.3 Services to determine the condition of the structural facilities, including roads and supply and disposal facilities, prior to the commencement of explosive ordnance clearance work, insofar as they go beyond the services referred to in Section 4.1.1.

4.2.4 Freischneiden von Flächen sowie Rodungsarbeiten.

4.2.5 Earthworks, drilling, shoring, dewatering, dredging, demolition and dismantling as well as the collection and lateral storage of scrap, building materials, components, building remains and the like, except for services pursuant to Section 4.1.2.

4.2.6 The Special Benefits listed in clauses 3.2.1.3, 3.2.1.4, 3.2.3.4, 3.5.3, 3.5.5, 3.6.2 and 3.8.6.

4.2.7 Establishing, maintaining and removing barriers and fortifications to maintain public and local traffic, in particular on the basis of official orders.

4.2.8 Payments for measures to be taken immediately and on the order of the competent authority in the case of untransportable explosive ordnance as well as for the

Encountering of explosive ordnance with chemical or biological warfare agents or with radioactive components (see section 3.1.5).

4.2.9 Assumption of fees for regulatory approvals and mandatory inspections.

4.2.10 Clearing snow and blunting in icy conditions to maintain traffic.

4.2.11 Preparation of as-built drawings.

4.2.12 Measurement of cables.

4.2.13 Installation of information signs and markings, except for the marking of test fields and clearing areas.

4.2.14 Refilling of pits, flushing funnels and the like created during single-point clearances as well as boreholes created during borehole soundings.

4.2.15 Safety devices when working in waters with flow velocities above 0.5 m/s, e.g. power shields, holding devices.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

The determination of the performance — regardless of whether it is carried out according to drawings or measurements — shall be based on the dimensions of the sounded and cleared areas.

5.2 Determination of dimensions/quantities

No regulations.

5.3 Overmeasurement rules

No regulations.

5.4 Individual provisions

No regulations.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Horizontal directional drilling work — DIN 18324

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 The type, location, dimensions, accessibility, nature and load-bearing capacity of the work areas or the subsoil for the work areas, in particular restrictions on working height, special requirements.

0.1.2 Restrictions on the dimensions and masses for the transport of machinery and materials.

0.1.3 Limit values, requirements, conditions and fees for the abstraction and/or discharge of process water.

0.1.4 Type, location, dimensions, materials and design of existing cables as well as their connections, house connections, fixtures and the like. The nature and scope of the resulting restrictions and requirements to be complied with.

0.1.5 the nature, location, dimensions and ownership of cavities, previous auxiliary construction measures, anchors, injection devices and the like. The nature and scope of the resulting restrictions and requirements to be complied with.

0.1.6 Type and extent of the previous use of the building areas and resulting restrictions on construction.

0.1.7 Foundation depths, types of foundations and loads of neighbouring structures. The nature and extent of the resulting restrictions and the specifications to be complied with for the construction and the structure to be constructed.

0.1.8 Type and possibilities of arranging flush recirculation systems to be installed above or below ground, especially in the area of traffic areas.

0.1.9 Type and possibilities for the temporary storage of the extracted soil and rock as well as drilling fluids.

0.1.10 Information on existing and planned groundwater lowering, provided that the construction project is within their sphere of influence.

0.1.11 Restrictions on removing or recovering obstacles.

0.2 Information on the execution

0.2.1 Information, e.g. time restrictions, or specifications on the execution of the horizontal directional drilling work, resulting from the coordination of the Client with the competent authorities.

0.2.2 Requirements and restrictions resulting from coordination with modes of transport and other bodies of public or private interest.

0.2.3 Course of the drill line in the geological longitudinal section with entry of the homogeneous areas to be intersected.

0.2.4 Description of soil and rock with regard to their properties and conditions as well as classification into homogeneous areas according to section 2.2.

0.2.5 Results of soundings to determine storage densities

0.2.6 Description and classification of conditioned soils and other substances according to Section 2.3

0.2.7 Information on the swelling behaviour of soil and rock.

0.2.8 Water pressure level in the relevant aquifers; pH values, water hardness, chloride and sulphate contents of the underground waters concerned.

0.2.9 Characteristic values of the subsoil parameters required in the case of geostatic and borehole hydraulic calculations, e.g. friction angle, cohesion, stiffness modulus.

0.2.10 Type, materials and dimensions of pipes and fittings. Number of pipe strings to be pulled in. Special requirements according to corresponding regulations and/or special specifications.

0.2.11 Permissible tensile force, minimum bending radii of pipes and pipe joints.

0.2.12 Type, characteristics and dimensions of cables. Number of cables to be pulled in. Special requirements according to corresponding regulations and/or special specifications.

0.2.13 Length, depth, direction, inclination and radius of the line axis; Distance between the line axes in parallel drilling; Minimum distance of the drilling axis to existing pipes, in each case taking into account the permissible deviations according to 3.2.1 and 3.2.3.

0.2.14 Information on cuts and lowering to the planned pipeline depth in the case of individual boreholes in a row.

0.2.15 Intended use of the lines and regulations to be observed.

0.2.16 Specifications from expert reports and approval documents and the extent to which they are to be observed during execution.

0.2.17 Information on ring or cavity filling, e.g. for the protection of neighbouring properties or structures to be driven underneath.

0.2.18 The nature and extent of the protection of pipes and their joints.

0.2.19 Location and height of the drilling entry and exit point.

0.2.20 Requirements for positioning and control equipment.

0.2.21 Type and scope of evidence to be provided.

0.2.22 Information on borehole casing.

0.2.23 Type and extent of soil improvements.

0.2.24 Type, scope and timing of measures to preserve evidence. Beuth-Ströhmann Steindesign GmbH-KdNr.9410286-LfNr.10177783001-2022-02-14 12:20

0.2.25 Nature and scope of examinations.

0.2.26 Rinsing treatment information.

0.2.27 Type and extent of securing endangered structures.

0.2.28 Type and extent of the re-measurement of the pipeline.

0.3 Details of deviations from the ATV

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 3.1.2,	if the choice of the process and construction sequence as well as the choice and use of drilling tools and construction equipment are to be specified to the contractor
Sections 3.2.1 to 3.2.3,	if other deviations are to apply, if the requirements for recording and logging are to be deviated from,
Section 4.1.4	if a different limit quantity is to be specified.

0.4 Individual information on fringe benefits and special services

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units, separated according to type and dimensions as well as homogeneous areas, are to be provided as follows:

- Pilot drilling, widening and cables to be pulled in according to length (m),
- Rinsing substances by mass (kg, t) or volume (m3),
- Relocation of the drilling rigs, separated according to the distances of the drilling entry points, according to number (St),
- Filling and sealing of ring and cavities according to length (m), volume (m3) or mass (kg, t),
- Downtime of the drilling equipment according to time (h),
- Removing obstacles by time (h),
- Disposal of the loosened soil and rock including the bentonite suspension according to the length of the borehole (m).

1 Scope of application

1.1 ATV DIN 18324 "Horizontal directional drilling work" applies to controlled drilling between an entry and exit point, consisting of a pilot borehole and further widening boreholes using the flush drilling method with subsequent pulling in of cables, e.g. pipes, pipe bundles, filter or seepage pipes and cables of any profile.

1.2 ATV DIN 18324 does not apply to

- the construction of start, finish, intermediate, recovery and other construction pits (see ATV DIN 18300 "Earthworks" and ATV DIN 18303 "Shoring work"),
- Drilling work (see ATV DIN 18301 "Drilling work"),
- Lining of boreholes (see ATV DIN 18302 "Work on the lining of boreholes"),
- Drainage canal work (see ATV DIN 18306 "Drainage canal work"),
- Pressure pipeline work (see ATV DIN 18307 "Pressure pipeline work outside buildings"),
- Pipe jacking work (see ATV DIN 18319 "Pipe jacking work") and
- the laying of cables and cable conduits in open construction (see ATV DIN 18322 "Cable line civil engineering work").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18324 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

2.1 Description of the subsoil

The following apply to the examination, naming and description of the subsoil:

DIN 4020	Geotechnical investigations for structural purposes — Supplementary regulations to DIN EN 1997-2
DIN 4030-2	Assessment of concrete-attacking waters, soils and gases — Part 2: Sampling and analysis of water and soil samples
DIN 4094-4	Subsoil — Field investigations — Part 4: Wing shear tests
DIN 18125-2	Subsoil — Examination of soil samples — Determination of soil density — Part 2: Field tests
DIN 18126	Subsoil — Examination of soil samples — Determination of the density of non-cohesive soils with loosest and densest storage
DIN 18128	Subsoil — Examination of soil samples — Determination of loss on ignition
DIN 18129	Subsoil — Examination of soil samples — Determination of lime content
DIN 18196	Earthworks and foundations — Soil classification for structural purposes
DIN EN 1997-2	Eurocode 7: Design, calculation and design in geotechnics — Part 2: Exploration and investigation of the subsoil
DIN EN 1997-2/NA	National Annex — Nationally defined parameters — Eurocode 7: Design, calculation and design in geotechnical engineering — Part 2: Exploration and investigation of the subsoil
DIN EN ISO 14688-1	Geotechnical exploration and investigation — Designation, description and classification of soil — Part 1: Designation and description
DIN EN ISO 14688-2	Geotechnical exploration and investigation — Designation, description and classification of soil — Part 2: Principles for soil classifications
DIN EN ISO 14689	Geotechnical Exploration and Investigation — Naming, Description and Classification of Rock
DIN EN ISO 17892-1	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 1: Determination of water content
DIN EN ISO 17892-2	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 2: Determination of soil density
DIN EN ISO 17892-4	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 4: Determination of grain size distribution
DIN EN ISO 17892-7	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 7: Uniaxial pressure test

DIN EN ISO 17892-8	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 8: Unconsolidated undrained triaxial test
DIN EN ISO 17892-11	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 11: Determination of water permeability
DIN EN ISO 17892-12	Geotechnical exploration and investigation — Laboratory tests on soil samples — Part 12: Determination of flow and roll-out limits
DIN EN ISO 22475-1	Geotechnical Exploration and Investigation — Sampling Methods and Groundwater Measurements — Part 1: Technical Principles of Execution
NF P18-579	Granulats — Détermination des coefficients d'abrasivité et de broyabilité (de: Gesteinskörnungen — Bestimmung der Koeffizienten für Abrieb und Brechbarkeit)1)

2.2 Classification of soil and rock into homogeneous areas

Soil and rock must be divided into homogeneous areas according to their condition before dissolving. The homogeneous area is a limited area, consisting of single or several layers of soil or rock, which has comparable properties for horizontal directional drilling work.

If environmentally relevant ingredients are to be taken into account, they must be taken into account when dividing them into homogeneous areas.

For the homogeneous ranges, the following properties and characteristic values as well as their determined bandwidth must be given. Below are the standards or recommendations with which these parameters may have to be verified. If several methods of determination are possible, a standard or recommendation must be established

For soil:

- local designation,
- Grain size distribution with grain strips according to DIN EN ISO 17892-4,
- Mass fraction of stones, blocks and large blocks according to DIN EN ISO 14688-1; Determination by sorting and measuring or sieving, then weighing and then relating to the corresponding excavated mass,
- mineralogical composition of the stones and blocks according to DIN EN ISO 14689,
- Moisture density according to DIN EN ISO 17892-2 and DIN 18125-2,
- Undrained shear strength according to DIN 4094-4 or DIN EN ISO 17892-7 or DIN EN ISO 17892-8,
- Water content according to DIN EN ISO 17892-1,
- Plasticity number according to DIN EN ISO 17892-12,
- Consistency number according to DIN EN ISO 17892-12,
- Permeability according to DIN EN ISO 17892-11,
- Associated storage density: Designation according to DIN EN ISO 14688-2, determination according to DIN 18126,
- Lime content according to DIN 18129,
- Sulphate content (acid-soluble) according to DIN 4030-2 and DIN EN 1997-2,
- organic content according to DIN 18128,
- Naming and description DIN EN ISO 14688-1,

- abrasiveness according to NF P18-5791) and
- Floor assembly according to DIN 18196.

For rock:

- ortsübliche Bezeichnung,
- Benennung von Fels nach DIN EN ISO 14689,
- Moisture density according to DIN EN ISO 17892-2,
- Weathering, changes, variability and DIN EN ISO 14689,
- Lime content according to DIN 18129,
- Sulphate content (acid-soluble) according to DIN 4030-2 and DIN EN 1997-2,
- uniaxial compressive strength of rock according to DIN 18141-1, subsoil — Examination of rock samples — Part 1: Determination of uniaxial compressive strength,
- Separation surface direction, separation surface distance, rock body shape according to DIN EN ISO 14689,
- Rock permeability according to DIN EN ISO 14689 and
- Abrasiveness according to DGGT Recommendation No. 23: "Determination of the Abrasiveness of Rocks with the CERCHAR Test" of AK 3.3 "Rock Experimental Technology"2).

2.3 Description and classification of artificial floors and other materials

As far as possible, artificial soils, e.g. backfills, and other substances, e.g. components, recycled materials, industrial by-products, waste and soils with foreign components are described in accordance with Section 2.1 and classified in accordance with Section 2.2. If this is not possible, they are specifically described with regard to their properties for horizontal directional drilling work.

2.4 Drilling fluid, suspensions

2.4.1 Drilling fluid The Contractor shall ascertain itself before the commencement of execution and, upon request, prove to the Client that the drilling fluid and its starting products are suitable for the intended purpose.

2.4.2 Suspensions for annular backfilling The Contractor shall ascertain before the commencement of execution and, upon request, prove to the Client that the suspensions for annular backfilling and their starting products are suitable for the intended purpose.

3 Execution

Ergänzend zur ATV DIN 18299, Abschnitt 3, giltλ

3.1 General

3.1.1 Horizontal directional drilling work is to be carried out in accordance with the "Technical Guidelines of the DCA"3), the respective sections 8, 9 and 10 of worksheet DWA-A 125:2008-12 "Pipe jacking and related methods"4) and the DVGW worksheet GW 304:2008-12 "Pipe jacking and related methods"5) in conjunction with the worksheet DVGW GW 304-B1:2012-12 "1st supplement on federal trunk roads and supply lines in the DVGW worksheet

GW 304:2008-12 Pipe jacking and related methods"5), DVGW worksheet DVGW GW 321 "Controllable horizontal flush drilling methods for gas and water pipelines — requirements, quality assurance and testing"5) as well as for the crossing of Deutsche Bahn installations in accordance with the "Gas and Water Pipeline Crossing Guidelines (GWKR 2012)"5).

3.1.2 The choice of the process and construction sequence as well as the selection and use of drilling tools and construction equipment are the responsibility of the Contractor.

3.1.3 The selected process and construction sequence, the selected drilling tools and their arrangement as well as the selected locating system shall be specified to the Client upon request.

3.1.4 If subsoil conditions deviating from the specifications are found, the Client shall be informed of this immediately. The required benefits must be determined jointly. These services are special services (see section 4.2.1). Beuth-Ströhmann Steindesign GmbH-KdNr.9410286-LfNr.10177783001-2022-02-14 12:20

3.1.5 If cables are provided by the client, the contractor must subject them to a visual inspection.

3.1.6 Findings which indicate a hazard, e.g. in the condition, smell or colour of the drilling fluid, ground buoyancy, leakage of drilling fluid over the terrain, sharp drop in the water level or drilling fluid, occurrence of mud losses, cavities, must be reported, observed and documented to the Client immediately.

3.1.7 If the findings in 3.1.6 indicate a risk of collapses, water intrusion, elevation of terrain, damage to the pipes to be pulled in or to structural facilities, the Contractor must immediately carry out the necessary services to prevent damage and inform the Client without delay. He must immediately notify the Client of any damage that has already occurred. The other benefits are to be determined jointly. The services rendered as well as the other services are, insofar as the Contractor is not responsible for special services (see Section 4.2.1).

3.1.8 In the event of unsuitable weather conditions, e.g. temperatures below 0 °C when working with drilling fluids, special precautions must be taken in consultation with the client. The required services are special services (see section 4.2.1).

3.2 Tolerances

3.2.1 The line axis may deviate from the line target axis by no more than 10% of the maximum depth in each direction, except at the entry and exit points. The reference line of the depth is the straight connection between the entry and exit points. The line radii may deviate from the respective line target radii by no more than 10%. If it becomes apparent during drilling that the above-mentioned tolerances will be exceeded, the customer must be informed immediately. The required benefits must be determined jointly.

3.2.2 Deviations at the entry point may be the single pipe diameter, but not more than 30 cm

3.2.3 Deviations at the exit point shall not exceed 2 % of the length of the borehole but not more than 5 m.

3.3 Obstacles

3.3.1 If obstacles are unexpectedly encountered in the subsoil, or if drill pipes, drill pipes or drilling tools can no longer be moved, or if drilling progress cannot be achieved, the Client shall be informed immediately. The Contractor must carry out the necessary security services without delay. The required benefits must be determined jointly. To the extent that the contractor is not responsible for these services, these services are special services (see section 4.2.1).

3.3.2 If it is to be assumed that obstacles are explosive ordnance, the work must be stopped immediately and the competent authority and the client must be notified. The Contractor must carry out the necessary safety measures without delay. The required benefits must be determined jointly. The services provided and the other services are special services (see section 4.2.1).

3.3.3 If the horizontal borehole has to be stopped, the contractor must notify the client thereof immediately. The other benefits are to be determined jointly. The necessary services and the replacement of the equipment and parts remaining in the borehole in whole or in part, e.g. drill pipes, drill pipes, drilling tools, are special services, unless the Contractor is responsible for the cause (see Section 4.2.1). The replacement of parts remaining in the borehole is based on the current value.

3.4 Pulling in the cables

The cables must be pulled in immediately after completion of the borehole, in compliance with the permissible tensile forces and bending radii. If necessary, pipes must be ballasted before and/or during the move-in. If they cannot be pulled or if they are visibly damaged during move-in, the Contractor must notify the Client of this immediately. The required benefits must be determined jointly. To the extent that the Contractor is not responsible for these services, these services are special services (see Section 4.2.1).

3.5 Documentation

Protocols must be kept for all work steps during drilling and handed over to the client on request. The logs must be clearly attributable to the individual borehole and contain at least the following:

- Serial number of the drill rod;
- Drill rod length (m);
- Station (m);
- Time – start/end;
- Direction (azimuth) and inclination (inclination) of the drill head in pilot drilling;
- Pulling force/compressive force (kN);

- Torque (kNm);
- Pump rate (l/min);
- Pump pressure (bar);
- Flushing formula;
- Viscosity of the drilling fluid;
- Description of the extracted drilling material, if reprocessing of the mud;
- Flush reflux home/landing page (%);
- Special incidents.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Determination of the condition of the road and terrain surfaces, the receiving waters and the like in accordance with § 3 para. 4 VOB/B.

4.1.2 Disposal of process water.

4.1.3 Scheduled relocation of the drilling rig and other equipment between the entry points as well as scheduled retooling of the drilling tools, except for services in accordance with section 4.2.5.

4.1.4 Delivery, mixing and, if necessary, reprocessing of drilling fluid up to a limit of 10 times the displaced pipe volume. In the case of tube bundles, the smallest common radius must be taken into account.

4.1.5 Configuration of the drilling fluid for the subsoil conditions specified in the specifications.

4.1.6 Transport of the drilling fluid from the inlet and outlet side to the reprocessing plant.

4.1.7 Additional expenses for the disposal of the dissolved soil and rock as a result of process-related mixing with additives, insofar as the Contractor has chosen the additives.

4.2 In addition to ATV DIN 18299, Section 4.2, **special services** are e.g.

4.2.1 The Special Benefits listed in Sections 3.1.4, 3.1.7, 3.1.8, 3.3.1, 3.3.2, 3.3.3 and 3.4. Beuth-Ströhmann Steindesign GmbH-KdNr.9410286-LfNr.10177783001-2022-02-14 12:20

4.2.2 Provision of design drawings and mathematical proof of stability.

4.2.3 Services for determining the condition of the structural facilities, including the roads as well as the supply and disposal facilities and the like, beyond the services referred to in 4.1.1, e.g. expert opinions on evidence, camera inspections, stability investigations.

4.2.4 Installation, provision and removal of splash protection devices.

4.2.5 Relocation of the drilling rig and other equipment between the entry points as well as retooling of the drilling tools for reasons for which the Contractor is not responsible.

4.2.6 Construction, securing, maintaining and backfilling of the start and finish pits.

4.2.7 Noise and vibration measurements, leak tests, calibre tests, corrosion protection measurements and optical inspections.

4.2.8 Re-surveying of the pipeline, preparation of a site or as-built plan.

4.2.9 Pressing, filling of annular spaces and cavities with hydraulically setting substances.

4.2.10 Loading at the interim storage facility or at the processing plant, transport and disposal of dissolved soil and waste

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

No regulations.

5.2 Determination of dimensions/quantities

5.2.1 The drilling length is the length of the actual line axis from the planned drilling starting point to the agreed target point.

5.2.2 Borehole casing shall be measured according to the actual length installed.

5.3 Overmeasurement rules

No regulations.

5.4 Individual regulations

Boreholes and borehole casings that have to be abandoned are measured according to the drilling progress achieved or the pipe length achieved.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Track construction work — DIN 18325

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

In der Leistungsbeschreibung sind nach den Erfordernissen des Einzelfalls insbesondere anzugeben:

0.1 Information on the construction site

0.1.1 Location of the track in relation to the neighbouring terrain, e.g. cut, cut, embankment, existing facilities and buildings.

0.1.2 Access to the workstations and facilities to be provided by the Contractor for entry and exit.

0.1.3 Designation/designation and location of the track systems made available to the Contractor for use or shared use for the performance of his services.

0.1.4 Track spacing, track occupancy and maximum speeds for working tracks and adjacent tracks.

0.1.5 Driving on tracks under construction, type of traffic and speed.

0.1.6 In the case of work in tunnels, the location, type, connected load and conditions for the provision of water and energy connections.

0.1.7 Type and condition of the underlay, e.g. subsoil, substructure, base course, supporting structure.

0.2 Information on the execution

0.2.1 Scope of work site lighting provided by the client.

0.2.2 Provisions on the approvals and movement of track-mounted construction machinery and equipment of the Contractor on railway tracks.

0.2.3 Type of work to be carried out in closed tracks, restriction of railway operations by permanent or temporary closure or closure of tracks (with a time).

0.2.4 Restrictions resulting from public law permits, e.g. under the Federal Immission Control Act, and to what extent these must be observed during implementation.

0.2.5 Type of work to be carried out during train breaks, with indication of the sequence of trains.

0.2.6 In the case of track systems with electrical operation, the power supply, e.g. catenary (overhead line, conductor rail), feed line, the line voltage, the shutdown options and shutdown times, and the location of live parts or sections.

0.2.7 The nature and extent of the measures to ensure that work on or next to the tracks is protected from the dangers arising from railway operations.

0.2.8 Type and scope of measures to safeguard rail operations during work on or next to tracks.

0.2.9 Type and extent of protection of the bedding, switching equipment, wire cables, cable trays, cable distributors, railway earthing systems and the like.

0.2.10 Type and extent of securing work on bridges and structures against falling parts.

0.2.11 Time span between request and handover for materials, components, means of transport (type of wagon) provided by the Client and the transfer point.

0.2.12 Regulations and guidelines of the Client for the performance of the service.

0.2.13 Treatment and retention of bedding residues, removed materials and components.

0.2.14 Type and extent of separation of degraded materials, e.g. due to different levels of pollutants.

0.2.15 Nature and requirements for the height accuracy of the ballast grade and the grade protection layer.

0.2.16 Type and thickness of the bedding.

0.2.17 Type and arrangement of the superstructure

0.2.18 Type of weld.

0.2.19 Type of grinding work.

0.2.20 Technical and timing of the work and dependencies on the services of others.

0.2.21 Ort, Art und Anzahl der dem Auftragnehmer zur Verfügung gestellten Baumaschinen, Fahrzeuge, Geräte, Werkzeuge und Messeinrichtungen.

0.2.22 Erstellen von Bauablaufplänen durch den Auftragnehmer und Zeitpunkt der Vorlage.

0.2.23 Start and duration of working hours.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 2.1, if the services are also to include the supply of the associated superstructure materials,

Section 2.2 if the materials and components provided by the contracting authority are not made available freely at the point of use, e.g. at the freight transport point closest to the construction site (tariff point),

Section 2.3, if the materials and components provided by the Client are to be transported from the factory or staging area on the Contractor's means of transport,

Section 2.5, if the delivery of the materials and components by the Contractor is not to include unloading and storage on the construction site,

Section 3.2, if the Contractor is to carry out the safety measures,

Section 3.4 if the protective and safety measures at the work site against dangers from road traffic are not to be the responsibility of the contractor.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units are to be provided as follows:

0.5.1 When loading and unloading:

- Bedding materials and bedding residues by mass (t) or volume (m3),
- Track yokes according to length (m),
- rails by length (m) or by mass (t),
- Sleepers by number (St)
- Switches, crossings, rail extension and brake shoe ejection devices by number (St) or by mass (t),
- linkages of switches, crossings, rail extension and brake shoe ejection devices by number (St) or mass (t),
- Switch sleepers by length (m), Switch sleeper sets by number (St),
- loose rail, sleeper and switch small iron as well as small parts by mass (t) or number (St),
- Switch setting devices and rail drainage boxes by number (St),
- Cable ducts and covers by number (St) or length (m),
- (Cable Protection)Pipes by number (St) or length (m)

0.5.2 When performing track construction work:

- bedding according to length (m), area (m2) or room size (m3),
- Tracks by length measurement (m),
- Rails according to length (m),
- Stress compensation of the rails according to length (m),
- Deposition welding according to length (m),
- Welds by number (St), separated by type, rail shape,
- Grinding of rails according to length (m),
- Sleepers by number (St),
- Switches, crossings, rail extension and brake shoe ejection devices by number (St) or service length (m),
- switch sleepers according to length (m),
- Rail and sleeper iron as well as small parts and the like by number (St), length of the track (m) or power length of the points (m),
- Switch setting devices and rail drainage boxes by number (St),
- Cable ducts and covers by length (m),
- (Cable Protection)Pipes by length (m),
- Edge paths and intermediate paths according to length (m), staggered according to width and paving thickness or area dimension (m2),
- Hiring of a welding supervisor by working time (h),
- Racks of a rail technology supervisor by working time (h).

1 Scope of application

1.1 ATV DIN 18325 "Track construction work" applies to the construction and dismantling of track and switch systems and to work on tracks and points as well as their ballasting.

1.2 ATV DIN 18325 does not apply

- for the earthworks to be carried out during track construction work (see ATV DIN 18300 "Earthworks"),
- for the frost protection and grade protection layers to be carried out during track construction work (see ATV DIN 18315 "Traffic infrastructure construction work — Superstructure layers without binders") and
- for the reinforcement of traffic routes (see ATV DIN 18315 "Traffic route construction work — Superstructure layers without binders", ATV DIN 18316 "Traffic route construction work — Superstructure layers with hydraulic binders", ATV DIN 18317 "Traffic route construction work — Asphalt superstructure layers" and ATV DIN 18318 "Pavement and slab coverings, edging").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18325 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

2.1 The services do not include the delivery of the associated superstructure materials, e.g. rails, switches, sleepers, small iron, bedding and the like.

2.2 The materials and components provided by the Client shall be made available free of charge at the point of use.

2.3 The materials and components provided by the Client shall be provided on the Client's means of transport.

2.4 Means of transport provided by the Client must be requested from the Client in good time.

2.5 If materials and components are to be delivered by the Contractor, the delivery shall also include unloading and storage on the construction site.

2.6 Removed materials and components shall not become the property of the Contractor.

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 Damage to structural facilities must be reported immediately to the Client and the owner or, if another person is authorised to give instructions, to the owner.

3.2 Work on or next to the tracks may only be started and carried out under the protection of the safety procedures specified by the Client against dangers arising from and for railway operations. This also applies to safety measures to protect road users, e.g. at level crossings. The precautionary measures shall be carried out by the Client.

3.3 Insofar as security measures pursuant to Section 3.2 are carried out by the Contractor, these as well as the security personnel and technical security systems provided for this purpose shall be released by the Client.

3.4 The Contractor is responsible for protective and safety measures at the work site against dangers from road traffic, such as the provision of safety personnel, warning devices and the like.

3.5 Welding and securing work must be reported by the Contractor. They must not be carried out without supervision. Welding and safety monitoring is the responsibility of the client.

3.6 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- insufficient load-bearing capacity,
- inadequate security measures,
- deviations from the planned altitude, inclination or flatness,
- obviously harmful soiling,
- provided materials and components that cannot be processed directly,
- the lack of necessary drainage facilities.

3.7 Unevenness of the surface of the bedding grade within a 4 m long measuring section must not be greater than 3 cm.

3.8 The Contractor shall make track systems that are to be used during construction so safe for the speed specified by the Client in the individual case and shall maintain them for the contractual construction period in such a way that railway operations are not endangered and materials and components are not damaged.

3.9 If work is to be carried out in live sections, the contractor must justify this to the contractor in text form before the work begins.

3.10 If electrical appliances are used in the tracks of electrically operated railways, the relevant VDE provisions must be observed.

3.11 Track-mobile construction vehicles and equipment – in particular small cars and transport axles – must be adequately secured against unauthorised access.

3.12 Boundary stones and fixed points may only be removed with the prior consent of the Client. The contractor must secure the Client's fixed points before removal.

3.13 The service must be carried out in such a way that the substrate, e.g. earth or gravel levelling/subgrade protection layer, is not damaged.

3.14 The surfaces of the track and switch components must be roughly cleaned before assembly.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Determination of the condition of the road and terrain surfaces, the receiving waters and the like in accordance with § 3 para. 4 VOB/B.

4.1.2 Cleaning of the components removed by the Contractor from loose substances for loading ready for dispatch.

4.1.3 Participation in the briefing by the Client regarding the location and type of the marked contacts, cable entries, cables, fixed points and the like.

4.1.4 Securing building materials and equipment from unauthorized access to prevent restrictions on the clearance gauge.

4.1.5 Work site lighting by work lights when working with the Contractor's machines.

4.1.6 Preparation of the run-out ramps in the event of planned work interruptions between construction stages, but not services in accordance with section 4.2.11.

4.1.7 Construction, maintenance and removal of the stairs or paths in the embankments required for the performance of the service.

4.1.8 Collecting and loading the containers, pallets, loading devices and the like provided by the Client onto the Client's vehicles until commissioning.

4.1.9 Restoration of the ballast profile, except for services according to section 4.2.9.

4.1.10 Relocation of track-laying machinery to the extent necessary for the performance of the service, but not services in accordance with section 4.2.2.

4.1.11 Acceptance measurement after point installation (before installation).

4.1.12 Racks of the specialist construction management Voltage compensation.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 Exploration of the location of existing pipes, cables, drains, sewers, markings, obstacles and other structural installations that cannot be specified before the work is carried out.

4.2.2 Relocation of track-laying machines at the special order of the Client.

4.2.3 Breaking up and restoring paved surfaces.

4.2.4 Erecting, maintaining and removing auxiliary structures to maintain public and local traffic, e.g. bridges, fortifications of diversions and access roads.

4.2.5 Services for determining the condition of the structural facilities, including the roads as well as the supply and disposal facilities, before the start of the track construction work, in addition to the services referred to in section 4.1.1, e.g. preparation of expert opinions, camera inspections, load-bearing capacity investigations.

4.2.6 Services for the protection of catenary technology, control and safety technology (LST) and track systems, cable ducts, shafts, platforms and the like.

4.2.7 Services to protect against soiling, e.g. covering bedding, side ducts, cable trays, cable distributors and the like.

4.2.8 Disposing or leveling of bedding residues.

4.2.9 Restoration of the ballast profile destroyed by tamping and straightening work.

4.2.10 Preparation of the substrate, e.g. densification, restoration of the planned altitude, cleaning, insofar as such services are not attributable to the Contractor.

4.2.11 Preparation of the outlet ramps for services that go beyond section 4.1.6, e.g. in the case of mechanical processing, tamping work into the existing structure.

4.2.12 Services for the maintenance and inspection of the track systems in the state of construction during the interruption of the work, insofar as this is not the responsibility of the Contractor.

4.2.13 Determining the position of the tracks before the start of the work, determining the position to be produced by calculating and transferring the correction dimensions.

4.2.14 Work site lighting, except for services referred to in section 4.1.5.

4.2.15 Weighing of materials and components provided by the Client.

4.2.16 Unloading of materials and components provided by the Client.

4.2.17 Loading, conveying and unloading of dismantled materials and components.

4.2.18 Turning of superstructure materials which are placed by the client in the opposite direction of installation on the construction site, thus necessitating a triangular drive.

4.2.19 Cleaning of contaminated substances and components provided by the Client, insofar as the soiling was not caused by the Contractor, with the exception of services in accordance with Sections 3.14 and 4.1.2.

4.2.20 Designing, erecting, maintaining, operating and dismantling ventilation systems, e.g. in tunnels.

4.2.21 Measures to reduce dust release, in particular in the Tunnel.

4.2.22 Racks of a welding supervisor for thermal stress compensation during final welding.

4.2.23 Frames of a rail technology supervisor for the construction of the gapless track.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

No regulations.

5.2 Determination of dimensions/quantities

5.2.1 Billing by Mass

5.2.1.1 For the calculation of the mass, the information in the DIN standards is decisive for standardised steels, and for other steels the information in the manufacturer's profile book.

5.2.1.2 The mass is determined at

- bedding materials and bedding residues by weighing or calculating,
- Rails by calculating,
- Switches, crossings, rail extension and brake shoe ejection devices, each without sleepers, by weighing,
- linkages of switches, crossings, rail extension and brake shoe ejection devices by calculating,
- Small iron and small parts by weighing or calculating.

5.2.2 Billing according to room dimensions

The volume of bedding materials and bedding residues is determined in bulk during loading and unloading, that of the installed bedding is determined in the compacted state.

5.2.3 Billing according to length

5.2.3.1 In track curves, the track length in the outer line is calculated.

5.2.3.2 The power length of points and crossings is limited

- for simple points (EW) by tongue and heart impacts,
- for single and double crossing points (EKW, DKW) by external heart joints,
- at EKW and DKW with outer-lying tongues through the tongue thrusts.

5.2.3.3 The performance length of rail extension devices (SAV) and brake shoe ejection devices (HAV) is limited by tongue joint and jaw rail joint.

5.3 Overmeasurement rules

No regulations.

5.4 Individual provisions

The following regulations apply to track work with an agreed quantity scale during ongoing rail operations:

5.4.1 The allocation of the daily quantities performed during working hours refers to the duration of the shift. The duration of the shift is determined by the client.

5.4.2 The working time begins 30 minutes before the first agreed track closure and ends 30 minutes after the last track closure.

5.4.3 If the working time per day exceeds the duration of the shift, the quantities worked per day are multiplied by the ratio of the duration of the shift to the working time in order to classify the work in the corresponding partial service (item).

5.4.4 If track closures are not used for reasons for which the Contractor is responsible, e.g. due to machine damage, the quantities produced shall be multiplied by the ratio of the duration of the shift to the working time worked. The working time results from the working time reduced by the downtime. The result of the calculation is the basis for the classification of the service provided in the corresponding partial service (item).

5.4.5 If closures of the track system are not granted for reasons for which the Contractor is not responsible, e.g. lack of safety personnel, fog, frost, high rail heat, only the quantities actually achieved shall be classified in the corresponding partial service (item) when calculating the quantities per shift.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Renovation work on drainage sewers — DIN 18326

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 Location, in particular bottom depth and slope, as well as materials and dimensions of the old pipes, in particular profile shapes and fittings.

0.1.2 Number, type, location, dimensions, materials and connection angle of existing connections.

0.1.3 Number, type, location, dimensions and materials of existing shaft structures. Dimensions of the entrance openings, type of installations and design of the channels and berms.

0.1.4 Position deviations and dimensional changes within the existing duct system.

0.1.5 Condition of old pipes according to DWA leaflet DWA-A 143-2 "Rehabilitation of drainage systems outside buildings — Part 2: Static calculations for the rehabilitation of sewers and sewers using lining and assembly methods"1) .

0.1.6 Number, type, dimensions and nature of the damaged areas on the drainage canal and in its vicinity.

0.1.7 Type, temperature, and physical and chemical properties of wastewater.

0.1.8 Minimum and maximum discharge volumes as well as possible surge events.

0.1.9 Special features of the operation of the sewer network, in particular industrial dischargers, connected penstocks.

0.1.10 Foundation depths, types of foundations, loads and construction of adjacent structures.

0.1.11 Traffic congestion in the area of drainage systems.

0.2 Information on the execution

0.2.1 Methods (technique groups according to DIN EN ISO 11296 (all parts) "Plastic piping systems for the renovation of buried pressureless drainage networks (gravity pipes)", scope and materials.

0.2.2 Type and extent of the condition assessment of drainage systems to be renovated.

0.2.3 Remediation concept with planned rehabilitation sections, work restrictions and work interruptions according to type, place and time. Dependencies on the operation of the drainage system.

0.2.4 Type and extent of the contamination to be removed in the old pipe, type of cleaning process.

0.2.5 Scope of preparatory work in the old pipe, in particular the number, type, location and dimensions of obstacles to be removed and repair sites.

0.2.6 Specifications for calibrations and optical inspections.

0.2.7 Number, type, location and dimensions of connections to connecting pipes and connections to shafts and other structures.

0.2.8 The nature and scope of the tests and test procedures to be carried out in accordance with Section 2.2.

0.2.9 Type and Scope of Documentation.

0.2.10 Safety and health requirements depending on the hazard arising from the operation of the drainage system.

0.2.11 Technical Regulations to Be Applied.

0.2.12 Wastewater transfers or wastewater diversions for the sewers and connecting pipes with the relevant flow rates. Special features, e.g. lifting stations, barriers. Discharge of wastewater in closed pipes, if necessary via special structures, e.g. pipe bridges, pipe crossings.

0.2.13 Evacuation concept and related safety requirements for wastewater transfer or wastewater diversion.

0.2.14 Type, scope and implementation of in-house and third-party monitoring.

0.2.15 Permissible deviations for material characteristics, wall thicknesses and flow cross-sections, also with regard to the formation of folds in liners.

0.2.16 Static requirements for the lining pipe and the resulting constructive wall thickness according to DWA leaflet DWA-A 143-2.

0.2.17 Type and scope of information provided to residents. Accessibility of the plots.

0.2.18 Type and quantity of fillers required per damage site for reprofiling work.

0.2.19 Preparatory work on existing shafts and structures. Creation of retractable construction pits. Restoration of shaft structures.

0.2.20 Number and type of pipe joints and fittings, joints and fittings. Production of joint seals.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in section 3.3.4.5 and section 3.3.4.6 if the lining pipe is to be cured by the ambient temperature.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units are to be provided as follows:

- Introduction of filler, e.g. into the annular space, separated by ingredients, by volume (l, m3) or mass (kg, t),
- static calculations by number (St),
- Sewer cleaning by length (m), number of sewer positions (St) or by time (h), separated by dimensions, profiles, degree of soiling,
- optical inspections by length (m), number of duct holdings (St) or by time (h), separated by dimensions and profiles,
- Measuring obstacles according to number (St), separated by type, location, circumference and condition,
- Locating and measuring connecting cables according to number (St), separated by dimensions,
- Calibration according to length (m), separated according to dimensions and profiles,
- Cross-sectional measurements by number (St),
- Liners by length (m), separated by type, dimensions and profiles,
- Integration of connections according to number (St), separated by type, dimensions and profiles,
- Shaft integrations by number (St), separated by type, dimensions and profiles,
- Adjustment of manhole channels according to number (St), separated by type and dimensions,
- Removal of obstacles and deposits according to number (St), area (m2) or time (h), separated by type and dimensions,
- Leak tests by number (St), separated by dimensions and profiles,
- Test support tubes by number (St), separated by dimensions.

1 Scope of application

1.1 ATV DIN 18326 "Renovation work on drainage canals" applies to services to improve the current functionality of drainage pipes and drainage channels in the ground as well as the associated structures, with full or partial inclusion of their original substance.

1.2 ATV DIN 18326 does not apply to

- Renovation work using the centrifugal process,
- Dewatering work (see ATV DIN 18305 "Dewatering work"),
- the construction of drainage channels and drainage pipes (see ATV DIN 18306 "Drainage canal work"),
- Work on pressure pipelines (see ATV DIN 18307 "Pressure pipeline work outside buildings"),
- Grouting work carried out to fill cavities in soil and rock from the drainage channel or other structures (see ATV DIN 18309 "Injection work"),
- the repair and reinforcement of drainage components with shotcrete and similar substances that are applied and compacted in the process by spraying (see ATV DIN 18314 "Shotcrete work"),
- the trenchless renewal of drainage channels with the help of bursting methods and microtunnelling (see ATV DIN 18319 "Pipe jacking work"),
- Work for the maintenance and repair of concrete structures and components (see ATV DIN 18349 "Concrete maintenance work"),
- the laying of tiles, slabs and the like in structures of the drainage system (see ATV DIN 18352 "Tile and slab work"),
- Work on pipes and sewers within buildings and other structures (see ATV DIN 18381 "Gas, water and drainage systems within buildings").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18326 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

2.1 General

For the most common substances and components, the DIN standards and other requirements are listed below.

2.1.1 General requirements

DIN 1986-30	Drainage systems for buildings and land — Part 30: Maintenance
DIN 1986-100	Drainage systems for buildings and land — Part 100: Provisions in connection with DIN EN 752 and DIN EN 12056
DIN 18200	Proof of Conformity for Construction Products — In-House Production Control, External Monitoring and Certification

DIN EN 752	Drainage systems outside buildings — Sewer management
DIN EN 12056 (all parts)	Gravity drainage systems within buildings
DIN EN 13380	General requirements for components for the renovation and repair of sewers and sewers outside buildings

2.1.2 Substances

DIN 16946-2 materials — Types	Reaction resin molding materials — Casting resin molding

2.1.3 Components

DIN 8061	Plasticizer-free polyvinyl chloride (PVC-U) pipes — General quality requirements, test
DIN EN 1401-1	Plastic Piping Systems for Underground Non-Pressurized Sewer and Pipeline — Plasticizer-Free Polyvinyl Chloride (PVC-U) — Part 1: Requirements for Pipes, Fittings and the Piping System
DIN EN 12666-1	Plastic piping systems for buried sewers and pipes — Polyethylene (PE) — Part 1: Requirements for pipes, fittings and the piping system
DIN EN 14364	Plastic piping systems for sewers and sewers with or without pressure — Glass fibre-reinforced thermoset plastics (GRP) based on unsaturated polyester resin (UP) — Specifications for pipes, fittings and joints
DIN EN 14636-1	Plastic piping systems for non-pressurized sewers and sewers — Filled polyester resin molding materials (PRC) — Part 1: Pipes and fittings with flexible connections
DIN EN 14758-1	Plastic piping systems for buried non-pressurised sewers and pipes — Polypropylene with mineral additives (PP-MD) — Part 1: Requirements for pipes, fittings and the piping system

2.2 Examinations

2.2.1 Initial examination

The Contractor shall ascertain itself before the commencement of the execution and, upon request, prove to the Client that the substances and mixtures of substances are suitable for the intended purpose. In particular, the following characteristics must be proven with the initial examination:

- Material characteristics in accordance with the DIN EN ISO 11296 series of standards "Plastic piping systems for the renovation of buried pressureless drainage networks (gravity pipes)",

- physical and chemical resistance according to specified requirements and test methods for wastewater and for purification processes,
- Tightness according to DIN EN 1610 "Installation and testing of sewage pipes and sewers".

The renovation procedure must be described in the documentation of the initial inspection.

2.2.2 Self-monitoring test The Contractor shall ensure that during the execution and, upon request, prove to the Client that substances and mixtures of substances as well as the renovation process comply with the contractual requirements.

2.2.3 Control Audits The Contractor's obligation under Sections 2.2.1 and 2.2.2 shall not be limited by the Client's control audits.

Sampling of locally manufactured and hardening tubes can first be carried out in the shaft structure with the help of a sample support tube. If the sample taken there does not meet the requirements, a second sample can be taken within the husbandry, which is then decisive.

3 Execution

In addition to ATV 18299, Section 3, the following applies:

3.1 General

3.1.1 The choice and use of the construction equipment is the responsibility of the Contractor.

3.1.2 The requirements of DIN EN ISO 11296-1 "Plastic piping systems for the renovation of underground non-pressurised drainage networks (gravity pipes) — Part 1: General" must be complied with.

3.1.3 Drainage systems may not be accessed without the consent of the operator.

3.1.4 Factory-impregnated pipe liners and materials for mobile impregnation must be protected against premature hardening and damage during transport and storage until installation.

3.1.5 Visual inspections shall be carried out in accordance with DIN EN 13508-1 'Investigation and assessment of drainage systems outside buildings — Part 1: General requirements' and DIN EN 13508-2 'Investigation and assessment of drainage systems outside buildings — Part 2: Coding system for optical inspection'.

3.2 Preparatory work

3.2.1 Cleaning of the components to be renovated.

3.2.2 Visual inspection to determine the current condition, handover of the documentation to the customer. These services are special services (see section 4.2.8).

3.2.3 Removal of obstacles, e.g. protruding inlets, deposits and the like. These services are special services (see section 4.2.1).

3.2.4 Existing groundwater infiltrations must be sealed if this is required by renovation technology.

3.2.5 If later work processes, e.g. the integration of connections, require this, the old pipe must be reprofiled. These services are special services (see section 4.2.1).

3.3 Making the Lining Pipe

3.3.1 General Immediately before installation, a visual inspection must be carried out to check whether the installation requirements for the chosen method are met. To avoid damage, installation aids must be used.

3.3.2 Prefabricated pipes

3.3.2.1 Rohrstrang-Lining

The work is to be carried out in accordance with DIN EN ISO 11296-2 "Plastic piping systems for the renovation of underground non-pressurised drainage networks (gravity pipes) — Part 2: Pipe string lining". The permissible bending radii must be observed. The permissible tractive force must not be exceeded. This is to be ensured by limiting the tensile force. The lining pipe may not be finally cut to length until the length change process has subsided after installation. This also applies to the integration into existing shafts and side connections.

3.3.2.2 Single Pipe Lining

The tensile and compressive forces during paving must be continuously measured and documented. The documentation must be handed over to the client. The permissible tensile and compressive forces must not be exceeded. A tensile force limitation must be used when pulling in.

After assembly, the pipes must be fixed according to the contractor's static calculation. The load case "buoyancy during annular space filling" must be taken into account.

3.3.2.3 Close-Fit-Lining

This procedure requires calibration of the old pipe. Immediately before installation, the old pipe must be cleaned again.

The work is to be carried out in accordance with DIN EN ISO 11296-3 "Plastic piping systems for the renovation of buried non-pressurised drainage networks (gravity pipes) — Part 3: Close-fit lining". The permissible bending radii must be observed. The permissible tractive force must not be exceeded. This is to be ensured by limiting the tensile force. The lining pipe may not be finally cut to length until the length change process has subsided after installation. This also applies to the integration into existing shafts and side connections.

3.3.3 Locally manufactured pipes (winding pipe lining)

Immediately before installation, the old pipe must be cleaned again. The work is to be carried out in accordance with DIN EN ISO 11296-7 "Plastic piping systems for the renovation of underground non-pressurised drainage networks (gravity pipes) — Part 7: Winding pipe lining".

3.3.4 Locally manufactured and hardening pipes (hose lining)

3.3.4.1 General

Immediately before installation, the old pipe must be cleaned again.

The work is to be carried out in accordance with DIN EN ISO 11296-4 "Plastic piping systems for the renovation of underground non-pressurised drainage networks (gravity pipes) — Part 4: On-site curing hose lining".

During the paving and hardening process, the following parameters must be continuously measured and documented:

- Tensile forces during the pull-in process;
- in the case of hot curing, temperature profile on the outside of the pipe liner;
- speed when pulling the light sources and temperature profile on the inside of the pipe liner during light curing;
- Internal pressure during curing. The documentation must be handed over to the client.

3.3.4.2 Installation by retraction

A tensile force limitation must be used and a sliding foil must be used.

3.3.4.3 Installation by inversion

An outer foil (preliner) must be used.

3.3.4.4 Combined installation

A tensile force limitation must be used and a sliding foil must be used.

3.3.4.5 Hot curing

In the case of steam curing, the condensate must be continuously removed from the pipe liner. The heating, holding and cooling phases must be observed.

3.3.4.6 Light curing

The permissible values for installation pressure, air temperature and internal surface temperature in the pipe liner must be observed. The required radiation intensity and speed when pulling the light sources must be observed.

3.3.5 Assembled individual elements

The elements of the respective assembly system must be manufactured at the factory in terms of size, shape and bending radius according to the conditions of the sewer or structure. Individual elements must be fixed in accordance with the contractor's static calculations. The connecting edges of the mounting system to the existing structure, e.g. in the case of partial lining, must be permanently sealed against rearward movement.

3.4 Annular space filling

The annular space must be completely filled. The target quantities must be compared with the actual quantities in order to detect the escape of the filler. The maximum filling heights and pressures must be complied with in accordance with the contractor's static calculations.

3.5 Rework

3.5.1 Watertightness must be tested in accordance with DIN EN 1610.

3.5.2 Connecting pipes shall be opened after the lining pipe has been constructed in order to restore the function of the drainage system.

3.5.3 Connections must be tightly integrated after the length change processes in the lining pipe have subsided, e.g. by filling, grouting or installing hat profiles.

3.5.4 Annular gaps at shaft connections must be sealed after the length change processes in the lining pipe have subsided.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Determination of the condition of the road and terrain surfaces, the receiving water pipes and the like in accordance with Section 3 (4) VOB/B.

4.1.2 Documentation according to Section 3.3.4.1.

4.1.3 Visual inspections immediately prior to the production of the lining tube.

4.1.4 Checking the nominal diameter of the old pipes on all shafts.

4.1.5 Delivery of documents and evidence of the initial tests as well as the delivery notes of substances and components.

4.1.6 Measuring and documenting the position of the connections before the construction of the lining pipe.

4.1.7 Erection, maintenance and dismantling of supporting structures and scaffolding, except for services according to 4.2.20.

4.1.8 Services for the reduction of stresses in the lining tube, e.g. making separation cuts and sealing the separation points.

4.2 Special services in addition to ATV DIN 18299, Section 4.2 are:

4.2.1 The Special Benefits listed in Sections 3.2.3 and 3.2.5.

4.2.2 Provision of static calculations, with the exception of the services according to 3.3.2.2, 3.3.5 and 3.4.

4.2.3 Services for determining the condition of the structural facilities, supply and disposal facilities and the like beyond the services referred to in Section 4.1.1.

4.2.4 Testing for leaks, including making and removing the anchorages and pipe closures required for the test.

4.2.5 Supply and discharge of the filler necessary for the leak test.

4.2.6 Cleaning of soiled substances and components provided by the Client, provided that the soiling was not caused by the Contractor.

4.2.7 Documentation the scope of which exceeds the parameters of Section 3.3.4.1.

4.2.8 Visual inspections to determine the condition of the old pipe and to prepare for acceptance.

4.2.9 Removal of contamination resulting from the operation of the sewer system.

4.2.10 Disposal of cleared material resulting from the operation of the sewer system.

4.2.11 Soil and water investigations.

4.2.12 Wastewater transfers and wastewater diversions in existing drainage sewers, including all connecting pipes.

4.2.13 Third-party monitoring of execution.

4.2.14 Binding the Lining Pipe to Manholes.

4.2.15 Opening and Connecting the Connecting Cables to the Lining Pipe.

4.2.16 Calibration of the old pipe.

4.2.17 Installation of specimen support tubes.

4.2.18 Sampling and testing in accordance with section 2.2.3 and sealing of the sampling points.

4.2.19 Preparation of as-built documentation.

4.2.20 Erection, maintenance and dismantling of support structures and scaffolding for the execution of work in shaft structures with a clear width > 1.5 m.

4.2.21 Manufacture of pipe joints, fittings, joints and fittings, joint seals and hand laminates.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

No regulations.

5.2 Determination of dimensions/quantities

When billing the lining pipe according to the length measure, the length in the axis of the old pipe is taken as a basis.

5.3 Overmeasurement rules

Intermediate shafts that are driven over are overmeasured.

5.4 Individual provisions

No regulations.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Traffic safety work — DIN 18329

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A. The information does not become part of the contract. According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 General conditions of the construction site, in particular use of traffic areas, classification of roads, visual obstructions, restrictions.

0.1.2 Type and condition of the surfaces on which traffic safety is set up as well as special properties, e.g. paved surfaces, porous asphalt, existing sludge on concrete surfaces.

0.1.3 Type, location, dimensions and nature of existing markings.

0.1.4 Data on the average daily traffic (DTV) and the proportion of heavy traffic.

0.1.5 Space conditions, in particular existing heights and widths, remaining widths and heights to be observed as well as installation areas.

0.1.6 Information on local traffic (public/private) by pedestrians/vehicles.

0.2 Information on the execution

0.2.1 Designation of the authority responsible for the traffic order.

0.2.2 Specifications and requirements for traffic safety resulting from the preliminary coordination between the contracting authority and the issuing authority.

0.2.3 Specifications and requirements resulting from the Client's preliminary agreement with

- other modes of transport, e.g. public transport, waterway, rail and air transport,
- other bodies of public interest, e.g. police, fire brigade, rescue services, waste disposal companies and
- residents.

0.2.4 Specifications resulting from the location, e.g. track systems, overhead lines, tunnels, bridges as well as specifications resulting from the preliminary coordination between the Client and the parties involved.

0.2.5 Type, location and scope of the safety measures for the construction, relocation, maintenance, operation and dismantling of traffic safety equipment.

0.2.6 Services and Duration for Approvals, Tests, Findings, Documentation and Acceptances.

0.2.7 Type and scope of services for applying for the traffic law order, e.g. traffic sign plans.

0.2.8 Number, type, location and dimensions of traffic safety equipment.

0.2.9 Number and type of relocations of traffic safety devices.

0.2.10 Execution period of the services for the construction, relocation, provision, maintenance, operation and dismantling of traffic safety equipment.

0.2.11 Time restrictions for the construction, relocation and dismantling of traffic safety equipment, e.g. major events.

0.2.12 Early or subsequent production of parts of the service, e.g. advance notice, mobile traffic jam warning systems, no-stopping zones.

0.2.13 Type and extent of the protection of traffic signs that must be erected in the area of traffic areas.

0.2.14 Type and extent of marking of installations that protrude into the traffic area or are directly adjacent to it, e.g. construction fences, pedestrian tunnels.

0.2.15 Type and extent of pre-treatment of road surfaces, e.g. high-pressure cleaning.

0.2.16 Special physical and chemical stresses to which substances and components are exposed after assembly, e.g. due to wind loads.

0.2.17 Type and scope of documentation, e.g. preservation of evidence.

0.2.18 Type and scope of mobile traffic jam warning and variable message sign systems.

0.2.19 Type and scope of services to cover, remove or disable traffic safety equipment.

0.2.20 Requirements for traffic safety equipment, e.g. reflection classes of the films, traffic classes, increased night visibility in wet conditions.

0.2.21 Number, type, location and dimensions of temporary markings.

0.2.22 Number, type and scope of demarcation services.

0.2.23 Number, type and location of barriers (mobile fall protection devices).

0.2.24 Number, type and location of warning lamps, surface-mounted light.

0.2.25 Minimum requirements for the weight of the towing vehicle in front of barrier boards, e.g. permissible or actual total weight.

0.2.26 Requirements for transportable traffic light systems, e.g. site plan, traffic volumes, corridor lines, pedestrian frequencies, lane layouts, fault service, remote maintenance, operating hours.

0.2.27 Special features of the locations of the installation devices of the transportable traffic light systems, e.g. residual widths of pedestrian and bicycle traffic facilities.

0.2.28 Special local requirements for transportable traffic lights, e.g. public transport, coordination with other junctions, information on existing traffic lights.

0.2.29 Test duration of traffic engineering calculations of transportable traffic signal systems.

0.2.30 Type and scope of special facilities for barrier-free accessibility, e.g. special signal transmitters and guidance devices for the blind.

0.2.31 Number, type and type (A, B, C or D)1) of the transportable traffic light system, including the type of synchronisation (crystal oscillators, radio, cables).

0.2.32 Type and scope of programming of signal schedules.

0.2.33 Power supply of the transportable traffic light systems, e.g. distance to the point of use, battery operation, mains supply, cable routing, line overvoltages, local conditions.

0.2.34 Number, type, location and dimensions as well as photometric characteristics of lighting equipment, e.g. on pedestrian overpasses, adaptation routes.

0.2.35 Number, type, location and dimensions of guiding and structural guiding elements when replacing and/or supplementing markings.

0.2.36 Number, type, location and dimensions of transportable (temporary) protective devices, in particular containment level, area of effect and impact severity in accordance with DIN EN 1317-2 "Road restraint systems — Part 2: Performance classes, acceptance criteria for impact tests and test methods for protective devices and vehicle balustrades".

0.2.37 Requirements for transportable (temporary) protective devices to avoid deformation in the contact areas, e.g. permissible ground pressures.

0.2.38 Number, type and position of fittings for transportable (temporary) protective devices, e.g. initial and final construction, dilatation joint, transition structure.

0.2.39 Number, type, location and dimensions of clearance profile frames and clearance height limits.

0.2.40 Number, type, location and dimensions of ditch bridges for pedestrians.

0.2.41 Number, type and scope of inspection, e.g. local or remote inspection, visual inspection, control of functionality, interval, time, documentation.

0.2.42 Type, extent of regular cleaning of traffic safety equipment.

0.2.43 Art und Umfang der Reinigung auf Grund besonderer Umstände, z. B. nach Einsatz von Streugut.

0.3 Details in case of deviation from the ATV

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 3.2.2 if these services are not to be provided by the Contractor.

0.4 Individual information on fringe benefits and special benefits

- In particular, pre-markings can be considered as ancillary services for which special ordinal numbers (items) are to be provided under the conditions of ATV DIN 18299, Section 0.4.1, if these are to be tendered separately (see Section 4.1.4).
- the initial programming of the signal schedule for the installation of transportable traffic light systems (see section 4.1.5).

0.5 Billing Units

In the bill of quantities, the billing units are to be provided as follows:

0.5.1 Area (m2), separated by type of construction, dimensions and construction phases, for

- large tables,
- temporary markings, and
- Graben bridges for pedestrians.

0.5.2 Measures of length (m), separated by type, dimensions and construction phases, for

- pre-markings,
- temporary markings,
- Barrier barriers (mobile fall protection devices),
- guide thresholds,
- Guardboards,
- guide walls and
- transportable (temporary) protective devices.

0.5.3 Number (pcs), separated by type, dimensions and construction phases, for

- Traffic sign plans,
- Beacons,
- Traffic sign
- Traffic control boards,
- Traffic cone
- Barrier barriers (mobile fall protection devices),
- installation devices,
- warning lights,
- transportable traffic light systems,
- mobile traffic jam warning and variable message sign systems,
- Advance warning signs,
- visual signs,
- temporary marking,
- marking buttons,
- transportable (temporary) protective devices,
- Fittings of transportable (temporary) protective devices,
- mobile barrier boards,

- small flashing arrows,
- Graben bridges for pedestrians,
- cross-out devices and
- Controls.

0.5.4 Duration (h, d, wo, mt), separated by construction phase, for

- Maintaining, maintaining, operating and
- Controls.

0.5.5 Combined billing (md, mWo, mMt, m2d, m2Wo, m2Mt, Std (× days each), StWo, StMt) for

- Maintaining, maintaining, operating and
- Controls.

1 Scope of application

1.1 ATV DIN 18329 "Traffic safety work" applies to the construction, relocation, maintenance, operation and dismantling of all traffic safety equipment, such as traffic signs, traffic facilities and transportable (temporary) protective equipment, for the regulation, guidance and safety of public road traffic within the scope of application of the Road Traffic Regulations (StVO), which are required for the execution of construction work of any kind.

It applies in particular to traffic safety during construction work on and on roads and paths of all kinds, squares, footpaths and cycle paths, inner-city roads, country roads and motorways where the Road Traffic Regulations apply.

1.2 ATV DIN 18329 does not apply to

- Services for traffic safety on waterways, in rail and air traffic,
- temporary bridges that go beyond ditch bridges for pedestrians,
- construction fences and curbs,
- Shoring as fall protection and impact protection (see ATV DIN 18303 "Shoring work") and
- Auxiliary structures, canopies and continuous scaffolding (see ATV DIN 18451 "Scaffolding work"),
- clearing snow and blunting in icy conditions to maintain traffic.

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18329 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

For the most common substances and components, the DIN standards and other requirements are listed below.

DIN 1451-2	Fonts — Sans Serif Linear-Antiqua — Traffic Fonts

DIN 6171	Transparent Colors for Traffic Signs and Traffic Facilities
DIN 32981	Facilities for blind and visually impaired persons at road traffic signalling systems (SVA) — Requirements
DIN 67520	Retroreflective materials for traffic safety — Minimum photometric requirements for reflective materials
DIN EN 1317-1	Road restraint systems — Part 1: Terminology and general criteria for test methods
DIN EN 1317-2	Road restraint systems — Part 2: Performance classes, acceptance criteria for impact tests and test methods for protective devices and vehicle parapets
DIN EN 1423	Road Marking Materials — Re-Spreading Agents — Glass Marking Beads, Skid Resistance Agents and Re-Spreading Mixtures
DIN EN 1424	Straßenmarkierungsmaterialien — Premix glass bead
DIN EN 1436	Road marking materials — Requirements for road markings DIN EN 1463-1 Road marking materials — Marking buttons — Part 1: Requirements in new condition
DIN EN 1463-2	Road marking materials — Retroreflective marking buttons — Part 2: Field tests
DIN EN 1790	Road Marking Materials — Prefabricated Markings
DIN EN 1871	Road Marking Materials — Physical Properties
DIN EN 12352	Traffic Control Systems — Warning and Safety Lights
DIN EN 12368	Traffic Control Systems — Signal Lamps
DIN EN 12675	Control Units for Light Signal Systems — Functional Safety Requirements
DIN EN 12767	Passive Safety of Load-Bearing Structures for Road Equipment — Requirements and Test Methods
DIN EN 12899	(all parts) Fixed, vertical road traffic signs
DIN EN 12966	Vertical Traffic Signs — Variable Message Signs
DIN EN 13422	Road traffic signs (vertical) — Transportable road traffic signs — Traffic cones and guide cylinders
DIN EN 50293 (VDE 0832-200)	Road Traffic Signalling Systems — Electromagnetic Compatibility

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 When carrying out traffic safety work, RSA-95 "Guidelines for the safety of work sites on roads"2) must be observed.

3.1.2 Traffic safety work may only be commenced after the written traffic law order from the competent authority has been issued. The traffic law order must be handed over to the client before the start of the work.

3.1.3 No traffic-endangering situations must arise during traffic safety work.

3.1.4 Before the start of the traffic safety work, a joint inspection must be carried out with the client on request, in which the specifications of the traffic law order must be compared with the local conditions; a record of this must be drawn up. Services that go beyond the inspection and preparation of the minutes are special services (see section 4.2.1).

3.1.5 If the traffic law order results in changes compared to the construction contract services of the traffic safety equipment as well as the agreed execution periods, the Contractor shall inform the Client of these changes without delay. The services resulting from the changes are to be determined jointly between the client and the contractor; these are special services, unless the Contractor is responsible for them (see Section 4.2.1). If existing traffic safety equipment must be changed immediately due to official orders, these are special services, unless the Contractor is responsible for them (see Section 4.2.1).

3.1.6 The dimensions for the erection distance of the traffic signs are indicative. Depending on the local conditions, deviations from the installation heights of ± 5 % and from the longitudinal distances of ± 10 % are tolerable in order to improve visibility. Unless otherwise stated, distance measures refer to the centre of the traffic safety equipment.

3.1.7 In the case of work sites of shorter duration, the towing vehicle must remain coupled in front of mobile barrier boards.

3.1.8 In particular, the risk of displacement in the contact area caused by the transportable (temporary) protective device may be considered as concerns under Section 4 (3) VOB/B.

3.2 Maintaining, maintaining, operating

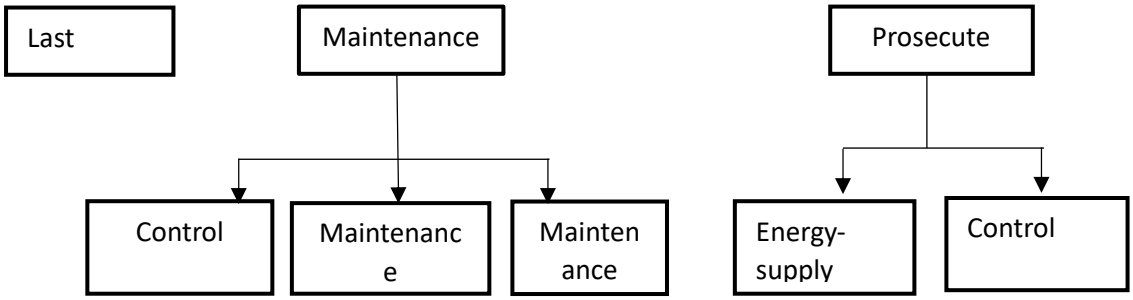


Figure 1 — Assignment of terms for traffic safety

3.2.1 Retention

The traffic safety equipment must be made available for contractual use within the agreed period.

3.2.2 Maintenance

The traffic safety equipment must be maintained during the agreed maintenance period. Maintenance within the meaning of this ATV includes services for inspection, maintenance and repair.

3.2.2.1 Control

During the inspection, the function and completeness of the traffic safety equipment must be checked in accordance with traffic law regulations and other contractual requirements. Checks must be carried out once a working day by the person responsible named in the traffic law order. If the controller appoints a representative or agent, he or she must meet the same conditions for carrying out the checks.

The result, scope and timing of the inspections must be documented; this documentation shall be handed over to the Client. Additional services for control are special services (see section 4.2.1).

3.2.2.2 Maintenance

If the traffic safety equipment no longer fulfils the purpose of the contract due to contamination, they must be cleaned.

3.2.2.3 Repair

The preparation and alignment of displaced, displaced, twisted and fallen traffic safety equipment must be ensured. Missing or destroyed traffic safety equipment as well as traffic safety equipment with poor visibility must be replaced immediately. At least 80% of the retroreflective surfaces, 85% of the marking surfaces and 50% of the marking buttons must be present. If three marking buttons are missing in a row, they must be replaced immediately.

3.2.3 Operation

Operation during the contractually agreed retention period includes the energy supply of beacon luminaires and the replacement of associated lamps. Additional energy supply services as well as control for traffic systems, e.g. transportable traffic signal systems, mobile traffic jam warning and variable message sign systems are special services (see section 4.2.1).

3.3 Temporary Marking

3.3.1 Loose dirt must be removed before marking. The removal of any additional contamination of the area to be marked is special services, unless the contractor is responsible for them (see section 4.2.1).

3.3.2 Temporary markings on final road surfaces must be removed without leaving any residue and with as little damage as possible to the road surface.

The following conditions are considered to be residue-free if the area of the remaining marking, based on 1 m of the original marking length, meets the following conditions:

- Adhesive residues, including any colour pigments, ≤ 10%;
- remaining colour pigments ≤ 5%.

Visually recognizable differences in surface structures that occur due to the protection of the roadway under temporary markings are unavoidable and are not considered residues. If, despite the proper removal of the markings, no clear traffic routing can be ensured, further measures must be determined between the client and the contractor, these are special services (see section 4.2.1).

3.4 Transportable traffic lights

In the case of transportable traffic light systems, the synchronisation, function and alignment of the vehicle detectors as well as the energy supply must be ensured.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Preservation of evidence when setting up no-stopping zones ordered under traffic law, in particular recording the time of the erection, the names of the person(s) setting up, the registration plates of the vehicles parked in this area and the storage of records.

4.1.2 Submission of type approvals, approvals or other proof of suitability, e.g. for ditch bridges for pedestrians.

4.1.3 Protocols and other evidence of the implementation of traffic safety inspections and maintenance work.

4.1.4 Making the pre-marking.

4.1.5 Initial programming of transportable traffic light systems (type A, B, C1) for the signal schedule for the contractually agreed construction phases and phases.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 The Special Benefits listed in Sections 3.1.4, 3.1.5, 3.2.2.1, 3.2.3, 3.3.1 and 3.3.2.

4.2.2 Services for the application or for changes to the traffic law order, e.g. drawings, calculations, erections, traffic sign plans, signal plans, insofar as the Contractor is not responsible for these.

4.2.3 Fees for traffic regulations and other applicable fees, e.g. special use fees.

4.2.4 Photo or video documentation, e.g. for the preservation of evidence, except for services in accordance with section 4.1.1.

4.2.5 Services resulting from the extension of the maintenance time of the traffic safety equipment, provided that the Contractor is not responsible for the extension.

4.2.6 Pre-treatment of concrete surfaces to apply the temporary marking, e.g. removal of after-treatment agents.

4.2.7 Changes to the pre-marking carried out, insofar as the Contractor is not responsible for this.

4.2.8 Services that go beyond the initial programming in accordance with Section 4.1.5.

4.2.9 Lighting calculations.

4.2.10 Cleaning of the roadway after dismantling of the traffic safety equipment and the transportable (temporary) protective equipment.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

The determination of the service is to be based on the order under traffic law. In this context, the service is to be determined from drawings to the extent that the service performed corresponds to these drawings.

5.2 Determination of dimensions/quantities

5.2.1 In the case of longitudinal and transverse markings, the length of the marked line shall be taken as a basis.

5.2.2 In the case of billing by area for temporary markings of arrows, letters, numbers, traffic signs and pictograms, this results from the smallest circumscribing rectangle.

5.2.3 Fittings of transportable (temporary) protective devices are calculated separately.

5.2.4 In the case of combined invoicing, the actual dimensions/quantities are invoiced multiplied by the actual holding time.

5.3 Overmeasurement rules The following are overmeasured:

5.3.1 When billed according to area

- Fugues
- Fixtures ≤ 1 m2 single size.

5.3.2 When billing according to length

- Interruptions caused by components, e.g. joints, fixtures, transitions ≤ 1 m individual length,
- in the case of transportable (temporary) protective devices, their fittings.

5.4 Individual provisions

The provision of traffic safety equipment in whole or in sections begins with the agreed date of the end of the construction and ends with the vereinbarten Termin des Beginns des Abbaus. Die Dauer des Vorhaltens wird durch vereinbarte Umbauten nicht unterbrochen.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Masonry work — DIN 18330

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299, Section 0 "General regulations for construction work of any kind". Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 Exposure to wind.

0.1.2 Foundation depths, foundation types and loads of neighbouring structures.

0.1.3 Construction of construction pits.

0.1.4 Type, location and formation of adjacent components against which masonry is to be built.

0.1.5 Type, location, dimensions and design as well as dates for the erection and dismantling of scaffolding on site.

0.2 Information on the execution

0.2.1 Type, location and dimensions of masonry.

0.2.2 Type of masonry blocks, compressive strength and bulk density class, thermal conductivity and formats.

0.2.3 Type of mortar, mortar group, admixture.

0.2.4 Height of the working level, floor height and height of free-standing masonry.

0.2.5 Type and dimensions of reinforced masonry.

0.2.6 Type and dimensions of non-load-bearing partition walls and the type and design of the connections to adjacent components.

0.2.7 Number, type, dimensions and formation of the closures at free wall ends and wall crowns, e.g. by rolling layers, as well as the type and design of the connections of walls to adjacent components.

0.2.8 Special requirements for rear sight layers, e.g. to reduce thermal bridges.

0.2.9 Type, location, dimensions, drawing, design and execution of shoring for structures in accordance with section 4.2.1.

0.2.10 Number, type, location, dimensions and design of movement, structure and component joints as well as of closures and connections to adjacent components.

0.2.11 Requirements for fire, sound, heat, moisture and radiation protection.

0.2.12 Position and design of plain bearings.

0.2.13 Inclination, curvature and height changes of surfaces.

0.2.14 Formation and course of masonry bent in the ground or elevation and not at right angles.

0.2.15 Flush side in masonry whose thickness is equal to a stone measure.

0.2.16 Requirements for exposed and facing masonry, e.g. masonry bond, type, colour and structure of the bricks and mortar, joint formation, anchoring, special formats or required cutting of stones.

0.2.17 Number, type, location and dimensions of the supports of the outer shells in the case of double-shell outer walls.

0.2.18 Number, type, location and dimensions of ventilation openings in double-shell masonry.

0.2.19 Number, type, position, dimensions and formation of recesses and the like.

0.2.20 Formation of the reveals at openings, e.g. smooth line for the installation of windows, doors.

0.2.21 Number, type, location, dimensions and masses of built-in and finished parts.

0.2.22 Number, type, location, dimensions and design of chimneys and chimney heads.

0.2.23 Formation of the components and condition of the surface of the masonry, e.g. for waterproofing, coatings, protective coatings.

0.2.24 Type and design of ring anchors.

0.2.25 Requirements for Glasbausteinwände.

0.2.26 Early or subsequent production of parts of the service.

0.2.27 Billing procedures for bulk materials whose quantities cannot be determined either at the removal or at the place of order, e.g. in the case of loose bulks after the quantity has been measured in the means of transport.

0.2.28 Requirements resulting from expert reports.

0.2.29 Shared use of scaffolding by other companies, special requirements.

0.2.30 Conversion of scaffolding for the purposes of other contractors.

0.2.31 Provision of scaffolding, enclosures and the like beyond the user's own useful life.

0.2.32 Mechanical, chemical and dynamic stresses to which substances and components are exposed during and after installation.

0.2.33 Protection of components or installations and the like.

0.2.34 Making obtuse or acute-angled corners

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 2.2 if the tolerance requirements for stones are different from those specified in the substance standards,

Section 3.1.3 if tolerances other than those listed therein are to apply,

Section 3.2.1, if butt joints that are planned to be up to 5 mm are to be closed with mortar,

Section 3.2.1, if the facing masonry is to be carried out in conjunction with the rear masonry or reinforced masonry,

Section 3.2.1 if other over-binding dimensions are to apply,

Section 3.2.5 if mortar group III is not to be used for precast concrete elements and steel components to be walled in,

Section 3.2.6 if facing masonry is to be grouted retrospectively.

0.4 Individual information on fringe benefits and special benefits

In particular, the following can be considered as ancillary services for which special ordinal numbers (items) are to be provided under the conditions of ATV DIN 18299, Section 0.4.1:

- Assembly, conversion and dismantling as well as provision of the working and protective scaffolding as well as the shoring in accordance with section 4.1.1,

- Making and maintaining covers and enclosures (see section 4.1.3).

0.5 Billing units In the bill of quantities, the billing units are to be provided as follows:

0.5.1 Area (m2), separated by type and dimensions, for

- Masonry
- Infills of wood, steel and concrete skeletons,
- non-load-bearing partition walls,
- exposed and facing masonry,
- Veneers, cladding,
- back surfaces of niches,
- Vault
- joints,
- floor coverings made of flat or rolled layers,
- Filling of ceilings,
- insulation layers,
- Vapour barriers, separation and protective layers,
- seals,
- Prefabricated elements and prefabricated ceilings.

0.5.2 Volume dimensions (m3), separated by type and dimensions, for

- Insulation materials for the filling of cavities,
- Partitions.
-

0.5.3 Length (m), separated by type and dimensions, for

- Reveals for exposed and facing masonry, sills and cornices, including any cantilevers,
- masonry or prefabricated lintels, vaults and relief arches over openings and niches,
- Pier
- pillar templates,
- Ceiling masonry,
- masonry chimneys, separated according to the number and cross-section of the draughts and the thickness of the stringers,
- chimneys made of fittings, separated by number and cross-section of the draughts,
- brick steps,
- Bricking, sheathing or facing, e.g. of steel beams, beams, columns,
- Making and closing slots,
- Ringanker,
- Manufacture of movement and separation joints,
- Supports of the outer shells of double-shell outer walls,
- rolled layers, wall coverings,
- Production of masonry slopes, e.g. sloping roofs,
- Manufacture of obtuse or acute-angled corners with shaped bricks or with cut masonry blocks,

- Smooth coating in the area of soffits, lintels, parapets and for upper wall closures

0.5.4 Quantity (pcs), separated by construction type and dimensions, for

- Creating recesses, e.g., openings, niches, slots, passages,
- Closing recesses,
- Prefabricated lintels, arches, and relieving arches over openings and niches,
- Prefabricated baseboards and cornices including any projections,
- Pillars,
- Chimney heads, separated by the number and cross-section of the ducts.
- Chimney cleaning closures, pipe sleeves, transition pieces, and the like,
- Basement light wells, sink boxes, foundations for equipment, and the like,
- Supply and installation of steel parts and prefabricated parts, e.g., prefabricated ceilings,
- Supply and installation, e.g., of connection and edge profiles, anchor rails, anchors, and bolts,
- Supply and installation of door and window frames and the like,
- Steel parts and rolled steel profiles, prefabricated parts and prefabricated ceilings,
- Roller shutter boxes.

0.5.5 Quantity (kg, t), separated by construction type and dimensions, for

- Reinforcing steel, steel profiles, anchors, bolts,
- Partitions.

1 Scope of application

1.1 ATV DIN 18330 "Masonry work" applies to the production of masonry of any kind from natural and artificial stones.

1.2 ATV DIN 18330 does not apply to:

- Formwork blocks (see ATV DIN 18331 "Concrete work"),
- Natural stones (see ATV DIN 18332 "Natural stone work"), provided that they are not structurally load-bearing,
- Cast concrete blocks (see ATV DIN 18333 "Cast stone work"), provided that they are not structurally load-bearing,
- Drywall construction work (see ATV DIN 18340 "Drywall construction work") and
- External thermal insulation composite systems (see ATV DIN 18345 "External thermal insulation composite systems").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18330 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

For the most common substances and components, the DIN standards and other requirements are listed below.

2.1 Natural stones

Natural stones must be weather-resistant, sufficiently pressure-resistant and storable and must not have any crevices, cracks, fractures, leaves or slate secretions, for example.

2.2 Artificial stones

DIN 105-4	Masonry bricks — Part 4: Ceramic clinker bricks
DIN 105-5	Masonry bricks — Part 5: Lightweight slotted bricks and slabs
DIN 105-6	Masonry bricks — Part 6: Flat bricks
DIN V 106	Sand-lime bricks with special properties
DIN 4159	Bricks for Brick Ceilings and Grouting Panels, Statically Contributing
DIN 18148	Cavity wall panels made of lightweight concrete
DIN V 18151-100	Hollow blocks of lightweight concrete — Part 100: Hollow blocks with special properties
DIN V 18152-100	Solid blocks and blocks of lightweight concrete — Part 100: Solid blocks and blocks with special properties
DIN V 18153-100	Concrete masonry blocks (normal concrete) — Part 100: Masonry blocks with special properties
DIN EN 771-1	Specifications for masonry bricks — Part 1: Masonry bricks
DIN 20000-401	Application of construction products in buildings — Part 401: Rules for the use of masonry bricks according to DIN EN 771-1:2015-11
DIN EN 771-2	Specifications for masonry blocks — Part 2: Sand-lime bricks
DIN 20000-402	Application of construction products in buildings — Part 402: Rules for the use of sand-lime bricks according to DIN EN 771-2:2015-11
DIN EN 771-3	Specifications for masonry blocks — Part 3: Masonry blocks made of concrete (with dense and porous aggregates)
DIN V 20000-403	Application of construction products in buildings — Part 403: Rules for the use of concrete masonry blocks according to DIN EN 771-3:2005-05
DIN EN 771-4	Specifications for masonry blocks — Part 4: Aerated concrete blocks
DIN 20000-404	Application of construction products in buildings — Part 404: Rules for the use of aerated concrete blocks according to DIN EN 771-4:2015-11
DIN EN 1457-1	Flue Systems — Ceramic Inner Tubes — Part 1: Inner Tubes for Dry Service — Requirements and Tests

DIN EN 1457-2	Exhaust systems — Ceramic inner tubes — Part 2: Inner tubes for wet operation — Requirements and tests
DIN EN 1858	Flue Systems — Components — Concrete Molding Blocks
DIN EN 12446	Flue Systems — Components — Concrete Outer Shells
DIN EN 13063-1	Flue Systems — System Flue Systems with Ceramic Inner Tubes — Part 1: Requirements and Tests for Soot Fire Resistance
DIN EN 13063-2	Flue gas systems — System exhaust systems with ceramic inner pipes — Part 2: Requirements and tests for damp operation
DIN EN 13063-3	Flue gas systems — System flue gas systems with ceramic inner pipes — Part 3: Requirements and tests for air-flue pipes
DIN EN 15037-3	Precast concrete elements — Beam slabs with intermediate components — Part 3: Ceramic intermediate components

2.3 Building plates

DIN V 106	Sand-lime bricks with special properties
DIN 278	Hollow Clay Slabs (Hourdis) — Statically Stressed
DIN 4166	Aerated concrete building boards and aerated concrete flat building boards
DIN 18148	Cavity wall panels made of lightweight concrete
DIN 18162	Wall building boards made of lightweight concrete, unreinforced
DIN EN 12859	Gypsum wall panels — Definitions, requirements and test methods

2.4 Insulation and fillers

DIN 4108-10	Thermal insulation and energy saving in buildings — Part 10: Application-related requirements for thermal insulation materials — Factory-made thermal insulation products
DIN 18159-2	Foaming plastics as in-situ foams in the construction industry — Urea-formaldehyde resin in-situ foam for thermal insulation, application, properties, design, testing
DIN EN 622 (all parts)	Fibreboard — Requirements
DIN EN 13162	Thermal insulation products for buildings — Factory made mineral wool (MW) products — Specification
DIN EN 13163	Thermal insulation products for buildings — Factory-made expanded polystyrene (EPS) products — Specification
DIN EN 13164	Thermal Insulation Products for Buildings — Factory Made Extruded Polystyrene Foam (XPS) Products — Specification

DIN EN 13165	Thermal insulation products for buildings — Factory made rigid polyurethane foam (PU) products — Specification
DIN EN 13166	Thermal insulation products for buildings — Factory made phenolic resin foam (PF) products — Specification
DIN EN 13167	Thermal Insulation Products for Buildings — Factory Made Foam Glass (CG) Products — Specification
DIN EN 13168	Thermal insulation products for buildings — Factory made wood wool (WW) products — Specification
DIN EN 13169	Thermal Insulation Products for Buildings — Factory Manufactured Expanded Perlite (EPB) Products — Specification
DIN EN 13170	Thermal insulation products for buildings — Factory made expanded cork (ICB) products — Specification
DIN EN 13171	Thermal insulation products for buildings — Factory made wood fibre (WF) products — Specification

2.5 Mortar

DIN V 18580	Masonry mortar with special properties
DIN V 20000-412	Application of construction products in buildings — Part 412: Rules for the use of masonry mortar according to DIN EN 998-2:2003-09
DIN EN 998-2	Specifications for Mortars in Masonry Construction — Part 2: Masonry Mortars

2.6 Steel

DIN 488-1	Reinforcing steel — Part 1: Steel grades, properties, marking
DIN 488-2	Reinforcing steel — Reinforcing steel

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- Deviations of the portfolio from the specifications,
- Condition of the subsoil, insufficient foundation area,
- lack of reference points,
- insufficient working space.

3.1.2 In the event of unsuitable conditions resulting from the weather or the indoor climate, e.g. frost, special measures must be taken in consultation with the Client. If services are required for this, these are special services (see section 4.2.24).

3.1.3 Deviations from prescribed dimensions are permissible within the limits specified by DIN 18202 "Tolerances in building construction — Structures".

If there are increased requirements for flatness compared to DIN 18202:2013-04, Table 3, lines 1 or 5, or other increased requirements for dimensional accuracy compared to the values listed in the said standard, the measures to be taken are special services (see section 4.2.2).

3.2 Masonry

3.2.1 Masonry of any kind made of natural and artificial stone, e.g. facing masonry, sills, cornices, wall coverings and thermal insulation layers in double-shell masonry, must be constructed in accordance with DIN EN 1996-21) in conjunction with DIN EN 1996-2/NA2). The supplementary regulations on structural design and execution, e.g. wall connections, masonry bonding, over-binding dimensions according to DIN EN 1996-1-13) in conjunction with DIN EN 1996-1-1/NA4) must be observed.

3.2.2 For natural stone masonry, DIN EN 1996-1-1:2013-02, Section 8.1.4.2 "Made-to-measure natural stones" and DIN EN 1996-1-1/NA:2012-05, Annex NA. L.

3.2.3 DIN 4123 "Excavations, foundations and underpinnings in the area of existing buildings" applies to the execution of underpinning masonry.

3.2.4 Wooden components, e.g. beam heads that are embedded in masonry, must be walled dry – without mortar – to protect against moisture.

3.2.5 Precast concrete elements and steel components shall be walled in using mortar of mortar group III.

3.2.6 Facing and exposed masonry must be carried out in the smooth joint line. In the event of subsequent cleaning, no acids must be added to the cleaning water.

3.3 The following applies to the manufacture of house chimneys:

DIN V 18160-1 Flue Systems — Part 1: Design and Execution.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section

4.1, in particular: 4.1.1 Erection, conversion and dismantling as well as provision of working and protective scaffolding as well as shoring scaffolding of design class A in accordance with DIN EN 12812 "Shoring scaffolding — Requirements, design and design", insofar as these scaffolding are necessary for the company's own performance.

4.1.2 Protection of building and plant components against contamination and damage during masonry work by loosely covering, hanging or wrapping them with building protection films up to 0.2 mm thick, except for protective measures according to section 4.2.26.

4.1.3 Manufacture, maintain and dismantle the covers and fencing of openings during their own period of use. During their own period of use, the facilities can also be used by other entrepreneurs. The Client must be notified in writing immediately of the completion of the own use and of the intended dismantling. A transfer of use, maintenance and inspection and subsequent dismantling beyond the duration of one's own use are special services according to section 4.2.27.

4.1.4 Leaving out and bricking up all scaffolding holes required for the execution of one's own services.

4.1.5 Leaving out cleaning openings and pipe openings in masonry chimneys.

4.1.6 Walling and grouting of beam and beam heads and other structural elements that are installed in the course of the company's own work, with the exception of grouting during steel construction work.

4.1.7 Preparation of the mortar and provision of the necessary equipment.

4.1.8 Presentation of sample stones.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 Services that go beyond section 4.1.1, e.g. shoring for

- Ceiling slabs, ≥ 0.3 m2 cross-sectional area per metre of width or
- Beams, ≥ 0.5 m2 cross-sectional area or
- Components with a clear span ≥ 6.0 m or
- Components whose underside is ≥ 3.50 m above the installation surface of the shoring system.

4.2.2 Performance to meet increased requirements for flatness or dimensional accuracy (see section 3.1.3).

4.2.3 Compensation of larger unevenness and dimensional deviations of the substrate than permissible according to DIN 18202.

4.2.4 Smooth lines on reveals, lintels and parapets, e.g. for the installation of windows, doors and upper wall closures.

4.2.5 Assembly, conversion and dismantling as well as provision of scaffolding for the services of other entrepreneurs.

4.2.6 Provision of lifting equipment, lifts, recreation and storage rooms, facilities and the like for the purposes of other entrepreneurs.

4.2.7 Preparation of building physics verifications as well as static calculations and the drawings required for these verifications.

4.2.8 Making and closing recesses.

4.2.9 Covering recesses with lintels, roller shutter boxes, vaults and relief arches.

4.2.10 Insertion of built-in parts, e.g. chimney cleaning doors and door and window frames.

4.2.11 Supply, cutting and installation of sectional steel.

4.2.12 Cutting, bending and installation of reinforcing steel.

4.2.13 Manufacture of movement and apparent joints as well as joint seals.

4.2.14 Closing of the gap at openings in double-shell masonry.

4.2.15 Interception of the outer shells in the case of double-shell outer walls.

4.2.16 Manufacture of door and window pillars in wall masonry if they are ≤ 50 cm and the openings on either side of these pillars are not measured in accordance with section 5.3.1.

4.2.17 Manufacture of reveals for exposed and facing masonry as well as sills, cornices and bands, including any cantilevers.

4.2.18 Manufacture of obtuse or acute-angled corners with shaped bricks or with cut masonry blocks.

4.2.19 Manufacture of masonry slopes, e.g. as the upper end of gable walls.

4.2.20 Creation of transverse slopes in masonry crowns.

4.2.21 Manufacture of masonry coverings, e.g. by rolling layers.

4.2.22 Manufacture of ceiling walls.

4.2.23 Services for fire, sound, heat, humidity and radiation protection.

4.2.24 Precautionary and protective measures for masonry in frost.

4.2.25 Production of sample surfaces, sample constructions.

4.2.26 Special protection of building and plant components beyond section 4.1.2 as well as of furnishings, e.g. masking of windows, doors, floors, coverings, stairs, wood, roof surfaces, finished surface parts, dust-proof masking of sensitive equipment and technical equipment, dust protection walls, emergency roofs, laying of hardboard or building protection films from 0.2 mm thick.

4.2.27 Transfer of use, maintenance and inspection of covers and fencing of openings beyond their own useful life and subsequent dismantling.

4.2.28 Cleaning the substrate of coarse soiling, e.g. plaster residues, mortar residues, paint residues, oil, insofar as this was not caused by the Contractor.

5.2 Determination of dimensions/quantities

5.2.1 Wall masonry is calculated from the top of the raw ceiling to the bottom of the raw ceiling.

5.2.2 The height of masonry with a cross-section of the wall beveled at the top is calculated up to the highest edge.

5.2.3 In the case of wall penetrations, only one wall is taken into account throughout, in the case of walls of unequal thickness, the thicker wall.

5.2.4 In the settlement of vaults, the dimensions of the unfolded soffit shall be taken as a basis.

5.2.5 In the case of billing according to the length measure, components such as

- Reveals for exposed and facing masonry, sills, cornices, bands, lintels, vaults, relief arches, cantilevers, rolling layers, masonry slopes and masonry steps in their greatest length,
- Supports for masonry shells measured in the greatest length of the intercepted component.

5.2.6 Chimneys are measured in their axis.

5.2.7 If a recess is proportionately integrated into adjacent areas that are to be calculated separately, the respective proportionate recess area is calculated to determine the overmeasurement variable.

5.2.8 Directly connected, different types of recesses, e.g. opening with adjacent niche, are counted separately.

5.3 Overmeasurement rules

The following are measured:

5.3.1 When billed according to area

Fugues

- lintels, roller shutter boxes, vaults and relief arches,
- recesses ≤ 2.5 m2 individual size, such as openings (also floor-to-ceiling), niches and penetrations, e.g. of ceiling tiles, cantilever slabs; when determining the individual size, the smallest dimensions of the recess are to be taken as a basis,
- Recesses ≤ 0.5 m2 individual size for floor coverings made of flat or rolled layers,
- Interruptions of the masonry surface ≤ 30 cm by rod-shaped components, e.g. by trusses, columns, templates.

5.3.2 When billing according to length

- Interruptions ≤ 1 m individual length.

5.4 Individual provisions

5.4.1 The mass of the reinforcement is calculated according to steel lists. For standardised section steels, the information in the DIN standards applies, for other steels the information in the manufacturer's profile book.

5.4.2 Door and window pillars in wall masonry are calculated separately if they are ≤ 50 cm and the openings on either side of these pillars are not measured in accordance with section 5.3.1. Otherwise, they are considered wall masonry.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Concrete work — DIN 18331

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 Foundation depths, types of foundations and loads of neighbouring structures.

0.1.2 Formation of construction pits.

0.1.3 Type, location and design of adjacent components against which concrete is to be poured.

0.1.4 Type, location, dimensions and design as well as dates for the assembly and dismantling of on-site scaffolding.

0.1.5 Exposure to wind.

0.2 Information on the execution

0.2.1 Number, type, location and dimensions of the components, inter alia according to component definitions in Table A.1, separated by concrete, formwork and reinforcement.

0.2.2 Requirements and specifications according to DIN EN 1992-1-1 "Eurocode 2: Design and construction of reinforced concrete and prestressed concrete structures — Part 1-1: General design rules and rules for building construction" in conjunction with DIN EN 1992-1-1/NA "National Annex — Nationally determined parameters — Eurocode 2: Design and construction of reinforced concrete and prestressed concrete structures — Part 1-1: General design rules and rules for building construction", DIN EN 1992-1-2 "Eurocode 2: Design and construction of reinforced concrete and prestressed concrete structures — Part 1-2: General rules — Structural design in the event of fire" in conjunction with DIN EN 1992-1-2/NA "National Annex — Nationally determined parameters — Eurocode 2: Design and construction of reinforced concrete and prestressed concrete structures — Part 1-2: General rules — Structural design in the event of fire", DIN EN 1992-2 "Eurocode 2: Design and construction of reinforced concrete and prestressed concrete structures Prestressed concrete structures — Part 2: Concrete bridges — Design and construction rules' in conjunction with DIN EN 1992-2/NA 'National Annex — Nationally defined parameters — Eurocode 2: Design and construction of reinforced concrete and prestressed concrete structures — Part 2: Concrete bridges — Design and construction rules', DIN EN 1992-3 'Eurocode 2: Design and construction of reinforced concrete and prestressed concrete structures — Part 3: Concrete silos and tank structures' in conjunction with DIN EN 1992-3/NA 'National Annex — Nationally defined parameters — Eurocode 2: Design and construction of reinforced concrete and prestressed concrete structures — Part 3: Concrete silos and container structures', construction documentation, including type of concrete, hardened concrete properties, exposure class, moisture class, compressive strength class, water penetration resistance.

0.2.3 Use of Concrete of special composition, e.g. lightweight concrete, fibre concrete, concrete with added paint, concrete with white cement, Concrete of special production, e.g. vacuum concrete, underwater concrete.

0.2.4 In the case of concrete surfaces that remain visible, etc.

- classification of the visible surfaces,
- Surface texture, if necessary description of the formwork and formwork system, surface formation of non-peeled partial surfaces
- Colour tint
- Area division,
- Formation of joints, edges, anchors and anchor holes as well as formwork joints,
- Reinforcement connections for integrating components,
- Increased requirements for the ceiling soffit and the resulting services, e.g. to protect against falling flash rust,
- Number of test plots, selection of the reference plot.

0.2.5 Single-sided formwork, doubling, e.g. formliners, special formwork process.

0.2.6 Type, location, dimensions, drawing, design and execution of shoring for structures in accordance with section 4.2.6.

0.2.7 Shared use of scaffolding by other companies, special requirements.

0.2.8 Conversion of scaffolding for the purposes of other entrepreneurs.

0.2.9 Provision of scaffolding, covers, fencing and the like beyond the user's own service life.

0.2.10 Inclination, curvature and height changes of surfaces.

0.2.11 Quantities, grades and dimensions of reinforcing and prestressing steel. Use of special steels. Corrosion protection. Special bending shapes, e.g. spirals, loops.

0.2.12 Special features of reinforcement routing, e.g. locally increased reinforcement degree for slab beams, and special features of reinforcement joints, e.g. welded and screw connections, storage boxes.

0.2.13 Number, type, position, dimensions and formation of recesses and the like.

0.2.14 Number, type, location, dimensions and masses of built-in parts, e.g. anchor channels for elevator systems.

0 0.2.15 Number, type, position, dimensions and formation of working, moving, inhibited, structural and component joints, formation of formwork joints as well as terminations and connections to adjacent components.

0.2.16 Number, type, location, dimensions and design of jointless concrete surfaces.

0.2.17 Specifications for concreting against existing components, e.g. maximum climbing speed during concreting.

0.2.18 Type, design and dimensions of sloping ceilings, walls, beams and beams and beams, coves as well as of consoles and profiles protruding from the surface.

0.2.19 Making obtuse or acute-angled corners.0

0.2.20 Increased concrete coverage of the steel inserts, e.g. for stone processing.

0.2.21 Requirements for spacers.

0.2.22 Type, nature and strength of the substrate, e.g. type, thickness and compressibility of insulating, separating and protective layers, waterproofing.

0.2.23 Formation of the components and condition of the surface of the concrete, e.g. for sealing, coatings, wallpapering.

0.2.24 Requirements for the post-treatment of concrete and special features of the use of release agents and post-treatment agents, among other things.

0.2.25 Surface formation and treatment of non-peeled surfaces.

0.2.26 Requirements for fire, sound, heat, humidity and radiation protection

0.2.27 Requirements arising from the installation of electrical installations, e.g. earthing and lightning protection systems.

0.2.28 Formation of pile base widenings and pile heads and their reinforcements.

0.2.29 Mechanical, chemical and dynamic stresses to which substances and components are exposed during and after installation.

0.2.30 Services to compensate for unevenness in the subsoil. 0.2.31 Protection of components or installations and the like.

0.2.32 Early or subsequent production of parts of the service.

0.2.33 Specifications resulting from expert reports.

0.2.34 Position and design of plain bearings.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

- Section 3.1.2 if tolerances other than those specified therein are to apply,
- Section 3.2, if special requirements are to be placed on the assembly, mixing, processing and post-treatment of the concrete in order to achieve the required properties,
- Section 3.3, if a certain type or design is to be used for the formwork,
- Section 3.3, if special requirements are placed on the concrete surfaces, e.g. exposed concrete, stone processing, broken edges, deburring,
- Section 3.3, if peeled surfaces of concrete are to be processed after stripping, e.g. for plaster adhesion

0.4 Individual information on fringe benefits and special benefits

In particular, the following can be considered as ancillary services for which special ordinal numbers (items) are to be provided under the conditions of ATV DIN 18299, Section 0.4.1:

- Assembly, conversion and dismantling as well as provision of the working and protective scaffolding as well as the shoring (see section 4.1.2),
- protection of the concrete against the effects of the weather until it has sufficiently hardened (see section 4.1.6),
- Preparation of static deformation calculations and drawings for auxiliary structures (see section 4.1.8),
- Making and maintaining covers and enclosures (see section 4.1.9).

0.5 Billing Units

In the bill of quantities, the billing units are to be provided as follows:

0.5.1 Volume dimensions (m3), separated by type and dimensions, for

- massive components, e.g. foundations, retaining walls, abutments, infill and overcast concrete,
- bridge superstructures, piers,
- Precautionary and protective measures (heating of the concrete).

0.5.2 Area (m2), separated by type and dimensions, for

- cleanliness layers,

- Walls, silo and container walls, wall-like beams, parapets, attics, foundation and floor slabs, ceilings,
- cantilevers, balconies,
- prefabricated elements,
- stair plates with or without steps, stair landing plates,
- Creation of recesses and profiles,
- Closing recesses,
- insulating, separating and protective layers,
- Covers
- special designs of concrete surfaces, e.g. requirements for formwork, subsequent processing,
- Formwork
- Protective measures of the formwork or concrete surface.

0.5.3 Length (m), separated by type and dimensions, for

- Columns, pillar templates, beams, window and door lintels, beams and beams,
- cantilevers,
- prefabricated elements,
- Levels
- Creation of slits, channels, profiling,
- Closing of slots and ducts,
- Manufacture of joints including installation of joint tapes, joint plates, grouting hoses, joint fillings,
- concrete piles,
- Enclosures,
- Formwork for slab, wall and slab edges, slots, channels, profiles.

0.5.4 Number (pcs), separated by type and dimensions, for

- Columns, pillar templates, beams, window and door lintels, beams and beams,
- Finished parts, prefabricated elements with brackets, angulation and the like,
- Levels
- Creation of recesses and profiles,
- Closing recesses,
- Production of coves, support slopes, brackets,
- Built-in parts, reinforcement connections, storage boxes, dowel strips, anchor channels, connecting elements, insulated connection baskets and the like,
- Concrete piles, preparation of pile heads, foot extensions,
- Covers, enclosures,
- Formwork, e.g. for recesses, profiles, coves, brackets,
- Precautionary and protective measures, e.g. heating the formwork, thawing ice formations, enclosures,
- prefabricated moulded parts, e.g. corners and knots for joint tapes,

- Prefabricated elements with a specially machined or textured surface.

0.5.5 Mass (kg, t), separated by type and dimensions, for

- Cutting, bending and laying of reinforcements and supports,
- Built-in parts, fasteners and the like.

1 Scope of application

1.1 ATV DIN 18331 "Concrete work" applies to the manufacture of components made of reinforced or unreinforced concrete.

1.2 ATV DIN 18331 does not apply to:

- Press-fit work (see ATV DIN 18309 "Press-fit work"),
- Diaphragm wall work (see ATV DIN 18313 "Diaphragm wall work with supporting fluids"),
- Shotcrete work (see ATV DIN 18314 "Shotcrete work"), □ Superstructure layers with hydraulic binders (see ATV DIN 18316 "Traffic route construction work")
- superstructure layers with hydraulic binders"),
- cast stone work (see ATV DIN 18333 "Cast stone work"),
- Steel construction work (see ATV DIN 18335 "Steel construction work") and
- Concrete maintenance work (see ATV DIN 18349 "Concrete maintenance work").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18331 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

For the most common substances and components, the DIN standards are listed below.

2.1 Concrete

DIN 1045-2:2008-08	Structures made of concrete, reinforced concrete and prestressed concrete — Part 2: Concrete — Specification, properties, manufacture and conformity — Rules of application of DIN EN 206-1
DIN EN 206-1:2001-07	Concrete — Part 1: Specification, properties, manufacture and conformity; German version EN 206-1:2000
DIN EN 1992-1-1	Eurocode 2: Design and construction of reinforced concrete and prestressed concrete structures — Part 1-1: General design rules and rules for building construction
DIN EN 1992-1-1/NA	National Annex — Nationally defined parameters — Eurocode 2: Design and construction of reinforced concrete and prestressed concrete structures — Part 1-1: General design rules and rules for building construction

DIN EN 1992-1-2	Eurocode 2: Design and construction of reinforced concrete and prestressed concrete structures — Part 1-2: General rules — Structural design in the event of fire
DIN EN 1992-1-2/NA	National Annex — Nationally defined parameters — Eurocode 2: Design and construction of reinforced concrete and prestressed concrete structures — Part 1-2: General rules — Structural design in the event of fire

2.2 Reinforcing steel

DIN 488-1	Reinforcing steel — Part 1: Steel grades, properties, marking
DIN 488-2	Reinforcing steel — Reinforcing steel DIN 488-4 Reinforcing steel — Reinforcing steel meshes

2.3 Wall, roof and ceiling panels

DIN 4166	Aerated concrete building boards and aerated concrete flat building boards
DIN 4213	Application of Prefabricated Reinforced Components of Lightweight Concrete in Buildings
DIN 4223 (all parts)	Application of prefabricated reinforced components made of steam-hardened aerated concrete
DIN EN 1520	Prefabricated Components of Lightweight Concrete with Bulk Pores and with Structurally Chargeable or Non-Chargeable Reinforcement

2.4 Intermediate components for ceilings, ceiling tiles, concrete glass and concrete windows

DIN 4159	Bricks for Brick Ceilings and Grouting Panels, Statically Contributing
DIN EN 1051-1	Glass in construction — Glass blocks and concrete glass — Part 1: Terms and descriptions
DIN EN 15037-2	Precast concrete elements — Beam slabs with intermediate components — Part 2: Intermediate concrete components
DIN EN 15037-3	Precast concrete elements — Beam slabs with intermediate components — Part 3: Ceramic intermediate components

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 The following shall apply in particular to the execution:

DIN 1045-2:2008-08	Structures made of concrete, reinforced concrete and prestressed concrete — Part 2: Concrete — Specification, properties, manufacture and conformity — Rules of application of DIN EN 206-1
DIN 1045-3	Structures made of concrete, reinforced concrete and prestressed concrete — Part 3: Construction — Rules of application according to DIN EN 13670
DIN 1045-4	Structures of concrete, reinforced concrete and prestressed concrete — Part 4: Supplementary rules for the manufacture and conformity of precast elements
DIN 1054	Subsoil — Safety Verification in Earthworks and Foundation Engineering — Supplementary Regulations to DIN EN 1997-1
DIN 4030-1	Assessment of concrete-attacking waters, soils and gases — Part 1: Principles and limit values
DIN 4030-2	Assessment of concrete-attacking waters, soils and gases — Part 2: Sampling and analysis of water and soil samples
DIN 4213	Application of prefabricated reinforced components made of porous lightweight concrete in buildings
DIN EN 206-1:2001-07	Concrete — Part 1: Specification, properties, manufacture and conformity; German version EN 206-1:2000
DIN EN 445	Grouting Mortars for Tendons — Test Methods
DIN EN 446	Grout for Tendons — Grouting Method
DIN EN 447	Grouting mortars for tendons — General requirements
DIN EN 1536	Execution of work in special civil engineering — Bored piles
DIN EN 12699	Execution of work in special civil engineering — Displacement piles
DIN EN 13670	Design of concrete structures
DIN EN ISO 17660-1	Welding — Welding of reinforcing steel — Part 1: Load-bearing welded joints
DIN EN ISO 17660-2	Welding — Welding of reinforcing steel — Part 2: Non-structural welded joints

3.1.2 Deviations from prescribed dimensions shall be permitted in the

DIN 18202	Tolerances in Building Construction — Structures

certain limits.

If flatness requirements are higher than DIN 18202:2013-04, Table 3, lines 1 or 5, or other increased requirements for dimensional accuracy compared to the values listed in the said standard, the required services are special services (see section 4.2.4).

The tolerances according to DIN EN 13670 in conjunction with DIN 1045-3 apply to the laying of the reinforcement.

3.1.3 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- Deviations of the portfolio from the specifications,
- insufficient foundation areas, e.g. loosened bottom,
- lack of reference points,
- insufficient working space,
- Reinforcement that is too narrow (lack of concreting opening, vibrating lanes).

3.2 Making the concrete

It is up to the contractor how to produce, mix, process and post-treat the concrete to achieve the required properties.

3.3 Formwork and concrete surfaces

The choice of formwork in terms of type and design is left to the contractor. Unpeeled surfaces must be peeled off raw. Peeled surfaces of the concrete remain unprocessed after stripping.

Formwork blocks as lost formwork must be processed in a stable manner during construction.

The location of construction joints must be agreed with the client.

3.4 Exposed concrete

Exposed concrete surfaces must be constructed in accordance with the requirements of DIN 1045-3:2012-03, Section 2.8.9.

4 Ancillary services, special services

4.1 **Ancillary services** are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 The compensation of minimum heights of the subsoil ≤ 3 cm, in relation to the target dimension.

4.1.2 Assembly, conversion and dismantling as well as provision of working and protective scaffolding as well as shoring scaffolding of design class A according to DIN EN 12812 "Shoring scaffolding — Requirements, dimensioning and design", insofar as these scaffolding are necessary for the company's own performance.

4.1.3 Protection of building and plant components against contamination and damage during concrete work by loosely covering, hanging or wrapping with building protection films up to 0.2 mm thick, except for protective measures according to section 4.2.3.

4.1.4 Removal of contamination of the connection surfaces by damp sweeping.

4.1.5 Making connections during the installation of precast concrete elements with the exception of joint sealing, insofar as the installation of precast concrete elements is part of the services provided by the Contractor.

4.1.6 Protection of the concrete against the effects of the weather until it has sufficiently hardened, except for the services referred to in section 4.2.10.

4.1.7 Services for the verification of the quality of the materials and components as well as the monitoring and conformity of the concrete in accordance with the provisions of DIN EN 206-1:2001-07 in conjunction with DIN 1045-2:2008-08, DIN 1045-3 in conjunction with DIN EN 13670, DIN EN 1992-1-1 in conjunction with DIN EN 1992-1-1/NA, DIN EN 1992-1-2 in conjunction with DIN EN 1992-1-2/NA, with the exception of services for monitoring the installation of concrete of monitoring classes 2 and 3 by recognised monitoring bodies.

4.1.8 Preparation of static deformation calculations and drawings for auxiliary constructions, insofar as these are necessary for one's own performance.

4.1.9 Manufacture, maintain and dismantle the covers and fencing of openings during their own period of use. During their own period of use, the facilities can also be used by other entrepreneurs. The Client must be notified in writing immediately of the completion of the own use and of the intended dismantling. A transfer of use, maintenance and control and subsequent dismantling beyond the duration of one's own use are special services according to section 4.2.7.

4.1.10 Supply and installation of accessories for prestressing reinforcement, e.g. ducts, clamping heads, coupling pieces, grouts, as well as clamping and grouting.

4.2 **Special services** are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 The compensation of minimum heights of the subsoil > 3 cm, in relation to the target dimension.

4.2.2 Cleaning the substrate of coarse soiling, e.g. plaster residues, mortar residues, paint residues, oil, insofar as this was not caused by the Contractor.

4.2.3 Special protection of building and plant components beyond section 4.1.3, as well as of furnishings, e.g. masking of windows, doors, floors, coverings, stairs, wood, roof surfaces, surface-finished parts, dust-proof masking of sensitive equipment and technical equipment, dust protection walls, emergency roofs, laying out and fixing of hardboard or building protection films with a thickness of 0.2 mm or more.

4.2.4 Performance to meet increased requirements for flatness and dimensional accuracy (see section 3.1.2).

4.2.5 Soil and water investigations.

4.2.6 Services that go beyond section 4.1.2, e.g. shoring for

- Ceiling slabs, ≥ 0.3 m2 cross-sectional area per metre of width or
- Beams, ≥ 0.5 m2 cross-sectional area or
- Components with a clear span ≥ 6.0 m or

- Components whose underside is ≥ 3.50 m above the installation surface of the shoring system.

4.2.7 Transfer of use, maintenance and inspection of covers and fencing of openings beyond their own useful life and subsequent dismantling.

4.2.8 Provision of hoists, lifts, recreation and storage rooms, facilities and the like for the purposes of other entrepreneurs.

4.2.9 Preparation of building physics verifications as well as static calculations and the drawings required for them.

4.2.10 Precautionary and protective measures for concreting at air temperatures below 5 °C and at air temperatures above 30 °C on average over a period of 48 hours before concreting.

4.2.11 Making and closing recesses.

4.2.12 Profiling.

4.2.13 Manufacture of coves, support slopes, obtuse or acute-angled corners and brackets.

4.2.14 Insertion of built-in parts, e.g. bearings, frames, anchors, fasteners, pipes, dowels.

4.2.15 Manufacture of movement, façade, building and component joints as well as joint sealing.

4.2.16 Supervision of the installation of concrete of monitoring classes 2 and 3 by recognised monitoring bodies as well as additional services beyond the services referred to in section 4.1.7.

4.2.17 Services for protection against effects damaging the bond, e.g. due to external vibrations during installation and curing.

4.2.18 Services for achieving a concrete surface beyond the requirements of section 3.3. Creation of test and reference areas.

4.2.19 Removal of the required concrete of the pile head to the planned height, including preparation of the connecting reinforcement.

4.2.20 Services for the removal of excess concrete on the pile shafts, e.g. chiseling, milling.

4.2.21 Services for fire, sound, heat, humidity and radiation protection.

4.2.22 Preparatory services for earthing and lightning protection systems.

4.2.23 Assembly, conversion and dismantling as well as provision of scaffolding for the services of other entrepreneurs.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 Concrete 5.1.1 General The determination of the performance — regardless of whether it is carried out according to drawings or measurements — shall be based on:

- for concrete components, their dimensions,
- for components with stone machining, the dimensions that the components had before machining,
- for specially processed or textured surfaces, the dimensions of the specially processed surfaces.

To determine performance, the simplifying rules, such as overmeasurement rules, are to be applied.

The component definitions according to Table A.1 shall be used as a basis for determining the performance.

5.1.2 Determination of the dimensions

5.1.2.1 Components whose cross-section has a bevelled or profiled head surface (end surface), e.g. components with notches for ceiling supports and the like, parapets with a sloping top, shall be calculated with the dimensions of their larger visible surface.

5.1.2.2 Inclined or curved ceilings are calculated with their actual dimensions.

5.1.2.3 Ceilings and cantilevers shall be calculated between their boundary surfaces.

5.1.2.4 If concrete components are structurally separated from each other by specified joints or in some other way, each component shall be calculated with its actual dimensions.

5.1.2.5 On Penetrations

- of walls only one wall is calculated, in the case of unequal thickness the thicker,
- of beams and beams, only one beam or beam shall be calculated, in the case of unequal height the higher beam, and in the case of the same height the wider beam.

5.1.2.6 For Integrations

- of walls, pillar templates and columns in ceilings, the height from the top of the raw ceiling or foundation to the bottom of the raw ceiling is calculated,
- of beams or beams in walls, the walls are measured,
- of columns in beams or beams, the beams and beams are measured if they are wider than the columns. In this case, the supports are calculated up to the underside beam or beam.

5.1.2.7 In the case of lintels and beams, the height is calculated from the bottom of the ceiling tile to the bottom of the ceiling tile, and in the case of coverings, from the top of the ceiling tile to the top of the covering.

5.1.2.8 In the area of ceiling offsets, components that are structurally designed like beams or beams are also counted as such. Overlapping areas between underlay and cover are calculated only once.

5.1.2.9 Joint tapes, joint plates and the like shall be calculated according to their greatest length, e.g. in the case of bevel cuts, mitres. Moulded parts are calculated by piece.

5.1.2.10 Precast concrete piles are calculated from the planned top of the pile head, in-situ concrete piles from the top after processing, to the prescribed bottom of the pile base or pile tip. In the case of cast-in-place concrete piles, additional quantities of concrete up to 10% above the theoretical amount are not taken into account.

5.1.3 Overmeasurement rules

5.1.3.1 General

Quantities of concrete displaced by the reinforcement, e.g. reinforcing bar steels, section steels, prestressed concrete reinforcement with accessories, anchor channels and moulded parts and joint tapes, as well as piling heads, rolled sections and sheet piling walls embedded in concrete, are not removed

The following are measured:

5.1.3.2 When billed according to room size

- recesses, cassettes, hollow bodies and the like ≤ 0.5 m3 individual size,
- however, slots, ducts, profiles and the like ≤ 0.1 m3 per m length, penetrating or integrating components, e.g. individual beams, beam webs for slab beam ceilings, columns, built-in parts, precast concrete elements, roller shutter boxes, pipes, ≤ 0.5 m3 individual size, if they are structurally delimited by specified concreting joints or in some other way; a component is also considered to be any component composed of individual parts, e.g. window and door frames, window and door lintels, cornices,
- built-in insulation layers and the like.

5.1.3.3 When billing according to area

- recesses ≤ 2.5 m2 individual size, the smallest dimensions of the recess are to be used as a basis for determining the individual size,
- joints, built-in insulation layers and the like.

5.1.3.4 When billing by length

- Moulded parts and prefabricated knots and corners of joint tapes, joint plates and the like.

5.2 Formwork

5.2.1 General

The determination of the performance — regardless of whether it is carried out according to drawings or measurements — shall be based on the processing of the formed surfaces.

To determine performance, the simplifying rules, such as overmeasurement rules, are to be applied.

5.2.2 Determination of the dimensions

5.2.2.1 Slab formwork is calculated between boundary components (e.g. walls, beams or beams) according to the formed surfaces of the ceiling slabs. The formwork of exposed boundary sides of the slab is calculated separately.

5.2.2.2 Formwork for recesses and for profiling is calculated in the settlement according to the area dimension in the handling of the formed concrete surface.

5.2.3 Overmeasurement rules

The following are measured:

- recesses, connections of components and the like ≤ 2.5 m2 individual size, the smallest dimensions of the recess are to be used as a basis for determining the individual size,
- joints, built-in insulation layers and the like.

5.3 Reinforcement

5.3.1 Determination of mass

5.3.1.1 The mass of the reinforcement is calculated according to the steel lists. The mass of the reinforcement also includes the supports, e.g. steel trestles, support cages, lattice girders for composite components, plug-in brackets and position securing for interior walls (e.g. S-hooks), spiral reinforcements, bracing, replacements, assembly irons, but not accessories for post-tensioning reinforcement in accordance with section 4.1.10.

5.3.1.2 The calculated mass shall be decisive. For standardised steels, the information in the DIN standards applies, for other steels the information in the manufacturer's profile book.

5.3.1.3 Binding wire, rolling tolerances and offcuts are not taken into account when determining the settlement masses. However, when invoicing reinforcing steel mesh, a waste for which the contractor is not responsible, the mass of which is more than 10% of the mass per mesh type of the installed reinforcing steel mesh, is additionally calculated.

5.4 Individual provisions

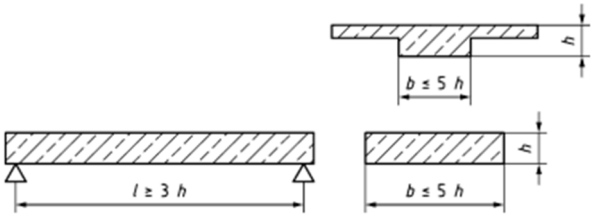
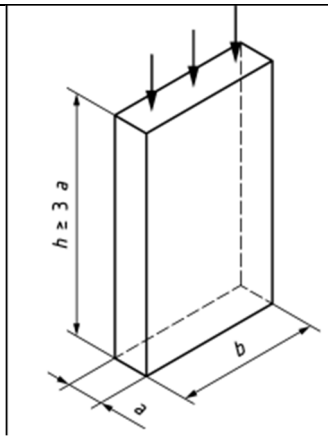
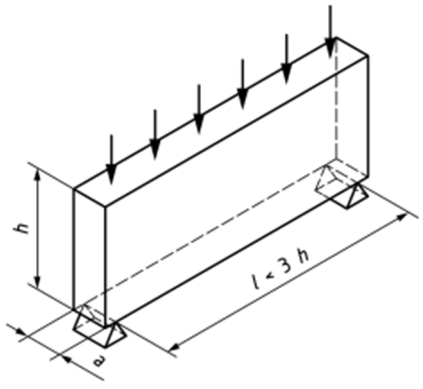
No individual regulations.

Appendix A

(regulatory)

Component Definitions

Table A.1 — Component definitions

Component	Representation
Beam/Plate – A beam is a rod-shaped component that is subjected to bending and has a span of at least three times the cross-sectional height and a cross-section or web width of no more than five times the cross-sectional height. In the case of larger widths, it is a plate.	 **Picture A.1 – Beam, Plate**
Column/Wall – A column is a rod-shaped compression link whose larger cross-sectional dimension does not exceed four times the smaller and whose total height is at least three times the smaller cross-sectional dimension. In the case of larger widths, it is a wall.	 **Wall** b > 4 a **Support** B ≤ 4 a **Figure A.2 – Column / Wall**
Wall-type beam – a plane-like disc-like component subjected to forces parallel to the central surface, subjected primarily to bending, the span of which is less than three times its cross-sectional height.	 **Figure A.3 — Wall-like beam**

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Natural stone work — DIN 18332

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

No supplementary regulation to ATV DIN 18299, section 0.1.

0.2 Information on the execution

0.2.1 Stone type by petrographic family and geographical origin, trade name, the required technical values and basic colour.

0.2.2 Dimensions (if necessary in unfolding) and profiles of the panels and workpieces, in the case of sheet coverings, the minimum and maximum formats of the panels. Type and dimensions of chamfers on the edges of the plates and workpieces.

0.2.3 Load, material strength, laying technique, panel format and panel thickness, if necessary according to the specifications of the static calculation.

0.2.4 Type, process and degree of surface treatment of the surfaces to be processed, e.g.

- polished
- ground, e.g. finely ground, coarsely ground,

- spaltrau,
- sauna, e.g. diamond-sauna,
- steel sandsawn,
- blasted, e.g. sandblasted, waterblasted,
- flamed,
- brushed
- scratched,
- free from blow,
- bush-hammered, e.g. plate-bushed,
- geriffelt,
- serrated
- hatcheted,
- area,
- crowned,
- pointed
- cheated,
- bossed. Type of processing, e.g. manual or mechanical.

0.2.5 Restrictions on colour, texture and texture variations according to a sampling.

0.2.6 Type and extent of surface treatment of visible edges, visible surfaces, backsides, soffits, heads or chamfers.

0.2.7 Permissibility of fours and reinforcements, e.g. with clamps, rails, dowels, in the case of natural stone with cracks caused by formation and low intrinsic strength.

0.2.8 Type and scope of installation and assembly plans to be drawn up.

0.2.9 Type and scope of graphic evidence, building mapping and photo documentation.

0.2.10 Type and scope of monument preservation requirements.

0.2.11 Specifications resulting from expert reports.

0.2.12 Preparation of static calculations and information on their type and scope.

0.2.13 Requirements for fire, sound, heat and moisture protection.

0.2.14 Physical stresses, e.g. live loads, additional loads caused by transport equipment or cleaning machines, impact loads, point loads.

0.2.15 Chemical stresses caused by e.g. salty air, de-icing salts, cleaning and care products.

0.2.16 Type, position, dimensions and formation of movement, structure, component and apparent joints.

0.2.17 The number, type, location and dimensions of coverings or cladding to be installed inside or outside buildings in the mortar bed.

0.2.18 The number, type, location and dimensions of coverings or cladding to be installed inside or outside buildings in the middle bed or in the thin bed with increased requirements for the thickness limit, e.g. calibrated panels.

0.2.19 Number, type, position and dimensions of coverings and cladding to be laid on inclined or rounded surfaces.

0.2.20 Number, type, position and dimensions of cladding to be manufactured as soffits of lintels, ceilings, vaulted ceilings and sloping ceilings.

0.2.21 Type and extent of subsequent sanding work on coverings and cladding.

0.2.22 Indication of installation heights and installation location.

0.2.23 Number, type, location and dimensions of coverings and wall coverings to be produced in rooms with special installations, e.g. in bathrooms, kitchens.

0.2.24 Number, type, location and dimensions of special components, e.g. counters, columns, pillars.

0.2.25 Number, type, location and dimensions of floor coverings with a special type of laying and design, e.g. diagonal laying, Roman bonding, friezes, inserts, dimension plates for certain area sizes, continuous joints.

0.2.26 Number, type, location and dimensions of natural stone masonry.

0.2.27 Type, nature and strength of the load-bearing substrate, e.g. concrete, screed, masonry, steel or drywall construction.

0.2.28 Type and layer thicknesses of the construction structure of floor coverings, e.g. moisture seals, thermal and impact sound insulation layers, screed, covering, type of underfloor heating, location of heating pipes or heating elements, position of heating circuits, location and design of movement joints.

0.2.29 Type and structure, type of anchoring and substructure of cladding.

0.2.30 Type and thickness of the concealed plaster.

0.2.31 Type and execution of bonding bridges, primers, spraying, roughening of the substrate.

0.2.32 Type and design of attachment and installation surfaces for medium- and thin-bed methods.

0.2.33 Formation of slopes.

0.2.34 Type and design of drainage, e.g. drainage layers, drainage mats, floor drains, drainage channels.

0.2.35 Type of connections to other components and fittings.

0.2.36 Type, design and dimensions of stairs, steps, contrasting stripes, thresholds, overhangs and visible side surfaces (heads) and soffits.

0.2.37 Type, design and dimensions of covers, e.g. window sills, and their protrusions, visible side surfaces (heads), soffits, slopes and water grooves; Type of load and fastening.

0.2.38 Information on anti-slip and tactile properties of floor coverings.

0.2.39 Size and number of notches, recesses, folds, grooves, mitres, holes.

0.2.40 Type, dimensions and design of skirting boards, e.g. flush with plaster, protruding, offset to gauges.

0.2.41 Type and dimensions of installation and installation components.

0.2.42 Type and width of joints, type and colour of grout and joint sealants.

0.2.43 Protection of installed components of other trades.

0.2.44 Special protection of the service performed.

0.2.45 Profile, format, processing and number of pieces of the required samples and the restoration mortar.

0.2.46 Number, type and dimensions of samples, e.g. surface and colour samples, sample areas. Place of installation.

0.2.47 Early or subsequent production of partial areas or parts of the service.

0.2.48 Type and scope of cleaning of natural stone surfaces, e.g. □ brushing, □ sanding, □ blasting processes, e.g. steam, wet, dry, low-pressure processes, □ dry ice processes, □ ultrasonic processes, □ laser processes, □ chemical processes.

0.2.49 Requirements for the exchange of data by electronic means.

0.2.50 Type and design of fours, e.g. straight or curved, on a flat or profiled surface, type of fastening.

0.2.51 Type and execution of applications with restoration mortar, e.g. straight or curved, on a flat or profiled surface, type of fastening.

0.2.52 Type and execution of crack rehabilitation.

0.2.53 the nature and implementation of conservation measures, e.g. strengthening, hydrophobic and salt reduction; Information on the application, e.g. by stroking, flooding, full soaking, injecting or compressing method.

0.2.54 Art und Ausführung von zu sanierenden Fugen, z. B. Breite, Ausräumtiefe, Reinigung, Schließen der Hohlräume; Angaben zur Art des Verfugungsmaterials.

0.2.55 Art und Ausführung der handwerklichen Bearbeitung und farblichen Anpassung von zu restaurierenden Oberflächen.

0.2.56 Type and extent of stone replacement, e.g. full or partial format replacement.

0.2.57 Type and extent of the production of models, copies and reconstructions, e.g. handcrafted replicas, casts.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 2.1.2	if different limit dimensions are to apply to plates and workpieces, if certain limit dimensions are to apply to split and hand-edged plates and workpieces,

Section 2.1.3	if different flatness tolerances are to apply to plates and workpieces with a ground or polished surface,
Section 3.2.1,	if panels and workpieces are to be laid in deviation from the intended regulation,
Section 3.2.3	if other binders, mortars, mixing ratios and adhesives are to be used,
Section 3.2.4	if other mortar bed thicknesses are to be produced for cladding and coverings,
Section 3.3.3	if cladding and coverings with different joint widths are to be applied,
Section 3.3.5	if materials other than grey hydraulically setting grout are to be used for grouting
Section 3.3.7,	if grouting is not to be carried out by slurry,
Section 3.4.1	if specific joint spacing for movement joints is to be applied to floor coverings.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units are to be provided as follows:

0.5.1 Area (m2), separated by type and dimensions, for

- levelling layers,
- reinforcements, load-bearing and substructures,
- floor coverings, ceiling and wall coverings,
- Insulation layers, separation layers,
- Exterior wall cladding,
- window sills, cover plates,
- cladding on columns, pillars and pilaster strips,
- free-standing walls,
- Subfloors with and without fills,
- Veneered masonry,
- Ashlar masonry
- Pre-treatment of the substrate,
- Surface treatment, cleaning of surfaces.

0.5.2 Volume dimensions (m3), separated by type and dimensions, for

- Veneered masonry,
- Ashlar masonry
- Fours with a size ≥ 0.03 m3 for maintenance work,
- Workpieces.

0.5.3 Length (m), separated by type and dimensions, for

- Cover plates, water noses,

- Processed front and side surfaces as well as soffits,
- Stop, separator, corner protection and anchoring rails,
- Movement and connection joints with joint sealants or profiles, joint maintenance,
- Corner formations for facing and ashlar masonry, thickened visible edges,
- corner formations with two-sided mitre cuts,
- corner and edge plates,
- Folds, mitres, grooves, profiles,
- cornices, window sills, door and window frames,
- Contrast stripes,
- Oblique and non-angled cuts,
- Skirting
- Steps and thresholds.

0.5.4 Number (pcs), separated by type and dimensions, for

- Working on bent components that are not right-angled and do not limit perpendicular and alignment,
- Anchor pockets for concealed anchors,
- machined side views (side heads), profile returns, offsets,
- Holes, notches, recesses, recesses,
- Installation of stop rails, separation rails and corner protection rails, mat frames, angle frames, grates and supporting structures for other installation parts,
- Workpieces,
- pillars, columns and pilaster strips,
- Wasserrillen,
- steps, thresholds, stepped and sloping skirting boards,
- Vierungen,
- repairs with restoration mortar during maintenance work,
- Installation and installation parts.

1 Scope of application

1.1 ATV DIN 18332 "Natural stone work" applies to the processing of natural stone as well as the laying and relocation of tiles, slabs and workpieces made of natural stone. It also applies to facing, facing and ashlar masonry made of natural stone.

1.2 ATV DIN 18332 does not apply to

- the production of paving surfaces and slab coverings as well as drainage channels and edging made of natural stone or natural stone with water-permeable underneath
  - Base courses without binders,
  - Base courses with hydraulic binders,
  - Asphalt base courses

  (see ATV DIN 18318 "Paving surfaces and slab coverings, edgings") and

- load-bearing masonry made of natural stones (see ATV DIN 18330 "Masonry work").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18332 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies: For the most common substances and components, the DIN standards and other requirements are listed below.

2.1 Natural stone

DIN 52008	Test Methods for Natural Stone — Assessment of Weathering Resistance
DIN EN 771-6	Specification for masonry blocks — Part 6: Natural stones
DIN EN 1469	Natural Stone Products — Cladding Panels — Requirements
DIN EN 12057	Natural Stone Products — Tiles — Requirements
DIN EN 12058	Natural Stone Products — Floor Slabs and Floor Coverings — Requirements
DIN EN 12059	Natural stone products — Stones for solid work — Requirements

2.1.1 Panel thicknesses

Natural stones with thicknesses ≤ 12 mm are considered tiles, with thicknesses > 12 mm and ≤ 80 mm they are considered slabs, with thicknesses above them are considered solid workpieces.

2.1.2 Limit dimensions

The limit dimensions for plates and workpieces that are not regulated in European product standards are:

a) for the thickness

- up to a thickness of 30 mm ± 10 %,
- for a thickness of more than 30 mm ± 3 mm,
- with a thickness of more than 80 mm ± 5 mm,
- in the case of composite panels, the difference in thickness at the joint is 1 mm,
- in the case of assembled workpieces, the difference in thickness at the joint is 2 mm,

b) for the length

- for a length of up to 600 mm ± 1 mm,
- for a length of more than 600 mm ± 2 mm,
- with a thickness of more than 80 mm ± 5 mm,

c) for the angle

- at a specified angle, based on the edge length, 0.2 %, maximum 2 mm.

This does not apply to split and hand-edged panels and workpieces.

2.1.3 Flatness tolerances

Deviations from the flatness of the surface of ground or polished natural stone products, which are not regulated by European product standards, must not be mehr als 0,2 % der maximum plate length, maximum 3 mm. This does not apply to rough and split surfaces.

2.1.4 Appearance

Variations in color, structure, and texture within the same occurrence are allowed. In the case of sampling, the specified bandwidth applies.

2.1.5 Repairs

Defects on sawn edges that are customary in the rock are permitted. Closing of rock pores and small defects is permitted.

Natural stone with cracks caused by formation and low intrinsic strength may be properly filled, cured and reinforced with solid plates (doubling) or reinforcement mats made of plastic, e.g. glass fleece or carbon fibre, for interior work.

In the case of solid workpieces with an unwound face area > 0.5 m2, repairs with repair mortar ≤ 100 cm2 face area or crossing pieces made of the same material ≤ 150 cm2 visible area may be used and adapted for natural defects, e.g. clay galls or coal dispersions.

2.2 Binders, aggregates, mortars, adhesives

DIN 1164-10	Cement with special properties — Part 10: Composition, requirements, proof of conformity of cement with low effective alkali content
DIN 51043	Trass — Requirements, Testing DIN EN 998-1 Specifications for mortars in masonry construction — Part 1: Plaster mortars
DIN EN 998-2	Specifications for Mortars in Masonry Construction — Part 2: Masonry Mortars
DIN EN 197-1	Cement — Part 1: Composition, requirements and conformity criteria of normal cement
DIN EN 459-1	Construction lime — Part 1: Definitions, requirements and conformity criteria
DIN EN 459-3	Construction lime — Part 3: Conformity assessment
DIN EN 12004-1	Mortars and adhesives for ceramic tiles and slabs — Part 1: Requirements, evaluation, and verification of constancy of performance, classification and marking

Aggregates must be free of harmful components.

2.3 Joints

DIN 18540	Sealing of exterior wall joints in building construction with joint sealants Joint fillers, joint sealants and joint mortar must not discolour the surface of the covering or cladding.

2.4 Insulation materials

DIN 4108-10	Thermal insulation and energy saving in buildings — Part 10: Application-related requirements for thermal insulation materials — Factory-made thermal insulation products
DIN EN 13162	Thermal insulation products for buildings — Factory made mineral wool (MW) products — Specification
DIN EN 13163	Thermal insulation products for buildings — Factory-made expanded polystyrene (EPS) products — Specification
DIN EN 13164	Thermal Insulation Products for Buildings — Factory Made Extruded Polystyrene Foam (XPS) Products — Specification
DIN EN 13165	Thermal insulation products for buildings — Factory made rigid polyurethane foam (PU) products — Specification
DIN EN 13166	Thermal insulation products for buildings — Factory made phenolic resin foam (PF) products — Specification
DIN EN 13167	Thermal Insulation Products for Buildings — Factory Made Foam Glass (CG) Products — Specification

2.5 Fasteners

DIN 18516-1	Exterior wall cladding, ventilated — Part 1: Requirements, test principles
DIN 18516-3	Exterior wall cladding, ventilated — Part 3: Natural stone — Requirements, design
DIN EN 1996-1-1	Eurocode 6: Design and construction of masonry structures — Part 1-1: General rules for reinforced and unreinforced masonry
DIN EN 1996-1-1/NA	National Annex — Nationally determined parameters — Eurocode 6: Design and construction of masonry structures — Part 1-1: General rules for reinforced and unreinforced masonry
DIN EN 1996-2	Eurocode 6: Design and construction of masonry structures — Part 2: Design, selection of building materials and execution of masonry
DIN EN 1996-2/NA	National Annex — Nationally defined parameters — Eurocode 6: Design and construction of masonry structures — Part 2: Design, selection of building materials and execution of masonry
DIN EN 1996-3	Eurocode 6: Design and construction of masonry structures — Part 3: Simplified calculation methods for unreinforced masonry structures
DIN EN 1996-3/NA	National Annex — Nationally defined parameters — Eurocode 6: Design and construction of masonry structures — Part 3: Simplified calculation methods for unreinforced masonry structures

2.6 Reinforcements

DIN 488-4	Reinforcing steel — Reinforcing steel meshes

2.7 Chemical feedstocks for repair and surface treatment

2.7.1 Chemical input materials, e.g. restoration mortars, coatings, stone consolidators, must be adapted in terms of chemical and physical properties to the natural stone to be added. They must not form shrinkage cracks when setting, must beAußenbereich UV-beständig sein und dürfen den Austausch von Wasserdampf nicht wesentlich behindern.

2.7.2 Acidic or acidic cleaning agents, e.g. fluids, solvents, fungicide solutions, paint strippers, must be set to protect the rock.

2.7.3 Impregnating agents, e.g. silanes, siloxanes, must be largely alkali-resistant and must not form a glossy or vapour-resistant film on the stone surfaces. The surface to be treated must be sufficiently dry and absorbent. Excess impregnating agents must be removed.

2.7.4 Plastic coatings on horizontal or slightly inclined surfaces must be resistant to UV rays and aggressive substances present in rainwater.

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B: □ unsuitable condition of the substrate, e.g. coarse soiling, faulty sealing, efflorescence, cracks, non-adhesive surfaces and joint flanks, □ unsuitable type, location and formation of movement joints and penetrating components, □ greater unevenness than permissible according to DIN 18202, □ lack of height reference points per storey, □ Missing, insufficient or deviating slope from the specification in the execution documents, □ Insufficient construction height, □ Lack of protrusion of the edge insulation strip, □ Insufficient dry substrate with regard to readiness for covering, □ Lack of marking of measuring points in the case of heated floor constructions, □ Lack of heating protocol in the case of heated floor constructions.

3.1.2 Deviations from prescribed dimensions are permissible within the limits specified by DIN 18202 "Tolerances in building construction — Structures". Unevenness in the surfaces of components that becomes visible in grazing light is permissible if it does not exceed the limit values according to DIN 18202. If increased requirements are placed on flatness in accordance with DIN 18202:2013-04, Table 3, line 4, or other increased requirements on dimensional accuracy compared to the values listed in the above-mentioned standard, the required services are special services (see section 4.2.9).

3.1.3 In the event of unsuitable conditions resulting from the weather or the indoor climate, e.g. temperatures below 5 °C of the substrate, the materials used and the work area, special measures must be taken in consultation with the Client. If services are required for this, these are special services (see section 4.2.6).

3.2 Relocation and relocation

3.2.1 Slabs and workpieces must be moved or laid vertically, vertically and horizontally or with the specified gradient, taking into account the specified height reference point.

3.2.2 Platten und Werkstücke, die an andere Bauteile, z. B. Türen, Fenster, Installationsobjekte, Anschlagschienen, angrenzen, sind nach dem Einbau dieser Bauteile oder nur aufgrund von Detailzeichnungen zu verlegen oder zu versetzen.

3.2.3 Binders, mortars, adhesives, cleaning agents and impregnating agents must be adapted to the area of application and the type of natural stone used.

Cements in accordance with DIN EN 197-1 with a trass content ≥ 25% are to be used for the laying mortar of slab coverings and for wall cladding. In the case of rocks that are particularly sensitive to discolouration, special cements must be used whose suitability for the rock in question is particularly demonstrated. The mixing ratio of cement to sand must be 1:4 room parts indoors and 1:3 room parts outdoors. Sand with a grain size of 0/4 mm is to be used as an aggregate.

For heap-porous mortars (drainage mortars), cement with a trace content ≥ 40 % and an aggregate of 2/8 mm or 2/11 mm grain size shall be used. The mixing ratio of cement to aggregate must be 1:6 room parts.

3.2.4 In the case of cladding or coverings which are to be attached and laid in the thick bed, the following mortar bed thicknesses must be made:

- for wall coverings 10 mm to 20 mm,
- for indoor floor and stair coverings, 10 mm to 20 mm,
- 10 mm to 30 mm for outdoor floor and stair coverings, 40 mm to 60 mm for mortar with a porous structure.

3.2.5 Mortar with a grain size of 0/8 mm in a stiff consistency shall be used for backfills, and mortar with a bulky structure in accordance with section 3.2.3 shall be used outside buildings.

3.2.6 Rear-ventilated exterior wall cladding must be designed in accordance with DIN 18516-3. The anchoring of external wall cladding is carried out in anchor holes to be drilled. The anchors are to be used in masonry mortar M10 according to DIN EN 998-2.

3.2.7 Mortared exterior wall cladding with tiles and slabs up to a thickness of 1.5 cm, a single size of up to 0.12 m2 and a maximum side length of 0.49 m shall be constructed in accordance with DIN 18515-1 "Exterior wall cladding — Principles for planning and execution — Part 1: Mortared tiles or slabs".

3.2.8 The following apply to the application and laying of tiles in a thin bed:

DIN 18157-1	Thin-bed finishing of cladding and coverings — Part 1: Mortars containing cement
DIN 18157-2	Design of thin-bed cladding and coverings — Part 2: Dispersion adhesives
DIN 18157-3	Thin-bed finishing of cladding and coverings — Part 3: Reactive resin adhesives

3.2.9 Wall coverings in buildings that are anchored shall be made of panels ≥ 20 mm thick.

3.2.10 Outdoor floor coverings shall be made of slabs ≥ a thickness of 30 mm. When laying on gravel or chippings, slabs ≥ 0.16 m2 with an edge ≥ 30 cm should be used.

3.2.11 Base benches and lintels must be installed and moved hollow joints and pressure-free. Aprons, panels, reveal plates can be connected to the mother plate.

3.2.12 Window sills must be moved over the entire surface in the mortar bed or mounted on consoles.

3.2.13 Facing, facing and ashlar masonry must be manufactured in accordance with DIN EN 1996-1-1/NA and DIN EN 1996-2/NA.

3.3 Formation of joints

3.3.1 The joint widths depend on the format and type of panels and workpieces, the purpose, the load and the type of jointing. 3.3.2 The joints must be laid out evenly wide. The limit dimensions of the slabs and workpieces in accordance with Section 2.1.2 shall be compensated for in the joints.

3.3.3 The average width of the mineral mortar joint shall be 3 mm for panel formats ≤ 600 mm and 5 mm for longer edge lengths. In the case of solid workpieces, ashlars and facing masonry, the joints must be ≥ 10 mm wide.

3.3.4 The strength of the grout must be chosen depending on the rock strength and porosity.

3.3.5 A grey, hydraulically setting grout must be used for grouting.

3.3.6 The grouting of coverings and mortared cladding may only be carried out after the laying mortar has dried out.

3.3.7 Mortar joints on wall and floor coverings must be closed by slurry, with the exception of natural stones with rough or porous surfaces.

3.3.8 In the case of workpieces and masonry, grouting may be carried out at the same time as moving. The joints must be smooth and flush with the leading edge.

3.4 Movement joints

3.4.1 Movement joints of the structure must be taken over at the same point with the same possibility of movement.

3.4.2 Building separation, movement and connection joints in buildings must be laid out with a width ≥ 5 mm, and with a width ≥ 8 mm outdoors.

3.5 Insulation materials

Insulation materials must be installed tightly jointed and mechanically fastened when attached to rising components and ceilings.

3.6 Restoration work

3.6.1 In the case of repairs, damaged rock must be replaced by the same and similar colour. If the rock is no longer available, rock with similar technical and optical properties must be used.

3.6.2 Fours must be made at right angles and with a precise fit. Structural securing can be made by anchoring or undercut. The recess is determined by the size and shape of the damaged area.

3.6.3 If the damage is < 100 cm2, the recesses may also be filled with restoration mortar. The subsoil of the damaged area must be load-bearing. The Restauriermörtelergänzung muss ggf. durch nichtrostende Bewehrung spannungsfrei konstruktiv gesichert und ausreichend can be covered. The restoration mortars must have similar technical and visual properties to the original stone.

3.6.4 If restored stone surfaces are to be coloured, they must be adapted to the existing stone surfaces.

3.6.5 In the case of broken workpieces, stainless staples, pins, anchorages or the like must be used.

3.6.6 The existing joint pattern must be retained in the event of repairs.

3.6.7 When treating and cleaning surfaces, no agents must be used that discolour rock minerals and impair strength and durability. Sample areas are to be created

3.6.8 Before the use of chemical agents, e.g. stone preservatives, test plots must be created to prove suitability.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on or clad is not higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.1.2 Compensation of stepped or inclined standing surfaces of scaffolding up to 40 cm difference in height, e.g. via stairs or ramps.

4.1.3 Compensation of unevenness of the substrate within the tolerances permissible according to DIN 18202 when attaching or laying slabs in the mortar bed.

4.1.4 Cleaning of the substrate, except for services according to section 4.2.7.

4.1.5 Removal of small plaster protrusions.

4.1.6 Making holes necessary for transporting, anchoring, clamping and anchoring the plates and workpieces.

4.1.7 Attaching to adjacent, installed components, such as windows, doors, thresholds, stop rails, except for services according to section 4.2.23.

4.1.8 Protection of laid surfaces and stairs until they are accessible by barriers, e.g. with barrier tape.

4.1.9 Protection of building and plant components against contamination and damage during natural stone work by loosely covering, hanging or wrapping, except for protective measures according to section 4.2.13.

4.1.10 Supply up to 6 sample plates, size ≤ 20 cm × 30 cm.

4.1.11 Completion of components in several work steps to enable work by other contractors, insofar as the company's own services can be provided continuously in the course of similar

natural stone work. If these conditions are not met, they are special services according to section 4.2.15.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 Provision of recreation and storage rooms if the Client does not provide rooms that can be easily made available.

4.2.2 Assembly, conversion and dismantling as well as provision of scaffolding for the services of other contractors.

4.2.3 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on or clad is higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.2.4 Erection, conversion and dismantling as well as provision of scaffolding with a stepped or inclined footprint, e.g. over stairs or ramps, if compensation of more than 40 cm is required.

4.2.5 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the depth of the gripping space is more than 60 cm.

4.2.6 Protection against unsuitable conditions resulting from the weather or the indoor climate in accordance with section 3.1.3, e.g. enclosure, heating.

4.2.7 Cleaning the substrate of coarse soiling, e.g. plaster residues, mortar residues, paint residues, oil, insofar as this was not caused by the Contractor.

4.2.8 Compensation of larger unevenness of the substrate and larger dimensional deviations than permissible according to DIN 18202.

4.2.9 Meeting increased requirements for flatness or dimensional accuracy (see section 3.1.2).

4.2.10 Services for fire, sound, heat, humidity and radiation protection, insofar as these go beyond the services under Section 3.

4.2.11 Closing motion joints.

4.2.12 Offsetting and Laying Patterns.

4.2.13 Special protection of building and plant components as well as furnishings, e.g. masking of windows, doors, floors, coverings, stairs, wood, roof surfaces, surface-finished parts, dust-proof masking of sensitive equipment and technical equipment, dust protection walls, emergency roofs, laying of hardboard or building protection films from 0.2 mm thick.

4.2.14 Adapting and Connecting to Adjacent Components.

4.2.15 Completion of components in several work steps to enable work by other contractors, insofar as the company's own services cannot be provided continuously in the course of similar natural stone work (see section 4.1.11).

4.2.16 Creating Static Verifications.

4.2.17 Preparation of the substrate to achieve a good primer for adhesion, e.g. pre-painting, mechanical brushing or sanding and vacuuming.

4.2.18 Filling of the substrate to achieve the required height or slope and the production of plaster to compensate for uneven or non-perpendicular and non-perpendicular walls in cases other than those referred to in section 4.1.3.

4.2.19 Manufacture of plain bearings or sliding layers, installation of bridge anchors.

4.2.20 Installation of façade anchors, substructures, brackets, sling, separation and movement rails, frames, scaffolding brackets remaining in the structure and the like.

4.2.21 Making notches, holes, recesses, anchor pockets and the like.

4.2.22 Insertion of installation and installation components.

4.2.23 Subsequent processing and adaptation to built-in parts, insofar as this is the responsibility of the Client.

4.2.24 Adaptation to curved, non-rectangular components and components that do not limit perpendicular and alignment rights.

4.2.25 Making mitres and bevel cuts.

4.2.26 Cutting off the overhang of verges of other trades.

4.2.27 Processing after relocation or laying, e.g. sanding.

4.2.28 Preparation of laying or relocation plans, as-built, rehabilitation and mapping plans, documentation.

4.2.29 Assembly, conversion and dismantling as well as provision of lifting equipment, cranes and the like.

4.2.30 Manufacture of scaffolding that is necessary for structural reasons, e.g. in the case of lintels or arches made of natural stone.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

The determination of the performance – regardless of whether it is carried out according to drawings or measurements – is to be based on the dimensions □ of the cladding or coverings produced, the masonry made of natural stone, the treated surfaces.

5.2 Determination of dimensions/quantities

5.2.1 In the case of levelling layers, separation layers, insulation layers, subfloors, reinforcements, load-bearing structures and substructures, the dimensions of the cladding/coverings produced shall be taken as a basis.

5.2.2 When calculating individual areas of any shape, the smallest circumscribed rectangle shall be used as a basis for determining the dimensions.

5.2.3 In the case of billing according to the length measure, the largest edge length of the component/workpiece shall be taken as a basis. In the case of sloping plinth plates (bishop's

caps) on stairs, the dimension of the upper edge is used, in the case of stepped plinth plates, the dimension of the unwinding.

5.2.4 In the calculation according to area dimensions, machined reveals and machined end faces are added. Visible profiled surfaces are measured in their unfolding.

5.3 Overmeasurement rules

The following are measured:

5.3.1 When billing according to room dimensions

- Fugues
- slots with a cross-sectional area ≤ 0.1 m2,
- openings, recesses and niches with a single size ≤ 0.5 m3,
- any intermediate layers in the case of composite workpieces and in the case of double-sided masonry.

5.3.2 When billing according to area

- Fugues
- recesses with a single size ≤ 0.5 m2,
- recesses in floors with a single size ≤ 0.1 m2,
- Recesses with a single size ≤ 2.5 m2 for pre-treatment of the substrate, surface treatment and cleaning of surfaces,
- Breaks with a single width ≤ 30 cm.

5.3.3 When billing according to length

- Fugues
- Interruptions with a single length ≤ 1 m.

5.4 Individual provisions

5.4.1 In the case of invoicing according to spatial dimensions, the smallest circumscribed rectangular body shall be used as the basis for workpieces. Room dimensions < 0.03 m3 are billed as 0.03 m3.

5.4.2 In the case of settlement according to area dimensions,

- Areas < 0.25 m2 with 0.25 m2,
- individual pieces, e.g. covers, window sills, with a width < 20 cm with a width of 20 cm,
- Single pieces with non-rectangular and notched surfaces with the dimensions of the smallest circumscribed rectangle

deducted.

5.4.3 In the case of billing by length, lengths < 1 m are billed as 1 m.

5.4.4 In the case of individual plates and individual workpieces, recesses are overmeasured.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Cast stone work — DIN 18333

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

No supplementary regulation to ATV DIN 18299, section 0.1.

0.2 Information on the execution

0.2.1 Number, type, location, dimensions, materials, load-bearing capacity and design of the components.

0.2.2 Number, type, location, dimensions and nature of sloped, curved or otherwise shaped surfaces.

0.2.3 Special requirements with regard to the dimensions or load-bearing capacity of cast stone.

0.2.4 Type of processing and surface design of cast stone. requirements, e.g. regarding the colour, the type of aggregates.

0.2.5 Required gradient.

0.2.6 Permissible ledges and height differences between adjacent plates.

0.2.7 Type and condition of the substrate, e.g. strength class of concrete or masonry, steel, waterproofing, heat and sound insulation, screed, underfloor heating.

0.2.8 Type, location and dimensions of the substructures for the installation of the prefabricated cast stones. Required infill heights. Type of integrations and integration depths.

0.2.9 Type of anchoring of large-format slabs and prefabricated elements.

0.2.10 Type and nature of the surface structure.

0.2.11 Type, thickness and strength of thermal and impact sound insulation layers, Type and thickness of separating and protective layers.

0.2.12 In the case of heated floor coverings, type of construction, type of heating, thickness and strength of the insulation layers, type of covering, location of heating pipes and heating elements, thickness of the load distribution layer, reinforcements, location and design of movement joints, mortar bed thickness.

0.2.13 Number, type, location, dimensions and masses of built-in parts.

0.2.14 Components to be concreted, e.g. angle frames, protective rails.

0.2.15 Number, type, location and dimensions of recesses for pipelines and the like to be made or closed.

0.2.16 Design and division of areas. Grid and joint formation. Special method of installation.

0.2.17 Width of joints and type and colour of jointing.

0.2.18 Number, position, dimensions and formation of movement joints and the type, colour, dimensions and formation of joint profiles and the like.

0.2.19 Type and design of stairs, angular steps, steps, risers and thresholds, dimensions, overhangs, visible heads.

0.2.20 Number, type, location, dimensions and design of terminations and connections to adjacent components.

0.2.21 Special physical and chemical stresses to which substances and components are exposed after installation.

0.2.22 Surface treatment of pavements, e.g. waxing, impregnation, crystallising.

0.2.23 Full-surface grinding of paved pads, number and type of processing steps.

0.2.24 Protection of components or equipment, furnishings and the like.

0.2.25 Early or subsequent production of parts of the service.

0.2.26 Cutting off the overhang of edge insulation strips.

0.2.27 Number, type, location and dimensions of samples, sample and reference surfaces. Place of installation.

0.2.28 Delivering installation plans.

0.3 Details of deviations from the ATVs

0.3.1 Wenn andere als die in dieser ATV vorgesehenen Regelungen getroffen werden sollen, sind diese in der Leistungsbeschreibung eindeutig und im Einzelnen anzugeben.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 3.1.3	if tolerances other than those listed therein are to apply,
Sections 3.1.5 and 3.1.6,	if the surface of cast stone is not to be sanded, but e.g. finely sanded, i.e. sanded, filled, resanded,
Section 3.3.2,	if slabs over 50 cm × 75 cm are not to be laid on mortar strips,
Section 3.4.3,	if panels for wall coverings are not to be installed vertically and perpendicularly,
Section 3.6.2	if the mortar bed for floor coverings is to have a different thickness, Section 3.7.2 if floor coverings with different joint widths are to be laid,
Section 3.7.3,	if bearing and butt joints in cladding, stair treads and other components are to have different widths,
Section 3.7.4,	if non-grey cement mortar is to be used for mortar joints,
Section 3.7.6,	if the grouting of floor coverings is not to be carried out by sludge,
Section 3.7.7	if you do not want to leave field boundary joints and connection joints open.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units are to be provided as follows:

0.5.1 Area (m2), separated by type and dimensions, for

- Floor coverings
- wall coverings,
- Workpieces,
- subsequent surface treatment.

0.5.2 Dimensions of length (m), separated by type and dimensions, for

- Cornices
- Profile Bands,
- Plinth
- Throats
- rounded edges,
- Stair treads and stair stringers,
- Window sills
- Wall cover plates,

- Bezels
- Workpieces,
- Closing joints,
- Bevel cuts,
- machined heads and offsets,
- drip edges,
- Insulation strips, cutting off the protrusion of edge insulation strips.

0.5.3 Number (pieces), separated by type and dimensions, for

- Workpieces, e.g. garbage can cabinets,
- interior and exterior window sills,
- Stair treads and stair stringers,
- stepped plinths per step,
- slanted bases, e.g. bishop's hats,
- machined heads and offsets,
- window frames,
- door frames,
- Pillars
- Pillars and pillar templates,
- recesses for pipe penetrations,
- dowels, railing posts, floor inlets and the like,
- Miters.

1 Scope of application

1.1 ATV DIN 18333 "Cast stone work" applies to the processing of concrete surfaces as well as to the installation, laying and relocation of cast concrete blocks in and on buildings.

1.2 ATV DIN 18333 does not apply to

- Verkehrswegebauarbeiten (siehe ATV DIN 18318 „Pflasterdecken und Plattenbeläge, Einfassungen“),
- the manufacture of components made of reinforced or unreinforced concrete (see ATV DIN 18331 "Concrete work"),
- Exterior wall cladding, panels with a nominal thickness of up to 30 mm with substructures (see ATV DIN 18351 "Rear-ventilated façades").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18333 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies: The DIN standards for the most common standardised substances and components are listed below.

2.1 Cast stone

DIN V 18500	Cast Stone — Definitions, Requirements, Testing, Monitoring

DIN 18516-5	Exterior wall cladding, rear-ventilated — Part 5: Cast stone — Requirements, design
DIN EN 13198	Precast concrete elements — Street furniture and garden design elements
DIN EN 13748-1	Terrazzo slabs — Part 1: Terrazzo slabs for indoor use
DIN EN 13748-2	Terrazzo slabs — Part 2: Terrazzo slabs for outdoor use

2.2 Mortars and fasteners

DIN 18515-1	Exterior wall cladding — Principles for design and execution — Part 1: Mortar tiles or slabs
DIN 18516-1	Exterior wall cladding, ventilated — Part 1: Requirements, test principles
DIN 18516-5	Exterior wall cladding, ventilated — Part 5: Cast stone — Requirements, design
DIN V 18580	Masonry mortar with special properties
DIN 51043	Trass — Requirements, Testing
DIN EN 459-1	Construction lime — Part 1: Definitions, requirements and conformity criteria DIN EN 998-2 Specifications for mortars in masonry construction — Part 2: Masonry mortars
DIN EN 1996-1-1	Eurocode 6: Design and construction of masonry structures — Part 1-1: General rules for reinforced and unreinforced masonry
DIN EN 1996-1-1/NA	National Annex — Nationally determined parameters — Eurocode 6: Design and construction of masonry structures — Part 1-1: General rules for reinforced and unreinforced masonry
DIN EN 1996-2	Eurocode 6: Design and construction of masonry structures — Part 2: Design, selection of building materials and execution of masonry
DIN EN 1996-2/NA	National Annex — Nationally defined parameters — Eurocode 6: Design and construction of masonry structures — Part 2: Design, selection of building materials and execution of masonry
DIN EN 1996-3	Eurocode 6: Design and construction of masonry structures — Part 3: Simplified calculation methods for unreinforced masonry structures
DIN EN 1996-3/NA	National Annex — Nationally defined parameters — Eurocode 6: Design and construction of masonry structures — Part 3: Simplified calculation methods for unreinforced masonry structures
DIN EN 12004-1	Mortars and adhesives for ceramic tiles and slabs — Part 1: Requirements, assessment and verification of constancy of performance, classification and marking

2.3 Color and structure fluctuations

Colour and structure fluctuations caused by different manufacturing processes but with the same concrete composition are permitted. This also includes colour fluctuations within the same aggregate, which are given by the natural occurrence.

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- Deviations of the portfolio from the specifications,
- unsuitable condition of the substrate, e.g. coarse contamination, efflorescence, surfaces that are too smooth, too damp, oily or frozen, cracks, missing or insufficiently cured load distribution layer when laid on insulation layers,
- too low a height for the installation of the decking structure,
- insufficient slope of the subsoil in weathered areas,
- greater unevenness of the subsoil than permissible according to DIN 18202 "Tolerances in building construction — Structures",
- unsuitable climatic conditions (see section 3.1.2),
- lack of reference points.

3.1.2 In the event of unsuitable climatic conditions, e.g. temperatures below 5 °C during mooring work or mortaring anchors, special measures must be taken in consultation with the Client. The benefits for measures to be taken are special services (see section 4.2.3).

3.1.3 Deviations from the prescribed dimensions are permissible within the limits specified by DIN 18202. Unevenness in the surfaces of components that becomes visible in grazing light is permissible if it does not exceed the limit values according to DIN 18202.

If increased requirements are placed on flatness in accordance with DIN 18202, Table 3, line 4, or other increased requirements for dimensional accuracy compared to the values listed in the above-mentioned standard, the services for measures to be taken are special services (see section 4.2.8).

Indoors, ledges and height differences of up to 1.5 mm are permitted for slabs up to 0.25 m2 between adjacent slabs.

Indoors, slabs larger than 0.25 m2 to 0.5 m2 between adjacent slabs and height offsets of up to 2 mm are permitted.

In weathered areas, ledges and height differences of up to 2 mm are permissible for slabs up to 0.25 m2 between adjacent slabs, and up to 5 mm for coarsely processed slabs such as washed-out, blasted, flame-blasted, split, embossed, pointed, bushhammered or chiselled.

In indoor areas, the permissible ledges and height differences must be agreed separately for slabs larger than 0.5 m2 and in weathered areas for slabs larger than 0.25 m2.

Services to meet increased requirements are special services (see section 4.2.9).

3.1.4 Cracks that come to light during or after the processing of concrete components and cast concrete blocks are to be detected within the limits of the limit values set out in DIN EN 1992-1-1 "Eurocode 2: Design and construction of reinforced concrete and prestressed concrete structures — Part 1-1: General design rules and rules for building construction" in conjunction with DIN EN 1992-1-1/NA "National Annex — Nationally defined parameters — Eurocode 2: Design and construction of reinforced concrete and prestressed concrete structures — Part 1-1: General design rules and rules for building construction'.

3.1.5 The surfaces of floor coverings made of cast stone that remain visible must be designed in accordance with DIN V 18500 in interiors with a polished surface, and in weathered areas with a blasted surface.

3.1.6 The surfaces of cladding made of cast stone that remain visible must be designed with a ground surface in accordance with DIN V 18500.

3.2 Stairs

3.2.1 Stairs must be designed in accordance with DIN 18065 "Building stairs — Terms, measurement rules, main dimensions".

3.2.2 Stair treads and paving slabs on concrete stairways must be free of constraints and laid on mortar strips in the direction of travel.

3.2.3 In the case of stair treads and decking slabs with impact sound insulation, the insulating material must be glued to the cast stone. The element prepared in this way must be laid over the entire surface in mortar of mortar group III.

3.2.4 Cantilevered stair coverings must be reinforced if the cantilever length is more than twice the thickness of the decking.

3.2.5 In the weathered area, block steps, load-bearing tread plates or angle steps on concrete stair runs must be laid on mortar strips in the direction of travel. The mortar strips must be laid on top of each other in alignment so that water drainage is guaranteed. Risers must not obstruct the flow of water.

3.3 Laying floor tiles

3.3.1 Floor slabs must be laid in a non-alignment and horizontal manner or with the specified slope.

3.3.2 Indoors, slabs up to 50 cm × 75 cm must be laid in a mortar bed, larger slabs on mortar strips.

3.3.3 In the weathered area, floor coverings shall be laid on drainage layers of drainage mortar or drained concrete, under which a drainage mat shall be laid.

3.4 Apparel

3.4.1 Mortar-coated wall coverings must be manufactured in accordance with DIN 18515-1.

3.4.2 Rear-ventilated wall coverings must be manufactured in accordance with DIN 18516-1 and DIN 18516-5.

3.4.3 Panels for wall coverings must be installed vertically and perpendicularly.

3.5 Other components

Window sills and wall cover plates as well as window and door jambs must be installed on mortar strips without constraint.

3.6 Mortar

3.6.1 The use of gypsum, alumina fusion cement and chloride-containing binders or additives is not permitted.

3.6.2 When laying floor coverings in a thick bed, the mortar bed must be at least 15 mm thick and not thicker than 45 mm.

3.6.3 Calibrated panels shall be used for installation in thin-bed mortar. Hydraulically hardening thin-bed mortar in accordance with DIN EN 12004-1 must be used and processed in accordance with DIN 18157-1 "Execution of cladding and coverings using the thin-bed method — Part 1: Mortars containing cement".

3.7 Joining and grouting

3.7.1 The joints shall be evenly wide. Dimensional deviations of the workpieces must be compensated for in the joints.

3.7.2 Coverings shall be laid with the following joint widths: Cast stone slabs in the mortar bed

- for the longest edge length up to 60 cm: 3 mm
- for the longest edge length over 60 cm: 5 mm

Cast stone slabs without mortar bed, e.g. on pedestals: 5 mm.

3.7.3 Bearing and butt joints in cladding and stair treads as well as in components referred to in section 3.5 shall be 2 mm wide indoors and 5 mm wide in weathered areas.

3.7.4 Grey cement mortar shall be used for mortar joints.

3.7.5 The grouting of floor coverings may only be carried out after the laying mortar has sufficiently hardened.

3.7.6 Grouting of floor coverings must be carried out by means of slurry.

3.7.7 Structural joints, field boundary joints and connecting joints remain open.

3.7.8 Movement joints of the structure must be adopted structurally with the same possibility of movement.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Erection, dismantling and provision of scaffolding, the working platforms of which are not higher than 2 m above the ground or floor.

4.1.2 Submission of prefabricated surface and color samples.

4.1.3 Removal of small plaster protrusions.

4.1.4 Attaching coverings to adjacent installed components, e.g. frames, cladding, stop rails, sleepers, except for services in accordance with section 4.2.6.

4.1.5 Working on recesses in the decking, e.g. on foundation bases, pillars, columns, up to 0.1 m2 individual size.

4.1.6 Blocking off occupied areas and stairs until the pavements are accessible.

4.1.7 Protection of building and plant components from contamination and damage during cast stone work by loosely covering, hanging or wrapping, except for protective measures according to section 4.2.4.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 Provision of recreation and storage rooms if the Client does not provide rooms that can be easily locked.

4.2.2 Erecting, dismantling and maintaining scaffolding whose working platforms are higher than 2 m above the ground or floor.

4.2.3 Protection against unsuitable climatic conditions in accordance with section 3.1.2.

4.2.4 Cleaning the substrate of coarse soiling, e.g. plaster residues, mortar residues, paint residues, oil, insofar as this was not caused by the contractor.

4.2.5 Filling the subsoil with a compensating mortar to create the required height or slope and to compensate for larger unevenness and dimensional deviations of the subsoil than permissible according to DIN 18202.

4.2.6 Services for fire, sound, heat and moisture protection, insofar as these go beyond the services in accordance with Section 3.

4.2.7 Manufacture of plain bearings or sliding layers.

4.2.8 Meeting increased requirements for flatness or dimensional accuracy (see section 3.1.3).

4.2.9 Fulfilment of increased requirements with regard to the heels and height differences between adjacent slabs, e.g. by subsequent grinding of the slab edges.

4.2.10 Making recesses, e.g. for pipe penetrations, dowels, railing posts, floor inlets.

4.2.11 Rounding of corners and edges and formation of throats.

4.2.12 Making mitres and bevel cuts.

4.2.13 Applying coverings, e.g. to washbasins, sinks, bathtubs, shower trays, bath underpasses, sloping bath aprons.

4.2.14 Working on recesses in the decking, e.g. on foundation bases, pillars, columns, over 0.1 m2 individual size.

4.2.15 Subsequent application of linings to built-in parts.

4.2.16 Forming, closing and covering of movement and connection joints.

4.2.17 Supply and installation of brackets, stop and partition rails, movement joint profiles, frames and the like.

4.2.18 Making finely ground surfaces.

4.2.19 Subsequent surface treatment.

4.2.20 Cutting off the overhang of edge insulation strips.

4.2.21 Special measures for the protection of building and plant components as well as furnishings, e.g. masking of windows, doors, floors, coverings, stairs, wood,

Roof surfaces, surface-finished parts, dust-proof masking of sensitive equipment and technical equipment, dust protection walls, emergency roofs, laying out of hardboard boards or building protection films.

4.2.22 Production of samples as well as sample and reference surfaces, insofar as these are not included in the service.

4.2.23 Creation of installation plans.

4.2.24 Provision of building physics verifications and static calculations.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

5.1.1 The determination of the performance — regardless of whether it is carried out according to drawings or measurements — shall be based on the dimensions of the manufactured or processed components, cladding and coverings.

5.1.2 The dimensions shall be determined on the basis of the largest component dimension, if any, completed. Joints are measured. In the case of assembled workpieces, the total length is the sum of the lengths of the individual workpieces, including the joint widths. The length of machined heads of workpieces is added to the length of the workpiece.

5.1.3 When invoicing non-rectangular individual surfaces according to area measurements, the dimensions of the smallest rectangle circumscribing the component shall be taken as a basis.

5.2 The following are deducted:

5.2.1 If billed according to area (m2): Recesses, e.g. openings in cladding and coverings, over 0.1 m2 individual size.

5.2.2 If billed according to length (m): Interruptions of more than 1 m individual length.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Carpentry and timber construction work — DIN 18334

Issue September 2016

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 Type, location and load-bearing capacity of anchor points for protective nets.

0.1.2 Type, location, dimensions and design as well as dates for the erection and dismantling of on-site scaffolding.

0.1.3 Walkability and breakthrough safety of components and roofs.

0.2 Information on the execution

0.2.1 Number, type, location, dimensions, materials and design as well as degree of prefabrication of components to be manufactured or surfaces to be processed, in particular excess lengths and special cross-sections, cants in the case of glulam. Type of wood, strength class, wood moisture, type of cut, dimensional tolerance classes, usage classes, visual requirements.

0.2.2 Type, nature and strength of the substrate, e.g. underlay, substructure, base course, supporting structure.

0.2.3 Component production according to the execution plan or local measurements.

0.2.4 Number, type and dimensions of sample surfaces, sample constructions and models. Place of application of samples.

0.2.5 Preparation of structural certificates, construction plans and workshop drawings.

0.2.6 Design and division of surfaces, special laying type and direction (e.g. grain direction) as well as grid and joint formation. Color, surface texture and surface treatment.

0.2.7 Protection of building, building or plant components, underlying or adjacent rooms, furnishings, e.g. emergency roofs, temporary coverings, dust protection walls.

0.2.8 Special protection of services, e.g. packaging, edge protection, covers, especially for finished and finished surfaces.

0.2.9 Requirements for fire, sound, heat, moisture and radiation protection as well as airtightness. Acoustic and ventilation requirements.

0.2.10 Special physical properties of the substances.

0.2.11 Indication of the class of use of the component, the type and extent of the basic structural wood protection, the type and extent of the special structural wood protection, in special cases if preventive chemical wood protection is necessary, taking into account the wood preservative with regard to its use.

0.2.12 Type and extent of infestation by wood-destroying organisms (e.g. insects, fungi).

0.2.13 Type, location, dimensions of the components to be treated with wood preservatives to be treated, e.g. wood preservatives, fumigation, hot air.

0.2.14 Type of fire protection coating.

0.2.15 Type and extent of corrosion protection for metallic components and fasteners.

0.2.16 Special physical and chemical stresses to which substances and components are exposed after installation, e.g. aggressive vapours, moisture.

0.2.17 Type of planking and cladding, dimensions of the individual parts; Formation of joints, corners and bevel cuts, window sills and reveals.

0.2.18 Spacing of boards in spar formwork.

0.2.19 Type, extent and design of the rear ventilation and the cover of its openings.

0.2.20 Type and design of the fastening of the components, e.g. visible or not visible.

0.2.21 Type and design of timber joints and supports as well as transverse tensile and transverse pressure reinforcements.

0.2.22 Type and design of steel components, e.g. welded plane or spatial steel parts with cut-outs or curves.

0.2.23 Early or subsequent production of components and partial surfaces.

0.2.24 Construction, shape and dimensions of roofs, e.g. ridge height, inclination, overhangs, dormers.

0.2.25 Number, type, dimensions and design of terminations and connections to adjacent components, e.g. ridge, throat and ridge rafters, penetrations, roof structures.

0.2.26 Type and location of roof drainage.

0.2.27 Number, type and dimensions of installation and installation components, e.g. roof windows, skylights, roof hatches, slide-in stairs, roller shutters, sun protection systems.

0.2.28 Type, location, dimensions and design of movement, structure and component joints.

0.2.29 Provision of built-in components, e.g. anchor channels, brackets, support stands.

0.2.30 Specifications resulting from structural evidence and expert reports (e.g. statics, fire, heat and sound insulation, infestation by wood-destroying organisms).

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 3.1.2,	if limit values other than those listed therein are to apply,
Section 3.1.5 and Section 3.1.6,	if different wood moisture levels are required during installation,
Section 3.1.7,	if sawn timber is not to be installed rough-sawn, but e.g. finely sawn, levelled or planed,
Section 3.11.10,	if joints are to be closed,
Section 3.12.2	if the process of processing the wood preservatives is not to be left to the contractor.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulations to ATV DIN 18299, Section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units are to be provided as follows:

0.5.1 Volume dimensions (m3), separated by type and dimensions, for

- wood for carpentry,
- Wood preservation
- Laminated wood
- Brettstapelelemente, Brettsperrholz,
- Laminated veneer lumber, beam laminated timber, finger-jointed solid wood.

0.5.2 Area (m2), separated by type and dimensions, for

- Walls, floors, sheds,
- Cladding, planking, formwork, battens, substructures,
- prefabricated surface components, facing shells,
- Wood-based panels, laminated veneer lumber,

- Brettstapelelemente, Brettsperrholz,
- Insulation layers, vapour barriers, separation and protective layers,
- fillings in stair railings,
- Surface treatments, e.g. planing, grinding,
- Wood preservation.

0.5.3 Length (m), separated by type and dimensions, for

- Assembled, prefabricated, parallel-belted wooden components, e.g. wooden I-beams,
- Setting and erecting, installing or laying columns, beams, beams,
- Sleepers, rails, soffits, benches, frames, overlays, bearing timbers and the like,
- Burring, grooving and beveling of wood,
- chamfering and profiling of wooden edges,
- Cutting of relief grooves,
- Formwork and cladding, e.g. on verges, attics, pillars, beams, pipelines, bulkheads,
- Connections and closures made of profiles made of wood or other building materials, corner formations,
- Joint formation and joint sealing,
- Skirting and rubbing strips, performances,
- Stair components, e.g. stringers, railings, handrails,
- protective layers under timber, e.g. under sleepers, beams,
- Wind and bracing bracing,
- Stockades
- Wood preservation.[1]

0.5.4 Number (pcs), separated by type and dimensions, for

- Spruce rafter cuts,
- Binding, erection and laying of timber in difficult carpentry, e.g. towers, domes, dormers, curved roof surfaces, ridge and throat rafters,
- Processing of rafter, purlin and beam heads, e.g. planing, profiling, gutting,
- Substitutions, e.g. on chimneys, stairs, skylights, roof hatches,
- Slip-on parts, wedges and slope parts,
- Prefabricated components, e.g. nailed, dowelled, glued or otherwise connected trusses, frames, columns, beams, beams,
- Reinforcements, e.g. for recesses, notches, cut cassettes as well as transverse tension reinforcements, attached loads,
- Making and closing recesses for built-in parts, e.g. for columns, doors, windows, skylights, luminaires, grilles, inspection flaps, installation equipment,
- Blind holes, plugs,
- Insertion of installation and installation components, e.g. roof windows, roof hatches, slide-in stairs, light strips, windows, frames, doors, gates, shutters, thresholds, roller shutter boxes, sun protection devices,
- Cladding and cladding on chimney heads and the like,
- Stairs and stair components,

- Coverings and protective covers,
- Insulation materials and protective layers on beam heads,
- Statically verifiable and structurally required components, e.g. dowels, bolts, anchors, fasteners, hangers, spacers, brackets, sheet steel fittings,
- Wood preservation.

0.5.5 Mass (kg, t), separated by type and dimensions, for statically verifiable

and structurally required, welded components made of steel, sectional steel or

others Metallen.

1 Scope of application

1.1 ATV DIN 18334 "Carpentry and timber construction work" applies to the processing and manufacture of all constructions of timber construction and timber engineering.

It also applies to the treatment of wood and wooden structures with combating wood protection measures and with wood preservatives.

1.2 ATV DIN 18334 does not apply to

- Formwork work for concrete and reinforced concrete work (see ATV DIN 18331 "Concrete work"),
- Shoring during excavation work (see ATV DIN 18303 "Shoring work"),
- Drywall construction work (see ATV DIN 18340 "Drywall work"),
- Rear-ventilated facades with cladding elements other than wood or wood-based materials (see ATV DIN 18351 "Rear-ventilated façades"),
- chiseled doors and gates (see ATV DIN 18355 "Carpentry") and
- Parquet work (see ATV DIN 18356 "Parquet and wooden paving work").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18334 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

For the most common substances and components, the DIN standards and other requirements are listed below.

2.1 Wood

DIN 1052-10	Production and execution of timber structures — Part 10: Supplementary provisions
DIN 4072	Spun boards made of coniferous wood

DIN 4074-1	Sorting of timber according to load-bearing capacity — Part 1: Softwood sawn timber
DIN 4074-5	Grading of wood according to load-bearing capacity — Part 5: Hardwood lumber
DIN 68119	Holzschindeln
DIN 68365	Sawn timber for carpentry work — Sort by appearance — Softwood
DIN 68368	Hardwood lumber for staircase construction — Quality conditions
DIN EN 1912	Structural timber for structural purposes — Strength classes — Assignment of visual grading classes and wood species
DIN EN 14080	Timber structures — Glulam and beam laminated timber — Requirements
DIN EN 14081-1	Timber structures — Structural timber for load-bearing purposes with rectangular cross-section sorted by strength — Part 1: General requirements
DIN EN 1995-1-1	Eurocode 5: Design and construction of timber structures — Part 1-1: General — General rules and regulations for building construction
DIN EN 1995-1-1/NA	National Annex — Nationally determined parameters — Eurocode 5: Design and construction of timber structures — Part 1-1: General — General rules and regulations for building construction
Specialist Rule 01	Exterior Wall Cladding, Edition 20061)
Specialist rule 02	Balconies and terraces, edition 20151)

Rules, Artisanal Wooden Stairs, 19982 edition)

2.2 Woody substances

DIN 68705-2	Plywood — Part 2: General purpose rod and rod plywood
DIN 68740-2	Panels — Part 2: Veneer top layers on wood-based materials
DIN EN 300	Sheets of Long, Flat, Aligned Chips (OSB) — Definitions, Classification and Requirements
DIN EN 312	Particleboard — Requirements
DIN EN 314-2	Plywood — Quality of bonding — Part 2: Requirements
DIN EN 315	Sperrholz — Maßtoleranzen
DIN EN 622 (all parts)	Fibreboard — Requirements
DIN EN 635-1	Plywood — Classification according to the appearance of the surface — Part 1: General
DIN EN 636	Plywood — Requirements

DIN EN 13986	Wood-based materials for use in construction — Properties, assessment of conformity and marking
DIN EN 14374	Timber structures — Laminated veneer lumber for load-bearing purposes — Requirements
DIN EN 15497	Finger-jointed solid timber for load-bearing purposes — Performance requirements and minimum requirements for production
DIN EN 16351	Timber structures — Cross-laminated timber — Requirements

2.3 Non-woody substances

DIN EN 520	Gypsum Boards — Definitions, Requirements and Test Methods
DIN EN 15283-2	Fibre-reinforced gypsum boards — Definitions, requirements and test methods —- Part 2: Gypsum fibreboard

2.4 Insulation materials

DIN 4108-10	Thermal insulation and energy saving in buildings — Part 10: Application-related requirements for thermal insulation materials — Factory-made thermal insulation products
DIN EN 13162	Thermal insulation products for buildings — Factory made mineral wool (MW) products — Specification
DIN EN 13163	Thermal insulation products for buildings — Factory-made expanded polystyrene (EPS) products — Specification
DIN EN 13164	Thermal Insulation Products for Buildings — Factory Made Extruded Polystyrene Foam (XPS) Products — Specification
DIN EN 13168	Thermal insulation products for buildings — Factory made wood wool (WW) products — Specification
DIN EN 13169	Thermal Insulation Products for Buildings — Factory Manufactured Expanded Perlite (EPB) Products — Specification
DIN EN 13170	Thermal Insulation Products for Buildings — Factory Made Expanded Cork (ICB) Products — Specification
DIN EN 13171	Thermal insulation products for buildings — Factory made wood fibre (WF) products — Specification
DIN EN 15101-1	Thermal insulation products for buildings — Cellulose filler thermal insulation material (LFCI) produced at the point of use — Part 1: Specification for pre-installation products

2.5 Fasteners and fasteners, adhesives

DIN 97	Countersunk Wood Screws with Slotted
DIN 7998	Threads and Screw Ends for Wood Screws
DIN EN 204	Classification of Thermoplastic Wood Adhesives for Non-Structural Applications

DIN EN 1995-1-1	Eurocode 5: Design and construction of timber structures — Part 1-1: General — General rules and regulations for building construction
DIN EN 1995-1-1/NA	National Annex — Nationally determined parameters — Eurocode 5: Design and construction of timber structures — Part 1-1: General — General rules and regulations for building construction
DIN EN 10230-1	Nails of steel wire — Part 1: Loose nails for general use
DIN EN 14545	Product Standard Non-Pin Fasteners
DIN EN 14592	Timber structures — Pin-shaped fasteners — Requirements
DIN EN ISO 4016	Hexagon Bolts with Shank, Product Class C

2.6 Wood protection

DIN 68800 (all parts)	Wood protection

2.7 Steel parts

Steel parts, e.g. anchors, plates, connectors, beams, supports, must be made of at least S235JR steel.

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 Concerns pursuant to section 4 (3) VOB/B can be considered in particular

come:

- lack of prerequisites for anchoring and fastening,
- too high building moisture,
- missing recesses,
- inadequate measures for preventive structural wood protection,
- incorrect location and height as well as unsuitable condition of the subsoil,
- lack of reference points.

3.1.2 Deviations from prescribed dimensions shall be permitted in the

DIN 18202	Tolerances in Building Construction — Structures
DIN 18203-3	Tolerances in building construction — Part 3: Components made of wood and wood-based materials

certain limits.

Unevenness in the surfaces that becomes visible in grazing light is permissible if it does not exceed the limit values according to DIN 18202.

The specified minimum dimensions for wood thicknesses and wood cross-sections are nominal dimensions for which the dimensional deviations regulated in the respective building material standards are permissible.

3.1.3 Movement joints of the structure must be adopted structurally with the same possibility of movement.

3.1.4 Ceiling cladding, suspended ceilings, wall coverings, facing shells and partition walls made of elements that form a regular grid must be constructed in alignment with the specified reference axes.

3.1.5 Unless otherwise specified in the following sections, construction timber shall be made of coniferous wood with a wood moisture content of U ≤ 20 %.

3.1.6 Timber made of hardwood shall be installed with a thickness ≤ 16 cm with a wood moisture content of U ≤ 20 %, with a thickness > 16 cm with a wood moisture content of U ≤ 25 %.

3.1.7 Sawn timber must be installed at least rough-sawn.

3.1.8 Glulam must be installed planed. The type of bonding is left to the contractor.

3.1.9 Shrinkage cracks in construction sawn timber, beam laminated timber, glued laminated timber and cross-laminated timber are permissible if the stability is not impaired by this.

3.1.10 When fastening boards, planks, slats or plates with smooth-shanked nails, they must be ≥ 2 1/2 times as long as the thickness of the parts to be fastened.

3.1.11 Load-bearing structures made of construction sawn timber made of softwood shall be made of wood of strength class C24 in accordance with DIN EN 338 "Construction timber for load-bearing purposes — Strength classes" and dimensional tolerance class 1 in accordance with DIN EN 336 "Construction timber for load-bearing purposes — Dimensions, permissible deviations", other structures made of construction sawn timber, of wood of quality class 2 in accordance with DIN 68365.

3.1.12 Load-bearing structures made of glued laminated timber must be made of wood of glued laminated timber strength class GL24h in accordance with DIN EN 14080.

3.2 Carpentry

3.2.1 Load-bearing and stiffening structures shall be carried out in accordance with DIN EN 1995-1-1, Design and Construction of Timber Structures in conjunction with DIN EN 1995-1-1/NA.

3.2.2 Constructions of wooden poles must be carried out in accordance with DIN 18900 "Timber mast design — Calculation and execution".

3.2.3 Wooden bridges are to be used in accordance with DIN EN 1995-2 "Design and construction of timber structures — Part 2: Bridges" in conjunction with DIN EN 1995-2/NA "National Annex — Nationally determined parameters — Eurocode 5: Design and construction of timber structures — Part 2: Bridges", bell towers in accordance with DIN 4178 "Bell towers" and temporary structures in accordance with DIN EN 13782 "Temporary structures — Tents — Safety" and DIN EN 13814 "Temporary structures and installations for event venues and amusement parks — Security".

3.2.4 The type of timber connections is up to the Contractor.

3.3 Timber House Construction, Timber Frame Construction, Timber Panel Building

3.3.1 Construction sawn timber is

- at least in strength class C24 according to DIN EN 338,
- with a wood moisture content of ≤ 18 %,
- at least heart-separated and equalized,
- with dimensional accuracy of the cross-section in accordance with dimensional tolerance class 2 in accordance with DIN EN 336,
- with a tree edge < 10 % of the smallest cross-sectional side, but sharp-edged in the visible area,

3.3.2 Sleepers, walls and the like on solid substrates must be force-locked along their entire length.

3.4 Roof formwork and sub-roof formwork

3.4.1 Roof formwork (load-bearing or stiffening) made of wood

3.4.1.1 Wooden roof formwork must be made of edged or spun boards or planks of strength class C24 in accordance with DIN EN 338 that are at least rough-sawn. Spun boards made of coniferous wood must comply with DIN 4072. Boards with a thickness of ≥ 24 mm and a width of ≤ 200 mm are to be installed. They are to be attached to any support, e.g. rafters, purlins. Floating impacts are not permitted.

3.4.1.2 Roof formwork for metal, bitumen, slate and fibre cement roofing shall be made of boards with a width of ≤ 160 mm.

3.4.1.3 Roof formwork under roof waterproofing shall be made of coniferous wood boards with a width of ≤ 160 mm. The minimum thickness is 24 mm.

3.4.2 Roof formwork made of wood-based panels (load-bearing and/or stiffening)

3.4.2.1 Roof formwork made of wood-based materials must be made in accordance with DIN EN 1995-1-1 and DIN EN 1995-1-1/NA. Wood-based materials are to be used in accordance with DIN EN 13986 "Wood-based materials for use in the construction industry - Properties, assessment of conformity and marking" in conjunction with DIN 20000-1 "Application of construction products in buildings - Part 1: Wood-based materials". Flat pressed panels in accordance with DIN EN 312 (P3 (non-load-bearing, damp area), P5 (load-bearing, damp area), P7 (heavy-duty, damp area)) must have a thickness of ≥ 19 mm, plywood panels in accordance with DIN EN 636 (Technical Class Wet or Outdoor) must have a thickness of ≥ 15 mm and OSB/3 or OSB/4 boards in accordance with DIN EN 300 "Boards made of long, flat, aligned chips (OSB) — definitions, Classification and requirements" have a thickness of ≥ 18 mm. Floating impacts are not permitted.

3.4.2.2 Roof formwork made of wood-based materials for metal, bitumen, slate and fibre cement roof panel coverings as well as formwork under roof waterproofing must have a thickness of ≥ 22 mm.

3.4.3 Sub-roof formwork (non-load-bearing)

3.4.3.1 Non-load-bearing sub-roof formwork that does not remain visible must be made of edged boards of quality class 3 in accordance with DIN 68365, with a thickness ≥ 18 mm.

3.4.3.2 Roof formwork that remains visible, e.g. verge, eaves and cornice formwork as well as sub-roof formwork, must be made of spun and planed on the visible surface boards or from planks of quality class 2 according to DIN 68365, with a thickness ≥ 16 mm. If the fastening is visible, it must be made of stainless steel.

3.4.4 Wall and slab formwork that remains invisible

3.4.4.1 Wall and slab formwork must be made of edged boards of quality class 3 in accordance with DIN 68365. Formwork for metal wall coverings must have a thickness ≥ 24 mm, for other wall coverings ≥ 22 mm on the outside and ≥ 18 mm on the inside.

3.4.4.2 Economy formwork shall be made of 70 mm to 120 mm wide boards of quality class 3 in accordance with DIN 68365 with a thickness ≥ 18 mm.

3.4.5 Non-weathered wall and ceiling cladding made of boards or planks

3.4.5.1 Non-weathered wall and ceiling cladding shall be made of spun boards or planks of equal width, planed at the visible surface.

3.4.5.2 Non-weathered wall and ceiling cladding must comply with quality class 2 according to DIN 68365 and must be installed with a wood moisture content of ≤ 15%.

3.4.5.3 The fastening must be concealed.

3.5 Roof battens

Roof battens shall be made of battens in accordance with Table 1, taking into account the rafter spacing and the grading class.

Table 1 — Roof battens, nominal cross-sections, support distances, grading classes

	Nominal cross-section **Mm**	**Support spacing, Axial dimension m**	**Sort class by DIN 4074-1 in Connection with mm m DIN 20000-5**
1	30/50	≤ 0,8	S 10
2	40/6	≤ 1,0	S 10

The roof battens must be attached to each rafter.

3.6 Floors, subfloors and false floors

3.6.1 Floors made of wood and wood-based materials, skirting boards and skirting boards

3.6.1.1 Wooden floor coverings (except parquet and wooden paving), skirting boards and cover strips must be installed from planed slats, boards or planks of at least quality class 2 in accordance with DIN 68365 with a wood moisture content ≤ 12%. The boards may be visibly attached. After installation, protruding edges on joints and joints must be removed. Floating impacts are not permitted.

3.6.1.2 Flooring made of wood-based materials must be made of wood-based materials in accordance with DIN EN 13986.

3.6.1.3 Skirting boards and skirting boards must be mitred at corners. The method of fastening the skirting boards and cover skirting boards is up to the contractor.

3.6.2 Blind floors made of wood or wood-based materials

3.6.2.1 Blind floors shall be made of boards of quality class 2 in accordance with DIN 68365 with a wood moisture content ≤ 15 % and a thickness ≥ 22 mm.

3.6.2.2 Blind floors made of wood-based panels shall be installed on bearing timber with a thickness ≥ 22 mm, or with a thickness ≥ 15 mm in the case of floating installation.

3.6.2.3 In the case of blind floors made of wood-based materials, panel joints must be staggered. The panel joints running parallel to the joists or ceiling beams are to be arranged on them. In the case of floating installation, the panel joints must be glued.

3.6.3 Slats and boards for false floors

3.6.3.1 Slats for false floors must have a minimum cross-section of 24 mm × 48 mm and comply with at least grade class S 10 in accordance with DIN 4074-1. The slats are to be fixed parallel to the edges of the beams at a distance of ≤ 30 cm.

3.6.3.2 Boards for false floors shall be made of wood of quality class 3 in accordance with DIN 68365 with a minimum thickness of 22 mm, edged and a gap ≤ 10 mm.

3.7 Balconies and terraces

Balconies and terraces are to be carried out in accordance with the specialist rule 02 "Balconies and terraces" of the carpentry trade, edition 20151).

.8 Exterior wall cladding

3.8.1 Exterior wall cladding made of wood or wood-based materials must be carried out in accordance with Specialist Rule 01 of the carpentry trade "Exterior wall cladding", edition 20062).

3.8.2 Exterior wall cladding must be made of at least rough-sawn, edged boards or planks of quality class 2 in accordance with DIN 68365. Board formwork must be ≥ 18 mm thick. In the case of visible fastening, stainless fasteners must be used. Hot-dip galvanized fasteners may be used in agricultural and forestry buildings.

3.8.3 In the case of inverted formwork made of non-profiled, edged boards, the overlap must be ≥ 20 mm.

3.8.4 In the case of floor, lid and cover strip formwork on walls made of non-profiled, parallel edged boards, the overlap must be ≥ 20 mm.

3.8.5 In the case of lid formwork, the outer boards must be fixed in the space between the lower boards. If joint cover strips are prescribed, each strip must be fixed in the joint.

3.8.6 Exterior wall cladding with wooden shingles shall be made of sawn shingles with fastening elements in accordance with DIN EN 14592, on a batten substructure in double covering. Connections must be made with shingles cut to the requirements.

3.8.7 For external wall cladding made of wood or wood-based materials, an air space ≥of 20 mm must be located behind the cladding.

3.8.8 Bei Außenwandbekleidungen aus Holzwerkstoffen müssen die Bekleidungselemente eine Dicke ≥ 12 mm aufweisen und hinterlüftet sein. Bei sichtbarer Befestigung sind nichtrostende Verbindungselemente zu verwenden.

3.9 Timbered doors and gates

Carpentry doors and gates must be made of uncouth and edged boards and planks of quality class 2 in accordance with DIN 68365 and of unplaned slats in grade class S 10 in accordance with DIN 4074-1.

3.10 Crates

3.10.1 Wooden crates must be made of unplaned boards of quality class 2 in accordance with DIN 68365. The boards must be joined close together.

3.10.2 Slat crates shall be made of unplaned slats of at least grade S 10 in accordance with DIN 4074-1, with a cross-section ≥ 24 mm × 48 mm. The slats must be fixed to each beam, with gaps of ≤ 50 mm.

3.11 Stairs

3.11.1 Stairs must be manufactured in accordance with DIN 18065 "Building stairs — Definitions, measurement rules, main dimensions".

Artisanal wooden stairs are to be executed in accordance with the Regulations for Artisanal Wooden Stairs, 19982 edition).

3.11.2 Softwood must comply with quality class 1 according to DIN 68365, hardwood quality class II according to DIN 68368.

3.11.3 Stair parts made of wood-based materials must be manufactured as wood-based panels in accordance with DIN EN 13986.

3.11.4 The wood moisture content at installation may be between 6 % and 12 %.

3.11.5 Stairs shall be constructed and installed in such a way as to prevent creaking when walked on. Isolated creaking noises cannot be ruled out in the event of major room climate fluctuations.

3.11.6 The bonding of stair sections must meet stress group D3 indoors and duty group D4 in accordance with DIN EN 204 outdoors.

3.11.7 A height offset between individual wooden slats due to adjustments to the wood compensation moisture is permissible, provided that the surface coating is not damaged as a result.

3.11.8 In the case of veneered treads (composite treads), the thickness of the top layer on the treads after sanding must be ≥ 2,3 mm when hardwood is used and ≥5 mm when softwood is used. At the butt edges, the thickness of the top layer must be ≥ 6 mm for both types of wood.

3.11.9 Cheek curves shall be connected to each other and to the stringers by means of bolsters and hardwood dowels, unless other connections are required for design reasons. If screw holes are dowelled or fittings are covered, the dowels or cover caps must be selected according to the type of wood and fitted in the direction of the grain.

3.11.10 Joints between stairs and wall remain open.

3.11.11 Handrail joints must be connected in such a way that the required spar loads can be absorbed.

3.11.12 Wooden surfaces of stairs and railings that remain visible must be sanded. In the case of non-opaque paints, the surface must be sanded in the direction of the grain, and all visible wooden edges must be broken.

3.11.13 Colour differences between longitudinal and end-grain wood surfaces, between solid wood and veneered surfaces and between and within the individual wooden slats are permitted.

3.12 Wood protection

3.12.1 DIN 68800 (all parts) applies to timber construction work. Preventive structural wood protection measures in accordance with DIN 68800-2 "Wood protection — Part 2: Preventive structural measures in building construction" have priority.

3.12.2 The process of processing the wood preservatives is left to the contractor and is to be selected in accordance with DIN 68800-3 "Wood protection — Part 3: Preventive protection of wood with wood preservatives".

3.12.3 DIN 68800-4 "Wood protection — Part 4: Control and remediation measures against wood-destroying fungi and insects" applies to wood protection measures. Benefits for combating wood protection measures are Special services, see section 4.2.31.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on or clad is not higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.1.2 Compensation of stepped or inclined standing surfaces of scaffolding up to 40 cm difference in height, e.g. via stairs or ramps.

4.1.3 Installing of:

- wood screws with a diameter ≤ 6 mm and a length ≤ 100 mm, unless they are quenched and tempered wood screws (e.g. made of stainless steel),
- nails, unless they are quenched and tempered nails (e.g. made of stainless steel),
- Clamps according to DIN EN 14592.

Specially shaped fasteners pursuant to paragraph 4.2.11 are also excluded.

4.1.4 Submission of pre-made samples.

4.2 Special services in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 Provision of recreation and storage rooms if the Client does not provide rooms that can be easily locked.

4.2.2 Auf-, Um- und Abbauen sowie Vorhalten von Gerüsten für Leistungen anderer Unternehmer.

4.2.3 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on or clad is higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.2.4 Erection, conversion and dismantling as well as provision of scaffolding with a stepped or inclined footprint, e.g. over stairs or ramps, if compensation of more than 40 cm is required.

4.2.5 Assembly, conversion and dismantling as well as provision of scaffolding for your own

services, provided that when working on the roof surface, there is a roof pitch

greater than 22.5°.

4.2.6 Setting up, dismantling and maintaining protective nets.

4.2.7 Cleaning the substrate of coarse soiling, e.g. plaster residues, mortar residues, paint residues, oil, insofar as this was not caused by the Contractor.

4.2.8 Compensation of larger unevenness and dimensional deviations of the substrate than permissible according to DIN 18202.

4.2.9 Special protection of building and plant components as well as furnishings, e.g. masking of windows, doors, floors, coverings, stairs, wood, roof surfaces, surface-finished parts, dust-proof masking of sensitive equipment and technical equipment, dust protection walls, emergency roofs, laying of hardboard or building protection films from 0.2 mm thick,

4.2.10 Protection of the structure below a roof truss to be removed.

4.2.11 Installation of connecting and fastening elements that are statically verifiable or structurally required, except those referred to in section 4.1.3.

4.2.12 Retightening of bolts and dowel bolts in accordance with DIN EN 1995-1-1 if shrinkage of the wood provided by the customer is to be expected.

4.2.13 Preparation of building physics verifications as well as static calculations and the drawings required for these verifications.

4.2.14 Tests to prove the stability of the structure, test loads, dowel extraction tests, impact tests and the like.

4.2.15 Creation of anchoring possibilities remaining in the structure, e.g. for scaffolding.

4.2.16 Making and closing recesses in masonry and concrete for supports and anchors.

4.2.17 Making recesses, e.g. for doors, windows, built-in parts, switches, pipe penetrations, cables.

4.2.18 Making and attaching sample surfaces, sample constructions and models.

4.2.19 Removal and reinstallation of clothing elements for the services of other entrepreneurs.

4.2.20 Processing of surfaces, e.g. by planing, sanding, as well as chamfering and profiling of wooden edges.

4.2.21 Cutting of formwork, cladding and the like on slanted connections and terminations.

4.2.22 Creation of special joint and corner formations.

4.2.23 Manufacture of soffit linings.

4.2.24 Manufacture of partitions, aprons and false beams for ceiling cladding, suspended ceilings and wall coverings.

4.2.25 Manufacture of rafter cuts as well as binding, erection or laying of timber in difficult carpentry, e.g. towers, domes, dormers, curved or crooked roof surfaces, ridge and throat rafters.

4.2.26 Planing and profiling of rafter, purlin and beam heads.

4.2.27 Reinforcing components, e.g. in the area of recesses, notches, cut cassettes.

4.2.28 Connection of airtight and windproof layers as well as vapour retardants to components created on site.

4.2.29 Services for fire, sound, heat, moisture and radiation protection as well as for the fulfilment of acoustic and ventilation requirements.

4.2.30 Filling of joints and connections to adjacent components, installation of cover strips and the like.

4.2.31 Benefits under Section 3.12.3.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

The determination of the service – regardless of whether it is carried out according to drawings or measurements – must be based on the dimensions of the

- manufactured cladding, coverings and coverings,
- manufactured components,
- treated component sections

The simplifying rules such as overmeasurement rules and individual regulations are to be used to determine performance.

5.2 Determination of dimensions/quantities

The following are to be taken as a basis:

5.2.1 When billing according to room dimensions

- the greatest length, including the tenons and other wooden joints,

- the full cross-section, in the case of planed constructions and components, the installation cross-section, without deduction of recesses, notches, bevels, cross-section weakening and the like.

5.2.2 When billed according to area

- in the case of angled surfaces, the largest component length unfolded,
- in the case of surfaces without limiting components, their dimensions, e.g. the dimensions of the formwork, insulation layer, cladding,
- in the case of surfaces with limiting components, the dimensions of the areas to be covered up to the unplastered, uninsulated, unclad components limiting them,
- in the case of facades, ceilings and walls for all layers (insulation, substructure, cladding and the like), the dimensions of the cladding,
- Back surfaces of niches.

5.2.3 When invoicing walls in timber construction

- their dimensions up to the unclad components that limit them,
- in the case of angled walls, the largest component length unfolded,
- in the case of wall penetrations, only one wall continuously, in the case of walls of unequal thickness, the thicker wall.

5.2.4 When billing according to length

- for carpentry timber, the greatest length, including the wooden joints,
- for other components, the largest component dimensions, if any.

5.2.5 When Billing by Piece

- fasteners such as screws, rod dowels, dowels of special design, bolts, quenched and tempered fasteners (e.g. of stainless steel), specially shaped fasteners (e.g. angle connectors, beam shoes), except fasteners referred to in section 4.1.3,
- Statically verifiable and structurally required components, e.g. dowels, bolts, anchors, fasteners, hangers, spacers, brackets, sheet steel fittings.

5.2.6 When Billing by Mass

For statically verifiable and constructive steel parts, with the exception of those mentioned in section 5.2.5, the following principles are to be applied when billing by mass:

- in the case of standardised profiles, the information in the DIN standards applies,
- for other profiles, the information in the manufacturer's profile book,
- in the case of steel sheets and strips, 7.85 kg per m2 area and 1 mm thickness,
- for stainless steel plates and strips, 7.9 kg per m2 area and 1 mm thick,

In the case of small iron parts with a total mass of up to 15 kg, the mass may be determined by weighing.

In the case of galvanized steel structures, 5% is added to the masses due to the increase in weight due to galvanizing.

5.2.7 If a recess is proportionately integrated into adjacent areas that are to be calculated separately, the respective proportionate recess area is calculated to determine the overmeasurement variable.

5.3 Overmeasurement rules

To be overmeasured

5.3.1 When billed according to area

- Recesses ≤ 2.5 m2 individual size, in floors ≤ 0.5 m2 individual size. When determining the individual size, the smallest dimensions of the recess shall be taken as a basis,
- interruptions in the area to be worked on by components, e.g. trusses, columns, beams, templates, rafters, substructures, with an individual width ≤ 30 cm in the case of intermediate floors, insulating, separating and protective layers, fills, vapour barriers, seals, formwork, cladding and the like,
- Recesses ≤ 2.5 m2 individual size in e.g. ceilings, walls, roofs, formwork, wall and ceiling cladding, facing shells, insulating, separating and protective layers, vapour barriers, waterproofing and light exterior wall cladding, whereby directly connected various recesses, e.g. opening with adjacent niche, are counted separately,
- Recesses, e.g. for pillar templates, chimneys, pipe penetrations ≤ 0.5 m2 individual size, in floors and the associated insulating, separating and protective layers, fills, vapour retarders and seals,
- Gaps in battens, economy formwork, blind floors, crates and cladding made of slats, boards, panels, slats and the like.

5.3.2 When billing according to length

- Interruptions ≤ 1 m individual length,
- Fugues.

5.4 Individual provisions

5.4.1 Rear surfaces of niches and reveals are calculated separately with their dimensions, regardless of their individual size.

5.4.2 The manufacture of recesses for individual luminaires, continuous rooflights, skylights, air outlets, inspection openings, columns, pillar templates, installation boxes, pipe penetrations, cables and the like shall be calculated separately according to dimensions.

5.4.3 In the case of borehole infusion, the distance between the outermost boreholes shall be measured in length and width. For each treated component section, a drill hole spacing is added to the determined dimensions in order to take into account the area of influence of the protective agents applied at the edge.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Steel construction work — DIN 18335

Issue September 2016

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 Type and condition, in particular load-bearing capacity of the substrate (e.g. subsoil, substructure, base course, supporting structure).

0.1.2 Type, location, dimensions, accessibility, nature and load-bearing capacity of storage and assembly areas as well as restrictions on working height, separated by construction phases.

0.1.3 Foundation depths, types of foundations and loads as well as construction of adjacent structures.

0.1.4 Formation of construction pits.

0.1.5 Type, location, dimensions and design as well as dates for the assembly and dismantling of scaffolding on site.

0.2 Information on the execution

0.2.1 Number/quantity, type, location, dimensions, materials and design (material quality) of components to be manufactured.

0.2.2 Component production/execution according to the execution plan or according to local measurements.

0.2.3 Type of pre-treatment of the substrate (e.g. cleaning, high-pressure cleaning, roughening, chipping off old substrates, consolidation of the substrate).

0.2.4 Number, type, location, dimensions and design of terminations and connections to adjacent components (e.g. with anchor plate, bumper, fork sleeve, separator strip).

0.2.5 Number, type, position, dimensions and design of bearings, support feet, joints, joints.

0.2.6 Number, type, location, dimensions and design of movement, structure and component joints.

0.2.7 Permissible joint presses on bearings and column feet; Course and extent of subsidence.

0.2.8 Number, type, location, dimensions of recesses to be made or closed.

0.2.9 Number, type, location, dimensions and masses of installation and installation components.

0.2.10 Requirements for fire, sound, heat, moisture and radiation protection as well as for airtightness and electrical conductivity, acoustic, lighting and ventilation requirements.

0.2.11 Increased requirements for flatness and dimensional tolerances according to DIN 18202 "Tolerances in building construction — Buildings", e.g. for façades, plant components.

0.2.12 Compensation of larger unevenness and dimensional deviations of the substrate than permissible according to DIN 18202, e.g. at support and connection points.

0.2.13 Special restrictions on changes of form.

0.2.14 Selection or exclusion of certain types of connections (e.g. welding, screwing, riveting).

0.2.15 Requirement of special machining of welds.

0.2.16 Specifications resulting from expert opinions.

0.2.17 Early or subsequent production of parts of the service.

0.2.18 Number, type and dimensions of patterns/surfaces and colour samples/pattern constructions, place of installation/assembly.

0.2.19 Protection of components and equipment, furnishings and the like.

0.2.20 Information for the preparation of workshop drawings with all components, connections and connections, e.g. cross-sections, materials, sheet thicknesses, screws, welds.

0.2.21 Execution documents prepared by the Contractor on the basis of the execution documents handed over by the Client (production documents), e.g.: Workshop drawings; Assembly overviews; Parts lists; Work instructions.

0.2.22 For which execution documents the approval of the Client is required.

0.2.23 The nature and scope of component or material tests that go beyond the requirements of the Building Rules List and the List of Technical Building Regulations.

0.2.24 Type and extent of any trial loads that may be required.

0.2.25 Further tests beyond the stipulations in section 3.1.1.

0.2.26 Requirements for the exchange of data by electronic means.

0.2.27 Information on corrosion protection work according to ATV DIN 18364 "Corrosion protection work on steel structures".

0.2.28 Special physical and chemical stresses to which substances and components are exposed after installation.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 3.1.1,	if the submission of factory certificates or acceptance test certificates 3.1 or 3.2 is to be agreed instead of the submission of a factory certificate,
Section 3.1.4,	if the contractor is to provide the drawings and strength calculations required for the building permit,
Section 3.1.4,	if parts of the execution documents are to be prepared by the Contractor,
Section 3.2	if tolerances other than those specified therein are to apply,
Section 3.2.2	if structures with nominal dimensions of more than 60 m are constructed,
Section 5.1,	if the mass is to be determined by weighing,

Section 5.2.2	if rolling tolerance and waste are to be taken into account in the calculation of the mass,
Section 5.2.3	if fasteners are to be taken into account in the calculation of the mass:
Section 5.4.1	if all the same components are to be weighed

0.4 Individual information on fringe benefits and special benefits

In particular, the following can be considered as ancillary services for which special ordinal numbers (items) are to be provided under the conditions of ATV DIN 18299, Section 0.4.1:

- provision of scaffolding (see section 4.1.1);
- Creation and maintenance of auxiliary structures (see section 4.1.2);
- leak tests (see section 4.1.9).

0.5 Billing Units

In the bill of quantities, the billing units are to be provided as follows:

0.5.1 Mass (kg, t), separated by type and dimensions, for

- Steel components,
- Bearing bodies, transition structures and other special components.

0.5.2 Number (pcs), separated by type and dimensions, for

- Steel components,
- composite components made of steel and reinforced concrete, bearing bodies, transition structures and other special components,
- Head bolt dowels.

0.5.3 Length (m), separated by type and dimensions, for

- Steel components,
- Composite components made of steel and reinforced concrete,
- Bearing bodies, transition structures and other special components. 0.5.4 Area (m2), separated by type and dimensions, for
- Steel components,
- Composite components made of steel and reinforced concrete,
- Bearing bodies, transition structures and other special components.

0.5.5 Volume dimension (m3) for

- Composite components made of steel and reinforced concrete

0.5.6 Composite components made of steel and reinforced concrete can also be billed separately:

- steel components in accordance with clauses 0.5.1 to 0.5.4,
- Concrete and reinforced concrete according to ATV DIN 18331 "Concrete work".

1 Scope of application

1.1 ATV DIN 18335 "Steel construction work" applies to steel construction services of structural engineering in building and civil engineering, including steel composite construction.

1.2 ATV DIN 18335 does not apply to

- Metal construction work (see ATV DIN 18360 "Metal construction work") and
- Corrosion protection work (see ATV DIN 18364 "Corrosion protection work on steel structures").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18335 take precedence.

2 Fabrics, components

No supplementary regulations to ATV DIN 18299, Section 2.

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 DIN EN 1090-2 "Execution of steel structures and aluminium structures — Part 2: Technical rules for the execution of steel structures" applies to steel construction services.

3.1.2 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- Deviations of the portfolio from the specifications,
- insufficient quality of the assembly areas designated in the construction site furnishing planning (BE planning),
- greater deviations in the connection and support points of the steel structure than permissible or contractually agreed in accordance with DIN 18202 "Tolerances in building construction — structures", greater deviations for concrete components than according to DIN EN 1992 (all parts) "Eurocode 2: Design and construction of reinforced concrete and prestressed concrete structures" including the associated National Annexes, DIN EN 1992/NA (all parts) "National Annex — Nationally determined parameters — Eurocode 2: Design and construction of reinforced concrete and prestressed concrete beams" and DIN 1045-3 "Structures of concrete, reinforced concrete and
- Prestressed concrete — Part 3: Construction — Rules of application for DIN EN 13670'.

3.1.3 Movement joints of the structure must be adopted structurally with the same possibility of movement.

3.1.4 The Contractor shall prepare the necessary production documents on the basis of the execution documents to be handed over by the Client before the start of production.

The Client shall return the production documents supplied by the Contractor, insofar as they require the approval of the Client and are not objectionable, in one copy with his approval note. Complaints must be reported to the Contractor immediately.

3.2 Tolerances

3.2.1 Manufacturing tolerances

The following tolerances apply to the production of load-bearing components made of steel:

- basic tolerances according to DIN EN 1090-2;
- Supplementary tolerances according to DIN EN ISO 13920 "Welding — General tolerances for welded constructions — Length and angular dimensions; Form and Position" for welded and non-welded structures, dimensional tolerances of tolerance class C for length and angular dimensions and tolerance class G for straightness, flatness and parallelism.

3.2.2 Assembly tolerances

The following tolerances apply to the assembly of load-bearing steel components:

- basic tolerances according to DIN EN 1090-2;
- Tolerances according to DIN 18202 for the finished structure with nominal dimensions up to 60 m.

Any additional increased requirements for dimensional accuracy compared to the values listed in the above-mentioned standards are special services according to section 4.2.7.

3.3 Assembly

3.3.1 Assembly basics

The basis for assembly is all the preliminary work required for the performance of the Contractor and to be provided by the Client, consisting of:

- the staking out of the main axes of the structural facilities, the terrain boundaries and height control points in accordance with § 3 para. 2 VOB/B,
- all substructures, foundation and installation parts prepared to accommodate and connect the steel structure, e.g. anchor channels and plates,
- Existing level access roads at floor level and load-bearing for truck and truck crane access (trucks with a permissible total weight of 40 t, cranes with an axle load of 12 t per axle),

- the provision of suitable, drivable areas for the use of mobile scaffolding, lifting masts and aerial work platforms, etc.,
- informing the contractor of any special safety regulations to be observed resulting from the place of installation.

3.3.2 Installation conditions

In case of unsuitable installation conditions, such as

- Temperatures below 5 °C during necessary welding work,
- wind speeds over 9.8 m/s (wind force 5),
- icing of the structure, the assembly, storage and access areas as well as the stored components and
- heavy snowfall

special measures must be taken in coordination with the client. If services are required for this, these are special services (see section 4.2.4).

3.3.3 Storage and connection components made of concrete and reinforced concrete

The measurement and compensation of time-dependent deformations of substructures, foundation and connecting components made of concrete, reinforced concrete and prestressed concrete must be described in detail in the client's execution documents.

The grouting or grouting of bearing joints may only be started after the contractor and client have jointly determined the contractual position of the bearings, column bases and anchors. The statement must be explained in a joint record.

The contractor must remove any auxiliary equipment that interferes with or is unsuitable during the final construction to restore the bearings to the planned position of the bearings, support bases and anchors during installation as soon as the underlay has reached the required strength.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Provision of scaffolding for one's own use.

4.1.2 Creation and provision of auxiliary structures for assembly and construction (e.g. guying, auxiliary supports and shoring). These constructions have no influence on the final structure and are limited in time.

4.1.3 Manufacture, maintain and dismantle the covers and fencing of openings during their own period of use. During the user's own period of use, the facilities can also be used by other entrepreneurs. The Client must be notified in writing immediately of the completion of the user's own use. Any further transfer of use, provision and subsequent dismantling are special services according to 4.2.28.

4.1.4 Determination of the condition of the roads, the terrain surface, the receiving waters, etc. in accordance with § 3 para. 4 VOB/B.

4.1.5 Cleaning of the substrate, except for services according to section 4.2.5.

4.1.6 Protection of components and installations from contamination and damage during steel construction work by loose covering, hanging or wrapping, except for protective measures under section 4.2.11.

4.1.7 Weighing the steel components or providing the weight calculations for billing.

4.1.8 Provision of the samples, manpower, machines and tools required for testing during production and for the acceptance of the Contractor's performance.

4.1.9 Leak tests, insofar as these are necessary to prove functionality.

4.1.10 Completion of components in several work steps to enable work by other contractors, insofar as the company's own services can be provided continuously in the course of similar assembly work. If these conditions are not met, they are special services according to section 4.2.13.

4.1.11 Measurement of foundation recesses up to a depth of 0.8 m.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 Provision of recreation and storage rooms if the Client does not provide rooms that can be easily locked.

4.2.2 Provision of scaffolding for other contractors beyond their own period of use.

4.2.3 Conversion of scaffolding, provision of hoists, lifts, recreation and storage rooms, facilities and the like for the purposes of other entrepreneurs.

4.2.4 Protection against unsuitable climatic conditions in accordance with section 3.3.2.

4.2.5 Cleaning of the substrate from coarse soiling, e.g. by building rubble, gypsum residues, mortar residues, concrete residues, paint residues, oil, insofar as this has not been caused by the Contractor.

4.2.6 Compensation of larger unevenness and dimensional deviations of the fastening substrate than permissible according to DIN 18202.

4.2.7 Meeting increased requirements for flatness and dimensional accuracy (see sections 3.2.1 and 3.2.2).

4.2.8 Services for fire, sound, heat, moisture and radiation protection, insofar as they go beyond the services under Section 3.

4.2.9 Production of movement joints and joint seals.

4.2.10 Manufacture, attach or install patterns, sample surfaces, sample constructions.

4.2.11 Special protection of building and plant components as well as furnishings, e.g. masking of windows, doors, floors, coverings, stairs, wood, roof surfaces, finished surface parts, dust-proof masking of sensitive equipment and technical equipment, dust protection walls, emergency roofs, laying of hardboard or building protection films larger than 0.2 mm thick.

4.2.12 Making connections to adjacent components, e.g. crane runways.

4.2.13 Completion of components in several operations to enable work by other contractors, insofar as the company's own services cannot be provided continuously in the course of similar assembly work (see section 4.1.10).

4.2.14 Performances to demonstrate the quality of the substances, components and compounds that go beyond the performance required under Section 2 and Section 3.1.

4.2.15 Material tests and their verifications that go beyond the test certificates required in the Implementing Standards in Section 3.

4.2.16 Introduction and removal of liquid fillers for leak testing if the leakage verification can also be carried out by other means.

4.2.17 Trial loads.

4.2.18 Making or closing recesses, e.g. holes, openings and slots in adjacent components.

4.2.19 Attachment or installation of components, e.g. substructures, façade connection components, anchor channels, pipes, cables, frames and the like.

4.2.20 Measurement of foundation recesses with a depth of more than 0.8 m.

4.2.21 Preparation of execution documents, e.g. static calculations, detailed proofs including fasteners.

4.2.22 Obtaining approval for the use of components for which individual approval or client-specific approval or approval is required.

4.2.23 Casting or grouting of bearings, column feet and anchors.

4.2.24 Services for the compensation of time- and load-dependent deformations of substructures, foundation and connecting components made of concrete, reinforced concrete and prestressed concrete.

4.2.25 Services for temporary bracing and support of composite structures.

4.2.26 Soil and water investigations.

4.2.27 Creation and provision of special auxiliary structures for the assembly and construction state that go beyond the services according to 4.1.2, as well as Verstärkungen, sofern dafür statische und zeichnerische Unterlagen erforderlich sind (z. B. wenn bestimmte Montagezustände vorgegeben sind; wenn für Montagezustände besondere statische Betrachtungen erforderlich werden).

4.2.28 Provision of use, provision and subsequent dismantling of covers and fencing of openings beyond the user's own period of use.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

The determination of the performance — regardless of whether it is carried out according to drawings or measurements — shall be based on the dimensions of the components manufactured.

All installed material is tempered. In the case of billing by mass, this is determined by calculating on the basis of drawings and parts lists. The mass of fittings, e.g. castings or forgings, is determined by weighing.

The simplifying rules, such as over-measurement rules and individual regulations, are to be used to determine performance.

5.2 Determination of dimensions/quantities

5.2.1 The following shall apply to the determination of the dimensions:

- for flat steels up to 180 mm wide and for shaped and bar steels, the longest length and full cross-section,
- in the case of flat steels over 180 mm in width and in the case of sheet metal, the area of the smallest circumscribed rectangle.

5.2.2 The calculation of the mass shall be based on:

- in the case of standardised profiles, the theoretical dimensions according to DIN standards,
- for other profiles, the measurements from the manufacturer's profile book,
- in the case of sheets, wide flat steels and strip steels, the mass of 7.85 kg per m2 area and mm thickness,
- in the case of fittings made of steel or cast steel, the density of 7.85 kg/dm3,
- for cast iron (grey cast iron) fittings, the density of 7.25 kg/dm3.

The above-mentioned billing principles are to be applied mutatis mutandis to small parts.

5.2.3 The following are not taken into account in the calculation of the mass:

- Fasteners, e.g. screws, rivets, weld metal.

5.3 Overmeasurement rules

Cutouts and recessed corners are measured.

5.4 Individual provisions

5.4.1 Weight determination by weighing

All components must be weighed. Only an appropriate number of identical components need to be weighed.

5.4.2 Head bolt anchors

Head bolt dowels are billed by piece.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Waterproofing work — DIN 18336

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 Type of use of the structures, rooms or areas to be sealed.

0.1.2 Type of supporting structure, slope, height of the structure and working height range.

0.1.3 Type, location, dimensions and design as well as dates for the erection and dismantling of scaffolding on site. 0.1.4 Restrictions on noise, dust and odour emissions.

0.1.5 Restrictions on chiseling, milling, drilling and welding work on the structure.

0.1.6 Permissible loads on the waterproofing surface or supporting structure.

0.1.7 Type of change in shape of the supporting structure.

0.1.8 Type, location and load-bearing capacity of anchorage points.

0.1.9 Conditions for the installation of agitator and melting boilers.

0.1.10 Construction of construction pits.

0.1.11 Foundation depths, types of foundations, loads and construction of adjacent structures.

0.1.12 Type, nature and inclination of the waterproofing substrate.

0.1.13 Design water level, greatest immersion depth of the waterproofing.

0.1.14 Water permeability coefficient of the soil in front of the soil.

0.2 Information on the execution

0.2.1 The number, type, location, dimensions and density of the structures or parts of structures to be sealed.

0.2.2 Planned work stages and work interruptions.

0.2.3 Early or subsequent creation of partial surfaces.

0.2.4 Number, location and dimensions of the individual areas, separated by storeys.

0.2.5 Number, type, position and dimensions of sloping, curved or otherwise shaped surfaces.

0.2.6 Protection of components or equipment, furnishings and the like.

0.2.7 Number, type, location, dimensions and execution of temporary waterproofing and their removal.

0.2.8 Type of waterproofing and materials according to immersion depth, water exposure class, rated water level, crack class, crack bridging class, use class, location of the tank and space use class.

0.2.9 Location of the waterproofing in rooms, on the outside or inside of the structure; Location of the installation site; Waterproofing of floor slabs, ceiling or wall surfaces.

0.2.10 Size of the surface pressure acting on the waterproofing and of the load surfaces. Affected areas, each divided into floor slabs, ceiling and wall surfaces.

0.2.11 Waterproofing installation as internal installation on wall recess or as external installation on external walls.

0.2.12 Type and length of transition from floor slab waterproofing to wall waterproofing, e.g. sweeping connection, receding joint.

0.2.13 Method of bonding the waterproofing layers to the substrate and to each other.

0.2.14 Type of pre-treatment of the waterproofing substrate.

0.2.15 Type, texture, e.g. degree of moisture penetration, moisture content, salinity and strength of the substrate, e.g. concrete, aerated concrete, plastered or unplastered masonry, wood, trapezoidal sheeting.

0.2.16 Surface tensile strength of the substrate.

0.2.17 Colour of waterproofing.

0.2.18 Measures to protect against wind suction or wind pressure.

0.2.19 Type, extent of upstands.

0.2.20 Number, type, quality, location, dimensions and formation of insulating, drainage and separation layers as well as vapour barriers.

0.2.21 Number, type, location, dimensions and formation of protective layers, protective layers and protective measures.

0.2.22 Type, location, dimensions and design of movement, structure and component joints to be sealed.

0.2.23 Requirements for joint fillers, joint, contact and end profiles.

0.2.24 Type, direction and size of joint movements.

0.2.25 Number, type, location, dimensions and masses of built-in parts, e.g. fans, roof drains, rooflights.

0.2.26 Number, type, location and dimensions of connections, e.g. to adjacent components, terminations, transitions, penetrations of built-in components.

0.2.27 Number, position and dimensions of recesses. Temporary recesses that can only be sealed at a later date.

0.2.28 Number, type, position, dimensions and formation of built-in parts to prevent slipping and buckling of structural components. Performance to prevent slipping on inclined surfaces.

0.2.29 Type of method of subsequent waterproofing.

0.2.30 Material properties of existing seals/old coatings.

0.2.31 Special physical and chemical stresses to which substances and components are exposed after installation.

0.2.32 Requirements for fire, heat, sound and radiation protection.

0.2.33 Specifications resulting from expert reports.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in sections 3.2 to 3.7 if other construction methods or construction methods are to be used.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units are to be provided as follows:

0.5.1 Area (m2), separated by type and dimensions, for

- waterproofing of wall surfaces, including areas of receding joints and subsequent sealing,
- waterproofing of floor slabs, including surfaces of receding joints, separated according to inclinations up to 1:1 and above 1:1,
- waterproofing of ceiling surfaces,
- reinforcements in the surface,
- Pre-treatment of the waterproofing substrate,
- Protective layers/protective layers and protective measures,
- mastic asphalt,
- Treatment of partial areas, differentiated according to areas shares, e.g.
    - ≤ 10% of the component area,
    - > 10 % ≤ 30 % of the component area,
    - > 30 % ≤ 50 % of the component area,
- Insulation and separation layers, vapour barriers and the like.

0.5.2 Dimensions of length (m), separated by type and dimensions, for

- Waterproofing over movement joints, separated according to inclinations of the surfaces up to 1:1 and over 1:1,
- horizontal waterproofing in walls against rising damp, including subsequent waterproofing,
- connections, terminations, transitions and penetrations,
- sweeping connections,
- decreasing impacts,
- Reinforcement at edges, grooves, connections, terminations and transitions,
- Formation of sealing fillets,
- Adhesive and connection flanges, loose/fixed flange constructions,
- Clamping rails, clamping profiles, coated sheets, covers and the like,
- Protective layers/protective layers in strips,
- edges and chamfers,
- Insulation and separation layers in strips.

0.5.3 Number (pcs), separated by type and dimensions, for

- Making and closing recesses,
- connections, terminations, transitions and penetrations,
- Adhesive and connection flanges, loose/fixed flange constructions,
- Sleeves, clamps, clamping rails, sealing corners, clamping profiles, coated sheets and the like,
- Plate anchors, built-in parts and the like,
- Protective measures.

0.5.4 Mass (kg, t), separated by type and dimensions, for

- cavity filling,
- mastic asphalt,
- Filling the substrate.

0.5.5 Combined billing (m2d, m2W, m2Mt, Std (piece × days), StWo, StMt, m3d, m3Wk)

- Recreation and storage rooms,
- Control, maintenance of protective measures,
- Drying.

1 Scope of application

1.1 ATV DIN 18336 "Waterproofing work" applies to waterproofing of

- roofs as well as balconies, loggias and pergolas,
- drivable concrete traffic areas,
- components in contact with the ground,
- Indoors
- Tanks and basins

against the effects of water, including the production of the necessary insulating, vapour barrier and protective layers, separation layers and support layers.

It also applies to:

- Subsequent sealing of components in contact with the ground,
- waterproofing under greenery,
- Drying work in the course of the waterproofing work.

1.2 ATV DIN 18336 does not apply to

- the earthworks to be carried out during waterproofing work (see ATV DIN 18300 "Earthworks"),
- drainage for the protection of structural facilities (see ATV DIN 18308 "Drainage and infiltration work"),

- Waterproofing of structures that are constructed using the closed construction method (see ATV DIN 18312 "Underground construction work"),
- Concrete with high water penetration resistance (see ATV DIN 18331 "Concrete work"),
- Surface protection systems for concrete maintenance (see ATV DIN 18349 "Concrete maintenance work"),
- Sealing surfaces made of mastic asphalt in plants for handling water-polluting substances (see ATV DIN 18354 "Mastic asphalt work"),
- waterproofing systems against water-polluting substances,
- waterproofing of landfills and earthworks, and
- Waterproofing of the pavement panels of bridges belonging to public roads.

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18336 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

For the most common standardised substances and components, the DIN standards and other requirements are listed below:

DIN 18195	Waterproofing of Structures — Terms
DIN 18531-5	Waterproofing of roofs and balconies, loggias and pergolas — Part 5: Balconies, loggias and pergolas
DIN 18532	(all parts) Waterproofing of drivable traffic areas made of concrete
DIN 18533	(all parts) Sealing of components in contact with the ground
DIN 18534	(all parts) Waterproofing of interiors
DIN 18535	(all parts) Sealing of tanks and basins
DIN EN 13162	Thermal insulation products for buildings — Factory made mineral wool (MW) products — Specification
DIN EN 13163	Thermal insulation products for buildings — Factory-made expanded polystyrene (EPS) products — Specification
DIN EN 13164	Thermal Insulation Products for Buildings — Factory Made Extruded Polystyrene Foam (XPS) Products — Specification

DIN EN 13165	Thermal insulation products for buildings — Factory made rigid polyurethane foam (PU) products — Specification
DIN EN 13166	Thermal insulation products for buildings — Factory made phenolic resin foam (PF) products — Specification
DIN EN 13167	Thermal Insulation Products for Buildings — Factory Made Foam Glass (CG) Products — Specification
DIN EN 13707	Waterproofing membranes — Bitumen membranes with support inserts for roof waterproofing — Definitions and properties
DIN EN 13956	Waterproofing membranes — Plastic and elastomer membranes for roof waterproofing — Definitions and properties
DIN EN 13984	Waterproofing membranes — Plastic and elastomer vapour barrier membranes — Definitions and properties

Acrylate gels must consist of at least 4 individual components. The water component can be replaced by an aqueous plastic dispersion.

Polyurethane gels must consist of a resin component and a water component in a mixing ratio of 1:1 to 1:10. The water component can be replaced by an aqueous plastic dispersion.

Gels for injection into reinforced concrete components must not cause reinforcement corrosion.

Against capillary water, injectables based on

- Alkali silicate and/or alkali methyl silicone (with ≥ 20 % by weight, active ingredient content),
- Epoxy
- Paraffin,
- Polyacrylate gel (with ≥ 40% by weight, active ingredient content),
- polyurethane gel (with ≥ 10% by weight, active ingredient content),
- polyurethane resin,
- Siliconate (with ≥ 10% by weight, active ingredient content),
- Silicone microemulsion (with ≥ 10% by weight, active ingredient content),
- Silane/siloxane (with ≥ 65% by weight, active ingredient content)

Fabrics for waterproofing under greenery must be resistant to penetration and penetration of the rhizomes of Agropyron repens (couch grass) as well as the roots of Alnus incana (grey alder) and Pyracantha coccinea "Orange Charmer" (firethorn). Tests to prove root and rhizome strength must be carried out on at least 8 planters.

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- Deviations of the portfolio from the specifications,
- unsuitable slope,
- unsuitable condition of the waterproofing substrate, e.g.
  - insufficient evenness,
  - insufficient strength or stiffness,
  - Stress or settlement cracks, holes, concrete nests, concrete stillage,
  - surfaces that are too rough, too porous, too smooth, too absorbent or oily,
  - sharp edges, ridges and height offsets,
  - lack of curves of edges, grooves and corners,
- missing anti-slip devices,
- unsuitable type and location of movement joints and penetrating components,
- unsuitable type, location or absence of drains and other drainage facilities,
- unsuitable type, location or absence of built-in elements for connecting the waterproofing to penetrations,
- unsuitable conditions (see section 3.1.2).

3.1.2 In the event of unsuitable conditions resulting from the weather, the indoor climate or the temperature of the component, e.g. wet substrates to be sealed, temperatures below 5 °C, snow, ice and frost, sharp winds, special measures must be taken in consultation with the Client. The benefits for measures to be taken are special services (see section 4.2.6).

3.1.3 Movement joints of the structure must be taken over at the same point with the same possibility of movement.

3.1.4 Movement joints must be sealed in such a way as to prevent water from entering the structure through the joint. The sealing of movement joints must absorb the effects of joint movements, e.g. as a result of settlement, temperature changes, shrinkage, creep and water pressure.

3.1.5 Transitions, connections and terminations as well as penetrations must be designed in such a way that they cannot be undermined or undermined, if necessary with the help of built-in parts. The necessary constructive and sealing measures must be adapted to the expected effect of water.

3.2 Waterproofing of roofs as well as balconies, loggias and pergolas

3.2.1 General

3.2.1.1 Heavy surface protection from slab coverings shall be made of concrete slabs 50 cm × 50 cm × 5 cm, laid in at least 3 cm thick gravel bed with a grain size of 5/8 mm, on a protective layer of plastic fleece 300 g/m2.

3.2.1.2 Surface protection by layer structure for green roofs must be provided in accordance with DIN 18915 "Vegetation technology in landscaping — Ground work".

3.2.1.3 Roof drains must be thermally insulated with gravel trap, in two parts in the case of thermally insulated roof surfaces.

3.2.1.4 Waterproofing with membranes must be finished at the edge with rigid aluminium profiles, which must be fixed every 20 cm and additionally secured against rainwater.

3.2.1.5 Roof edge covers must be stored with covers on retaining brackets or with hat profiles open at the top. Corners and transitions are to be made with fittings.

3.2.1.6 Supporting or auxiliary structures made of wood shall be constructed with dry-sorted timber in accordance with DIN EN 14081-1 "Timber structures — Structural timber sorted by strength for load-bearing purposes with a rectangular cross-section — Part 1: General requirements".

3.2.1.7 Securing the waterproofing against wind suction is to be carried out in accordance with a static verification in accordance with DIN EN 1991-1-4 "Eurocode 1: Actions on structures — Part 1-4: General actions — Wind loads" in conjunction with DIN EN 1991-1-4/NA "National Annex — Nationally determined parameters — Eurocode 1: Actions on structures — Part 1-4: General actions – Wind loads" and DIN EN 1990 "Eurocode: Fundamentals of structural design" in conjunction with DIN EN 1990/NA 'National Annex — Nationally Determined Parameters — Eurocode: Fundamentals of Structural Design'.

3.2.1.8 Corrosion-resistant fasteners shall be used for mechanical fasteners.

3.2.1.9 Mechanical fastenings on trapezoidal profiles must be made with non-slip fasteners.

3.2.1.10 In the case of roof waterproofing that requires measures to absorb horizontal forces, linear fastening must be carried out. For this purpose, 3 fasteners per metre are to be installed in line in the edge area.

3.2.1.11 Insulation layers as a base for waterproofing are made of thermal insulation materials in accordance with DIN 4108-10 "Thermal insulation and energy saving in buildings — Part 10: Application-related requirements for thermal insulation materials — Factory-made thermal insulation materials", application area DAA and at least the compressive strength i.e.

3.2.1.12 Movement joints shall be designed as joints for rapid or frequently repeated movements, e.g. changes in length due to fluctuations in temperature during the day.

3.2.1.13 Movement joints must also be adopted in the same place in the wear layer. The joint construction must also be able to absorb the mechanical effects from the use of the surface.

3.2.1.14 Protective layers shall be made of plastic fleece of at least 300 g/m2.

3.2.1.15 Vapour barriers shall be sealed airtight at seams, joints, penetrations and connections.

3.2.1.16 In the case of transitions between different seals, the connection in the overlap area must be carried out depending on the system.

3.2.2 Waterproofing with bitumen membranes

At

- all supporting structures,
- all used and unused areas,
- all gradient situations

Applies:

3.2.2.1 Bonding bridges shall be applied with solvent-based primer.

3.2.2.2 Vapour barriers above load-bearing structures shall be constructed from a single layer of bitumen welding membrane G 200 S4 Al in accordance with DIN EN 13707.

3.2.2.3 In the case of waterproofing underlays made of wood, a separation layer must be made of a layer G 200 DD in accordance with DIN EN 13707.

3.2.2.4 The waterproofing must be carried out in two layers.

The bottom layer is

- for underlays made of insulating materials with a cold-self-adhesive polymer bitumen membrane PYE-KTG KSP 2.8,
- for other substrates with a polymer bitumen welding track PYEG 200 S4

The upper layer is to be slate-coated with a polymer bitumen welding membrane PYE-PV 200 S5.

The waterproofing membranes must comply with DIN EN 13707 in conjunction with DIN SPEC 20000-201 "Application of construction products in buildings — Part 201: Application standard for waterproofing membranes according to European product standards for use in roof waterproofing".

3.2.2.5 Connections to edge upstands, walls and other components shall be made with

- Insulation wedge, at least 50 mm / 50 mm,
- Polymer bitumen welding track PYE-G 200 S4 according to DIN EN 13707 in conjunction with DIN SPEC 20000-201, approx. 33 cm cut, as lower layer,

- Polymer bitumen welding membrane PYE-PV 200 S5 according to DIN EN 13707 in conjunction with DIN SPEC 20000-201, slate, about 50 cm cut, as top layer.

3.2.2.6 Connections to skylights and the like shall also be glued with a strip of at least 35 cm of polymer bitumen welding membrane PYE-PV 200 S5 in accordance with DIN EN 13707 in conjunction with DIN SPEC 20000-201. In the case of shear stress, a separating strip, 10 cm wide, must also be laid.

3.2.2.7 Seals over movement joints shall be made of

- two insulating wedges for lifting,
- Separating strips, about 33 cm wide,
- Polymer bitumen welding membrane PYE-PV 200 S5 according to DIN EN 13707 in conjunction with DIN SPEC 20000-201, approx. 50 cm cut, as a lower layer,
- Polymer bitumen welding track PYE-PV 200 S5 according to DIN EN 13707 in conjunction with DIN SPEC 20000-201, slated, approx. 75 cm cut, as upper layer. 3.2.2.8 In the case of butt joints in the supporting structure, cover strips made of bitumen roof waterproofing membrane G 200 DD in accordance with DIN EN 13707, at least 20 cm wide, must be laid over the supports and secured against displacement by one-sided gluing.

3.2.3 Waterproofing with plastic sheets

At

- all supporting structures,
- all used and unused areas,
- all gradient situations

Applies:

3.2.3.1 Dampfsperren oberhalb von tragenden Konstruktionen sind aus Polyethylen-Film according to DIN EN 13984, 0.4 mm thick, normally flammable, loosely laid.

3.2.3.2 Separation layers shall be made of glass fleece of ≥ 120 g/m2.

3.2.3.3 Roof waterproofing must be made with reinforced bitumen-compatible 1.5 mm thick sheets of polyvinyl chloride, PVC-P-BV-V-(PV/GG/PG)-1.5, loosely laid, with mechanical fastening. The waterproofing membranes must comply with DIN EN 13956 in conjunction with DIN SPEC 20000-201.

3.2.3.4 Connections to edge upstands, walls and other components must be made with the same materials as the surface waterproofing with strips about 33 cm wide in the transition area between the roof surface and the wall.

3.2.3.5 Waterproofing via movement joints must be lifted out of the waterproofing plane and designed in a loop-like manner.

3.2.4 Waterproofing with liquid plastics

At

- all supporting structures,

- all used and unused areas,
- all gradient situations

Applies:

3.2.4.1 Vapour barriers above load-bearing structures must be made of polyethylene foil, in accordance with DIN EN 13984, 0.4 mm thick, normally flammable, loosely laid.

3.2.4.2 On wooden formwork, wood-based materials or unlaminated thermal insulation, separation/beam layers must be made between the roof waterproofing and the above-mentioned underlays.

3.2.4.3 Separation/beam layers shall be constructed from bitumen membranes G 200 DD in accordance with DIN EN 13707 in conjunction with DIN SPEC 20000-201.

3.2.4.4 The waterproofing must be coated with 2-component polyurethane resin (2K-PUR) with an insert made of synthetic fibre fleece ≥ 110 g/m2 and with an inlay of synthetic fibre fleece 110 g/m2 and 2-component polyurethane resin (2K-PUR) with an insert made of synthetic fibre fleece 110 g/m2 and the European Technical Assessment in accordance with ETAG 0051) of the performance levels

- Climate zone S,
- expected useful life W3,
- Roof pitch S1 to S4,
- Payload P4,
- lowest surface temperature TL4,
- Highest surface temperature TH4

in a minimum dry layer thickness of 2.1 mm.

3.2.4.5 Waterproofing over movement joints must be lifted out of the waterproofing level with the same material and made in a loop by means of inserted closed-cell PE round cord.

3.2.5 Sealing in a Composite (AIV-F)

3.2.5.1 General

Waterproofing with waterproofing materials to be processed in liquid form in combination with tiles and slabs (AIV-F) for balconies, loggias and pergolas must be carried out in accordance with DIN 18531-5.

At

- Substrate concrete,
- two components of the waterproofing material, and
- Gradient of at least 1.5%

Applies:

3.2.5.1.1 The waterproofing is carried out with a 2-component polyurethane resin (2K-PUR) with an insert made of synthetic fibre fleece ≥ 110 g/m2 with a minimum dry layer thickness of 2.0 mm.

3.2.5.1.2 The waterproofing must be carried out in a full-surface adhesive bond on the substrate.

3.2.5.2 Movement joints

3.2.5.2.1 Movement joints shall be designed as joints for rapid or frequently repeated movements, e.g. changes in length due to fluctuations in temperature during the day.

3.2.5.2.2 Sealings over movement joints shall be carried out in a loop-like manner with the same material by means of inserted closed-cell PE round cord.

3.2.5.3 Connections, Terminations, Penetrations

3.2.5.3.1 Connections The sealing must be carried out on rising components at least 15 cm above the surface of the wear layer/covering.

3.2.5.3.2 Closures The seal with insert must be connected to built-in parts in a watertight manner.

3.2.5.3.3 Penetrations The waterproofing with insert must be worked to the penetration and raised at least 15 cm above the surface of the wear layer/covering.

3.3 Waterproofing of drivable concrete traffic areas

3.3.1 General

Waterproofing of drivable traffic areas made of concrete must be carried out in accordance with DIN 18532 (all parts). The usage classes N1-V, N2-V, N3-V and N4-V apply.

3.3.2 Waterproofing of exposed surfaces without thermal insulation (parking decks, courtyard cellar ceilings, ramps, bridges that do not belong to public roads)

At

- Construction method 1a (without thermal insulation, exposed to the elements) Applies:

The waterproofing is to be applied to a concrete substrate prepared for mechanical removal and pre-treated with reactive resin as sealant with a lower waterproofing layer made of polymer bitumen welding membrane BE-PYE-PV 175 HL S4.5 in accordance with DIN V 20000-203 "Application of construction products in buildings — Part 203: Application standard for waterproofing membranes in accordance with European product standards for use in waterproofing of concrete bridges and other transport structures made of concrete" and an upper layer of mastic asphalt screed in accordance with DIN EN 12970 "Mastic asphalt and asphalt mastic for waterproofing — Definitions, requirements and test methods' with a nominal thickness of 2,5 cm.

A mastic asphalt screed with a nominal thickness of 2.5 cm is to be installed on top of this.

On bridge structures, instead of mastic asphalt screed, mastic asphalt is installed in accordance with DIN EN 13108-6 "Asphalt mixes — Mix requirements — Part 6: Mastic asphalt".

3.3.3 Waterproofing of surfaces without thermal insulation that are not exposed to the weather (covered parking levels, underground car parks)

At

- Construction method 1b (without thermal insulation, not exposed to the weather)

Applies:

The waterproofing shall be constructed on a concrete substrate prepared for mechanical removal and pre-treated with reactive resin as sealant with a lower waterproofing layer made of polymer bitumen welding membrane BE-PYE-PV 175 HL S4.5 in accordance with DIN V 20000-203 and an upper layer of mastic asphalt screed in accordance with DIN EN 12970 with a nominal thickness of 3.5 cm.

3.3.4 Waterproofing of surfaces with thermal insulation (parking roofs, courtyard cellar ceilings)

3.3.4.1 Sealing under thermal insulation

At

- Construction method 2a (under thermal insulation)

Applies:

The waterproofing shall be carried out on a concrete substrate prepared for mechanical removal and pre-treated with an adhesive bridge made of a primer in accordance with DIN EN 14188-4 "Joint inserts and joint compounds — Part 4: Specifications for primers for joint inserts and joint compounds" with a lower waterproofing layer made of polymer bitumen roofing membrane BA-PYE-PV 200 DD, in accordance with DIN SPEC 20000-202 "Application of construction products in buildings — Part 202: Application standard for waterproofing membranes in accordance with European product standards for use as waterproofing of components in contact with the ground, of interiors and of containers and basins", with polymer bitumen adhesive compound in the casting process and an upper layer of polymer bitumen welding membrane BO-PYE-PV 200 S5 in accordance with DIN SPEC 20000-202.

3.3.4.2 Sealing on the thermal insulation

At

- Construction method 2b (on thermal insulation)

Applies:

Before the waterproofing is installed, a levelling layer of asphalt mastic must be installed on the heat-resistant and pressure-resistant thermal insulation. The waterproofing must be made with a lower waterproofing layer made of polymer bitumen

welding membrane BE-PYE-PV 175 HL S4.5 according to DIN V 20000-203 and an upper layer of mastic asphalt screed with a nominal thickness of 2.5 cm.

3.3.5 Movement joints

Movement joints in drivable concrete traffic areas must be constructed with metallic joint profiles with sealing inserts and a connection option for the track-shaped part of the waterproofing.

3.3.6 Connections, Terminations, Transitions, Penetrations

3.3.6.1 Connections

The polymer bitumen membrane must be integrated with two throat membranes in the horizontal area overlapping by at least 10 cm. The throat panels must be raised at least 15 cm above the upper edge of the decking.

3.3.6.2 Degrees

The throat panels must be attached to the upper edge to prevent slipping and rear flow with a clamping rail.

3.3.6.3 Transitions

In the case of transitions from polymer bitumen membranes to liquid plastics, the polymer bitumen membrane must be primed on the upper side in an overlap area at least 20 cm wide and the liquid plastic must be bonded adhesively.

3.3.6.4 Penetrations

In the case of penetrations, the polymer bitumen membrane must be guided bluntly to the rising component. The fleece-reinforced liquid plastic with a minimum dry layer thickness of 2.0 mm shall be carried out on the polymer bitumen membrane with an overlap at least 20 cm wide and shall be raised vertically at least 15 cm above the upper edge of the wear layer. For floor drains, the flange width is at least 12 cm. The waterproofing layer must end on the connecting surfaces of adhesive flanges or weld-on flanges.

3.4 Sealing of components in contact with the ground

The sealing of components in contact with the ground must be carried out in accordance with DIN 18533 (all parts).

At

- Rice class R 1-E,
- Room use class RN2-E,
- Crack bridging class RÜ1-E

Applies to:

3.4.1 Sealing against soil moisture and non-pressurized water

3.4.1.1 In

- Water exposure class W1-E (soil moisture and non-pressurized water)

Applies:

Components in contact with the ground must be sealed with plastic-modified bitumen thick coating (PMBC) with a minimum dry layer thickness of 3 mm in two passes. In addition, the waterproofing must be provided with a protective layer or protective layer.

The drainage required for W1.2-E is a special service (see section 4.2.26)

3.4.1.2 At

Water exposure class W3-E (earth-covered ceilings)

Applies:

Components covered in the earth must be sealed in two layers with polymer bitumen roof waterproofing membranes PYE-PV 200 DD in accordance with DIN SPEC 20000-202. In addition, the waterproofing must be provided with a protective layer or protective layer.

3.4.2 Sealing against pressing water

3.4.2.1 In

- Water exposure class W 2.1-E (Moderate exposure to pressurized water ≤ 3 m immersion depth)

Applies:

Components in contact with the ground must be sealed with PMBC with a minimum dry layer thickness of 4 mm in two passes. In addition, a reinforcement insert must be integrated and the waterproofing must be provided with a protective layer or protective layer.

3.4.2.2 In

- Water exposure class W 2.2-E (High exposure to pressurized water > 3 m immersion depth)

Applies:

a) Immersion depth ≤ 4 m:

Components in contact with the ground are to be sealed in two layers with polymer bitumen roof waterproofing membranes PYE-PV 200 DD in accordance with DIN SPEC 20000-202. In addition, the waterproofing must be provided with a protective layer or protective layer.

b) Immersion depth > 4 m and ≤ 9 m:

Components in contact with the ground must be sealed in three layers with polymer bitumen roofing membranes PYE-PV 200 DD in accordance with DIN SPEC 20000-202. In addition, the waterproofing must be provided with a protective layer or protective layer.

c) Immersion depth > 9 m:

Components in contact with the ground must be sealed with polymer bitumen roofing membranes PYE-PV 200 DD in accordance with DIN SPEC 20000-202 in three layers (of which 1 layer with copper tape insert CU 01, D). In addition, the waterproofing must be provided with a protective layer or protective layer.

3.4.3 Sealing against splash water and soil moisture at the wall base as well as capillary water in and under walls

At

- Water exposure class W4-E (splash water and soil moisture at the wall base as well as capillary water in and under walls)

Applies:

- Exterior walls that are contaminated by splash water must be sealed in two steps by means of a crack-bridging mineral waterproofing slurry (CM) with a minimum dry layer thickness of 2 mm. In addition, the waterproofing must be provided with a protective layer.
- Exterior walls and interior walls that are capillary conductive, based on capillary conductive components and are loaded by rising damp must be equipped with a horizontal seal (cross-sectional sealing) made of crack-bridging mineral waterproofing slurry (CM) with a minimum dry layer thickness of 2 mm in two operations or with a sanded bitumen roofing membrane R 500 in accordance with DIN EN 13969 "Waterproofing membranes — Bitumen membranes for waterproofing buildings against soil moisture and water — Definitions and Properties" in conjunction with DIN SPEC 20000-202.

3.4.4 Movement joints

3.4.4.1 At

- Water exposure classes W1-E, W2.1-E and
- Verformungsklasse VK1-E

Applies:

a) Joint type I (DIN 18533-1): In the case of surface waterproofing made of PMBC, waterproofing is carried out over joints with bitumen-compatible joint tapes made of plastic waterproofing membranes, which have a fleece lamination for embedding in the PMBC. The butt joints of the joint tapes must be welded. The binding width of the joint tapes into the PMBC must be at least 10 cm.

b) Services for joint type II (DIN 18533-1) are special services according to section 4.2.37.

3.4.4.2 In

- Water exposure class W2.2-E, W3-E and Deformation class VK1-E

Applies:

a) Joint type I (DIN 18533-1): In the case of surface waterproofing consisting of two layers of PYE PV 200 DD in accordance with DIN SPEC 20000-202, the sealing is carried out over joints with a polymer bitumen membrane with a carrier insert made of polyester fleece, width 50 cm.

b) Services for joint type II (DIN 18533 1) are special services according to section 4.2.37.

3.4.5 Connections, Terminations, Transitions, Penetrations

3.4.5.1 At

- Water exposure class W1-E and W2.1-E

gilt:

3.4.5.1.1 Closures The PMBC is concluded in accordance with water exposure class W4-E (sealing on wall base).

3.4.5.1.2 Connections

The vertical waterproofing layer must be made against the horizontal waterproofing layer of the floor slab with an overlap ≥ 10 cm.

3.4.5.1.3 Transitions

Transitions are to be executed as an adhesive connection.

3.4.5.1.4 Penetrations

For W1-E: The PMBC is connected adhesively to built-in parts or penetrations.

For W2.1-E: The PMBC with insert must be connected to built-in parts or penetrations by means of loose/fixed flange construction.

3.4.5.2 At

- Water exposure class W2.2-E

Applies:

3.4.5.2.1 Connections

The connection of the vertical waterproofing layer with polymer bitumen membranes must be made in layers to the horizontal waterproofing layer of the floor slab, the overlap must be 10 cm in each case.

3.4.5.2.2 Degrees

The upper end of the polymer bitumen membranes must be designed with a clamping rail (back-proof).

3.4.5.2.3 Transitions

Transitions are to be designed with loose/fixed flange constructions as double flanges.

3.4.5.2.4 Penetrations

Built-in parts or penetrations are to be connected with loose/fixed flange constructions.

3.5 Waterproofing of interiors

The waterproofing of interiors must be carried out in accordance with DIN 18534 (all parts).

3.5.1 At

- Water exposure class W0-I (surfaces with not frequent exposure to splash water, e.g. areas of wall surfaces above washbasins in bathrooms and sinks in domestic kitchens, areas of floor surfaces in the domestic area without drain, e.g. in kitchens, utility rooms, guest toilets) and
- Rice class R1-I

Applies:

The waterproofing must be produced on the prepared substrate with a polymer dispersion (DM) with a minimum dry layer thickness of 0.5 mm in combination with tiles and slabs.

3.5.2 At

- Water exposure class W1-I (surfaces with frequent exposure to splashing water or not frequent exposure to service water, without intensification by accumulating water, e.g. wall surfaces above bathtubs and in showers and baths, floor surfaces in the domestic area with drain and floor surfaces in bathrooms without/with drain without high water exposure from the shower area) and
- Rice class R1-I

Applies:

The waterproofing must be made on the prepared substrate with a crack-bridging mineral waterproofing slurry (CM) with a minimum dry layer thickness of 2.0 mm in combination with tiles and slabs.

3.5.3 At

- Water exposure class W2-I (surfaces with frequent exposure to splashing water and/or service water, especially on the floor temporarily intensified by accumulating water, e.g. wall surfaces of showers in sports facilities/commercial premises, floor surfaces with drains and/or gutters, floor surfaces in rooms with floor-level showers and wall and floor surfaces of sports facilities/commercial premises) and
- Scratch class R1-I bis R3-I

Applies:

The waterproofing is to be carried out on a concrete substrate in the floor area that has been mechanically prepared for removal and pre-treated with reaction resin as a sealant with a polymer bitumen welding membrane with a high-lying carrier insert made of

polyester fleece in accordance with DIN V 20000-203 and mastic asphalt with a nominal thickness of 2.5 cm.

3.5.4 In

- Water exposure class W3-I (surfaces with very frequent or long-lasting exposure to splashing and/or process water and/or water from intensive cleaning processes intensified by accumulating water, e.g. areas in the area around swimming pools, areas of showers and shower facilities in sports facilities/commercial premises and areas in commercial premises (commercial kitchens, laundries, breweries, etc.) and
- Scratch class R1-I bis R3-I

Applies:

The waterproofing is to be carried out on a concrete substrate in the floor area that has been mechanically prepared for removal and pre-treated with reaction resin as a sealant with a polymer bitumen welding membrane with a high-lying carrier insert made of polyester fleece in accordance with DIN V 20000-203 and mastic asphalt with a nominal thickness of 2.5 cm. In the case of kitchens, waterproofing with reactive resin (RM) must be made above the mastic asphalt layer with a minimum dry layer thickness of 1.0 mm.

3.5.5 Movement joints are to be worked on as follows:

3.5.5.1 Sealing via structural joints

At

- Water exposure class W2-I and W3-I,
- Crack class R1-I to R3-I and Joint movement up to 10 mm

Applies:

Sealing is carried out by installing joint profiles made of corrosion-resistant metal. The connection to the joint profile is made on both sides with the surface sealing and a 30 cm wide polymer bitumen welding membrane PYE PV 200 S5 in accordance with DIN V 20000-203.

3.5.5.2 Sealing via edge connection and field boundary joints

Bei

- Wassereinwirkungsklasse W0-I und W1-I und
- Rissklasse R1-I

Applies:

Edge joints must be made in a width ≥ 5 mm. Sealing tapes must be installed via edge joints and integrated into the waterproofing. The joints of the sealing tapes must overlap ≥ 50 mm and be permanently sealed. 3.5.6 The following applies to connections, terminations, transitions, penetrations:

3.5.6.1 At

- Water exposure classes W0-I and W1-I and
- Rice class R1-I

Applies:

3.5.6.1.1 Connections

Sealing tapes must be used for connections to built-in components and integrated into the waterproofing layer in a watertight and back-proof manner.

3.5.6.1.2 Degrees

Closures must be made of liquid plastic. The waterproofing must be at least 5 cm high at the floor/wall transition. At water intake points, it must be 20 cm higher than the water intake point.

3.5.6.1.3 Transitions

When changing between floor/ceiling and wall as well as in wall corners, fleeces with cut protection must be installed in the waterproofing material to be processed in a back-proof manner.

3.5.6.1.4 Penetrations

For penetrations, sealing sleeves with flexible sealing lips must be used and integrated into the waterproofing layer. If drainage channels, floor drains and built-in parts have flanges, the width of the flange must be at least 5 cm.

3.5.6.2 At

- Water exposure classes W2-I and W3-I and
- Scratch class R1-I bis R3-I

Applies:

3.5.6.2.1 Connections

Sealing tapes must be used for connections to built-in components and integrated into the waterproofing layer in a watertight and back-proof manner.

3.5.6.2.2 Degrees

In the wall and connection area, waterproofing must be carried out with fleece-reinforced liquid plastic with a minimum dry layer thickness of 2.0 mm.

3.5.6.2.3 Transitions

The transition is designed as an adhesive connection (without built-in parts).

3.5.6.2.4 Penetrations

In the case of penetrations, the surface waterproofing must be brought bluntly to the rising component. On the surface waterproofing, liquid plastic with an insert with a

minimum dry layer thickness of 2.0 mm with an overlap at least 20 cm wide must be made and vertically at least 15 cm above the upper edge of the wear layer.

If drainage channels, floor drains and built-in parts have flanges, the width of the flange must be at least 5 cm.

3.6 Sealing of tanks and basins

The sealing of tanks and basins must be carried out in accordance with DIN 18535 (all parts).

3.6.1 Outdoor container that is not connected to a structure (S1-B)

At

- Water exposure class W1-B (filling height ≤ 5 m),
- Scratch class R0-B

Applies:

The waterproofing must be made with a non-crack-bridging mineral waterproofing slurry (CM) with a minimum dry layer thickness of 2.0 mm.

3.6.2 Containers in the outdoor area that are adjacent to and connected to a building and containers in the interior area (S2-B)

At

- Water exposure class W2-B (filling height ≤ 10 m),
- Scratch class R2-B

Applies:

The waterproofing must be made with a crack-bridging mineral waterproofing slurry (CM) with a minimum dry layer thickness of 2.0 mm. The CM must be processed using the coating process. At least two jobs are required. Each application must be carried out over the entire surface and evenly.

3.6.3 Movement joints

3.6.3.1 Outdoor container that is not connected to a structure (S1-B)

At

- Water exposure class W1-B (filling height ≤ 5 m),
- Scratch class R0-B

Applies:

The joints must be sealed with sealing tapes. The joints of the sealing tapes must be overlapped ≥ 5 cm and permanently sealed. The sealing layer is connected to the sealing tape via a flange construction ≥ 3 cm wide.

3.6.3.2 Containers in the outdoor area that are adjacent to and connected to a building and containers in the interior area (S2-B)

At

- Water exposure class W2-B (filling height ≤ 10 m),
- Scratch class R2-B

Applies:

The joints are sealed with sealing tapes. The joints of the sealing tapes must be overlapped ≥ 5 cm and permanently sealed. The sealing layer is connected to the sealing tape via a flange construction ≥ 3 cm wide.

3.6.4 Connections, Terminations, Penetrations

3.6.4.1 Connections The connection of the waterproofing layer shall be at least 15 cm above the highest water level.

3.6.4.2 Closures The closure of the waterproofing must be watertight and back-proof.

3.6.4.3 Penetrations The penetration is sealed by means of an adhesive flange with a flange width ≥ 5 cm. In the area of the flange connection, a reinforcement insert must be incorporated into the waterproofing.

3.7 Subsequent sealing of components in contact with the ground

3.7.1 At

- Water exposure class W1-E (soil moisture and non-pressing water),
- W3-E (non-pressurized water on earth-covered ceilings)

Applies:

The subsequent vertical sealing from the outside is to be carried out with PMBC in two steps with a minimum dry layer thickness of 3 mm. In addition, the waterproofing must be provided with a protective layer or protective layer.

3.7.2 In

- Water exposure class W2.1-E (pressing water ≤ 3 m),
- Water exposure class W2.2-E (pressing water > 3 m)

gilt:

The subsequent surface sealing from the inside is to be injected as an injection within components or as a curtain injection using acrylate gels in accordance with suitability testing with 2-component pumps.

3.7.3 In

- Water exposure class W4-E (splash water and soil moisture at the wall base as well as capillary water in and under walls)

Applies:

Subsequent horizontal barriers against capillary water must be carried out with injections in accordance with the suitability test.

If cavities are unexpectedly encountered in the component, this must be reported to the client immediately. The required benefits must be determined jointly. These services are special services (see section 4.2.25).

3.7.4 Movement joints

3.7.4.1 In

- Water exposure classes W1-E, W2.1-E and
- Verformungsklasse VK1-E

Applies:

a) Joint type I (DIN 18533-1): In the case of surface waterproofing made of PMBC, waterproofing is carried out over joints with bitumen-compatible joint tapes made of plastic waterproofing membranes, which have a fleece lamination for embedding in the PMBC. The butt joints of the joint tapes must be welded. The binding width of the joint tapes into the PMBC must be ≥ 10 cm.

b) Services for joint type II (DIN 18533-1) are special services according to section 4.2.37.

3.7.4.2 At

- Water exposure class W2.2-E, W3-E and
- Verformungsklasse VK1-E

Applies:

a) Joint type I (DIN 18533-1): In the case of surface waterproofing consisting of two layers of PYE PV 200 DD, the sealing is carried out via joints with a polymer bitumen membrane with a carrier insert made of polyester fleece, width 50 cm.

b) Services for joint type II (DIN 18533-1) are special services according to section 4.2.37.

3.7.5 Connections, Terminations, Transitions, Penetrations

3.7.5.1 At

- Water exposure class W1-E and W2.1-E

Applies:

3.7.5.1.1 Connections

The connection of the PMBC vertical waterproofing layer to the horizontal waterproofing layer of the floor slab must overlap by 10 cm.

3.7.5.1.2 Degrees

The PMBC must be completed in accordance with water exposure class W4-E (sealing on wall bases).

3.7.5.1.3 Transitions The transition shall be executed as an adhesive connection.

3.7.5.1.4 Penetrations

For W1-E: The PMBC must be connected adhesively to built-in parts or penetrations.

For W2.1-E: The PMBC with insert must be connected to built-in parts or penetrations by means of loose/fixed flange construction.

3.7.5.2 At

- Water exposure class W2.2-E

Applies:

3.7.5.2.1 Ports

The vertical waterproofing layer must be connected in layers to the horizontal waterproofing layer of the floor slab. The overlap must be ≥ 10 cm each.

3.7.5.2.2 Degrees

The upper end of the surface waterproofing must be made back-proof with a clamping rail.

3.7.5.2.3 Transitions

Transitions are to be made with loose/fixed flange construction as a double flange.

3.7.5.2.4 Penetrations

Built-in parts or penetrations are to be connected by means of loose/fixed flange construction.

3.8 Waterproofing under greenery

The waterproofing is to be made in a single layer with PVC-P plastic waterproofing membranes in accordance with DIN EN 13956 ≥ 1.5 mm thick. The membranes used must be root- and rhizome-resistant.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on or clad is not higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.1.2 Compensation of stepped or inclined standing surfaces of scaffolding up to 40 cm difference in height, e.g. via stairs or ramps.

4.1.3 Cleaning of the waterproofing substrate, except for services according to section 4.2.7.

4.1.4 Control of wet film thickness at PMBC. Compliance with the layer thickness requirement must be carried out and documented in accordance with DIN 18533-3 "Waterproofing of components in contact with the ground — Part 3: Waterproofing with waterproofing materials to be processed in liquid".

4.1.5 Protection of components and installations from contamination and damage during waterproofing work by loose covering, hanging or wrapping, except for protective measures in accordance with section 4.2.22.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 Provision of recreation and storage rooms if the Client does not provide rooms that can be easily locked.

4.2.2 Assembly, conversion and dismantling as well as provision of scaffolding for the services of other contractors.

4.2.3 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on or clad is higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.2.4 Erection, conversion and dismantling as well as provision of scaffolding with a stepped or inclined footprint, e.g. over stairs or ramps, if compensation of more than 40 cm is required.

4.2.5 Erecting, converting and dismantling as well as maintaining scaffolding for one's own services, provided that the roof surface has a roof pitch > 22.5° when working on it.

4.2.6 Benefits for measures to protect against unsuitable climatic conditions in accordance with section 3.1.2, e.g. enclosure, heating.

4.2.7 Cleaning the substrate of coarse soiling, e.g. plaster residues, mortar residues, paint residues, oil, earth adhesions, insofar as this was not caused by the Contractor.

4.2.8 Pre-treatment of the waterproofing substrate.

4.2.9 Compensation of greater unevenness of the substrate than according to DIN 18202:2013-04, "Tolerances in building construction — Buildings", Table 3, lines 2 or 6, permissible by filling, plastering with materials other than the waterproofing material (mortaring of defects).

4.2.10 Manufacture, transfer of use, maintenance and control of protective measures beyond one's own useful life and subsequent dismantling.

4.2.11 Production of protective layers.

4.2.12 Making and closing recesses.

4.2.13 Making seals over movement joints.

4.2.14 Strengthening the waterproofing in the surface, at edges, grooves, connections, closures and transitions.

4.2.15 Production of sealing fillets, chamfering of edges.

4.2.16 Consolidation of the substrate, e.g. by soaking.

4.2.17 Manufacture of seals at connections, terminations, penetrations and transitions, e.g. adhesive or weld-on flanges, sleeves, clamping rails, clamping profiles, loose/fixed flange constructions.

4.2.18 Making sweeping connections and receding joints.

4.2.19 Accessories, e.g. floor drain attachments.

4.2.20 Installation and sealing of components provided as well as removal and installation of components for the services of other contractors.

4.2.21 Completion of waterproofing in several operations to enable work by other contractors, insofar as the services cannot be provided continuously in the course of similar waterproofing work.

4.2.22 Services for special measures for the protection of building and plant components as well as furnishings, e.g. masking of components and technical equipment, laying out of hardboard or building protection films from 0.2 mm thick.

4.2.23 Testing of the surface tensile strength of the substrate.

4.2.24 Checking the thickness of the dry layer for waterproofing materials to be processed in liquid.

4.2.25 Services for sealing measures for cavities.

4.2.26 Services for the execution of drainage in accordance with DIN 4095 "Subsoil; drainage for the protection of structural facilities; Planning, Dimensioning and Execution".

4.2.27 Leak tests.

4.2.28 Drying, if not the responsibility of the Contractor.

4.2.29 Planning of slope insulation.

4.2.30 Preparation and submission of usage restrictions as well as care and cleaning instructions for directly used areas.

4.2.31 Setting up, dismantling and maintaining protective nets.

4.2.32 Preparation of building physics verifications and static calculations.

4.2.33 Services for fire, sound, heat and radiation protection.

4.2.34 Preparation of assembly and installation plans, detailed and construction drawings, revision documents.

4.2.35 Making and Applying Sample Surfaces.

4.2.36 Manufacture of structures for joint type II (see sections 3.4 and 3.7).

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

The determination of the performance — regardless of whether it is carried out according to drawings or measurements — must be based on the dimensions of the

- treated areas,
- seals,
- Separation, vapour barrier, insulation and protective layers

and the like. On surfaces bounded by components, the dimensions apply up to the bounding, unplastered, unclad components.

5.2 Determination of dimensions/quantities

5.2.1 When determining the dimensions of waterproofing or waterproofing reinforcements over joints, at transitions, penetrations, connections, sweeping connections, receding joints, closures, edges and the largest component dimension, if any, shall be used as a basis in each case.

5.2.2 In the case of receding joints, their surfaces, in addition to the length of the joints, are counted as both floor slab waterproofing and wall sealing.

5.2.3 If a recess is proportionately integrated into adjacent areas that are to be calculated separately, the proportionate recess area is calculated to determine the overmeasurement variable, e.g. chimney in the ridge.

5.3 Overmeasurement rules

The following are measured:

5.3.1 When billed according to area

- Recesses, e.g. openings, penetrations, ≤ 2.5 m2 individual size,
- in the case of insulating layers, construction parts, e.g. planks, edge timbers,
- Fugues.

5.3.2 When billing according to length

- Interruptions ≤ 1 m individual length.

5.4 Individual provisions

5.4.1 In the case of borehole infusions and injections from the inside and outside, the distance between the outermost boreholes shall be measured in length and height. For each treated component section, a drill hole spacing is added to the determined dimensions in order to take into account the area of influence of the protective agents applied at the edge. When waterproofing exterior walls, integrating interior walls are measured.

5.4.2 In the case of drying work, the duration from the installation of the equipment notified to the Client until the indicated parking of the equipment shall be taken as a basis.

5.4.3 In the case of waterproofing ridges, ridges, grooves and the like, their length in the centre line is simply measured.

5.4.4 If roof waterproofing is connected to the ridge, ridges and throats, measurements are taken to the middle of the ridge, ridge or throat.

5.4.5 In the case of roof waterproofing, directly connected different recesses for built-in components, e.g. roof windows and roof-integrated solar system, are calculated separately.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Roofing work — DIN 18338

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 Type of roof, roof shape, roof pitch and eaves height as well as the number, location and dimensions of the individual areas.

0.1.2 Type, nature and strength of the substrate, e.g. underlay, substructure, base course, supporting structure, purlin and rafter spacing.

0.1.3 Permissible loads on the roof surface or supporting structure.

0.1.4 Type, location and load-bearing capacity of anchor points, e.g. for protective nets.

0.1.5 Type, location, dimensions and design as well as dates for the erection and dismantling of scaffolding on site.

0.2 Information on the execution

0.2.1 Requirements for protective scaffolding. Protective measures.

0.2.2 Type of cladding, roofing, fastening, coverings and types of finishing.

0.2.3 The type, quality and colour of the roofing materials and the materials and components for the various layers.

0.2.4 Number, type, location, dimensions and design of terminations, connections to adjacent components, penetrations and the like.

0.2.5 Number, type, location and dimensions of safety roof hooks, anchor points, snow guards, fans, walkways, skylights, skylights and the like.

0.2.6 Number, type, location, power and dimensions of solar installations and the like.

0.2.7 Number, type, location and dimensions of roof and emergency drainage.

0.2.8 Type and scope of the services to protect against wind suction and wind pressure.

0.2.9 Requirements for fire, sound, heat, moisture and radiation protection as well as airtightness.

0.2.10 Type, dimensions, quality and formation of the thermal insulation layers.

0.2.11 Type, dimensions and design of the ventilation of the attic space, the roof structure or the outer wall cladding.

0.2.12 Type and scope of services to meet increased requirements for roofing, e.g. against the ingress of dust, drifting snow.

0.2.13 Special physical and chemical stresses to which substances and components are exposed after installation.

0.2.14 The Customer's Terms and Conditions for the Installation of Melting Vessels.

0.2.15 Type, position, dimensions and design of movement, structure and component joints.

0.2.16 Type, materials and design of joint covering.

0.2.17 Number, type, location, dimensions and execution of temporary covers or waterproofing and their removal.

0.2.18 Number, type, location and dimensions of sample surfaces, sample assemblies, fabric samples and samples.

0.2.19 Type of wood and corrosion protection.

0.2.20 Design and division of surfaces, special laying methods, grid and joint formation as well as structure, colour and surface treatment.

0.2.21 Number, type, location, dimensions and nature of curved or otherwise shaped surfaces.

0.2.22 Special protection of services, e.g. packaging, edge protection, covers.

0.2.23 Protection of building or plant components, furnishings and the like when opening roof surfaces.

0.2.24 Early or subsequent creation of partial surfaces.

0.2.25 Type, scope and requirements for installation plans.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating provisions may be considered in particular in Sections 3.2 to 3.3.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units are to be provided as follows:

0.5.1 Area (m2), separated by type and dimensions, for

- Roof coverings, e.g. with clamp fastening, screwing, nailing,
- Primers, separating, barrier, insulating and protective layers, protective layers, additional rain-securing measures, gravel fills, slab coverings, layers for greening,
- Exterior wall cladding,
- covered back surfaces of niches.

0.5.2 Dimensions of length (m), separated by type and dimensions, for

- covering of ridges, ridges, throats, verges and the like,
- Roofing of fire walls,
- Profiles, covers, edges, closures and connections, e.g. on skylights, roof windows, roof structures,
- Planks
- Covering of soffits,
- Gratings,
- Snow guards and the like.

0.5.3 Number (pcs), separated by type and dimensions, for

- Connections to openings and penetrations, e.g. drains, pipes, chimneys,
- dormer posts and dormers,
- skylights, skylights, light panels, glass fittings and the like,
- anchor points, safety roof hooks, steps, supports, fans and the like,
- Single-moulded bricks and single-fittings, e.g. fan tiles, corner tiles.

1 Scope of application

1.1 ATV DIN 18338 "Roofing work" applies to roofing including the necessary waterproofing, insulating material and protective layers. It also applies to exterior wall cladding with roofing fabrics.

1.2 ATV DIN 18338 does not apply to

- the production of cover underlays from slats or as formwork and the production of exterior wall cladding with wooden shingles (see ATV DIN 18334 "Carpentry and timber construction work"),
- the production of roof coverings with metal components and metal connections to be folded during construction (see ATV DIN 18339 "Plumbing work"),
- rear-ventilated façades with materials other than roofing materials (see ATV DIN 18351 "Rear-ventilated façades") and
- Metal construction work (see ATV DIN 18360 "Metal construction work").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18338 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

For the most common substances and components, the DIN standards and other requirements are listed below.

2.1 Fabrics for roofing and exterior wall cladding

DIN 59231	Corrugated sheets and ladle plates, surface-finished — Dimensions, mass and static values
DIN 68119	Holzschindeln
DIN EN 490	Concrete Roof and Shaped Blocks for Roofs and Wall Cladding — Product Specifications
DIN EN 492	Fibre cement roofing panels and associated mouldings — Product specification and test methods
DIN EN 494	Fibre cement corrugated sheets and associated fittings — Product specification and test methods
DIN EN 534	Bitumen Corrugated Sheets — Product Specifications and Test Methods
DIN EN 544	Bitumen shingles with mineral-containing insert and/or plastic insert — Product specification and test methods

DIN EN 1090-4	Design of steel structures and aluminium structures — Part 4: Technical requirements for load-bearing cold-formed structures Bauelemente aus Stahl und tragende, kaltgeformte Bauteile für Dach-, Decken-, Boden- und Wandanwendungen
DIN EN 1090-5	Design of steel structures and aluminium structures — Part 5: Technical requirements for load-bearing cold-formed aluminium structural elements and load-bearing cold-formed components for roof, ceiling, floor and wall applications
DIN EN 1304	Roof and Shaped Tiles — Terms and Product Specifications
DIN EN 12326-1	Slate and natural stone for overlapping roofing and exterior wall cladding — Part 1: Product specifications for slate and carbonate-containing slate
DIN EN 14782	Self-supporting roofing and wallcovering elements for indoor and outdoor use made of sheet metal — Product specification and requirements
DIN EN 14783	Fully Supported Sheet Metal Roofing and Wall Cladding Elements for Interior and Exterior Application — Product Specification and Requirements

2.2 Materials for underlays, undervoltages, sub-roofs and pre-roofs

DIN EN 13707	Waterproofing membranes — Bitumen membranes with support inserts for roof waterproofing — Definitions and properties
DIN SPEC 20000-201	Application of construction products in buildings — Part 201: Application standard for waterproofing membranes according to European product standards for use in roof waterproofing

ZVDH Product Data Sheet for Roofing Membranes1)

ZVDH Product Data Sheet for Underlays1)

2.3 Substances for vapour barriers

DIN EN 13970	Waterproofing membranes — Bitumen vapour barrier membranes — Definitions and properties
DIN EN 13984	Waterproofing membranes — Plastic and elastomer vapour barrier membranes — Definitions and properties

2.4 Insulation materials

DIN EN 622 (all parts)	Fibreboard — Requirements
DIN EN 13162	Thermal insulation products for buildings — Factory made mineral wool (MW) products — Specification

DIN EN 13163	Thermal insulation products for buildings — Factory made expanded polystyrene (EPS) products — Specification
DIN EN 13164	Thermal Insulation Products for Buildings — Factory Made Extruded Polystyrene Foam (XPS) Products — Specification
DIN EN 13165	Thermal insulation products for buildings — Factory made rigid polyurethane foam (PU) products — Specification
DIN EN 13166	Thermal insulation products for buildings — Factory made phenolic resin foam (PF) products — Specification
DIN EN 13167	Thermal Insulation Products for Buildings — Factory Made Foam Glass (CG) Products — Specification
DIN EN 13168	Thermal insulation products for buildings — Factory made wood wool (WW) products — Specification
DIN EN 13169	Thermal Insulation Products for Buildings — Factory Manufactured Expanded Perlite (EPB) Products — Specification
DIN EN 13170	Thermal insulation products for buildings — Factory made expanded cork (ICB) products — Specification
DIN EN 13171	Thermal insulation products for buildings — Factory made wood fibre (WF) products — Specification

2.5 Fabrics for substructures and auxiliary structures

DIN EN 14081-1	Timber structures — Structural timber for load-bearing purposes with rectangular cross-section sorted by strength — Part 1: General requirements

2.6 Fortifications

DIN EN 10230-1	Nails of steel wire — Part 1: Loose nails for general use
DIN EN 10088-3	Stainless steels — Part 3: Technical conditions of delivery of semi-finished products, rods, wire rods, drawn wire, sections and bright steel products of corrosion-resistant steels for general use
DIN EN ISO 1461	Zinc coatings applied to steel by hot-dip galvanizing — Requirements and tests

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 In the event of unsuitable conditions resulting from the weather, e.g. temperatures below 5 °C during bonding, damp and wet, snow and ice, sharp winds, frost when

working with mortar, special measures must be taken in coordination with the client. If services are required for this, these are special services (see section 4.2.1).

3.1.2 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- unsuitable condition of the laying substrate.

3.1.3 If corrosion protection by galvanizing is prescribed for fasteners, this must comply with DIN EN ISO 1461 and have a zinc coating of at least 50 µm.

3.1.4 The roof covering must be designed to be rainproof.

3.2 Roofing

3.2.1 General

3.2.1.1 The Contractor shall provide the Client with the dimensions of roof battens or purlin spacings, burr strips, fillet formwork, eaves and the like, if the Client does not carry out the underlay for his roof covering himself.

3.2.1.2 In the case of non-ventilated roof structures, a roofing membrane of class UDB-A according to ZVDH product data sheet for roofing membranes must be used on the basis of a building physics verification in accordance with DIN 4108-3 "Thermal insulation and energy saving in buildings - Part 3: Climate-related moisture protection - Requirements, calculation methods and notes for planning and execution" or without verification in accordance with DIN 4108-3.

3.2.1.3 In the case of ventilated roof structures, a roofing membrane or roofing membrane of the classification USB-A or UDB-A according to the ZVDH product data sheet for roofing membranes must be used.

3.2.1.4 A pre-covering of bitumen membranes V 13 sanded in accordance with DIN EN 13707 must be applied to formwork as an underlay for roof coverings.

3.2.1.5 Sub-roofs shall be designed as watertight single-layer sub-roofs with cold-self-adhesive polymer bitumen membranes PYE-KTG KSP 2,8 in accordance with DIN EN 13707 in conjunction with DIN SPEC 20000-201.

3.2.1.6 In the case of roofing on support surfaces, counter battens with a minimum cross-section of 30 mm × 50 mm shall be constructed.

3.2.1.7 Fasteners directly exposed to weather conditions must be made of corrosion-resistant building materials.

3.2.1.8 For fastening elements of small-format roofing that are not directly exposed to the weather, at least corrosion-protected building materials must be used.

3.2.2 Roofing with roof tiles or roof tiles

3.2.2.1 Tile roofing must be covered with roof tiles in accordance with DIN EN 1304 with requirement level 1 for waterproofness and method E (performance level 1 with 150 freeze-thaw cycles) according to DIN EN 539-2 "Roof tiles for covering installation —

Determination of physical properties — Part 2: Testing of frost resistance" for frost resistance, roof tile roofing with concrete roof tiles according to DIN EN 490.

3.2.2.2 Beavertail covers must be dry in double covering. Fillets are to be designed as recessed covered metal fillets.

3.2.2.3 Hollow ladle covers must be dry as sliced cover covers. The Endort (Endortgang) is to be made with double bead bricks. Throats are to be designed as underlaid three-pan throats.

3.2.2.4 Rim brick roofing must be dry. Throats are to be made as covered metal grooves.

3.2.2.5 Roofing of interlocking tiles, reform tiles, rebate tiles, flat roof tiles, flat brimming tiles and the like must be carried out dry. The end is to be made with double bead bricks, throats are to be made as covered metal grooves.

3.2.2.6 Roof tile covers must be dry with roof tiles with a symmetrical central bead – semicircular – with a level watercourse and high side rebate and with multiple foot ribbing. The verge is to be covered with verge stones. Throats are to be made as covered metal grooves.

3.2.2.7 Verges shall be constructed with verge or end tiles or verge or keystones, which shall be fastened individually with corrosion-protected wood screws 4.5 mm × 60 mm.

3.2.2.8 The covering on the eaves must be made without protrusion and with eaves plate

3.2.2.9 Ridges and ridges shall be covered with ridge bricks or ridge stones and with dry ridge systems.

3.2.2.10 The covering shall be fastened in accordance with the requirements of a static verification in accordance with DIN EN 1991-1-4 'Eurocode 1: Actions on structures — Part 1-4: General actions — Wind loads' and DIN EN 1991-1-4/NA 'National Annex — Nationally determined parameters — Eurocode 1: Actions on structures — Part 1-4: General actions — Wind loads'.

3.2.3 Roofing with roofing slates

3.2.3.1 Roofing must be made with roofing slate in accordance with DIN EN 12326-1.

3.2.3.2 Old German roofing must be carried out with capstones with normal felling of suitable grading as right-hand covering on full formwork with pre-covering. Verges and ridges are integrated to cover with overhang. Eaves must be covered with an integrated foot and eaves plate. Ridges are to be built in simple cover with overhang. Throats are to be covered as integrated throats.

3.2.3.3 Shed roofing must be carried out with sheds of the same size in normal cut on full formwork with pre-covering as right-hand covering. Verges and ridges are integrated to cover with overhang. Eaves are bound and connected with eaves plate.decken. Firste are to be carried out in simple cover with overhang. Throats are to be covered as integrated throats.

3.2.3.4 German roofing is to be carried out with square slates with arch cut on full formwork with pre-covering as right-hand covering. Verges and ridges are integrated to cover with overhang. Eaves are pointed and designed with eaves plate. Ridges are to be built in simple cover with overhang. Throats are to be covered as integrated throats.

3.2.3.5 Rectangular double roofing shall be carried out with rectangular slates in a half bond with hook fastening. Verges are to be covered at an expiration. Burrs are to be carried out as applied track cover in single cover. Eaves must be covered with attachment plates. Ridges are to be designed as single roofing with overhang. Throats are to be covered as covered metal throats.

3.2.4 Roofing with fibre cement roofing panels

3.2.4.1 Roofing must be made with fibre cement roof panels in accordance with DIN EN 492.

3.2.4.2 German roofing must be carried out with roof panels with arch cut on full formwork with pre-covering as right-hand covering.

Verges and ridges are to be covered in an integrated manner.

Eaves must be covered with a pointed foot and eaves plate.

Ridges are to be constructed with applied roof panels as a single covering with overhang. Throats are to be covered as covered metal throats.

3.2.4.3 Double roofing must be carried out with rectangular panels in a half bond on roof battens.

Verges are to be covered at an expiration. Burrs are to be executed as placed places in single cover.

Eaves are to be covered with attachment plates.

Ridges are to be constructed in single roofing.

Throats are to be designed as covered metal throats.

3.2.5 Roofing with fibre cement corrugated sheets

3.2.5.1 Roofing must be constructed with fibre cement corrugated sheets in accordance with DIN EN 494 with prefabricated corner cuts.

3.2.5.2 In the case of coverings with short-corrugated plates and support spacing of up to a maximum of 500 mm, fastening must be carried out with hot-dip galvanised wood screws with a 7 mm diameter and mushroom seal.

3.2.5.3 Verges must be covered with flat angles; Burrs with fibre cementburr caps.

3.2.5.4 Eaves shall be covered with eaves footpieces.

3.2.5.5 Ridges must be constructed with multi-part fittings.

3.2.5.6 Throats are to be covered as covered metal fillets.

3.2.5.7 In the case of large-format panels, the covering must be fastened in accordance with the specifications of a static verification in accordance with the general building authority approvals and the Technical Building Rules in accordance with DIN EN 1991-1-4 including DIN EN 1991-1-4/NA and DIN EN 1990 "Eurocode: Fundamentals of Structural Design" including DIN EN 1990/NA "National Annex — Nationally Determined Parameters — Eurocode: Fundamentals of Structural Design".

3.2.6 Roofing with prefabricated metal elements

3.2.6.1 For roofing with prefabricated metal elements, building materials and elements in accordance with DIN EN 14782, DIN EN 14783, DIN EN 1090-4 or DIN EN 1090-5 must be used.

3.2.6.2 Self-supporting roofs are to be laid from galvanised sheet steel on a substructure in accordance with the system. The fastening of the roof covering must be carried out in accordance with the specifications of a static verification. Fasteners directly exposed to the weather must be corrosion-resistant. Outside the water-bearing level, the fastening must be self-sealing.

3.2.6.3 Non-self-supporting roofing must be made of aluminium on solid formwork with pre-roofing. The fastening of the surface elements is to be carried out indirectly in the cover area in accordance with the system.

3.2.6.4 Details, e.g. corners, covers, connections, must be made with moulded parts made of the same material as the roof covering. If the details cannot be produced with moulded parts, they must be produced by hand.

3.2.7 Roofing made of wooden shingles

3.2.7.1 Coverings made of wooden shingles must be made of three layers. Wedge-shaped normal shingles made of larch, quality class 1, sawn, are to be used in accordance with DIN 68119.

3.2.7.2 Each shingle shall be fastened with two stainless steel shingle pins of material number 1.4301 in accordance with DIN EN 10088-3.

3.2.7.3 Ridges are to be covered as superimposed ridges.

3.2.7.4 Burrs shall be designed as a swing ridge with straight rows.

3.2.7.5 Throats are to be designed as integrated throats.

3.2.7.6 Connections shall be made with shingles cut to size.

3.2.8 Roofing with bitumen shingles

3.2.8.1 Roofing with bitumen shingles must be installed as a double covering of three-blade bitumen shingles in accordance with DIN EN 544 with glass fleece backing with the fire behaviour class BROOF (t1) in accordance with DIN EN 13501-5 "Classification of building products and construction methods on their reaction to fire — Part 5: Classification with the results of tests of roofing exposed to external fire'.

3.2.8.2 The bitumen shingles must be fastened with at least 4 corrosion-protected pins with an extra-large flat head in accordance with DIN EN 10230-1 per shingle.

3.2.8.3 The eaves are covered on eaves sheet without rebate beveling. The attachment on the eaves plate remains unglued.

3.2.8.4 Pre-covers and bitumen shingle roofs at the verge must be raised to a triangular strip at least 30 mm high.

3.2.8.5 Ridges and burrs shall be constructed as lateral double roofing with cut-to-size bitumen shingles.

3.2.8.6 Throats are to be designed as an integrated bitumen shingle throat.

3.2.8.7 Connections on rising components shall be provided with ≤ 30 mm high triangular strips. The bitumen shingles must be raised and connected with a cross-cut strip.

3.2.9 Roofing with corrugated bitumen sheets

3.2.9.1 Roofing with corrugated bitumen sheets must be constructed with panels in accordance with DIN EN 534.

3.2.9.2 Corrugated bitumen sheets shall be laid in a bond and fastened with bell nails. In the area of the height cover, the fastening is carried out on every wave crest, in the support area between the height covers on every second wave crest.

3.2.9.3 The covering of the eaves shall be covered with a free overhang and each crest of the shaft shall be fastened.

3.2.9.4 Verges must be made without fittings with the last wave crest resting on the lining.

3.2.9.5 Ridges shall be formed with one-piece ridge hoods.

3.2.9.6 Burrs shall be covered with moulded parts.

3.2.9.7 Fillets are to be designed as covered metal fillets.

3.2.9.8 Connections to rising components shall be made with metal connection strips.

3.2.10 Roofing with thatch or straw

3.2.10.1 Roofing with thatch or straw must be ≥ 0.3 m thick.

3.2.10.2 Sewn roofs shall be made with plastic-coated wire, minimum total thickness 2 mm, minimum thickness of the wire 1.4 mm.

3.2.10.3 Bonded roofs shall be constructed with at least 4,5 mm thick corrosion-protected tension wire and at least 2 mm thick plastic-coated binding wire, minimum wire thickness 1,4 mm.

3.2.10.4 Bolted roofs shall be constructed with stainless screws 4.5 mm × 35 mm at intervals of ≤ 0.2 m and stainless steel wire of material number 1.4571 in accordance with DIN EN 10088-3.

3.2.10.5 Roof details, e.g. dormers, ridges, throats, must be covered with thatch or straw.

3.2.10.6 Verges and eaves must be covered with an overhang of ≥ 0.15 m.

3.2.10.7 Ridges are to be covered with sweeping tape as thatch ridge.

3.3 Exterior wall cladding

3.3.1 Exterior wall cladding with slate

3.3.1.1 Exterior wall cladding must be made with slate in accordance with DIN EN 12326-1.

3.3.1.2 Exterior wall cladding with slate shall be fastened with at least three corrosion-resistant roughened slate pins per stone.

3.3.1.3 The cladding shall be designed as shed roofing with sheds of the same size, format 24/19, in normal cutting on full formwork with pre-covering as right-hand covering without container pitch. The areas must be divided evenly. Connections and closures to windows, doors and the like must be covered with overhang.

3.3.2 Exterior wall cladding with flat fibre cement panels

3.3.2.1 Exterior wall cladding with fibre cement panels shall be manufactured with panels in accordance with DIN EN 492.

3.3.2.2 Cladding with small-format slabs shall be double-covered with 30/30 full-edged rectangular slabs, which shall be fixed with at least two corrosion-resistant roughened slate pins. Connections or terminations on windows, doors and the like must be made with layered pieces of metal without protrusion.

3.3.2.3 Cladding with large-format panels shall be constructed on a system-by-system basis with full-edged, rectangular panels, format 2.53 m × 1.28 m × 8 mm, and shall be carried out in accordance with the specifications of a static verification in accordance with DIN EN 1991-1-4 including DIN EN 1991-1-4/NA and DIN EN 1990 including DIN EN 1990/NA as well as the general building authority approval of the panel

fortifiable. Connections or closures on windows, doors and the like must be made without overhanging.

3.3.3 Exterior wall cladding with fibre cement corrugated sheets

3.3.3.1 Exterior wall cladding with fibre cement corrugated sheets shall be manufactured with panels in accordance with DIN EN 494.

3.3.3.2 Exterior wall cladding shall be covered by fibre cement corrugated sheets with prefabricated corner cuts, covered in height and on sides. The Outer Corner of the

Building must be covered with fittings. Building interior corners are to be constructed with simple fiber cement wall angle. The upper end is to be covered at a tapering angle.

3.3.3.3 The fastening of the cladding must be carried out on the basis of a static verification in accordance with the general building authority approvals and the technical building regulations in accordance with DIN EN 1991-1-4 including DIN EN 1991-1-4/NA and DIN EN 1990 including DIN EN 1990/NA.

3.3.4 Exterior wall cladding with prefabricated metal elements

3.3.4.1 Exterior wall cladding with prefabricated metal roofing elements shall be manufactured with elements in accordance with DIN EN 14782 or DIN EN 14783, depending on the type of support.

3.3.4.2 Exterior wall cladding with small-format elements shall be made of pointed rhomboids with single folds of aluminium on all sides, format 29/29. The elements are to be fastened with aluminium sticks and grooved nails made of stainless steel at least 2.8 mm × 25 mm.

3.3.4.3 Cladding with large-format roofing elements shall be made of aluminium, in a corrugated profile, minimum width 1 m. The fastening must be carried out in accordance with the specifications of a static verification. Fasteners must be made of corrosion-resistant material. Fastenings directly exposed to the weather must be self-sealing.

3.3.4.4 Details, e.g. corners, covers, edgings and the like must be made with moulded parts of the same material as the clothing. If moulded parts are not available, roof details must be produced by hand.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on or clad is not higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.1.2 Compensation of stepped or inclined standing surfaces of scaffolding up to 40 cm difference in height, e.g. via stairs or ramps.

4.1.3 Cleaning of the substrate, except for services under section 4.2.8. 4.1.4 Submission of prefabricated samples.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 Services for protection against unsuitable conditions resulting from the weather in accordance with Section 3.1.1.

4.2.2 Provision of recreation and storage rooms if the Client does not provide rooms that can be easily locked.

4.2.3 Assembly, conversion and dismantling as well as provision of scaffolding for services provided by other contractors.

4.2.4 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on or clad is higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.2.5 Erection, conversion and dismantling as well as provision of scaffolding with a stepped or inclined footprint, e.g. via stairs or ramps, if compensation of more than 40 cm is required.

4.2.6 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that work on the roof surface has a roof pitch of more than 22.5°.

4.2.7 Setting up, dismantling and maintaining protective nets.

4.2.8 Cleaning the substrate of coarse soiling, e.g. plaster residues, mortar residues, paint residues, oil, insofar as this was not caused by the Contractor.

4.2.9 Creation of anchoring options and anchorage points remaining in the structure, e.g. for scaffolding, protective nets.

4.2.10 Lining of the substructure by more than 10 mm to create flat surfaces, e.g. feeding of battens.

4.2.11 Preparation of building physics verifications and static calculations.

4.2.12 Services for fire, sound, heat and radiation protection

4.2.13 Preparation of assembly and installation plans, detailed and construction drawings.

4.2.14 Production and attachment of sample surfaces, sample constructions and models, insofar as these are not included in the service.

4.2.15 Subsequent creation and closing of recesses, e.g. openings in substructures.

4.2.16 Completion of roofing in several work steps to enable work by other contractors, insofar as the company's own services cannot be provided continuously in the course of similar roofing work.

4.2.17 Services for the protection of building and plant components as well as furnishings, e.g. masking of windows, doors, stairs, wood, surface-finished parts, dust-proof masking of sensitive equipment and technical equipment, dust protection walls, emergency roofs, laying of hardboard or building protection films from 0.2 mm thick.

4.2.18 Installation and covering or sealing of provided components.

4.2.19 Removal and installation of components for the services of other contractors.

4.2.20 Subsequent installation, processing, adaptation or connection of components.

4.2.21 Connections to components and built-in parts, e.g. to walls, attics, penetrations.

4.2.22 Cladding dormer posts.

4.2.23 Installation of accessories, e.g. safety roof hooks, anchor points, fans.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

5.1.1 Determination of performance

For the determination of the performance — regardless of whether it is carried out according to drawings or measurements — the dimensions

- of the covered areas,
- the sealed surfaces of sub-roofs,
- of the clad areas,
- of the occupied areas,
- of the manufactured components,
- of the treated areas and
- the length of the joints

The simplifying rules such as deduction and overmeasurement rules are to be applied to determine performance.

5.2 Determination of dimensions/quantities

5.2.1 The dimensions are determined on the basis of the largest component dimension, if any, e.g. in the case of connections and terminations, eaves, verges.

5.2.2 When determining the dimensions, the following must be taken into account in the case of roof coverings, cladding, separating layers, insulation layers, barrier layers, protective layers, protective layers, gravel fills, panel coverings and the like:

- on surfaces bounded by components, e.g. attics, walls, the surface up to the boundary, unplastered, unclad components,
- on surfaces without limiting components, the dimensions of the roof coverings, cladding, separation layers, insulation layers, barrier layers and the like

5.2.3 In the case of roofs, ridges, grooves and the like, their length is simply measured in the midline.

5.2.4 If roofing is connected to the ridge, ridges and grooves, measurements are taken up to the middle of the ridge, ridge or throat.

5.2.5 In the case of cladding of outer and inner corners and the like, their length is simply measured in the centerline.

5.2.6 If cladding connects to outer and inner corners, measure up to the center line.

5.2.7 If a recess is proportionately integrated into adjacent areas that are to be calculated separately, the respective proportionate recess area is calculated to determine the overmeasurement variable, e.g. chimney in the ridge.

5.2.8 In the case of roofing and cladding, directly connected different recesses for built-in parts, e.g. roof windows and roof-integrated solar system, are calculated separately.

5.2.9 Clad back surfaces of niches are calculated separately with their area dimensions, regardless of whether they are overmeasured or not.

5.2.10 Clothed soffits shall be calculated separately with their length measurements, regardless of whether they are overmeasured or not.

5.2.11 Areas which cannot be determined by using simple mathematical formulas, e.g. for rectangles, triangles, trapezoids, rhombuses, are determined by dividing them into circumscribed rectangles, each with a width of 1 m.

5.2.12 When determining the dimensions, the length in the centerline is to be used as a basis for accounting for the joints.

5.3 Overmeasurement rules The following are overmeasured:

5.3.1 When billed according to area

- Fugues
- recesses ≤ 2.5 m2 individual size,
- Built-in fittings, e.g. fan tiles, single-form tiles, corner bricks, glass fittings,
- Structural parts such as planks, edge timbers, rafters and the like, in the case of insulating layers.

5.3.2 When billing according to length

- Fugues
- Interruptions ≤ 1 m individual length.

5.4 Individual provisions

No regulations.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Plumbing — DIN 18339

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

Windzone.

0.2 Information on the execution

0.2.1 Type, nature and strength of the substrate.

0.2.2 Training of connections to buildings.

0.2.3 Type and number of required sample areas, sample assemblies and samples.

0.2.4 Permissible loads on the roof surface or supporting structure.

0.2.5 Securing of covers and cladding against lifting due to wind loads with mechanical fastenings or load on the substructure.

0.2.6 Dachneigung und Dachform.

0.2.7 Dormers, bay windows, attic conversions and the like, as well as curved partial or small areas.

0.2.8 Number, type and formation of roof penetrations, skylights, skylights.

0.2.9 Covering and cladding of chimneys.

0.2.10 Saddles available on site above penetrations.

0.2.11 Type and location of roof drainage.

0.2.12 Cutting width or guideline size of the gutters. The number, type and dimensions of the gutter holders, rainwater downpipes, eaves plates and the like in the cutting width (if applicable, the largest component width unfolded) and their thickness.

0.2.13 Type and design of anchor points, ladder hooks, snow guard systems and water deflectors.

0.2.14 Slope levels existing on site.

0.2.15 Special mechanical, chemical and thermal stresses to which substances and components are exposed after installation.

0.2.16 Measures for temporary storm protection.

0.2.17 Requirements for fire, sound, heat and moisture protection as well as ventilation requirements.

0.2.18 Type and thickness of insulation layers.

0.2.19 Type, extent and design of rear ventilation and cover of its openings.

0.2.20 Design and division of surfaces, grid and joint formation, structure, colour, surface treatment. Special method of installation.

0.2.21 Sealing and covering of joints.

0.2.22 Type, materials and dimensions of the roofing components and the type and design of their fastening.

0.2.23 Type and materials of the clothing, dimensions of the individual parts and the type and design of their fastening, e.g. visible or invisible.

0.2.24 Type and formation of separation layers.

0.2.25 Type of corrosion protection and type and colour of surface protection or coating.

0.2.26 Type of constructive and chemical wood preservation.

0.2.27 Execution of additional corrosion protection.

0.2.28 Share widths and centre distances.

0.2.29 Supply of installation or assembly plans.

0.2.30 Befestigungen bei besonderen Dachformen oder Vorliegen der Windzone 4.

0.2.31 Type and design of the substructure and its anchorage.

0.2.32 Type and number of dowels, dowel strips, eaves planks and the like available for anchoring on site.

0.2.33 Type and design of wall connections.

0.2.34 Motion compensators by type or type and number.

0.2.35 Type and construction of temporary covers and seals and their removal.

0.2.36 Special protection of services, e.g. packaging, edge protection and covers.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 3.1.5,	if the maximum blade length according to Table 1, line 4 is to be exceeded, e.g. by using special sliding joints (e.g. long-slide joints),
Section 3.1.8	if structural specifications require that the minimum connection height be undercut (e.g. terrace exit, barrier-free design),
Section 3.2.1,	if in the case of roll-welded roofs, wind suction is protected by means of an additional load,
Section 3.2.4	if roof geometries require a different rebate course,
Section 3.2.10,	if a watertight design of the transverse seams is to be dispensed with in the case of roof pitches ≥ 3° < 7° (e.g. by means of a slope step),
Section 3.5.3,	if the distance between the drip edge is to be less than 20 mm,
Section 3	if there are roof shapes other than those in Figure 1 to Figure 3 and/or objects in wind zone 4.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units are to be provided as follows:

0.5.1 Area (m2), separated by type and dimensions, for

- Dachdeckungen, Wandbekleidungen und dergleichen,
- Trenn- und Dämmschichten und dergleichen.

0.5.2 Dimensions of length (m), separated by type and dimensions, for

- shaped sheets, sheet metal profiles, e.g. ridges, burrs, eaves, grooves, connections and ends, borders, slope steps, movement elements, covers for cornices, aisles, window sills, reveals, lintels, overhang strips,
- Snow guard systems, including supports,
- gutters and eaves plates,
- Bead reinforcements on gutters,
- Rainwater downpipes,
- Strangpressprofile,
- separating and insulating layers laid in strips.

0.5.3 Number (pcs), separated by type and dimensions, for

- corners of shaped sheets and sheet metal profiles,
- Fittings for extruded profiles,
- Anchor points, ladder hooks, running grates, brackets for running grates, roof hatch covers, snow guards, edging for penetrations, e.g. ventilation hoods, roof vents, pipes and supports for railings,
- Motion compensators, e.g. on gutters, eaves sheets, connections and ends, cornice and wall coverings,
- gutter angles, floor pieces, drain nozzles, gutter boilers, gutter holders, spreaders, articulated bends, conical pipes for drain nozzles, rain pipe flaps, pipe connections, pipe bends, branches, bulges, caps and angles, standpipes, pipe clamps and cover plates, leaf and mud flaps, gargoyles and the like,
- Covers on chimneys, shafts and the like.

1 Scope of application

1.1 ATV DIN 18339 "Plumbing work" applies to the execution of metal roofs, metal wall cladding with metal components to be folded on the building and other plumbing work.

1.2 ATV DIN 18339 does not apply to:

- Roofing with standardised welding and ladling plates (see ATV DIN 18338 "Roofing work"),
- Facades and cladding with metal components (see ATV DIN 18360 "Metal construction work"),
- Sheet metal work for insulation work (see ATV DIN 18421 "Insulation and fire protection work on technical installations"),
- rear-ventilated exterior wall cladding with substructures (see ATV DIN 18351 "Rear-ventilated façades").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18339 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies: For the most common substances and components, the DIN standards and other requirements are listed below.

2.1 Zinc sheets and strips

DIN EN 988	Zinc and zinc alloys — Requirements for rolled flat products for the construction industry

2.2 Steel sheets and steel strips

2.2.1 Hot-dip galvanized and coated steel sheets and steel strips

DIN EN 10143	Continuous Hot Dip Coated Steel Sheet and Strip — Dimensional Limits and Dimensional Tolerances
DIN EN 10346	Continuous hot-dip coated flat products of steel — Technical delivery conditions

2.2.2 Stainless steel sheets and steel strips

DIN EN 10028-7	Flat products of pressure vessel steels — Part 7: Stainless steels
DIN EN 10088-2	Stainless steels — Part 2: Technical delivery conditions for sheet and strip of corrosion-resistant steels for general use
DIN EN ISO 9445-1	Continuous cold-rolled stainless steel — Limit dimensions and shape tolerances — Part 1: Cold-rolled and cold-rolled strip in bars
DIN EN ISO 9445-2	Continuous cold-rolled stainless steel — Limit dimensions and dimensional tolerances — Part 2: Cold-rolled strip and sheet

2.3 Copper sheets, copper strips, copper profiles

DIN EN 1652	Copper and copper alloys — Plates, sheets, strips, strips and discs for general use

2.4 Aluminum and aluminum alloys

DIN 17611	Anodically oxidized products of aluminum and wrought aluminum alloys — Technical delivery conditions
DIN EN 485-1	Aluminium and aluminium alloys — Strips, sheets and plates — Part 1: Technical delivery conditions
DIN EN 485-2	Aluminium and aluminium alloys — Strips, sheets and plates — Part 2: Mechanical properties
DIN EN 485-4	Aluminium and aluminium alloys — Strips, sheets and plates — Part 4: Limit dimensions and dimensional tolerances for cold-rolled products

DIN EN 573-3	Aluminium and aluminium alloys — Chemical composition and shape of semi-finished products — Part 3: Chemical composition and product forms
DIN EN 754-1	Aluminium and aluminium alloys — Drawn rods and tubes — Part 1: Technical delivery conditions
DIN EN 754-2	Aluminium and aluminium alloys — Drawn rods and tubes — Part 2: Mechanical properties
DIN EN 755-1	Aluminium and aluminium alloys — Extruded rods, tubes and profiles — Part 1: Technical delivery conditions
DIN EN 755-2	Aluminium and aluminium alloys — Extruded rods, tubes and profiles — Part 2: Mechanical properties

2.5 Sheets of lead and lead alloys

DIN 17640-1	General Use Lead Alloys
DIN 59610	Lead and lead alloys — Rolled sheets of lead for general use
DIN EN 12548	Lead and lead alloys — Lead alloys in ingots for cable sheaths and joints

2.6 Hot-dip galvanized and hot-leaded components

DIN EN ISO 1461	Zinc coatings applied to steel by hot-dip galvanizing (piece galvanizing) — Requirements and tests Hot-dip galvanized steel parts must have well-adhering and tight coatings.

2.7 Gutters and downpipes

DIN EN 607	Suspended gutters and accessories made of PVC-U — Definitions, requirements and testing
DIN EN 612	Suspended gutters with gutter front bracing and rain pipes made of sheet metal with seam connections
DIN EN 1462	Gutter brackets for suspended gutters — Requirements and testing 2.8 Fasteners (welding, soldering and adhesives) and fasteners
DIN EN 1045	Brazing — Fluxes for brazing — Classification and technical delivery conditions
DIN EN ISO 3506 (all parts)	Mechanical properties of stainless steel fasteners
DIN EN ISO 3581	Welding consumables — Coated rod electrodes for manual arc welding of stainless and heat-resistant steels — Classification

DIN EN ISO 9453	Soft solders — Chemical composition and delivery forms
DIN EN ISO 9454-1	Fluxes for soft soldering — Classification and requirements — Part 1: Classification, marking and packaging
DIN EN ISO 17672	Brazing – Solders
DIN EN ISO 18273	Welding consumables — Solid wires and rods for fusion welding of aluminium and aluminium alloys — Classification

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- Deviations of the portfolio from the specifications,
- insufficient load-bearing capacity or condition of the subsoil,
- greater unevenness of the subsoil than permissible according to DIN 18202 "Tolerances in building construction — Structures",
- unsuitable conditions resulting from the weather (see section 3.1.2),
- lack of reference points,
- Missing or unsuitable fastening options on connections, recesses, e.g. penetrations,
- Lack of ventilation for roofs that need to be ventilated and rear-ventilated wall cladding,
- unsuitable type and location of penetrations, drains, connections, thresholds and the like,
- Lack of or insufficient opportunities for movement (e.g. gradient level),
- Missing or insufficient structural requirements for safety overflows,
- missing saddles on roof penetrations,
- too large center distances.

3.1.2 In the event of unsuitable conditions resulting from the weather, e.g. moisture during gluing work, standing wetness, temperatures below +5 °C for gluing work, as well as metal temperature below +10 °C for work with titanium zinc or in snow and ice, special measures must be taken in consultation with the Client. If services are required for this, these are special services (see section 4.2.6).

3.1.3 When different metals are used, even if they do not touch each other, harmful effects on each other must be excluded; this applies in particular in the direction of flow of the water.

3.1.4 Metalle sind gegen schädigende Einflüsse angrenzender Stoffe zu schützen, z. B. durch Trennschichten.

3.1.5 Joints and fastenings must be designed in such a way that the parts can expand, contract or shift without damage in the event of temperature changes. A temperature difference of 100 K — in the range of −20 °C to +80 °C — is to be assumed. The spacing of motion compensators must be selected depending on their design and the type and arrangement of the components. Table 1 applies to the distances between the equalizers. For the distances of corners or fixed points, half lengths apply in each case.

3.1.6 Suitable safety measures must be taken against take-off and damage caused by storms. Industrially produced adhesives must be used. These must be fastened at least twice and must have a permissible adhesive load of at least 400 N under dynamic loading. For adhesives, nails and screws, the requirements of Table 2 apply.

3.1.7 Brackets for roof edge edging and storage in the deck area must be flush and recessed.

3.1.8 Connections to higher parts of the building must be made at least 150 mm above the top of the roof covering if the roof pitch is up to 5° (8.8 %) and at least 100 mm above the top of the roof covering if the roof pitch is more than 5° (8.8 %) and must be stored in a rain-proof manner.

3.1.9 Metal connections to be glued must have an adhesive surface of at least 120 mm width. Connections must be made watertight. For lengths over 3 m, the fastening must be carried out indirectly.

3.2 Metal roofing as rebate and strip roofs, as well as roll-welded roofs

3.2.1 Metal roofing must be made from strips or panels. Tables 3 to 7 apply to the execution. Table 3 applies to minimum material thicknesses and blade widths as a function of the building height. For the distance and number of sticks, Figures 1 to 3 in conjunction with Tables 4 to 6 apply to wind zones 1 to 3 in accordance with DIN EN 1991-1-4 "Eurocode 1: Actions on structures — Part 1-4: General actions — Wind loads" in conjunction with DIN EN 1991-1-4/NA:2010-12 "National Annex — Nationally determined parameters — Eurocode 1: Actions on structures — Part 1-4: General actions — Wind loads".

3.2.2 In the case of roof pitches of less than 7° (12.3 %), the longitudinal rebates must also be sealed.

3.2.3 In the case of titanium zinc, the roof pitch must be at least 3° (5.2 %), and in the case of roof pitches of up to 15° (26.8 %), separation layers with drainage function must be installed.

3.2.4 Folded roofs must have double standing seams of at least 23 mm in height perpendicular to the eaves.

3.2.5 Strip roofs must be designed with a strip cross-section of at least 40 mm × 40 mm.

3.2.6 A distance of at least 3 mm shall be provided between the lower edges of the longitudinal upstand of the shares to accommodate the movement between the folds.

3.2.7 If the distance between the ridge and the eaves is greater than the permissible coulter length, provision shall be made for compensation for movement in accordance with Table 8.

3.2.8 The eaves must be designed in such a way that the changes in the length of the shares and the wind suction loads are absorbed. The blade ends must be attached to the eaves plate, which is designed as an adhesive strip, by means of an envelope.

3.2.9 In the case of ventilated roofs, the ventilation cross-sections must not be impaired by the design of the metal roofing.

3.2.10 Transverse seams shall be made in accordance with Table 9 in accordance with the roof pitch.

3.3 Metal wallcoverings

3.3.1 Metal wall coverings shall be made of strips or panels in angular rebate design.

3.3.2 Rear-ventilated exterior wall cladding must be constructed in accordance with DIN 18516-1 "Exterior wall cladding, rear-ventilated — Part 1: Requirements, test principles".

3.3.3 Substructures must be installed in a vertical and perpendicular manner, adapted to the blade widths.

3.3.4 For distance and number of adhesives, the following applies to wind zones 1 to 3 in accordance with DIN EN 1991-1-4 and DIN EN 1991-1-4/NA:2010-12, Figure 4 in conjunction with Table 7.

3.3.5 Sheets less than 1 mm thick shall be edged or flanged.

3.4 Throats

3.4.1 Metal fillets shall be watered on both sides.

3.4.2 Unsoldered overlaps shall be at least 100 mm. For fillet inclinations below 15° (26.8%), covers must be made watertight.

3.4.3 Grooves on metal roofs must rest over the entire surface. In the case of small-format roofing, grooves on battens and economical formwork are possible.

3.5 Other plumbing work

3.5.1 The required sheet thickness must be selected depending on the size, the cutting width, the shape, the fastening, the substructure and the material used. The minimum thickness for folded roof edges, wall coverings and connections according to Table 10 must be observed.

3.5.2 Roof edges, wall coverings and connections must be concealed with corrosion-protected fasteners.

3.5.3 Covers must have a drip edge at least 20 mm away from the parts of the structure to be protected.

3.5.4 Corners must be designed to be rainproof.

3.5.5 Attached cross-cut strips must be fastened at least every 250 mm, and wall connection rails at least every 200 mm.

3.5.6 Gutter brackets shall be flush with the formwork and fastened recessed.

3.6 Compilation of tables and pictures

Explanation of the symbols and abbreviations used in Tables 4 to 7 and Figures 1 to 4 for the simplified division of roofs:

b	Length
d	Width
h	Height
F, G, H, J	Roof panel surfaces
High	corner area for monopitch and trough roofs
A, B	Wall parts
α	Dachneigung
e	Auxiliary quantity e = 2h or b (the smaller value is decisive)

Table 1 — Maximum spacing of motion compensators Line	**design and the type and arrangement of the components**	**max. distance** m
1	in water-bearing levels for glued-in edgings, angle connections, gutter hangers and shedrins	6
2	for extrusion profiles	6
3	Outside water-bearing levels for wall coverings, roof edge closures and internal, non-glued gutters with a cut of more than 500 mm	8
	in steel	14
4	for flocks of roofing and wall cladding, as well as for internal, non-glued gutters with a cutting width of less than 500 mm and suspended gutters with a cut of more than 500 mm	10
	in steel	14
5	for suspended gutters with a cutting width of up to 500 mm	15

Table 2 — Adhesives, nails and screws; Requirements

Material of the fastening parts**	**Adhesions**		**Fasteners*** **			
			roughened nails**		**Countersunk screws**	
	Material	**Thickness** mm	**Material**	**Metrics** mm × mm	**Material**	**Metrics** mm × mm
Aluminium	stainless steel* galvanized steel	≥ 0,4 ≥ 0,6	stainless steel galvanized steel	≥ (2,8 × 25)	stainless steel, galvanized steel	≥ (4 × 25)
Lead	stainless steel* copper	≥ 0,4 ≥ 0,7	stainless steel Copper	≥ (2,8 × 25) ≥ (2,8 × 25)	stainless steel, galvanized steel	≥ (4 × 30)
Stainless Steel	stainless steel*	≥ 0,4	Stainless Steel	≥ (2,8 × 25)	stainless steel	≥ (4 × 25)
Copper	Comforting steel* Copper	≥ 0,4 ≥ 0,6	stainless steel Copper	≥ (2,8 × 25) ≥ (2,8 × 25)	stainless steel	≥ (4 × 25)
Titanium Zinc	nichtrostender Stahl*	≥ 0,4	stainless steel galvanized steel	≥ (2,8 × 25)	stainless steel, galvanized steel	≥ (4 × 25)
	Galvanized steel	≥ 0,6				
galvanized steel	galvanized steel	≥ 0,6	galvanized steel	≥ (2,8 × 25)	galvanized steel	≥ (4 × 25)
	stainless steel*	≥ 0,4	Stainless Steel	≥ (2,8 × 25)	stainless steel	≥ (4 × 25)

* Stainless steel adhesives can be used with all cover materials (adhesive bases with rounded corners).

** The required nominal thickness of the formwork for roofing is at least 30 mm for lead, at least 24 mm for all other materials (22 mm for wood-based panels).

*** At least 2 pieces per adhesive with an embedding depth of at least 20 mm.

**** Grooved nails made of stainless steel and hot-dip galvanized steel 2.5 mm × 25 mm according to DIN 20000-6 "Application of construction products in buildings — Part 6: Pin-shaped and non-pin-shaped fasteners according to DIN EN 14592 and DIN EN 14545", load-bearing capacity class 3/C.

Table 3 — Metal roofing, minimum material thickness and blade width as a function of building height

Building height h	**Material thickness and max. width of the coulters**														
	Until 10 m				10 until 20 m				20 until 50 m				50 until 100 m		
Width of the Archipelago Mm*	520	590	620	720	520	590	620	720	520	590	620	720	520	590	620
Material	**Minimum Material Thickness** mm														
Aluminium	0,7	0,7	0,8	-	0,7	0,7	0,8	-	0,7	0,7	-	-	0,7	0,7	-
Copper	0,6	0,6	0,6	-	0,6	0,6	0,6	-	0,6	0,6	-	-	0,6	0,6	-
Titanium Zinc	0,7	0,7	0,7	-	0,7	0,7	0,7	-	0,7	0,7	-	-	0,7	0,7	-
Hot-dip galvanized steel	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6
Stainless steel	0,4	0,5	0,5	-	0,4	0,5	0,5	-	0,4	0,5	-	-	0,5	0,5	-

* The blade widths are calculated from the strip or sheet widths of 600 mm, 670 mm, 700 mm, 800 mm and 1,000 mm minus 80 mm for folded roofs. When using a roll forming machine , the blades are 10 mm wider. For strip roofs, there is a smaller blade width depending on the strip cross-section

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Table 4 — Metal roofing: Distance (in mm) and number (in 1/m2) of clings as a function of the width and height of the building for wind zone 1 and flat, gable, trough, monopitch and hipped roofs

Windzone 1																
Building height h		Until 10 m				10 until 20 m				20 until 50 m				50 Until 100 m		
Width of the Archipelago Mm		520	590	620	720	520	590	620	720	520	590	620	720	520	590	620
Roof (α ≤ 30)	Fhoch	330	290	270	240	250	220	210	180	180	160	150	130	150	130	130
		5,9	5,9	5,9	5,9	7,6	7,6	7,6	7,6	10,7	10,7	10,7	10,7	12,7	12,7	12,7
	F	380	330	320	270	290	260	250	210	210	180	180	150	180	150	150
		5,1	5,1	5,1	5,1	6,6	6,6	6,6	6,6	9,2	9,2	9,2	9,2	11,0	11,0	11,0
	G	470	420	400	340	370	320	310	260	260	230	220	190	220	190	180
		4,1	4,1	4,1	4,1	5,3	5,3	5,3	5,3	7,4	7,4	7,4	7,4	8,8	8,8	8,8
	H	500	500	500	500	500	500	500	440	440	380	370	310	370	320	310
		3,8	3,4	3,2	2,8	3,8	3,4	3,2	3,2	4,4	4,4	4,4	4,4	5,3	5,3	5,3
	J	500	500	500	460	490	430	410	350	350	310	290	250	290	260	250
		3,8	3,4	3,2	3,0	3,9	3,9	3,9	3,9	5,5	5,5	5,5	5,5	6,6	6,6	6,6
Roof (α > 30°)	Fich	400	350	330	290	250	220	210	180	180	160	150	130	150	130	130
		4,9	4,9	4,9	4,9	7,6	7,6	7,6	7,6	10,7	10,7	10,7	10,7	12,7	12,7	12,7
	F	500	500	500	460	490	430	410	350	350	310	290	250	290	260	250
		3,8	3,4	3,2	3,0	3,9	3,9	3,9	3,9	5,5	5,5	5,5	5,5	6,6	6,6	6,6
	G	470	420	400	340	370	320	310	260	260	230	220	190	220	190	180
		4,1	4,1	4,1	4,1	5,3	5,3	5,3	5,3	7,4	7,4	7,4	7,4	8,8	8,8	8,8
	H	500	500	500	500	500	500	500	440	440	380	370	310	370	320	310
		3,8	3,4	3,2	2,8	3,8	3,4	3,2	3,2	4,4	4,4	4,4	4,4	5,3	5,3	5,3
	J	500	500	500	500	500	500	470	410	400	350	340	290	340	300	280
		3,8	3,4	3,2	2,8	3,8	3,4	3,4	3,4	4,8	4,8	4,8	4,8	5,7	5,7	5,7

Table 5 — Metal roofing: Distance (in mm) and number (in 1/m2) of the clings as a function of the share width and the height of the building for wind zone 2 and flat, gable, trough, monopitch and hipped roofs

Windzone 2																
Building height h		Until 10 m				10 until 20 m				20 until 50 m				50 until 100 m		
Width of the Archipelago Mm		520	590	620	720	520	590	620	720	520	590	620	720	520	590	620
Roof (α ≤ 30)	Fich	270	240	220	190	210	180	170	150	150	130	120	110	120	110	100
		7,2	7,2	7,2	7,2	9,4	9,4	9,4	9,4	13,1	13,1	13,1	13,1	15,6	15,6	15,6
	F	310	270	260	220	240	210	200	170	170	150	140	120	140	130	120
		6,2	6,2	6,2	6,2	8,1	8,1	8,1	8,1	11,3	11,3	11,3	11,3	13,4	13,4	13,4
	G	390	340	330	280	300	260	250	220	210	190	180	150	180	160	150
		5,0	5,0	5,0	5,0	6,5	6,5	6,5	6,5	9,0	9,0	9,0	9,0	10,7	10,7	10,7
	H	500	500	500	470	500	440	420	360	360	310	300	260	300	260	250
		3,8	3,4	3,2	3,0	3,9	3,9	3,9	3,9	5,4	5,4	5,4	5,4	6,4	6,4	6,4
	J	500	460	430	370	400	350	330	290	280	250	240	210	240	210	200
		3,8	3,7	3,7	3,7	4,8	4,8	4,8	4,8	6,8	6,8	6,8	6,8	8,0	8,0	8,0
Dach (α > 30°)	Fich	320	290	270	230	210	180	170	150	150	130	120	110	120	110	100
		5,9	5,9	5,9	5,9	9,4	9,4	9,4	9,4	13,1	13,1	13,1	13,1	15,6	15,6	15,6
	F	500	460	430	370	400	350	330	290	280	250	240	210	240	210	200
		3,8	3,7	3,7	3,7	4,8	4,8	4,8	4,8	6,8	6,8	6,8	6,8	8,0	8,0	8,0
	G	390	340	330	280	300	260	250	220	210	190	180	150	180	160	150
		5,0	5,0	5,0	5,0	6,5	6,5	6,5	6,5	9,0	9,0	9,0	9,0	10,7	10,7	10,7
	H	500	500	500	470	500	440	420	360	360	310	300	260	300	260	250
		3,8	3,4	3,2	3,0	3,9	3,9	3,9	3,9	5,4	5,4	5,4	5,4	6,4	6,4	6,4
	J	500	500	500	430	460	400	380	330	330	290	280	240	280	240	230
		3,8	3,4	3,2	3,2	4,2	4,2	4,2	4,2	5,9	5,9	5,9	5,9	7,0	7,0	7,0

Table 6 — Metal roofing: Distance (in mm) and number (in 1/m2) of clings as a function of the blade width and the height of the building for wind zone 3, for flat, gable, trough, monopitch and hipped roofs

Windzone 3																
Building height h		Until 10 m				10 until 20 m				20 until 50 m				50 until 100 m		
Width of the Archipelago Mm		520	590	620	720	520	590	620	720	520	590	620	720	520	590	620
Roof (α ≤ 30)	Fich	220	190	190	160	170	150	140	120	120	110	100	90	100	90	90
		8,7	8,7	8,7	8,7	11,2	11,2	11,2	11,2	15,8	15,8	15,8	15,8	18,7	18,7	18,7
	F	260	230	220	190	200	180	170	140	140	120	120	100	120	110	100
		7,5	7,5	7,5	7,5	9,7	9,7	9,7	9,7	13,6	13,6	13,6	13,6	16,1	16,1	16,1
	G	320	280	270	230	250	220	210	180	180	160	150	130	150	130	130
		6,0	6,0	6,0	6,0	7,7	7,7	7,7	7,7	10,9	10,9	10,9	10,9	12,9	12,9	12,9
	H	500	470	450	390	410	370	350	300	290	260	250	210	250	220	210
		3,8	3,6	3,6	3,6	4,6	4,6	4,6	4,6	6,5	6,5	6,5	6,5	7,7	7,7	7,7
	J	430	380	360	310	330	290	280	240	240	210	200	170	200	180	170
		4,5	4,5	4,5	4,5	5,8	5,8	5,8	5,8	8,2	8,2	8,2	8,2	9,7	9,7	9,7
Roof (α > 30°)	Fhoch	270	240	220	190	170	150	140	120	120	110	100	90	100	90	90
		7,2	7,2	7,2	7,2	11,2	11,2	11,2	11,2	15,8	15,8	15,8	15,8	18,7	18,7	18,7
	F	430	380	360	310	330	290	280	240	240	210	200	170	200	180	170
		4,5	4,5	4,5	4,5	5,8	5,8	5,8	5,8	8,2	8,2	8,2	8,2	9,7	9,7	9,7
	G	320	280	270	230	250	220	210	180	180	160	150	130	150	130	130
		6,0	6,0	6,0	6,0	7,7	7,7	7,7	7,7	10,9	10,9	10,9	10,9	12,9	12,9	12,9
	H	500	470	450	390	410	370	350	300	290	260	250	210	250	220	210
		3,8	3,6	3,6	3,6	4,6	4,6	4,6	4,6	6,5	6,5	6,5	6,5	7,7	7,7	7,7
	J	490	430	410	360	380	340	320	280	270	240	230	200	230	200	190
		3,9	3,9	3,9	3,9	5,0	5,0	5,0	5,0	7,1	7,1	7,1	7,1	8,4	8,4	8,4

Table 7 — Wall cladding: Distance (in mm) and number (in 1/m2) of cladding as a function of building height for wind zones 1 to 3

Windzone 1															
Building height h	Until 10 m				10 until 20 m				20 until 50 m				50 until 100 m		
Width of the Archipelago mm	520	590	620	720	520	590	620	720	520	590	620	720	520	590	620
Wall A h/d; h/b ≥ 5	500	490	470	400	430	380	360	310	310	270	260	220	260	220	230
	3,8	3,4	3,4	3,4	4,5	4,5	4,5	4,5	6,2	6,2	6,2	6,2	7,5	7,5	7,5
Wall A h/d; h/b ≤ 1	500	500	500	500	500	500	500	480	480	420	400	340	400	350	330
	3,8	3,4	3,2	2,8	3,8	3,4	3,2	2,9	4,0	4,0	4,0	4,0	4,8	4,8	4,8
Wall B	500	500	500	500	500	500	500	480	480	420	400	340	400	350	330
	3,8	3,4	3,2	2,8	3,8	3,4	3,2	2,9	4,0	4,0	4,0	4,0	4,8	4,8	4,8
Windzone 2															
Building height h	Until 10 m				10 until 20 m				20 until 50 m				50 until 100 m		
Width of the Archipelago mm	520	590	620	720	520	590	620	720	520	590	620	720	520	590	620
Wall A h/d; h/b ≥ 5	460	400	380	330	350	310	290	250	250	220	210	180	210	190	180
	4,2	4,2	4,2	4,2	5,5	5,5	5,5	5,5	7,7	7,7	7,7	7,7	9,1	9,1	9,1
Wall A h/d; h/b ≤ 1	500	500	500	500	500	500	500	480	480	420	400	340	400	350	330
	3,8	3,4	3,2	2,8	3,8	3,4	3,2	2,9	4,0	4,0	4,0	4,0	4,8	4,8	4,8
Wall B	500	500	500	500	500	480	450	390	390	340	330	280	330	290	270
	3,8	3,4	3,2	2,8	3,8	3,5	3,5	3,5	5,0	5,0	5,0	5,0	5,9	5,9	5,9
Windzone 3															
Building height h	Until 10 m				10 until 20 m				20 until 50 m				50 until 100 m		
Width of the Archipelago Mm	520	590	620	720	520	590	620	720	520	590	620	720	520	590	620
Wall A h/d; h/b ≥ 5	380	330	320	270	290	260	250	210	210	180	170	150	180	150	150
	5,1	5,1	5,1	5,1	6,6	6,6	6,6	6,6	9,2	9,2	9,2	9,2	11,0	11,0	11,0
Wall A h/d; h/b ≤ 1	460	400	380	330	360	310	300	260	250	220	210	180	210	190	180
	4,2	4,2	4,2	4,2	5,4	5,4	5,4	5,4	7,6	7,6	7,6	7,6	9,0	9,0	9,0
Wall B	500	500	490	420	450	400	380	330	320	280	270	230	270	240	230
	3,8	3,4	3,3	3,3	4,2	4,2	4,2	4,2	6,0	6,0	6,0	6,0	7,1	7,1	7,1

Table 8 — Initiation of flock movement

	Type of design	Required roof pitch
1	Sliding seam with simple fold	≥ 25° (46,6 %)
2	Sliding seam with additional rebate	≥ 10° (17,6 %)
3	Gradient jump*	≥ 3° (5,2 %)
4	Procrastinator**	≥ 7° (12,3 %)
5	Double Cross Seam***	≥ 7° (12,3 %)
*	On-site design of the substructure. If the roof pitch is less than 7°, the upper sheet metal must protrude 100 mm.	
**	On-site addition to the substructure. Only with table covering.	

Table 9 — Transverse seams

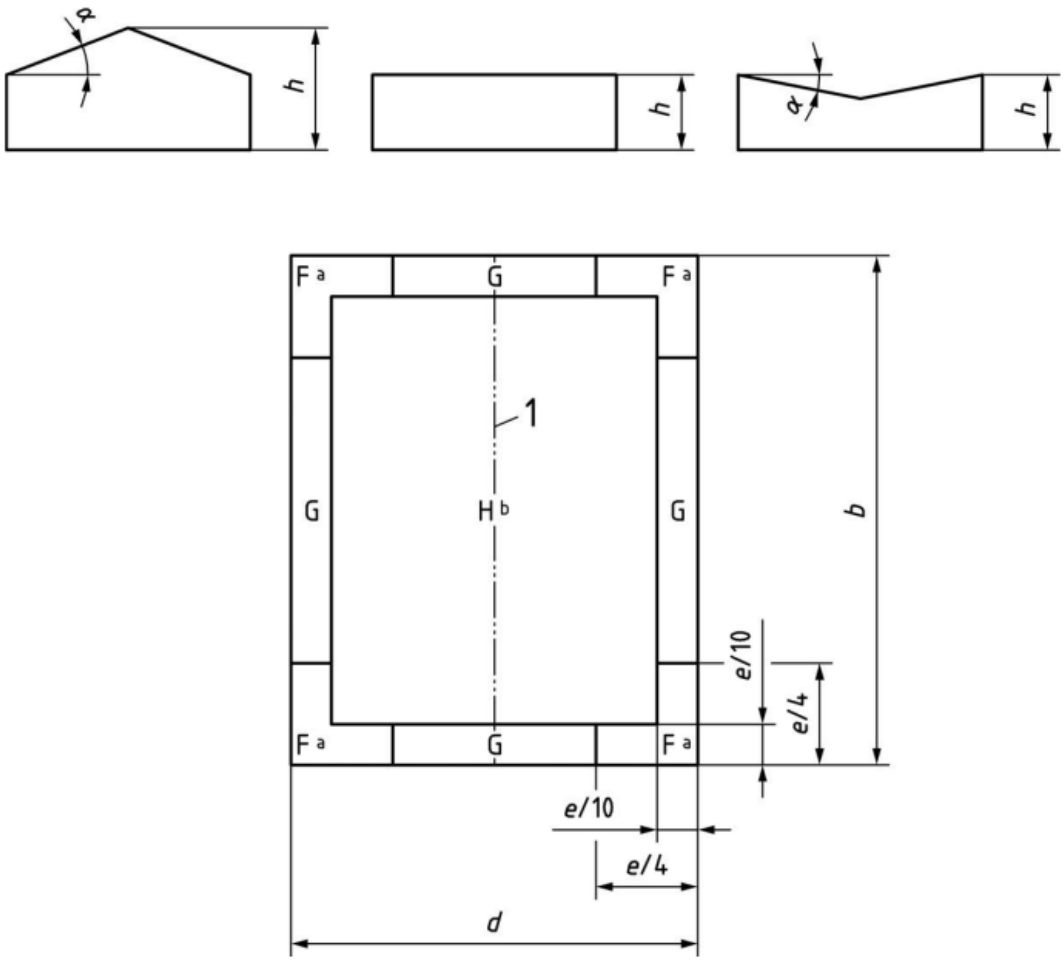
	Roof pitch	Type of transverse seams
1	≥ 30° (57,7 %)	Overlap 100 mm
2	≥ 25° (46,6 %)	simple cross seam
3	≥ 10° (17,6 %)	Simple transverse seam with additional rebate
4	≥ 7° (12,3 %)	double cross seam (without seal)
5	< 7° (12,3 %)	Waterproof design, depending on the material used

Table 10 — Minimum material thicknesses of terminals and covers

Material	Wall coverings of folded metal parts, roof edge finishes mm	Non-self-supporting connectors and covers** mm	Material mm
Aluminium	1,0	0,7	0,7 (1,5)*
Copper (semi-hard)	1,0	0,6	0,7
Titanzink	1,0	0,7	0,7
Stainless steel	0,8	0,4	0,7
Galvanized steel	0,8	0,6	0,7
*	The minimum thickness for extruded sections shall be 1.5 mm; for metal parts laid on substructures, the dimensions indicated shall apply.		
**	Table 3 applies to minimum thicknesses and widths		

DIN EN 1991-1-4 "Eurocode 1: Actions on Structures — Part 1-4: General Actions — Wind Loads"

a) Simplified Zoning of Roof Areas



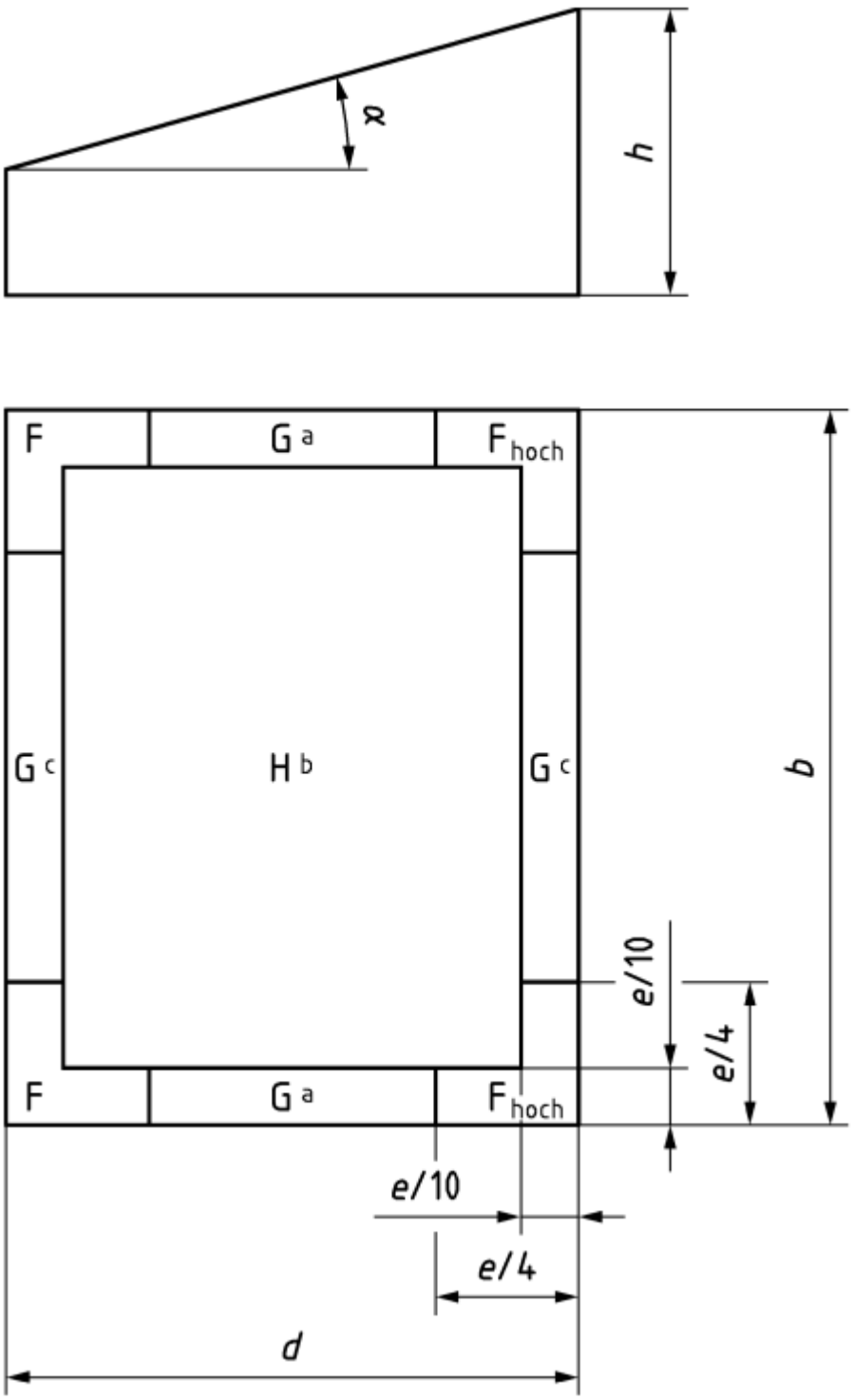
a at α ≤ −15° Fhoch

b at α ≤ −30° and at α ≥ +15° J

Legend

1 ridge or throat

Figure 1 — Simplified division of flat roofs, gable roofs and trough roofs



a bei α ≤ 30° F

b bei α ≤ 30° J

c bei α > 30° F

Figure 2 — Simplified division of areas for monopitch roofs

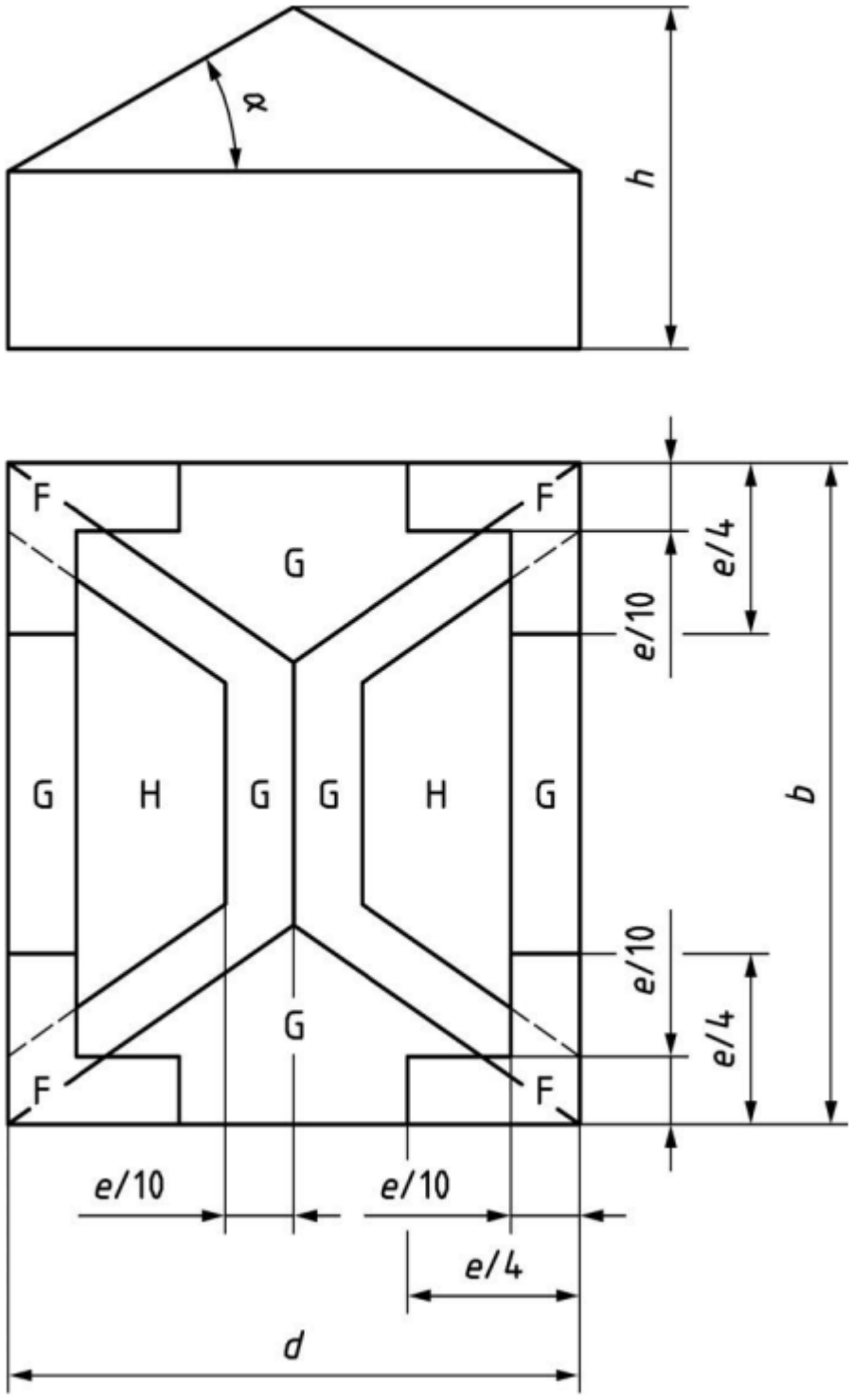
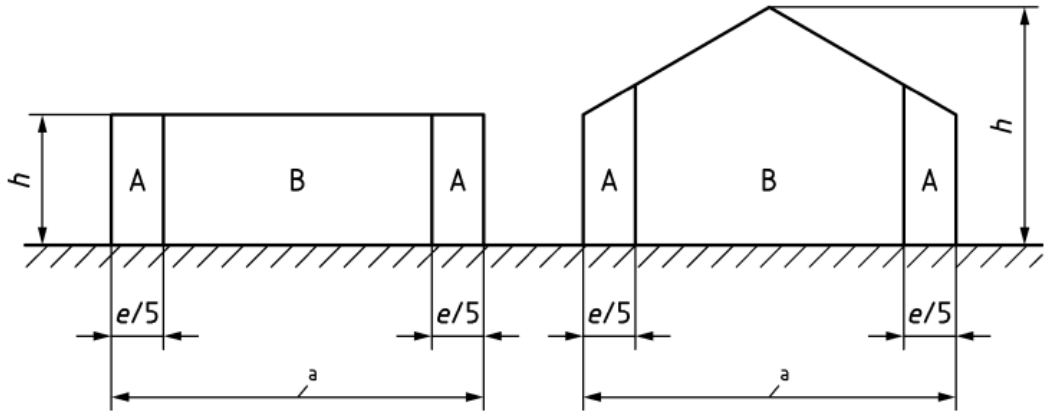


Figure 3 — Simplified division of areas for hipped roofs

b) Simplified division of vertical walls



e = b or 2 h, the smaller value is decisive

a = b or d

Figure 4 — Simplified division of areas for vertical walls

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on or clad is not higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.1.2 Compensation of stepped or inclined standing surfaces of scaffolding up to 40 cm difference in height, e.g. via stairs or ramps.

4.1.3 Cleaning of the substrate, except for services in accordance with section 4.2.7.

4.1.4 Protection of components and plant components from contamination and damage during plumbing work by loose covering, hanging or wrapping, except for protective measures according to section 4.2.12.

4.1.5 Completion of components in two work steps to enable work by other contractors, insofar as the services can be provided continuously in the course of similar plumbing work. If these conditions are not met, they are special services according to section 4.2.14.

4.1.6 Marking of recesses, slots and openings.

4.1.7 Insertion and fastening of the gutter holders, brackets for running grates, anchoring elements, pipe clamps.

4.1.8 Installation, provision and removal of water deflectors for the drainage of rainwater during the construction period. The water deflectors must extend at least 50 cm beyond the structure, and in the case of scaffolding, correspondingly far beyond it.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 Provision of recreation and storage rooms if the Client does not provide rooms that can be easily locked.

4.2.2 Assembly, conversion and dismantling as well as provision of scaffolding for services provided by other entrepreneurs.

4.2.3 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on or clad is higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.2.4 Erection, conversion and dismantling as well as provision of scaffolding with a stepped or inclined footprint, e.g. over stairs or ramps, if compensation of more than 40 cm is required.

4.2.5 Erecting, converting, dismantling and maintaining scaffolding for one's own services, provided that when working on the roof surface, it has a roof pitch of more than 22.5°.

4.2.6 Protection against unsuitable conditions resulting from the weather in accordance with section 3.1.2, e.g. preheating of metals.

4.2.7 Cleaning the substrate of coarse soiling, e.g. plaster residues, mortar residues, paint residues, oil, insofar as this was not caused by the Contractor.

4.2.8 Compensation of larger unevenness and dimensional deviations of the substrate than permissible according to DIN 18202.

4.2.9 Services for fire, sound, heat, moisture and radiation protection, insofar as these go beyond the services under Section 3.

4.2.10 Production of movement and apparent joints, as well as joint seals.

4.2.11 Making and attaching sample surfaces, sample constructions and models.

4.2.12 Special protection of building and plant components as well as furnishings, e.g. masking of windows, doors, stairs, wood, roof surfaces, finished parts, dust-proof masking of sensitive equipment and technical equipment, dust barriers, emergency roofs, laying of hardboard or building protection films from 0.2 mm thick.

4.2.13 Services for the construction of connections to adjacent components, insofar as these exceed the services in accordance with Section 3.

4.2.14 Completion of components in several work steps to enable work by other contractors, insofar as the services cannot be provided continuously in the course of similar plumbing work.

4.2.15 Herstellen von am Bauwerk verbleibenden Verankerungsmöglichkeiten.

4.2.12 Special protection of building and plant components as well as furnishings, e.g. masking of windows, doors, stairs, wood, roof surfaces, finished parts, dust-proof masking of sensitive equipment and technical equipment, dust barriers, emergency roofs, laying of hardboard or building protection films from 0.2 mm thick.

4.2.13 Services for the construction of connections to adjacent components, insofar as these exceed the services in accordance with Section 3.

4.2.14 Completion of components in several work steps to enable work by other contractors, insofar as the services cannot be provided continuously in the course of similar plumbing work.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

The determination of the performance — regardless of whether it is carried out according to drawings or measurements — must be based on the dimensions of the

- covers,
- garments produced,
- manufactured components

The simplifying rules such as overmeasurement rules and individual regulations are to be used to determine performance.

5.2 Determination of dimensions/quantities

5.2.1 When invoicing individual elements according to area (m2), the smallest circumscribed rectangle of the individual part is calculated in the case of non-rectangular or notched surfaces.

5.2.2 Gutters and eaves plates shall be measured at the front bulges,

5.2.3 Rainwater downpipes are measured in the centerline.

5.3 Overmeasurement rules

The following are measured:

5.3.1 When billed according to area

- Recesses and openings with individual sizes ≤ 2.5 m2, e.g. chimneys, windows, skylights, vents,
- planks, rafters and the like in the case of separating and insulating layers,
- unclad frames, transoms, posts, beams, beams and the like with individual widths ≤ 30 cm in surfaces of metal exterior wall cladding,
- Overlapping and rebating in formed sheets and sheet metal profiles.

5.3.2 When billing according to length

- Interruptions ≤ 1 m individual length,

- angles and bends as well as branches for downpipes. These are calculated separately,
- Overlaps and rebents in shaped sheets and sheet metal profiles,
- Gutter angles, gutter bottoms, gutter nozzles and motion compensators. These are calculated separately.

5.4 Individual provisions

No regulations.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Drywall work — DIN 18340

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

Type, location, dimensions and constructive design as well as dates for the erection and dismantling of on-site scaffolding.

0.2 Information on the execution

0.2.1 Number, type, dimensions, load-bearing capacity, materials and design of the components.

0.2.2 Design and division of areas. Grid and joint formation, special laying method.

0.2.3 Dimensions, special formats, shapes and profiles, e.g. panels, panels, cassettes, surface type, structure and surface treatment as well as colours of the components, formation of the edges and corners.

0.2.4 Number, type, location, dimensions and properties of individual surfaces, of inclined, curved or otherwise shaped surfaces as well as of moulded parts, cladding of special components.

0.2.5 Number, type, quality and colour of fasteners, e.g. nails, staples, clips, rivets, visible or not visible, designed with or without cover caps, fastening in peripheral areas, execution of fastening of the components.

0.2.6 Type, design and dimensions of load-bearing structures and substructures, including suspension and construction heights.

0.2.7 Type and design of the anchoring of the supporting structures and substructures, e.g. dowels, screws.

0.2.8 Type, nature and strength of the substrate, e.g. plastered or unplastered masonry, concrete, aerated concrete, hollow-core or wooden beam ceiling, composite screed, screed on separating or insulating material layer with or without underfloor heating, hollow floor, raised floor.

0.2.9 Component production according to the execution plan or according to local measurements.

0.2.10 Number, type, position, dimensions and design of recesses to be made or closed.

0.2.11 Number, type of cut-outs in interior insulation, e.g. for pipes, ducts.

0.2.12 Type, dimensions and design of recesses for ventilated structures and their cover, e.g. for ventilation openings.

0.2.13 Inputs made by other contractors, in particular with regard to the execution of purchases and closings.

0.2.14 Type, dimensions, profiling and floor recess of frames, type of stop and opening direction of the doors, type of rebate seals and damping agents, type of door leaves, fittings and glazing as well as time of respective installation.

0.2.15 Number, type, location, dimensions and masses of fittings and fittings.

0.2.16 Suspension design of installation and installation components.

0.2.17 Number, type and dimensions of profiles and edge formations.

0.2.18 Type and length of reinforcements for fixtures, e.g. door frames, sanitary elements.

0.2.19 Type, location, dimensions and design of movement, structure and component joints.

0.2.20 Type and colour of joint sealants, joint covers and joint backings.

0.2.21 Requirements for fire, sound, heat, moisture and radiation protection as well as for airtightness and electrical conductivity, acoustic, light and radiation protection

ventilation requirements, fire resistance class, e.g. according to DIN 4102 (all parts) "Fire behaviour of building materials and components".

0.2.22 Number, type, location, dimensions and design of surface heating and cooling systems, e.g. register modules, connections of the register modules to each other, information on connections to the distribution network.

0.2.23 Number, type, location, dimensions and design of connections and terminations to adjacent components, e.g. with profiles, separation joints, separation strips, separation cuts, airtight connections.

0.2.24 Type, thickness, nature and physical properties, e.g. of insulation materials, vapour barriers, nonwovens.

0.2.25 Type and design of on-site waterproofing.

0.2.26 Type, design and properties of moisture and corrosion protection, e.g. for fastenings, substructures and cladding.

0.2.27 Special physical and chemical stresses to which substances and components are exposed after installation, e.g. aggressive vapours, shock loads, moisture.

0.2.28 Type and scope of the laying or assembly plans, lists of materials and other documentation to be supplied by the Contractor.

0.2.29 Number, type and dimensions of samples, e.g. surface and colour samples, sample surfaces, sample constructions, models, place of attachment or installation.

0.2.30 Pre-treatment of the substrate, e.g. cleaning, roughening, picking, knocking off old substrates, application of adhesive bridges, primers, pre-treatment of highly absorbent substrates. Production of full-surface reinforcements.

0.2.31 Number, type, dimensions and time of installation of partial areas to be pre-built or retrofitted, e.g. areas behind installations and radiators, partial planking for screed installation.

0.2.32 Type of floor covering and filling as well as type and time of surface treatment, impregnation and application of the floor covering. Floor construction in the transition area of different floor surfaces, installation of levelling compound, levelling fills.

0.2.33 Special protection of services, e.g. packaging, edge protection, covers, especially for finished and finished surfaces.

0.2.34 Protection of e.g. building or plant parts, furnishings.

0.2.35 Special measures to absorb structural movements and deflections.

0.2.36 Increased requirements for flatness or dimensional accuracy.

0.2.37 Quality levels of surface filling.

0.2.38 Manufacture of covers, shelves, side cladding, bulkheads, friezes, pilaster strips, grooves, aprons, beams, sheathing, recesses, templates.

0.3 Details in case of deviation from the ATV

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 3.1.3	if tolerances other than those listed therein are to apply,
Section 3.3.6,	if other than visible wall angles are to be executed,
Section 3.4.1	if partition walls are not to be made with plasterboard but with other cladding, e.g. gypsum fibreboard.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units are to be provided as follows:

0.5.1 Area (m2), separated by type and dimensions, for

- Cleaning and pre-treatment of the substrate,
- substructures for ceilings, walls and floors with an area > 5 m2,
- insulation layers and nonwovens with an area > 5 m2,
- ceiling cladding and suspended ceilings with an area > 5 m2,
- non-load-bearing partition walls with an area > 5 m2,
- wall coverings with an area > 5 m2,
- facing shells with an area > 5 m2,
- recesses with a length > 2 m and a width > 0.5 m,
- Reveal cladding of openings and niches with a depth > 1 m, e.g. for windows, doors, skylights,
- aprons, partitions, shelves, covers and lateral cladding, friezes, steps, trunks, pillars, columns, beams and the like, with a width > 1 m per visible area,
- Sword and reducer elements with a width > 1 m,
- Separating and protective layers, protective coatings, foils, membranes, vapour retarders and the like with a width > 1 m,
- Fillings, levelling compounds and fills,
- Raised floors, cavity and dry floors and other system floors, prefabricated screeds with an area > 5 m2, Closing recesses with a face >
- Chipping, picking, high-pressure cleaning, application of adhesive bridges, primers, consolidation of old substrate surfaces with an area > 5 m2.

0.5.2 Dimensions of length (m), separated by type and dimensions, for

- Reveal cladding of openings and niches with a depth ≤ 1 m, e.g. for windows, doors, skylights,
- aprons, partitions, shelves, covers and lateral cladding, friezes, steps, trunks, pillars, columns, beams and the like with a width ≤ 1 m per visible area,

- Separating and protective layers, protective coatings, foils, membranes, vapour retarders and the like with a width ≤ 1 m,
- airtight connections to components,
- Cuts of cladding, insulation boards and floor elements, e.g. straight, slanted, curved, differently shaped,
- window sills, window and door frames and the like,
- Shadow gaps, grooves and the like,
- Recesses with a length > 2 m and a width ≤ 0.5 m, e.g. openings for continuous rooflights, skylight strips, ventilation outlets, cable ducts, guide rails, built-in parts,
- Substructures, reinforcements, bracing, replacements and bridging with a length > 2 m for add-on and built-in parts, e.g. for doors, skylights, support and guide rails, lighting strips, inspection openings, wall cabinets, floor structures, notches, cut cassettes and panels,
- Sword and reducer elements with a width ≤ 1 m,
- sliding ceiling, wall and floor connections,
- Wide-span girders with a length > 2 m,
- wall branches, cladding of the front sides with free wall ends and free ceiling ends,
- Integration of wall and ceiling constructions in top layers of limiting components,
- Processing and adaptation to existing components and incorporation of built-in parts with a length ≤ 1 m per side to be incorporated into ceilings and wall surfaces, e.g. for columns, pillar templates, beams, pipes, installation ducts, door and window elements, roof windows,
- Formation of inner and outer corners with a length > 1 m,
- Connection, movement and building separation joints,
- Sealing tapes, sealing profiles, joints,
- Profiles, edges, skirting boards, edge brackets, wall brackets, skirting boards, edge strips and the like,
- Recessed and deposited plinth connections > 1 m individual length,
- Cut-outs in interior insulation, e.g. for pipes, ducts.

0.5.3 Number (pcs), separated by type and dimensions, for

- individual areas ≤ 5 m2,
- Recesses with a length ≤ 2 m and a width ≤ 0.5 m, e.g. for windows, niches, columns, pillar templates, pipes, individual luminaires, skylights, ventilation outlets, switches, sockets, cables, built-in parts,
- Closing recesses ≤ 5 m2,
- Substructures, reinforcements, bracing, replacements and bridging with a length ≤ 2 m for surface-mounted and built-in parts, e.g. for doors, skylights, support and guide rails, lighting strips, Inspection openings, wall cabinets, floor structures, notches, cut cassettes and panels,
- Wide-span girders with a length ≤ 2 m,

- Installation of inspection flaps, individual luminaires, ventilation grilles, air outlets, support stands, frames, doors and the like,
- Adaptation and processing to existing components and incorporation of built-in parts with a length ≤ 1 m per side to be incorporated into ceilings and wall surfaces, e.g. for columns, pillar templates, beams, pipes, installation ducts, door and window elements, roof windows,
- airtight connections to built-in parts and installations,
- Recessed and deposited plinth connections ≤ 1 m individual length, e.g. on columns, pillars, niches,
- Special formats, e.g. shims,
- revision tools, spare elements and the like,
- Change of direction of walls and friezes. Mitres of profiles and the like, e.g. in the joint area, grooves,
- Forming inner and outer corners ≤ 1 m,
- Chipping, picking, application of bonding bridges, primers, consolidation of old substrate surfaces with an area ≤ 5 m2.

1 Scope of application

1.1 ATV DIN 18340 "Drywall construction work" applies to space-forming components of the fit-out that are manufactured using the dry construction method.

It includes, in particular, the manufacture of open and closed ceiling cladding and suspended ceilings, wall cladding, dry plaster, interior insulation and facing shells, fire protection cladding, partitioning, assembly and system walls, prefabricated screeds, dry underfloors and system floors as well as the installation of frames, doors and other built-in parts in the aforementioned constructions.

1.2 It also applies to drywall construction work in connection with the installation of surface heating and cooling systems.

1.3 ATV DIN 18340 "Drywall work" does not apply to

- Constructions of timber construction (see ATV DIN 18334 "Carpentry and timber construction work"),
- plastering and stucco work (see ATV DIN 18350 "Plastering and stucco work"),
- Screed work (see ATV DIN 18353 "Screed work"),
- carpentry work (see ATV DIN 18355 "Carpentry"),
- Metal construction work (see ATV DIN 18360 "Metal construction work"),
- painting and varnishing work (see ATV DIN 18363 "Painting and varnishing work — coatings") and
- Flooring work (see ATV DIN 18365 "Flooring work").

1.4 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18340 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

For the most common substances and components, the DIN standards and other requirements are listed below.

2.1 Ceiling and wall panels

DIN 18177	Mineral Plates Factory-Produced by the Wet Process — Characteristic Values and Test Methods
DIN 18180	Plasterboard — Types and Requirements
DIN 18184	Gypsum board composite elements with polystyrene or polyurethane rigid foam as insulation material
DIN EN 438 (all parts)	Decorative high-pressure laminate boards (HPL) — Sheets based on hardenable resins (laminates)
DIN EN 520	Gypsum Boards — Definitions, Requirements and Test Methods
DIN EN 12467	Fibre cement panels — Product specification and test methods
DIN EN 13963	Materials for Plasterboard Joint Filling — Definitions, Requirements and Test Methods
DIN EN 14190	Plasterboard products from further processing — Definitions, requirements and test methods
DIN EN 14322	Wood-based panels — Melamine-coated panels for indoor use — Definition, requirements and classification
DIN EN 14496	Gypsum-based adhesives for thermal and acoustic composite panels and gypsum boards — Definitions, requirements and test methods
DIN EN 15283-1	Fibre-reinforced plasterboard — Definitions, requirements and test methods — Part 1: Plasterboard with fleece reinforcement
DIN EN 15283-2	Fibre-reinforced gypsum boards — Definitions, requirements and test methods — Part 2: Gypsum fibreboard

2.2 Prefabricated screeds, dry subfloors and system floors

DIN EN 12825	Raised floors
DIN EN 13213	Hohlböden

DIN EN 13810-1	Wood-based panels — Floating flooring — Part 1: Performance specifications and requirements
DIN EN 13813	Screed mortars, screeds and screeds — Screed mortars and screeds — Properties and requirements

2.3 Substructures

DIN 4103-4	Non-load-bearing internal partition walls — Substructure in timber construction
DIN 18168-2	Plasterboard ceiling cladding and suspended ceilings — Part 2: Verification of the load-bearing capacity of metal substructures and hangers
DIN 18182-1	Accessories for the processing of plasterboard — Part 1: Profiles of sheet steel
DIN EN 13964	Suspended ceilings — Requirements and test methods
DIN EN 14195	Metal profiles for substructures of gypsum board systems — Definitions, requirements and test methods

2.4 Insulation materials

DIN 4108-10	Thermal insulation and energy saving in buildings — Part 10: Application-related requirements for thermal insulation materials — Factory-made thermal insulation products
DIN EN 12431	Thermal insulation products for construction — Determination of the thickness of insulation materials under floating screed
DIN EN 13162	Thermal insulation products for buildings — Factory made mineral wool (MW) products — Specification
DIN EN 13163	Thermal insulation products for buildings — Factory-made expanded polystyrene (EPS) products — Specification
DIN EN 13164	Thermal Insulation Products for Buildings — Factory Made Extruded Polystyrene Foam (XPS) Products — Specification
DIN EN 13168	Thermal insulation products for buildings — Factory made wood wool (WW) products — Specification
DIN EN 13950	Gypsum composite panels for thermal and acoustic insulation — Definitions, requirements and test methods

2.5 Frames and doors

DIN 18101	Doors — Doors for residential construction — Door leaf sizes, hinge seat and lock seat — Interdependence of dimensions
DIN 18111 (all parts)	Doorframes — Steel frames
DIN 68706 (all parts)	Interior doors made of wood and wood-based materials

2.6 Fasteners and fasteners

DIN 18182-2	Accessories for the processing of plasterboard — Part 2: Screws, staples and nails
DIN EN 14566	Mechanical fasteners for plasterboard systems — Definitions, requirements and test methods

2.7 Fire, sound, heat and moisture protection

DIN 4102 (all parts)	Reaction to fire of building materials und Bauteilen
DIN 4108-7	Thermal insulation and energy saving in buildings — Part 7: Airtightness of buildings — Requirements, planning and execution recommendations and examples
DIN 4109 (all parts) Sound	insulation in building construction

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- Deviations of the stand from the specifications, e.g. in the event of incorrect location and height of the subsoil,
- insufficient load-bearing capacity of the subsoil,
- unsuitable condition of the substrate, e.g. efflorescence, surfaces that are too smooth, dusty or wet or frozen, various substances of the substrate,
- insufficient component temperature, e.g. for filling work at temperatures below 10 °C (see section 3.1.2),
- greater unevenness of the substrate than permissible according to DIN 18202,
- unsuitable climatic conditions (see section 3.1.2);
- weakening of the substructure, e.g. due to installations and crossings of pipes and the like,
- lack of reference points, in particular lack of information on reference axes in non-perpendicular spaces,

- Lack of information on the soil structure in the transition area of different soil surfaces.

3.1.2 In the event of unsuitable conditions resulting from the weather or the indoor climate, e.g. room temperatures below 5 °C for assembly work, special measures must be taken in consultation with the client. If services are required for this, these are special services (see section 4.2.5).

3.1.3 Deviations from prescribed dimensions are permissible within the limits specified by DIN 18202 "Tolerances in building construction — Structures".

Unevenness in the surfaces that becomes visible in grazing light is permissible if it does not exceed the limit values according to DIN 18202. If increased requirements are placed on flatness and dimensional accuracy in accordance with DIN 18202:2013-04, Table 3, lines 4 and 7, the required services are special services (see section 4.2.8). In the case of raised floors, a height offset of ≤ 1 mm is permissible at the joint of adjacent slabs.

3.1.4 Movement joints of the structure must be adopted structurally with the same possibility of movement.

3.1.5 In plasterboard surfaces, movement joints must be arranged at intervals of no more than 15 m, and in areas made of gypsum fibreboard at intervals of no more than 10 m. Movement joints must also be arranged in the case of constrictions in the ceiling area, e.g. in the case of constrictions caused by wall projections, in the case of narrow corridors and friezes, and in the case of weakening of the overall structure by built-in parts. In the case of raised and hollow floors, movement joints must be provided according to their construction. The formation of movement joints is a special achievement (see section 4.2.28).

3.1.6 Gypsum boards are to be processed in accordance with DIN 18181 "Gypsum boards in building construction — Processing". The thickness of the single-layer cladding must be at least 12.5 mm, and at least 9.5 mm in the case of gypsum perforated boards and gypsum plaster carrier boards.

3.1.7 Gypsum fibreboards shall be processed in accordance with their approval. The thickness of the clothing must be at least 10 mm.

3.1.8 Adaptations and connections to adjacent components of the same material must be made bluntly without separating strips. Adjustments and connections to adjacent components of different materials must be made bluntly with separating strips and filled. Rectilinear hairline cracks in the edge area along adjacent components due to e.g. temperature fluctuations and component movements are permitted. Drywall constructions in the cladding of roof structures must be made with profiles at the connections. These are special services (see section 4.2.26). Connections of gypsum and gypsum fibre boards to thermally stressed components, e.g. to recessed luminaires and to components made of other building materials, must be designed to be movable. These are special services (see section 4.2.27).

Rigid connections to penetrations, sanitary installations and the like must be decoupled from sound technology. Joints between floor constructions and begrenzenden Bauteilen are to be formed with edge insulation strips. In the case of raised floors, care must be taken to ensure sufficient horizontal support to the limiting component.

3.1.9 Cross joints are only permitted for gypsum and gypsum fibreboards with a perforated or slotted surface.

3.1.10 Constructions and cladding made of elements which form a regular grid shall be manufactured in accordance with the specified reference axes.

3.2 Fillers

3.2.1 Plasterboard fillers — quality levels

3.2.1.1 Scope of services quality level Q 1 — plasterboard

In the case of plasterboard ceiling and wall surfaces that do not have any visual or decorative requirements, e.g. under tile and board coverings, a basic filler must be carried out, which includes filling the butt joints and coating the visible parts of the fastening elements. Protruding filler must be repelled. Tool-related burrs are permitted. Depending on the filling system chosen, joint cover strips may have to be incorporated as reinforcement.

3.2.1.2 Scope of work quality level Q 2 — plasterboard

In the case of ceiling and wall surfaces made of gypsum boards, which serve, for example, as a substrate for matt, filling paints and coatings, for medium and coarsely structured wall coverings as well as for top plasters with a maximum grain size > 1 mm, a basic filling in accordance with section 3.2.1.1 and a re-filling must be carried out until a stepless transition of the filler to the board surface has been achieved. No machining marks or filler burrs must remain visible.

3.2.1.3 Scope of services quality level Q 3 — Gypsum boards

In the case of ceiling and wall surfaces made of gypsum boards, which serve, for example, as a substrate for matt, non-structured paints, finely structured wall coverings and for top plasters with a maximum grain size ≤ 1 mm, a filling of quality level Q 2 — gypsum boards must be carried out and in addition, a wider filling of the joints and sharp stripping of the cardboard surface with filler to seal the pores. These services are special services (see section 4.2.9)

3.2.1.4 Scope of services quality level Q 4 — plasterboard

In the case of ceiling and wall surfaces made of gypsum boards, which serve, for example, as a substrate for smooth or structured wall coverings, glazes, high-quality smoothing techniques, a filling quality level Q 2 must be carried out and, in addition, a full-surface coating and smoothing of the entire surface with surface filler with a layer thickness > 1 mm must be carried out.

These services are special services (see section 4.2.9).

3.2.1.5 In the case of multi-layer planking of plasterboard, the butt and connection joints of the lower slab layers must be filled.

3.2.2 Filling of gypsum fibreboards — quality levels

The joint techniques for gypsum fibreboards are filler or adhesive joints of the contractor's choice.

3.2.2.1 Scope of services quality level Q 1 — gypsum fibreboards

In the case of ceiling and wall surfaces made of gypsum fibreboard that do not have any visual or decorative requirements, e.g. under floor coverings made of tiles and slabs, a basic filler must be carried out, which includes filling the butt joints and coating the visible parts of the fasteners. Protruding filler or joint adhesive at the adhesive joint must be repelled. Tool-related markings, grooves and burrs are permitted. Depending on the filling system chosen, joint cover strips may have to be incorporated as reinforcement.

3.2.2.2 Scope of services quality level Q 2 — gypsum fibreboards

In the case of ceiling and wall surfaces made of gypsum fibreboards, which serve, for example, as a substrate for matt, filling paints and coatings, for medium and coarsely structured wall coverings as well as for top plasters with a maximum grain size > 1 mm, a basic filling in accordance with section 3.2.2.1 and a re-filling must be carried out until a stepless transition to the board surface is achieved. No filler burrs must remain visible.

3.2.2.3 Scope of services quality level Q 3 — gypsum fibreboards

In the case of ceiling and wall surfaces made of gypsum fibre boards, which serve as a substrate for matt, non-structured paints, finely structured wall coverings and for top plasters with a maximum grain size ≤ 1 mm, a filling of quality level Q 2 — gypsum fibre boards must be carried out and, in addition, a wider filling of the joints and a full-surface, opaque coating of the entire surface with filler material. These services are special services (see section 4.2.9).

3.2.2.4 Scope of services quality level Q 4 — gypsum fibreboards

In the case of ceiling and wall surfaces made of gypsum fibre boards, which serve as a substrate for smooth or finely structured wall coverings, glazes, high-quality smoothing techniques, filler quality level Q 2 – gypsum fibre boards and, in addition, a full-surface, opaque coating and smoothing of the entire surface with surface filler with a layer thickness greater than 1 mm must be carried out.

These services are special services (see section 4.2.9).

3.3 Ceiling cladding and suspended ceilings

3.3.1 DIN 18168-1 "Gypsum board ceiling coverings and suspended ceilings — Part 1: Requirements for execution" apply to the execution of lightweight ceiling cladding and suspended ceilings with plasterboard, and DIN EN 13964 for metal and mineral fibre ceilings.

3.3.2 Metal substructures and hangers for plasterboard ceilings must be designed in accordance with DIN 18168-1, for metal and mineral fibre ceilings and the like in accordance with DIN EN 13964. The substructure must be matched to the panel System. For gypsum fibreboards, substructures and hangers must be designed in accordance with the respective approval.

3.3.3 In the case of built-in parts with a higher installation mass than permitted for the ceiling construction, suitable measures must be defined jointly, e.g. additional hangers, individual hangers, structural reinforcements. The measures to be taken are special services (see section 4.2.22).

3.3.4 Individual, open or closed ceiling elements, e.g. baffles, slats, ceiling sails, must be fastened separately if their load cannot be absorbed by the suspended ceiling. These services are special services (see section 4.2.22).

3.3.5 The edges of truncated metal and plastic cassettes and metal panels shall be stiffened in such a way that the cutting edge does not curl and the surface does not sag more than permissible in accordance with DIN EN 13964.

3.3.6 In the case of mineral fibre and metal ceiling constructions and the like, connections to adjacent components shall be formed with a visible metal wall angle simply bent at right angles, which must be butt-butted at the corners.

3.3.7 The filling of light ceiling cladding and suspended ceilings made of gypsum board in accordance with DIN 18168-1 shall be manufactured in quality level Q 2 — Gypsum boards in accordance with Section 3.2.1.2.

3.3.8 The filling of lightweight ceiling cladding and suspended ceilings made of gypsum fibreboard in accordance with DIN EN 15283-2 shall be manufactured in quality level Q 2 — gypsum fibre boards in accordance with section 3.2.2.2.

3.4 Partition and assembly walls

3.4.1 Partition and assembly walls are to be constructed as single-stud walls with a full-surface cladding of plasterboard with a thickness of at least 12.5 mm in accordance with DIN 18183-1 "Partition walls and facing shells made of gypsum boards with metal substructures — Part 1: Planking with gypsum boards", a metal substructure in accordance with DIN 18182-1 with a stud centre distance of 625 mm, a mineral wool insulation layer of at least 40 mm thickness and a filler in the Quality level Q 2 — To produce plasterboard in accordance with 3.2.1.2.

3.4.2 Partition and assembly walls shall be constructed as single-stud walls with a single-layer full-surface cladding of gypsum fibreboard with a thickness of at least 12.5 mm, a metal substructure in accordance with DIN 18182-1 with a stud centre distance of 625 mm, a mineral wool insulation layer of at least 40 mm thick and a filling in quality level Q 2 — gypsum fibreboards in accordance with Section 3.2.2.2.

3.4.3 Partition walls with wooden substructures must be manufactured in accordance with DIN 4103-4.

3.4.4 The fastening of the substructure of partition walls must be carried out as a rigid connection to the floor, e.g. screed, raw floor, and to the ceiling. The connection to limiting components must be made with a connection seal.

3.4.5 Exterior corners shall be designed with an edge profile or with V-milling at the Contractor's choice.

3.4.6 Facing shells shall be constructed with a metal substructure in accordance with DIN 18183-1 and full-surface planking made of gypsum boards with a thickness of at least 12.5 mm.

3.4.7 Facing shells with gypsum fibre boards must be manufactured in accordance with the approval.

3.5 Precast screeds, dry subfloors and system floors

3.5.1 Separating films and vapour barriers must be pulled up to the top of the finished floor on the adjacent wall surfaces. Separating foils must overlap at least 20 cm at the joints.

3.5.2 Dry subfloors

3.5.2.1 Dry subfloors made of gypsum or gypsum fibreboard, composite elements or chipboard shall be laid with joint offset. joints must be glued together. A protrusion caused by a spring at the end of the wall must be cut off. An edge insulation strip of at least 10 mm thickness must be inserted at the wall connection.

3.5.2.2 Dry fills must be placed in such a way that sideways evasion or trickling away is not possible. Pipelines, cables and the like must be covered by at least 10 mm.

3.5.2.3 Movement joints in the surface and in door passages must be underlaid with a relining board, e.g. wood-based panel, solid wood panel, and a stiff insulating strip underlay.

3.5.3 Raised floors

3.5.3.1 Raised floors must be constructed in such a way that they allow free access to the cavity at any time. The substructure must be permanently glued to the raw floor.

3.5.3.2 For construction heights > 50 cm, additional securing measures are required, e.g. horizontal securing of the substructure with grid bars, anchoring of the supports to the substrate.

3.5.3.3 Raised floor tiles must be laid loose. Cut edges of moisture-sensitive building materials must be protected against moisture.

3.5.3.4 The width of the columns in the edge area shall not exceed 2 mm, and the horizontal offset at the intersection of the corners of the panels in relation to each other shall not exceed 4 mm.

3.5.3.5 Surface filling of raised floor surfaces is not permitted.

3.5.4 Built-in parts in raised and hollow floors must be structurally suitable and must not cause the required load-bearing capacity of the overall structure to fall short of the required load-bearing capacity.

3.6 Insulation

Insulation materials to be installed must be tightly jointed over the entire surface and must be laid without slipping and connected to limiting components. Cavities between door or window frames and the flanking stud profiles must be filled with fibre insulation materials.

3.7 Frames and built-in parts

3.7.1 Frames made of cold-formed sheet steel must have a plate thickness of at least 1,5 mm and be primed in accordance with DIN EN ISO 12944-5 "Coating materials — Corrosion protection of steel structures by coating systems — Part 5: Coating systems".

3.7.2 In the case of walls with construction heights > 2.6 m, door widths ≥ 0.885 m or door leaf masses > 25 kg, reinforced stud profiles with a minimum thickness of 2 mm must be installed in the door opening area. Head and foot connection areas must be fastened with connection brackets with a minimum thickness of 2 mm. A substructure wall profile is to be installed as a door lintel and attached to the vertical profiles in a force-fit manner.

3.7.3 Panel joints on door and window stud profiles and other mechanically stressed installation elements are not permitted.

3.7.4 Design requirements for conone buttons must be taken into account in accordance with DIN 18183. In the case of wall-mounted wall cabinets, boilers and built-in parts, additional substructures must be installed as reinforcements, e.g. trusses, UA profiles. Sanitary support stands for wall-hung washbasins, toilets and bidets are

- in the case of floor-to-ceiling walls, it must be formed on both sides with reinforced stud profiles with a minimum thickness of 2 mm and attached to the head and foot connections with connection brackets,
- in the case of facing shells, they must be formed on both sides with reinforced stud profiles with a minimum thickness of 2 mm and fastened to the foot connection with connection brackets and to the upper end of the respective rear wall in a force-fit manner, provided that the existing sanitary support columns do not have these fastenings,
- in the case of cladding in front of a partition and assembly wall in the washbasin, toilet and bidet area, both in the facing shell and in the partition and assembly wall, with reinforced stud profiles with a minimum thickness of 2 mm and connected to each other in a force-fit manner and fastened to the head and foot connections with connection brackets.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on or clad is not higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.1.2 Compensation of stepped or inclined standing surfaces of scaffolding up to 40 cm difference in height, e.g. via stairs and ramps.

4.1.3 Cleaning of the substrate, except for services in accordance with section 4.2.7.

4.1.4 Submission of prefabricated surface and color samples.

4.1.5 Completion of partition and assembly walls and facing shells in two steps to enable the assembly of installations by other contractors, provided that the services can be provided continuously in the course of similar drywall construction work. If these conditions are not met, they are special benefits according to section 4.2.16.

4.1.6 Installation of dividing strips for adjustments and connections.

4.1.7 Inspection documents for installed surface heating and cooling systems.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 Provision of recreation and storage rooms if the Client does not provide rooms that can be easily locked.

4.2.2 Assembly, conversion and dismantling as well as provision of scaffolding for the services of other contractors.

4.2.3 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on or clad is higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.2.4 Erection, conversion and dismantling as well as provision of scaffolding with a stepped or inclined footprint, e.g. over stairs or ramps, if compensation of more than 40 cm is required.

4.2.5 Measures to protect against unsuitable conditions resulting from the weather or the indoor climate, according to section 3.1.2, e.g. heating.

4.2.6 Special measures for the protection of building and plant components as well as furnishings, e.g. by masking windows, doors, floors and finished surface parts, dust-proof masking of sensitive equipment and technical equipment, dust protection walls, laying out of hardboard or building protection films from a thickness of 0.2 mm.

4.2.7 Cleaning the substrate of coarse soiling, e.g. plaster residues, mortar residues, paint residues, oil, insofar as this was not caused by the Contractor.

4.2.8 Measures to meet increased requirements for flatness or dimensional accuracy (see section 3.1.3).

4.2.9 Services for the production of higher surface qualities Scope of work Q 3 or Q 4 (see sections 3.2.1.3, 3.2.1.4, 3.2.2.3 and 3.2.2.4).

4.2.10 Manufacture and installation of sample surfaces, sample constructions and models.

4.2.11 Provision of building physics verifications, static calculations and the drawings required for these verifications as well as tests to prove the stability of the structure, e.g. dowel pull-out tests, test loads.

4.2.12 Preparation of installation and assembly plans as well as revisions of specified installation and assembly plans.

4.2.13 Production, processing and adaptation as well as closing of recesses, e.g. for doors, windows, lights, built-in parts, installations, revision elements. Temporary opening and closing of recesses in system floors, e.g. for installations.

4.2.14 Installation of e.g. frames, doors, windows, lights, built-in parts, installations, inspection elements, sealing tapes, sealing profiles.

4.2.15 Subsequent adaptation and adaptation to fixtures and installations, advance and subsequent construction of partial surfaces, e.g. surfaces behind radiators, pipelines and the like.

4.2.16 Completion of partition and assembly walls and facing shells, insofar as the services cannot be provided continuously in the course of similar drywall construction work (see section 4.1.5).

4.2.17 Closing of ceiling and floor constructions if substructures and cladding in the work area cannot be carried out in a single operation.

4.2.18 Work for services provided by other contractors, e.g. calibration work, installation, removal and reinstallation of cladding elements and installations, partial cladding of walls for floor laying, design of radiator niches.

4.2.19 Removal of the protrusion of edge insulation strips.

4.2.20 Cutting of cladding or factory-prefabricated elements and special formats. Adaptation to slopes, curved or non-rectangular components, e.g. trapezoidal profiles, cut-outs in interior insulation.

4.2.21 Reinforcing truncated elements in the area of connections and recesses, e.g. in the case of truncated metal cassettes.

4.2.22 Manufacture of special substructures as reinforcement to absorb loads, e.g. lighting fixtures, inspection flaps, cable trays and superstructure of installation parts.

4.2.23 Post-treatment of cut elements, e.g. deburring, protection of the cut edges by sealing or coating.

4.2.24 Manufacture of mitres, e.g. for friezes, fillets, aprons, partitions, steps.

4.2.25 Manufacture, for example, of covers, shelves, window sills, side cladding, recessed or deposited plinth connections, soffits, partitions, friezes, aprons, recesses, cornices, cantilevers, gradations, upstands.

4.2.26 Installation of connection and end profiles, e.g. wall and edge angles, edge profiles and the like, as well as production and installation of moulded parts.

4.2.27 Making connections to components as elastic, densely worked, sliding or open connections, separating cuts, grooves or shadow gaps.

4.2.28 Manufacture of movement and apparent joints and joint seals (see sections 3.1.4 and 3.1.5). Grouting behind edge brackets to compensate for unevenness in the wall area.

4.2.29 Making sword and reducer connections for partition and assembly walls and free wall and ceiling closures.

4.2.30 Making airtight connections to adjacent components, built-in parts, penetrations and the like.

4.2.31 Primers and impregnations of surfaces, e.g. in damp rooms. Application of adhesive bridges and the like.

4.2.32 Installation of levelling compounds and fills.

4.2.33 Services for fire, sound, heat, humidity and radiation protection, insofar as these go beyond the services in accordance with Section 3, as well as for the fulfilment of room acoustics and lighting requirements.

4.2.34 Measurement of missing reference points for carrying out necessary measurements in accordance with ATV DIN 18299, Section 4.1.3 as well as special measurement work of curved, curved wall and ceiling constructions as well as recesses in scattered, irregular arrangement, e.g. constellation, Mikado arrangement.

4.2.35 Connecting the Register Modules of Surface Heating and Cooling Systems.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

5.1.1 The determination of the service – regardless of whether it is carried out according to drawings or measurements – must be based on the dimensions of the

- garments produced,
- covered areas,
- coverings produced,
- manufactured components

The simplifying rules such as overmeasurement rules and individual regulations are to be used to determine performance.

5.2 Determination of dimensions/quantities

5.2.1 For cladding, substructures, vapour barriers, insulating, separating and protective layers, fills, surface treatments, protective films, adhesive bridges and the like without limiting components, the dimensions of the finished clothing shall be taken as a basis.

5.2.2 In the case of surfaces with limiting components, the dimensions up to the unplastered, uninsulated, unclad components that border them shall be taken as a basis. Space-forming system floors, dry subfloors, screeds, light partition walls as well as suspended ceilings and suspended ceilings are considered limiting components, provided that their surfaces are not penetrated.

5.2.3 The dimensions are determined on the basis of the largest component dimension, if any, e.g. in the case of vaults, partial planking, wall connections, wall corners, wall integrations and wall branches, circumferential friezes. The same applies to processing of existing components and incorporation of existing components, built-in parts and the like.

5.2.4 Directly connected, different types of recesses, e.g. opening with adjacent niche, are calculated separately. Similar recesses separated by constructive elements are also calculated separately.

5.2.5 If a recess is proportionately integrated into adjacent areas that are to be calculated separately, the respective proportional recess area is calculated to determine the overmeasurement variable.

5.2.6 Back surfaces of niches, fully or partially clad free wall ends and wall tops, undersides of apron cladding and reveals shall be calculated separately with their dimensions, regardless of their individual size.

5.2.7 Areas which cannot be determined by using simple mathematical formulas, e.g. for rectangles, triangles, trapezoids, rhombuses, are determined by dividing them into circumscribed rectangles, each with a width of 1 m.

5.3 Overmeasurement rules

The following are measured:

5.3.1 When billed according to area

- Recesses, e.g. openings (also floor-to-ceiling), niches with a single size ≤ 2.5 m2. In floors, recesses with a single size ≤ 0.5 m2. When determining the individual size, the smallest dimensions of the recess shall be taken as a basis,
- Fugues
- Interruptions in the area to be processed, e.g. columns, trusses, beams, continuous rooflights, built-in parts, beams with a single width ≤ 30 cm.

5.3.2 When billing according to length

- Interruptions of individual lengths ≤ 1 m.

5.4 Individual provisions

5.4.1 In the case of cladding and clad surfaces, connections, reducing connections, friezes, edge friezes, open joints, recesses, cases and the like up to an individual width ≤ 30 cm shall be measured and calculated separately.

5.4.2 Special formats, e.g. shims, are charged separately.

5.4.3 Mitres for friezes, joints, grooves, profiles and the like are calculated only once per change of direction.

5.4.4 Areas ≤ 5 m2 are counted separately.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

External thermal insulation composite systems — DIN 18345

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The notices do not become part of the contract

In accordance with the requirements of the individual case, the specifications shall state in particular

0.1 Information on the construction site

0.1.1 Type, location, dimensions and design as well as dates for the erection and dismantling of on-site scaffolding.

0.1.2 Indication of the wind zone.

0.2 Information on the execution

0.2.1 Type, location, nature and strength of the surfaces to be insulated, e.g. concrete, plastered or unplastered masonry, wood.

0.2.2 Type and scope of the laying or assembly plans to be supplied by the Contractor.

0.2.3 Type, location, dimensions and formation of movement, structure and component joints.

0.2.4 Protection of components or equipment and the like.

0.2.5 Special physical and chemical stresses to which substances and components are exposed after installation, e.g. impact loads.

0.2.6 Requirements for fire, sound, heat, moisture and radiation protection. Type, location, dimensions and design of fire barriers, fire bars and the like.

0.2.7 Type and thickness as well as method of fastening of the insulation boards. Type, grain size, colour and properties of the plaster, e.g. single or multi-layer plaster, type of binder, surface structure. Type of coatings or other surfaces, e.g. ceramic coverings, flat facing bricks. Dimensions of the individual parts.

0.2.8 Number, type, dimensions and design of terminations and connections to adjacent components, e.g. with connection profiles, separation joints, separation strips.

0.2.9 Number, type, location, dimensions and nature of sloped, curved or otherwise shaped surfaces.

0.2.10 Number, type, location and dimensions of samples, e.g. surface and colour samples, sample surfaces, pattern constructions.

0.2.11 Design and division of surfaces, grid and joint formation, surface structure, colour, colour gradations, use of decorative profiles, embossing.

0.2.12 Type and colour of joint sealants, joint covers and joint backings.

0.2.13 Dimensions, orientation and geometry of the building. Beuth-Ströhmann Steindesign GmbH-KdNr.9410286-LfNr.10177783001-2022-02-14 12:20

0.2.14 Dimensions of height and edge zones according to DIN EN 1991-1-4 'Eurocode 1: Actions on structures — Part 1-4: General actions — Wind loads' and DIN EN 1991-1-4/NA 'National Annex — Nationally determined parameters — Eurocode 1: Actions on structures — Part 1-4: General actions — Wind loads'.

0.2.15 Besondere Befestigungsmaßnahmen bei besonderen Fassadenformen, Vorliegen der wind zone 4 or exposed locations in wind zones 1 to

0.2.16 Pre-treatment of the substrate, e.g. cleaning, high-pressure cleaning, roughening, picking, chipping off old substrates, consolidation of the substrate. Pre-treatment of highly absorbent substrates, removal of algae and fungal infestation, biocidal pre-treatment.

0.2.17 Type, position and dimensions of additional reinforcements, e.g. reinforcing arrows, lintel corner angles, armour fabrics.

0.2.18 Type, position and dimensions of profiles, e.g. edge profiles, plinth profiles, ventilation profiles, end profiles, plaster strips, fabric angles, boss profiles.

0.2.19 Vorgezogenes und nachträgliches Herstellen von Flächen, z. B. Flächen hinter Rohrleitungen und dergleichen.

0.2.20 Anzahl, Art, Lage, Maße und Masse von Installations- und Einbauteilen.

0.2.21 Design of the plinth insulation and the transitions to plinths and perimeters Insulation layers as well as spanning of the transitions between different materials and components

0.2.22 Type, thickness and nature of levelling plasters.

0.2.23 Biocidal adjustment of plasters and coatings.

0.2.24 Number, type, position, dimensions of recesses to be made or closed.

0.2.25 Number, type, location, dimensions of window sills, window sill brackets, wall protection panels, special elements for energy generation, mounting cylinders and the like to be installed.

0.3 Details in case of deviation from the ATV

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular

Section 3.1.2,	if limit values other than those listed therein are to apply,
Section 3.2.2	if the fastening is to be glued and dowelled or only mechanical fastening, e.g. with profile rails and retaining strips, with special dowel systems.

0.4 Individual information on fringe benefits

No supplementary regulation to ATV DIN 18299, Section 0.4

0.5 Billing Units

In the bill of quantities, the billing units are to be provided as follows:

0.5.1 Area (m2), separated by type and dimensions, for

- Thermal insulation composite systems and external thermal insulation, separated into walls, ceilings, flat and curved surfaces,
- Pre-treatment of the substrate,
- Leveling of uneven surfaces,
- Feeding for areas > 2.5 m2 individual size,
- additional flat reinforcements,
- Perimeter insulation with a height > 1 m.

0.5.2 Dimensions of length (m), separated by type and dimensions, for

- Soffits,
- aprons, covers and the like with a width ≤ 1 m on each side,
- fire bars and fire barriers with a width ≤ 1 m,
- External thermal insulation composite systems and external thermal insulation on pillars, pilaster strips, columns, beams, steps and the like with a width ≤ 1 m per visible area, - Cuts of insulation boards and the like for sloping ceilings as well as for curved or otherwise shaped components,
- Perimeter insulation with a height ≤ 1 m,
- Sealing of surfaces in contact with the ground and plinth surfaces ≤ a height of 1 m,
- window sills, window and door frames, flanges, decorative profiles, plaster tapes, boss joints, shadow gaps and the like,
- Sealing level under window sills,
- auxiliary structures in the area of ceilings and walls to accommodate installation parts, lighting fixtures and the like,

- Recesses in insulation boards for pipes and the like,
- Profiles, plaster strips, fabric angles and the like as well as edge formations without profiles, -
- Connections to other components, connection, movement and building separation joints, joint sealing tapes,
- Reinforcement plasters and additional flat reinforcements ≤ 1 m wide,
- Attachment and additional work on building and installation parts, roof cornices and the like,
- Sealing tapes, sealing profiles, spraying.

0.5. Number (pcs), separated by type and dimensions, for

- Thermal insulation composite systems, external thermal insulation, linings, pre-treatments on surfaces ≤ 2.5 m2, differentiated according to individual sizes:
    - ≤ 0,5 m2,
    - > 0,5 m2 ≤ 1 m2,
    - > 1 m2 ≤ 1,5 m2,
    - > 1,5 m2 ≤ 2,5 m2,
- Manufacture of recesses for individual luminaires, air outlets, inspection openings, supports, pillar templates, switch boxes, pipe penetrations, letter boxes, window sill brackets, cables, installation parts and the like,
- Installation of window sill brackets, auxiliary structures or assembly cylinders for awnings, advertising media, individual luminaires, inspection openings, installation parts and the like,
- Diagonal reinforcements and reinforcing arrows as well as lintel corner angles at corners of recesses, e.g. openings, niches,
- corners, mitres, crossings, offsets and ends of decorative profiles,
- Closing anchorage openings, scaffolding anchor holes, openings and openings,
- Working on installations, pipes, protruding switch boxes,
- Fasteners, dowels.

1 Scope of application

1.1 ATV DIN 18345 "Thermal insulation composite systems" applies to thermal insulation composite systems and plastered external thermal insulation including the associated surface.

1.2 ATV DIN 18345 does not apply to:

- Rear-ventilated facades (see ATV DIN 18351 "Rear-ventilated façades").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18345 take precedence

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies: For the most common substances and components, the DIN standards and requirements are listed below.

2.1 External thermal insulation composite systems

DIN EN 13499	Thermal insulation materials for buildings — Exterior thermal insulation composite systems (ETICS) made of expanded polystyrene — Specification
DIN EN 13500	Thermal insulation materials for buildings — External external thermal insulation composite systems (ETICS) made of mineral wool — Specification

2.2 Insulation materials

DIN EN 13162	Thermal insulation products for buildings — Factory made mineral wool (MW) products — Specification
DIN EN 13163	Thermal insulation products for buildings — Factory-made expanded polystyrene (EPS) products — Specification
DIN EN 13164	Thermal Insulation Products for Buildings — Factory Made Extruded Polystyrene Foam (XPS) Products — Specification
DIN EN 13165	Thermal insulation products for buildings — Factory-made
DIN EN 13166	Thermal insulation products for buildings — Factory made phenolic resin foam (PF) products — Specification
DIN EN 13167	Thermal Insulation Products for Buildings — Factory Made Foam Glass (CG) Products — Specification
DIN EN 13168	Thermal insulation products for buildings — Factory made wood wool (WW) products — Specification
DIN EN 13169	Thermal Insulation Products for Buildings — Factory Manufactured Expanded Perlite (EPB) Products — Specification
DIN EN 13170	Thermal insulation products for buildings — Factory made expanded cork (ICB) products — Specification
DIN EN 13171	Thermal insulation products for buildings — Factory made wood fibre (WF) products — Specification

2.3 Mortars, plaster mortars, coating materials

DIN EN 998-1	Specifications for mortars in masonry construction — Part 1: Plaster mortars
DIN EN 1062-1	Coating materials — Coating materials and coating systems for outdoor mineral substrates and concrete — Part 1: Classification
DIN EN 15824	Specifications for Exterior and Interior Plasters with Organic Binders

2.4 Profiles

Profiles, e.g. edge profiles, end profiles, movement joint profiles, must be corrosion-resistant according to their intended use.

Profiles made of textile fabrics must be alkali-resistant.

3 Ausführung

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- unsuitable condition of the substrate, e.g. efflorescence, surfaces that are too smooth, surfaces that are unevenly absorbent, various substances of the substrate,
- unsuitable climatic conditions (see section 3.1.3),
- greater unevenness of the subsoil than permissible according to DIN 18202 "Tolerances in building construction — structures",
- insufficient anchoring and fastening options,
- lack of reference points.

3.1.2 Deviations from prescribed dimensions are permissible within the limits specified by DIN 18202.

Unevenness in the surfaces that becomes visible in grazing light is permissible if it does not exceed the limit values according to DIN 18202. If increased requirements are placed on flatness in accordance with DIN 18202:2013-04, Table 3, line 7, the required services are special services (see section 4.2.16).

3.1.3 In the event of unsuitable climatic conditions, e.g. excessive humidity, strong sunlight, unsuitable temperatures, special measures must be taken in consultation with the Client. If **services are required for this, these are special services (see section 4.2.6)**

3.1.4 Movement joints of the structure must be adopted structurally with the same possibility of movement.

3.2 Thermal insulation composite systems and plastered external thermal insulation

3.2.1 DIN 55699 "Application and processing of external thermal insulation composite systems (ETICS) with insulation materials made of expanded polystyrene rigid foam (EPS) or mineral wool (MW)" as well as the building regulations, e.g. approvals, apply to the processing of external thermal insulation composite systems.

3.2.2 The insulation boards must be laid tightly jointed in a bond and fastened with adhesive mortar and adapted to limiting components. 3.2.3 If the bonding of insulation boards alone is not sufficient for secure fastening, they must also be anchored. The required services are special services (see section 4.2.33).

3.2.4 In the case of substrates that are not suitable for adhesives, the insulation boards must only be attached mechanically. The required services are special services (see section 4.2.33).

3.2.5 A reinforcing plaster with fabric insert shall be applied to the insulation panels.

3.2.6 Diagonal reinforcements shall be installed in the case of openings, recesses and niches.

3.2.7 Surfaces

3.2.7.1 A top plaster must be applied to the reinforcing plaster. Thin-layer top coats are rubbed with a grain size of 3 mm, thick-layer top coats are to be designed as scratch plaster. DIN EN 13914-1 "Planning, preparation and execution of interior and exterior plasters — Part 1: Exterior plaster" or DIN 18550-1 "Planning, preparation and execution of interior and exterior plasters — Part 1: Supplementary specifications to DIN EN 13914 -1 for exterior plasters" and DIN 18558 "Synthetic resin plasters — Definitions, requirements, execution" apply.

3.2.7.2 Flat facing bricks, ceramic coverings, composite elements, decorative elements and the like shall be fixed to the reinforcing plaster

3.3 Formation of edges and profiles

Edges must be made with fabric angles or edge profiles. The installation of other profiles, e.g. plinth profiles, ventilation profiles, end profiles, plaster strips, boss profiles is a special service (section 4.2.25).

4 Ancillary services , Special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Erection, modification, and dismantling of scaffolding, as well as providing scaffolding for own services, provided that the area to be worked on is no higher than 3.50 meters above the standing surface of the required scaffolding.

4.1.2 Compensation of stepped or inclined standing surfaces of scaffolding up to 40 cm difference in height, e.g. via stairs or ramps.

4.1.3 Cleaning of the substrate, except for services according to section 4.2.9.

4.1.4 Submission of prefabricated surface and color samples.

4.1.5 Finishing and plastering work, except for services in accordance with section 4.2.26.

4.1.6 Protection of components from contamination and damage during work by loose covering, hanging or wrapping, except for protective measures under section 4.2.7.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 Vorhalten von Aufenthalts- und Lagerräumen, wenn der Auftraggeber Räume, die leicht verschließbar gemacht werden können, nicht zur Verfügung stellt.

4.2.2 Assembly, conversion and dismantling as well as provision of scaffolding for the services of other contractors.

4.2.3 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on or clad is higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.2.4 Erection, conversion and dismantling as well as provision of scaffolding with a stepped or inclined footprint, e.g. over stairs or ramps, if compensation of more than 40 cm is required.

4.2.5 Closing anchor holes for scaffolding anchoring.

4.2.6 Measures to protect against unsuitable climatic conditions in accordance with section 3.1.3, e.g. fine-meshed scaffolding net, enclosure, heating.

4.2.7 Special protection of building and plant components, e.g. masking of windows, doors, floors, coverings, stairs, wood, roof surfaces and finished surface parts, dust-proof masking of sensitive equipment and technical equipment, laying of hardboard or building protection films from 0.2 mm thick.

4.2.8 Removal of existing protective films and the like, e.g. on window sills, light metal profiles. Beuth-Ströhmann Steindesign GmbH-KdNr.9410286-LfNr.10177783001-2022-02-14 12:20

4.2.9 Cleaning the substrate of coarse soiling, e.g. mortar residues, paint residues, oil, insofar as these were not caused by the Contractor.

4.2.10 Pre-treatment of the substrate, e.g. by chipping, picking, roughening, high-pressure cleaning. Application of primers, consolidators, bonding bridges, removal of algae and fungal infestation, biocidal pre-treatment and the like.

4.2.11 Removal of obstacles in the subsoil, e.g. removal of concrete burrs, foam residues, anchoring brackets for bracket scaffolding that are no longer required

4.2.12 Making and attaching sample surfaces, sample constructions and models.

4.2.13 Provision of building physics verifications.

4.2.14 Preparation of installation and assembly plans.

4.2.15 Compensation of larger unevenness of the substrate than permissible according to DIN 18202. 4.2.16 Fulfilment of increased requirements for flatness or dimensional accuracy (see section 3.1.2).

4.2.17 Manufacture of top plasters in deviation from the execution according to section 3.2.7.1.

4.2.18 Execution of coloured plasters. Coating of the top plaster.

4.2.19 Services for protection against algae and fungal infestation.

4.2.20 Fitting and connecting to components and penetrations, e.g. anchors, rafters, windowsill brackets, covers.

4.2.21 Making recesses.

4.2.22 Closing and plastering of slots and recesses.

4.2.23 Installation of window sills, their brackets, covers, profiles and decorative profiles, as well as the manufacture of window and door frames, façades, plaster tapes, shadow gaps, embossing and the like.

4.2.24 Manufacture of corners, mitres, crossings, offsets and ends on decorative profiles and the like.

4.2.25 Installation of lintel corner brackets, prefabricated reveal plates, plinth profiles, ventilation profiles, end profiles, plaster strips, bossing profiles and the like.

4.2.26 Plastering and plastering work, insofar as it cannot be carried out in the course of the other insulation work on the façade on each side of the façade.

4.2.27 Cuts to adapt to slopes and curved or otherwise shaped components, as well as cutting out insulation boards for pipes laid on the ground.

4.2.28 Manufacture of auxiliary structures for fastening awnings, advertising media and the like, e.g. with assembly cylinders, as well as making anchors remaining in the structure, e.g. for scaffolding and the like

4.2.29 Manufacture of partitions, aprons and false beams, shelves, covers, pilaster strips and the like.

4.2.30 Manufacture of movement and apparent joints as well as joint seals.

4.2.31 Manufacture of fire barriers, fire bars and the like.

4.2.32 Services for fire, sound, heat, humidity and radiation protection, insofar as these go beyond the services referred to in Section 3.

4.2.33 Additional anchoring or mechanical fastening of insulation boards (see sections 3.2.3 and 3.2.4).

4.2.34 Sealing of the plaster against moisture in the area in contact with the ground, in the splash water area, installation of waterproofing below window sills and the like.

4.2.35 Removal and installation of e.g. fittings, switches, socket covers and the like, as well as gluing of sealing profiles.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

The determination of the performance — regardless of whether it is carried out according to drawings or measurements — is based on the dimensions of the finished thermal insulation composite systems and plastered external thermal insulation.

- plastered surfaces,
- occupied surfaces. The simplifying rules, such as overmeasurement rules and individual regulations,

are to be applied for the determination of performance.

5.2 Determination of dimensions/quantities

5.2.1 For external thermal insulation composite systems and plastered external thermal insulation, linings, dowels and pre-treatment of substrates, the dimensions of the finished plastered or covered surface shall apply.

5.2.2 The dimensions are determined on the basis of the largest component dimension, if any, e.g. in the case of wall connections, circumferential friezes, bezels, rafters and the like.

5.2.3 Rear surfaces of niches, even if they are formed by lower insulation thicknesses, as well as reveals are calculated separately with their dimensions, regardless of their individual size.

5.2.4 Directly connected, different types of recesses, e.g. opening with adjacent niche, are calculated separately.

5.2.5 If a recess is proportionately integrated into adjacent areas that are to be calculated separately, the respective proportional recess area is calculated to determine the overmeasurement variable.

5.2.6 Areas which cannot be determined by the use of simple mathematical formulas, e.g. for rectangles, triangles, trapezoids, rhombuses, are determined by dividing them into circumscribed rectangles, each with a width of 1 m.

5.3 Overmeasurement rules

When determining the dimensions for the overmeasurement, the smallest dimensions of the recess shall be taken as a basis. The following are measured:

5.3.1 When billed according to area

- recesses, e.g. openings, niches, fire barriers with a single size ≤ 2.5 m2,
- Interruptions in the area to be processed, e.g. due to supports, beams, templates, balcony slabs, landings, profiles, belts, friezes, frames, grooves, recesses, plaster tapes, fire bars with a single width ≤ 30 cm,
- joints, decorative profiles and decorative elements.

5.3.2 When billing according to length

- Interruption of individual lengths ≤ 1 m.

5.4 Individual regulations

5.4.1 Decorative profiles and decorative elements are calculated separately.

5.4.2 Mitres, crossings, offsets and endings as well as decorative cornices are calculated separately.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Concrete maintenance work — DIN 18349

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

Type, location, dimensions and design as well as dates of assembly and dismantling of on-site scaffolding.

0.2 Information on the execution

0.2.1 Type, nature and strength of the surfaces and components to be processed, as-is assessment in accordance with DAfStb concrete components, DAfStb guideline — Protection and repair of concrete components (Repair Directive) — Part 1: General regulations and planning principles; Part 2: Construction Products and Application; Part 3: Requirements for the establishments and supervision of execution; Part 4: Test methods)1) .

0.2.2 Repair concept, repair plan and stability relevance according to the Repair Directive.

0.2.2 Repair concept, repair plan and stability relevance according to the Repair Directive.

- Cause of the crack,
- crack width,
- crack width change during filling and in the filled state,
- moisture condition of the cracks and crack flanks,
- Fillability.

0.2.3 Surface preparation and associated post-treatment according to the repair guideline, e.g.:

- Chiseling,
- Milling,
- Flame blasting according to DIN 32539 "Flame blasting of steel and concrete surfaces",
- Sandblasting, specifying pressure and abrasive material.

Required surface roughness.

0.2.4 Type of reinforcement. Required surface preparation level after working on the reinforcement.

0.2.5 Type of corrosion protection for the reinforcement according to the repair guideline.

0.2.6 Type of repair concrete and repair mortars with associated system components according to the repair guideline.

0.2.7 Spraying method, type and properties of the sprayed concrete, SPCC, e.g., dry or wet spraying method, exposure class, maximum grain size of the mix, compressive strength and early strength, water penetration resistance, leachability.

0.2.8 Type, condition, and dimensions of the cracks, e.g.:
• Cause of the crack,
• Crack width,
• Change in crack width during filling and in the filled state,
• Moisture condition of the cracks and crack faces,
• Fillability.

0.2.9 Method of processing cracks and cavities with details of the respective fillers and their quantities, e.g.:

- Water
- Inject
- Sealing water-bearing cracks,
- limited tensile bonding,
- Force-fit filling,
- Post-processing of the component surfaces in the crack area,

- external sealing.

0.2.10 Number, type and dimensions of packers, one- or double-sided insulation.

0.2.11 Type of fillers for force-fit filling of cracks, e.g. epoxy resin, cement glue, cement suspension.

0.2.12 Number, type and dimensions of bonded reinforcements, e.g. CFRP fins, steel plates.

0.2.13 Roughness depth and requirements for surface protection systems.

0.2.14 Protection of building and plant components, furnishings and the like.

0.2.15 Number, type, location and dimensions of recesses and existing components.

0.2.16 Number, type and dimensions of sample areas.

0.2.17 Design of the surface structure.

0.2.18 Type of surface protection.

0.2.19 Special stresses, e.g. due to

- concrete-attacking waters, soils and gases,
- Pollutants
- mechanical stress, wear, thermal or dynamic stress.

0.2.20 Measures to maintain stability.

0.2.21 Monitoring by the executing company that deviates from the requirements of the Repair Directive.

0.2.22 Monitoring by a recognised monitoring body.

0.2.23 Collection, separation and disposal of rebound.

0.2.24 Requirements for systems for supply and disposal, ventilation, dust removal, dedusting taking into account local conditions.

0.2.25 Ventilation measures to ensure compliance with occupational health and safety depending on the spraying method selected in 0.2.7.

0.2.26 Special measures to protect people, e.g. residents, staff of other companies, during shotcrete work.

0.3 Details of deviations from the ATV

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 3.1.4 if tolerances other than those specified therein are to apply,

Section 3.2.1, if a different type of preparation is to be carried out,

Section 3.3.1,	if the rust removal of the exposed reinforcing steel is not to be carried out mechanically, but e.g. by means of high-pressure water jets,
Section 3.3.2	if the alkaline environment is to be restored, e.g. by: 1. Concrete 2. shotcrete or spray mortar, 3. SPCC,
Section 3.4.1	if reaction resin is to be used as an adhesive bridge,
Section 3.4.2	if reactive resin mortar (PC) is to be used to repair the concrete chips and damaged areas or to close the pores and cavities and to remove unevenness up to 2 mm of reactive resin mortar (PC) or plastic dispersion filler,
Section 3.5.3	if cement glue or cement suspension is to be used for force-fit filling of cracks.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units are to be provided as follows:

0.5.1 Area (m2), separated by type and dimensions, for

- Walls, ceilings, foundations, floor slabs, stair running plates, landings,
- localized defects, e.g. excavations of more than 1 m2 individual size, separated according to the greatest depth in each case,
- Covers, beams, columns, beams, templates, window and door lintels with more than 1.6 m in the unfolding,
- Processing of surfaces,
- Formwork
- Extensive covering and protective measures with foils, plates and the like,
- Enclosures,
- extensive dams.

0.5.2 Dimensions of length (m), separated by type and dimensions, for

- Covers, beams, columns, beams, templates, window and door lintels up to 1.6 m in development,
- Cornices, soffits, fascis,
- Trusses,
- steps and stringers,
- Forming edges, drip edges, chamfers for more than 1 m individual length,
- localized defects, e.g. excavations up to 0.1 m wide and over 1 m individual length, separated according to the greatest depth in each case,

- Formwork for slots, reprofiling, coves, brackets and the like, over 1 m individual length,
- Exposure of reinforcing steel over 1 m individual length, separated by diameter up to 16 mm and over 16 mm,
- corrosion protection of reinforcing steel over 1 m individual length,
- Shape
- Making joints,
- Filling of cracks, separated by process, purpose and type of fillers,
- Alignment of the component surface in the area of filled cracks with the adjacent concrete structure,
- Sealing the joints with joint tapes, injection hoses, joint profiles, joint fillings and the like.

0.5.3 Number (pcs), separated by type and dimensions, for

- Consoles
- localized defects, e.g. excavations over 0.1 m wide, separated according to the greatest depth and area size in each case,

  up to 0.01 m2,
  over 0.01 m2 to 0.05 m2,
  over 0.05 m2 to 0.10 m2,
  over 0.10 m2 to 0.25 m2,
  over 0.25 m2 to 0.50 m2,
  over 0.50 m2 to 0.75 m2,
  over 0.75 m2 to 1.00 m2,

- Exposure of reinforcing steel up to 0.5 m individual length,
- Exposing reinforcing steel over 0.5 m to 1 m individual length,
- Corrosion protection of reinforcing steel up to 1 m individual length,
- Formwork for slots, reprofiling, coves, brackets and the like, up to 1 m individual length,
- prefabricated moulded parts, e.g. corners and knots for joint tapes and profiles,
- Bonding of reinforcements, e.g. slats, steel plates,
- Preparing the concrete base for bonding reinforcements,
- covering measures on doors, windows, partition walls, awnings, railings and the like,
- Filling of recesses,
- anchoring anchors,
- Structural investigations, tests, e.g. testing of surface tensile strength,
- Removal of disturbing foreign bodies, e.g. binding wire, nails, plastic parts, wooden parts,
- Formwork for recesses,
- Packer
- Enclosures.

0.5.4 Mass (kg, t), separated by type and, where appropriate, dimensions, for

- Fillers
- Supply, cutting, bending and laying of reinforcements and position stabilizations,
- Built-in parts, reinforcement connections, dowel strips, anchor rails, connecting elements and the like.

1 Scope of application

1.1 ATV DIN 18349 "Concrete maintenance work" applies to work for the maintenance and repair of structures and components made of reinforced or unreinforced concrete as well as for the application of associated surface protection systems.

1.2 ATV DIN 18349 does not apply to

- the production of components made of reinforced or unreinforced concrete by spraying method (see ATV DIN 18314 "Shotcrete work"),
- the manufacture of concrete components (see ATV DIN 18331 "Concrete work") and
- the surface treatment of buildings and components (see ATV DIN 18363 "Painting and varnishing work — Coatings").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18349 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

2.1 For the most common substances and components, the DIN standards and other requirements are listed below.

DIN 1045-2:2008-08	Structures made of concrete, reinforced concrete and prestressed concrete — Part 2: Concrete — Specification, properties, manufacture and conformity — Rules of application of DIN EN 206-1
DIN 18551	Shotcrete — National application rules for the DIN EN 14487 series and rules for the design of shotcrete structures
DIN EN 206-1:2001-07	Concrete — Part 1: Specification, properties, manufacture and conformity; German version EN 206-1:2000
DIN EN 934 (all parts)	Admixtures for concrete, mortar and grout

DIN EN 13395 (all parts)	Products and systems for the protection and repair of concrete structures — Test methods; Determination of processability

DAfStb Concrete Components, DAfStb Directive — Protection and Repair of Concrete Components (Repair Directive) — Part 1: General Regulations and Planning Principles; Part 2: Construction Products and Application; Part 3: Requirements for the establishments and supervision of execution; Part 4: Test methods)1)

DAfStb Grouting Concrete and Grouting Mortar, DAfStb Directive — Production and Use of Cementitious Grouting Concrete and Grouting Mortar1)

2.2 Materials for reinforcing concrete components by bonding steel plates, CFRP fins and CFRP fabrics must comply with the provisions of their approval.

2.3 Materials for concrete repair must be alkali-resistant.

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 The following shall apply to the execution:

- DAfStb Concrete Components (Repair Directive)1)
- DAfStb grouting concrete and grouting mortar1) ,
- DIN EN 14487 (all parts) "Shotcrete" in conjunction with DIN 18551 "Shotcrete — National rules of application for the DIN EN 14487 series and rules for the design of shotcrete structures",
- DIN EN 13670 "Execution of concrete structures" in conjunction with DIN 1045-3 "Structures of concrete, reinforced concrete and prestressed concrete — Part 3: Construction — Rules of application for DIN EN 13670",
- Approvals for reinforcing concrete components by bonding steel plates, CFRP fins and CFRP fabrics.

3.1.2 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- recognisable threat to stability,
- Deviations in the type or extent of the damage from the description of the actual situation,
- deviating quality of the concrete substrate from the specified actual state,
- Deviations of the portfolio from the specifications,
- inappropriate predetermined preparation procedures,
- unsuitable climatic conditions,
- unsuitable external conditions, e.g. physical or chemical stresses.

3.1.3 In the event of unsuitable climatic conditions, e.g. temperatures below 5 °C when using cementitious building materials, special measures must be taken in consultation with the client. If services are required for this, these are special services (see section 4.2.7).

3.1.4 Deviations from prescribed dimensions shall be permitted in the

DIN 18202 Tolerances in Building Construction — Structures

certain limits.

If the increased requirements of DIN 18202 or beyond are placed on the flatness of surfaces, the required services are special services (see section 4.2.1).

3.2 Preparing the concrete substrate

3.2.1 Concrete that is not sufficiently solid or defective in the surface as well as separating substances must be removed by blasting. Horizontal surfaces or surfaces inclined up to 15% should be prepared by shot blasting, other surfaces should be prepared by vapour blasting. The mean surface tensile strength must be at least 1.5 N/mm2 for strength classes greater than or equal to C 20/25. If the nominal strength of the concrete is lower, it must not be less than 1.1 N/mm2. If the above-mentioned values of surface tensile strength are not achieved after blasting at a removal depth of 2 mm, special services must be agreed. These services are special services (see section 4.2.1).

3.2.2 The dimensions and profile of the substrate may not be changed by the preparatory work more than as a result of the process. Prepared substrate ist vor Bewitterung, Staub und losen Teilen zu schützen und vor dem Aufbringen einer nachfolgenden Lage oder Schicht zu säubern, z. B. durch Absaugen.

3.3 Treatment of steel in concrete

3.3.1 Exposed or exposed steel must be rusted in accordance with the system. Only mechanical processes may be used. DIN EN ISO 12944-4 "Coating materials — Corrosion protection of steel structures by coating systems — Part 4: Types of surfaces and surface preparation" must be observed mutatis mutandis. The required degree of surface preparation of the reinforcement depends on the repair principle. At the tie-in points, the steel must be exposed at least 20 mm in the non-corroded area. The outcrop banks are to be carved out at an angle between 30° and 60°. The concrete must be removed to the extent that it has cracked or loosened as a result of corrosion of the reinforcement. The concrete must be removed to such an extent that it is possible to insert the repair mortar or concrete without cavities. Exposed steel inserts must be fastened without vibration.

3.3.2 Steel surfaces must be rusted to the surface preparation degree Sa 2 1/2 in accordance with DIN EN ISO 12944-4.

Reinforcing steel must be protected against corrosion by plastic-modified cement slurries.

3.4 Concrete repair

3.4.1 Adhesive bridges shall be applied on the basis of cement mortar with a plastic additive (PCC) to the extent required by the system.

3.4.2 Pores and cavities shall be closed with mortar based on PCC by scraping fillers. If full-surface filling is planned to remove unevenness up to 2 mm, this must be carried out with mortars based on PCC. Concrete chips, damaged areas and unevenness over 2 mm must be repaired with PCC.

3.4.3 When using SPCC (Sprayable Polymer Cement Concrete — SPCC), the spray application must be carried out using the wet spraying process.

3.4.4 Sprayed surfaces must be left rough, while peeled surfaces remain rough in formwork.

3.4.5 Agreed application thicknesses for spray application are minimum thicknesses

3.4.6 Coatings for surface protection of concrete surfaces that cannot be walked on or driven on must have a low crack bridging capacity in accordance with the Repair Directive1) Surface protection system OS 5a (OS D II). Coatings as surface protection of concrete surfaces that can be walked on and driven on must have increased dynamic crack bridging capability in accordance with the Repair Directive Surface Protection System OS 11 (OS F).

3.4.7 The final coating shall be in a light grey tone.

3.5 Filling of cracks and cavities

3.5.1 If cracks are closed by soaking, they shall be filled with epoxy resin EP-T to a depth of 5 mm or 15 times the crack width. The greater value is decisive. Only cracks in the plan view of approximately horizontal surfaces with crack widths greater than or equal to 0.2 mm may be impregnated.

3.5.2 For the limited elongation bonding of crack flanks, polyurethane resin PUR-I with 5 % elasticity shall be injected. The minimum crack width must be 0.3 mm, and the filling degree must be at least 80%.

3.5.3 The force-fit filling of cracks must be carried out using epoxy resin EP-I. The minimum crack width must be 0.1 mm, and the filling degree must be at least 80%. The crack flanks must be dry and free of adhesion-impairing impurities.

3.5.4 Pressureless water-bearing cracks must be sealed using polyurethane resin PUR-I from crack widths of more than 0.3 mm. Pressurized water-bearing cracks must be injected with polyurethane foam (SPUR) in advance on the water inlet side to seal the water-absorbing crack sections.

3.5.5 The filling of cavities with continuity in the concrete structure must be carried out by means of cement suspension ZS-I, the filling degree must be at least 80 %.

3.6 Joint sealing with elastic joint tapes

3.6.1 Joints whose width does not comply with the requirements of DIN 18540 "Sealing of exterior wall joints in building construction with joint sealants" must be sealed with elastic joint tapes. Permanent rear ventilation must be ensured.

If the surface tensile strength in the area of the bonded surface is less than 1.5 N/mm2, special services must be agreed. These services are special services (see section 4.2.1).

3.6.2 For joints in the area in contact with the ground, the following must be observed:

DIN 18531 (all parts)	Waterproofing of roofs as well as balconies, loggias and pergolas
DIN 18532 (all parts)	Waterproofing of drivable traffic areas made of concrete
DIN 18533 (all parts)	Sealing of components in contact with the ground
DIN 18534 (all parts)	Waterproofing of interiors
DIN 18535 (all parts)	Sealing of tanks and basins

The corresponding waterproofing must be carried out in accordance with ATV DIN 18336 "Waterproofing work".

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Determination of the condition of roads and terrain surfaces, green spaces, receiving waters and the like in accordance with § 3 para. 4 VOB/B.

4.1.2 Services to prove the quality of the materials and components as well as the conformity of the shotcrete in accordance with DIN 18551, with the exception of services in accordance with section 4.2.22.

4.1.3 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on or clad is not higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.1.4 Compensation of stepped or inclined standing surfaces of scaffolding up to 40 cm difference in height, e.g. via stairs or ramps.

4.1.5 Production of sample surfaces for the final coating up to 2% of the area to be coated, but no more than 3 sample surfaces with a maximum of 1.5 m2 of individual size.

4.1.6 Removal of excess grouting material and damping.

4.1.7 Monitoring by the executing company in accordance with the Repair Directive.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 Benefits under Sections 3.1.4, 3.2.1 and 3.6.1.

4.2.2 Special protection of building and plant components as well as furnishings, e.g. masking of windows, doors, floors, coverings, stairs, wood, roof surfaces, surface-finished parts, dust-proof masking of sensitive equipment and technical equipment, dust protection walls, emergency roofs, laying of hardboard or building protection films from a thickness of 0.2 mm; furthermore, the use of extraction systems, use of filter systems, diversions of water.

4.2.3 Provision of recreation and storage rooms if the Client does not provide rooms that can be easily locked.

4.2.4 Assembly, conversion and dismantling as well as provision of scaffolding for the services of other contractors.

4.2.5 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on or clad is higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.2.6 Assembly, conversion and dismantling as well as provision of scaffolding with a stepped or inclined footprint, e.g. via stairs or ramps, if compensation of more than 40 cm is required.

4.2.7 Protection against unsuitable climatic conditions (see section 3.1.3), insofar as the Client demands further work, e.g. by enclosure, heating.

4.2.8 Soil and water investigations as well as chemical analyses.

4.2.9 Special measures to determine the condition of the receiving waters, e.g. video recordings.

4.2.10 Special services to prove the quality of the materials and components as well as the monitoring of stability-relevant measures in accordance with the Repair Directive by recognised testing bodies.

4.2.11 Preparation of damage documentation.

4.2.12 Cleaning the substrate of coarse soiling, e.g. plaster residues, mortar residues, paint residues, oil, insofar as this was not caused by the Contractor.

4.2.13 Removal and disposal of process-related mixtures and waste from the Client's area, e.g. during blasting work.

4.2.14 Removal of disturbing foreign bodies from the concrete, e.g. binding wire, nails, plastic parts, wooden parts.

4.2.15 Special measures for drying components or reducing humidity, e.g. by heating.

4.2.16 Additional subsurface pre-treatment measures, e.g. sanding off non-load-bearing concrete layers, removing coatings, removing impregnation as well as repairing edge chipping and lining of exposed concrete surfaces.

4.2.17 Manufacture of movement and false joints as well as joint seals.

4.2.18 Formation of grooves, edges and water drip edges.

4.2.19 Pre-wetting of dry cracks for filling with polyurethane resin.

4.2.20 Special protective measures against harmful influences, e.g. from chemical stress, external vibration.

4.2.21 Cleaning work insofar as it goes beyond the services according to ATV DIN 18299, Section 4.1.11, e.g. window cleaning, cleaning of light metal facades or fixtures.

4.2.22 Monitoring by a recognised monitoring body, insofar as initiated by the Client.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

5.1.1 The determination of the service – regardless of whether it is carried out according to drawings or measurements – shall be based on the dimensions of the treated area. The simplifying rules, such as over-measurement rules and individual regulations, are to be used to determine performance.

5.2 Determination of dimensions/quantities

5.2.1 The wall heights of vaulted rooms are calculated up to the vault section, the wall height of the shield walls up to 2/3 of the vault stitch.

5.2.2 When determining the area of vaulted ceilings with a stitch height of less than 1/6 of the span, the area of the covered space is calculated. Vaults with a larger piercing height are calculated according to the area of the unfolded soffit.

5.2.3 If columns are integrated into beams or beams, the beams and beams shall be measured if they are wider than the columns. In this case, the supports are calculated up to the underside beam or beam.

5.2.4 In the case of uneven thickness of excavations and layers, the greatest machining depth shall be determined by comparing profiles before and after execution.

5.2.5 Directly connected different types of recesses, e.g. opening with adjacent niche, are calculated separately.

5.2.6 Stair stringers are calculated in their greatest width.

5.2.7 Reprofiling of edges is calculated separately in the processing.

5.2.8 Excavation of reinforcing steel, excavations and restoration of the surface are calculated according to the largest dimensions.

5.2.9 When calculating individual areas of any shape, the smallest circumscribed rectangle shall be used as a basis for determining the dimensions. Excluded from this rule are circles, triangles, trapezoids and diamonds.

5.2.10 If the formwork is billed according to surface area, the smallest circumscribed rectangle shall be taken as a basis.

5.2.11 Protective covers are calculated in their settlement when billing according to the area dimension.

5.2.12 The pre-treatment and corrosion protection of the reinforcing steel are each calculated separately.

5.2.13 Delivery, cutting, bending and installation of reinforcing steel shall be charged separately. The calculated mass is decisive. For standardised steels, the information in the DIN standards applies, for other steels the information in the manufacturer's profile book.

5.2.14 Binding wire, rolling tolerances and offcuts are not taken into account when determining the billing masses.

5.2.15 Joint tapes and joint profiles are calculated in their greatest length, e.g. in the case of bevel cuts, mitres.

5.2.16 Additional or reduced consumption of fillers is calculated separately.

5.2.17 Alignment of the sealed cracks with the concrete structure is calculated separately according to the crack length.

5.2.18 When accounting for flat dams according to area measurements, the smallest circumscribed rectangle is to be used. Excluded from this rule are circles, triangles, trapezoids and diamonds.

5.3 Overmeasurement rules

The following are measured:

5.3.1 When billed according to area

- Fugues
- recesses, e.g. openings, niches with individual sizes ≤ 2.5 m2,
- Interruptions in the treated area by components, e.g. columns, beams, templates, with individual widths ≤ 30 cm.

5.3.2 When billing according to length

- Interruptions with individual lengths ≤ 1 m.

5.4 Individual provisions

No regulations.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Plastering and stucco work —

DIN 18350 Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind, section 0". Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

Type, location, dimensions and design as well as dates of assembly and dismantling of on-site scaffolding.

0.2 Information on the execution

0.2.1 Type, location, texture and strength of the surfaces to be processed, e.g. concrete, masonry.

0.2.2 Type and scope of the installation or assembly plans to be supplied by the Contractor.

0.2.3 Type, position, dimensions and design of movement, structure and component joints.

0.2.4 Protection of components or installations, finished components, furnishings and the like.

0.2.5 Special physical and chemical stresses to which substances and components are exposed after installation, e.g. aggressive vapours, shock loads, moisture.

0.2.6 Requirements for fire, sound, heat, humidity and radiation protection as well as airtightness.

0.2.7 Type of clothing, thickness, dimensions of the individual parts and their fastening. Type, dimensions and design of recesses for ventilated structures and their cover, e.g. for ventilation openings.

0.2.8 Type, number, dimensions and design of connections and terminations to adjacent components, e.g. with profiles, separation joints, separation strips, separation cuts.

0.2.9 Number, type, location, dimensions and nature of sloped, curved or otherwise shaped surfaces.

0.2.10 Number, type, location and dimensions of samples, e.g. surface and colour samples, sample areas.

0.2.11 Design and division of surfaces, grid and joint formations, surface structures, colours, colour gradations, transitions between differently structured surfaces, embossing. Specifications for surface treatment.

0.2.12 Type and colour of joint sealants, joint covers and joint deposits.

0.2.13 Type and extent of corrosion protection of substructures, profiles and the like.

0.2.14 Pre-treatment of the plaster primer, e.g. cleaning, high-pressure cleaning, removal of algae and fungal infestation, roughening, picking, knocking off old substrates, consolidation of the plaster primer, application of a spray grout, application of an adhesive bridge, pre-treatment of highly absorbent plaster substrates, and application of biocides.

0.2.15 Installation of plaster reinforcements to span the transitions of different materials and components, e.g. transitions from insulated surfaces to concrete and masonry surfaces and additional reinforcement at openings, e.g. diagonal reinforcement.

0.2.16 Information on edge formation with or without edge profiles.

0.2.17 Type, location and dimensions of edge profiles, plaster separation rails, plinth profiles, edge angles, ventilation profiles, end profiles, plaster strips, fabric angles, shadow profiles, boss profiles and the like.

0.2.18 Specifications for the execution of increased requirements for flatness or dimensional accuracy.

0.2.19 Intended use of the plaster, type, location, thickness and requirements of intended coverings, coatings or cladding on the plaster executed.

0.2.20 Advance and subsequent construction of surfaces behind installations, e.g. surfaces behind radiators, pipelines and the like.

0.2.21 Number, type, location, dimensions and mass of installation and installation components.

0.2.22 Type, thickness and properties of the insulation materials and their fastening. Type, thickness and properties of the plaster, e.g. single or multi-layer plaster, thermal insulation plaster, type of binder, surface structure, grain size of the top plaster.

0.2.23 Surface quality of interior plaster, e.g. according to DIN 18550-1 "Planning, preparation and execution of exterior and interior plasters — Part 2: Supplementary specifications to DIN EN 13914-2:2016-09 for interior plasters" or DIN EN 13914-2 "Planning, preparation and execution of interior and exterior plasters — Part 2: Interior plasters.

0.2.24 Levelling paint for coloured plasters.

0.2.25 Algaecides and fungicidal adjustment of plaster and coating.

0.2.26 Number, type, position, dimensions of recesses to be made or closed.

0.2.27 Type, dimensions of plaster waterproofing against moisture, e.g. in the area in contact with the ground, in the splash water area, below window sills and the like.

0.2.28 Type, location, dimensions of protection against moisture of cantilevered plaster-containing mortar on the outside.

0.2.29 Manufacture of covers, shelves, partitions, openings, friezes, pilaster strips, grooves, aprons, sheaths, beams, recesses, templates, shelves, covers and the like.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 3.1.2 if tolerances other than those listed there are to apply.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units are to be provided as follows:

0.5.1 Area (m2), separated by type and dimensions, for

- Wall and ceiling plaster inside and outside, separated according to the type of plaster, flat, inclined, curved or otherwise shaped surfaces,
- Columns, beams, sheathing and the like with a width > 1 m per visible area,
- Reveals with a width > 1 m,
- smoothing plasters, fillers and pieced surfaces,
- Extensive pre-treatments,
- Compensation of uneven substrates, linings, additional plaster thicknesses of 5 mm each,
- Chipping, picking, roughening, high-pressure cleaning, consolidation of old substrate surfaces,
- Wire plaster walls and wire plaster ceilings,
- Flat reinforcements and plaster substrates,
- Insulation layers on ceilings and walls,
- wall coverings,
- facing shells, facing masonry to be sprayed,

- Substructures
- Foils, vapour retarders and the like.

0.5.2 Dimensions of length (m), separated by type and dimensions, for

- Reveals with a width ≤ 1 m,
- aprons, partitions, shelves, covers and the like with a width ≤ 1 m on each side,
- piers, pilaster strips, columns, beams, steps, sheathing and the like with a width ≤ 1 m per visible area,
- Closing of joints in precast concrete elements up to a total processing width of 20 cm,
- Cuts of insulating materials, plaster carrier boards, e.g. oblique, bent or otherwise shaped,
- plaster on belts, cornices and throats as well as curves,
- plaster connections and plaster finishes,
- stucco profiles, friezes, façades, plaster tapes, shadow gaps and the like,
- window sills, window and door frames,
- Substructures for components ≤ a visible area of 1 m, e.g. in the area of soffits, pillars, pilaster strips, columns and beams,
- auxiliary constructions in the area of ceilings and walls to accommodate installation parts, lighting fixtures and the like,
- Cut-outs for pipes in insulation layers and plaster carrier boards,
- Edge profiles, plinth profiles, edge angles, ventilation profiles, end profiles, plaster strips, mesh angles, shadow profiles, boss profiles and the like, as well as edge formation without profiles, connections to other components, connection, movement and building separation joints, joint sealing tapes, crack bridging,
- Strip reinforcements and strip plaster beams ≤ 1 m wide,
- plaster work on windows, doors, stair and landing stringers, built-in parts, slots,
- strip plaster and the like ≤ 1 m single width,
- sealing tapes, sealing profiles, spraying,
- Foils, vapour retarders ≤ 1 m wide,
- Waterproofing of plaster surfaces in contact with the ground and plinth surfaces ≤ a height of 1 m,
- Waterproofing under window sills.

0.5.3 Number (pcs), separated by type and dimensions, for

- Pre-treatment and plastering of limited areas up to 2.5 m2, differentiated according to individual sizes, e.g.
  - ≤ 0,02 m2,
  - > 0,02 m2 ≤ 0,10 m2,
  - > 0,10 m2 ≤ 0,25 m2,
  - > 0,25 m2 ≤ 0,50 m2,
  - > 0,50 m2 ≤ 1,00 m2,
  - > 1,00 m2 ≤ 1,50 m2,
  - > 1,50 m2 ≤ 2,50 m2,
- Production of recesses for individual luminaires, Continuous rooflights, skylights, ventilation grilles, air outlets, inspection openings, supports, pillar templates, switches, sockets, pipe penetrations, cables, installation parts and the like,

- Installation of auxiliary structures or mounting cylinders for individual luminaires, awnings, window sills, advertising media, continuous rooflights, skylights, air outlets, inspection openings, installation parts and the like,
- Diagonal reinforcement at the corners of openings, recesses and niches,
- Rosettes, ornaments, consoles and the like,
- corners, mitres, crossings, offsets and ends of stucco profiles, cornices and grooves,
- Plastering of chimney heads, consoles and the like,
- Closing anchorage openings, e.g. in scaffolding,
- Closing and plastering of openings and openings,
- Working on installations, pipes, protruding switch boxes

1 Scope of application

1.1 ATV DIN 18350 "Plastering and stucco work" applies to the production of plaster, stucco and thermal insulation plaster.

1.2 In addition, ATV DIN 18299 "General regulations for construction work of any kind", sections 1 to 5 shall apply. In the event of contradictions, the regulations of ATV DIN 18350 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

For the most common substances and components, the DIN standards and other requirements are listed below.

2.1 Plasters

DIN EN 15824	Specifications for Exterior and Interior Plasters with Organic Binders
DIN EN 998-1	Specifications for mortars in masonry construction — Part 1: Plaster mortars
DIN EN 13279-1	Gypsum trusses and gypsum dry-mix mortars — Part 1: Definitions and requirements 2.2 Structural mortars
DIN EN 998-1	Specifications for mortars in masonry construction — Part 1: Plaster mortars
DIN EN 998-2	Specifications for Mortars in Masonry Construction — Part 2: Masonry Mortar 2.3 Plaster Beams, Plaster Reinforcements, Fasteners
DIN 488-4	Reinforcing steel — Reinforcing steel meshes
DIN EN 13658-1	Metal plaster substrates and plaster profiles — Definitions, requirements and test methods — Part 1: Interior plasters
DIN EN 13658-2	Metal plaster substrates and plaster profiles — Definitions, requirements and test methods — Part 2: Exterior plasters

2.4 Insulation materials

DIN EN 13162	Thermal insulation products for buildings — Factory made mineral wool (MW) products — Specification
DIN EN 13163	Thermal insulation products for buildings — Factory-made expanded polystyrene (EPS) products — Specification
DIN EN 13164	Thermal Insulation Products for Buildings — Factory Made Extruded Polystyrene Foam (XPS) Products — Specification
DIN EN 13165	Thermal insulation products for buildings — Factory made rigid polyurethane foam (PU) products — Specification
DIN EN 13166	Thermal insulation products for buildings — Factory made phenolic resin foam (PF) products — Specification
DIN EN 13167	Thermal Insulation Products for Buildings — Factory Made Foam Glass (CG) Products — Specification
DIN EN 13168	Thermal insulation products for buildings — Factory made wood wool (WW) products — Specification
DIN EN 13169	Thermal Insulation Products for Buildings — Factory Manufactured Expanded Perlite (EPB) Products — Specification
DIN EN 13170	Thermal insulation products for buildings — Factory made expanded cork (ICB) products — Specification
DIN EN 13171	Thermal insulation products for buildings — Factory made wood fibre (WF) products — Specification

2.5 Substructures, connecting and anchoring elements

DIN EN 10025-1	Hot-rolled products of structural steels — Part 1: General technical delivery conditions
DIN EN 10025-2	Hot-rolled structural steel products — Part 2: Technical conditions of delivery for unalloyed structural steels
DIN EN 10088-2	Stainless steels — Part 2: Technical delivery conditions for sheet and strip of corrosion-resistant steels for general use
DIN EN 10088-3	Stainless steels — Part 3: Technical conditions for delivery of semi-finished products, bars, wire rod, drawn wire, sections and bright steel products of corrosion-resistant steels for general use 2.6 Profiles
DIN EN 13658-1	Metal plaster substrates and plaster profiles — Definitions, requirements and test methods — Part 1: Interior plasters
DIN EN 13658-2	Metal plaster substrates and plaster profiles — Definitions, requirements and test methods — Part 2: Exterior plasters

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- unsuitable condition of the substrate, e.g. in the case of efflorescence, surfaces that are too smooth, unevenly absorbent, various substances of the substrate,
- insufficient component temperature, e.g. for plastering work at temperatures below +5 °C (see section 3.1.3),
- greater unevenness of the subsoil than permissible according to DIN 18202 "Tolerances in building construction — Structures",
- too much building moisture,
- unsuitable climatic conditions (see section 3.1.3);
- insufficient anchoring and fastening options,
- lack of reference points.

3.1.2 Deviations from prescribed dimensions are permissible within the limits specified by DIN 18202. Unevenness in the surfaces that becomes visible in grazing light is permissible if it does not exceed the limit values according to DIN 18202. If increased requirements are placed on flatness in accordance with DIN 18202:2013-04, Table 3, line 7, the required services are special services (see section 4.2.23).

3.1.3 In the event of unsuitable conditions, insufficient component temperature, e.g. for plastering work temperatures below +5 °C, in consultation with the Client, besondere take action. If services are required for this, these are special services (see section 4.2.9).

3.1.4 Movement joints of the structure must be adopted structurally with the same possibility of movement.

3.1.5 Profiles

Profiles, e.g. edge profiles, end profiles, movement joint profiles, edge angles, edging profiles, must be galvanized or corrosion-resistant according to the intended use. Profiles made of textile fabrics must be alkali-resistant.

3.1.6 Plaster substrate

Wire mesh, ribbed expanded metal and the like must be galvanized or corrosion-resistant, and welded steel mesh and the like must be free of loose rust. Textile fabrics must be alkali-resistant when using lime, lime-cement or cement mortar. Nails, staples and other fasteners must be corrosion-resistant when used in damp rooms and for work with plaster.

3.2 Plasters

3.2.1 Mortar plasters with mineral binders with or without additives are to be used in accordance with DIN 18550-1 "Planning, preparation and execution of interior and exterior plasters — Part 1: Supplementary specifications to DIN EN 13914-1:2016-09 for exterior plasters" and DIN 18550-2 "Planning, preparation and execution of interior and exterior plasters — Part 2: Supplementary requirements to DIN EN 13914-2:2016-09 for interior plasters" or DIN EN 13914-1 "Planning, preparation and execution of interior and exterior

plasters" or DIN EN 13914-1 "Planning, preparation and execution of interior and exterior plasters" Preparation and execution of exterior and interior plasters — Part 1: Exterior plasters" and DIN EN 13914-2 "Design, preparation and execution of interior and exterior plasters — Part 2: Interior plasters". Synthetic resin plasters are to be produced in accordance with DIN 18558 "Synthetic resin plasters — Terms, requirements, execution".

3.2.2 Interior plasters must be manufactured in quality level Q 2 – smoothed or quality level Q 2 – felted in accordance with DIN 18550-2 or DIN EN 13914-2.

3.2.3 Additional services are required for plasters of quality level Q 3 – smoothed or felted and quality level Q 4 – smoothed or felted in accordance with DIN 18550-2. These are special services (see section 4.2.25).

3.2.4 Exterior plasters must be produced in two layers with a base and a top coat. Thin-layered finishing plasters are to be produced as textured plasters with a grain size of 3 mm. Thin-layered finishing plasters with different grain sizes require additional measures. The required services are special services (see section 4.2.26). Thick-layered top plasters are to be produced as scratch plaster. In exterior plasters, diagonal reinforcements must be installed at openings, recesses and niches.

3.2.5 Old plasters that show cracks, damaged areas and the like must be reworked with a reinforcing plaster with fabric insert as an additional layer of plaster. In the case of partial plaster repairs, transitions can remain visible.

3.3 Making and repairing stone plaster surfaces

Cantilevered partial surfaces are to be created by installing a corrosion-protected substructure. After the plaster has been applied and the plaster has set, the surface to thicken or scrape. Damaged areas that need to be repaired must be filled with mortar of the same type. The surface must be adapted to the existing stone plaster surface or profile.

3.4 Sgraffito

The desired representation is to be recorded or broken off on several coloured plaster layers applied on top of each other. The specified contours are to be cut and scraped out to the desired coloured plaster layer.

3.5 Components made of wire plaster

Components made of wire plaster are to be manufactured in accordance with DIN 4121 "Hanging wire plaster ceilings — plaster ceilings with metal plaster substrates, Rabitz ceilings — Requirements for execution". Section 3.2.2 applies to the execution of the surfaces.

3.6 Pieces

3.6.1 Drawn and Prefabricated Stucco

Drawn profiles with a piece thickness of more than 5 cm must be produced on a corrosion-protected substructure. Stucco parts to be prefabricated with a stucco thickness of more than 5 cm must be manufactured with corrosion-protected reinforcement. They must be applied and fastened with mortar of the same type, e.g. corrosion-protected fasteners. Required substructures are special services. Shaped, prefabricated and drawn stucco parts for exterior surfaces shall be made with mortar of the contractor's choice. In the case of cantilevered stucco parts in the exterior, the tops must be protected. These services are

special services. Stucco made of gypsum-containing mortar in the outdoor area must be protected from moisture. These services are special services.

3.6.2 Piece application work

The stucco mortar used for application work shall be produced at the Contractor's choice.

Section 3.6.1 applies to substructures, reinforcements and stucco parts in outdoor areas.

3.6.3 Applied stucco marble

The dry and carefully cleaned substrate must be wetted and provided with a spray of gypsum mortar mixed with glue water, which is not too thin. The substrate (marble ground) is to be made with a rough surface 2 cm to 3 cm thick from suitable stucco plaster with the addition of glue water and pure sharp sand and, if necessary, roughened by combing. The completely dried out marble ground must be wetted with water. The stucco marble must be made of stucco plaster with the addition of lightfast and lime-fast colour pigments, applied, filled and sanded several times in alternation until the required matt or polished closed surface is achieved. The surface must be polished after drying and must correspond in structure and colour to the marble to be imitated.

3.6.4 Molded stucco marble

After being exposed from the negative mould, moulded pieces and profiles made of stucco marble must be trimmed appropriately in their decorations, filled and smoothed alternately several times. schleifen und in der vorgeschriebenen Form und Oberfläche, matt oder polished. Necessary metal inserts must be corrosion-protected. Fittings and profiles must be anchored with mortar of the same type and/or with corrosion-protected fasteners. The surface must be re-sanded if necessary and polished after drying.

3.6.5 Stuccolustre

A multi-layered 2 cm to 3 cm thick, rough plaster made of long-stored, fatty limestone and coarse-grained, pure sand should be applied to prepared substrate. If the substrate is evenly absorbent, up to 20% of the gypsum binder may be added to the mortar. Cement must not be processed. In the case of unevenly absorbent substrates, pure lime mortar should be used. Apply a layer of slightly finer lime mortar about 1 cm thick to the completely dry plaster and rub it completely smooth. As a third layer, a fine plaster layer of finely sieved lime, marble powder and dye of the intended base tone is to be applied and rubbed completely smooth.

It is to be rubbed over with an even finer marble mortar. Smoothing can be used to create a completely closed, smooth painting surface. Finally, apply the stucco paint and iron and wax with warmed steel.

3.7 Smoothing technology

If a smooth, shiny, decorative surface is to be achieved, the surface must be smoothed, filled, compacted and sanded several times.

3.8 Formation of edges and profiles

Edges must be produced with edge profiles. The installation of other profiles, e.g. plinth profiles, edge brackets, ventilation profiles, end profiles, plaster strips, fabric angles, shadow profiles, boss profiles and the like, is a special service (see section 4.2.19).

3.9 Plastered interior insulation

Insulation materials must be laid tightly jointed over the entire surface and glued to the substrate. A fabric must be embedded in the plaster over the entire surface.

3.10 Plastered interior wall coverings

Interior wall cladding, e.g. with calcium silicate boards, must be laid and plastered in a mortar bed.

3.11 Exterior wall cladding with plaster carrier boards

Rear-ventilated exterior wall cladding must be manufactured in accordance with DIN 18516-1 "Exterior wall cladding, rear-ventilated — Part 1: Requirements, test principles".

3.12 Thermal insulation plaster systems

Thermal insulation plaster systems must be manufactured with thermal insulation plaster and top plaster. Thermal insulation plaster can be produced in a single layer up to a thickness of 4 cm, and in several layers for larger thicknesses. Top plaster must be made in two layers. The first layer is to be produced as an intermediate plaster, fibre-reinforced or with a full-surface fabric insert. At corners of recesses, e.g. openings, niches, additional diagonal reinforcements must be installed. The second layer of plaster is to be produced as a structured rubbed top plaster. Scratch plaster as a top plaster must be produced without intermediate plaster.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on or clad is not higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.1.2 Compensation of stepped or inclined standing surfaces of scaffolding up to 40 cm difference in height, e.g. via stairs or ramps.

4.1.3 Cleaning of the substrate, except for services according to section 4.2.12.

4.1.4 Keeping the plaster surfaces moist until the rooms have set and ventilated, except for measures under section 4.2.9.

4.1.5 Preparation of the mortar and provision of all necessary equipment, even if the Client provides the materials.

4.1.6 Submission of prefabricated surface and color samples.

4.1.7 Plastering and plastering work, except for work in accordance with section 4.2.35.

4.1.8 Protection of building and plant components against contamination and damage during plastering work by loosely covering, hanging or wrapping, except for protective measures according to section 4.2.10.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 Providing evidence of building physics.

4.2.2 Preparation of installation and assembly plans.

4.2.3 Manufacture and attachment of sample surfaces, sample constructions and models.

4.2.4 Provision of recreation and storage rooms if the Client does not provide rooms that can be easily locked.

4.2.5 Assembly, conversion and dismantling as well as provision of scaffolding for the services of other entrepreneurs.

4.2.6 Erection, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on or clad is higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.2.7 Erection, conversion and dismantling as well as provision of scaffolding with a stepped or inclined footprint, e.g. over stairs or ramps, if compensation of more than 40 cm is required.

4.2.8 Closing anchor holes for scaffolding anchoring.

4.2.9 Measures to protect against unsuitable climatic conditions in accordance with section 3.1.3, e.g. enclosure, heating, fine-meshed scaffolding net, services for ventilating the rooms that go beyond the services in accordance with section 4.1.4, e.g. technical ventilation, insofar as the necessity is not attributable to the Contractor.

4.2.10 Measures for the protection of building and plant components as well as furnishings, e.g. by masking windows, doors, floors, coverings, stairs, wood, roof surfaces, electrical sockets, surface-finished parts, dust-proof masking of sensitive equipment and technical equipment, dust protection walls, emergency roofs, laying of hardboard or building protection films from 0.2 mm thick.

4.2.11 Removal of on-site protective films and the like, e.g. on window sills, light metal profiles.

4.2.12 Cleaning the substrate of coarse soiling, e.g. plaster residues, mortar residues, paint residues, oil, insofar as this was not caused by the Contractor.

4.2.13 Removal of obstacles in the plaster substrate, e.g. removal of concrete burrs, foam residues and anchoring brackets for bracket scaffolding, cutting to length of horizontal plaster rails on roller shutter boxes.

4.2.14 Pre-treatment of the plaster substrate, e.g. by chipping, picking, roughening, high-pressure cleaning, removal of algae and fungal infestation, application of primers, consolidators, adhesive bridges, biocides and the like, services for plastering concreted insulation boards.

4.2.15 Installation of joint spans, strip reinforcements and strip plaster beams, services for the reinforcement of plasters, diagonal reinforcements and the like.

4.2.16 Fastening plaster substrates, plaster substrates, insulation materials and the like with dowels.

4.2.17 Production of movement and false joints with e.g. profiles, parting cuts and joint seals.

4.2.18 Making connections, connection joints and airtight connections to adjacent components, e.g. roofs, built-in parts, installations, switch boxes that protrude due to the system, as well as adapting and finishing the plaster surfaces to adjacent components.

4.2.19 Installation of profiles, e.g. plinth profiles, edge angles, ventilation profiles, end profiles, plaster strips, fabric angles, connection and end profiles, shadow profiles, boss profiles and the like.

4.2.20 Forming of embossing, edges without profiles and the like.

4.2.21 Closing and plastering of recesses, e.g. slots, by an additional operation.

4.2.22 Early and subsequent construction of partial surfaces, e.g. surfaces behind radiators, pipelines and the like.

4.2.23 Compensation of greater unevenness of the substrate than permissible according to DIN 18202.

4.2.24 Performance to meet increased requirements for flatness or dimensional accuracy (see section 3.1.2).

4.2.25 Achievements to achieve surface qualities in accordance with Section 3.2.3.

4.2.26 Manufacture of plasters with a grain size other than that of 3.2.4.

4.2.27 Coloured finish of the plasters.

4.2.28 Measures against algae and fungal infestation.

4.2.29 Sealing of the plaster against moisture in the area in contact with the ground, in the splash water area. Installation of seals below window sills and the like.

4.2.30 Cutting of cladding to fit bevels and curved or otherwise shaped components.

4.2.31 Manufacture and plastering of covers, shelves, bulkheads, friezes, grooves, aprons, false beams, sheathing, beams, recesses, templates, pilaster strips and the like.

4.2.32 Manufacture of auxiliary structures for fastening awnings, advertising media and the like, e.g. assembly cylinders. Creation of anchors remaining in the structure, e.g. for scaffolding.

4.2.33 Manufacture of belts, fillets and cornices, sills, window and door frames, fascines.

4.2.34 Manufacture of corners, offsets and visible endings on stucco profiles, fillets and cornices.

4.2.35 Plastering and plastering work, insofar as it cannot be carried out in the course of other plastering work, in the case of interior plastering work on the same floor and on the façade on each side of the façade.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

For the determination of the performance — regardless of whether it is carried out according to drawings or measurements — the dimensions

- of the treated areas,
- of the areas produced,
- of the clad surfaces

. The simplifying rules, such as over-measurement rules and individual regulations, are to be used to determine performance.

5.2 Determination of dimensions/quantities

5.2.1 For plaster, stucco, insulating, separating and protective layers, linings, cladding, vapour barriers, dowels, facing shells, substructures, flat reinforcements and plaster substrates, foils and preparation of substrates:

- on interior surfaces without limiting components, the dimensions of the surfaces to be treated, insulated, clad or stuccoed,
- on interior surfaces with limiting components, the dimensions of the surfaces to be treated up to the unplastered, uninsulated, unclad components limiting them,
- in the case of façades, the dimensions of the areas produced

. In the case of interior surfaces, raw walls, columns, raw ceilings, beams, load-bearing timbers and steel beams are considered limiting components.

5.2.2 The dimensions are determined on the basis of the largest component dimension that may be completed, e.g. in the case of wall connections, circumferential friezes, bevels, attachments and incorporations of components, built-in parts and the like.

5.2.3 Rear surfaces of niches and reveals are calculated separately with their dimensions, regardless of their individual size.

5.2.4 Directly connected, different types of recesses, e.g. opening with adjacent niche, are calculated separately.

5.2.5 If a recess is proportionately integrated into adjacent areas that are to be calculated separately, the respective proportional recess area is calculated to determine the overmeasurement variable.

5.2.6 When calculating individual areas of any shape, the smallest circumscribed rectangle is to be used as a basis for determining the dimensions. Excluded from this rule are circles, triangles, trapezoids and diamonds. The individual areas must not overlap.

5.3 Overmeasurement rules

The following are measured:

5.3.1 When billed according to area

- Recesses, e.g. openings (also floor-to-ceiling), niches with a single size ≤ 2.5 m2. When determining the dimensions for the overmeasurement, the smallest dimensions of the recess shall be taken as a basis.
- Fugues
- Interruptions in the area to be processed, e.g. by columns, beams, cornices, balcony slabs, landings, belts, plaster tapes with a single width ≤ 30 cm.

5.3.2 When billing according to length

- Interruptions of individual lengths ≤ 1 m.

5.4 Individual provisions

5.4.1 The wall heights of vaulted rooms are calculated up to the vault section, the wall height of the shield walls up to 2/3 of the vault cut.

5.4.2 Vaulted ceilings are calculated according to the area of the unfolded soffit.

5.4.3 Mitres, crossings, offsets and endings of stucco cornices, rosettes are calculated separately.

5.4.4 Plastering of chimney heads and incorporation of diagonal reinforcements are calculated separately.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Rear-ventilated facades — DIN 18351

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

Type, location, dimensions and design as well as dates of assembly and dismantling of on-site scaffolding.

0.2 Information on the execution

0.2.1 Quantity, type, dimensions, fabrics and design of the garments.

0.2.2 Dimensions, shapes and profiles, e.g. corrugated plates, panels, cassettes, as well as surface structure and colours of the cladding elements and the design of the edges and corners.

0.2.3 Design and division of areas, special laying method, grid and joint formation, joint width, taking into account changes in length due to building materials, e.g. due to weather influences, shrinkage, swelling.

0.2.4 Number, type, location, dimensions, formation and nature of individual surfaces and of inclined, curved or otherwise shaped surfaces as well as of moulded parts, e.g. window sills, interior and exterior corner elements, lintel elements, reveals, cladding of special components and soffits.

0.2.5 Surface treatment, e.g., anodized, polished, ground, brushed, or surface coating, e.g., roll application process, tape, foil or piece coating, screen printing, mirroring, vapor deposition, enameling.

0.2.6 Classification, location and dimensions of areas A to E of wall surfaces subject to different wind loads as a function of the wind velocity pressure in accordance with DIN EN 1991-1-4 'Eurocode 1: Actions on structures — Part 1-4: General actions — Wind loads' in conjunction with DIN EN 1991-1-4/NA 'National Annex — Nationally determined parameters — Eurocode 1: Actions on structures — Part 1-4: General actions — Wind loads'.

0.2.7 Type and design of deposits for perforated and similarly structured elements or other requirements to minimise the wind load and prevent the intrusion of small animals.

0.2.8 Type, quality and colour of fasteners, e.g. undercut anchors, staples, screws, rivets, whether visible or not visible, designed with or without cover caps. Fastening in areas with increased wind load.

0.2.9 Type, nature and strength of the anchoring base, e.g. steel, concrete, sandwich panels, plastered or unplastered masonry, solid brick or perforated stone, indication of bulk density and compressive strength.

0.2.10 Restrictions on chiseling, milling, drilling and welding work on the structure.

0.2.11 Type of pre-treatment of the substrate, e.g. knocking off loose plaster, removing insulation residues.

0.2.12 Type and design of the anchoring of the substructure, e.g. dowels, screws, anchor channels. Special features of anchoring for multi-layer substrates, e.g. anchoring in the weather shell, bracket anchors, through holes, if necessary, separate securing of ventilation shells.

0.2.13 Type, dimensions and design of substructures for cladding and of thermal decoupling.

0.2.14 Number, type, location, dimensions, design and condition of fire and wind barriers.

0.2.15 Additional loads for substructures or individual elements of the cladding.

0.2.16 Special chemical and physical stresses to which substances and components are exposed after installation, e.g. due to aggressive vapours, maritime climate, industrial air or due to shock loads, movements and vibrations of the building or individual building components, as well as increased wind loads caused by fluid mechanics in accordance with DIN EN 1991-1-4 in conjunction with DIN EN 1991-1-4/NA, in particular in the case of perforated and similarly structured façade elements.

0.2.17 Component production according to the execution plan or according to local measurements.

0.2.18 Number, type, dimensions and design of terminations and connections to adjacent components.

0.2.19 Number, type, position and dimensions of recesses to be made or closed.

0.2.20 Advance payments by other contractors, in particular with regard to the execution of connections and connections to plinths, windows, roof edges, neighbouring buildings and the like.

0.2.21 Type, location, dimensions and formation of movement, structure and component joints. Expected component and structure movements as well as deflections.

0.2.22 Type of joint design. Open or closed joint, e.g. backed, covered, sealed joint. Color of the backing, cover, sealing.

0.2.23 Supply of installation or assembly plans as well as lists of materials and project documentation.

0.2.24 Number, type and dimensions of samples. Place of installation.

0.2.25 Boundary patterns for the colour, structure and gloss of finished surfaces, especially in the case of anodic oxidised aluminium.

0.2.26 Requirements for fire, sound, heat, moisture, radiation and lightning protection as well as for noise suppression. ventilation and other special requirements, e.g. with regard to radar reflection behaviour.

0.2.27 Type, dimensions and design of the rear ventilation and the covers of its openings.

0.2.28 Requirements with regard to joint tightness, protection against draught snow and driving rain as well as protection against the penetration of small animals into joints and openings.

0.2.29 Type, thickness and properties of the insulation layers, single or multi-layer installation.

0.2.30 Type and extent of corrosion protection.

0.2.31 Early or subsequent production of partial surfaces, e.g. after removing scaffolding anchors or closing assembly openings.

0.2.32 Subsequent treatment of the surface. Assumption of maintenance and care or handover of a maintenance plan with care instructions.

0.2.33 Number, type, location, dimensions and masses of installation and installation components. Installation of roller shutters, access systems, sun protection systems and the like. Specifications for the accessibility of sun protection systems.

0.2.34 Type and scope of services for lightning protection and for the cabling of installations and the like.

0.2.35 Provision of built-in components, e.g. anchor channels.

0.2.36 Special protection of the services to be provided, e.g. packaging, edge protection, covers, especially for finished or finished surfaces.

0.2.37 Protection of neighbouring properties, structures, components of buildings or installations, furnishings and the like.

0.2.38 Number, type and location of remaining scaffolding anchorages. Special requirements for scaffolding.

0.2.39 Requirements for the exchange of data by electronic means.

0.3 Details of deviations from the ATVs

If regulations other than those provided for in this ATV are to be made, these must be clearly and individually stated in the service description.

0.4 Individual information on fringe benefits and special benefits

In particular, the following can be considered as ancillary services for which special ordinal numbers (items) are to be provided under the conditions of ATV DIN 18299, Section 0.4.1:

Anchoring elements, e.g. for multi-layer substrates.

0.5 Billing Units

In the bill of quantities, the billing units are to be provided as follows:

0.5.1 Area (m2), separated by type and dimensions, for

- Cladding with or without substructures and with or without insulation layers, separated according to wind load ranges,
- Substructures and cladding, also in the area of increased loads, separated according to wind load ranges,
- insulation layers,
- Levelling layers, separation layers,
- Non-woven fabrics, foils,
- Pre-treatment of the substrate,
- Subsequent surface treatments.

0.5.2 Dimensions of length (m), separated by type and dimensions, for

- Screens, parapet cladding, covers and other striped cladding, e.g. on eaves, cornices, balconies, pillars, columns, beams,
- Soffits, window sills,
- Base and lintel formations,
- Connection and end profiles, ventilation profiles, protective grilles on ventilation openings,
- Foreclosures,
- Fire and wind barriers,
- Graduates and qualifications as well as corner training,
- Forming and closing of movement and component joints,
- Sealing of building joints or their covering,
- waterproofing strips for connections to windows, metal surrounds, wall coverings and the like,
- strip-shaped separating and insulating material layers and the like,
- Cutting of cladding, e.g. at slanted attachments and ends.

0.5.3 Number (pcs), separated by type and dimensions, for

- Cladding of special components, e.g. balconies, foundation bases, columns, pillars,
- mouldings, window sills and the like,
- Tails
- special substructures and anchors,
- individual components, decorative plates and the like,
- Recesses, e.g. for luminaires, air outlets, pipe penetrations, sockets,
- Closing installation passages and the like,
- reinforcements on components, e.g. in the area of recesses or corners,
- remaining scaffolding anchors,
- parts to be retrofitted, e.g. after or during the dismantling of the scaffolding.

1 Scope of application

1.1 ATV DIN 18351 "Rear-ventilated façades" applies to rear-ventilated cladding of exterior and interior components such as walls, columns, parapets, attics, ceilings and the like.

1.2 ATV DIN 18351 does not apply to

- rear-ventilated exterior wall cladding with natural stone and cast stone slabs with a nominal thickness ≥ 30 mm (see ATV DIN 18332 "Natural stone work" and ATV DIN 18333 "Cast stone work"),
- Exterior wall cladding made of boards or planks as well as with wooden shingles (see ATV DIN 18334 "Carpentry and timber construction work"),
- Exterior wall cladding with roofing materials (see ATV DIN 18338 "Roofing work"),

- Metal wall cladding with metal components to be folded in construction (see ATV DIN 18339 "Plumbing work") and
- External thermal insulation composite systems (see ATV DIN 18345 "External thermal insulation composite systems").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18351 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

The most common standardised metallic materials and components, including corresponding anchoring, connecting and fastening elements, are listed in DIN 18516-1 "Exterior wall cladding, rear-ventilated — Part 1: Requirements, test principles".

In addition, the following apply in particular:

2.1 Ceramics

DIN EN 14411	Ceramic tiles and slabs — Definitions, classification, properties, evaluation and verification of constancy of performance and marking

Tiles and slabs must comply with the provisions of their approval.

2.2 High-pressure laminate and fibre-reinforced building materials

DIN EN 438-1	Decorative high-pressure laminate boards (HPL) — Sheets based on hardenable resins (laminates) — Part 1: Introduction and general information

Cladding elements made of high-pressure laminate and fibre-reinforced building materials, e.g. mineral-bonded flat pressed panels, fibre cement panels, fibre-reinforced resin composite panels, must comply with the provisions of their approval.

2.3 Plastic

Clothing elements made of plastic must comply with the provisions of their approval.

2.4 Glass

Glass for exterior cladding must comply with the requirements of DIN 18516-4 "Exterior wall cladding, rear-ventilated — toughened safety glass; requirements, design, testing" or the provisions their approval for outdoor clothing.

2.5 Natural and cast stone

Natural and cast stone must meet the requirements of DIN 18516-3 "Exterior wall cladding, rear-ventilated — Part 3: Natural stone; Requirements, Bemessung“ und DIN

18516-5 "Exterior wall cladding, rear-ventilated — Part 5: Cast stone; requirements, design".

2.6 Composite elements and fabric combinations

Composite elements and material combinations, e.g. photovoltaic elements, carrier plates with small-format ceramic top covering, metal composite panels, honeycomb composite panels, must comply with the provisions of their approval.

2.7 Insulation materials

DIN EN 13162	Thermal insulation products for buildings — Factory made mineral wool (MW) products — Specification

2.8 Color and structure fluctuations, veining and inclusions

Colour and structure fluctuations as well as veining and inclusions caused by natural occurrences are permitted.

2.9 Corrosion protection

DIN 55634-1	Coating materials and coatings — Corrosion protection of load-bearing thin-walled steel components — Part 1: Requirements and test methods
DIN EN ISO 12944 (all parts)	Coating materials — Corrosion protection of steel structures by coating systems

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 DIN 18516-1 applies to the design.

3.1.2 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- Deviations of the stock from the specifications, e.g. insufficient alignment and perpendicular supports,
- unsuitable condition of the substrate,
- lack of or insufficient anchoring possibilities,
- greater dimensional deviations than permissible in accordance with DIN 18202 "Tolerances in building construction — Structures" (see section 3.1.4),
- unsuitable condition of the scaffolding, e.g. incorrect distance to the shell, coarse soiling,
- unsuitable climatic conditions (see section 3.1.5);
- lack of reference points.

3.1.3 The Contractor shall prepare assembly drawings and descriptions in accordance with the Client's planning documents before the start of production.

3.1.4 Deviations from prescribed dimensions are permissible within the limits specified by DIN 18202. Unevenness in the surfaces that becomes visible in grazing light is permissible if it does not exceed the limit values according to DIN 18202. If increased requirements are placed on flatness in accordance with DIN 18202:2013-04, Table 3, line 7 or other increased requirements for dimensional accuracy compared to the values listed in the above-mentioned standards, the required performances are special services (see section 4.2.1).

3.1.5 In the event of unsuitable climatic conditions, e.g. temperatures below 5 °C during gluing work, snow, ice, wind, special measures must be taken in consultation with the Client. If services are required for this, these are special services (see section 4.2.2).

3.1.6 Chiseling, milling, drilling and welding work on the building may only be carried out in agreement with the Client.

3.2 Connections and fasteners

3.2.1 The type of connections between the individual parts of the substructure and the cladding elements is left to the Contractor, provided that approvals do not make any statements to the contrary.

3.2.2 Only corrosion-resistant materials may be used for joints and fasteners, e.g. for clamps, clips, hooks, screws, rivets.

3.2.3 Connections and fastenings must be designed in such a way that they can absorb movements on the components and the structure with little noise.

3.2.4 Screw connections must be secured against independent loosening.

3.2.5 Contact corrosion must be excluded when assembling components of different materials.

3.3 Substructures and anchorages

3.3.1 Substructures must be installed vertically and perpendicularly, adapted to the formats of the cladding elements.

3.3.2 The substructure must be anchored with approved dowels.

3.3.3 The standards specified in DIN 18516-1 apply in particular to the execution of metallic substructures.

3.3.4 All steel parts that are no longer accessible after installation must comply with corrosion protection class III according to DIN 55634:2010-04, Table 1.

3.4 Apparel

3.4.1 General

3.4.1.1 Cladding elements shall be laid with evenly wide, open joints and shall be visibly fastened.

3.4.1.2 Level Cladding elements and panels must be screwed onto wooden substructures and riveted onto metal substructures, as far as possible depending on the format and material. Shaped cladding elements, e.g. trapezoidal profiles, corrugated profiles, must be screwed, ceramic façade panels must be clamped, cassettes hung in and composite elements fastened system-specific.

3.4.2 Cladding elements made of metal and metal composite elements

3.4.2.1 Exposed cut edges must be free of burrs.

3.4.2.2 Sheets less than 1 mm thick shall be edged or flanged.

3.4.2.3 Steel elements must be corrosion-protected on all sides.

3.4.2.4 The cladding elements must be installed without noise control and ready for the surface.

3.4.2.5 If noise suppressants are required, they shall be applied to at least 60 % of the rear surface of the elements.

3.4.2.6 In the case of thermally curing coatings, the thickness of the surface coating on the visible sides shall be at least 60 µm in the case of piece coating and at least 20 µm in the case of coil coating coating.

3.4.2.7 Decorative anodic oxidation shall be carried out in accordance with DIN 17611 "Anodically oxidised products of aluminium and wrought aluminium alloys — Technical delivery conditions".

3.4.3 Ceramic cladding elements

3.4.3.1 Ceramic tiles and slabs must have a glazed surface and brick tiles must have a machine-smooth surface.

3.4.3.2 Exposed cut edges must not be sharp-edged.

3.4.3.3 Joints between ceramic cladding elements shall be made with a minimum width of 8 mm.

3.4.4 Cladding elements made of high-pressure laminate and fibre-reinforced building materials

3.4.4.1 Cladding elements made of high-pressure laminate and fibre-reinforced building materials, e.g. mineral-bonded flat pressed panels, fibre-cement panels, fibre-reinforced resin composite panels, shall be installed with a joint width of 10 mm. Boards coated on both sides must be used.

3.4.4.2 The spacing of the edge fastenings must comply with the provisions of their approval when the cladding elements are installed.

3.4.5 Plastic cladding elements

Plastic elements must be installed in accordance with their approval.

3.4.6 Glass cladding elements

3.4.6.1 Exterior cladding must be installed with mirror glass panes made of thermally toughened toughened safety glass in accordance with the requirements of DIN 18516-4.

3.4.6.2 Disc fasteners shall include at least two pane edges in their entire length and thickness by means of metal profiles.

3.4.7 Cladding elements made of natural and cast stone

Exterior wall cladding made of natural and cast stone must be installed with stainless steel fasteners set at the back in accordance with their approval.

3.4.8 Composite elements and material combinations

Composite elements and cladding elements in which different materials are combined with each other must be installed in accordance with their approval.

3.5 Thermal insulation

Insulation is provided with mineral wool insulation boards, which are tightly jointed over the entire surface in the bond and are to be laid in such a way that there are no continuous cavities between the substrate and the insulation layer. The insulation boards are to be mechanically fastened by means of an average of 5 insulation holders per m2 and are tightly connected to boundary components.

If the mineral wool insulation boards cannot be mechanically attached to the substrate, they must be glued on, with a tensile strength perpendicular to the board plane of at least 1 kPa in accordance with DIN EN 13162.

3.6 Design requirements

3.6.1 Movement joints of the structure must be adopted structurally with the same possibility of movement.

3.6.2 Rainwater must be drained away by constructive measures. Damaging effects from chemical and electrochemical processes must be ruled out.

3.6.3 In the plinth area, ventilation openings of more than 20 mm must be secured by ventilation grilles for the rear ventilation of external cladding. A free cross-section of at least 50 cm2 per 1 m wall length must be maintained.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Auf-, Um- und Abbauen sowie Vorhalten von Arbeits- und Schutzgerüsten für die eigene Leistung, sofern die zu bearbeitenden Flächen an keiner Stelle mehr als 3,50 m über der Standfläche des Gerüstes liegen.

4.1.2 Compensation of stepped or inclined standing surfaces of scaffolding up to 40 cm difference in height, e.g. via stairs or ramps.

4.1.3 Submission of prefabricated surface and color samples.

4.1.4 Completion of components in two work steps to enable work by other contractors, insofar as the services can be provided continuously in the course of the assembly work. If these conditions are not met, they are special services according to section 4.2.15.

4.1.5 Handing over the manufacturer's operating, maintenance and operating instructions.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 Meeting increased requirements for flatness or dimensional accuracy (see section 3.1.4).

4.2.2 Protection against unsuitable climatic conditions (see section 3.1.5).

4.2.3 Provision of recreational, social and storage rooms if the Client does not provide rooms that can be easily locked.

4.2.4 Erecting, converting, dismantling and maintaining scaffolding for own services in which the areas to be worked on are more than 3.50 m above the standing surface of the scaffolding that exceed the services specified in section 4.1.1, e.g. scaffolding that requires more than one scaffolding layer, scaffolding for stairwells or in areas with a particular hazard and the like.

4.2.5 Services for fire, sound, heat, moisture, radiation and lightning protection, for noise suppression and for other special building physics measures, insofar as these go beyond the services in accordance with Section 3.

4.2.6 Services in connection with the cabling of installations, sun protection systems, photovoltaic elements and the like.

4.2.7 Making anchorages remaining in the structure, e.g. for scaffolding.

4.2.8 Cleaning the substrate of coarse soiling, e.g. plaster residues, mortar residues, paint residues, oil, insofar as this was not caused by the Contractor.

4.2.9 Compensation of larger unevenness of the substrate and non-perpendicular and non-perpendicular mounting surfaces in the event of greater deviations than permissible according to DIN 18202 (see section 3.1.4).

4.2.10 Preparation of verifiable stability certificates and preparation of the associated drawings.

4.2.11 Preparation of building physics and chemical verifications.

4.2.12 Making and Applying Patterns.

4.2.13 Work for services provided by other contractors, e.g. calibration work, installation, removal and reinstallation of cladding elements and built-in parts.

4.2.14 Completion of components in two work steps to enable work by other contractors, insofar as the services cannot be provided continuously in the course of the assembly work (see section 4.1.4).

4.2.15 Subsequent processing and subsequent installation of parts, e.g. when dismantling scaffolding.

4.2.16 Installation or sealing of provided parts as well as installation and installation parts.

4.2.17 Cutting of cladding, factory-prefabricated elements and insulation materials to adapt to slopes and rounded or differently shaped components, as well as cutting of insulation panels for pipes laid on the ground.

4.2.18 Reinforcement of cut elements and substructures in the area of connections and recesses.

4.2.19 Measurement of missing reference points for carrying out necessary measurements according to ATV DIN 18299, Section 4.1.3.

4.2.20 Preparation of documentation, e.g. as-built plans, if the services exceed those of Section 3.1.3.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

The determination of the performance — regardless of whether it is carried out according to drawings or measurements — shall be based on the external dimensions of the cladding for cladding, substructures, insulation layers, surface treatments and the like. The simplifying rules, such as over-measurement rules and individual regulations, are to be used to determine performance.

5.2 Determination of dimensions/quantities

5.2.1 The dimensions are determined on the basis of the largest component dimension in each case, and in the case of bent components the outer unfolded component dimension.

5.2.2 When invoicing non-rectangular individual parts according to area measurements, the smallest circumscribed rectangle shall be taken as a basis.

5.2.3 In the manufacture of components, directly connected different types of recesses are calculated separately, e.g. opening with adjacent niche. Similar recesses separated by constructive elements are also calculated separately.

5.2.4 If a recess is proportionately integrated into adjacent surfaces that are to be calculated separately, the respective proportionate recess area is calculated to determine the overmeasurement variable.

5.3 Overmeasurement rules

The following are measured:

5.3.1 When billed according to area

- Recesses, e.g. openings (also floor-to-ceiling), niches, ≤ 2.5 m2 individual size. The smallest dimensions of the recess shall be used as a basis for determining the deduction dimensions.
- interruptions of the façade surface by components, e.g. trusses, columns, beams, templates, with an individual width ≤ 30 cm,
- Fugues
- Shims.

5.3.2 When billing according to length

- Interruptions ≤ 1 m individual length,
- Fugues.

5.4 Individual provisions

Special formats, e.g. shims, are calculated separately.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Tile and slab work — DIN 18352

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

No supplementary regulation to ATV DIN 18299, section 0.1.

0.2 Information on the execution

0.2.1 Formation of the connections.

0.2.2 Number, quantity, type, location, dimensions, materials and design of surfaces to be processed/components to be manufactured.

0.2.3 Execution according to the execution plan or according to local measurements.

0.2.4 Type and condition of the substrate, e.g. cracks and space use classes, as well as the area to be processed, e.g. concrete, masonry, waterproofing.

0.2.5 Type of pre-treatment of the substrate, e.g. cleaning, high-pressure cleaning, roughening, chipping off old substrates, consolidation of the substrate. Pre-treatment of highly absorbent substrates, peeling of old tile coverings.

0.2.6 The type and extent of the installation of floor coverings or cladding inside or outside buildings.

0.2.7 Type and extent of installation in thick bed or thin bed, on release or insulation layer, with scraper filling or application on both sides.

0.2.8 Type of construction for heated floor coverings; Type of cover; location of heating pipes and heating elements; Thickness of load distribution layers; the type, position and design of the reinforcements and the movement joints; Mortar bed thickness.

0.2.9 Type and extent of other structures, e.g. stairs and outdoor coverings.

0.2.10 Type, thickness and compressibility of thermal insulation and impact sound insulation layers, type and thickness of separation layers and insulation covers.

0.2.11 Type and design of bonding bridges, e.g. primers, spraying, roughening of the substrate.

0.2.12 Type and design of flat attachment and installation surfaces for thin-bed processes and filler layers.

0.2.13 Type and thickness of the plaster, reinforced or unreinforced.

0.2.14 Type, thickness and design of filling and levelling layers, e.g. fills, and of subfloors in dry construction.

0.2.15 Number, type, position and dimensions of recesses to be made or closed.

0.2.16 Number, type, location, dimensions and masses of fittings and fittings.

0.2.17 Type, dimensions and design of load-bearing structures.

0.2.18 Number, type and location of floor coverings in rooms with special installations, e.g. central heating units, machine rooms.

0.2.19 Type, dimensions, shape and nature of tiles, slabs, moulded bricks and fittings. Panel gluing, e.g. on the front or back. Surface finish, colour tint, chemical and physical stress, intended use. In the case of floor coverings, the wear class of the glaze and anti-slip properties.

0.2.20 Number, type and location of sloping areas and their reference points.

0.2.21 Angular attachment of wall coverings to each other.

0.2.22 Dimensions, design and stress of cladding of special components, e.g. wells, counters, foundation bases, free-standing columns and pillars.

0.2.23 Number, type and dimensions of small-area coverings, e.g. wall tile signs, radiator niches, fireplace cladding.

0.2.24 Number, type and dimensions of walling and cladding with support elements, e.g. on built-in baths, shower trays; one-, two- or three-sided cladding, with or without underlap, sloping baths, side covers.

0.2.25 Type and extent of adaptations of cladding to bathtubs, shower trays, bathtub underlays or tub slopes.

0.2.26 Number, type, dimensions and design of stairs, steps, thresholds, overhangs and visible heads.

0.2.27 Type, dimensions and design of grooves and rounded corners.

0.2.28 Type, dimensions and design of pool heads in swimming pools and type and arrangement of built-in components, e.g. ladders, spotlights, line holders.

0.2.29 Number, type and dimensions of stop rails, separation rails, corner protection rails, mat frames, angle frames, inspection frames, manhole covers.

0.2.30 Design, type, width and colour of the joint.

0.2.31 Type, position, dimensions and design of movement, structure and component joints. Colour of the backfill, cover.

0.2.32 Method of anchoring or fixing large-format panels and prefabricated elements.

0.2.33 Type and dimensions of partitions, arrangement of openings.

0.2.34 Type and dimensions of door frames.

0.2.35 Design and division of areas. Grid and joint formation, structure, surface treatment. Special method of installation.

0.2.36 Type and extent of continuous joint cuts in wall cladding, plinths and floor coverings.

0.2.37 Number, type, position, dimensions and nature of sloping, curved or otherwise shaped surfaces.

0.2.38 Number, type and dimensions of samples, e.g. surface and colour samples, sample areas. Place of installation.

0.2.39 Protection of building or plant components, furnishings and the like, e.g. in the case of third-party services or in existing buildings.

0.2.40 Early or subsequent creation of partial surfaces, e.g. behind installations.

0.2.41 The type and extent of cleaning of the floor coverings after grouting and the cleaning agents and methods to be used, e.g. water, acidic/alkaline cleaning agents, mechanical cleaning.

0.2.42 Type and execution of subsequent surface treatments.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 2,	if tiles, slabs and mosaics are not to comply with the first quality class,
Section 3.1.3	if tolerances other than those listed therein are to apply,
Section 3.1.4,	if a laying deviating from DIN 18515-1 is to be carried out on outdoor walls,

Section 3.2.1.1,	if tiles, slabs and mosaics are to be applied or laid in deviation from the provided regulation,
Section 3.2.2.1	if other mortar bed thicknesses are to be produced for cladding or coverings in the thick bed,
Section 3.2.2.2	if other binders are to be used,
Section 3.4.2	if cladding or coverings with different joint widths are to be applied,
Section 3.4.3	if grouting is not to be carried out by slurry,
Section 3.4.3	if cleaning of the surface with special cleaning agents and procedures is necessary after grouting
Section 3.4.3	if materials other than grey hydraulically setting joint compounds are to be used for grouting purposes, e.g. in the case of special stress.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299.

0.5 Billing Units

In the bill of quantities, the billing units are to be provided as follows:

0.5.1 Area (m2), separated by type and dimensions, for

- Pre-treatment of the substrate,
- levelling layers,
- Separation layers,
- seals,
- insulation layers,
- Underbodies,
- ceiling, wall and floor coverings,
- Surface treatment of the coverings,
- reinforcements, load-bearing and substructures,
- Laying on a slope.

0.5.2 Dimensions of length (m), separated by type and dimensions, for

- Steps and thresholds,
- Pedestal and throats,
- Soffits,
- Mitres on tile and slab edges,
- Bevel cuts,
- Profiles and strips made of fittings, borders,
- gutters and grates,
- Rails
- Forming and closing movement joints,
- Connecting the waterproofing to gutters,
- sealing tapes,
- basin heads and drainage channels,
- Cutting edge insulation strips.

0.5.3 Number (pcs), separated by type and dimensions, for

- Steps and thresholds,
- free step heads, subviews,
- Gusset for graduated boundaries of the coverings, e.g. over stairs,
- Cladding of special components, e.g. foundation bases, columns, pillars,
- Cladding of bathtubs and shower trays, e.g. with aerated concrete or rigid foam elements,
- Adapting the coverings, e.g. to washbasins, sinks, bathtubs, shower trays, shower channels and floor drains,
- Tub underskirts, slanted tub aprons,
- Adapting the decking to recesses in the decking such as openings, foundation bases, pipe penetrations and the like larger than 0.1 m2 individual size,
- Installation of built-in parts and rails,
- Mouldings, decorative plates,
- Insertion of switches, sockets and drain box attachments and the like,
- Making recesses in wall and floor coverings for installations and built-in parts,
- elastic joint filling at installation passages, soil drainage and the like,
- Sealing corners, sealing sleeves,
- Door frames,
- Miters
- pipe penetrations,
- Inner/outer corners of waterproofing,
- Creating pipe boxes.

0.5.4 Combined billing (m2d, m2W, m2Mt, Std (pieces × days), StWo, StMt, m3d, m3Wk)

- Recreation rooms, storage rooms.

1 Scope of application

1.1 ATV DIN 18352 "Tile and slab work" applies to the preparation and laying of ceramic tiles, slabs and mosaics as well as tiles, slabs and mosaics made of glass.

1.2 ATV DIN 18352 "Tile and slab work" does not apply to the attachment and laying of

- tiles, slabs and mosaics made of natural stones (see ATV DIN 18332 "Natural stone work") and
- Slabs made of cast stone (see ATV DIN 18333 "Cast stone work").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18352 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

Tiles, slabs and mosaics must comply with the first quality class.

For the most common substances and components, the DIN standards and other requirements are listed below.

2.1 Ceramic tiles, slabs, ceramic mosaic

DIN 12912	Laboratory equipment — Ceramic tiles for laboratory benches (laboratory bench tiles)
DIN 18158	Floor Clinker Tiles
DIN EN 14411	Ceramic tiles and slabs — Definitions, classification, properties, evaluation and verification of constancy of performance and marking

2.2 Binders, aggregates, mortars, adhesives

DIN 1164-10	Cement with special properties — Part 10: Composition, requirements and proof of conformity of cement with low effective alkali content
DIN EN 197-1	Cement — Part 1: Composition, requirements and conformity criteria of normal cement
DIN EN 12004-1	Mortars and adhesives for ceramic tiles and slabs — Part 1: Requirements, assessment and verification of constancy of performance, classification and marking

Aggregates must be mixed-grained and free of harmful components.

2.3 Joints

DIN 18540	Sealing of Exterior Wall Joints in Building Construction with Joint Sealants

Putties, pre-mixed hydraulically setting grouts, reactive resin-based grouts and joint sealants in accordance with DIN 18540 must not affect the surface of the pavement.

2.4 Insulation materials

DIN EN 622 (all parts)	Fibreboard — Requirements
DIN EN 13162	Thermal insulation products for buildings — Factory made mineral wool (MW) products — Specification
DIN EN 13163	Thermal insulation products for buildings — Factory-made expanded polystyrene (EPS) products — Specification;
DIN EN 13164	Thermal Insulation Products for Buildings — Factory Made Extruded Polystyrene Foam (XPS) Products — Specification
DIN EN 13165	Thermal insulation products for buildings — Factory made rigid polyurethane foam (PU) products — Specification
DIN EN 13166	Thermal insulation products for buildings — Factory made phenolic resin foam (PF) products — Specification

DIN EN 13167	Thermal Insulation Products for Buildings — Factory Made Foam Glass (CG) Products — Specification
DIN EN 13168	Thermal insulation products for buildings — Factory made wood wool (WW) products — Specification
DIN EN 13169	Thermal Insulation Products for Buildings — Factory Manufactured Expanded Perlite (EPB) Products — Specification
DIN EN 13170	Thermal insulation products for buildings — Factory made expanded cork (ICB) products — Specification
DIN EN 13171	Thermal insulation products for buildings — Factory made wood fibre (WF) products — Specification

2.5 Seals

DIN 18531 (all parts)	Waterproofing of roofs as well as balconies, loggias and pergolas
DIN 18534 (all parts)	Waterproofing of interiors
DIN 18535 (all parts)	Sealing of tanks and basins

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- unsuitable condition of the substrate, e.g. coarse soiling, faulty sealing, efflorescence, attachment and installation surfaces that are too smooth, too damp, oily or frozen, cracks,
- greater unevenness of the subsoil than permissible in accordance with section 3.1.3,
- lack of reference points,
- missing, insufficient or deviating gradients from those specified in the implementation documents,
- if the surface of the tiles does not allow the slurry to be removed without leaving any residue.

3.1.2 In the event of unsuitable conditions resulting from the weather or the indoor climate, e.g. temperatures below 5 °C for tiling and slab work, special measures must be taken in consultation with the Client. If services are required for this, these are special services (see section 4.2.16).

3.1.3 Deviations from prescribed dimensions are permissible within the limits specified by DIN 18202 "Tolerances in building construction — Structures".

If there are increased requirements for flatness compared to DIN 18202:2013-04, Table 3, line 3 and line 6, or other increased requirements for dimensional accuracy compared to the values listed in the above-mentioned standard, the required services are special services (see section 4.2.10).

3.1.4 Façade cladding must be carried out in accordance with:

DIN 18515-1 Exterior wall cladding — Principles for design and execution — Part 1: Mortar tiles or slabs

3.1.5 Waterproofing must be carried out in accordance with:

DIN 18531 (all parts) Waterproofing of roofs as well as balconies, loggias and pergolas

DIN 18534 (all parts) Waterproofing of interiors

DIN 18535 (all parts) Sealing of tanks and basins

3.2 Attachment and installation

3.2.1 General

3.2.1.1 Tiles, slabs and mosaics are to be applied or laid in interior work only after window and door frames, stop rails, installations and plaster have been installed.

3.2.1.2 Insulation materials must be laid over the entire surface in the bond, tightly jointed and slip-proof and connected to limiting components.

3.2.2 Attachment and laying in the thick bed

3.2.2.1 In the case of cladding or coverings which are to be applied or laid in the thick bed, the following nominal thicknesses of the mortar bed shall be produced:

- for wall coverings: 15 mm;
- for floor coverings: 20 mm;
- for floor coverings on internal separating layer: 30 mm;
- for floor coverings on external separating layer: 50 mm;
- for floor coverings on insulation layers inside: 45 mm;
- for floor coverings on external insulation layers: 50 mm.

3.2.2.2 In the case of ceramic tiles and slabs, cement in accordance with DIN 1164-10 and DIN EN 197-1 shall be used as the binder.

3.2.3 Attachment and installation in the thin bed

The following apply to attachment and installation in a thin bed:

DIN 18157-1 Thin-bed finishing of cladding and coverings — Part 1: Mortars containing cement

DIN 18157-2 Design of thin-bed cladding and coverings — Part 2: Dispersion adhesives

DIN 18157-3 Thin-bed finishing of cladding and coverings — Part 3: Reactive resin adhesives

3.3 Fastening to substructures

Tiles and slabs that are not attached or laid with mortar or adhesives must be fastened in accordance with the system.

3.4 Joints

3.4.1 The joints must be laid out evenly wide. Material/execution tolerances must be compensated for in the joint.

3.4.2 The technically required joint width is 2 mm to 8 mm. Depending on the type, format, and material tolerance as well as the intended use of the covering materials, larger joint widths may be required. Mosaics in prefabricated panel units are not subject to these specifications.

3.4.3 Grouting is carried out by injecting a grey, hydraulically setting joint compound.

3.4.4 Movement joints, such as building separation joints, field boundary joints, edge and connection joints, must be arranged and closed with joint sealants or profiles when applying and laying tiles and slabs using the thin-bed method in accordance with DIN 18157-1, DIN 18157-2 and DIN 18157-3 and in the case of façade cladding in accordance with DIN 18515-1.

3.4.5 Movement joints of the structure must be taken over at the same place with the same possibility of movement.

3.5 Cleaning

3.5.1 Beläge sind so zu reinigen, dass die Unterhaltsreinigung nach Herstellerangaben erfolgen kann.

3.5.2 Glazed coverings must be cleaned with clean water.

3.5.3 Unglazed and textured coverings must be cleaned with acidic cleaner.

3.5.4 Unglazed and structured coverings that are grouted with plastic-modified grout must be cleaned mechanically (see 4.2.31).

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on or clad is not higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.1.2 Compensation of stepped or inclined standing surfaces of scaffolding up to 40 cm difference in height, e.g. via stairs or ramps.

4.1.3 Submission of surface and color samples.

4.1.4 Protection of the floor coverings until they are accessible, e.g. by blocking off the rooms.

4.1.5 Cleaning of the substrate, except for services in accordance with section 4.2.8.

4.1.6 Measures to compensate for unevenness and dimensional deviations of the substrate within the deviations permissible according to DIN 18202 when attaching or laying tiles or slabs in the thick bed.

4.1.7 Completion of components in several work steps to enable work by other contractors, insofar as the company's own services can be provided continuously in the course of similar tile and slab work. If these conditions are not met, they are special services according to section 4.2.5.

4.1.8 Removal of small plaster protrusions.

4.1.9 Adaptation of coverings to adjacent installed components, e.g. frames, cladding, stop rails, sleepers, except for services according to section 4.2.14.

4.1.10 Adaptation to recesses in the decking, e.g. on foundation bases, pillars, columns, less than or equal to 0.1 m2 individual size.

4.1.11 Preparation of the mortar and provision of the necessary equipment, even if the Client provides the materials.

4.1.12 Cleaning the coverings after grouting with clear water or acidic cleaner.

4.1.13 Delivery of care and cleaning instructions.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 Provision of recreation and storage rooms if the Client does not provide rooms that can be easily locked.

4.2.2 Assembly, conversion and dismantling as well as provision of scaffolding for the services of other contractors.

4.2.3 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on or clad is higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.2.4 Erection, conversion and dismantling as well as provision of scaffolding with a stepped or inclined footprint, e.g. over stairs or ramps, if compensation of more than 40 cm is required.

4.2.5 Completion of components in several work steps to enable work by other contractors, insofar as the company's own services cannot be completed continuously in the course of similar tile and slab work.

4.2.6 Preparation of attachment, joint and installation plans.

4.2.7 Making and affixing patterns, sample surfaces and pattern constructions.

4.2.8 Removal of old coverings and coatings, adhesive and filler layers. Cleaning the substrate of coarse soiling, e.g. plaster residues, mortar residues, larger plaster protrusions, paint residues, oil, provided that this was not caused by the contractor.

4.2.9 Compensation of larger unevenness and dimensional deviations of the substrate than permissible according to DIN 18202.

4.2.10 Meeting increased requirements for flatness or dimensional accuracy (see section 3.1.3).

4.2.11 Sanding or sanding of screeds.

4.2.12 Application of adhesive bridges.

4.2.13 Levelling of the substrate to create the required height or slope as well as the production of plaster to compensate for uneven or non-perpendicular and non-perpendicular walls in cases other than in the case of services in accordance with section 4.1.6.

4.2.14 Adaptation of the same height to existing constructions, e.g. stop rails, separation rails.

4.2.15 Attaching and laying gauges made of tiles or slabs in preparation for a dimensionally accurate installation.

4.2.16 Protection against unsuitable conditions resulting from the weather or indoor climate, e.g. enclosure, heating at temperatures below 5 °C (see section 3.1.2).

4.2.17 Services for fire, sound, heat, humidity and radiation protection, insofar as these go beyond the services under Section 3.

4.2.18 Special protection of building and plant components as well as furnishings, e.g. masking of windows, doors, floors, coverings, stairs, wood, roof surfaces, surface-finished parts, dust-proof masking of sensitive equipment and technical equipment, dust protection walls, emergency roofs, laying of hardboard or building protection films from 0.2 mm thick.

4.2.19 Making recesses in wall and floor coverings for installations and built-in parts.

4.2.20 Chiseling work for installations and built-in parts.

4.2.21 Insertion of installation and installation components.

4.2.22 Adaptation of the coverings to built-in parts, e.g. washbasins, sinks, bathtubs, shower trays, tub underskirts, sloping bath aprons.

4.2.23 Production, closing and covering of movement and false joints as well as joint seals.

4.2.24 Anchoring and pouring of false joints in the subsoil.

4.2.25 Cutting off the protrusion of edge insulation strips of other contractors.

4.2.26 Supply and installation of mouldings, decorative panels and mouldings, e.g. soap dishes.

4.2.27 Training of free step heads.

4.2.28 Making gussets for graduated boundaries of the coverings, e.g. over stairs.

4.2.29 Adapting the decking to recesses in the decking, e.g. openings, foundation bases, pipe penetrations and the like, larger than 0,1 m2 individual size.

4.2.30 Making mitres on tile and slab edges.

4.2.31 Mechanical cleaning of the floor coverings after grouting with the help of acidic/alkaline cleaning agents.

4.2.32 Subsequent surface treatment, e.g. impregnation, waxing.

4.2.33 Special testing of the condition of the substrate, e.g. with regard to adhesive tensile strength.

4.2.34 Moisture measurement of the subsoil using the calcium carbide method (CM method).

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

For the determination of the performance — regardless of whether it is carried out according to drawings or measurements — the dimensions

- the area produced and processed,
- of the covered area,
- the occupied area,
- of the garments produced, or
- of the surfaces produced

The simplified rules, such as deduction and overmeasurement rules and individual regulations, are to be applied for the determination of benefits.

5.2 Determination of dimensions and quantities

5.2.1 For interior wall cladding, ceiling cladding, floor coverings, levelling layers, separating layers, insulation layers, subfloors, surface treatments, reinforcements as well as load-bearing and substructures

- on surfaces with limiting components, the dimensions of the areas to be clad or covered, up to the bounding, unplastered, uninsulated, unclad components,
- on surfaces without limiting components, the dimensions of the areas to be clad or covered,

5.2.2 For wall coverings that connect to standing plinths, throat plinths, fillet strips or rounded corners as a plinth or rest directly on the floor covering, the dimension from the top of the plinth or top of the floor covering shall be taken as a basis.

5.2.3 For floor coverings that connect to groove bases, fillet strips or rounded corners as a plinth or connect directly to the wall cladding, the dimension up to the unclad vertical component shall be taken as a basis.

5.2.4 For facades, the dimensions of the cladding are to be taken as a basis.

5.2.5 When determining the length dimension, the largest component length, if any, is measured, e.g. in the case of sleepers, plinths, grooves, bevel cuts, profiles, strips.

5.2.6 For areas which cannot be determined by using simple geometric formulas and for areas which cannot be determined by dividing them into simple geometric shapes, e.g. rectangles, triangles, trapezoids, rhombuses, the smallest circumscribed rectangle shall be used.

5.2.7 If a recess is proportionately integrated into adjacent areas that are to be calculated separately, the respective proportionate recess area is calculated to determine the overmeasurement variable.

5.2.8 Cladding/coated back surfaces of niches and reveals are calculated separately with their dimensions, regardless of whether they are oversized or not.

5.3 Deduction and overmeasurement rules

The following are measured:

5.3.1 If billed according to area size:

- Recesses ≤ 0.1 m2 individual size, e.g. openings,
- the borders, mouldings, decorative panels and mouldings, e.g. soap dishes, used in the laid cladding or covering.

5.3.2 Bei Abrechnung nach Längenmaß: Unterbrechungen mit einer Einzellänge ≤ 1 m.

5.4 Individual provisions

5.4.1 If wall coverings consist of layers, one of which does not have the full layer height but more than half the layer height, this layer is billed at the full layer height. This does not apply to wall coverings, the height of which is determined by measurements in the service description.

5.4.2 If tile partitions are incorporated into floor coverings, the floor coverings are calculated. In the case of tile partitions that cross or integrate into each other, only one wall is taken into account in the area of integration.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Screed work — DIN 18353

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

Type and extent of fall edges and openings that are not secured against falling.

0.2 Information on the execution

0.2.1 Type, location, dimensions, materials and formation of the screeds as well as wear and protective layers. Type of construction, strength class and nominal thickness. Nature and properties of the additives and additives.

0.2.2 Colour tint and surface finish

0.2.3 Use of the screeds as well as special physical, chemical and thermal stresses to which they are exposed after installation, e.g. high perpendicular payloads.

0.2.4 Type and thickness of intended coverings.

0.2.5 Execution according to certain drawings, in particular detailed and joint plans.

0.2.6 Requirements for fire, sound, heat and moisture protection.

0.2.7 Design and division of areas.

0.2.8 Type, location, dimensions and design of movement, structure and component joints.

0.2.9 Type and dimensions of joint profiles and the like. Type of grout. Special requirements for joint profiles and joint compounds.

0.2.10 Type, location, nature and strength of the substrate.

0.2.11 Type and location of the waterproofing of the building.

0.2.12 Slope of the subsoil. Elevation reference points.

0.2.13 Type of pre-treatment of the substrate. type of detention bridges.

0.2.14 Type, location, dimensions and, if applicable, slope of levelling screeds, levelling layers and substrate fillings.

0.2.15 Number, type, position and dimensions of barrier, separating and sliding layers, films and the like.

0.2.16 Number, type, location, dimensions and formation of insulation layers and edge insulation strips, type and thickness of the covers of insulation layers.

0.2.17 Type of heating and cooling systems, location and dimensions of heating and cooling elements, nominal screed thickness and minimum pipe cover.

0.2.18 Number, type, location and dimensions of recesses and penetrations.

0.2.19 Number, type, dimensions and design of stair treads and landings to be occupied and their connections and terminations.

0.2.20 Number, type, position, dimensions and formation of edges, height differences, parking and the like.

0.2.21 Number, type, position and dimensions of angle frames, stop rails, bump rails and separation rails.

0.2.22 Type of impregnations, sealants and coatings.

0.2.23 Protection of components or equipment, furnishings and the like.

0.2.24 Type and location of metal components to be protected.

0.2.25 Number, type and dimensions of surface and colour samples.

0.2.26 Requirements for covers in the area of workplaces and traffic routes, e.g. slip resistance, slip resistance, breakthrough resistance.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 3.1.3 if tolerances other than those listed therein are to apply,

Section 3.2.4,	if the surface of screeds is not to be rubbed but e.g. smoothed or fluted,
Section 3.3.1,	if terrazzo floors are not to be produced in two layers,
Section 3.3.6	if terrazzo floors are not to be sanded, filled and finely sanded, but only sanded or washed out, for example.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units are to be provided as follows:

0.5.1 Area (m2), separated by type and dimensions, for

- Pre-treatment of the substrate,
- Adhesive bridges,
- levelling layers, filling of the substrate,
- barrier, separating, protective and sliding layers, films,
- insulation layers,
- Screeds, terrazzo floors, wear and protective layers,
- Surface treatments, surface treatments.

0.5.2 Dimensions of length (m), separated by type and dimensions, for

- edge insulation strips, cutting off the protrusion of edge insulation strips,
- Strips, profiles, rails,
- Throats, plinths, edges,
- Forming and closing joints,
- Attaching and adapting to recesses > 0.1 m2 individual size.

0.5.3 Number (pcs), separated by type and dimensions, for

- Screeds on steps and thresholds,
- Rails, profiles, frames,
- Closing recesses,
- Work and adapt to recesses ≤ 0.1 m2 individual size.

1 Scope of application

1.1 ATV DIN 18353 "Screed work" applies to the production of screeds from screed mortars, including the necessary separating, insulating and protective layers.

1.2 ATV DIN 18353 does not apply to the production of mastic asphalt screeds (see ATV DIN 18354 "Mastic asphalt work") as well as prefabricated screeds and dry subfloors (see ATV DIN 18340 "Drywall work").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18353 shall take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

For the most common substances and components, the DIN standards and other requirements are listed below.

2.1 Binders

DIN 1164-10	Cement with special properties — Part 10: Composition, requirements and proof of conformity of cement with low effective alkali content
DIN EN 197-1	Cement — Part 1: Composition, requirements and conformity criteria of normal cement
DIN EN 13454-1	Calcium sulphate binders, calcium sulphate composite binders and calcium sulphate mortars for screeds — Part 1: Definitions and requirements
DIN EN 14016-1	Binders for magnesia screeds — Caustic magnesia and magnesium chloride — Part 1: Definitions and requirements

2.2 Kunstharze

DIN 16945	Reaction resins, reactants and reactive resin masses — Test methods Synthetic resins must be alkali-resistant.

2.3 Aggregates

DIN 1100	Hard materials for cementitious hard screeds — Requirements and test methods
DIN EN 12620	Aggregates for Concrete
DIN EN 13139	Aggregates for mortars

As an aggregate for sanded terrazzo floors, grits of as equal hardness as possible that can be sanded and polished must be used.

2.4 Insulation materials

DIN EN 622-1	Fibreboard — Requirements — Part 1: General requirements
DIN EN 13162	Thermal insulation products for buildings — Factory made mineral wool (MW) products — Specification
DIN EN 13163	Thermal insulation products for buildings — Factory-made expanded polystyrene (EPS) products — Specification
DIN EN 13164	Thermal Insulation Products for Buildings — Factory Made Extruded Polystyrene Foam (XPS) Products — Specification
DIN EN 13165	Thermal insulation products for buildings — Factory made rigid polyurethane foam (PU) products — Specification

DIN EN 13166	Thermal insulation products for buildings — Factory made phenolic resin foam (PF) products — Specification
DIN EN 13167	Thermal Insulation Products for Buildings — Factory Made Foam Glass (CG) Products — Specification
DIN EN 13168	Thermal insulation products for buildings — Factory made wood wool (WW) products — Specification
DIN EN 13169	Thermal Insulation Products for Buildings — Factory Manufactured Expanded Perlite (EPB) Products — Specification
DIN EN 13170	Thermal insulation products for buildings — Factory made expanded cork (ICB) products — Specification
DIN EN 13171	Thermal insulation products for buildings — Factory made wood fibre (WF) products — Specification

Non-standardised insulation materials, e.g. granulated, foamed, puffed materials, may be used if their serviceability has been proven in accordance with the building regulations.

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- Deviations of the portfolio from the specifications,
- insufficient condition of the subsoil,
- greater flatness deviations of the subsoil than permissible according to DIN 18202 "Tolerances in building construction — Structures",
- lack of reference points,
- too low a height for the installation of the screed structure,
- missing, insufficient or deviating slope or slope that does not allow execution in accordance with section 3.1.4,
- Lack of sealing against soil moisture in the case of components in contact with the ground,
- Pipelines and the like on the ground, if no height compensation is provided,
- non-existent or unsuitable plaster connections, missing door frames, missing stop rails,
- ungeeignete Bedingungen (siehe Abschnitt 3.1.2),
- Lack of corrosion protection in metal components to be protected, e.g. when installing magnesia screeds.

3.1.2 In the event of unsuitable conditions resulting from the weather or the indoor climate, e.g. temperatures below 5 °C, draughts, special measures must be taken in consultation with the Client. If services are required for this, these are special services (see section 4.2.2).

3.1.3 Deviations from prescribed dimensions are permissible within the limits specified by DIN 18202. Unevenness in the surfaces that becomes visible in grazing light is permissible if it does not exceed the limit values according to DIN 18202. If increased requirements are placed on flatness in accordance with DIN 18202:2013-04, Table 3, line 4 or other increased requirements for dimensional accuracy compared to the values listed in the said standard, the required services are special services (see section 4.2.9).

3.1.4 Screeds on insulating layers or separating layers, even if they are carried out on a slope, must be made of uniform thickness.

3.1.5 Movement joints of the structure must be taken over at the same place with the same possibility of movement.

3.1.6 In the case of coloured screeds, the paint must be evenly mixed with the mortar, in the case of single-layer screeds in the entire thickness of the screeds, and in the case of multi-layer screeds in the entire thickness of their respective wear layer. Differences in colour and structure due to the substance and production are permitted.

3.1.7 Screeds must be protected against drying out too quickly and unevenly.

3.2 Screeds

3.2.1 Calcium sulphate, synthetic resin, magnesia and cement screeds must be produced in accordance with DIN 18560 (all parts) "Screeds in the building industry". The screed mortars shall be constructed in at least the strength classes listed in Table 1.

Table 1 — Minimum strength classes of screed mortars

	Type of screed	**Screed on insulation layers**	**Screeds on separation layers**		**Verbundestriche**	
			when used with pavement	**when used without rubber**	**when used with pavement**	**when used without rubber**
	1	**2**	**3**	**4**	**5**	**6**
	Calciumsulfatfließestrich CAF	F4	F4	F4	C20/F3	C25/F4
2	Calciumsulfatestrich CA	F4	F4	F4	C20/F3	C25/F4
3	Kunstharzestrich SR	F7	F7	F7	C20/F3	C25/F4
4	Magnesiaestrich MA	F4	F4	F7	C20/F3	C25/F4
5	Zementestrich CT	F4	F4	F4	C20/F3	C25/

3.2.2 In the case of floating calcium sulphate, calcium sulphate flow, magnesia and cement screeds for the reception of stone and ceramic coverings, the nominal thicknesses must be

increased in accordance with DIN 18560-2 "Screeds in the building industry — Part 2: Screeds and heated screeds on insulation layers (floating screeds)".

3.2.3 The pipe cover must have a nominal thickness of at least 45 mm for heated screeds of flexural tensile strength class F4 and a nominal thickness of at least 40 mm for calcium sulphate flowing screeds.

3.2.4 The surface of earth-moist and plastic screeds must be rubbed off.

3.2.5 Synthetic resin screeds in accordance with DIN 18560-7 "Screeds in the building industry — Part 7: Heavy-duty screeds (industrial screeds)" must be designed with a nominal thickness of at least 5 mm.

3.2.6 Wear and protective coatings of synthetic resins on screeds and concrete shall not be less than the following nominal thicknesses:

- Resin sealants: 0.1 mm,
- Synthetic resin coatings: 0.5 mm,
- Synthetic resin coverings: 2.0 mm.

3.3 Terrazzo floors

3.3.1 Terrazzo floors must be produced in two layers. Terrazzo floors in a composite can also be produced in a single layer with thicknesses of 15 mm to 30 mm.

3.3.2 The thickness of the facing layer for terrazzo floors must be at least 15 mm.

3.3.3 The strength of terrazzo floors produced in combination with the load-bearing substrate must comply with DIN V 18500 "Cast stone — Terms, requirements, testing, monitoring".

3.3.4 For terrazzo floors as floating screeds, the specifications for cement screed according to DIN 18560-2 apply.

3.3.5 The grinding wear of terrazzo floors must not exceed the values according to DIN V 18500.

3.3.6 Terrazzo floors must be sanded, filled and finely sanded after sufficient hardening so that the largest grain size is visible.

3.4 Insulation materials

Insulation layers, covers and edge strips must be laid in accordance with DIN 18560-2.

3.5 Separation layers

In the case of screeds on separating layers, the separating layers and edge strips must be laid in accordance with DIN 18560-4 "Screeds in construction — Part 4: Screeds on separating layers".

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Cleaning of the substrate, except for services in accordance with sections 4.2.4 and 4.2.5.

4.1.2 Protection of building and plant components against contamination and damage during screed work by loose covering, hanging or wrapping, except for protective measures according to section 4.2.13.

4.1.3 Establishing the connections of the screeds to adjacent components, e.g. walls, thresholds, frames, cladding, stop rails, push rails.

4.1.4 Submission of prefabricated surface and color samples.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 Provision of recreation and storage rooms if the Client does not provide rooms that can be easily locked.

4.2.2 Measures to protect against unsuitable conditions in accordance with Section 3.1.2.

4.2.3 Special measures for the production of outdoor screeds, e.g. protection by tents, covers.

4.2.4 Cleaning the substrate of coarse soiling, e.g. plaster residues, mortar residues, paint residues, oil, insofar as this was not caused by the contractor.

4.2.5 Special cleaning of the substrate by means of vacuum cleaners, high-pressure cleaners and the like.

4.2.6 Preparation of the substrate by means of milling, bush-hammering, blasting and the like.

4.2.7 Measures to compensate for larger unevenness and dimensional deviations of the substrate than permissible according to DIN 18202.

4.2.8 Compensation of flatness and angle deviations of the substrate within the tolerances according to DIN 18202 for screeds made of flowable masses up to 10 mm nominal thickness, if the additional consumption exceeds 20 %.

4.2.9 Meeting increased requirements for flatness or dimensional accuracy (see section 3.1.3).

4.2.10 Removal of plaster protrusions.

4.2.11 Application of adhesive bridges.

4.2.12 Adaptation of thermal insulation materials to pipes, cable ducts and the like lying on the raw ceiling.

4.2.13 Special measures for the protection of building and plant components as well as furnishings, e.g. masking of windows, doors, floors, coverings, stairs, wood, finished surface parts, dust-proof masking of sensitive equipment and technical equipment, dust protection walls, laying of hardboard or building protection films with a thickness of 0.2 mm or more.

4.2.14 Installation of stop rails, bumper rails, separation rails, mat frames and the like.

4.2.15 Manufacture of movement and apparent joints as well as joint seals.

4.2.16 Creating edges and height offsets as well as shutdowns, e.g. at recesses.

4.2.17 Closing Recesses.

4.2.18 Subsequent making of connections to adjacent components, insofar as this is not the responsibility of the Contractor.

4.2.19 Formation of grooves and plinths as well as application of screed on steps and thresholds.

4.2.20 Special surface treatment of screeds.

4.2.21 Cutting off the protrusion of edge insulation strips.

4.2.22 Producing sample surfaces.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

5.1.1 The determination of the performance – regardless of whether it is carried out according to drawings or measurements – is to be based on the dimensions of the screeds produced.

The simplifying rules, such as over-measurement rules and individual regulations, are to be used to determine performance.

5.2 Determination of dimensions/quantities

5.2.1 The dimensions shall be determined on the basis of the largest component dimension, if any. On surfaces with limiting components, the dimensions up to the limiting unplastered components are to be taken as a basis. Facing shells and the like are considered limiting components as long as they are not undercut.

5.2.2 For the processing and adaptation to recesses > 0.1 m2 individual size, the length of the recess of the respective recess is taken as a basis.

5.3 Overmeasurement rules

The following are measured:

5.3.1 When billed according to area

- Fugues
- Recesses ≤ 0.1 m2 single size.

5.3.2 When billing according to length gues

- Interruptions ≤ 1 m individual length.
- Fugues

5.4 Individual provisions

No regulations.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Mastic asphalt work — DIN 18354

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

No supplementary regulation to ATV DIN 18299, section 0.1.

0.2 Information on the execution

0.2.1 Type, location, dimensions and design of mastic asphalt screed or mastic asphalt pavement, separated by storeys. Intended use, type and size of the traffic loads, other loads, intended floor covering.

0.2.2 Indoor temperature stress.

0.2.3 Special chemical stresses, e.g. due to acids, alkalis, fats, oils, petrol.

0.2.4 Type, texture, strength and inclination of the substrate. 0.2.5 Type of pre-treatment of the substrate, e.g. rust removal of steel substrates, shot blasting.

0.2.6 Type, location and dimensions of existing or to be installed insulating, separating, sealing and protective layers.

0.2.7 Requirements for fire, sound, heat, moisture and radiation protection, as well as electrical conductivity.

0.2.8 Type, location and dimensions of the necessary filling of the substrate.

0.2.9 Required gradient. Indications of elevation reference points.

0.2.10 Number, type, location and design of terminations and connections to adjacent components.

0.2.11 Number, type, location, dimensions and design of separating, movement and structural joints. Type and size of the expected movements of the building parts.

0.2.12 Design and division of areas. Grid and joint formation.

0.2.13 Surface treatment.

0.2.14 Requirements for joint fillers, joint, contact and end profiles.

0.2.15 Number, type, position and dimensions of recesses to be made or closed. Design of the connections at recesses.

0.2.16 Number, type, location and dimensions of built-in components.

0.2.17 Protection of building or plant components, furnishings and the like.

0.2.18 Early or subsequent creation of partial areas.

0.2.19 Cutting off the overhang of edge insulation strips.

0.2.20 Number and type of samples.

0.2.21 Number, type, location and dimensions of sample areas.

0.2.22 Conditions for the installation of agitator and melting boilers.

0.2.23 Specifications resulting from expert reports.

0.2.24 Creating installation plans.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating provisions may be considered in particular in the case of

Section 3.1.3, if mastic asphalt screeds and mastic asphalt pavements are not to be produced horizontally,

Section 3.1.11 if the surfaces of mastic asphalt screeds and mastic asphalt pavements are not to be rubbed with sand but are to be treated differently.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units are to be provided as follows:

0.5.1 Area (m2), separated by type and dimensions, for

- Pre-treatment and filling of the substrate,
- insulating, separating, sealing and protective layers,
- Mastic asphalt screeds, mastic asphalt pavements,
- Surface treatment.

0.5.2 Dimensions of length (m), separated by type and dimensions, for

- stepped coverings,
- Recesses for joints,
- joint fillings,
- Stop, butt and separation rails as well as joint, pressure and end profiles,
- Upstands,
- Machine, adjust or connect to recesses ≥ 0.1 m2 individual size.

0.5.3 Number (pcs), separated by type and dimensions, for

- stepped coverings,
- Connections of sealing layers to adjacent components,
- Processing, adapting or connecting to recesses ≤ 0.1 m2 individual size,
- Corner formations for joint and end profiles,
- Built-in parts, e.g. mat frames,
- Making and closing recesses.

0.5.4 Mass (kg, t), separated by type and dimensions, for filling the substrate.

1 Scope of application

1.1 ATV DIN 18354 "Mastic asphalt work" applies to the production of

- Screeds made of mastic asphalt according to DIN 18560 (all parts) "Screeds in construction",
- Screed layers of mastic asphalt in accordance with DIN EN 14879-3 "Coatings and linings of organic materials for the protection of industrial installations against corrosion caused by aggressive media — Part 3: Coatings for concrete components" and
- Sealing surfaces made of mastic asphalt in plants for handling water-polluting substances.

1.2 ATV DIN 18354 does not apply to mastic asphalt surface courses in road construction and mastic asphalt surface courses on bridges (see ATV DIN 18317 "Traffic route construction work — Asphalt superstructure layers").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18354 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

For the most common substances and components, the DIN standards and other requirements are listed below.

2.1 Bitumen and natural asphalt

DIN EN 12591	Bitumen and bituminous binders — Requirements for road construction bitumen
DIN EN 13305	Bitumen and bituminous binders — Specification framework for hard bitumen for industrial applications
DIN EN 14023	Bitumen and bituminous binders — Framework for the specification of polymer-modified bitumen

For natural asphalt, DIN EN 13108-4 "Asphalt mixes — Mix requirements — Part 4: Hot rolled asphalt" applies.

2.2 Mix

The composition of the mix is left to the contractor. In doing so, he must take into account the information on the intended use, traffic loads, other loads, climatic influences and local conditions.

2.3 Insulation materials

DIN EN 13162	Thermal insulation products for buildings — Factory made mineral wool (MW) products — Specification
DIN EN 13165	Thermal insulation products for buildings — Factory made rigid polyurethane foam (PU) products — Specification
DIN EN 13166	Thermal insulation products for buildings — Factory made phenolic resin foam (PF) products — Specification
DIN EN 13167	Thermal Insulation Products for Buildings — Factory Made Foam Glass (CG) Products — Specification
DIN EN 13169	Thermal insulation products for buildings — Factory made products made of expanded perlite (EPB) — Specification

DIN EN 13170	Thermal insulation products for buildings — Factory made expanded cork (ICB) products — Specification
DIN EN 13171	Thermal insulation products for buildings — Factory made wood fibre (WF) products — Specification

Non-standardised insulation materials, e.g. boards or bulk materials made of granulated, foamed or expanded minerals, may be used if their suitability for use has been proven in accordance with the building regulations.

2.4 Covers, Separation Layers

Fabrics for covers and separating layers must meet the requirements of

DIN 18560-2	Screeds in construction — Part 2: Screeds and heated screeds on insulating layers (floating screeds),
DIN 18560-4	Screeds in construction — Part 4: Comply with screeds on separation layer.

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- Deviations of the portfolio from the specifications,
- lack of reference points,
- substrates that do not meet the requirements of DIN 18560 (all parts),
- Substrates with
- deviations from the horizontal or from the gradient necessary according to the circumstances,
- incorrect altitude,
- greater unevenness than permissible in accordance with DIN 18202 "Tolerances in building construction — Structures",
- Cracks and holes,
- frozen, damp, oily or soiled surfaces,
- residues of plaster, mortar, concrete or paint,
- lack of rounding of edges, grooves and corners,
- unsuitable type, position and formation of movement joints and penetrating components,
- lack of drainage facilities.

3.1.2 Mastic asphalt screeds and mastic asphalt pavements as well as sealing layers may only be produced on frost-free substrates.

3.1.3 Mastic asphalt screeds and mastic asphalt pavements must be made horizontally.

3.1.4 Mastic asphalt layers with nominal thicknesses of more than 40 mm shall be constructed in several layers.

3.1.5 Deviations from prescribed dimensions are permissible within the limits specified by DIN 18202. Unevenness in the surfaces that becomes visible in grazing light is permissible if it does not exceed the limit values according to DIN 18202. If increased requirements are placed on flatness in accordance with DIN 18202:2013-04, Table 3, line 4 or other increased requirements for dimensional accuracy compared to the values listed in the above-mentioned standard, the measures to be taken are special services (see section 4.2.5).

3.1.6 In the case of mastic asphalt screeds and mastic asphalt pavements to be produced on inclined surfaces, the unevenness of the surface within a measuring distance of 4 m

- for inclinations of up to 5 % 1 cm,
- for gradients above 5 % to 10 % 1.5 cm and
- do not exceed 2 cm for inclinations above 10%.

3.1.7 Movement joints of the structure must be structurally adopted in the mastic asphalt screed or mastic asphalt pavement with the same possibility of movement.

3.1.8 Joints in mastic asphalt layers must be filled in such a way that no movement-inhibiting foreign bodies can penetrate the joints.

3.1.9 Joints in mastic asphalt screeds that are provided with floor coverings shall remain unfilled.

3.1.10 In the case of multi-layer mastic asphalt screeds and mastic asphalt pavements, the working seams of the individual layers must be offset by at least 20 cm.

3.1.11 The surfaces of mastic asphalt screeds and mastic asphalt pavements shall be rubbed with sand immediately after installation. So much sand must be used that after the mastic asphalt has cooled, an excess of unbound sand remains on the surface.

3.2 Mastic asphalt screeds and mastic asphalt heating screeds on insulation layers

Mastic asphalt screeds and mastic asphalt heating screeds on insulation layers must be designed in accordance with DIN 18560-2. In the case of highly stressed screeds, DIN 18560-7 "Screeds in construction - Part 7: Heavy-duty screeds (industrial screeds)" must also be taken into account.

3.3 Mastic asphalt screeds on separation layers

Mastic asphalt screeds on separation layers must be carried out in accordance with DIN 18560-4. In the case of highly stressed screeds, DIN 18560-7 must also be taken into account.

3.4 Mastic asphalt composite structures

3.4.1 Mastic asphalt composite structures must be constructed in accordance with DIN 18560-3 "Screeds in construction — Part 3: Composite screeds". In the case of highly stressed screeds, DIN 18560-7 must also be taken into account.

3.4.2 Composite metal must be applied directly to bituminous substrates; in the case of steel substrates, an adhesive bridge must be applied beforehand.

3.5 Outdoor heated mastic asphalt pavements

In the case of heated mastic asphalt pavements outdoors, the coverage of the heating elements must be at least 25 mm. Edge joints at least 10 mm wide must be arranged for adjacent components.

3.6 Mastic asphalt screeds as surface protection for concrete components in process plants

Mastic asphalt screeds in combination with a sealing layer as surface protection for concrete components in process plants must be designed in accordance with DIN EN 14879-3.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Cleaning of the substrate, except for services in accordance with section 4.2.2.

4.1.2 Protection of construction and plant components against contamination and damage during mastic asphalt work by loose covering, hanging or wrapping, except for protective measures according to section 4.2.13.

4.1.3 Processing of mastic asphalt screeds and mastic asphalt pavements to adjacent components and penetrations.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 Provision of recreation and storage rooms if the Client does not provide rooms that can be easily locked.

4.2.2 Cleaning the substrate of coarse soiling, e.g. plaster residues, mortar residues, paint residues, oil, insofar as this was not caused by the Contractor.

4.2.3 Special testing of the condition of the substrate, e.g. the adhesive tensile strength, roughness depth.

4.2.4 Measures to compensate for greater unevenness and dimensional deviations of the substrate than permissible according to DIN 18202.

4.2.5 Measures to meet increased requirements for flatness or dimensional accuracy (see section 3.1.5).

4.2.6 Installation and attachment of stop rails, butt rails and separation rails, joint, pressure and end profiles, mat frames and the like.

4.2.7 Making the connection of sealing layers to adjacent components and penetrations.

4.2.8 Removal of plaster protrusions.

4.2.9 Cutting off the overhang of edge insulation strips.

4.2.10 Removal of the unbound rubbing or spreading material.

4.2.11 Special treatment of surfaces.

4.2.12 Control tests including sampling and related ancillary services.

4.2.13 Special protection of building and plant components as well as furnishings, e.g. masking of windows, doors, floors, coverings, stairs, wood, roof surfaces, surface-finished parts, dust-proof masking of sensitive equipment and technical equipment, dust protection walls, emergency roofs, laying of hardboard or building protection films from 0.2 mm thick.

4.2.14 Creating Sample Surfaces.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

For the determination of the performance — regardless of whether it is carried out according to drawings or measurements — the dimensions

- of the screeds produced,
- of the surfaces produced and
- of the treated areas

. The simplifying rules such as overmeasurement rules and individual regulations are to be used to determine performance.

5.2 Determination of dimensions/quantities

5.2.1 Billing according to the length measure shall be based on the largest component dimension that may have been completed.

5.2.2 In the case of billing according to the length measure, the length of the processing of the respective recesses shall be used as a basis for the processing, adaptation or connection to recesses ≥ 0.1 m2 individual size.

5.3 Overmeasurement rules

The following are measured:

5.3.1 When billed according to area

- Fugues
- Recesses ≤ 0.1 m2 single size.

5.3.2 When billing according to length

- Fugues
- Interruptions ≤ 1 m individual length.

5.4 Individual provisions

In the case of billing by mass for the filling of the subsoil, billing is to be made according to weighing certificates.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Joinery — DIN 18355

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

These notices do not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

Type, location, dimensions and design as well as dates of assembly and dismantling of on-site scaffolding.

0.2 Information on the execution

0.2.1 Number, type, location, dimensions, materials and design of components to be manufactured, e.g. doors, gates, windows, window elements, (hinged) shutters, partition walls, wall and ceiling cladding, wall units, interior fittings, built-in furniture.

0.2.2 Execution according to the execution plan or according to local measurements.

0.2.3 Type, characteristics and grades of the wood to be used.

0.2.4 Type, nature and strength of the substrate.

0.2.5 Number, type, dimensions and design of terminations and connections to adjacent components or structures. Type, dimensions and formation of waterproofing.

0.2.6 Type and nature of existing connections.

0.2.7 Types of stops, e.g. blunt, outer stop, inner stop.

0.2.8 Type of substructure for ceiling and wall coverings.

0.2.9 Type of component fastening.

0.2.10 Design and division of surfaces, special laying methods and grid and joint formation. Covering joints.

0.2.11 Consideration of the installation of roller shutters.

0.2.12 Type of surface treatment.

0.2.13 Type and extent of corrosion and wood protection.

0.2.14 Use of dark paints on components exposed to the outside climate.

Section 3.1.3	if tolerances other than those listed therein are to apply,
Section 3.3.1,	if narrow surfaces of plywood, chipboard and composite panels that remain visible are not to be veneered, but are to be coated, for example,
Section 3.3.5,	if furniture surfaces are to comply with a higher stress group,
Section 3.5.3.2,	if the type of insulation material is to be specified to the Contractor,
Section 3.5.3.3	if the connection joint is not to be made permanently airtight,
Section 3.5.4,	if cavities between frames and building structures are to be filled in the case of apartment doors or if the type of insulation material is to be specified to the contractor,

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Section 3.5.3.3	if the connection joint is not to be made permanently airtight,
Section 3.5.4,	if cavities between frames and building structures are to be filled in the case of apartment doors or if the type of insulation material is to be specified to the contractor,

Section 3.10,	if a building material other than hardwood is to be used for sleepers,
Section 3.13.3.2	if exterior components are to be provided with more than one primer coat and one intermediate coat before installation and before glazing.

0.4 Individual information on fringe benefits and special benefits

As ancillary services, for which special ordinal numbers (items) are to be provided under the conditions of ATV DIN 18299, Section 0.4.1, the installation of necessary wheel chocks and the production of relinquishments can be considered in particular (see Section 4.1.1).

0.5 Billing Units

In the bill of quantities, the billing units are to be provided as follows:

0.5.1 Area (m2), separated by type and dimensions, for

- wall and ceiling cladding,
- Surface treatment.

0.5.2 Dimensions of length (m), separated by type and dimensions, for

- Achieve
- Dazzle
- Closing and closing profiles,
- seals,
- Shadow gaps,
- Reveal clothing and the like.

0.5.3 Number (pcs), separated by type and dimensions, for

- Windows, doors, gates,
- window sills and the like,
- roller shutter covers,
- Shutters
- Lining and clothing,
- Frames
- Wardrobes
- Surface treatment
- Recesses for columns, pillar templates, installation and installation parts and the like.

1 Scope of application

1.1 ATV DIN 18355 "Carpentry" applies to the manufacture and installation of components made of wood and plastic, e.g. doors, gates, windows, window elements,

(hinged) shutters, partition walls, wall and ceiling cladding, wall units, interior fittings, built-in furniture. It also applies to wood-metal constructions.

1.2 ATV DIN 18355 does not apply to

- Exterior wall cladding with substructures (see ATV DIN 18351 "Rear-ventilated façades"),
- fittings (see ATV DIN 18357 "Fittings") and
- glazing (see ATV DIN 18361 "Glazing work").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18355 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

For the most common substances and components, the DIN standards and other requirements are listed below.

2.1 Wood

2.1.1 In particular, the following shall apply to solid timber

DIN 4072	Spun boards made of coniferous wood
DIN 68120	Wooden profiles — basic shapes DIN 68125-1 skirting boards made of European (except Nordic) woods
DIN 68126-1	Profile boards with shadow groove — Dimensions
DIN 68127	Acoustic Boards
DIN EN 942	Wood in joinery — General requirements
DIN EN 975-1	Sawn timber — Grading according to the appearance of hardwood — Part 1: Oak and beech
DIN EN 1313-1	Round and sawn timber — Permissible deviations and preferred dimensions — Part 1: Softwood sawn timber
DIN EN 1313-2	Round and sawn timber — Permissible deviations and preferred dimensions — Part 2: Hardwood sawn timber
DIN EN 13307-1	Timber scantlings and semi-finished sections for non-structural applications — Part 1: Requirements
DIN EN 14080	Timber structures — Glulam and beam laminated timber — Requirements
DIN EN 14519	Solid softwood interior and exterior cladding — Tongue-and-groove profiled timber

2.1.2 For the components concealed after installation, at the option of the Contractor, use the type of wood prescribed for the non-concealed components or an equally suitable building material, e.g. in the case of wall cabinets or wall coverings.

2.1.3 The moisture content of fully assembled wooden parts may be up to 10 % in relation to the kiln weight when leaving the manufacturing plant for interior fittings which are not in contact with the outside air, and up to 15 % for components which are in constant contact with the outside air.

This moisture content must be proven at the request of the client.

2.2 Wood-based materials

2.2.1 General

DIN EN 13986	Wood-based materials for use in construction — Properties, assessment of conformity and marking
DIN EN 14322	Wood-based panels — Melamine-coated panels for indoor use — Definition, requirements and classification

2.2.2 Sperrholz

DIN 68705-2	Plywood — Part 2: General purpose rod and rod plywood
DIN EN 315	Sperrholz — Maßtoleranzen
DIN EN 635 (all parts)	Plywood — classification according to the appearance of the surface
DIN EN 13986	Wood-based materials for use in construction — Properties, assessment of conformity and marking The surfaces of components made of plywood that remain visible must meet at least the appearance class E according to DIN EN 635 (all parts).

2.2.3 Particleboard

DIN EN 312	Particleboard — Requirements

2.2.4 Fibreboard

DIN EN 622 (all parts)	Fibreboard — Requirements

2.3 Panels

DIN 68740-2	Panels — Part 2: Veneer top layers on wood-based materials

2.4 Veneers

DIN 4079	Furnaces — Dicken

2.5 Insulation materials

DIN EN 13162	Thermal insulation products for buildings — Factory made mineral wool (MW) products — Specification
DIN EN 13163	Thermal insulation products for buildings — Factory-made expanded polystyrene (EPS) products — Specification
DIN EN 13164	Thermal Insulation Products for Buildings — Factory Made Extruded Polystyrene Foam (XPS) Products — Specification
DIN EN 13165	Thermal insulation products for buildings — Factory made rigid polyurethane foam (PU) products — Specification
DIN EN 13166	Thermal insulation products for buildings — Factory made phenolic resin foam (PF) products — Specification
DIN EN 13167	Thermal Insulation Products for Buildings — Factory Made Foam Glass (CG) Products — Specification
DIN EN 13168	Thermal insulation products for buildings — Factory made wood wool (WW) products — Specification
DIN EN 13169	Thermal Insulation Products for Buildings — Factory Manufactured Expanded Perlite (EPB) Products — Specification
DIN EN 13170	Thermal insulation products for buildings — Factory made expanded cork (ICB) products — Specification
DIN EN 13171	Thermal insulation products for buildings — Factory made wood fibre (WF) products — Specification

2.6 Plastic coating plates and films

DIN EN 438-1	Decorative high-pressure laminate boards (HPL) — Sheets based on hardenable resins (laminates) — Part 1: Introduction and general information

2.7 Adhesives and glues

DIN EN 204	Classification of Thermoplastic Wood Adhesives for Non-Structural Applications

2.8 Sealants

DIN 18545	Sealing of glazing with sealants — Requirements for glass seams and glazing systems

2.9 Fasteners and fasteners

DIN 95	Slotted Countersink Wood Screws

DIN 96	Slotted Half Round Wood Screws DIN 97 Slotted Countersunk Wood Screws
DIN 68150-1	Wooden dowels — Dimensions, technical delivery conditions
DIN EN 10230-1	Nails of steel wire — Part 1: Loose nails for general use

2.10 Holzbeizen

Wood stains must be designed in such a way that they change the colour of the wood surface, but the structure of the wood is retained or highlighted.

2.11 Wood preservatives and primers

DIN 68800-3	Wood protection — Part 3: Preventive protection of wood with wood preservatives

Wood preservatives must be compatible with paints and odourless in the case of interior coatings.

2.12 Windows and doors

DIN 18055	Criteria for the use of windows and external doors according to DIN EN 14351-1
DIN 18101	Doors — Doors for residential construction — Sizes of door leaves, hinge seat and lock seat — Interdependence of dimensions
DIN 68121-1	Wooden profiles for windows and french doors — Dimensions, quality requirements
DIN 68121-2	Wooden profiles for windows and french doors — General principles
DIN 68706-1	Interior doors made of wood and wood-based materials — Part 1: Door leaves; Terms, Dimensions, Requirements
DIN EN 755-1	Aluminium and aluminium alloys — Extruded rods, tubes and profiles — Part 1: Technical delivery conditions
DIN EN 755-2	Aluminium and aluminium alloys — Extruded rods, tubes and profiles — Part 2: Mechanical properties
DIN EN 755-9	Aluminium and aluminium alloys — Extruded bars, tubes and profiles — Part 9: Profiles, limit dimensions and dimensional tolerances
DIN EN 12020-1	Aluminium and aluminium alloys — Extruded precision profiles made of alloys EN AW-6060 and EN AW-6063 — Part 1: Technical delivery conditions

DIN EN 12020-2	Aluminium and aluminium alloys — Extruded precision profiles made of alloys EN AW-6060 and EN AW-6063 — Part 2: Limit dimensions and dimensional tolerances
DIN EN 14351-1	Windows and doors — Product standard, performance characteristics — Part 1: Windows and exterior doors

2.13 Furniture fittings

DIN EN 15338	Furniture fittings — Strength and durability of pull-outs and their components
DIN EN 15570	Furniture fittings — Strength and durability of hinges and their components — Hinges with vertical axis of rotation
DIN EN 16014	Furniture fittings — Strength and durability of locking mechanisms

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 For standardised components, there is no need to take measurements on the construction site. For non-standardised components, the contractor must check the dimensions before commencing production on the construction site.

3.1.2 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- Lack of opportunities to check the dimensions on the construction site before starting production,
- lack of prerequisites for fastening and sealing,
- greater dimensional deviations of the subsoil than permissible according to DIN 18202 "Tolerances in building construction — Structures",
- lack of structural wood protection,
- incorrect position and height of supports and other substructures,
- lack of reference points,
- too high building moisture.

3.1.3 Deviations from prescribed dimensions shall be permitted in the

DIN 18202	Tolerances in Building Construction — Structures
DIN 18203-3	Tolerances in Building Construction — Components of Wood and Wood-Based Materials

certain limits.

Unevenness in the surfaces that becomes visible in grazing light is permissible if it does not exceed the limit values according to DIN 18202.

3.1.4 Specified dimensions apply to the finished wood.

3.1.5 All components must be manufactured in such a way that they do not warp when properly handled and used.

3.2 Components made of solid wood

3.2.1 In the dimensions of planed and non-planed timber, dimensional deviations are permissible in accordance with the relevant standards.

3.2.2 Solid woods must be bonded together in such a way that the woods can swell and shrink in the event of fluctuations in humidity without affecting the bonds.

3.2.3 Solid wood may also be used in layers if the individual layers are made of the same type of wood.

3.2.4 In the case of non-opaque paint, finger jointing is only permissible with the consent of the client and must be carried out in accordance with DIN EN 13307-1.

3.3 Barrier, veneering, coating

3.3.1 Narrow surfaces of plywood, chipboard and composite panels that remain visible, with the exception of the narrow surfaces of barrier doors, must be veneered. Natural colour differences between veneered surfaces and narrow surfaces are permitted.

3.3.2 In the case of coated surfaces, joints and unevenness of the substrate must not be visible.

3.3.3 Top veneers or coatings must close tightly in the joints and must not have any unglued areas.

3.3.4 Burl veneers must be secured against tearing. Hairline cracks are permitted.

3.3.5 Furniture surfaces must comply with at least the lowest stress group from the following standards:

DIN 68861-4	Furniture surfaces — Part 4: Behaviour under scratch stress
DIN EN 12720	Furniture — Evaluation of the resistance of surfaces to cold liquids
DIN EN 12721	Furniture — Evaluation of the resistance of surfaces to damp heat
DIN EN 12722	Furniture — Evaluation of the resistance of surfaces to dry heat
DIN EN 15186	Furniture — Evaluation of scratch resistance of surfaces

3.4 Verleimen

The type of gluing must be selected according to the installation location and the intended use of the component in accordance with DIN EN 204.

3.5 Installation

3.5.1 Components must be fastened and supported in such a way that the forces are safely transferred to the building structure and movements from the components are absorbed. Fasteners must be corrosion-protected.

3.5.2 Components in interior lining which are given an opaque coating after installation may be visible, but must then be recessed. Components in the interior lining that have not been given an opaque coat of paint or have been finished before installation must be concealed.

3.5.3 Exterior components

3.5.3.1 The waterproofing between external components and the building structure must be circumferential, durable and driving rain-proof.

3.5.3.2 The joints remaining on the inside of the room between external components and the building structure must be completely filled with insulating materials. The choice of insulation material is left to the contractor. The use of the selected insulation material must not interfere with the construction process. When using in-situ foams, the adjacent surface-finished components, e.g. by masking that can be removed without leaving any residue.

3.5.3.3 Connection joints must be permanently sealed on the inside so that they are impermeable to air.

3.5.4 Cavities between the frames and the structure of apartment doors must be completely filled with insulating materials, Section 3.5.3.2 applies mutatis mutandis. The building authority requirements for apartment buildings must be observed.

3.5.5 Detachable components and their frames must be permanently marked as belonging together in an inconspicuous place. The marking must remain visible even after painting.

3.6 Windows

3.6.1 Profiles must be designed in such a way that water is drained. For wooden window profiles, the specifications according to DIN 68121-1 and DIN 68121-2 apply.

3.6.2 Seam seals must be replaceable, circumferential in one plane and tight in the corners.

3.6.3 In the case of wood-aluminium windows, there must be an air space between the wood and the aluminium frame. This air space must have openings for vapour pressure equalisation with the outside air.

3.6.4 Frame joints in wooden windows must be glued over the entire surface — including on balustrades. Aluminium frames of wood-aluminium windows must be connected at the corners in a system-appropriate manner. Frame corners of plastic windows must be welded.

3.6.5 Outer blow bars are to be glued to the frame timber, inner blow bars are to be screwed together. If the weather strip and the lower sash frame wood are not made of one piece, the weather strip must be glued to the frame wood.

3.6.6 Wooden rungs must be professionally connected to each other and to the frame, e.g. leafed, mortised, doweled.

3.6.7 Glass retaining strips made of wood must be nailed concealed or fastened in accordance with DIN 68121-2. In addition, DIN 18545 applies. 3.6.8 Depending on the size of the arches, arch-shaped frame timbers must be made from several pieces and connected with finger joints or tenons.

3.7 Window sills and intermediate lining

Window sills, lining and intermediate lining must be connected to the frame in such a way that warping or warping as well as damage to the building structure due to temperature or material-related changes in length are avoided.

3.8 Window and door shutters

In the case of chiseled window and door shutters, the upper frame timbers must go through. The vertical frame timbers are to be tapped concealed into the upper frame timbers. The gluing of exterior components must comply with stress group D 4 according to DIN EN 204.

3.9 Doors and gates

3.9.1 Frame Doors and Frame Gates

3.9.1.1 Frame timbers must be connected to each other professionally, e.g. by mortise or dowel fastening; they may be glued from a width of 100 mm.

3.9.1.2 Fillings must be fastened in such a way that temperature or fabric-related dimensional changes do not cause damage.

3.9.1.3 Section 3.6.5 applies to blow bars and weather strips.

3.9.2 Smooth Doors and Smooth Gates

DIN 68706-1 applies to smooth door leaves. Section 3.9.1 shall apply mutatis mutandis to the frame substructures of smooth gates.

3.10 Chuck and Sides

The components must be professionally connected to each other at the corners, e.g. by falsification, doweling, galvanizing, tenoning, concealed screwing. Hardwood is to be used for sleepers.

3.11 Cladding, suspended ceilings, facing shells, non-load-bearing partition walls

3.11.1 Visible edge angles, cover strips and shadow gap cover strips must be butt-butted at the corners and on the boundary surfaces, edge angles must be adapted to the course of the wall or ceiling.

3.11.2 Insulation layers to be installed must be laid tightly jointed over the entire surface in a bond and must be laid in a non-slip manner and connected to boundary components.

3.11.3 Ceiling cladding and suspended ceilings must be manufactured in accordance with DIN EN 13964.

3.11.4 When using wood wool and multi-layer lightweight panels as thermal insulation materials, DIN 4108-10 "Thermal insulation and energy saving in buildings — Part 10: Application-related requirements for thermal insulation materials — Factory-made thermal insulation materials" in conjunction with DIN EN 13168 must be observed.

3.11.5 Sound-insulating cladding must be designed in accordance with the DIN 4109 series of standards "Sound insulation in building construction".

3.11.6 Non-load-bearing partition walls shall be constructed in accordance with DIN 4103-1 "Non-load-bearing internal partition walls — Part 1: Requirements and verifications".

3.12 Built-in wardrobes

3.12.1 The following shall apply to the design and installation of built-in wardrobes:

- for kitchens DIN EN 14749 "Furniture — Living room and kitchen container furniture and kitchen worktops — Safety requirements and test methods",
- for shelves DIN 68874-1 "Furniture shelves and shelf supports — Requirements and testing in furniture".

Built-in cupboards in front of exterior walls and walls in front of damp rooms must be connected to the building in such a way that sufficient rear ventilation is ensured.

3.12.2 Doors, flaps, furniture roller shutters and drawers must fit flat and be easy to move in accordance with the chosen construction. Classic guides are made of hardwood, HPL or plastic.

3.12.3 Frame plinth structures and shelves of cupboards, shelves and drawers must be dimensioned and arranged in such a way that they correspond to the expected load. In particular, the following material-specific thicknesses apply:

- for back walls, inserted floors, corrugated floors and fillings made of plywood ≥ 6 mm, made of chipboard (P2 according to DIN EN 312) ≥ 8 mm,
- for plywood drawer shelves with a size > 0.25 m2 ≥ 6 mm.

3.13 Surface Treatment

3.13.1 General

3.13.1.1 Wooden surfaces that remain visible must be cleaned, e.g. by planing, sanding; Planing blows must not be recognizable. Wood must be locked as far as its ingredients require it and finely sanded only after sufficient drying.

3.13.1.2 Surface treatments of cladding with boards and fillings must be carried out over the entire surface of the components before they are installed.

3.13.2 Pre-treatment of the wood surface

The surface of the wood must not have any torn areas, annoying residues in pores and visible streaks from cross-sanding. In addition, veneered surfaces must not have any plastered areas and no visible glue penetrations.

3.13.3 Surface Treatment of Exterior Components

3.13.3.1 The protection of the wood of external components must comply with DIN 68800-3.

3.13.3.2 Exterior components must be provided with at least one primer coat and one intermediate coat on all sides before installation and glazing. Weather protection rails, fittings, other metal parts and seals may not be applied until after the first intermediate coat at the earliest.

3.13.4 Surface Treatment of Interior Components

3.13.4.1 Stains must be evenly distributed without streaks and brush attachments. Drivers, wipers, light-coloured streaks, light-coloured unstained pores or oil stains must not occur. Differences in colour between longitudinal wood and end-grain wood surfaces are permissible.

3.13.4.2 Mattins or waxes must be applied in such a way that the treated area does not remain rough or appear obscured. The pores of the surfaces must not be closed.

3.13.4.3 When polishing, a drying time appropriate to the polishing material used and the porosity of the wood processed shall be observed. The color of pore fillers must match the color of the wood. Polished surfaces must not appear veiled or wavy and must not show a gray shimmer. Residues of pore fillers and oil deflection must be removed. The pores of the surface must be completely closed.

3.14 Constructive and chemical wood protection

3.14.1 DIN 68800-2 "Wood protection — Part 2: Preventive structural measures in building construction" must be observed for all timber construction work.

3.14.2 The chemical protection of construction timber and the chemical protection of wood-based materials shall be carried out in accordance with DIN 68800-3. The process of processing wood preservatives is left to the contractor.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Installation of necessary chocks and production of relinings.

4.1.2 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on or clad is not higher than 3.50 m above the standing surface of the scaffolding required for this purpose.

4.1.3 Compensation of stepped or inclined standing surfaces of scaffolding up to 40 cm difference in height, e.g. via stairs or ramps.

4.1.4 Protection of furnishings, components and equipment from contamination and damage during joinery work by loose covering, hanging or wrapping, except for protective measures under section 4.2.15.

4.1.5 Installation of the necessary anchoring, connecting and fastening elements, e.g. screws, nails, frame anchors, except for services in accordance with section 4.2.7.

4.1.6 Taking into account deviations of the finished dimensions from the widths and heights of the windows specified in the service description or drawing, doors and gates or equivalent dimensions of other components ≤ 5% of each of these dimensions, but ≤ 50 mm,

- if the necessity of the deviations is determined before the start of production or should have been determined by the contractor,
- if the external dimensions of the frame differ uniformly for the total quantities of the individual items,
- if the deviation does not necessitate a design change for structural reasons.

4.1.7 Precautions for working with in-situ foam, e.g. masking of adjacent surface-finished components, moistening of the substrate, measures at low temperatures.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 Provision of recreation and storage rooms if the Client does not provide rooms that can be easily locked.

4.2.2 Assembly, conversion and dismantling as well as provision of scaffolding for the services of other contractors.

4.2.3 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on or clad is higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.2.4 Erection, conversion and dismantling as well as provision of scaffolding with a stepped or inclined footprint, e.g. over stairs or ramps, if compensation of more than 40 cm is required.

4.2.5 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the depth of the gripping space is more than 60 cm, e.g. in the case of glass roofs.

4.2.6 Cleaning the substrate of coarse soiling, e.g. plaster residues, mortar residues, paint residues, oil, insofar as this was not caused by the contractor.

4.2.7 Installation of structurally verifiable anchoring, connecting and fastening elements as well as fastenings on steel.

4.2.8 Subsequent sealing of connection joints, insofar as these services cannot be provided continuously in the course of the assembly work.

4.2.9 Installation of cover strips when connected to other components.

4.2.10 Production of samples, insofar as they are not included in the service.

4.2.11 Installation of seals supplied on site.

4.2.12 Removing and reinserting seam seals.

4.2.13 Preparation of building physics verifications as well as static calculations and the drawings required for these verifications.

4.2.14 Services for fire, sound, heat, moisture and radiation protection, insofar as they go beyond the services under Section 3.

4.2.15 Special protection of building and plant components as well as furnishings, e.g. masking of windows, doors, floors, coverings, stairs, wood, roof surfaces, surface-finished parts, dust-proof masking of sensitive equipment and technical equipment, dust protection walls, emergency roofs, laying of hardboard or building protection films from 0.2 mm thick.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

5.1.1 The determination of the service — regardless of whether it is carried out according to drawings or measurements — shall be based on the dimensions of the

- manufactured components,
- garments produced,

The simplifying rules such as overmeasurement rules and individual regulations are to be used to determine performance. On surfaces with limiting components, the dimensions up to the bounding, unplastered components are to be taken as a basis. Facing shells and the like are considered limiting components as long as they are not penetrated or undercut.

5.2 Determination of dimensions/quantities

5.2.1 When determining the length dimension, the largest component length, if any, is measured.

5.2.2 Directly connected, different types of recesses, e.g. opening with adjacent niche, are calculated separately.

5.2.3 Clad back surfaces of niches and reveals are calculated separately with their dimensions, regardless of whether the recesses are overmeasured or not.

5.2.4 If a recess is proportionately integrated into adjacent surfaces that are to be calculated separately, the respective proportionate recess area is calculated to determine the overmeasurement variable.

5.3 Overmeasurement rules

The following are measured:

5.3.1 If billed according to area size:

- Recesses, e.g. openings (also floor-to-ceiling), niches, ≤ 2.5 m2 individual size, in shelves recesses ≤ 0.5 m2 individual size. When determining the individual size, the smallest dimensions of the recess shall be taken as a basis,
- interruptions in the clad area by components, e.g. trusses, columns, beams, rafters, battens, with an individual width ≤ 30 cm,
- skirting boards and constructions ≤ 10 cm high,
- interstices of cladding made of slats, boards, panels, slats and the like,
- Fugues.

5.3.2 If billed according to length: Interruptions with a single length ≤ 1 m.

5.4 Individual provisions

No regulations.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Parquet and wooden paving work — DIN 18356

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

No supplementary regulation to ATV DIN 18299, section 0.1.

0.2 Information on the execution

0.2.1 Type, dimensions and nature of the substrate.

0.2.2 Special thermal influences and moisture effects on the substrate, from bottom to top and from outside to inside.

0.2.3 Type of heating/cooling in heated/cooled floor structures.

0.2.4 Type of pre-treatment of the substrate e.g. brushing, sanding, vacuuming, pre-painting, full-surface filling.

0.2.5 Anzahl und Art der geforderten Proben.

0.2.6 Deviation of the substrate from the horizontal.

0.2.7 Species of wood, type of parquet, quality and dimensions of parquet timber. Wood type and height of the wooden paving blocks. Laying method and direction.

0.2.8 Exceptional indoor climatic conditions and temperature conditions.

0.2.9 Intended use of the rooms; intended use of the parquet and wooden paving, e.g. pressure and shear loads caused by traffic.

0.2.10 Wood type and width of wall and intermediate friezes.

0.2.11 Wood species, dimensions and profiles of skirting boards and skirting boards (see section 2.2).

0.2.12 Type, location, dimensions and design of connection and movement joints.

0.2.13 Number, type, location and dimensions of installation and installation parts, machine foundations and the like.

0.2.14 Type of surface treatment, e.g. grinding, sealing, waxing, oiling.

0.2.15 Number, type, position and dimensions of the recesses to be made.

0.2.16 Shape of the area to be covered that deviates from the rectangle, e.g. oblique-angled surfaces, round surfaces, spiral stairs and their dimensions.

0.2.17 Location of unrecognisable pipes, pipes and the like in the floor and wall area.

0.2.18 Type and quality of documents to be used.

0.2.19 Protection of building or plant components, furnishings and the like, e.g. by means of protective covers.

0.2.20 Direction of installation of parquet and wooden paving floors.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 2.2,	if other quality requirements are to apply to wooden skirting boards and cover strips,
Section 3.2.1.1,	if parquet is to be produced from a different grade,
Section 3.2.1.2,	if parquet is to be laid on underlays,
Section 3.2.1.3,	if a certain laying direction is required for parquet,
Section 3.2.1.7	if joints on end rails and separation rails are to be filled with a specific substance,

Section 3.2.6,	if skirting boards are not to be fastened with steel pins, but e.g. with screws or by gluing,
Section 3.3.1,	if wooden paving is to be laid on underlays;
Section 3.3.2,	if a certain direction of installation is required for wooden paving,
Section 3.4.1	if parquet is not to be sealed, but is to be carried out with another surface treatment, e.g. oiling, waxing,
Section 3.4.2,	if a specific agent is to be used for sealing,
Section 3.5.1.1	if RE and WE wooden pavements are not to be sealed, but are to be carried out with another surface treatment, e.g. oiling, waxing.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units are to be provided as follows:

0.5.1 Area (m2), separated by type and dimensions, for

- Pre-treatment of the substrate, e.g. cleaning, filling, sanding,
- Parquet
- Holzpflaster,
- Data
- Protective cover
- Surface treatment.

0.5.2 Dimensions of length (m), separated by type and dimensions, for

- cutting off covers and the protrusions of edge insulation strips,
- Mouldings, profiles, edges, rails, as well as their surface treatment,
- Adapting to limiting components, e.g. built-in parts, furnishings and the like,
- Fugues.

0.5.3 Number (pcs), separated by type and dimensions, for

- Inspection flaps, openings and the like,
- Covering and surface treatment of steps, door sills and the like,
- Rosettes.

1 Scope of application

1.1 ATV DIN 18356 "Parquet and wooden paving work" applies to the laying of parquet and wooden paving indoors.

1.2 ATV DIN 18356 does not apply to the laying of joists and blind floors (see ATV DIN 18334 "Carpentry and timber construction work").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18356 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

For the most common substances and components, the DIN standards and other requirements are listed below.

2.1 Parquet and wooden paving

DIN 68702	Wooden paving DIN EN 13226 Wooden floors — Solid wood elements with tongue and/or groove
DIN EN 13227	Wood flooring — solid wood lam parquet products
DIN EN 13228	Wood Flooring — Solid Wood Overlay Parquet Strips Including Parquet Blocks with a Connection System
DIN EN 13488	Floors — Mosaic parquet elements
DIN EN 13489	Wood Flooring and Parquet — Multilayer Parquet Elements
DIN EN 13629	Wood Flooring — Solid Hardwood Planks and Composite Solid Hardwood Plank Elements
DIN EN 13990	Wood Flooring — Solid Softwood Floorboards DIN EN 14342 Wood Flooring and Parquet — Characteristics, Assessment of Conformity and Marking
DIN EN 14761	Wooden flooring — Solid wood parquet flooring — Upright lamella, wide slat and modular block Parquet and wooden paving must not have a moisture content other than that permissible according to the above-mentioned standards, even when delivered to the place of use.

2.2 Wooden skirting boards and skirting boards

For wooden skirting boards and cover strips, the quality regulations for standardised parquet timber apply mutatis mutandis.

2.3 Nails

DIN EN 10230-1	Nails of steel wire — Part 1: Loose nails for general use

2.4 Adhesives

2.4.1 General

Adhesives must be designed in such a way that they achieve a strong and permanent bond. They must not adversely affect parquet and wooden paving, underlays and substrates and must not cause any nuisance due to odours after application.

2.4.2 Adhesives for parquet

DIN EN 14293	Adhesives — Adhesives for bonding parquet to a substrate — Test methods and minimum requirements

2.4.3 Adhesives for wooden paving

DIN 68702	Wooden paving

2.5 Surface treatment agents

Surface treatment agents must be designed in such a way that they protect the surface of the parquet and wooden pavement against the temporary penetration of dirt and liquids in conjunction with the appropriate care measures.

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- incorrect elevation of the surface of the subsoil in relation to the elevation of adjacent components,
- greater unevenness of the subsoil than permissible according to DIN 18202 "Tolerances in building construction — Structures",
- Cracks in the substrate, surface of the substrate that is not sufficiently firm, too porous, too rough or contaminated,
- lack of rails, sleepers and the like as a stop for wooden pavements,
- Lack of protrusion of the edge insulation strip,
- insufficiently dry ground with regard to the readiness for covering,
- Lack of marking of measuring points in heated floor constructions,
- unsuitable temperature of the substrate,
- unsuitable conditions resulting from the weather or the indoor climate.

3.1.2 In the event of unsuitable conditions resulting from the weather or the indoor climate, e.g. component temperatures below 15 °C during installation work, special measures must be taken in consultation with the Client. If services are required for this, these are special services (see section 4.2.16).

3.1.3 Deviations from prescribed dimensions are permissible within the limits specified by DIN 18202. Unevenness in the surfaces that become visible in grazing light Surfaces

of components are permissible if they do not exceed the limit values according to DIN 18202. If increased requirements are placed on flatness in accordance with DIN 18202:2013-04, Table 3, line 4, or other increased requirements on dimensional accuracy compared to the values listed in DIN 18202, the required services are special services (see section 4.2.1).

3.1.4 Before laying parquet and wooden paving, the substrate must be sufficiently dry. In order to avoid damage to the heating installation, moisture measurements in heated floor constructions may only be carried out at the marked measuring points.

3.1.5 The Contractor shall provide the Client with written care instructions. These must also contain information about the appropriate indoor climate.

3.2 Laying parquet

3.2.1 General

3.2.1.1 Parquet must be made from elements of grade O. Softwood floorboards are to be made from grade A. Skirting boards and skirting boards that are not to be painted opaque must comply with the grading specified for the parquet.

3.2.1.2 Parquet must be laid without an underlay.

3.2.1.3 The direction of laying is left to the Contractor.

3.2.1.4 Parquet elements must not have a moisture content other than that permitted by the standards in section 2.1 when they are laid.

3.2.1.5 The average moisture content of the parquet elements (upon delivery) must be determined according to the expected indoor climate.

3.2.1.6 Joints must be made between the parquet and adjacent fixed components, e.g. walls, pillars, columns. Their width is to be determined according to the type of parquet, the method of installation and the dimensions of the parquet surfaces.

The same applies mutatis mutandis to joints between underlays and adjacent fixed components.

3.2.1.7 Joints must be made on end rails and separation rails if this is necessary according to the type of parquet and the method of installation. These joints must be filled with a suitable material of the contractor's choice.

3.2.1.8 Movement and edge joints in the subsoil must not be closed in a force-fit manner or otherwise impaired in their function. Movement joints must be adopted constructively with the same possibility of movement.

3.2.1.9 False joints in the substrate must be permanently closed in a force-fit manner.

3.2.2 Nailed parquet

Parquet strips, parquet planks and multi-layer parquet must be connected to each other in a system-appropriate manner, laid tightly and nailed concealed. For all-round grooved

elements müssen die Federn auf der ganzen Länge der Nuten verteilt und fest be trapped. The proportion of springs must be at least 3/4 of the length of the groove.

3.2.3 Glued parquet

The parquet elements must be laid tightly and in accordance with the system and glued with a parquet adhesive in accordance with DIN EN 14293. The selection of the parquet adhesive to be used depends on both the substrate and the type of parquet to be glued. The parquet adhesive must be applied to the substrate over the entire surface.

3.2.4 Floating parquet

Parquet elements that are laid floating/loose must be connected on the long and top sides in a system-appropriate manner.

3.2.5 Parquet underlays

The underlay must be matched to the type of parquet and the superstructure construction. In the case of parquet flooring in accordance with Section 3.2.3, underlay boards to be laid floating must be designed diagonally to the direction of installation of the parquet.

3.2.6 Skirting boards and cover strips

Skirting boards and cover strips must be mitred at corners and joints. Skirting boards must be permanently attached to the wall by nailing at intervals of less than 60 cm. Cover strips are to be fastened with wire pins.

3.2.7 Sanding Nailed parquet must be sanded evenly after installation, glued parquet after the parquet adhesive has sufficiently hardened. The number of sanding passes and the fineness of the grinding depend on the agreed surface treatment.

3.3 Laying wooden paving

DIN 68702 applies to the design.

3.3.1 Wooden paving must be laid without underlay.

3.3.2 Blocks shall be laid in combination with straight-line longitudinal joints. The direction of laying is left to the contractor.

3.3.3 Joints must be created between the wooden pavement and adjacent fixed components, e.g. walls, pillars, columns. Its width is to be determined according to the type of wooden paving, the method of laying and the dimensions of the wooden paving surfaces. The same applies mutatis mutandis to joints between underlays and adjacent fixed components.

3.3.4 Joints must be made on end rails and dividing rails if this is necessary according to the type of wooden paving and the method of installation. These joints must be filled with a suitable fabric.

3.3.5 Movement joints in the subsoil must be adopted in the same place and with the same possibility of movement in the wooden pavement and in the underlay.

3.3.6 Wooden paving RE and WE in accordance with DIN 68702 must be sanded evenly after installation. The number of sanding passes and the fineness of the grinding depend on the agreed surface treatment.

3.4 Surface treatment of parquet

3.4.1 Parquet must be sealed immediately after sanding.

3.4.2 The type of sealant and sealant must be selected according to the intended use of the room and the intended load and adapted to the respective type of wood.

3.4.3 The sealing must be carried out in such a way that an even surface is created.

3.4.4 If a different surface treatment has been agreed, e.g. oiling, waxing, sections 3.4.2 and 3.4.3 shall apply mutatis mutandis.

3.5 Surface Treatment of Wooden Pavement

3.5.1 Wooden paving RE and WE

3.5.1.1 Wooden paving RE and WE in accordance with DIN 68702 must be sealed immediately after sanding.

3.5.1.2 The type of sealant and sealant must be selected according to the intended use of the room and the intended use and adapted to the respective type of wood.

3.5.1.3 The sealing must be carried out in such a way that an even surface is created.

3.5.1.4 If a surface treatment other than sealing has been agreed, e.g. oiling, waxing, sections 3.5.1.2 and 3.5.1.3 shall apply mutatis mutandis.

3.5.2 Wooden paving GE Wooden paving GE in accordance with DIN 68702 must be treated immediately after installation to delay moisture absorption.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Cleaning of the substrate, except for services according to section 4.2.3.

4.1.2 Finishing the parquet and wooden paving on components, built-in parts or furnishings, except for services according to section 4.2.9.

4.1.3 Compensation of flatness deviations of the substrate up to 1 mm.

4.1.4 Barrier measures up to the accessibility of the parquet and wooden pavement.

4.1.5 Submission of ready-made samples.

4.1.6 Initial examination of the substrates to determine the readiness for covering.

4.1.7 Protection of building and plant components from contamination and damage during parquet and wooden paving work by loose covering, hanging or wrapping, except for protective measures according to section 4.2.20.

4.1.8 Completion of components in several work steps to enable work by other contractors, insofar as the company's own services can be provided continuously in the course of similar parquet and wooden paving work. If these requirements are not met, they are special benefits according to section 4.2.22.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 Meeting increased requirements for flatness or dimensional accuracy in accordance with Section 3.1.3.

4.2.2 Provision of recreation and storage rooms if the Client does not provide rooms that can be easily locked and, if necessary, heated for the storage of parquet elements and wooden paving.

4.2.3 Removal of soiling/impurities that cannot be removed by grinding and vacuuming, insofar as these have not been caused by the Contractor.

4.2.4 Pre-treatment of the substrate to achieve a good primer for adhesion, e.g. pre-painting, mechanical brushing, sanding and vacuuming.

4.2.5 Compensation of flatness deviations in cases other than in accordance with section 4.1.3 and full-surface filling.

4.2.6 Lining on beams or joists.

4.2.7 Removal of old floor coverings, adhesive and filler layers.

4.2.8 Adjustment of the same height, e.g. to existing stop rails or separation rails.

4.2.9 Adaptation to components, built-in parts or furnishings.

4.2.10 Creation of recesses, joints and connections that remain visible.

4.2.11 Covering floor flaps and the like, e.g. electricians.

4.2.12 Installation of transition, end and separation rails, mats, inspection frames and the like.

4.2.13 Closing and covering joints, e.g. movement, connection and false joints.

4.2.14 Sanding of wooden pavement GE.

4.2.15 Fastening strips with screws and dowels or by gluing.

4.2.16 Services for protection against unsuitable conditions resulting from the weather or the indoor climate in accordance with Section 3.1.2, e.g. heating.

4.2.17 Attaching sound insulation strips to skirting boards.

4.2.18 Cutting off the overhang of edge insulation strips.

4.2.19 Repeated tests required to determine the readiness of the documents in accordance with section 4.1.6.

4.2.20 Special protection of building and plant components as well as furnishings, e.g. masking of windows, doors, floors, coverings, stairs, wood, finished parts, dust-proof masking of sensitive equipment and technical equipment, dust protection walls, laying of hardboard or building protection films from 0.2 mm thick.

4.2.21 Manufacture and installation of patterns or sample surfaces.

4.2.22 Completion of components in several work steps to enable work by other contractors, insofar as the company's own services cannot be provided continuously in the course of similar parquet and wooden paving work (see section 4.1.8).

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

5.1.1 The determination of the performance — regardless of whether it is carried out according to drawings or measurements — shall be based on the dimensions of the area occupied or treated. The simplifying rules, such as overmeasurement rules and individual regulations, are to be applied to determine the benefit.

5.2 Determination of dimensions/quantities

5.2.1 On Surfaces

- with limiting components are the dimensions of the occupied areas up to the bounding, unplastered, unclad components,
- without limiting components, their dimensions are

Facing shells and the like are considered limiting components as long as they are not undercut.

5.2.2 In the case of coverings on steps and sleepers, their largest dimensions shall be taken as a basis.

5.2.3 The length dimension shall be determined on the basis of the largest component length, if any.

5.3 Overmeasurement rules

The following are measured:

5.3.1 When billed according to area

- Recesses, e.g. for piers, pier templates, pipe penetrations, ≤ 0.1 m2 individual size,
- parts subsequently incorporated into floors, e.g. inlays, markings,
- Fugues.

5.3.2 When billing according to length

- Interruptions ≤ 1 m individual length,
- parts subsequently incorporated into floors, e.g. inlays, markings,
- Fugues.

5.4 Individual provisions

No regulations.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Fittings — DIN 18357

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

No supplementary regulation to ATV DIN 18299, section 0.1.

0.2 Information on the execution

0.2.1 Number, type, location, dimensions, materials and design of the fittings or fittings, e.g. attached or recessed locks, hinges, gears, traction bolts, handles, brakes, door closers, closing sequencers, panic door locks.

0.2.2 Type of locks and lock design, e.g. locking type, lock for tubular frame door, furniture lock. Special functions for door closers, e.g. closing delay, opening damping, locking device. Type of activation, safety devices, special functions and the like in the case of automatic door operators, e.g. door closers with automatic opening.

0.2.3 Surface treatment of fittings, e.g. hot-dip galvanised, electro-galvanised and chromated, anodised, chrome-plated, plastic-coated, stove-enamelled.

0.2.4 Colour and, in the case of special requirements, the layer thickness of visible fittings such as handles, door plates, olives, hinges, panic door locks, door closers, levers and the like.

0.2.5 Special physical and chemical stresses to which the fittings are exposed after installation, e.g. high frequency of use, wind loads or temperatures, sea air, industrial air. Contact with food.

0.2.6 Number, type, location, materials, dimensions and dimensions of the building elements to be mounted, e.g. windows, doors, fire doors, gates, built-in cupboards. Number of wings.

0.2.7 Type and dimensions of the recesses in the components to be fogged up, e.g. lock pockets.

0.2.8 Stop of the doors to be fogged up, e.g. rebated, unbleated. Type and dimensions of the folds.

0.2.9 Type of surface treatment of components to be fogged up.

0.2.10 Requirements for locking systems and locking plans. Number, type and locking function of the locking cylinders. Number and numbering of individual locks and keys, including the parent keys such as group, main group, and master keys.

0.2.11 Fastening the straps, e.g. pinning, screwing, welding.

0.2.12 Number, type and location of gate locks on swing gates.

0.2.13 Requirements for fire, sound, heat and radiation protection, ventilation or airtightness and protection against burglary.

0.2.14 Protective treatment of fittings to prevent damage.

0.2.15 Exceptional lengths of keys or cylinders.

0.2.16 Adjusting hardware parts, such as door plates, olives, rosettes and the like, prior to coating work; Removal and attachment to complete the coating work.

0.2.17 Requirements for the opening angle and opening width of windows, doors, gates, built-in cupboards and the like and, in the case of hold-open devices, also for the hold-open points.

0.2.18 Installation of locking devices and closing sequence controllers integrated into or independent of door closers.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 2.1.4,	if a different corrosion protection is required for fittings,
Section 2.2.1	if hinges may allow an opening angle of 90° or less or if the pin is not to be made of steel,
Section 2.2.4.3	if different or more keys are to be supplied than those specified in Table 1,
Section 2.7.1,	if electric door openers do not have to act in such a way that they only allow the door to be opened while the door opener is being operated,
Section 3.2.3,	if the recesses and the like necessary for the fittings are not to be made by the contractor on the components to be shoed,
Section 3.2.15	if folding and harmonica doors and folding gates consisting of more than 3 leaves are not to be equipped with a lower guide.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units are to be provided as follows:

Number (St), separated according to the type and dimensions of the fittings and according to the components to be shoed, for

- fogging of windows, doors, gates, built-in furniture and the like,
- Attaching individual fittings.

1 Scope of application

1.1 ATV DIN 18357 "Fittings" applies to the installation of fittings for manual and automatic opening, closing and locking windows, doors, gates and the like.

1.2 In addition, ATV DIN 18299 "General regulations for construction work of any kind", sections 1 to 5 shall apply. In the event of contradictions, the regulations of ATV DIN 18357 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

For the most common standardized materials and components, the DIN standards and other requirements are listed below.

2.1 General requirements

2.1.1 Fittings that have latches, latches, roller pins, tongues or other locking devices must be supplied with suitable fittings in which the bolts and the like can engage, e.g. strike plates, striking pistons.

2.1.2 Latches must be easily movable, but must be fixed in the end positions by locking or self-inhibiting. For edge bolts, hole or handle sliders are sufficient.

2.1.3 Fittings requiring maintenance must be designed in such a way that they are easy to maintain after installation.

2.1.4 Corrosion protection classes for locks and fittings on external windows, external doors and gates as well as in damp rooms are specified in DIN EN 1670 "Locks and building fittings — Corrosion resistance — Requirements and test methods".

2.2 Door fittings

2.2.1 Türbänder

DIN 18268	Building fittings — Door hinges — Hinge reference line Door hinges must allow an opening angle of more than 90°. The pin must be made of steel, even for door hinges made of non-ferrous metal and for hinges for all-glass doors.

2.2.2 Spring bands

DIN 18264	Building hardware — Hinges with spring
DIN 18265	Building fittings — Swing door hinges with spring
DIN 18272	Fire protection closures — Hinges for fire doors — Spring and construction tape

Spring straps must be such that they close the door completely; they must be adjustable and readjustable.

2.2.3 Door handles and door plates

DIN 18255	Building hardware — Door handles, door plates and door rosettes — Terms, dimensions, requirements, marking
DIN 18257	Building hardware — Security fittings — Terms, dimensions, requirements, marking
DIN 18273	Building fittings — Door handle sets for fire and smoke protection doors — Definitions, dimensions, requirements, testing and marking
DIN EN 1906	Locks and building fittings — Door handles and doorknobs — Requirements and test methods

2.2.4 Door locks

2.2.4.1 The following apply in particular to door locks:

DIN 18250	Locks — mortise locks for fire and smoke protection doors
DIN 18251 (all parts)	Locks — mortise locks
DIN 18252	Profile cylinders for door locks — Definitions, dimensions, requirements, test methods and marking
DIN EN 1303	Building fittings — Lock cylinders — Requirements and test methods
DIN EN 12209	Locks and building fittings — Mechanically operated locks and strike plates — Requirements and test methods

2.2.4.2 The design, materials and fastening method of locks, strike plates and locking pistons must comply with the security requirements with regard to unauthorised unlocking and violent attacks.

2.2.4.3 Keys must not bend or break during the locking process by hand. The number, substances and surface treatment of the keys to be supplied shall be governed by the information in Table 1.

Table 1

Schlossart	**Key**		
	Anzahl	**Fabric**	**Surface treatmentng**
Cichlid Castle	1	Malleable	galvanized
Additional lock	2	Malleable Iron, Steel	
Occupation Castle	2	Stahl	
Cylinder lock	3	Stahl	
	3	Nickel silver	-

2.2.4.4 Locks in tubular frame doors for higher security requirements must have a bolt that engages at least 15 mm in the closing opening of the frame.

2.2.4.5 Locks for wooden front doors must be 2-round or have a bolt exclusion of at least 20 mm.

2.2.4.6 Locks in doors to transformer rooms must comply with the specifications of DIN EN 61936-1 (VDE 0101-1) "High-voltage installations with nominal alternating voltages above 1 kV — Part 1: General provisions" and DIN EN 50522 (VDE 0101-2) "Grounding of high-voltage installations with nominal alternating voltages above 1 kV".

2.2.4.7 In the case of panic locks in doors to escape routes, public law regulations must be observed, even in the private sector.

2.3 Fittings for gates as well as for harmonica, folding and sliding doors

2.3.1 The requirements of DIN EN 1527 "Locks and building fittings — Fittings for sliding doors and folding doors — Requirements and test methods" must be observed.

2.3.2 The drives must be secured against jumping out of the rails.

2.3.3 Fittings for lifting and up-and-over doors must work in such a way that the door remains in place when fully open and does not close by itself in any position.

2.3.4 Undercarriages exposed to the outside climate must be protected against the effects of the weather.

2.3.5 Sliding doors, harmonica doors and folding doors in living rooms must be able to move quietly.

2.3.6 Bar bolt locks must be designed in such a way that they cannot be opened and closed independently by vibrations.

2.4 Hydraulic door closers and door closers with automatic opening

2.4.1 The following apply in particular to locks and fittings

DIN 18263-1	Locks and building fittings — Controlled locking devices — Part 1: Overhead door closers with crank drive and spiral spring
DIN 18263-4	Locks and building fittings — Controlled locking devices — Part 4: Swing door operators with self-closing function
DIN EN 1154	Locks and building fittings — Controlled locking devices — Requirements and test methods
DIN EN 1158	Locks and building fittings — Locking sequence regulators — Requirements and test methods

2.4.2 The closing movement of door closers must be damped and it must be adjustable and adjustable with regard to the closing speed.

2.4.3 In order to push the lock latch securely into place, the damping of overhead door closers must be adjustable so that it can be lifted just before the end stop of the door.

2.4.4 Door closers must be designed and installed in such a way that the force required to open the door decreases during manual opening at the latest from the 10° opening angle to at least 60° opening angle.

2.4.5 Hydraulic door closers exposed to outside temperatures must be designed with regard to the closing speed in such a way that readjustment is not necessary in the event of normal temperature fluctuations. The pour point of the hydraulic fluid must not be higher than −40 °C.

2.4.6 Floor door closers must have a watertight housing.

2.5 Automatic door systems

DIN EN 16005	Power-operated doors — Safety of use — Requirements and test methods

2.6 Locking devices

DIN EN 1155	Locks and building fittings — Electrically operated hold-open devices for swing doors — Requirements and test methods
DIN EN 14637	Locks and building fittings — Electrically controlled hold-open systems for fire/smoke protection doors — Requirements, test methods, application and maintenance

2.7 Electric door openers

2.7.1 Electric door openers must act in such a way that they only allow the door to be opened while the door opener is being operated.

2.7.2 Electric openers for gates and doors exposed to the outside climate must be protected against the effects of the weather.

2.8 Fittings for windows and french doors

2.8.1 The following apply in particular to locks and fittings:

DIN EN 13126-8	Building fittings — Fittings for windows and balcony doors — Part 8: Requirements and test methods for tilt-and-turn, tilt-turn and tilt-turn fittings
DIN EN 13126-15	Building fittings — Fittings for windows and french doors — Requirements and test methods — Part 15: Horizontal sliding and folding sliding windows and french doors
DIN EN 13126-16	Building fittings — Fittings for windows and balcony doors — Requirements and test methods — Part 16: Fittings for lift-and-slide windows and balcony doors
DIN EN 13126-17	Building fittings — Fittings for windows and balcony doors — Requirements and test methods — Part 17: Fittings for tilt-and-slide windows and balcony doors

2.8.2 Fittings for windows and French doors must not be able to be opened from the outside when closed.

2.8.3 In the case of window brakes with brakes, this must be adjustable and adjustable.

2.8.4 Skylight openers must have a lever drive when operated by hand.

2.8.5 In the case of skylight openers, lever rods and transverse shafts must be mounted and guided in such a way that they do not deform permanently during operation.

2.8.6 Scissors of skylight openers must be unhookable if the sashes can only be cleaned from the inside of the room.

2.8.7 In the case of swing sash fittings, the bearings must allow the sashes to rotate 180° around their horizontal axis and have brakes that can be adjusted and adjusted according to their mass.

2.8.8 In the case of reversible sash fittings, the bearings must allow the window sashes to rotate around their vertical axis to such an extent that the outer surfaces of the windows can be cleaned safely from the room. The bearings must have sufficiently effective brakes that can be adjusted and adjusted.

2.8.9 Fittings for vertical sliding or retracted windows must compensate for their mass in such a way that the window remains in place in any position.

2.8.10 Horizontal sliding and lift-and-slide windows and French doors must be able to be operated quietly. The rollers must not deform under dynamic and static loads.

2.9 Fittings for emergency exits and panic doors

DIN EN 179	Locks and building fittings — Emergency exit locks with handle or bumper plate for doors in escape routes — Requirements and test methods
DIN EN 1125	Locks and building fittings — Panic door locks with horizontal operating rod for doors in escape routes — Requirements and test methods

2.10 Fittings for built-in furniture

2.10.1 Locks and locks are to be used in accordance with DIN 68871 "Furniture — Designations and their application".

2.10.2 Fittings for built-in furniture must be corrosion-protected. For damp rooms, the fittings must be resistant to the aggressive effects that come into question.

2.10.3 Hinges for built-in furniture must be adjustable.

2.10.4 Drawer guides must allow the drawer to be lifted.

2.10.5 In the case of flap holders with brakes, this must be adjustable and adjustable.

2.10.6 In the case of upward-opening flaps with a projection of more than 30 cm, the fittings shall ensure that the flap is held in the opening position.

2.10.7 Floor actuators must have a range of at least 15 mm.

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- Deviations of the portfolio from the specifications,
- specifications for the installation of fittings and locks that prove to be inappropriate,

- expected overuse.

3.1.2 In the case of fittings for which the manufacturer's operating instructions apply, a copy of the respective operating instructions must be handed over to the customer.

3.1.3 The locks, with the exception of Buntbart locks and furniture locks, must be so different that no lock can be locked with a key from another lock supplied.

3.1.4 For front doors and apartment doors, interchangeable locks must be installed, e.g. cylinder locks, tumbler locks.

3.1.5 In the case of double-leaf doors with emergency exit and panic door locks, both leaves must be able to be opened in the direction of escape without a key.

3.1.6 Buntbart locks may only be used for doors with low security requirements, such as interior doors of apartments.

3.1.7 In the case of locking systems, a locking plan must be supplied. It must show the assignment of the individual cylinders and keys to the doors as well as the locking function of the individual keys and the higher-level keys. The numbering of keys and cylinders must be carried out with the help of impact stamps and must be clearly legible. The keys of a locking system may only have the locking functions specified in the locking plan.

3.2 Attaching fittings

3.2.1 Fittings must be installed in such a way that they can be operated easily and without accidents.

3.2.2 Fittings that are subject to wear and tear must be easily replaceable. Cuff screws must not be concealed.

3.2.3 The recesses and the like necessary for attaching the fittings must be made to fit the components to be fitted precisely.

3.2.4 Components must not be weakened by the attachment of fittings more than is absolutely necessary and possible without endangering the component to be shoed.

3.2.5 Fittings and locking devices in gymnasiums and sports halls must be recessed.

3.2.6 Wood screws must be screwed in along their entire length; they must remain free of burrs. Screwed-in countersunk screws must not protrude. Nail screws must not be used.

3.2.7 Suitable fittings must be attached for the engagement of bolts, latches, roller pins, tongues or other locking devices, e.g. strike plates, strike pistons.

In the case of built-in furniture, handles and knobs that have to be screwed on the inside must be provided with cover sleeves on the inside.

3.2.8 Doors, windows and French doors must be fogged up in such a way that they can be opened and closed easily and without accidents, and the closed sashes fit well. The

wings must not graze at any point even after coating. Spacers used by the carpenter must not be removed during shoeing.

3.2.9 It must be possible to lock and hold swing sash windows with certainty when they are turned 180°.

3.2.10 Folding gates shall be fitted with latches between each two leaves for locking; at the suspension points, the transoms shall be affixed only at the bottom, at the other points at the top and bottom.

3.2.11 Accordion doors must be provided with latches between the leaves for locking. The latches are to be attached at the top and bottom.

3.2.12 Folding doors and harmonica doors as inner closures must be equipped with bolts that act only downwards.

3.2.13 In the case of sliding doors, harmonica doors and folding doors, the movement mechanism must be accessible.

3.2.14 Sliding doors and sliding gates with an upper undercarriage must be fitted with a lower guide and those with a lower undercarriage with an upper guide.

3.2.15 Folding and harmonica doors and folding gates consisting of more than 3 leaves must be equipped with a lower guide.

3.2.16 Spigot hinges shall be positioned in such a way that the doors can be opened beyond 90°.

3.2.17 Double-leaf swing doors must be fogged up in such a way that the leaves cannot touch each other. The distance between the sashes and from the frame or soffit must not exceed 5 mm and must be uniform. This applies mutatis mutandis to single-leaf swing doors.

3.2.18 Swing shutters must be shod in such a way that they can be held open by brakes without touching the structure. They must not be lifted out when closed. The fittings must not be removable from the outside when the shutters are closed.

3.2.19 Flaps with a projection of more than 30 cm must have additional holding devices, e.g. scissors.

3.2.20 After all fittings have been attached, the fittings must be cleaned, hydraulic door closers, spring hinges and drives of automatic door systems must be adjusted in accordance with the manufacturer's specifications, locks, panic door locks, gears, hinges, bearings and the like must be made operable and, if technically necessary, lubricated.

3.2.21 In the case of sliding metallic fittings that are concealed after installation, the sliding surfaces must first be treated with acid-free grease.

3.2.22 Installation boxes for floor door closers must be secured against soiling after installation. If floor door closers are exposed to water penetration, e.g. in damp rooms or

external doors without rain protection, the space between the installation box and the door closer housing must be filled with potting compound.

3.2.23 Locks and emergency exit locks with latch and bolt shall be fitted in such a way that the latch can be closed pre-closed when the latch is engaged without rubbing against the closing opening of the frame.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Erection, dismantling and provision of scaffolding, the working platforms of which are not higher than 2 m above the ground or floor.

4.1.2 Submission of prefabricated samples of building hardware.

4.1.3 Supply of workshop drawings required for the fitting work.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 Provision of recreation and storage rooms if the Client does not provide rooms that can be easily locked.

4.2.2 Erecting, dismantling and maintaining scaffolding whose working platforms are higher than 2 m above the ground or floor.

4.2.3 Manufacture of test specimens insofar as they cannot be used in construction.

4.2.4 Making and closing recesses, e.g. holes, in masonry, concrete and the like.

5 Billing

No supplementary regulation to ATV DIN 18299, Section 5.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Roller shutter work — DIN 18358

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with § 7 et seq., § 7 EU et seq. or § 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 Wind resistance classes or wind load zone and terrain category according to DIN EN 1991-1-4 'Eurocode 1: Actions on structures — Part 1-4: General actions — Wind loads' and DIN EN 1991-1-4/NA National Annex — 'Nationally defined parameters — Eurocode 1: Actions on structures — Part 1-4: General actions — Wind loads', installation height above ground for the highest component to be installed, ground height above sea level.

0.1.2 Type, location, dimensions and design as well as dates for the erection and dismantling of on-site scaffolding.

0.2 Information on the execution

0.2.1 Number, type, location, dimensions, colour and design of components to be installed.

0.2.2 Number, type and dimensions of samples, place of application.

0.2.3 Preparation of design and installation drawings by the contractor.

0.2.4 Type, nature and strength of the fastening substrate, e.g. lintels, soffits, as well as indication of the installation option of the control elements.

0.2.5 Number, type and dimensions of existing guide rails.

0.2.6 Type, dimensions, colour, shape and texture

- bars for roller shutters,
- of slats for blinds, pleated and external venetian blinds,
- of curtains for external roller blinds, awnings, sun protection, glare protection and blackout systems, insect protection.

0.2.7 Requirements for corrosion protection.

0.2.8 Special requirements, e.g. for thermal insulation, sound insulation, radiation protection and burglary resistance.

0.2.9 Information on use in the course of escape and rescue routes.

0.2.10 Emergency operation of electrically operated systems.

0.2.11 Use of awnings also as rain protection, intended inclination.

0.2.12 Design as a blackout system or as a blackout or glare protection system. Lighting values, e.g. light transmittance.

0.2.13 Number, type, location and dimensions of existing or to be installed roller shutter boxes, roller shutter box lids or panels. Type and dimensions of existing recesses.

0.2.14 Dimensions of the roller space, the space for the blind package or the recess for the sun protection, anti-glare, blackout or awning system.

0.2.15 Dimensions of the openings or surfaces to be closed or protected by roller shutters, mechanically operated sun protection and blackout systems and the openings or surfaces to be closed or protected by insect screens. In the case of systems installed before opening, also lateral covering.

0.2.16 Type of drive; in the case of an electric drive, connected loads and required safety devices.

0.2.17 Type and scope of controls.

0.2.18 Type, connection and positioning of the control sensors, e.g. wind, light, humidity and temperature sensors on the building.

0.2.19 Execution and scope of electrical connection work.

0.2.20 Number, type, dimensions and design of connections to adjacent components

0.2.21 Protection of components or equipment, furnishings and the like.

0.2.22 Early or subsequent production of parts of the service.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 3.6 if tolerances other than those listed there are to apply.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units are to be provided as follows:

0.5.1 Number (pieces), separated by type and dimensions.

1 Scope of application

1.1 ATV DIN 18358 "Roller shutter work" applies to the manufacture and installation of roller shutters, sun protection and blackout systems, inside and outside, as well as for insect screens.

1.2 ATV DIN 18358 does not apply to

- Roller shutter and sectional doors, roller grilles or other gates consisting of components of roller shutters to close an opening intended for the passage of vehicles, the passage of persons and the passing of goods (see ATV DIN 18360 "Metal construction work").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18358 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

For the most common substances and components, the DIN standards and other requirements are listed below.

DIN EN 1627 Doors, windows, curtain walls, lattice elements and shutters — Burglar resistance — Requirements and classification

DIN EN 12216	Terminations — Terminology, Designations and Definitions DIN EN 13120 Terminations Inside — Performance and Safety Requirements
DIN EN 13561	Awnings — Performance and safety requirements
DIN EN 13659	External and external venetian blinds — Performance and safety requirements

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- Deviations of the portfolio from the specifications,
- insufficient load-bearing capacity or condition of the subsoil,
- products that are not suitable for their intended use in accordance with the generally accepted rules of technology,
- unsuitable or missing supports or recesses for the parts to be fastened or installed,
- unsuitable installed parts, e.g. unsuitable existing guide rails,
- lack of opportunities to check the dimensions before starting production,
- Lack of electrical connection options.

3.2 The Contractor shall check the dimensions in good time before the start of production.

3.3 In the event of unsuitable conditions resulting from the weather or the indoor climate, e.g. surface temperatures below 5 °C, roller shutters and sun protection work, special measures must be taken in consultation with the Client. If services are required for this, these are special services (see section 4.2.14).

3.4 Movement joints of the structure must be structurally adopted with the same possibility of movement.

3.5 Connections and fastenings must be designed in such a way that they can absorb the movements from the components and the structure.

3.6 Deviations from prescribed dimensions shall be permitted in the

DIN 18202	Tolerances in Building Construction — Structures
DIN 18203-3	Tolerances in building construction — Part 3: Components made of wood and wood-based materials permissible within certain limits.

3.7 If surfaces of components require corrosion protection but are no longer accessible after installation, they must be provided with corrosion protection corresponding to the planned service life in accordance with the ambient conditions.

3.8 When using galvanised rods, pipes and sheets, the unprotected surfaces created by processing must be protected against corrosion. Schnittkanten dürfen im bewitterten Area up to 1.5 mm thickness should remain untreated if a suitable cutting method is used.

3.9 Connection for the fastening of components may only be carried out in agreement with the Client.

3.10 For the electrotechnical components to be installed by the contractor, the Contractor shall provide the Client with a binding equipment diagram, an object-specific circuit diagram or a circuit diagram with terminal diagram and any necessary voltage drop diagram for the laying of the electrical cables, and shall specify the starting current. Connection cables and couplings must be made freely accessible.

3.11 Testing and commissioning of the electrical wiring and control system created by the Contractor must be carried out by a qualified electrician, at least one of those for specified activities. If the electrical wiring or control system is not a contractual service, the shutdown of this qualified electrician during the test or commissioning is a special service (see section 4.2.17).

3.12 Adjustment, instruction and acceptance of the system.

3.12.1 The Contractor shall adjust the plant components in such a way that the planned functions and services are performed.

3.12.2 The control system must be set with at least object-specific default values for acceptance. Adjusting the control system based on the user's experience after acceptance is a special service (see section 4.2.15).

3.12.3 The competent representative of the Client shall be instructed in the operation of the system once before acceptance by the Contractor. Repeated admission is a special service (see section 4.2.18).

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the areas to be processed/clad are not more than 3.50 m above the standing surface of the scaffolding required for this purpose at any point.

4.1.2 Compensation of stepped or inclined standing surfaces of scaffolding up to 40 cm difference in height, e.g. via stairs or ramps.

4.1.3 Cleaning of the substrate, except for services according to section 4.2.6.

4.1.4 Protection of components and equipment from contamination and damage during assembly work by loose covering, hanging or wrapping, except for protective measures in accordance with section 4.2.9.

4.1.5 Completion of components in several work steps to enable work by other contractors, insofar as the company's own services in the course of the assembly work can be carried out continuously. If these conditions are not met, they are special services according to section 4.2.10.

4.1.6 Cutting to length and notching of roller shutter box end rails in accordance with specifications before their installation, provided that the delivery of roller shutter boxes is part of the scope of services, with the exception of services in accordance with section 4.2.8.

4.1.7 Submission of plans for recesses, entry of necessary recesses in construction plans provided by the customer or marking of the necessary recesses necessary for the installation of roller shutters, manually and electrically operated sun protection and blackout systems as well as insect screens.

4.1.8 Submission of prefabricated surface and color samples.

4.1.9 Programming Controls in Object-Specific Defaults.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 Provision of recreation and storage rooms if the Client does not provide rooms that can be easily locked.

4.2.2 Assembly, conversion and dismantling as well as provision of scaffolding for the services of other contractors.

4.2.3 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be processed/clad is higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.2.4 Erection, conversion and dismantling as well as provision of scaffolding with a stepped or inclined footprint, e.g. over stairs or ramps, if compensation of more than 40 cm is required.

4.2.5 Erecting, converting and dismantling as well as maintaining scaffolding for one's own services, provided that the depth of the gripping space is more than 60 cm, e.g. in the case of sun protection systems on glass roofs.

4.2.6 Cleaning the substrate of coarse soiling, e.g. plaster residues, mortar residues, paint residues, oil, insofar as this was not caused by the contractor.

4.2.7 Making and closing recesses, e.g. core holes, openings and slots.

4.2.8 Cutting to length and notching of roller shutter box end rails after their installation or if the delivery of roller shutter boxes is not part of the scope of services.

4.2.9 Special measures for the protection of building and plant components as well as furnishings, e.g. masking of windows, doors, floors, coverings, finished surface parts, dust-proof masking of sensitive equipment and technical equipment, laying of hardboard or building protection films, from 0.2 mm thick.

4.2.10 Completion of components in several work steps to enable work by other contractors, insofar as the company's own services cannot be provided continuously in the course of the assembly work (see section 4.1.5).

4.2.11 Re-installation of controls and covers, unless the Contractor is responsible.

4.2.12 Making and affixing samples if they cannot be used in construction.

4.2.13 Preparation of static calculations and the drawings required for them.

4.2.14 Protection against unsuitable conditions resulting from the weather or indoor climate in accordance with section 3.3, e.g. heating.

4.2.15 Adjustment of the control system based on the user's experience after acceptance.

4.2.16 Subsequent fastening of electrical coupling elements and cables.

4.2.17 Secondment of a qualified electrician, at least one of them for specified activities, during the inspection or commissioning of the electrical wiring or control system, if the services have not been carried out by the Contractor. (see section 3.11).

4.2.18 Repeated instruction (see section 3.12.3).

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

5.1.1 Determination of performance The determination of performance — regardless of whether it is carried out according to drawings or measurements — shall be based on the dimensions of the components manufactured.

5.2 Determination of dimensions/quantities

5.2.1 The largest component dimension shall be used as a basis for determining the dimensions. The measurements are determined on the basis of:

5.2.2 New or built-in roller shutters, blackout system without box

- the largest width to trailing edge of the guide rail and the height of the bottom edge of the guide rail to the middle of the shaft.

5.2.3 Attachment or front-mounted roller shutters, top-mounted or top-mounted roller shutters, blackout system with box

- the largest width to the trailing edge of the guide rail and the height of the bottom edge of the guide rail to the top of the box.

5.2.4 Exterior venetian blinds

- in the case of rope-guided slats, the width of the curtain and the height from the lower edge of the lower rail to the upper edge of the upper head,
- in the case of rail-guided slats, the width to the trailing edge of the guide rail and the height from the lower edge of the lower rail to the top of the head.

5.2.5 The Marquis

- the largest width of the system and the failure in the fabric slope.

5.2.6 Boxes, Screens and Roofs

- the actual width measurements and the length unfolded.

5.3 Overmeasurement rules

To be overmeasured

- Fugues.

5.4 Individual provisions

No regulations.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Metal construction work — DIN 18360

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 Type, location, dimensions, accessibility, nature and load-bearing capacity of storage and assembly areas, main wind direction and restrictions on working height, separated by construction phases.

0.1.2 Type, location, dimensions and design as well as dates for the assembly and dismantling of scaffolding on site.

0.1.3 Type, location, dimensions, accessibility and carrying capacity of the transport routes. Restrictions due to the building geometry, opening dimensions. Assembly openings, drop-down platforms or other construction aids. Installation areas for lifting and access technology.

0.2 Information on the execution

0.2.1 Type, nature, design and load-bearing capacity of the building parts on or into which the components are to be installed, e.g. in the case of doors and windows, inner or outer stop, smooth soffit, type of lintel, plaster.

0.2.2 Number, type, location, dimensions and design of closures and connections to adjacent structures or components.

0.2.3 Number, type, location and dimensions of recesses for fastening anchors, type of fastening, e.g. welding, bolts, dowels.

0.2.4 Expected time- and load-dependent deformations, also from temperature, e.g. deflection of ceilings, bimetallic effect of thermally insulated components.

0.2.5 Special stresses, e.g. increased wind loads, temperatures, movements and vibrations of the structure or individual parts of the structure, heavy traffic and other dynamic loads.

0.2.6 Special requirements for wind load classes higher than class 2 for doors in building facades.

0.2.7 Type and scope of safety devices, e.g. for power-operated gates and power-operated doors.

0.2.8 Type, dimensions and shape of profiles for roller shutters, mesh parts for roller shutters, gate leaves or door segments and type of deflection in sectional doors.

0.2.9 Available lintel height for roller shutters, roller grilles and sectional doors, dimensions of the roller space.

0.2.10 Number, type, location, dimensions and design of the sealing of joints.

0.2.11 Requirements for thermal insulation, sound insulation, noise suppression, air permeability, fire protection, radiation protection, burglary and bullet resistance, moisture protection and the like.

0.2.12 Preparation and delivery of test elements, including the necessary tests, e.g. with regard to increased sound insulation.

0.2.13 Accessibility requirements, e.g. window and door operators, threshold training.

0.2.14 Position of smooth sides of single-walled doors and gates.

0.2.15 Sash type, opening direction, opening limitation and operating forces of windows and doors.

0.2.16 Requirements for the design of thresholds on doors and French doors.

0.2.17 Design, profiling and bottom recess of frames.

0.2.18 Preparation and delivery of construction drawings, descriptions and structural calculations by the contractor.

0.2.19 Type and thickness of glass. Type of glazing, e.g. sealant, sealing profiles, rebate strips inside or outside.

0.2.20 Number, type, material and shape of fittings.

0.2.21 Load capacity of fixed sun protection devices, e.g. resistance to wind load.

0.2.22 Special requirements for plastics, e.g. UV resistance.

0.2.23 Type and extent of corrosion protection and pre-treatment of aluminium components, e.g. pre-odisation.

0.2.24 Type and timing of surface treatment.

0.2.25 Special protective measures for finished surfaces, e.g. by means of wood cladding, repeated removal and installation of window and door leaves.

0.2.26 Information on anti-slip properties of walkable components.

0.2.27 Time of installation of fittings and rebate seals.

0.2.28 Type and number of samples required.

0.2.29 Colour and gloss limit patterns for finished surfaces.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 3.4.3,	if the panes of showcases and showcases are not to be rear-ventilated,
Section 3.7.1	if the sheet thickness of frames is to be less than 1,5 mm,
Section 3.8.2	if the sheet thickness of door leaves is to be less than 2 mm in the single-walled version and less than 1,5 mm in the double-walled version without filler.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units are to be provided as follows:

0.5.1 Area (m2), separated by type and dimensions, for

- Platforms, walkways, covers, grates,
- Sheets
- facades, cladding, suspended ceilings and the like,

- Substructures.

0.5.2 Dimensions of length (m), separated by type and dimensions, for

- railings, grids, ladders, grates, covers,
- Profiles
- Substructures.

0.5.3 Number (pieces), separated by type and dimensions, for

- Window
- Doors
- Facades
- Goals
- Stages
- Showcases, showcases and the like,
- railings, grids, ladders, grates, covers,
- Profiles
- Substructures.

0.5.4 By weight (kg), separated by type and dimensions, for sheets, strips, sections, small iron parts.

1 Scope of application

1.1 ATV DIN 18360 "Metal construction work" applies to metal constructions, also in combination with other materials.

1.2 ATV DIN 18360 does not apply to

- Steel construction work (see ATV DIN 18335 "Steel construction work"),
- Plumbing work (see ATV DIN 18339 "Plumbing work"),
- suspended ceilings made of industrially manufactured components (see ATV DIN 18340 "Drywall work"),
- Rear-ventilated facades (see ATV DIN 18351 "Rear-ventilated façades"),
- Fittings (see ATV DIN 18357 "Fittings"),
- Roller shutter work (see ATV DIN 18358 "Roller shutter work"),
- coatings (see ATV DIN 18363 "Painting and varnishing work — Coatings") and
- Corrosion protection work (see ATV DIN 18364 "Corrosion protection work on steel structures").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18360 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

For the most common substances and components, the DIN standards and other requirements are listed below.

2.1 Steel

DIN 1623	Cold-rolled strip and sheet — Technical delivery conditions — General structural steels
DIN EN 10025-1	Hot-rolled products of structural steels — Part 1: General technical delivery conditions
DIN EN 10025-2	Hot-rolled structural steel products — Part 2: Technical conditions of delivery for unalloyed structural steels
DIN EN 10210-1	Hot-finished hollow sections for steel structures made of unalloyed structural steels and fine-grained structural steels — Part 1: Technical delivery conditions
DIN EN 10219-1	Cold-finished welded hollow sections for steel construction made of unalloyed structural steels and fine-grained structural steels — Part 1: Technical delivery conditions
DASt Guideline 022[1])	Hot-dip galvanizing of load-bearing steel components

2.2 Stainless steels

DIN EN 10088-4	Stainless steels — Part 4: Technical delivery conditions for sheet and strip of corrosion-resistant steels for the construction industry
DIN EN 10088-5	Stainless steels — Part 5: Technical delivery conditions for bars, wire rod, drawn wire, sections and bright steel products of corrosion-resistant steels for the construction industry
DIN EN 10296-2	Welded circular steel tubes for mechanical engineering and general technical applications — Technical delivery conditions — Part 2: Stainless steels
DIN EN 10297-2	Seamless circular steel tubes for mechanical engineering and general technical applications — Technical delivery conditions — Part 2: Stainless steel tubes

2.3 Aluminium

DIN 17611	Anodically oxidized products of aluminum and wrought aluminum alloys — Technical delivery conditions

DIN EN 485-1	Aluminium and aluminium alloys — Strips, sheets and plates — Part 1: Technical delivery conditions
DIN EN 754-1	Aluminium and aluminium alloys — Drawn rods and tubes — Part 1: Technical delivery conditions
DIN EN 755-1	Aluminium and aluminium alloys — Extruded rods, tubes and profiles — Part 1: Technical delivery conditions
DIN EN 1706	Aluminium and aluminium alloys — Castings — Chemical composition and mechanical properties
DIN EN 12020-1	Aluminium and aluminium alloys — Extruded precision profiles made of alloys EN AW-6060 and EN AW-6063 — Part 1: Technical delivery conditions

2.4 Fasteners

DIN 267-2	Mechanical fasteners — Technical delivery conditions, surface roughness for product classes A and B
DIN EN 15048-1	Fittings for non-prestressed bolted joints in metal construction — Part 1: General requirements

2.5 Sealing, release and coating materials

DIN 18545	Sealing of glazing with sealants — Requirements for glass seams and glazing systems
DIN EN 15651-1	Joint sealants for non-structural applications in buildings and pedestrian walkways — Part 1: Joint sealants for façade elements
DIN EN 15651-2	Joint sealants for non-structural applications in buildings and pedestrian walkways — Part 2: Joint sealants for glazing

2.6 Doors, gates, windows

DIN 18055	Criteria for the use of windows and external doors according to DIN EN 14351-1
DIN 18095-1	Doors — Smoke protection doors — Definitions and requirements
DIN 18095-2	Doors — Smoke protection doors — Design test for long-term functionality and tightness
DIN 18111-1	Door frames — Steel frames — Part 1: Standard frames (1-shell and 2-shell) for rebated doors in masonry walls and stud walls
DIN EN 13241	Gates — Product Standard, Performance Characteristics
DIN EN 14351-1	Windows and doors — Product standard, performance characteristics — Part 1: Windows and exterior doors

DIN EN 16034	Doors, gates and windows — Product standard, performance characteristics — Fire and/or smoke protection properties
DIN EN 16361	Power-operated doors — Product standard, performance characteristics — Door systems, other than swing doors, intended for power-operated operation
DIN EN 13830	Vorhang façade — Product standard

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- Deviations of the portfolio from the specifications,
- insufficient load-bearing capacity or condition of the subsoil,
- lack of prerequisites for fastening and sealing,
- excessive building moisture, unsuitable conditions resulting from the weather or indoor climate (see section 3.1.2),
- lack of reference points for installation, in particular missing height reference points and axis points per storey,
- greater dimensional deviations than are permissible under section 3.1.4.

3.1.2 In the event of unsuitable conditions resulting from the weather or the indoor climate, e.g. component temperatures below +5 °C or over +40 °C during bonding and sealing work, special measures must be taken in consultation with the Client. If services are required for this, these are special services (see section 4.2.9).

3.1.3 For manufacturing, deviations from prescribed dimensions in the

DIN EN ISO 13920	Welding — General tolerances for welded structures — Length and angular dimensions; Shape and location

for welded and non-welded components, dimensional tolerances of tolerance class C for length and angular dimensions and tolerance class G for straightness, flatness and parallelism.

3.1.4 For installation, deviations from prescribed dimensions must be made in the

DIN 18202	Tolerances in Building Construction — Structures

certain limits, provided that the function and load-bearing capacity of the components are not impaired.

3.1.5 Unevenness in the surfaces that becomes visible in grazing light is permissible if it does not exceed the limit values according to DIN 18202:2013-04, Table 3, line 6.

3.1.6 If increased requirements for flatness are met in accordance with DIN 18202:2013-04, Table 3, line 7, or other increased requirements for dimensional accuracy compared to those specified in den oben genannten Normen aufgeführten values, the required services are special services (see section 4.2.10).

3.1.7 For components, the Contractor shall prepare and deliver drawings and/or descriptions prior to the commencement of production. The designs, dimensions, installation, fastening and construction connections of the components as well as the installation sequence must be recognisable. The Client shall return the drawings and/or descriptions supplied by the Contractor in a copy with his inspection report for conformity with the implementation planning.

3.1.8 The following shall apply to the design and execution of load-bearing structures:

DIN EN 1090-1	Design of Steel Structures and Aluminium Structures — Part 1: Verification of Conformity Methods for Load-Bearing Components
DIN EN 1090-2	Execution of steel structures and aluminium structures — Part 2: Technical rules for the execution of steel structuresDIN EN 1090-3 Execution of steel structures and aluminium structures — Part 3: Technical rules for the execution of aluminium structures DIN EN 1993 (all parts) Eurocode 3: Design and construction of steel structures
DIN EN 1993/NA (all parts)	National Annex — Nationally defined parameters — Eurocode 3: Design and construction of steel structures
DIN EN 1999 (all parts)	Eurocode 9: Design and construction of aluminium structures
DIN EN 1999/NA (all parts)	National Annex — Nationally defined parameters — Eurocode 9: Design and construction of aluminium structures

3.1.9 Design requirements

3.1.9.1 The following shall apply to weld preparations:

DIN EN ISO 9692-1	Welding and related processes — Types of weld preparation — Part 1: Manual arc welding, arc welding, gas welding, TIG welding and beam welding of steels
DIN EN ISO 9692-3	Welding and related processes — Types of weld preparation — Part 3: Metal inert gas welding and weldingWolfram-Inertgasschweißen von Aluminium und Aluminiumlegierungen

3.1.9.2 Protruding weld beads from butt welds must be removed from visible surfaces if they are not structurally necessary.

3.1.9.3 Bends, bends and offsets shall be free of folds, cracks and waves.

3.1.9.4 The structures for glazing must be designed in such a way that each pane can be replaced individually.

3.1.9.5 The following shall apply to the fastening of filling elements, e.g. glass, plates:

DIN 18008 (all parts) Glass in construction — Design and construction rules.

When embedding in hardening sealants, ensure a tight fit until curing.

3.1.9.6 Condensation and penetrating rainwater must be diverted by constructive measures.

3.1.9.7 Contact corrosion should be avoided when using different metals. Appropriate fasteners or separating layers must be used.

3.1.10 Fastening to the structure

3.1.10.1 The method of fastening components to the structure is left to the Contractor.

3.1.10.2 Components must be fastened and supported in such a way that the forces are safely transferred to the structure.

3.1.10.3 Connections and fastenings must be designed in such a way that they can absorb the movements from the components and the structure.

3.1.10.4 In damp rooms and outdoors, suitable materials (hot-dip galvanised fasteners in accordance with DIN EN ISO 10684 'Fasteners — hot-dip galvanizing' or made of stainless steels according to building authority approval) must be used for fasteners and fasteners. Anchorages that require approval by the building authorities must be designed in corrosion resistance class III or IV in accordance with their approval.

3.1.10.5 The joints between climatically space-enclosing components, e.g. the window and the building, are

- on the side facing the room. The vapour pressure equalisation to the outside must be ensured by the choice of sealing.
- with insulating materials. The choice of insulation material is left to the contractor. When using in-situ foams, the adjacent surface-finished components must be reliably protected, e.g. by means of tapers that can be removed without leaving any residue.
- on the side facing away from the room.

3.1.11 Surface Protection

3.1.11.1 If surfaces of components require corrosion protection but are no longer accessible after installation, they must be treated in accordance with the environmental conditions to provide corrosion protection corresponding to the planned service life.

3.1.11.2 Hot-dip galvanized steel parts are zinc coatings (piece galvanizing) applied to steel by hot-dip galvanizing — Requirements and examinations according to DIN EN ISO 1461 "Zinc coatings applied to steel by hot-dip galvanizing — Requirements and examinations". For load-bearing hot-dip galvanized metal and steel components, the requirements of the DASt guideline 0221) "Hot-dip galvanizing of load-bearing steel components" must also be complied with.

3.1.11.3 Continuously galvanized steel sheets must comply with DIN EN 10346 "Continuous hot-dip coated steel flat products for cold forming — Technical delivery conditions". The zinc layer must not crack or peel off even if it is bent.

3.1.11.4 If galvanized parts have to be welded, the zinc coating in the welding zone must be removed in advance. The welded area is to be cleaned and then coated with zinc dust coating fabric with a small overlap to the intact zinc coating. The layer thickness of the repaired area must be at least 100 µm.

3.1.11.5 When using galvanised rods, pipes and sheets, the unprotected surfaces created by the processing must be protected against corrosion. Cut edges may be left untreated in weathered areas up to 1.5 mm thick if a suitable cutting process is used.

3.1.11.6 Anodic oxidation of aluminium shall be carried out in accordance with DIN 17611.

3.1.11.7 Coatings with thermal curing (powder coating) on components of aluminium shall be carried out in accordance with DIN EN 12206-1 'Coating materials — Coatings on aluminium and aluminium alloys for construction purposes — Part 1: Coatings made of coating powders'. Coatings with thermal hardening on components made of zinc and galvanized steel must be carried out in accordance with DIN EN 13438 "Coating materials — Powder coatings for hot-dip galvanized or sherardized steel products for construction purposes".

3.2 Windows

3.2.1 DIN 18055 in conjunction with DIN EN 14351-1 applies to requirements for windows.

3.2.2 Tilt-and-turn sashes must have an operating error lock. Swing blades must have locking devices at a rotation of 180°.

3.2.3 Exterior window sills must be edged up in the reveal area or provided with end pieces. Joints are to be formed with labyrinth seals. The thermal change in length must be taken into account.

3.2.4 Windows and French doors must be easy to open and close. DIN 18055 provides an overview of the classification of operating forces. The closed wings must fit snugly.

3.2.5 Wear parts of fittings must be replaceable.

3.3 Doors

3.3.1 The provisions of Section 3.2 shall apply mutatis mutandis to doors.

3.3.2 DIN EN 16361 applies to requirements for automatic doors.

3.3.3 Türdrücker und -knöpfe an Schlössern mit einem Dornmaß unter 55 mm müssen gekröpft sein.

3.3.4 Transport- und Montagehilfen bei Türzargen sind nach dem Einbau der Zargen zu entfernen.

3.4 curtain walls, exterior wall coverings, showcases and showcases

3.4.1 DIN EN 13830 applies to requirements for curtain walls.

3.4.2 Rear-ventilated metal facades shall be constructed in accordance with DIN 18516-1 "Exterior wall cladding, rear-ventilated — Part 1: Requirements, test principles".

3.4.3 Glazing of outdoor showcases and showcases must be rear-ventilated.

3.4.4 Parts of the substructure that are no longer accessible after installation must be adequately protected against corrosion in accordance with the environmental conditions.

3.4.5 If wooden substructures are to be treated with preventive wood preservatives, this must be done in accordance with DIN 68800-3 "Wood protection — Part 3: Preventive protection of wood with wood preservatives".

3.5 Cladding, suspended metal ceilings

3.5.1 Cladding, suspended ceilings and the like must be even. If necessary, compensating pieces must be used, especially in the case of suspended ceilings.

3.5.2 Cladding in front of and suspended ceilings below drive units and control elements for supply lines must be removable.

3.6 Canopies, canopies, fixed sun protection structures

3.6.1 In order to reduce noise transmission into the structure, the fastening points of the individual construction components must be soundproofed.

3.6.2 Bearings and joints of sunshade structures with moving parts shall be smooth.

3.7 Frames without test certificates or approval notices

3.7.1 Frames shall be made of cold-formed steel sheets with a thickness of at least 1,5 mm.

3.7.2 Openings for halyards, bolts, locking bolts and safety bolts must be covered in such a way that no building material, e.g. mortar, can penetrate the closing slots.

3.7.3 Wall anchors must be placed in such a way that the forces acting on the bands and interlocks are transferred to the building.

3.7.4 Corner frames must be fitted with at least one spacer rails for their installation, and perimeter frames must have at least two spacer rails. The spacer rails must be easy

to dismantle. They must only be removed after the potting compound has set. Spacer rails above the floor surface must be dismountable without visible residues.

3.8 Door leaves without test certificates or approval notices

3.8.1 Door leaves must be torsion- and bend-resistant. Door leaves with recesses, e.g. for light openings, must be stiffened in the form of frames.

3.8.2 The sheet thickness shall be at least 2 mm for the single-walled version and at least 1,5 mm for the double-walled version without filler.

3.8.3 Double-walled door leaves must be reinforced in the locking and hinge areas in such a way that acting forces are safely transmitted. They must be designed in such a way that no splash or precipitation water can penetrate the spaces between the door leaves.

3.9 Goals

3.9.1 DIN EN 13241 applies to requirements for doors.

3.9.2 Gates must be lockable when fully open. The wings must be torsion- and bend-resistant. Locking rods must lock the wings and run in special guides.

3.9.3 The leaves of folding gates and folding sliding gates must be parallel to each other when open.

3.10 Platforms, walkways, covers, grates

3.10.1 Fixed work platforms are to be constructed in accordance with DIN EN ISO 14122-2 "Safety of machinery — Fixed access to machinery — Part 2: Work platforms and walkways".

3.10.2 Insertable cover plates and grates in frames must be flush and torsion-free. Covers and grates must be secured in their position.

3.10.3 Frames, cover plates and grates shall be dimensioned on their cantilevered side according to the intended load.

3.10.4 Handles and hinges of foldable parts that lie in accessible areas must be retractable.

3.11 Stairs, ladder stairs, fixed stair ladders, handrails, railings, fencing, grilles

3.11.1 Stairs, handrails, railings and enclosures are to be

DIN 18065	Building Stairs — Terms, Measurement Rules, Main Dimensions
DIN EN ISO 14122-3	Safety of machinery — Fixed access to machinery — Part 3: Stairs, stair ladders and railings
DIN 24531-1	Gratings as steps — Part 1: Gratings made of metallic materials

be performed.

3.11.2 Permanently mounted ladder stairs and ladders made of steel shall be

DIN 14094-1	Fire brigades — Emergency ladder systems — Part 1: Fixed emergency ladders with back protection, holding device, platforms
DIN 18799 (all parts)	Fixed vertical ladders on structural installations
DIN EN ISO 14122-4	Safety of machinery — Fixed access to machinery — Part 4: Fixed vertical ladders

be performed.

3.11.3 Equipment for the use of fall arresters must comply with DIN EN 353-1 'Personal protective equipment against falls from a height — Running fall arresters including a guide — Part 1: Running fall arresters including fixed guide'.

3.11.4 Handrails shall be deburred on all sides and ground flush at welded joints. If they consist of composite profiles, they must not be screwed together from above.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on or clad is not higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.1.2 Compensation of stepped or inclined standing surfaces of scaffolding up to 40 cm difference in height, e.g. via stairs or ramps.

4.1.3 Manufacture of individual samples, provided that they can be used in the execution.

4.1.4 Supply of fasteners, e.g. anchors, screws.

4.1.5 Insertion and fastening of doors, gates, frames, windows and the like, including connecting elements, except for services in accordance with section 4.2.8.

4.1.6 Protection of components and equipment from contamination and damage during metal construction work by loose covering, hanging or wrapping, except for protective measures in accordance with section 4.2.12.

4.1.7 Completion of components in several work steps to enable work by other contractors, insofar as the company's own services can be provided continuously in the course of similar metal construction work. If these conditions are not met, they are special services according to section 4.2.13.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 Provision of recreation and storage rooms if the Client does not provide rooms that can be easily locked.

4.2.2 Assembly, conversion and dismantling as well as provision of scaffolding for the services of other contractors.

4.2.3 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on or clad is higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.2.4 Erection, conversion and dismantling as well as provision of scaffolding with a stepped or inclined footprint, e.g. over stairs or ramps, if compensation of more than 40 cm is required.

4.2.5 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the depth of the gripping space is more than 60 cm, e.g. in the case of canopy constructions.

4.2.6 Manufacture and attachment or installation of samples, insofar as they are not included in the service.

4.2.7 Making recesses, e.g. in masonry, concrete, for fastening doors, gates, windows, frames and the like.

4.2.8 Casting of anchors and plastering of frames and frames.

4.2.9 Protection against unsuitable conditions resulting from the weather or the indoor climate in accordance with section 3.1.2, e.g. heating, temporary closing of building openings with foils or panels.

4.2.10 Services to compensate for greater unevenness and dimensional deviations of the substrate than permissible according to DIN 18202.

4.2.11 Creating and delivering static calculations.

4.2.12 Special protection of building and plant components as well as furnishings, e.g. masking of windows, doors, floors, coverings, stairs, wood, roof surfaces, surface-finished parts, dust-proof masking of sensitive equipment and technical equipment, dust protection walls, emergency roofs, laying of hardboard or building protection films ≥ 0.2 mm thick.

4.2.13 Completion of components in several operations to enable work by other contractors, insofar as the company's own services cannot be provided continuously in the course of similar metal construction work (see section 4.1.7).

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

The determination of the performance – regardless of whether it is carried out according to drawings or measurements – is based on the dimensions

- of the garments produced,
- of the treated areas,
- of manufactured components

On surfaces with limiting components, the dimensions up to the bounding, unplastered components are to be taken as a basis. The simplifying rules, such as overmeasurement rules and individual regulations, are to be applied to determine the benefit.

5.2 Determination of dimensions/quantities

5.2.1 In the case of invoicing of individual components according to area dimensions, the dimensions of the smallest circumscribed rectangle shall apply.

5.2.2 In the case of billing according to the length measure, the largest length shall be taken as a basis, even in the case of diagonally cut and notched profiles. In the case of curved profiles, the outer unfolded length is used.

5.2.3 Clad back surfaces of niches and covered reveals shall be calculated separately with their dimensions, regardless of whether the recesses are overmeasured or not.

5.2.4 In the case of settlement by mass, the following principles shall apply:

5.2.4.1 The following are to be taken into account:

- in the case of standardised profiles, the theoretical dimensions according to DIN standards,
- for other profiles, the mass from the manufacturer's profile books,
- for sheets, wide flat steels and strip steels, each with an area of 1 m2 and a thickness of 1 mm
  - made of steel 7.85 kg,
  - made of stainless steel 7.90 kg,
  - made of aluminium 2.70 kg,
  - made of copper, brass 9.00 kg,
- in the case of steel and cast steel fittings, the density of 7.85 kg/dm3,
- for cast iron (grey cast iron) fittings, the density of 7.25 kg/dm3.

5.2.4.2 In the case of small iron parts up to 15 kg individual mass, the mass may be determined by weighing.

5.2.4.3 Fasteners, e.g. screws, rivets, welds, are not taken into account.

5.2.4.4 In the case of hot-dip galvanized steel structures, 5 % is added to the masses for the weight increase in the course of galvanizing.

5.3 Overmeasurement rules

The following are measured:

5.3.1 If billed according to area size: Recesses, e.g. openings and niches in walls and ceilings ≤ 2.5 m2 individual size, in floorn ≤ 0,5 m2 Einzelgröße.

5.3.2 When billed according to length: Interruptions ≤ 1 m individual length.

5.4 Individual provisions

No regulations

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Glazing work — DIN 18361

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

Type, location and load-bearing capacity of anchor points for protective nets, PPE against falls.

0.2 Information on the execution

0.2.1 Components to be glazed, separated e.g. according to storeys and angles of inclination.

0.2.2 Type of frame material, e.g. wood, metal, plastic, concrete.

0.2.3 Type, thickness (nominal thickness), pane size, pane structure and intended processing of the glass.

0.2.4 Requirements, e.g. with regard to thermal insulation, sun protection, lighting and energy technology, sound insulation, fire protection, property protection, personal protection, traffic safety.

0.2.5 Structure of patterned glass.

0.2.6 Stress group of the glazing system according to DIN 18545 "Sealing of glazing with sealants — Requirements for glass seams and glazing systems", the colour of the sealant and the possible post-treatment of the sealant surface.

0.2.7 Type, design and colour of sealing profiles and type of sealing of profile joints, e.g. corner vulcanisation.

0.2.8 Type of existing impregnation and coating of the structures to be glazed.

0.2.9 Method of fastening glass retaining strips.

0.2.10 Special physical and chemical stresses to which substances and components are exposed after installation, e.g. shock loads, aggressive vapours, wet rooms or swimming pools.

0.2.11 Type and number of samples required.

0.2.12 Type and number of cleanings to be carried out during construction up to acceptance, e.g. in the case of tempered or coated glass, heavy soiling, long service lives between installation and acceptance.

0.3 Details of deviations from the ATVs

If regulations other than those provided for in this ATV are to be made, these must be clearly and individually stated in the service description.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units are to be provided as follows:

0.5.1 Area (m2), separated by glass products, glass thicknesses and pane sizes, for

- glazing of windows, doors and glass facades,
- Overhead glazing,
- glass constructions,
- lead, brass and light metal glazing,
- Processing of glass surfaces,
- coating of glass surfaces,
- Mirror
- translucent plastic sheets.

0.5.2 Measure of length (m), separated by glass products, glass thicknesses and pane sizes, for

- Processing of glass edges,
- Sealing of glass connection joints.

0.5.3 Number (pcs), separated by glass products, glass thicknesses, pane sizes and size of the glazed component, for

- glazing with multi-pane insulating glass,
- glazing of windows and doors, parapets and fencing,
- Overhead glazing, horizontal glazing,
- walk-in/walk-in glasses,
- glass constructions,
- lead, brass and light metal glazing,
- Stabilizing strips made of glass,
- translucent plastic sheets,
- cut-outs, holes and corner roundings, separated according to dimensions,
- Mirror
- Aquariums
- Showcases
- Shower cubicles.

1 Scope of application

1.1 ATV DIN 18361 "Glazing work" applies to glazing, glass constructions and the installation of translucent plastic sheets.

1.2 ATV DIN 18361 does not apply to

- Fittings (see ATV DIN 18357 "Fittings"),
- Processing of glass blocks (see ATV DIN 18330 "Masonry work"),
- laying glass roof tiles (see ATV DIN 18338 "Roofing work") and
- rear-ventilated exterior wall cladding (see ATV DIN 18351 "Rear-ventilated façades").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18361 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

For the most common substances and components, the DIN standards and other requirements are listed below.

2.1 Glass products

DIN 1249-11	Flat glass in construction — Part 11: Glass edges — Definitions, edge shapes and execution
DIN EN 572-2	Glass in construction — Basic products of soda-lime silicate glass — Part 2: Float glass

DIN EN 572-3	Glass in construction — Basic products of soda-lime silicate glass — Part 3: Polished clinched glass
DIN EN 572-4	Glass in construction — Basic products of soda-lime silicate glass — Part 4: Drawn flat glass
DIN EN 572-5	Glass in construction — Basic products of soda-lime silicate glass — Part 5: Patterned glass
DIN EN 572-6	Glass in construction — Basic products of soda-lime silicate glass — Part 6: Patterned wire glass
DIN EN 572-7	Glass in construction — Basic products of soda-lime silicate glass — Part 7: Profiled structural glass with or without wire insert
DIN EN 1036-1	Glass in construction — Mirror of silver-coated float glass for indoor use — Part 1: Definitions, requirements and test methods
DIN EN 1096-1	Glass in construction — Coated glass — Part 1: Definitions and classification
DIN EN 1096-4	Glass in construction — Coated glass — Part 4: Product standard
DIN EN 1279-1	Glass in construction — Multi-pane insulating glass — Part 1: General, system description, exchange rules, tolerances and visual quality
DIN EN 1863-1	Glass in construction — Heat-strengthened soda-lime glass — Part 1: Definition and description
DIN EN 12150-1	Glass in construction — Thermally toughened soda-lime toughened safety glass — Part 1: Definition and description
DIN EN 14179-1	Glass in the building industry — Hot-stored thermally toughened soda-lime toughened safety glass — Part 1: Definition and description
DIN EN 14449	Glass in construction — Laminated glass and laminated safety glass — Conformity assessment/product standard
DIN EN ISO 12543-2	Glass in construction — Laminated glass and laminated safety glass — Part 2: Laminated safety glass
DIN EN ISO 12543-5	Glass in construction — Laminated glass and laminated safety glass — Part 5: Dimensions and edge processing
DIN EN ISO 12543-6	Glass in construction — Laminated glass and laminated safety glass — Part 6: Appearance

2.2 Translucent plastic sheets

Translucent plastic sheets must be permanently translucent and impact-resistant.

2.3 Glazing sealants

DIN 18545	Sealing of glazing with sealants — Requirements for glass seams and glazing systems
DIN EN 15651-2	Joint sealants for non-structural applications in buildings and pedestrian walkways — Part 2: Joint sealants for glazing

2.4 Glazing sealing profiles

DIN 7863-1	Elastomer sealing profiles for windows and façades — Technical delivery conditions — Part 1: Non-cell elastomer sealing profiles in window and façade construction

2.5 Glazing Aids

Pre-treatment agents, e.g. cleaners, adhesive cleaners, primers, barrier primers and components, e.g. serving tapes and blocks, must meet the requirements of DIN 18545.

2.6 Chemical fasteners for glass joints

Chemical fasteners for glass joints must have set no later than two days after processing. According to this, they must be adherent and correspond to the respective intended use, e.g. elastic, waterproof, detachable by means that can be used in construction. If they are used in toughened safety glass, they must be elastic enough with a sufficient joint width so that the breakage of a pane does not spread to the pane connected to it.

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- insufficient strength of frames, posts, transoms, muntins and fittings in relation to the weight of the panes and under the block points,
- insufficient fastening of frames,
- Unevenness of the glass contact surfaces,
- Clamping strips and brackets that are not suitable for secure fastening of the discs,
- frames and glass retaining strips on which the necessary preparation for fastening has not been carried out or the fastening means are missing,
- frames to which the glass retaining strips can only be attached at a later date and the necessary retaining elements for securing the windscreen are missing,
- insufficient properties of the tendered glass,
- Insufficient design, dimensioning and pre-treatment of the glass rebates and glass retaining strips,
- glazing with curved panes, if the width of the glass rebate is not at least 20 mm greater than the thickness of the glass,

- glazing systems with free glass rebate space, if the pressure equalization is structurally disturbed or obstructed, e.g. openings for pressure compensation are missing or these are insufficiently dimensioned,
- unsuitable climatic conditions (see section 3.1.2).

3.1.2 In the event of unsuitable conditions resulting from the weather or the indoor climate, e.g. sealing work below 5 °C, special measures must be taken in consultation with the Client. If services are required for this, these are special services (see section 4.2.7).

3.1.3 DIN 18008-1 'Glass in construction — Design and construction rules — Part 1: Definitions and general principles', DIN 18008-2 'Glass in construction — Design and construction rules — Part 2: Linear glazing', DIN 18008-3 'Glass in construction — Design and construction rules — Part 3: Point-mounted glazing', DIN 18008-4 'Glass in construction — Design and construction rules — Part 4: Additional requirements for fall-resistant glazing" and DIN 18008-5 "Glass in construction — Design and construction rules — Part 5: Additional requirements for walkable glazing".

3.1.4 Exterior glazing must be rainproof and capable of absorbing wind loads in accordance with DIN EN 1991-1-4 'Eurocode 1: Actions on structures — Part 1-4: General actions — Wind loads' and DIN EN 1991-1-4/NA 'National Annex — Nationally defined parameters — Eurocode 1: Actions on structures — Part 1-4: General actions — Wind loads'.

3.1.5 In the case of frame constructions in which the glass retaining strips cannot be attached immediately after the glazing units have been installed, the glazing units must be secured on all sides by strips with an elastic intermediate layer to the glass until the glass retaining strips are attached.

3.1.6 Glass edge processing must be carried out in accordance with DIN 1249-11. In the case of ground edges, the corners must be butted.

3.2 Blocks

3.2.1 Glazing must be blocked in such a way that the glass edge is not overstressed. The glass edges must not touch the frame at any point. For glazing, blocks made of age-resistant and permanently pressure-resistant materials are to be used. The panes must be blocked according to the type of opening. The blocks must support at least the full thickness of the glazing unit.

3.2.2 In systems with pressure compensation, this must not be obstructed by the block, if necessary block bridges must be used.

3.2.3 In the case of a sealant-free glass rebate space, the blocks must be secured against displacement or slipping.

3.3 Sealing glazing systems

3.3.1 DIN 18545 applies to glazing systems with sealants.

3.3.2 In the case of glazing with sealing profiles, there must be openings in the rebate space for pressure compensation. In the case of sealing profiles, the profile joints must be made tight.

3.4 Greenhouses

In the case of greenhouses for sale, Section 3.1.3 shall apply.

3.5 Glass structures made of non-tempered glass

Panes that are flat or at an angle and free-standing glass edges must be ground and hemmed at the joints at right angles to the pane surface or the mitre angle in accordance with DIN 1249-11. The glass edges must have ground chamfers that change the thickness only slightly. In the case of free-standing glass edges, the visible glass edges and chamfers must be ground. The joints between the joint surfaces, with the exception of joints with UV-curing adhesives, must be dimensioned in such a way that dimensional changes of the components to be joined can be absorbed. They must be filled fully and evenly with glass fasteners and smoothed out.

3.6 Glass structures made of tempered glass

Fasteners and fittings must not have direct contact with glass-metal.

3.7 Profile building glass

Profiled glass must be installed in frame constructions in such a way that forces from the building structure do not act on the glazing. In order to avoid damage to the glazing and the building structure, the removal of condensate must be ensured. The manufacturer's general building authority approval must be observed for execution.

3.8 Glazing with lead, brass and light metal profiles

In the case of artificial glazing with lead, brass and light metal profiles, the cross points of the metal frames must be connected on both sides, in the case of lead by tin plating, in the case of brass by soldering, in the case of light metal by intermediate pieces. The discs must be sealed in the metal sockets. The lead sockets must be pressed against the windows after sealing. In the event of stress caused by wind loads and dynamic loads, reinforcements must be applied. Art glazing in the space between the panes of multi-pane insulating glazing must not be cemented.

3.9 Translucent plastic sheets

Translucent plastic sheets must be installed and fastened in such a way that their temperature-related dimensional changes are absorbed in the frame construction.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 In the case of repair glazing, the glazing of panes or glass residues and the cleaning of the glass seams.

4.1.2 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on or clad is not higher than 3.50 m above the standing surface of the scaffolding required for this purpose.

4.1.3 Compensation of stepped or inclined standing surfaces of scaffolding up to 40 cm difference in height, e.g. via stairs or ramps.

4.1.4 Supplying glass samples up to 0.05 m2 single size.

4.1.5 Supply and installation of steel inserts and wind irons for leaded glazing as well as reinforcement inserts for light metal and brass glazing that correspond to the respective metal.

4.1.6 Unhooking and unhooking window and door sashes as well as joining the composite sashes.

4.1.7 Residue-free removal of adhesive strips, labels, spacers or the like, as well as residues of sealants or glass fasteners.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 Provision of recreation and storage rooms if the Client does not provide rooms that can be easily locked.

4.2.2 Assembly, conversion and dismantling as well as provision of scaffolding for the services of other contractors.

4.2.3 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on or clad is higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.2.4 Erecting, converting, dismantling and maintaining scaffolding in stairwells or in areas with exceptional hazards, e.g. fall edges.

4.2.5 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the depth of the gripping space is more than 60 cm, e.g. in the case of glass roofs.

4.2.6 Setting up, dismantling and maintaining protective nets.

4.2.7 Protection against unsuitable climatic conditions in accordance with section 3.1.2.

4.2.8 Additional services that become necessary due to the subsequent installation of glass retaining strips and sealing profiles (see section 3.1.5).

4.2.9 Cutting, fitting and, if necessary, pre-drilling glass retaining strips and supplying fastening material, excluding wire pins.

4.2.10 Supply of glass samples beyond the services set out in Section 4.1.4.

4.2.11 Preparation of static calculations, e.g. glass thickness design, and the drawings and verifications required for this.

4.2.12 Special marking of installed panes by order of the Client and the removal of this marking.

4.2.13 Special protection of building and plant components as well as furnishings, e.g. masking of windows, doors, floors, coverings, stairs, roof surfaces, finished parts, dust-proof masking of sensitive equipment and technical equipment, dust protection walls, emergency roofs, laying of hardboard or building protection films from 0.2 mm thick.

4.2.14 Performing Cleanings.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

The determination of the performance — regardless of whether it is carried out according to drawings or measurements — shall be based on the dimensions of the glazing produced.

The simplifying rules, such as overmeasurement rules and individual regulations, are to be applied to determine the benefit.

5.2 Determination of dimensions/quantities

5.2.1 In the case of billing according to area (m2), the following applies:

When determining the performance performed, the panes including the glass rebates are measured and the dimensions are rounded up to centimeters divisible by 3.

Panes under 0.25 m2 are calculated at 0.25 m2. For multi-pane insulating glass and tempered glass as well as laminated safety glass, minimum areas of 0.5 m2 are used. In the case of non-rectangular discs, the dimensions of the smallest circumscribed rectangle are calculated.

5.2.2 In the case of billing according to length (m), the following applies:

The lengths and widths determined from the surface dimensions are also used as a basis for edge processing.

5.3 Overmeasurement rules

The following are measured:

5.3.1 If invoiced according to area dimensions Glazing bars and movable sashes in glazing with profiled glass and translucent plastic sheets, Metal frames for lead, brass and light metal glazing.

5.4 Individual provisions

If billed according to number (St), the following applies:

If the size of the installed panes deviates from the dimensions for width and height specified in the specifications by less than 20 mm for each of these dimensions, the deviations will not be taken into account in the billing.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Painting and varnishing work — Coatings — DIN 18363

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 Type, location, dimensions and design as well as dates for the erection and dismantling of on-site scaffolding.

0.1.2 Type and extent of fall edges and openings that are not protected against falling.

0.2 Information on the execution

0.2.1 Type, location, dimensions, texture and strength of the surfaces to be processed, e.g. existing surfaces and coatings, seals, if applicable, indications of release agent residues.

0.2.2 Number, location, dimensions and materials of the sides of windows, doors and the like to be processed. For new components, the number and type of coatings that have already been applied.

0.2.3 Type of coating materials.

0.2.4 Shades white, light, medium or dark/rich; Effect varnishing such as metal or pearlescent effect; with iron mica pigment; Colour specifications according to DIN 6164-1 "DIN colour chart — DIN colour chart system for the 2° normal observer" or on the basis of colour samples.

0.2.5 The number, type, position, dimensions and classification of surfaces or components to be coated and the length of the boundaries between surfaces or components to be coated in different ways.

0.2.6 Type of coating to be carried out, e.g. initial coating or overhaul coating in accordance with DIN 55945 "Coating materials and coatings — Supplementary terms to DIN EN ISO 4618".

0.2.7 Type of coating process, e.g. hand or machine coating, application of final coatings by structuring, modelling by dabbing, rolling.

0.2.8 Requirements for the coating in terms of smoothness, surface structure and gloss level; in the case of plaster-like coatings, the grain size. Stress on coating materials, e.g. class of wet abrasion resistance according to DIN EN 13300 "Coating materials — Water-containing coating materials and coating systems for interior walls and ceilings — Classification".

0.2.9 Algaecides and fungicidal adjustment of the coating.

0.2.10 Requirements for fire, sound, humidity and radiation protection as well as electrical conductivity. Acoustic and lighting requirements.

0.2.11 Requirements for reactive intum-forming fire protection coatings, e.g. flammability according to DIN 4102-1 "Fire behaviour of building materials and components — Part 1: Building materials — Terms, requirements and tests", Fire resistance period of the entire component according to DIN 4102-2 "Fire behaviour of building materials and components — Components — Definitions, requirements and tests".

0.2.12 Special physical and chemical stresses to which substances and components are exposed after installation, e.g. shock loads, moisture, aggressive vapours, coatings in the area in contact with the ground.

0.2.13 Special protection of coatings against abrasion and to improve cleanability, e.g. with emulsion or varnish paint for dark shades and metal effect coatings.

0.2.14 Impregnation of wood and wood-based materials with wood preservatives against wood-discolouring fungi.

0.2.15 Type and quantity of silicone and silica ester impregnating agents

0.2.16 Treatment and execution of joint sealants

0.2.17 Removal and reinstallation of sealing profiles and fittings on windows, doors, frames and the like.

0.2.18 Type of substrate preparation, e.g. cleaning, high-pressure cleaning, degreasing and rust removal, as well as removal of chalk, rolling skin and scale, sweep blasting, matt sanding of substrates and old coatings.

0.2.19 Removal of algae and fungal infestation, disinfection of infested surfaces, and application of biocides.

0.2.20 Number and type of filling, e.g. as stain or partial filling; proportion of area to be filled. Indication of the quality level, e.g. Q 2, Q 4 according to DIN 18550-2 "Planning, preparation and execution of exterior and interior plasters — Part 2: Supplementary specifications to DIN EN 13914-2:2019-06 for interior plasters".

0.2.21 Bridging of plaster and concrete cracks with reinforcing fabric.

0.2.22 Filling of joints, anchorage openings and connections to adjacent components.

0.2.23 Number, type, location and dimensions of markings. Surface reflection, grip and wear resistance, e.g. sprinkling glass beads or quartz sand.

0.2.24 Number, type, location and dimensions of fittings penetrating the surfaces to be manufactured.

0.2.25 Number, type, location, dimensions and nature of sloping, curved or otherwise shaped surfaces, strongly profiled component surfaces, e.g. on roof cornices with visible rafters, corner bracing, quarry stones, trapezoidal sheets, stucco profiles.

0.2.26 Number, type, location and dimensions of back surfaces of niches, reveals and projections to be coated.

0.2.27 Number, type, position and dimensions of samples, e.g. surface and colour samples, sample areas.

0.2.28 Protection of building and plant components, furnishings and the like.

0.2.29 Services to be performed by the Contractor outside the installation site of the components to be coated. Place of execution.

0.2.30 Early or subsequent production of parts of the service.

0.2.31 Requirements for covers in the area of workplaces and traffic routes, e.g. slip resistance, slip resistance, breakthrough resistance.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Abschnitt 3.1.3,	if the coating process is not to be left to the contractor,
Section 3.1.6,	if fillers are to be carried out as stain or partial fillers or repeated fillings,
Section 3.1.7,	if white coatings are to be applied at a certain brightness,
Section 3.1.8,	if paintwork is not to be glossy, but e.g. satin or matt,
Sections 3.4.1.2, 3.4.2 and 3.4.3	if in the case of overhaul coatings — including outdoor areas — well-preserved substrates are only to be treated with a final coating.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units are to be provided as follows:

0.5.1 Area (m2), separated by type and dimensions, for

- Ceilings, walls, floors and cladding for areas > 2.5 m2 individual size,
- pillars, pilaster strips, columns, beams, wall templates, cornices, soffits of roof overhangs, pilasters and the like with a width > 1 m per visible area,
- stair soffits,
- Doors, gates, frames,
- Windows, shutters, shutters,
- steel profiles and pipes with a circumference > 1 m, wooden formwork,
- Radiator
- Grids, railings, fences, enclosures, grates,
- Trapezprofile, Wellbleche,
- tin roofs and the like,
- Treatment of partial areas, differentiated according to areas shares, e.g.
    - ≤ 10% of the component area,
    - > 10 % ≤ 30 % of the component area,
    - > 30 % ≤ 50 % of the component area.

0.5.2 Dimensions of length (m), separated by type and dimensions, for

- Soffits,
- Fugues
- pillars, pilaster strips, columns, beams, wall templates, cornices, soffits of roof overhangs, pilasters and the like with a width ≤ 1 m per visible area,
- Treppenwangen,
- Achieve
- Ceiling beams, trusses and the like, of wood or concrete,
- Sparren,

- Stahlprofile und Rohre mit einem Umfang ≤ 1 m,
- Corner profiles, mesh angles, joint profiles,
- Roller shutter guide rails, opening rods, stop rails,
- gutters, downpipes,
- Throats, snow guards,
- Markings
- Facings, frames, finishing strokes, corner bands, colour demarcations,
- cutting off the protrusion of edge insulation strips,
- Adaptation to components and built-in parts,
- Bridging plaster or concrete cracks.

0.5.3 Number (pcs), separated by type and dimensions, for

- Doors, gates, frames,
- Windows, shutters, shutters,
- Grids, grates and frames,
- Radiators, radiator consoles and brackets,
- Engines
- Fittings
- directional arrows, letters and the like,
- Closing anchorage openings, e.g. in scaffolding,
- Adaptation to components and built-in parts,
- ceilings, walls, floors and cladding for areas ≤ 2.5 m2 individual size,
- Rosettes, ornaments, consoles, chimney heads and the like.

0.5.4 Volume dimension (l) for

Silicone and silica ester impregnating agents.

1 Scope of application

1.1 ATV DIN 18363 "Painting and varnishing work — Coatings" applies to coating with varnishes, varnishes and other coating materials.

1.2 ATV DIN 18363 does not apply to

- External thermal insulation composite systems (see ATV DIN 18345 "External thermal insulation composite systems"),
- plastering and stucco work (see ATV DIN 18350 "Plastering and stucco work"),
- Staining and polishing of wooden parts (see ATV DIN 18355 "Carpentry"),
- Sealing of parquet and wooden paving (see ATV DIN 18356 "Parquet and wooden paving work"),
- Corrosion protection work (see ATV DIN 18364 "Corrosion protection work on steel structures").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18363 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

For the most common substances and components, the DIN standards and other requirements are listed below. For paint strippers and barriers, coating materials, impregnating agents and fillers and levelling compounds, DIN EN ISO 4618 "Coating materials — Terms" applies.

2.1 Stoffe zur Untergrundvorbehandlung

2.1.1 Lye substances

Leaching materials such as ammonium hydroxide must roughen the surface of existing oil paint and paint coatings.

2.2 Base coating materials

Base coating materials must reduce or compensate for the absorbency of substrates and ensure the adhesion strength of the following coatings.

2.2.1 Base coatings on wood and wood-based materials

DIN EN 152	Wood preservatives — Determination of the preventive efficacy of a protective treatment of processed wood against blue stain fungi — Laboratory method
DIN EN 927-1	Coating materials — Coating materials and coating systems for outdoor wood — Part 1: Classification and selection
DIN EN 927-2	Coating materials — Coating materials and coating systems for outdoor wood — Part 2: Performance requirements

2.2.2 Base coating materials on metals

DIN 55900-1	Coatings for Space Radiators — Part 1: Definitions, Requirements and Testing for Base Coatings and Industrial Base Coatings
DIN EN ISO 3549	Zinc dust pigments for coating materials — Requirements and test methods

2.3 Fillers and levelling compounds

Fillers and levelling compounds must not show any shrinkage cracks after drying.

2.4 Coating materials

2.4.1 Opaque pigmented coating materials

2.4.1.1 Coating materials on mineral substrates

- Lime paints

  DIN EN 459-1 Lime — Part 1: Definitions, requirements and conformity criteria Lime paints made from white lime may contain lime-resistant pigments up to 10 % by weight.

- Lime-white cement paints

  DIN EN 197-1 Cement — Part 1: Composition, requirements and conformity criteria of normal cement

  DIN EN 459-1 Construction lime — Part 1: Definitions, requirements and conformity criteria

- Glue colours

  Glue paints must not contain any additives of plastic-based polymer dispersion.

- Silicate Paints

  Silicate paints must consist of potash water glass solutions and potash water glass-resistant pigments and must not contain any organic components, e.g. plastic dispersions.

- Emulsion silicate paints, dispersion silicate filling paints and dispersion silicate coatings for plaster-like surfaces

  Emulsion silicate paints, dispersion silicate fillers and dispersion silicate coatings for plaster-like surfaces must consist of potash water glass with potassium water glass-resistant pigments and additives of hydrophobic agents. They may contain a maximum of 5% organic components by weight.

- Dispersion coatings, dispersion silicate coatings and silicone resin paints for interior use

  DIN EN 13300 Coating materials — Water-based coating materials and coating systems for interior walls and ceilings — Classification

Dispersion coatings, dispersion silicate coatings and silicone resin paints for interior use must comply with wet abrasion resistance class 3 in accordance with DIN EN 13300.

- Dispersion coatings, dispersion silicate paints and silicone resin paints for outdoor use

  DIN EN 1062-1 Coating materials — Coating materials and coating systems for outdoor mineral substrates and concrete — Part 1: Classification

  Silicone resin paints for outdoor use must be permanently water-repellent and resistant to dirt adhesion.

- Polyurethane resin paint paints (PUR paint paints)

  DIN EN ISO 11909 Binders for coating materials — Isocyanate resins — General test methods

- Epoxy Resin Paints (EP Paints)

DIN EN ISO 7142 Binders for coating materials — Epoxy resins — General test methods

- Coating materials for crack bridging

  DIN EN 1062-1 Coating materials — Coating materials and coating systems for outdoor mineral substrates and concrete — Part 1: Classification

  Coating materials for crack bridging must at least comply with crack bridging class A1 according to DIN EN 1062-1.

2.4.1.2 Coatings for wood and wood-based materials for outdoor use

DIN EN 927-1 Coating materials — Coating materials and coating systems for outdoor wood — Part 1: Classification and selection

DIN EN 927-2 Coating materials — Coating materials and coating systems for outdoor wood — Part 2: Performance requirements

2.4.1.3 Coating materials for metals

- Radiator paint colours

  DIN 55900-2 Coatings for space radiators — Part 2: Definitions, requirements and testing for topcoats and industrially produced topcoats
- Polyurethane resin paint paints (PUR paint paints)

  DIN EN ISO 11909 Binders for coating materials — Isocyanate resins — General test methods
- Epoxy Resin Paints (EP Paints)

  DIN EN ISO 7142 Binders for coating materials — Epoxy resins — General test methods

2.4.2 Translucent coating materials

2.4.2.1 Coating materials for mineral substrates

Glazes must produce transparent colouring coatings, glaze pigments must be alkali-resistant.

2.4.2.2 Coatings for wood and wood-based materials for outdoor use

DIN EN 927-1 Coating materials — Coating materials and coating systems for outdoor wood — Part 1: Classification and selection

DIN EN 927-2 Coating materials — Coating materials and coating systems for outdoor wood — Part 2: Performance requirements

Impregnation glazes must result in dry film thicknesses of less than 5 µm (minimally film-forming) for a single application.

2.4.3 Colourless coating materials

2.4.3.1 Clear coats for mineral substrates

Polyurethane resin coatings (PUR coatings) must comply with DIN EN ISO 11909.

2.4.3.2 Clear coats for wood and wood-based materials for outdoor use

DIN EN 927-1	Coating materials — Coating materials and coating systems for outdoor wood — Part 1: Classification and selection
DIN EN 927-2	Coating materials — Coating materials and coating systems for outdoor wood — Part 2: Performance requirements

2.4.3.3 Clear coats for metals

Polyurethane resin coatings (PUR coatings) must comply with DIN EN ISO 11909.

2.5 Marking Coatings

DIN 67510-4	Photoluminescent pigments and products — Part 4: Products for photoluminescent safety guidance systems — Markings and markings
DIN EN 1436	Road Marking Materials — Requirements for Road Markings and Test Methods

2.6 Reinforcement fabrics

2.6.1 Reinforcement adhesives

Reinforcement adhesives must consist of polymer dispersions in accordance with DIN EN ISO 4618.

2.6.2 Reinforcement fabrics and reinforcement fleeces

DIN 60000	Textiles — Basic Concepts
DIN 61850	Textile glass and processing aids — Definitions

2.7 Substances for covering with sheet metals

- Gold leaf
  Gold leaf with a gold content of at least 23 1/2 carats is to be used outdoors, and gold with a gold content of at least 22 carats indoors.
- Silver
  Silver leaf must be made of pure silver for coatings.

2.8 Sealants

DIN 18540	Sealing of exterior wall joints in building construction with joint sealants

DIN 18545	Sealing of glazing with sealants — Requirements for glass seams and glazing systems

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- unsuitable condition of the substrate, e.g. too low a quality level, sanding and chalking plaster, insufficiently strong, cracked and damp substrate, sinter layers, efflorescence, mould formation, corroded metal components,
- Wood that is visibly infested with blue stain, rot or insects,
- non-load-bearing base or old coatings,
- unsuitable conditions resulting from the weather or indoor climate (see section 3.1.11),
- Unevenness that affects the technical and visual requirements for the coating.

3.1.2 Individual, smaller damaged areas in the subsoil are to be repaired. Services that go beyond this are special services (see section 4.2.1).

3.1.3 The choice of coating method is left to the Contractor.

3.1.4 The surfaces must appear uniformly without roots and streaks, depending on the type of coating material and the coating process used.

3.1.5 All coatings must be carried out without filling.

3.1.6 If a filler has been agreed, the surfaces must be covered with filler over the entire surface and smoothed.

3.1.7 Coatings shall be made in one colour, white; in the case of concrete protection and floor coatings, in a light shade of grey.

3.1.8 Paintwork shall be glossy.

3.1.9 In the case of multi-layer coatings, each preceding coating shall be dry before the following coating is applied. This does not apply to wet-on-wet techniques.

3.1.10 Connections to doors, windows, mouldings, plinths, profiles, fittings, built-in parts and the like must be strictly limited.

3.1.11 In the event of unsuitable conditions resulting from the weather or the indoor climate, e.g. when coating with dispersion paints a relative humidity of over 80 % or surface temperatures below 8 °C, special measures must be taken in consultation with the client. If services are required for this, these are special services (see section 4.2.3).

3.1.12 Components must be free of grease and corrosion layers. If components need to be degreased or corrosion layers removed, special measures must be taken. If services are required for this, they are special services (see sections 4.2.10 and 4.2.13).

3.1.13 On substrates with penetrating ingredients, a coating with a barrier agent must be applied. This is a special service (see section 4.2.1).

3.2 Initial coatings

3.2.1 Initial coatings on mineral substrates, gypsum and gypsum fibre boards A base coat and a final coat must be applied.

In outdoor areas, coatings with dispersion coatings, dispersion paints, polymer resin and silicone resin paints or alkyd resin, polyurethane resin and epoxy resin paints as well as coatings on aerated concrete must also be subject to an intermediate coating. Coatings on aerated concrete exterior surfaces must be applied with a total consumption of at least 1 800 g/m2.

3.2.1.1 Crack-bridging coatings in outdoor areas

Crack-bridging coatings must be carried out in accordance with crack bridging class A1 according to DIN EN 1062-1.

3.2.1.2 Hairline crack-bridging coatings on surfaces made of gypsum and gypsum fibre boards

Surfaces made of gypsum and gypsum fibre boards must be reinforced with a fleece over the entire surface before coating.

3.2.1.3 Glazes on pre-coated substrates

Glazes are to be carried out in a single coating process.

3.2.1.4 Silicone, silane, siloxane and silica ester impregnations Silicone, silane, siloxane and silica ester impregnations must be applied until the substrate is saturated, if necessary in several wet on wet steps.

3.2.2 Initial coatings on wood and wood-based materials

3.2.2.1 A primer, an intermediate and a final coat shall be applied. In the case of windows and external doors, a second intermediate coating must be applied; Interior glazes must be carried out without an intermediate coating.

3.2.2.2 Components made of coniferous woods in outdoor areas must be treated with a primer coating in accordance with DIN EN 152 to protect against wood-discolouring fungi (blue stain protection).

3.2.2.3 The base and first intermediate coating of windows and external doors must be applied on all sides. Rebates of windows or doors must be coated in the colour of the corresponding side. The outward-facing seams belong to the outer coating, the inward-facing seams to the inner coating. In the case of windows and exterior doors, only the

side exposed to the weather is part of the exterior coating; all other sides belong to the inner coating.

Putties must be provided with an intermediate and a final coating in accordance with the other coating structure. Plastic and elastic sealants must be covered by the adjacent coating up to 1 mm wide.

3.2.3 Initial coatings on metal

3.2.3.1 A base and final coating must be applied to the interior. In rooms contaminated with moisture, an intermediate coating must also be applied to steel surfaces.

3.2.3.2 In the outdoor area, a primer, intermediate and final coating must be applied. No intermediate coating is applied to bitumen paint and non-ferrous metals.

3.2.3.3 A primer and final coating shall be applied to non-primed heating surfaces, and a final coating shall be applied to primed heating surfaces.

3.2.4 Initial coatings on plastic

3.2.4.1 Plastic surfaces must be cleaned and roughened.

3.2.4.2 A base coat and a final coat must be applied.

3.3 Special coating processes

3.3.1 Covering with Leaf Metals

Coatings made of metal leaf must be produced with a uniform surface effect. Coatings of silver leaf, aluminium leaf and composition gold must be protected against corrosion with a colourless varnish.

3.3.2 Fire Protection Coating Systems

Reactive intumescent fire protection coatings must be carried out in accordance with the provisions of their approval. No other coatings may be applied to fire protection coatings that do not comply with the provisions of the approval of the fire protection coating.

3.4 Overhaul coatings

The existing coating must be cleaned or roughened. Damage to the old coating must be repaired. measures that go beyond the benefits under section 4.1.7 are Special Achievements. After cleaning, any remaining microbiological growth on old coatings in outdoor areas must be pre-treated and removed with biocides. These services are special services (see section 4.2.24).

3.4.1 Overhaul coatings on mineral substrates, gypsum and gypsum fibre boards

3.4.1.1 Surface Preparation

Glue paint coatings must be removed by washing. These services are special services (see section 4.2.12).

3.4.1.2 Coating

In the interior area, the coating must be carried out in a single step. In the outdoor area, an intermediate and a final coating must be applied.

3.4.1.2.1 Crack bridging ends

Crack-bridging coatings must be carried out in accordance with crack bridging class A1 according to DIN EN 1062-1.

3.4.1.2.2 Hairline crack-bridging coatings on surfaces made of gypsum and gypsum fibre boards

Surfaces made of gypsum and gypsum fibre boards must be reinforced with a fleece over the entire surface before coating.

3.4.2 Overhaul coatings on wood and wood-based materials

Inside, the coating must be produced in a single step. In the outdoor area, an intermediate and a final coating must be applied. Windows and external doors must be coated up to the first sealing profile; if there are no sealing profiles, up to the first fold.

3.4.3 Overhaul coatings on metal

Inside, the overhaul coating must be produced in a single operation. In the case of steel in rooms exposed to moisture, an intermediate coating must also be applied. In the outdoor area, an intermediate and a final coating must be applied.

3.4.4 Overhaul coatings on plastic

The overhaul coating must be produced in a single operation.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on or clad is not higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.1.2 Compensation of stepped or inclined standing surfaces of scaffolding up to 40 cm difference in height, e.g. via stairs or ramps.

4.1.3 Protection of building and plant components, e.g. furnishings, floors, railings, doors, windows from contamination and damage during work by loose covering, hanging or wrapping, including subsequent removal of protective measures, except for services under section 4.2.11.

4.1.4 Removal and reattachment of up to five switch, socket covers and the like of simple design (clamped or secured with a screw) per room.

4.1.5 Unhooking and unhooking of doors, windows, shutters and the like in a simple design for the processing and marking of these components.

4.1.6 Cleaning of the substrate, except for services according to section 4.2.10.

4.1.7 Repair of individual minor damages in the old coating and in the substrate, e.g. isolated depressions caused by impact, except for services in accordance with section 4.2.1.

4.1.8 Sanding of wooden surfaces, mineral substrates and metal surfaces between the individual coatings as well as fine cleaning of the surfaces to be coated.

4.1.9 Submission of prefabricated surface and color samples.

4.1.10 Completion of components in several operations to enable work by other contractors, insofar as one's own services can be provided continuously in the course of similar painting and varnishing work. If these conditions are not met, they are special benefits according to section 4.2.28.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 Repairing extensive damage to the old coating and the substrate. Pre-treatment of unsuitable substrates, e.g. by high-pressure cleaning, roughening and alkalining, removal of algae and fungal infestation, application of primers, biocides and the like (see section 3.1.13).

4.2.2 Provision of recreation and storage rooms if the Client does not provide rooms that can be easily locked.

4.2.3 Services to protect against unsuitable conditions in accordance with Section 3.1.11, e.g. enclosure, heating.

4.2.4 Assembly, conversion and dismantling as well as provision of scaffolding for the services of other contractors.

4.2.5 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on or clad is higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.2.6 Assembly, conversion and dismantling as well as provision of scaffolding with a stepped or inclined footprint, e.g. via stairs or ramps, if compensation of more than 40 cm is required.

4.2.7 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that work on the roof surface has a roof pitch of more than 22.5°.

4.2.8 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the depth of the gripping space is more than 60 cm, e.g. for glass roofs, railings.

4.2.9 Removal and installation of doors, windows, shutters and the like, insofar as this goes beyond the services in accordance with Section 4.1.5.

4.2.10 Cleaning the substrate of coarse soiling, e.g. plaster residues, mortar residues, paint residues, oil, adhering sanding dust, provided that the soiling was not caused by the contractor.

4.2.11 Special protection of building and plant components as well as furnishings, e.g. by masking windows, doors, floors, coverings, stairs, wood, roof surfaces, switch and socket covers, surface-finished parts, dust-proof masking of sensitive equipment and technical equipment, dust protection walls, scaffolding cladding, protective coatings, emergency roofs, laying out of hardboard boards and building protection films from 0.2 mm thick, cover fleece.

4.2.12 Removal of coatings and existing wall and ceiling cladding.

4.2.13 Degreasing and rust removal and removal of rolling skin and scale (see section 3.1.12).

4.2.14 Matt sanding of substrates and old coatings.

4.2.15 Bridging plaster and concrete cracks with reinforcing fabrics.

4.2.16 Drawing final strokes, stenciling and applying finishing borders and the like.

4.2.17 Setting off fittings in a different shade on doors, windows, shutters and the like.

4.2.18 Colour settling in the coating or changing of the coating material within components to be coated.

4.2.19 Adaptation of the coating (trimming) to highly profiled component surfaces, e.g. roof cornices with visible rafters, corner bonds, quarry stones, trapezoidal sheets, stairs, stucco profiles.

4.2.20 Cutting off the overhang of edge insulation strips.

4.2.21 Removal and installation as well as masking of sealing profiles and fittings.

4.2.22 Transporting doors, window sashes and shutters, radiators and the like.

4.2.23 Filling of anchorage openings and alignment with the surface coating.

4.2.24 Biocides Pre-treatment of microbiological growth and services for the protection of surfaces against algae, fungal and insect infestation.

4.2.25 Production and application of surface and colour samples as well as sample surfaces for wall and colour designs, insofar as these services go beyond the services referred to in section 4.1.9.

4.2.26 Filling of joints and connections to adjacent components, installation of profiles and the like.

4.2.27 Removal of on-site protective films and the like, e.g. on window sills, light metal profiles.

4.2.28 Coating of components in partial areas to enable work by other contractors, insofar as the company's own services cannot be provided continuously in the course of similar coating work (see section 4.1.10).

4.2.29 Removal of obstacles in the subsoil, e.g. removal of concrete burrs, foam residues.

4.2.30 Removal and reinstallation of switch, socket covers and the like, insofar as they go beyond the services referred to in section 4.1.4.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

5.1.1 The determination of the service – regardless of whether it is carried out according to drawings or measurements – shall be based on the dimensions

- of the treated areas,
- of the coated surfaces

The simplifying rules, such as overmeasurement rules and individual regulations, are to be applied to determine the benefit.

5.2 Determination of dimensions/quantities

5.2.1 For the preparation of substrates, coating and treatment,

- on interior surfaces without limiting components, the dimensions of the unplastered, uninsulated, unclad surfaces,
- on interior surfaces with limiting components, the dimensions of the surfaces to be treated up to the unplastered, uninsulated, unclad components that limit them, e.g. raw flooring, raw ceiling,
- in the case of interior work, the treated areas, if the shell dimensions cannot be determined,
- in the case of façades, the treated surfaces

Space-forming system floors, dry subfloors, facing shells as well as suspended ceilings and suspended ceilings are considered limiting components.

5.2.2 When calculating individual areas of any shape, e.g. repair areas, the smallest circumscribed rectangle is to be used as a basis for determining the dimensions. Excluded from this rule are circles, triangles, trapezoids and diamonds.

5.2.3 Coated back surfaces of niches and reveals are calculated separately with their dimensions, regardless of their individual size.

5.2.4 In the case of coating work, directly connected, different types of recesses are calculated separately, e.g. opening with adjacent niche.

5.2.5 If a recess is proportionately integrated into adjacent areas that are to be calculated separately, the respective proportional recess area is calculated to determine the overmeasurement variable.

5.2.6 Windows, doors, partitions, cladding and the like shall be calculated by area per coated side.

5.2.7 Pipe railings are calculated separately according to the length of the pipes according to dimensions.

5.2.8 Profiles, radiators, trapezoidal profiles, corrugated sheets and the like shall be calculated according to the area covered or, if available, according to tables.

5.2.9 The dimensions are determined on the basis of the largest component dimension, if any, e.g. cornices, frames, wall connections, circumferential friezes, façades. Gutters are measured at the bead, downpipes in the outer bend.

5.2.10 Silicone impregnations and silica ester impregnations are calculated according to the quantity consumed.

5.3 Overmeasurement rules

The following are measured:

5.3.1 When billed according to area

- recesses with a single size ≤ 2.5 m2, e.g. openings (also floor-to-ceiling), niches; Recesses in floors with a single size ≤ 0.5 m2. When determining the dimensions for the overmeasurement, the smallest dimensions of the recess shall be taken as a basis.
- Fugues
- surface-enclosing cornices, friezes, pilaster strips, corner bonds, frames and façades and the like ≤ 30 cm individual width, regardless of whether they are treated,
- mouldings, plinth tiles and the like ≤ 10 cm high,
- interruptions in the area to be processed, e.g. due to trusses, columns, beams, balcony slabs, landings, wall templates, cornices, friezes, pilaster strips, with a single width ≤ 30 cm, regardless of whether they are treated,
- Glazing, fillings and the like for windows, doors, partitions, cladding and the like.

5.3.2 When billing according to length

- interruptions with a single length ≤ 1 m,
- Gate valves, flanges and the like for pipelines. They are calculated separately.

5.4 Individual provisions

5.4.1 For doors > a thickness of 60 mm, for block frames > a depth of 60 mm, for linings and cladding of doors and windows as well as for steel door frames and the like, the unwound

area is calculated. Window grilles, scissor grilles, roller grilles, grates, fences, enclosures and bar railings are calculated on one side.

5.4.2 If doors, windows, roller shutters and the like are calculated by number, deviations from the prescribed dimensions of up to 5 cm in height and width and up to 3 cm in depth shall not be taken into account.

5.4.3 In the case of percentage treatment of surfaces in non-contiguous partial areas, the total area of the component shall be taken as a basis.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Corrosion protection work on steel structures — DIN 18364

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

Type, location, dimensions and design as well as dates of assembly and dismantling of on-site scaffolding.

0.2 Information on the execution

0.2.1 Type and scope of the measure, e.g. initial protection, partial renewal, full renewal.

0.2.2 Corrosivity category and period of protection to be achieved (see standards of the series DIN EN ISO 12944 "Coating materials — Corrosion protection of steel structures by coating systems" and DIN EN ISO 14713-1 "Zinc coatings — Guidelines and recommendations for the protection of iron and steel structures against corrosion — Part 1: General design principles and corrosion resistance").

Procedure for corrosion protection of steel structures by coating systems according to DIN EN ISO 12944-8 "Coating materials — Corrosion protection of steel structures by coating systems — Part 8: Development of specifications for initial protection and repair".

0.2.3 Special physical and chemical stresses to which substances and components are exposed after installation.

0.2.4 Selected anti-corrosion system:

- Coating according to DIN EN ISO 12944-5 "Coating materials — Corrosion protection of steel structures by coating systems — Part 5: Coating systems",
- Hot-dip galvanizing according to DIN EN ISO 1461 "Zinc coatings applied to steel by hot-dip galvanizing (piece galvanizing) — Requirements and tests",
- Thermal spraying according to the series of standards DIN EN ISO 2063 "Thermal spraying — Zinc, aluminium and their alloys" as well as surface preparation and application according to the specification.

0.2.5 Colour of the coatings, effect pigmentation or the like, e.g. according to RAL, DIN 6164-1 "DIN colour chart — DIN colour chart system for the 2° normal observer", NCS colour system, DB colour chart. Multi-colour of the components to be treated.

0.2.6 Number, type, location, dimensions and design of the components and structures, e.g.

- Bridges, cranes, containers, masts,
- solid wall or truss constructions,
- load-bearing thin-walled structures,
- riveted, bolted or welded structures,
- the type and scope of the assembly connections,
- Gap width for structures made of composite profiles,
- Steel grade, insofar as it is important for surface preparation.

0.2.7 Coating of fittings and flanges.

0.2.8 Type and nature of the surface to be coated

- for steel in accordance with DIN EN ISO 8501-1 "Preparation of steel surfaces before the application of coating materials — Visual assessment of surface cleanliness — Part 1: Degrees of rust and surface preparation of uncoated steel surfaces and steel surfaces after removal of existing coatings over the entire surface" and DIN EN ISO 8501-3 "Preparation of steel surfaces before the application of coating materials — Visual assessment of surface cleanliness — Part 3: Degree of preparation of welds, edges and other surfaces with surface irregularities",
- in the case of existing coatings: age, type, structure, adhesion strength, layer thicknesses, degree of rust, degree of rust, impurities, chalking, pollutants contained (e.g. according to the DIN EN ISO 4628 series of standards "Coating materials — Assessment of coating damage — Evaluation of the amount and size of damage and the intensity of uniform changes in appearance"),

- for hot-dip galvanized (piece galvanized) surface,
- for thermally sprayed surfaces,
- for fire protection coatings: layer thicknesses of existing corrosion protection systems, indicating the approval of the fire protection system

0.2.9 Requirements for fire, sound, humidity and radiation protection as well as electrical conductivity. Acoustic and lighting requirements.

0.2.10 Requirements for reactive intum-forming fire protection coatings, e.g. flammability according to DIN 4102-1 "Fire behaviour of building materials and components — Part 1: Building materials — Definitions, requirements and tests" and the indication of the required corrosivity category for the intended application.

0.2.11 Compatibility of the coating with drinking water and foodstuffs.

0.2.12 Preparation and corrosion protection of joints.

0.2.13 Type and scope of third-party monitoring and control audits.

0.2.14 Number, location and dimensions of control surfaces in accordance with DIN EN ISO 12944-7 "Coating materials — Corrosion protection of steel structures by coating systems — Part 7: Execution and supervision of coating work and DIN EN ISO 12944-8.

0.2.15 Number, type and dimensions of samples. Place of installation.

0.2.16 Protection of building and plant components, furnishings and the like.

0.2.17 Services that the Contractor is to perform outside the installation site of the components to be coated. Place of execution.

0.2.18 Early or subsequent production of parts of the service.

0.2.19 Restrictions on noise, dust and odour emissions.

0.2.20 Removal of algae and fungal growth, mosses, lichens, bird droppings and the like.

0.3 Details of deviations from the ATVs

If regulations other than those provided for in this ATV are to be made, these must be clearly and individually stated in the service description.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units are to be provided as follows:

0.5.1 Area (m2), separated by type and dimensions, for

- solid wall constructions and truss constructions made of profiles with a circumference of > 1 m,
- Windows, doors, gates and the like
- Pipes with a circumference of > 1 m,

- Containers, sheet piling and profiled sheets,
- Railing
- Cover plates, gratings and the like.

0.5.2 Dimensions of length (m), separated by type and dimensions, for

- profiles and partial surfaces of profiles with a circumference ≤ 1 m,
- Pipes with a circumference ≤ 1 m,
- Railing
- additional coating, e.g. of edges, welds.

0.5.3 Number (pcs), separated by type and dimensions, for

- containers, cover plates, grates, grilles, railings,
- windows, doors, gates and the like,
- fastenings, e.g. brackets, pipe clamps, suspensions,
- additional coating of fasteners, flanges, fittings including their flanges,
- Control surfaces.

0.5.4 Mass (kg, t) for components or separately detectable structural parts.

1 Scope of application

1.1 ATV DIN 18364 "Corrosion protection work on steel structures" applies to the corrosion protection of steel components and steel constructions that require static calculation or approval. It applies to corrosion protection through coating work, hot-dip galvanizing (piece galvanizing) and thermal spraying of metals on steel components and in connection with structural fire protection through fire protection coatings.

1.2 In addition, ATV DIN 18299 "General regulations for construction work of any kind", sections 1 to 5 shall apply. In the event of contradictions, the regulations of ATV DIN 18364 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

For the most common substances and components, the DIN standards and other requirements are listed below.

DIN EN ISO 1461	Zinc coatings applied to steel by hot-dip galvanizing (piece galvanizing) — Requirements and tests
DIN EN ISO 2063 (all parts)	Thermal spraying — zinc, aluminium and their alloys
DIN EN ISO 12944-5	Coating materials — Corrosion protection of steel structures by coating systems — Part 5: Coating systems

DIN EN ISO 12944-7 Coating materials — Corrosion protection of steel structures by coating systems — Part 7: Execution and supervision of coating work

DASt guideline 022, hot-dip galvanizing of load-bearing steel components.

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- Deviations of the portfolio from the specifications,
- coarse soiling of the surface,
- insufficient degree of preparation of welds, edges and other surfaces with surface irregularities,
- insufficient adhesion strength of existing coatings or coatings,
- insufficient curing of existing coatings,
- cracks, bubbles, chalks and the like in existing coatings or coatings,
- unsuitable environmental conditions,
- unsuitable conditions resulting from the weather or indoor climate (see section 3.1.3).

3.1.2 The choice of methods for preparing the surface and for applying the coating materials shall be left to the Contractor. The procedures must be communicated to the contracting authority before execution.

3.1.3 In the event of unsuitable conditions resulting from the weather or the indoor climate, e.g. when carrying out coating work on surfaces whose temperatures are less than 3 K above the dew point temperature of the ambient air, special measures must be taken in consultation with the Client. The measures to be taken are special services (see section 4.2.11).

3.2 Corrosion protection through coating systems

3.2.1 Initial coating

The surface shall be prepared in accordance with the surface preparation grade Sa 21/2 in accordance with DIN EN ISO 12944-4 "Coating materials — Corrosion protection of steel structures by coating systems — Part 4: Types of surfaces and surface preparation" and shall be coated on the basis of the corrosion protection system specified by the client.

3.2.2 Repairs

Depending on the specified period of protection in accordance with DIN EN ISO 12944-1 "Coating materials — Corrosion protection of steel structures by coating systems — Part

1: General introduction", loose and/or rusted-through coatings must be removed according to the specified protection period, but at least prepared with the surface preparation grade P Ma in accordance with DIN EN ISO 12944-4. The surfaces to be coated must be cleaned/derusted, roughened if necessary and coated in accordance with the system.

3.2.3 Partial renewal

The entire surface must be cleaned with water (without additives) in accordance with DIN EN ISO 12944-4. Damaged areas are to be treated in accordance with section 3.2.2. A top coat in accordance with DIN EN ISO 12944-5 must be applied over the entire surface.

3.2.4 Complete renewal

The entire surface must be prepared according to surface preparation grade Sa 21/2 in accordance with DIN EN ISO 12944-4 and coated in accordance with section 3.2.1 in accordance with the system.

3.2.5 Coatings on hot-dip galvanized and thermally sprayed surfaces

The surface preparation process in accordance with DIN EN ISO 12944-4 and the subsequent coating in accordance with DIN EN ISO 12944-5 must be carried out on the basis of the coating system specified by the customer.

3.2.6 Measuring Layer Thickness

The coating thickness of coatings is measured in accordance with DIN EN ISO 2808 "Coating materials — Determination of coating thickness".

3.3 Corrosion protection by hot-dip galvanizing (piece galvanizing)

Hot-dip galvanizing must be carried out in accordance with DIN EN ISO 1461. The DASt guideline 022 "Hot-dip galvanizing of load-bearing steel components"1) is to be applied.

3.4 Corrosion protection by thermal spraying

Thermal spraying must be carried out in accordance with the DIN EN ISO 2063 series of standards.

3.5 Fire protection coating systems

Fire protection coating systems must be designed in accordance with the provisions of their approval. No other coatings may be applied to fire protection coatings that do not comply with the provisions of the approval of the fire protection coating.

3.6 Control surfaces

3.6.1 The Contractor shall agree with the Client on the location of agreed control areas in accordance with DIN EN ISO 12944-7 on the property and the time of installation.

3.6.2 The Contractor shall be entitled to create control areas in accordance with DIN EN ISO 12944-7 for its own purposes. The location of the object and the time of investment must be agreed with the client.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Determination of the condition of the road and terrain surfaces, the receiving waters and the like (see § 3 para. 4 VOB/B).

4.1.2 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on or clad is not higher than 3.50 m above the standing surface of the scaffolding required for this purpose.

4.1.3 Compensation of stepped or inclined standing surfaces of scaffolding up to 40 cm difference in height, e.g. via stairs or ramps.

4.1.4 Protection of components and plant components against contamination and damage during corrosion protection work by loose covering, hanging or wrapping, except for protective measures according to section 4.2.12.

4.1.5 Removal of dust and loose dirt on the substrates to be treated.

4.1.6 Submission of prefabricated surface and color samples.

4.1.7 Completion of components in several work steps to enable work by other contractors, insofar as the company's own services can be provided continuously in the course of similar corrosion protection work. If these requirements are not met, they are special services according to section 4.2.20.

4.1.8 Marking the coating on the object.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 Provision of recreation and storage rooms if the Client does not provide rooms that can be easily locked.

4.2.2 Cleaning the substrate of coarse soiling, e.g. concrete and mortar residues, paint residues, oil, insofar as this was not caused by the Contractor.

4.2.3 Removal of algae and fungal growth, mosses, lichens, bird droppings and the like.

4.2.4 Preparation of the surfaces of base and intermediate coatings before the application of subsequent coatings, insofar as the necessity is not attributable to the Contractor.

4.2.5 Assembly, conversion and dismantling as well as provision of scaffolding for the services of other entrepreneurs.

4.2.6 Erection, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on or clad is higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.2.7 Erection, conversion and dismantling as well as provision of scaffolding with a stepped or inclined footprint, e.g. over stairs or ramps, if compensation of more than 40 cm is required.

4.2.8 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that work on the roof surface has a roof pitch of more than 22.5°.

4.2.9 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the depth of the gripping space is more than 60 cm, e.g. in the case of glass roofs.

4.2.10 Rework and adjustment of attachment points/stop surfaces of the scaffolding fasteners.

4.2.11 Protection against unsuitable conditions resulting from the weather or indoor climate, according to section 3.1.3.

4.2.12 Special measures for the protection of building and plant components as well as furnishings, e.g. by masking windows, doors, floors, coverings, stairs, roof surfaces, surface-finished parts, dust-proof masking of sensitive equipment and technical equipment, dust protection walls, enclosures, use of extraction and filter systems, scaffolding cladding, laying out of hardboard or building protection films from 0.2 mm thick.

4.2.13 Removal, installation and masking of sealing profiles and fittings.

4.2.14 Removal and disposal of process-related mixtures and waste from the client's area, e.g. during blasting work.

4.2.15 Removal and reapplication of grates, coverings, cover plates and the like.

4.2.16 Degreasing bolted joints.

4.2.17 Additional coating of edges, welds and fasteners, e.g. screws, rivets.

4.2.18 Creation of control surfaces in accordance with Section 3.6.1.

4.2.19 Producing and attaching sample surfaces and colour schemes, coating sample constructions and models.

4.2.20 Completion of the services in several work steps to enable work by other contractors, insofar as the company's own services cannot be provided continuously in the course of similar corrosion protection work (see section 4.1.7).

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

The determination of the performance — regardless of whether it is carried out according to drawings or measurements — shall be based on the dimensions of the areas treated.

The simplifying rules, such as over-measurement rules and individual regulations, are to be used to determine performance.

5.2 Determination of dimensions/quantities

5.2.1 In the case of standardised profiles, the information in the DIN standards applies, in the case of other profiles, the information in the manufacturer's profile book.

5.2.2 The dimensions are determined on the basis of the largest component dimension, if any, which has been unfolded, e.g. in the case of pipes, the dimension of the outer bend.

5.2.3 In the case of billing according to area measurements, the area of railings, gratings, grids and the like is only calculated on one side with the visible area.

5.2.4 For surfaces which cannot be determined by dividing them into simple geometric shapes, e.g. rectangles, triangles, trapezoids, rhombuses, the smallest circumscribed rectangle shall be used.

5.2.5 If gates, doors, windows and the like are calculated by number, deviations from the prescribed dimensions of up to 5 cm in height and width and up to 3 cm in depth shall not be taken into account.

5.2.6 In the case of billing by mass, the following shall be required for sheet and strip

- of steel, the mass of 7.85 kg/m2,
- made of stainless steel, the mass of 7.90 kg/m2

1 mm thickness each. Fasteners, e.g. screws, rivets, welds, are not taken into account when determining the mass.

5.2.7 Hot-dip galvanizing (piece galvanizing) is billed according to mass. This is based on the mass of the ungalvanized steel structures and components.

5.2.8 Valves, e.g. gate valves, flanges, are calculated individually according to number.

5.3 Overmeasurement rules

The following are measured:

5.3.1 When billed according to area

- recesses with a single size ≤ 0.1 m2,

- Interruptions in the area to be treated by components, e.g. columns, beams, templates, landings, depressions, with a single width ≤ 30 cm.

5.3.2 When billing according to length

- interruptions with a single length ≤ 1 m,
- valves, e.g. gate valves, flanges, for pipelines,
- Crossings, coverings and penetrations.

5.3.3 When Billing by Mass

- the mass of parts whose surfaces could not be treated in whole or in part is not subtracted, e.g. column bases embedded in concrete.

5.4 Individual provisions

No regulations.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Flooring work — DIN 18365

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

Type and extent of fall edges and openings that are not secured against falling.

0.2 Information on the execution

0.2.1 Type, thickness and nature of the individual layers of the subsoil.

0.2.2 Special thermal influences and moisture effects on the substrate from bottom to top and from the outside to the inside.

0.2.3 Type of heating/cooling in heated/cooled floor structures.

0.2.4 Type and pre-treatment of substrate surfaces, e.g. brushing, sanding, vacuuming, pre-painting, full-surface filling.

0.2.5 Type and dimensions of documents.

0.2.6 Dimensions, colour tone, surface layout, surface quality, stress classes, properties and suitability of the floor coverings, e.g. suitability for chair castors, suitability for damp rooms.

0.2.7 Special requirements for floor coverings, e.g. in the case of high mechanical, thermal and chemical influences. Electrically insulating or electrically conductive as well as antistatic finishing of the floor coverings and appropriate installation.

0.2.8 Laying floor coverings on underlays.

0.2.9 Tensioning of textile floor coverings on nail strips, including underlays.

0.2.10 Type and design of connections to structural components.

0.2.11 Type and design of movement joints.

0.2.12 Number, type and dimensions of samples, e.g. surface and colour samples, sample areas. Place of installation.

0.2.13 Direction of laying of floor coverings.

0.2.14 Installation of floor coverings of a particular type and design, e.g. friezes, inlays, markings and their dimensions.

0.2.15 The shape of the surfaces to be covered that deviates from the rectangle, e.g. oblique-angled surfaces, round surfaces, spiral stairs and their dimensions.

0.2.16 Type of stairs, design of the steps to be covered, the stair base, if necessary, with drawings attached.

0.2.17 Deviation of the substrate from the horizontal.

0.2.18 Number, type and dimensions of recesses, e.g. pipe penetrations, frames, separation and stop rails and the like.

0.2.19 Number, type and dimensions of niches.

0.2.20 Type, dimensions, profile and fastening of skirting boards and skirting boards.

0.2.21 Location of unrecognisable pipes, pipes and the like in the floor and wall area.

0.2.22 Type, provision, maintenance and removal of protective covers.

0.2.23 Requirements for covers in the area of workplaces and traffic routes, such as slip resistance, slip resistance, breakthrough resistance.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 3.2 if Increased Flatness Requirements Are Imposed,

Section 3.3,	if the substrate for coverings that are laid without an underlay is not to be smoothed with filler,
Section 3.4.1,	if floor coverings with underlays are to be laid,
Section 3.4.3,	if floor coverings are not to be glued over the entire surface, but are to be laid loosely, fixed with pressure-sensitive adhesive or tensioned, for example,
Section 3.4.4,	if the direction of laying of the floor coverings is not to be left to the contractor,
Section 3.4.6,	if floor surfaces of door openings, niches and the like are to be laid contrary to the provision provided for therein,
Section 3.4.9	if resilient floor coverings are to be welded or grouted,
Section 3.6.1	if strips, butt edges and profiles are not to be fastened by gluing or nailing, but e.g. by screws.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units are to be provided as follows:

0.5.1 Area (m2), separated by type and dimensions, for

- Pre-treatment of the substrate, e.g. cleaning, filling, sanding,
- Underlays, floor coverings and protective covers,
- Welding and grouting.

0.5.2 Dimensions of length (m), separated by type and dimensions, for

- cutting off covers and the protrusions of edge insulation strips,
- Floor coverings of steps, thresholds and niches,
- Skirting boards, profiles, edges, rails, skirting boards, floor flooring skirting strips,
- friezes, grooves, coverings of grooves and marking lines,
- Welding and grouting,
- Finishing the floor coverings on rising components without a strip cover or on built-in parts and furnishings,
- Closing joints.

0.5.3 Number (pcs), separated by type and dimensions, for

- Floor coverings of steps, thresholds and niches,
- lateral step profiles,
- Inlays and individual markings,
- Termination and separation rails,

- prefabricated interior and exterior corners for skirting boards,
- Adaptation of floor coverings, e.g. to pipe penetrations, electricians, floor containers, inspection openings, built-in parts and furnishings.

1 Scope of application

1.1 ATV DIN 18365 "Flooring work" applies to the installation of floor coverings in sheets and panels made of linoleum, plastic, elastomer, textiles and cork as well as to the installation of multi-layer elements.

1.2 ATV DIN 18365 does not apply to the installation of floor coverings made of

- Natural stone (see ATV DIN 18332 "Natural stone work"),
- Cast stone (see ATV DIN 18333 "Cast stone work"),
- Tiles and slabs (see ATV DIN 18352 "Tile and slab work"),
- Screed (see ATV DIN 18353 "Screed work"), Mastic asphalt (see ATV DIN 18354 "Mastic asphalt work") and
- Parquet and wooden paving (see ATV DIN 18356 "Parquet and wooden paving work").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18365 CO

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

For the most common substances and components, the DIN standards and other requirements are listed below.

2.1 General

DIN EN 14041	Elastic, textile, laminate and modular multi-layer floor coverings — Key features
DIN EN ISO 10874	Resilient, textile and laminate floor coverings — Classification Flooring work

2.2 Linoleum floor coverings

DIN EN 686	Resilient floor coverings — Specification for linoleum with and without pattern with foam backing
DIN EN 687	Resilient floor coverings — Specification for linoleum with and without pattern with cork backing
DIN EN 688	Resilient floor coverings — Specification for cork linoleum
DIN EN ISO 24011	Resilient floor coverings — Specification for linoleum with and without pattern

2.3 Plastic floor coverings

DIN EN 650	Resilient floor coverings — Floor coverings of polyvinyl chloride with a backing of jute or polyester fleece or on polyester fleece with a backing of polyvinyl chloride — Specification
DIN EN 651	Resilient floor coverings — Polyvinyl chloride floor coverings with a foam layer — Specification
DIN EN 652	Resilient floor coverings — Polyvinyl chloride floor coverings with a cork-based backing — Specification
DIN EN 13413	Resilient floor coverings — Polyvinyl chloride floor coverings with a fibrous backing — Specifications
DIN EN 13553	Resilient floor coverings — Polyvinyl chloride floor coverings for use in special wet rooms — Specification
DIN EN 13845	Resilient floor coverings — Polyvinyl chloride floor coverings with particle-based increased sliding resistance — Specification
DIN EN 14565	Resilient floor coverings — Synthetic thermoplastic-based floor coverings — Specification
DIN EN ISO 10581	Resilient floor coverings — Homogeneous polyvinyl chloride floor coverings — Specification
DIN EN ISO 10582	Resilient floor coverings — Heterogeneous poly(vinyl chloride) floor coverings — Specifications
DIN EN ISO 10595	Resilient floor coverings — Semi-flexible PVC floor tiles — Specification
DIN EN ISO 26986	Resilient floor coverings — Foamed polyvinyl chloride floor coverings — Specification

2.4 Elastomer flooring

DIN EN 1816	Resilient floor coverings — Specification for homogeneous and heterogeneous flat elastomer floor coverings with foam coating
DIN EN 1817	Resilient Floor Coverings — Specification for Homogeneous and Heterogeneous Flat Elastomer Floor Coverings
DIN EN 12199	Resilient floor coverings — Specification for homogeneous and heterogeneous profiled elastomer floor coverings
DIN EN 14521	Resilient floor coverings — Specification for flat elastomer floor coverings with or without foam base layer with a decorative layer

2.5 Textile floor coverings

DIN EN 1307	Textile floor coverings — Classification

DIN EN 14215	Textile floor coverings — Classification of machine-made carpets and carpets

2.6 Floor coverings made of pressed cork

DIN EN 655	Resilient floor coverings — Sheets on a backing of pressed cork with a polyvinyl chloride wear layer — Specification
DIN EN 12104	Resilient floor coverings — Pressed cork boards — Specifications

2.7 Multi-layered elements

DIN EN 13329	Laminate flooring — Elements with a top layer based on aminoplastic, heat-curable resins — Specifications, requirements and test methods
DIN EN 14978	Laminate flooring — Elements with an acrylic-based electron-beam-cured top layer — Specifications, requirements and test methods
DIN EN 16511	Panels for floating installation — Semi-rigid, multi-layer, modular floor coverings (MMF) with abrasion-resistant top layer
DIN EN ISO 20326	Resilient floor coverings — Specification for floor panels for loose installation

2.8 Appearance

Color deviations from samples may only be minor.

2.9 Adhesives

DIN EN 14259	Adhesives for floor coverings — Mechanical and electrical performance requirements

Adhesives must be designed in such a way that they achieve a strong and permanent bond. They must not adversely affect the floor covering, underlays and substrate and must not cause any nuisance due to odours after processing.

2.10 Documents

DIN EN 12455	Resilient floor coverings — Specification for cork underlays DIN EN 12103 Resilient floor coverings — Pressed cork underlays — Specification

2.11 Primers, fillers

Primers and fillers must bond firmly and permanently to the substrate. They must enable good bonding of the adhesives to be used. They must not adversely affect the substrate, underlay, adhesive and floor covering and must not cause any nuisance due to odours after processing. Fillers for special applications must be suitable for the respective purpose, e.g. chair castors, underfloor heating, cooling.

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- greater angular and flatness deviations of the subsoil than permissible in accordance with DIN 18202 "Tolerances in building construction — Structures",
- cracks in the subsoil,
- insufficiently dry substrate according to DIN 18560 (all parts) "Screeds in construction",
- the surface of the substrate is not sufficiently firm, too porous and too rough,
- contaminated surface of the substrate, e.g. by oil, wax, paint, mortar and gypsum residues,
- incorrect elevation of the surface of the subsoil in relation to the elevation of adjacent surfaces and adjacent components,
- unsuitable temperature of the substrate,
- unsuitable indoor climate,
- Lack of marking of measuring points in heated floor constructions,
- Lack of heating protocol for heated floor constructions,
- missing protrusion of the edge insulation strip.

3.1.2 Before laying the floor coverings, the substrate must be sufficiently dry. In order to avoid damage to the heating installation, moisture measurements in heated floor constructions may only be carried out at the marked measuring points.

3.1.3 Movement and edge joints in the substrate must not be closed in a force-fit manner or otherwise impaired in their function. Movement joints must be adopted constructively with the same possibility of movement.

3.1.4 False joints must be permanently closed in a force-fit manner.

3.1.5 The Contractor shall provide the Client with written cleaning and care instructions for the floor covering.

3.2 Dimensional tolerances

Deviations from prescribed dimensions are permissible within the limits specified by DIN 18202. Unevenness in the surfaces of components that becomes visible in grazing light is permissible if it does not exceed the limit values according to DIN 18202:2013-04, Table 3, line 3. If the flatness is raised or otherwise requirements compared to the values listed in DIN 18202, the required services are special services (see section 4.2.7).

3.3 Preparation and pre-treatment of the substrate

The substrate must be cleaned by sanding and vacuuming. A primer must be applied to screeds and precast screeds (dry subfloors) with which the filler is insufficiently bonded, e.g. on calcium sulphate, magnesia and cement screeds. The substrate for floor coverings that are laid without underlays must be smoothed with filler.

3.4 Laying the floor coverings

3.4.1 Floor coverings must be laid without underlays.

3.4.2 If underlays are to be executed, they must be laid in such a way that their joints and seams are offset from the joints and seams of the floor covering.

3.4.3 In the case of glued underlays and floor coverings, the bonding must be carried out over the entire surface.

3.4.4 The direction of installation of the floor covering is left to the Contractor.

3.4.5 Head seams are only permitted for strip lengths of more than 5 m, whereby an attachment length of less than 1 m may not be undercut.

3.4.6 Membranes leading to doorways, niches and the like must be laid in such a way that these areas are covered; such floor surfaces must not be covered with strips.

3.4.7 Floor surfaces of door openings, niches and the like, which are not approached by the railways, may be covered with strips.

3.4.8 Membranes with repeat must be laid in the same pattern.

3.4.9 Resilient floor coverings must be laid unwelded and unjointed.

3.4.10 Floor coverings in tracks shall, where suitable, cut at the edges and butt joint.

3.4.11 If floor coverings are to be laid in an electrically conductive manner, the VDE regulations must be observed.

3.5 Multi-layered elements

Multi-layer elements that are laid floating/loose must be connected on the long and head sides in a system-appropriate manner.

3.6 Attaching strips, butt edges and profiles

3.6.1 Skirting boards and cover strips made of wood, metal and rigid PVC must be fastened according to the material and mitred at the corners. Flexible skirting boards and cover strips must be permanently fastened, adapted to the corners and jointed according to the material. The fastening is done by gluing or nailing.

3.6.2 Stair butt edges and other butt edges must be fastened in accordance with the material. Elastic stair butt edges are only to be attached to the treads of the steps.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Submission of prefabricated surface and color samples.

4.1.2 Cleaning of the substrate in accordance with section 3.3, with the exception of services in accordance with section 4.2.3.

4.1.3 Compensation of flatness deviations of the substrate up to 1 mm.

4.1.4 Making recesses in floor coverings and working the floor coverings on built-in parts, if covers or strips are provided.

4.1.5 Adjusting and connecting the floor coverings to frames, dividers and stop rails.

4.1.6 Initial examination of the substrates to determine the readiness for covering.

4.1.7 Protection of floor and stair coverings by blocking them off until they are accessible.

4.1.8 Completion of components in several work steps to enable work by other contractors, insofar as the company's own services can be provided continuously in the course of similar flooring work. If these requirements are not met, they are special benefits according to section 4.2.21.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 Provision of recreation and storage rooms if the Client does not provide rooms that can be easily locked.

4.2.2 Removal of old floor coverings, adhesive and filler layers.

4.2.3 Removal of soiling/impurities that cannot be removed by grinding and vacuuming, insofar as these have not been caused by the Contractor.

4.2.4 Pre-treatment of the substrate to achieve a good primer for adhesion, e.g. pre-painting, mechanical brushing, sanding and vacuuming.

4.2.5 Compensation of flatness deviations in cases other than in accordance with section 4.1.3 and full-surface filling.

4.2.6 Adjustment of the same height, e.g. on stop rails, separation rails.

4.2.7 Meeting increased requirements for flatness or dimensional accuracy (see section 3.2) compared to the values listed in DIN 18202:2013-04, Table 3, line 3.

4.2.8 Installation of butt edges, lateral step profiles, separation rails, movement joint profiles, mat and inspection frames and the like.

4.2.9 Fastening strips, butt edges and profiles with screws and dowels.

4.2.10 Making recesses in floor coverings and adapting the floor coverings to built-in parts, unless covers or strips are provided.

4.2.11 Closing or covering joints, e.g. movement, connection and false joints.

4.2.12 Services required for further work at component temperatures ≤ 15 °C, e.g. heating.

4.2.13 Subsequent connection to adjacent components.

4.2.14 Cutting off the protrusion of edge insulation strips after filling or laying the floor coverings.

4.2.15 Welding and grouting of resilient floor coverings.

4.2.16 Manufacture of friezes, grooves, inlays and marking lines as well as coverings in grooves, profiles and plinths.

4.2.17 Installation of prefabricated interior and exterior corners for skirting boards.

4.2.18 Repeated tests required to determine the readiness to be documented in accordance with section 4.1.6.

4.2.19 Special protection of building and plant components as well as furnishings, e.g. masking of windows, doors, floors, coverings, stairs, wood, finished surface parts, dust-proof masking of sensitive equipment and technical equipment, dust protection walls, laying of hardboard or building protection films from 0.2 mm thick.

4.2.20 Manufacture and/or installation of patterns and/or sample surfaces.

4.2.21 Completion of components in several work steps to enable work by other contractors, insofar as the company's own services cannot be provided continuously in the course of similar flooring work (see section 4.1.8).

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

For the determination of the performance — regardless of whether it is carried out according to drawings or measurements — the dimensions

- the occupied area, or
- of the surfaces produced

in the case of skirting boards, joints, profiles and the like, their length.

The simplifying rules, such as overmeasurement rules and individual regulations, are to be applied to determine the benefit.

5.2 Determination of dimensions/quantities

5.2.1 On Surfaces

- with limiting components are the dimensions of the occupied areas up to the bounding, unplastered, unclad components,
- without limiting components, their dimensions,
- of steps and thresholds, the largest dimensions of which

Facing shells and the like are considered limiting components as long as they are not undercut.

5.2.2 The length dimension shall be determined on the basis of the largest component length, if any.

5.2.3 Parts incorporated into floor coverings, e.g. inlays, markings, are calculated separately.

5.3 Overmeasurement rules

The following are measured:

5.3.1 When billed according to area

- recesses ≤ 0.1 m2 individual size,
- parts incorporated into floor coverings, e.g. inlays, markings, joints and profiles.

5.3.2 When billing according to length

- Interruptions with a single length ≤ 1 m.

5.4 Individual provisions

No regulations.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Wallpapering work — DIN 18366

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 Type, location, dimensions and design as well as dates for the erection and dismantling of on-site scaffolding.

0.1.2 Type and extent of fall edges and openings that are not protected against falling.

0.2 Information on the execution

0.2.1 Type, location, dimensions, texture and strength of the surfaces to be processed, e.g. existing surfaces and coatings, wallpapering, if applicable, indications of release agent residues.

0.2.2 Type and nature of the base coating materials and underlays, e.g. heat-insulating, sound-insulating.

0.2.3 Number, type, dimensions and quality of ceiling and wall coverings, tension fabrics, braids, strips and cords to be delivered or provided by the customer. Approach and repeat of the pattern and peculiarities of processing, e.g. double cut.

0.2.4 Height of the walls, stair soffits or stair landings to be processed.

0.2.5 The number, type, location, dimensions and nature of sloping, curved or otherwise shaped surfaces, e.g. surfaces with a special structure, slopes, arches.

0.2.6 Number, type, location, dimensions and nature of the coatings, wallpapers, ceiling and wall coverings to be removed, e.g. wash-resistant, lacquer wallpaper, as well as type of bonding, e.g. bonding with dispersion adhesive, wallpaper or wallpaper underlay with peeling effect, wallpaper change primer.

0.2.7 Use of underlays with peeling effect.

0.2.8 Type of substrate preparation, e.g. cleaning, high-pressure cleaning, degreasing, matt sanding of substrates and old coatings.

0.2.9 Removing fungal infestation and disinfecting the infested surfaces.

0.2.10 Number and type of fillers, e.g. stain or partial filling. Proportion of area to be filled. Indication of the quality level, e.g. Q 2, Q 4 according to DIN 18550-2 "Planning, preparation and execution of exterior and interior plasters — Part 2: Supplementary specifications to DIN EN 13914-2:2016-09 for interior plasters".

0.2.11 Type of substrate pre-treatment, e.g. with pigmented wallpaper ground.

0.2.12 Separate wallpapering of lids and the like.

0.2.13 The number, type, location, dimensions and classification of surfaces or components to be wallpapered and the length of the boundaries between surfaces or components to be wallpapered in different ways. Grid and joint formation of the substrate.

0.2.14 Number, type, position and dimensions of edge protection profiles, connection strips, decorative profiles and the like.

0.2.15 Filling of joints and connections to adjacent components.

0.2.16 Requirements for fire, sound, heat, moisture and radiation protection as well as electrical conductivity. Acoustic and lighting requirements.

0.2.17 Special physical and chemical stresses to which substances and components are exposed after installation, e.g. shock loads, moisture, aggressive vapours.

0.2.18 Number, type, location and dimensions of installation and installation parts penetrating surfaces to be manufactured.

0.2.19 the number, type, location, dimensions and nature of sloped, curved or otherwise shaped surfaces.

0.2.20 Number, type, location and dimensions of back surfaces of niches, reveals and projections to be wallpapered.

0.2.21 Number, type, location and dimensions of samples, e.g. surface and colour samples, sample surfaces.

0.2.22 Protection of components or equipment, furnishings and the like.

0.2.23 Services that the Contractor is to perform outside the installation site of the components to be wallpapered. Place of execution.

0.2.24 Early or subsequent production of parts of the service.

0.2.25 Requirements for covers in the area of workplaces and traffic routes, e.g. slip resistance, slip resistance, breakthrough resistance.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 3.1.5	if wallpapering is to be carried out with preceding full-surface filling,
Section 3.1.6	if fillers are to be carried out as patch or partial fillers or by repeated filling,
Section 3.2.3.3,	if wallpaper is to be wallpapered over a narrow seam rather than a joint,
Section 3.2.3.4	if wallpaper strips may be jointed lengthwise,
Section 3.2.3.9	if the lids of junction boxes are to be wallpapered separately.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units are to be provided as follows:

0.5.1 Area (m2), separated by type and dimensions, for

- Ceilings, walls and cladding for areas > 2.5 m2 individual size,
- pillars, pilaster strips, columns, beams, wall projections and the like with a width > 1 m per visible area,
- stair soffits,

Wall and ceiling cladding fabrics and the like,

- Treatment of partial areas, differentiated according to areas shares, e.g.
    - ≤ 10% of the component area,
    - > 10 % ≤ 30 % of the component area,

- > 30 % ≤ 50 % of the component area.

0.5.2 Dimensions of length (m), separated by type and dimensions, for

- Soffits,
- Fugues
- pillars, pilaster strips, columns, beams, wall templates, cornices and the like with a width ≤ 1 m per visible area,
- Treppenwangen,
- coves, specifying height and radius,
- Frames, fascishes, and the like,
- Lids for roller shutter boxes,
- Screens, curtain strips and the like,
- Strips, cords, braids, profiles and the like,
- Plastic films, clamping materials,
- cutting off the protrusion of edge insulation strips,
- Adaptation to components and built-in parts,
- Bridging plaster or concrete cracks.

0.5.3 Number (pcs), separated by type and dimensions, for

- Ceilings, walls and cladding for areas ≤ 2.5 m2,
- field divisions on walls, doors and the like,
- wallpapered, covered or clad individual surfaces,
- Mouldings, curtain strips and the like,
- Profile, Ornamente, z. B. Rosetten,
- Wallpaper in rolls, tension fabrics in bales.

1 Scope of application

1.1 ATV DIN 18366 "Wallpapering work" applies to the wallpapering and stretching of wall and ceiling cladding as well as to the gluing of wallpaper-like fabrics.

1.2 In addition, ATV DIN 18299 "General regulations for construction work of any kind", sections 1 to 5 shall apply. In the event of contradictions, the regulations of ATV DIN 18366 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

For the most common substances and components, the DIN standards and other requirements are listed below. For paint strippers and shut-off agents,

Base coating materials as well as fillers and levelling compounds are subject to DIN EN ISO 4618 "Coating materials — Definitions".

2.1 Substances for substrate preparation and pre-treatment

2.1.1 Barrier materials Barrier agents must prevent the effect of substances from the substrate on the wallpapering.

2.1.2 Leaches Leaches must roughen the surface of existing oil varnish and paint coatings.

2.2 Base coating materials

Base coating fabrics may be pigmented or unpigmented. These must reduce or equalize the absorbency of substrates and ensure the adhesion strength of the wall coverings.

2.3 Underlays

Base paper, e.g. waste paper, must be unprinted and absorbent. Underlays with a peeling effect must allow the pasted wallpaper to be peeled off when dry.

2.4 Reinforcement fabrics

2.4.1 Reinforcement adhesive

Reinforcement adhesives must consist of polymer dispersions in accordance with DIN EN ISO 4618.

2.4.2 Reinforcement fabrics and reinforcement nonwovens

DIN 60000	Textiles — Basic Concepts
DIN 61850	Textile glass and processing aids — Definitions

2.5 Wall coverings

DIN EN 233	Wall coverings in rolls — Specifications for finished paper, vinyl and plastic wall coverings
DIN EN 234	Wall coverings in rolls — Specifications for wall coverings for subsequent treatment
DIN EN 235	Wall coverings — Terms and symbols
DIN EN 259-1	Wallcoverings in rolls — Heavy-duty wallcoverings — Part 1: Requirements
DIN EN 259-2	Wallcoverings in rolls — Heavy-duty wallcoverings — Part 2: Determination of impact resistance
DIN EN 266	Wall coverings in rolls — Specifications for textile wall coverings
DIN EN 13085	Wall coverings — Specifications for cork rolls

Decorative wall coverings — roll and plate form

DIN EN ISO 11654	Acoustics — Sound absorbers for use in buildings — Evaluation of sound absorption

Wall coverings of a production must be of the same quality. Wallcoverings of different productions must each bear a different production number.

2.6 Tensioning materials

Tensioning materials in a delivery, even if they are not assembled from one production, must be of the same quality, colour and pattern. Clamping materials from several productions must be sorted by production number.

2.7 Adhesives

Reversible adhesives must be made of pure cellulose paste.

2.8 Strips

Mouldings must be uniform in colour tint, surface modelling and cross-section; they must not tear, throw themselves or warp.

2.9 Cords

Cords must not change due to the effect of humidity or heat.

2.10 Fasteners

Fasteners must be corrosion-resistant.

2.11 Braids

Borders must have the same properties as the corresponding wall coverings.

2.12 Profile, Ornament

Profiles and ornaments must have a flat contact surface, they must not warp and must be uniform in structure.

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- unsuitable condition of the substrate, e.g. too low a quality level, sanding and chalking plaster, insufficiently firm, cracked and damp substrate, efflorescence, mould formation,

3.2.2 Application of underlays

Wallpaper underlays made of base paper and backing paper with peeling effect must be wallpapered with special paste to the butt.

3.2.3 Wallpapering

3.2.3.1 Only wallpaper of the same production number shall be wallpapered on a wall or ceiling surface.

3.2.3.2 Wallpaper strips must be wallpapered without bubbles or wrinkles, and they must be applied vertically to walls.

3.2.3.3 Wallpaper must be wallpapered on edge, if the type, thickness and repeat of the wallpaper allow it.

3.2.3.4 Wallpaper strips must not be jointed lengthwise.

3.2.3.5 Wallpaper above doors as well as on recesses and the like must be cut out of the adjacent strips if necessary.

3.2.3.6 Wallpaper at corners should be separated and overlapped if the type and thickness permitted.

3.2.3.7 In the case of connections to doors, windows, skirting boards, plinths and other components, the wallpaper must be adjacent to these components and must be sharply demarcated.

3.2.3.8 Wallpaper is not to be installed behind stoves and radiators.

3.2.3.9 Lids of junction boxes must be wallpapered over.

3.3 Wallpapering on wallpapered or coated surfaces

3.3.1 Preparation and pre-treatment of the substrate

3.3.1.1 Reversible coatings, e.g. glue paint coatings, shall be removed by washing. These services are special services (see section 4.2.13).

3.3.1.2 Microbiological growth must be removed. These services are special services (see section 4.2.19).

3.3.1.3 Non-absorbent substrates must be roughened and provided with an adhesive bridge. These services are special services (see section 4.2.1).

3.3.1.4 Existing underlays and wallpapering must be removed. These services are special services (see section 4.2.13). In the case of wallpaper with a removable top layer, the backing must be retained as an underlay material, provided that it adheres over the entire surface and is sufficiently load-bearing. Firmly adhering glass fabrics are to be preserved.

3.3.1.5 In the case of damaged substrates, pre-treatment in accordance with section 3.2.1 is necessary.

3.3.2 Application of underlays

Underlays shall be applied in accordance with Section 3.2.2.

3.3.3 Wallpapering

Wallpapering must be carried out in accordance with section 3.2.3.

3.4 Attaching wallpaper finishes and field divisions

3.4.1 Mouldings

Strips must be jointed precisely and cut to mitre at and in corners. They must be fastened in such a way that they fit tightly. Fasteners must be installed in such a way that they do not interfere visually.

3.4.2 Cords

Cords must be fastened in such a way that they remain sufficiently taut.

3.4.3 Braids

Borders must be glued in a straight line, free of bubbles and wrinkles and in accordance with the pattern and must not be glued to adjacent parts of the building.

3.4.4 Profiles, ornaments Profiles and ornaments must be fastened with adhesive or mechanically. The joints must be filled with fillers or sealants. Profiles are to be mitred in corners.

3.5 Attaching Tensioning Fabrics

3.5.1 Tensioning materials shall be applied to stenter frames.

3.5.2 Tensions must not be visible. 3.5.3 In the case of wrinkled covering, the addition of fabric must be appropriate to the intended drape and must be at least 100%.

3.5.4 The folds must be evenly distributed and perpendicular.

3.5.5 In the case of visibly stapled, under-padded covering, the hilt division must be even.

3.5.6 Pattern and structure must be carefully adapted to each other, starting from the approach at eye level.

3.5.7 Seams must be in a straight line. They must not cause transverse creases.

3.5.8 If sewn fabrics are stretched smoothly on the substrate, the seams on the back must be smoothed.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on or clad is not higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.1.2 Compensation of stepped or inclined standing surfaces of scaffolding up to 40 cm difference in height, e.g. via stairs or ramps.

4.1.3 Protection of components and equipment, e.g. furnishings, raw floors, railings, doors, windows from contamination and damage during wallpapering work by loosely covering, hanging or wrapping, including the subsequent removal of the protective measures, except for the benefits referred to in section 4.2.10.

4.1.4 Cleaning of the substrate, except for services according to section 4.2.8.

4.1.5 Handing over the remains of the wall coverings that are considered to have been used according to section 5.2.7 but can still be used for repairs, with the name of the place of use, e.g. building, floor, room number.

4.1.6 Remove and reattach up to five simple switch, socket covers and the like of simple design (clamped or secured with a screw) per room.

4.1.7 Submission of pre-made samples.

4.1.8 Completion of components in several work steps to enable work by other contractors, insofar as the company's own services can be provided continuously in the course of similar wallpapering work on the same floor. If these conditions are not met, they are special services according to section 4.2.25.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 Benefits under Sections 3.2.1 and 3.3.1.3.

4.2.2 Provision of recreation and storage rooms if the Client does not provide rooms that can be easily locked.

4.2.3 Services to protect against unsuitable conditions in accordance with Section 3.1.2, e.g. partitioning, heating.

4.2.4 Assembly, conversion and dismantling as well as provision of scaffolding for the services of other contractors.

4.2.5 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on or clad is higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.2.6 Assembly, conversion and dismantling as well as provision of scaffolding with a stepped or inclined footprint, e.g. via stairs or ramps, if compensation of more than 40 cm is required

4.2.7 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the gripping space depth is more than 60 cm, e.g. in the case of railings.

4.2.8 Cleaning the substrate of coarse soiling, e.g. plaster residues, mortar residues, paint residues, oil, adhering sanding dust, insofar as this was not caused by the Contractor.

4.2.9 Removing and putting away or assembling furniture and the like, picking up carpets, removing curtain rails, lamps and curtains.

4.2.10 Special protection of building and plant parts as well as furnishings, e.g. by masking windows, doors, floors, coverings, stairs, wood, switch and socket covers, surface-finished parts, dust-proof masking of sensitive equipment and technical

equipment, dust protection walls, scaffolding cladding, protective coatings, laying of hardboard boards and building protection films from 0.2 mm thick, covering fleece.

4.2.11 Repair of extensive damage in the subsoil.

4.2.12 Bridging plaster and concrete cracks with reinforcing fabric.

4.2.13 Removal of coatings and wall and ceiling cladding.

4.2.14 Fluating and sanding of plasters, closing of cavities, removal of formwork burrs.

4.2.15 Filling of surfaces and services to meet higher surface quality levels of the substrate to be wallpapered.

4.2.16 Filling of transitions and refilling of joints, joints and the like.

4.2.17 Manufacture of fasteners and terminations with sealants, e.g. for door and window coverings.

4.2.18 Installation of edge protection profiles, connection strips, decorative profiles, cords, borders and the like.

4.2.19 Removal of microbiological fouling.

4.2.20 Treat with barrier agents, base coating materials, anti-corrosion coating materials and the like.

4.2.21 Wallpapering of cornices and coves.

4.2.22 Dismantling and reattaching skirting boards and the like.

4.2.23 Separate wallpapering of lids, e.g. on junction boxes.

4.2.24 Production and application of surface and colour samples as well as sample surfaces for wall and colour designs, insofar as these services go beyond the services under section 4.1.7

4.2.25 Wallpapering in partial areas to enable work by other contractors, insofar as one's own services cannot be provided continuously in the course of similar wallpapering work (see section 4.1.8).

4.2.26 Removal of protective films and the like available on site, e.g. on window sills, light metal profiles.

4.2.27 Removal of obstacles in the subsoil, e.g. removal of concrete ridges, foam residues.

4.2.28 Adaptation to sloping and curved components, strongly profiled component surfaces, e.g. to visible rafters, corner bracing, quarry stones, stairs, stucco profiling.

4.2.29 Change of material within the surface to be wallpapered.

4.2.30 Production of corners, mitres, crossings, offsets and ends on decorative profiles and borders.

4.2.31 Cutting off the protrusion of edge insulation strips

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

5.1.1 The performance shall be determined on the basis of the dimensions of the area treated, regardless of whether it is carried out on the basis of drawings or measurements. The simplifying rules such as overmeasurement rules and individual regulations are to be used to determine performance.

5.2 Determination of dimensions/quantities

5.2.1 For preparing substrates and wallpapering,

- on interior surfaces without limiting components, the dimensions of the unplastered, uninsulated, unclad surfaces,
- on interior surfaces with limiting components, the dimensions of the surfaces to be treated up to the unplastered, uninsulated, unclad components that limit them, e.g. raw flooring, raw ceiling,
- in the case of interior work, the treated areas, if the shell dimensions cannot be determined,

Space-forming system floors, dry subfloors, facing shells as well as suspended ceilings and suspended ceilings are considered limiting components.

5.2.2 When calculating individual areas of any shape, e.g. repair areas, the smallest circumscribed rectangle is to be used as a basis for determining the dimensions. Excluded from this rule are circles, triangles, trapezoids and diamonds.

5.2.3 Clad rear surfaces of niches and reveals are calculated separately with their dimensions, regardless of their individual size.

5.2.4 In the case of wallpapering work, directly connected, different types of recesses are counted separately, e.g. opening with adjacent niche.

5.2.5 If a recess is proportionately integrated into adjacent areas that are to be calculated separately, the respective proportional recess area is calculated to determine the overmeasurement variable.

5.2.6 Doors, partition walls, cladding and the like are calculated by area per wallpapered side.

5.2.7 The dimensions are determined on the basis of the largest component dimension, if any, e.g. cornices, frames, wall connections, circumferential friezes, bevels.

5.2.8 If the delivery of wallpapers, wall and ceiling coverings, underlays, wallpapers, stretching materials and the like is calculated according to the quantity consumed, the quantity actually consumed is to be taken as a basis for the economic utilisation of the

materials. Unavoidable leftovers and offcuts as well as cut rolls are considered to be used.

5.3 Overmeasurement rules

The following are measured:

5.3.1 When billed according to area

- Recesses with a single size ≤ 2.5 m2, e.g. openings (also floor-to-ceiling), niches. When determining the dimensions for the overmeasurement, the smallest dimensions of the recess shall be taken as a basis,
- Fugues
- surface-enclosing cornices, friezes, pilaster strips, corner bonds, frames and façades and the like ≤ 30 cm individual width, regardless of whether they are treated,
- mouldings, plinth tiles and the like ≤ 10 cm high,
- Interruptions in the area to be processed, e.g. due to trusses, columns, beams, wall templates, landings, cornices, friezes and pilaster strips with a single width ≤ 30 cm, regardless of whether they are treated.

5.3.2 When billing according to length

- Interruptions of individual lengths ≤ 1 m.

5.4 Individual provisions

5.4.1 Mitres, crossings, offsets and ends of decorative profiles and borders, rosettes are calculated separately.

5.4.2 If doors, roller shutter boxes and the like are calculated by number, deviations from the prescribed dimensions of up to 5 cm in height and width shall not be taken into account.

5.4.3 In the case of percentage treatment of surfaces in non-contiguous partial areas, the total area of the component shall be taken as a basis.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Air conditioning systems — DIN 18379

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 Main wind direction.

0.1.2 Formation of construction pits.

0.1.3 Buildings in the surrounding area.

0.1.4 Type of waterproofing of buildings and building components, e.g. trough formation of basements.

0.1.5 Construction of the floor and roof structure, insulation and sealing.

0.1.6 Type and scope of protective measures in accordance with VDE regulations.

0.1.7 Type, location, dimensions and design as well as dates for the erection and dismantling of scaffolding on site.

0.1.8 Type and location of the drainage points available for drainage points.

0.2 Information on the execution

0.2.1 Number, type, location, dimensions, materials and design of the equipment to be manufactured.

0.2.2 Scope of the installation of the system's internal electrical cables to be carried out by the Contractor, including placing them on the terminals.

0.2.3 Type and requirements, e.g. thermal energy requirements, of other components not part of the contractual service.

0.2.4 Required pressure levels and tightness classes for air duct systems.

0.2.5 Number, type and dimensions of openings and their covers for technical and hygienic work in the air duct network.

0.2.6 Provision of permits, tests and acceptances, e.g. proof of usability.

0.2.7 Number, type and dimensions of samples and pattern constructions. Place of installation.

0.2.8 Type and scope of services for winter construction.

0.2.9 Protection of components and equipment, furnishings and the like.

0.2.10 Special requirements for wall and ceiling penetrations.

0.2.11 Requirements for fire, sound, heat, moisture and radiation protection, energy efficiency and airtightness of the building envelope. Type and scope of required services.

0.2.12 Requirements for the pipes to be laid on the raw floor.

0.2.13 Type and scope of services to create zones with different indoor climate requirements.

0.2.14 Special physical, chemical and biological stresses to which substances and components are exposed after installation, e.g. aggressive vapours.

0.2.15 Type and scope of hygiene measures, e.g. in accordance with VDI 6022 Part 1 "Ventilation technology, indoor air quality — Hygiene requirements for ventilation and air-conditioning systems and equipment (VDI ventilation rules)"1)

0.2.16 Type and scope of temporary measures.

0.2.17 Early or subsequent production of parts of the service. Dates of completion and commissioning, if necessary in stages.

0.2.18 Interfaces to other trades.

0.2.19 Information on building automation, e.g. interfaces, interface definition.

0.2.20 Type and scope of services for cross-trade commissioning.

0.2.21 Type and scope of the documents to be prepared and handed over before assembly or for as-built documentation, e.g.:

- Functional and strand diagrams,
- File file,

- Parts list, containing all measuring, control and regulation devices (MSR),
- Circuit diagram and, if applicable, function diagram of the control system in accordance with DIN EN 60848 "GRAFCET, Specification language for function diagrams of the sequence control",
- Functional description including the control system with presentation of the control schemes,
- Protocols of the final adjustments and measurements carried out in the course of the adjustment work,
- Spare parts
- Calculation of energy requirements,
- Diagrams and characteristic curve fields,
- Information lists for I&C systems in DDC technology (see guidelines of the VDI 3814 series "Building Automation (GA)"1)).

0.2.22 Test class and scope of testing according to DIN EN 12599 "Ventilation of buildings — Test and measurement methods for the transfer of ventilation and air-conditioning systems".

0.2.23 Performing functional measurements.

0.2.24 Offer of a maintenance contract.

0.2.25 Type and scope of the planning documents and calculations to be supplied to the Contractor for the assessment and execution of the plant.

0.2.26 Type, scope and design of services for protection against the ingress of rainwater and snow.

0.2.27 Type of connection of air ducts, e.g. flanged, plugged, riveted, screwed.

0.2.28 Type and scope of baffles (air deflectors).

0.2.29 Type and extent of marking of air ducts.

0.2.30 Possibilities for absorbing forces of suspended components and apparatus.

0.2.31 Type and scope of condition checks of existing air ducts and plant components.

0.2.32 Component production according to the execution plan or according to local measurements.

0.2.33 Type, nature and strength of the substrate, e.g. steel, concrete, plastered or unplastered masonry, wood.

0.2.34 Number, type, dimensions and design of terminations and connections to adjacent components, e.g. airtight connections.

0.2.35 Type, position, dimensions and design of movement, structure and component joints.

0.2.36 Number, type, position and dimensions of recesses to be made or closed.

0.2.37 Number, type, location, dimensions and masses of installation and installation components.

0.2.38 Design and division of areas as well as grid and joint formation.

0.2.39 Number, type, position, dimensions and nature of sloping, curved or otherwise shaped surfaces.

0.2.40 Information on special ventilation systems, e.g. smoke extraction system, smoke protection pressure system.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 3.2.9,	if provisions other than VDI 2081 Part 1 "Ventilation and air-conditioning technology — Noise generation and noise reduction"1) are to be used as a basis for sound insulation,
Section 3.6	if the required documents are not to be handed over in 3 copies in paper form and in German, but are to be handed over in larger numbers or in another form, e.g. drawings under glass, on data carriers.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units are to be provided as follows:

0.5.1 Area dimension (m2), separated by type and billing groups according to Table 1, for angular air ducts and their fittings, e.g. end bottoms, end covers, dividers and overlaps, fittings, baffles (air deflectors).

Table 1 — Settlement groups

Lfd. Nr.	**Payroll Group**		**Large edge length Mm**
	Air ducts	Moldings	
1	L1	F1	Up to 500
2	L2	F2	Over 500 to 1000
3	L3	F3	Over 1000 to 1500
4	L4	F4	Over 1500 to 2000
5	L5	F5	Over 2000

0.5.2 Measure of length (m), separated by type, dimensions and wall thickness, for regularly industrially prefabricated air ducts.

0.5.3 Number (pcs),

- separated according to performance data and characteristic features, for
    - fans, drive motors, air filters, humidifiers, hot air generators, air heaters, air coolers, silencers and the like;
- separated according to type and dimensions, for
    - Shut-off devices, control devices, throttle valves and similar devices,
    - air diffusers, covers of openings for technical and hygienic work in the air duct network, wall and ceiling sleeves,
    - Wall and ceiling penetrations with special requirements, e.g. airtight,
    - fasteners, e.g. welded structures, suspensions,
    - oscillating elements and other components for structure-borne sound-absorbing fastenings,
    - Sliding nozzles, air diffusers, air diffuser boxes, cut-outs for air diffusers;
- separated according to type, dimensions and fire resistance class, for
    - Shut-off devices against fire transmission, e.g. fire dampers;
- separated according to type, dimensions, wall thickness, angle and mean arc radius for
    - Bows
    - Fittings and fittings for air ducts referred to in 0.5.2.

0.5.4 Mass (kg, t), separated by type and measure, for

- special fastening structures, e.g. load-bearing structures,
- Antifreeze
- organic heat transfer fluids,
- Refrigerant.

1 Scope of application

1.1 ATV DIN 18379 "Ventilation and air-conditioning systems" applies to the manufacture of air-conditioning systems (HVAC systems) in which air is mechanically conveyed.

1.2 ATV DIN 18379 does not apply to the manufacture of free ventilation systems and process ventilation systems in which the air is conveyed exclusively for the purpose of carrying out a technical process within apparatus, cabins or machines.

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18379 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

2.1 General

If the intended use requires it, materials and components must be corrosion protected. Components in which condensation or overflow water is to be expected must be equipped with collecting devices for water drainage. Substances and components in the air flow of ventilation and air-conditioning systems must be odour-free and — with the exception of wear parts, e.g. V-belts — abrasion-resistant. The requirements of VDI 6022 Part 1 "Ventilation technology, indoor air quality — Hygiene requirements for ventilation systems and devices (VDI ventilation rules)1) must be observed. Mechanical components and heat exchangers must be provided with type and performance plates. Signage on components, e.g. signs, scales, instructions, must be in German and in accordance with the "Law on Units in Metrology and Time Determination (Units and Time Determination – EinhZeitG)". For the most common substances and components, the DIN standards and other requirements are listed below.

2.2 Fans

If fans are driven by three-phase motors of type B 3, the motors must comply with DIN EN 50347 "Three-phase asynchronous motors for general use with standardised dimensions and performance - sizes 56 to 315 and flange sizes 65 to 740".

2.3 Air Filter

Air filters must be equipped with devices for monitoring the degree of load.

2.4 Central HVAC units

Components of central air handling units, e.g. fans and air filters, must comply with the requirements described in sections 2.1 to 2.3.

2.5 Measuring, control and regulation equipment, building automation

2.5.1 Electrical measuring instruments shall comply with accuracy class E-1.5 in accordance with DIN EN 60051-1 (VDE 0411-51-1) "Direct-acting analogue electrical measuring instruments and their accessories — Part 1: Definitions and general requirements for all parts".

2.5.2 Control cabinets must comply with at least protection class IP 43 according to DIN EN 60529 (VDE 0470-1) "Protection classes by enclosures (IP code)".

2.5.3 When using components for connection to building automation, the guidelines of the series VDI 38131) and VDI 38141) "Building Automation (GA)" must be observed.

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 The components of ventilation and air-conditioning systems must be coordinated with each other in such a way that the required performance is achieved, operational safety is guaranteed, economical and economical operation is possible and corrosion processes are largely restricted. The airborne and structure-borne noise generated and transmitted by ventilation and air-conditioning systems must not exceed the permissible or agreed values.

3.1.2 The Contractor shall provide the Client with all information necessary for the unhindered installation and proper operation of the system prior to the commencement of the installation work. According to the planning documents and calculations of the client, the contractor must provide the assembly and workshop planning required for the execution and, if necessary, coordinate it with the client.

These include, in particular:

- Assembly plans,
- Workshop drawings,
- Ladders
- Fundamentpläne.

The Contractor shall provide the Client with the information on the

- Dimensions of built-in parts,
- current consumption and, if necessary, the starting current of the electrical components and
- other requirements for installation

.

The documents required for the execution and to be handed over by the client (see § 3 para. 1 VOB/B) include, in particular:

- Execution plans as floor plans, functional and string diagrams as well as sections with dimensional information,
- Plant design with control schemes,
- Slot and breakthrough plans,
- Calculations for heating and cooling load with associated air duct and fan designs, the energy verification and the essential energy-related characteristics on which the system cost figure is based,
- Performance data of the heat exchangers,
- Information on sound, heat and fire protection.

3.1.3 When reviewing the planning documents and calculations supplied by the Client (see Section 3 (3) VOB/B), the Contractor shall, inter alia, pay particular attention to the nature and function of the system:

- the heating load,
- the cooling load,
- The Air Volume Stream,
- the calculation of air lines,
- air temperatures,
- humidity,
- the measuring, control and regulation equipment,
- openings for technical and hygienic work in the air duct network,
- sound insulation,
- thermal insulation,
- fire protection,
- the airtightness of the building envelope.

3.1.4 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- Inconsistencies in the planning documents and calculations provided by the client (see § 3 para. 3 VOB/B),
- recognisably defective workmanship, failure to complete on time or the absence of foundations, slots and openings,
- inadequate measures for sound, heat and fire protection,
- unsuitable design of the flue gas systems and unsuitable cross-section of the flue gas pipes as well as the air-conducting and installation shafts,
- insufficient connected load for energy sources,
- insufficient space for the components,
- lack of reference points,
- unsuitable conditions resulting from the weather or indoor climate (see section 3.1.5),
- changes to the prerequisites on which the planning was based that have become known to the contractor.

3.1.5 In the event of unsuitable conditions resulting from the weather or the indoor climate, e.g. temperatures below 5 °C for sealing tape bonding operations, special measures must be taken in consultation with the Client. If services are required for this, these are special services (see section 4.2.27).

3.1.6 If the pipeline routing is left to the contractor, the contractor must draw up implementation plans for this purpose. These must be agreed with the client before execution so that the necessary foundation, slot, breakthrough and assembly plans can be drawn up. These services are special services (see section 4.2.1).

3.1.7 In the event of changes that could impair existing electrical protective measures on existing installations, e.g. the installation of insulating pieces, the Contractor shall inform the Client that an approved electrician must check whether the planned work will affect the protective measures.

3.1.8 Chiseling, milling and drilling work on the structure may only be carried out in agreement with the Client. 3.1.9 If reaction forces that occur must be dissipated into the structure, the forces must be determined by the Contractor and notified to the Client before the performance of the service.

3.2 Requirements

3.2.1 General

3.2.1.1 The following shall apply to the execution of ventilation and air-conditioning systems:

DIN 1946-4	Ventilation and air-conditioning systems — Part 4: Ventilation and air-conditioning systems in buildings and rooms in the health care sector
DIN 1946-6	Ventilation and air-conditioning technology — Part 6: Ventilation of dwellings — General requirements, requirements for design, execution and marking, handover/acceptance (acceptance) and maintenance
DIN 1946-7	Ventilation and air-conditioning systems — Part 7: Ventilation and air-conditioning systems in laboratories
DIN 18017-3	Ventilation of bathrooms and toilets without external windows — Part 3: Ventilation with fans
DIN EN 12792	Ventilation of buildings — Symbols, terminology and graphic symbols
DIN EN 16798-3	Energy Assessment of Buildings — Ventilation of Buildings — Part 3: Ventilation of Non-Residential Buildings — Performance Requirements for Ventilation and Air Conditioning Systems and Space Cooling Systems (Modules M5-1, M5-4)
VDI 2052 Part 1	Ventilation Technology — Kitchens (VDI Ventilation Rules)1)
VDI 2053 Part 1	Ventilation Technology — Garages — Ventilation (VDI Ventilation Rules)1)
VDI 2078	Calculation of thermal loads and room temperatures (design of cooling load and annual simulation)1)
VDI 2081 Part 1	Ventilation and air-conditioning technology — Noise generation and noise reduction1)
VDI 2082	Ventilation Technology — Sales Outlets (VDI Ventilation Rules)1)
VDI 2083 Part 1	Cleanroom Technology — Air Particle Purity Classes1)
VDI 2083 Part 4.1	Cleanroom Technology — Planning, Construction and Initial Commissioning of Cleanrooms1)
VDI 2083 Part 5.1	Cleanroom Technology — Operation of Cleanrooms
VDI 2087	Air duct systems — Assessment bases1)

VDI 3803 Part 1	Ventilation and air-conditioning technology — Central ventilation and air-conditioning systems — Structural and technical requirements (VDI ventilation rules)1)
VDI 3803 Part 5	Ventilation Technology, Equipment Requirements — Heat Recovery Systems (VDI Ventilation Rules)1)
VDI 6022 Part 1	Indoor air technology, indoor air quality — Hygiene requirements for ventilation and air-conditioning systems and equipment (VDI ventilation rules)1)

3.2.1.2 The penetration of water droplets into parts of the system not intended for this purpose must be prevented as far as possible. The downstream section of the plant must be drained if necessary. Condensate must be discharged.

3.2.2 Fans

If fan parts consist of splinterable materials, sufficient splinter protection attached to the device must be provided.

3.2.3 Air heaters, air coolers, hot air generators

3.2.3.1 Air heaters and air coolers shall be installed in such a way as to allow for easy complete emptying and ventilation.

3.2.3.2 Air coolers must be installed in such a way that proper condensate drainage is possible.

3.2.3.3 Electric air heaters shall be equipped with flow and overtemperature safeguards.

3.2.4 Air Filter

Air filters must be installed in such a way that the quality classes according to DIN EN 1822-1 "HEPA filters (EPA, HEPA and ULPA) — Part 1: Classification, performance testing, marking" and the DIN EN ISO 16890 series of standards "Air filters for general ventilation technology" are complied with even when installed.

3.2.5 Air humidification devices

3.2.5.1 Air humidification devices with a water or steam connection must be equipped with the necessary shut-off and regulating devices. They must be easy to clean.

3.2.5.2 Air humidification systems with a water connection must be installed in such a way that they are connected to the water supply network in compliance with DIN EN 1717 "Protection of drinking water from Contamination in drinking waterInstallations and general requirements for safety devices for the prevention of drinking water contamination by backflow" in conjunction with DIN 1988-100 "Technical rules for drinking water installations — Part 100: Protection of drinking water, maintenance of drinking water quality; Technical Rule of the DVGW" and, if necessary, also to the wastewater network in compliance with DIN EN 12056 (all parts) "Gravity drainage systems within buildings" and DIN 1986-100 "Drainage systems for buildings and land — Part 100: Provisions in conjunction with DIN EN 752 and DIN EN 12056".

3.2.6 Central air handling units

3.2.6.1 Sections 3.2.1 to 3.2.5 must be observed during installation.

3.2.6.2 In the case of an internal belt drive, the repair switch must be arranged in accordance with DIN EN 60947-3 (VDE 0660-107) "Low-voltage switchgear and switchgear — Part 3: Load switches, disconnectors, switch disconnectors and switch fuse units" and DIN EN 60204 (VDE 0113) (all parts), "Safety of machinery — Electrical equipment of machinery".

3.2.6.3 Connecting cables must be laid in such a way that there are no obstructions at the service doors and openings for technical and hygienic work on the central unit.

3.2.7 Air ducts with accessories

3.2.7.1 All air line connections must be airtight and stable in accordance with the operating conditions.

3.2.7.2 Air ducts shall, where necessary, be equipped with lockable measuring openings.

3.2.7.3 Air diffusers must be able to be removed without damaging the structure.

3.2.7.4 The location of components in air ducts that must be accessible for maintenance work must be recognisable or, if necessary, indicated by signs.

3.2.8 Measuring, control and regulation equipment

3.2.8.1 Actuators of the control sections of functionally independent equipment which are installed in systems that are not part of the contractual service must be agreed by the Contractor with the person responsible for the system in question.

3.2.8.2 Transmitters must be installed at suitable locations in such a way that the measured value is correctly recorded.

3.2.8.3 Display devices must be easy to read, and devices to be operated must be easily accessible and operable.

3.2.8.4 The Contractor shall provide a specialist who is familiar with systems of this type during the inspection and commissioning of the electrical cabling carried out by the Contractor and the control and regulation system installed by the Contractor. If the electrical cabling or the control and regulation technology is not part of the contractual services, the secondment of a skilled worker during the test or commissioning is a special service (see section 4.2.12).

3.2.9 Sound insulation

If noise protection measures are to be carried out on the system, they must comply with the requirements of DIN 4109-1, "Sound insulation in building construction - Part 1: Minimum requirements" and the guideline VDI 2081 Part 11).

3.2.10 Insulation and fire protection

Parts of the ventilation and air-conditioning system that are to be sheathed must be installed in such a way that this service can be carried out properly.

3.3 Notification, Permission, Approval and Examination

The contractor shall make available to the Client the drawings and other documents and certificates required for the officially prescribed notifications or applications in accordance with the number prescribed for the notification, permit or approval obligation. This shall not apply if the test regulations for plant components permit permanent identification instead of a certificate.

3.4 Setting up the system

3.4.1 The Contractor shall adjust the plant components in such a way that the planned functions and services are performed and the statutory provisions are met. The balancing of the air volume flows must be carried out in accordance with the calculated setting values. Measured values must be documented.

3.4.2 The operating and maintenance personnel for the plant must be instructed once by the contractor.

3.5 Acceptance test

An acceptance test must be carried out in accordance with DIN EN 12599 "Ventilation of buildings - Test and measurement methods for the transfer of ventilation and air-conditioning systems". Additional functional measurements require special agreement. VDI 6031 "Acceptance test of room cooling surfaces"1) applies to the acceptance of room cooling surfaces1).

3.6 Documents to be supplied

The Contractor shall hand over the following documents to the Client at the latest upon acceptance after the following sorting:

- Functional and strand diagrams,
- Electrical overview circuit diagrams and connection diagrams in accordance with DIN EN 61082-1 (VDE 0040-1) "Electrical engineering documents — Part 1: Rules",
- Compilations of the most important technical data,
- Copies of the prescribed test and manufacturer certificates, proof of usability, specialist contractor declarations,
- all operating and maintenance instructions required for safe and economical operation,
- Protocol on the briefing of maintenance and operating personnel.

The documents must be handed over to the Client in paper form, 3 copies, in German. Terms, abbreviations, abbreviations, etc. may be used in accordance with the normative regulations.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Examination of the Client's documents in accordance with Section 3.1.3.

4.1.2 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on is not higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.1.3 Compensation of stepped or inclined standing surfaces of scaffolding up to 40 cm difference in height, e.g. via stairs or ramps.

4.1.4 Type and Performance Plates.

4.1.5 Fasteners and fasteners as well as associated components, e.g. flanges, profile connectors, screws, gaskets, stiffeners for air ducts.

4.1.6 Attachment of brackets and brackets, except for services under section 4.2.10.

4.1.7 Measuring openings with sealing plugs without special requirements up to 35 mm in diameter.

4.1.8 Protection of components and installations from contamination and damage during work on ventilation and air-conditioning systems by loosely covering, hanging or wrapping, with the exception of protective measures in accordance with section 4.2.25.

4.1.9 Completion of components in several operations to enable work by other contractors, provided that one's own services can be provided continuously in the course of similar work. If these conditions are not met, they are special benefits according to section 4.2.26.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 Planning services such as design, execution and approval planning as well as the planning of slots and openings.

4.2.2 Marking of openings if their execution is not included in the Contractor's scope of services.

4.2.3 Special measures for sound insulation and vibration damping of system components against the building.

4.2.4 Provision of recreation and storage rooms if the Client does not provide rooms that can be easily locked.

4.2.5 Assembly, conversion and dismantling as well as provision of scaffolding for the services of other entrepreneurs.

4.2.6 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on is higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.2.7 Erection, conversion and dismantling as well as provision of scaffolding with a stepped or inclined footprint, e.g. over stairs or ramps, if compensation of more than 40 cm is required.

4.2.8 Making Slots and Openings.

4.2.9 Adaptation of plant components to services performed by other contractors that are not carried out to measure.

4.2.10 Special fastening structures, e.g. supporting scaffolding.

4.2.11 Function, designation and information signs.

4.2.12 Inspection of the electrical wiring, the measuring, control and regulation system as well as the dispatch of a specialist during the commissioning of the measurement and control system, if the services have not been carried out by the Contractor.

4.2.13 Supply of the operating materials and media required for commissioning and trial operation.

4.2.14 Filter replacement after the end of trial operation.

4.2.15 Provisional measures for the operation of the plant or parts of the plant before acceptance by order of the client.

4.2.16 Operation of the Plants or Components of Plants.

4.2.17 Leak tests of air-conducting system components.

4.2.18 Special tests, e.g. testing of welds, airtightness of the building envelope.

4.2.19 Water analyses and expert opinions.

4.2.20 Expenses for inspections prescribed by building regulations.

4.2.21 Repeated instruction of operating and maintenance personnel (see section 3.4.2).

4.2.22 Additional functional measurements according to section 3.5.

4.2.23 Creation of as-built plans, functional and string diagrams.

4.2.24 Provision of additional data beyond the specifications of VDI 3813 (all parts)1) and VDI 3814 (all parts)1).

4.2.25 Special protection of building and plant components as well as furnishings, e.g. masking of windows, doors, floors, coverings, stairs, wood, roof surfaces, surface-finished parts, dust-proof masking of sensitive equipment and technical equipment, dust barriers, emergency roofs, laying out of hardboard boards or building protection films from 0.2 mm thick.

4.2.26 Completion of components in several operations to enable work by other contractors, insofar as one's own services cannot be provided continuously in the course of similar work (see section 4.1.9).

4.2.27 Measures to protect against unsuitable conditions resulting from the weather or indoor climate in accordance with section 3.1.5.

4.2.28 Measures for fire, sound, heat, moisture and radiation protection, insofar as they go beyond the services under Section 3.

4.2.29 Cleaning of the substrate from coarse soiling, e.g. plaster residues, mortar residues, paint residues, oil, insofar as this has not been caused by the contractor.

4.2.30 Airtight connections to adjacent components.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

The determination of the performance — regardless of whether it is carried out according to drawings or measurements — is

- the dimensions of the manufactured plants or plant components

. Parts lists may be consulted. The simplifying rules, such as over-measurement rules and individual regulations, are to be used to determine performance.

5.2 Determination of dimensions/quantities

5.2.1 In the case of billing according to the area dimension, air ducts and air duct fittings are calculated according to the outer surface, determined from the largest circumference and length, without taking into account the thermal insulation.

5.2.2 In the case of billing according to the length measure, air ducts are measured in the central axis. Arcs are measured up to the intersection of the central axes. Sheets and other fittings are additionally calculated. Lids of openings are additionally calculated.

5.2.3 In the case of billing by mass, this is to be calculated according to the following principles:

5.2.3.1 The following are to be taken into account:

- for steel sheets and strip steel 7.85 kg/m2 per 1 mm thickness,
- in the case of standardised profiles, the dimensions according to the specifications in the DIN standards,
- for other profiles, the mass according to the information in the manufacturer's profile books.

5.2.3.2 The following are not taken into account in the calculation of the mass: fasteners, e.g. screws, rivets, weld metal.

5.2.3.3 In the case of galvanised components or galvanised structures, 5 % shall be added to the masses determined in accordance with the above-mentioned principles on account of the increase in weight due to galvanisation.

5.3 Overmeasurement rules

The following are measured:

5.3.1 Cut-outs for air diffusers and nozzles.

5.3.2 When billing according to length

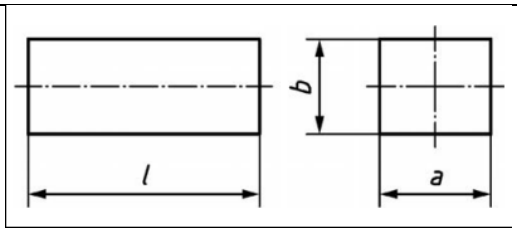
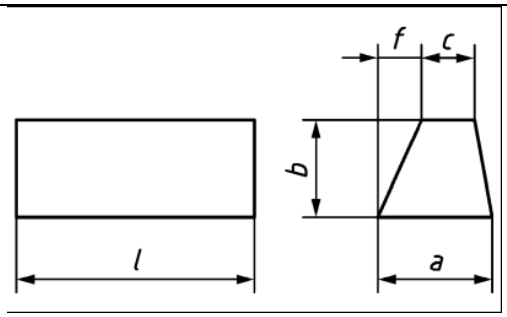
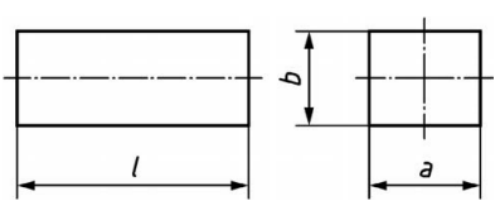
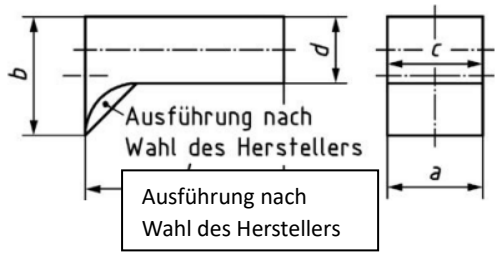
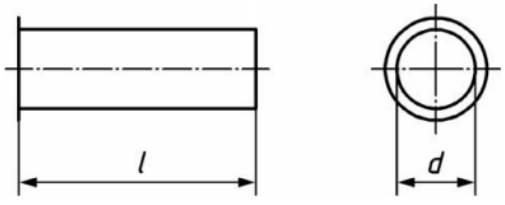
- Bows
- Molded parts and
- Connectors.

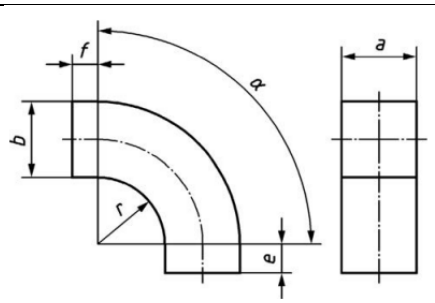
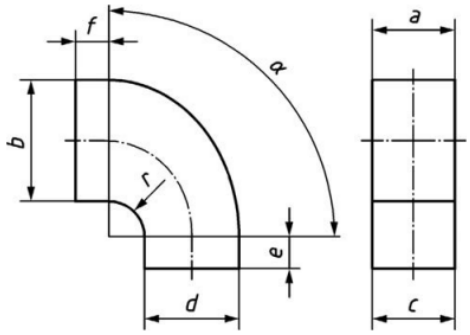
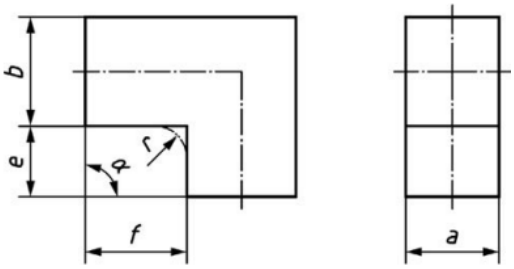
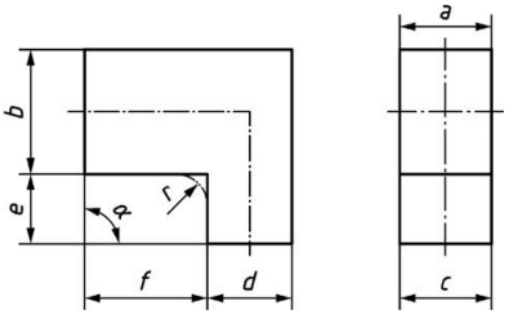
5.4 Individual provisions

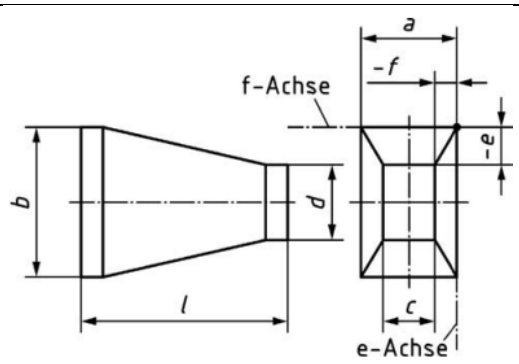
Moulded parts according to Table 2 and moulded parts of the settlement groups F 1 to F 5 according to Table 1 (see section 0.5.1) with a determined surface area of < 1 m2 are calculated at 1 m2, moulded parts with the abbreviation SR only with a length ≤ 500 mm.

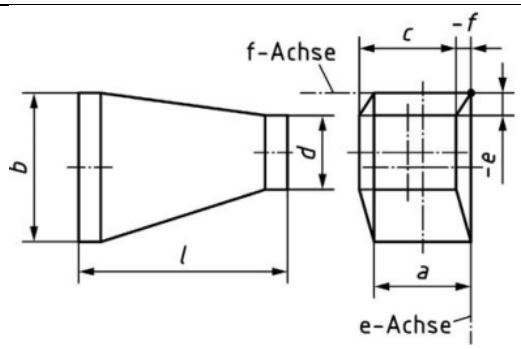
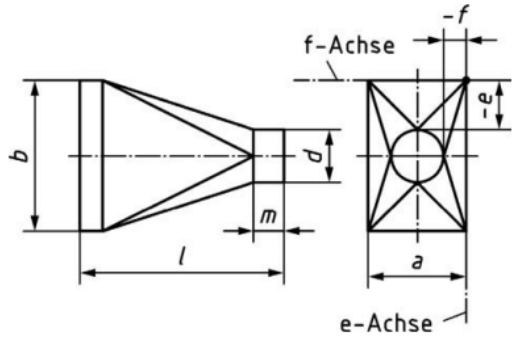
The formulas in Table 2 shall be used to determine the circumference and length.

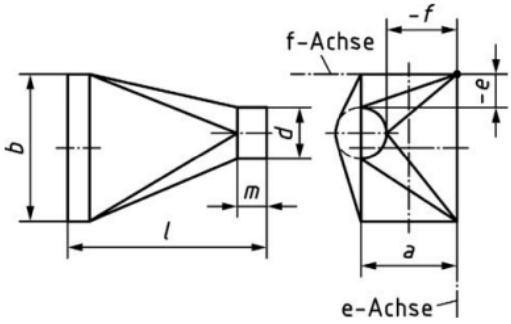
Table 2 — Air ducts and their fittings, largest circumferences, greatest lengths and areas

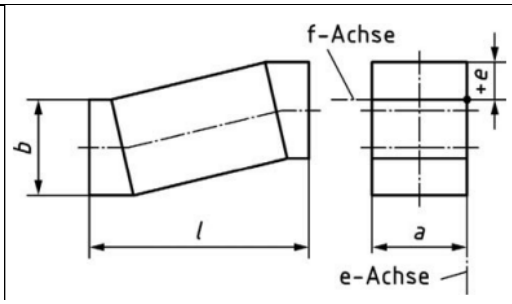
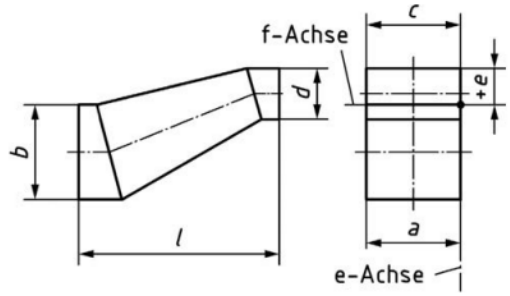
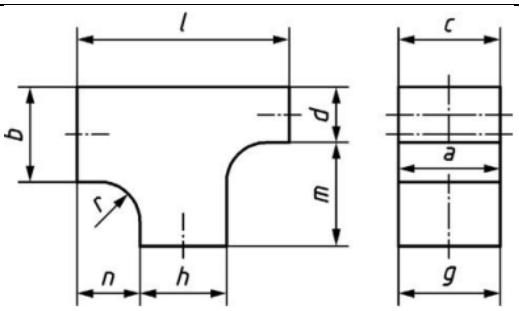
No.	Naming abbreviations Size	Presentation, dimensions Section view from the left	Largest Scope $U_{max\ b}$	Longest Length a bis c bzw. Ø d $l_{max\ b}$
1	Air line L l > 900		2(a + b)	l for pass lengths: l + 200
2	Trapezoidal air duct TL f = fmax		$a+c+\sqrt{b^2+f^2}+\sqrt{(a-c-f)^2+b^2}$	l
3	Air line part LT l ≤ 900		2(a + b)	l
4	Transition Nozzle SU l ≤ 900 c = a		2(a + b)	$\sqrt{\left(l^2+(b-d)^2\right)}$
5	Socks, round SR l ≤ 500		πd	L

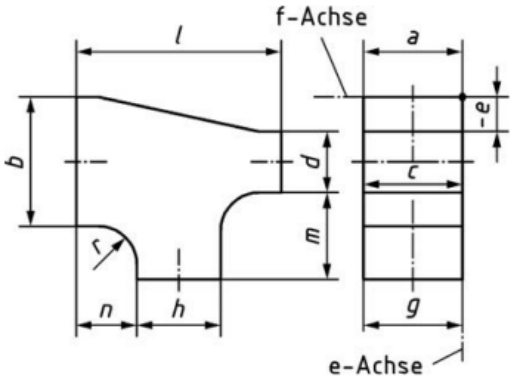
No.	Naming abbreviations Size	Presentation, dimensions Section view from the left	Largest Scope $U_{max\ b}$	Longest Length a bis c bzw. Ø d $l_{max\ b}$
6	Bow, symmetrical BS e ≤ 500 f ≤ 500		2(a + b)	$\frac{\alpha\pi(r+b)}{180} + e + f$
7	Bogenübergang BA c = a and ≤ 500 f ≤ 500		**Condition b ≥ d:**	
			2(a + b)	$\frac{\alpha\pi(r+b)}{180} + e + f$
			Condition b < d:Condition b < d:	
			2(c + d)	$\frac{\alpha\pi(r+d)}{180} + e + f$
8	Angle (knee), symmetrical WS r = 0c e ≤ 500 f ≤ 500		2(a + b)	2b + e + f
9	Angle (knee) transition WA r = 0c and ≤ 500 f ≤ 500		**Condition b ≥ d:**	
			2(a + b)	b + d + e + f
			Condition b < d:	
			2(c + d)	b + d + e + f

No.	Naming abbreviations Size	Presentation, dimensions Section view from the left	Largest Scope $^{U}max\ ^{b}$	Longest Length a bis c bzw. Ø d $^{lmax\ b}$
10	d Image containing screenshot, font, number, line Content generated by AI technology may be incorrect. $e=\frac{b-d}{2}$ $f=\frac{a-c}{2}$ h US $e=\frac{b-d}{2}$ $f=\frac{a-c}{2}$ h US		**Condition A + B ≥ C + D:**	**Condition e ≥ f:**
			2(a + b)	$\sqrt{(l^2+e^2)}$
			Condition A + B < C + D:	**Condition E < f:**
			2(c + d)	$\sqrt{(l^2+f^2)}$

Lfd. Nr.	Abbreviation Size Naming	Presentation, dimensions Section view from the left	Largest Scope ^{U}max ^{b}	Longest Length a bis c bzw. Ø d lmax b
11	d Transition, asymmetrical Astronomical unit		**Condition** **A + B ≥ C + D:**	**Condition** **b – d + e ≥ e:** $\sqrt{l^2+(b-d+e)^2}$
			2(a + b)	**Condition** **b – d + e < e:** $\sqrt{(l^2+e^2)}$
			Condition **A + B < C + D:**	**Condition** **a – c + f ≥ f** $\sqrt{l^2+(a-c+f)^2}$
			2(c + d)	**Condition** **a – c + f < f:** $\sqrt{(l^2+f^2)}$
12	d Pipe Transition, Symmetrical CASE $e=\frac{b-d}{2}$ $f=\frac{a-d}{2}$	 l_p nach DIN EN 1506	**Condition** **a + b ≥ 2 πd/2 :**	**Condition** **e ≥ f:**
			2(a + b)	$\sqrt{(l^2+e^2)}$
			Condition **a + b < 2 πd/2 :**	**Condition** **E < f:**
			πd	$\sqrt{(l^2+f^2)}$

No.	Naming abbreviations Size	Presentation, dimensions Section view from the left	Largest Scope ^{U}max ^{b}	Longest Length a bis c bzw. Ø d lmax b
13	d Pipe Transition, Asymmetrical RA	 l_p nach DIN EN 1506	**Condition** **a + b ≥ 2 πd/2 ::**	**Condition** **b – d + e ≥ e:** $\sqrt{l^2 + (b - d + e)^2}$
			2(a + b)	**Condition** **b – d + e < e:** $\sqrt{(l^2 + e^2)}$
			Condition **a + b < 2 πd/2 :**	**Condition** **a – d + f ≥ f** $\sqrt{l^2 + (a - d + f)^2}$
			πd	**Condition** **a – d + f < f:** $\sqrt{(l^2 + f^2)}$

No.	Naming abbreviations Size	Presentation, dimensions Section view from the left	Largest Scope $U_{max\ b}$	Longest Length a bis c bzw. Ø d $l_{max\ b}$
14	d Etage, symmetrisch ES f = 0		2(a + b)	$\sqrt{(l^2+e^2)}$
15	d Floor transition EA c = a f = 0		**Condition** **b ≥ d:**	**Condition** **b − d + e ≥ e:**
			2(a + b)	$\sqrt{l^2+(b-d+e)^2}$
			Condition **b < d:**	**Condition** **b − d + e < e:**
			2(c + d)	$\sqrt{(l^2+e^2)}$
16	T-Piece top straight TG g = c = a		**a) continuous part**	
			Condition **A + B ≥ C + D:**	l
			2(a + b)	
			Condition **A + B < C + D:**	
			2(c + d)	
			b) branching part	
			2(g + h)	**Condition** **d + m − b ≥ m:**
				d + m − b
				Condition **d + m − b < m:**
				m
			The surfaces of a) and b) are added.	

<table>
<tr><th>No.</th><th>Naming
abbreviations
Size</th><th>Presentation, dimensions
Section view from the left</th><th>Largest Scope
$^{U}max\ ^{b}$</th><th>Longest Length
a bis c bzw. Ø d
lmax b</th></tr>
<tr><td rowspan="9">17</td><td rowspan="9">d
T-piece, slanted at the top
TA
g = c = a</td><td rowspan="9"> 
</td><td colspan="2">a) continuous part</td></tr>
<tr><td>Condition
b ≥ d</td><td rowspan="4">$\sqrt{(l^2+e^2)}$</td></tr>
<tr><td>2(a + b)</td></tr>
<tr><td>Condition
b < d:</td></tr>
<tr><td>2(c + d)</td></tr>
<tr><td colspan="2">b) branching part</td></tr>
<tr><td rowspan="3">2(g + h)</td><td>Condition
d + m – b – e ≥ m:</td></tr>
<tr><td>d + m – b – e</td></tr>
<tr><td>Condition
d + m – b – e < m:</td></tr>
<tr><td>m</td></tr>
<tr><td colspan="2">The surfaces of a) and b) are added.</td></tr>
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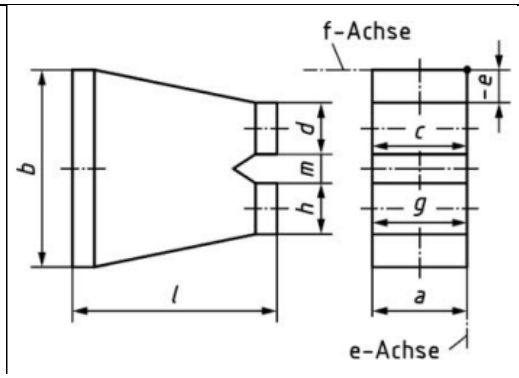
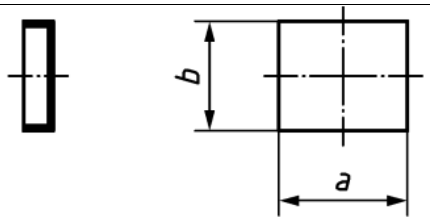
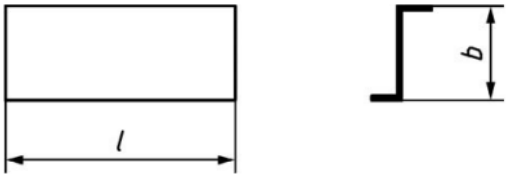
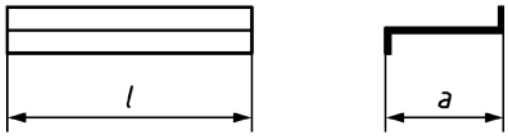
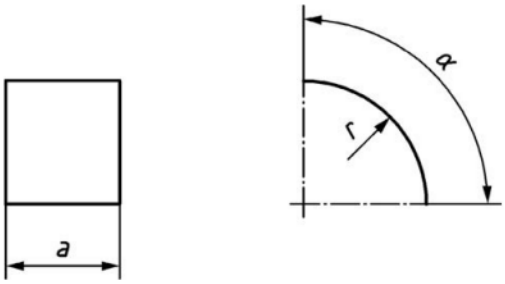
Trouser Piece
HS
g = c = a
f = 0
m ≥ 2 Flange Height</td><td> 
</td><td>Condition
B ≥ D + M + H:</td><td>Condition
b – h – m – d + e ≥ e:</td></tr>
<tr><td>2(a + b)</td><td>$\sqrt{l^2+(b-h-m-d+e)^2}$</td></tr>
<tr><td>Condition
B < D + M + H:</td><td>Condition
b – h – m – d + e < e:</td></tr>
<tr><td>2(c + d + m + h)</td><td>$\sqrt{(l^2+e^2)}$</td></tr>
</table>

<table>
<tr><th>No.</th><th>Naming
abbreviations
Size</th><th>Presentation, dimensions

Section view from the left</th><th>Square measure

A</th></tr>
<tr><td>19</td><td>Floor BO</td><td> 
</td><td>a · b</td></tr>
<tr><td rowspan="2">20</td><td rowspan="2">Cutting Plate TR</td><td> 
</td><td>b · l</td></tr>
<tr><td> 
</td><td>a · l</td></tr>
<tr><td>21</td><td>Baffle LB</td><td> 
</td><td>$\frac{\alpha \cdot \pi \cdot r}{180} \cdot a$

Only those baffles whose number of units is greater than stated below are included in the bill:

Edge length b (molding): mm | Baffles Number

400 to 800 (according to DIN EN 1505) 1 | 1

over 800 to 1 600 2 | 2

over 1,600 (according to DIN EN 1505) | 3</td></tr>
<tr><td colspan="2">Combination part KO</td><td>Combination, e.g. of air duct and moulded part or of moulded parts with each other, factory-mounted on a frame and supplied as a single part.</td><td>The surface area is determined by adding the surfaces of the parts belonging to the combination.</td></tr>
</table>

Special moulded part SO	Moulded parts that cannot be classified in the table due to their design.	The surface is to be determined on the basis of the above formulas.
Sliding nozzles, air diffusers, air diffuser boxes, cut-outs for air diffusers, openings and lids for technical and hygienic work in air duct systems.		Billing is to be made according to number (St).

a For air ducts L (l > 900 mm) the billing groups L apply, for all other components the billing groups F 1 to F 5 of Table 1 (in Section 0.5.1).

b If several calculation formulas are given for Umax and lmax, the formulas which give the largest dimensions for you and l are to be used for the calculation of the surface area .

c Unless specifically specified.

d The coordinate center is always in the upper right corner of the left cross-section. For the result of the comparison conditions, the calculated values are to be used without sign.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Heating systems and central water heating systems — DIN 18380

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 Main wind direction.

0.1.2 Formation of construction pits.

0.1.3 Buildings in the surrounding area.

0.1.4 Type of waterproofing of buildings and building components, e.g. trough formation of basements.

0.1.5 Construction of the floor and roof structure, insulation and sealing.

0.1.6 Type and scope of protective measures in accordance with VDE regulations.

0.1.7 Type, location, dimensions and design as well as dates for the erection and dismantling of scaffolding on site.

0.2 Information on the execution

0.2.1 Number, type, location, dimensions, materials and design of the equipment to be manufactured.

0.2.2 Scope of the installation of the system's internal electrical cables to be carried out by the Contractor, including placing them on the terminals.

0.2.3 Type and requirements, e.g. thermal energy requirements, of other components not part of the contractual service.

0.2.4 Required pressure levels for plant components.

0.2.5 Provision of permits, tests and acceptances, e.g. container tests in accordance with the Industrial Safety Ordinance (BetrSichV).

0.2.6 Non-destructive testing of high-pressure pipelines and pipelines that are difficult to access.

0.2.7 Number, type and dimensions of samples and pattern constructions. Place of installation.

0.2.8 Type and scope of services for winter construction.

0.2.9 Protection of components and equipment, furnishings and the like.

0.2.10 Reduction of the heat output of the space heating surfaces by radiator cladding or other measures.

0.2.11 Special requirements for wall and ceiling penetrations.

0.2.12 Requirements for fire, sound, heat, moisture and radiation protection, energy efficiency and airtightness of the building envelope. Type and scope of required services.

0.2.13 Requirements for the pipes to be laid on the raw floor.

0.2.14 Type and scope of services to create zones with different indoor climate requirements.

0.2.15 Requirements for the thermal insulation of pipes laid on the raw floor.

0.2.16 Special physical and chemical stresses to which substances and components are exposed after installation.

0.2.17 Type and extent of corrosion protection measures (see sections 2.1 and 3.1.1) and measures to prevent stone formation (see section 3.1.1).

0.2.18 Type and scope of marking of pipelines.

0.2.19 Type and scope of temporary arrangements, e.g. temporary supply by a transportable heating centre, provision of fuel, operating personnel.

0.2.20 Early or subsequent production of parts of the service. Dates of completion and commissioning, if necessary in stages.

0.2.21 Interfaces to other trades.

0.2.22 Information on building automation, e.g. interfaces, interface definition.

0.2.23 Type and scope of services for cross-trade commissioning.

0.2.24 Performing Functional Measurements.

0.2.25 Type and scope of the documents to be provided and handed over before assembly or for as-built documentation, e.g.:

- Functional and strand diagrams,
- As-built plans of the erected turbines,
- Parts list, containing all measuring, control and regulation devices (MSR),
- Circuit diagram and, if applicable, function diagram of the control system in accordance with DIN EN 60848 "GRAFCET, Specification language for function diagrams of the sequence control",
- Functional description including the control system with presentation of the control schemes,
- Protocols of the final adjustments and measurements carried out in the course of the adjustment work,
- Spare parts
- Calculation of energy requirements,
- Calculation of networks and setting values,
- Diagrams and characteristic curve fields,
- Information lists for I&C systems in DDC technology (see guidelines of the VDI 3814 series "Building Automation (GA)" 1)).

0.2.26 Type, procedure and scope of piping flushing.

0.2.27 Offer of a maintenance contract.

0.2.28 Type and scope of the planning documents and calculations to be supplied to the Contractor for the assessment and execution of the plant.

0.2.29 Possibilities for absorbing forces of suspended components and apparatus.

0.2.30 Type and scope of condition checks of existing pipelines and plant components.

0.2.31 Nature of the filling water.

0.2.32 Component production according to the execution plan or according to local measurements.

0.2.33 Type, nature and strength of the substrate, e.g. steel, concrete, plastered or unplastered masonry, wood.

0.2.34 Number, type, dimensions and design of terminations and connections to adjacent components, e.g. airtight connections.

0.2.35 Type, position, dimensions and design of movement, structure and component joints.

0.2.36 Number, type, position and dimensions of recesses to be made or closed.

0.2.37 Number, type, location, dimensions and masses of installation and installation components.

0.2.38 Design and division of areas as well as grid and joint formation.

0.2.39 Number, type, position, dimensions and nature of sloping, curved or otherwise shaped surfaces.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 3.7,	if the required documents are not to be delivered in 3 copies in paper form and in German, but are to be handed over in larger quantities or in another form, e.g. drawings under glass, on data carrier.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units are to be provided as follows:

0.5.1 Area dimension (m2), separated by type, structure and mean installation distance, for surface heating systems, e.g. underfloor heating.

0.5.2 Measure of length (m), separated by type and dimensions, for

- Piping
- Mounting rails,
- Flushing of pipelines.

0.5.3 Number (pcs), separated by type and dimensions, for

- Pipe bends, fittings and fasteners including welding, soldering and sealing materials in pipelines,
- fasteners, e.g. sleeves, screw connections, flange connections,
- Wall and ceiling penetrations with special requirements, e.g. airtight or gas-tight,
- Individual fastenings for pipelines, supporting structures, fixed points,
- Apparatus, Verteiler, Sammler,
- Heat generators, water heaters, flue gas systems, regulations,
- Heating surfaces of all kinds,
- Removing, re-erecting and reconnecting heating surfaces that have already been installed,

- Function, designation and information signs, ? Components with special requirements for sound insulation, e.g. structure-borne sound insulation,
- Components for fire protection measures,
- all other parts, such as
  - devices for regulating and displaying temperature, pressure, water level and the like,
  - safety devices for temperature, pressure, water level and the like,
- Pumps and valves.

0.5.4 Mass (kg, t), separated by type and measure, for

- special fastening structures, e.g. supporting structures, fixed points,
- Antifreeze
- organic heat carriers.

1 Scope of application

1.1 ATV DIN 18380 "Heating systems and central water heating systems" applies to the manufacture of heating systems with central heat generation as well as central water heating systems. ATV DIN 18380 also applies to the manufacture of heat distribution systems (heating and cooling systems) in which water or water mixtures are used as energy carriers.

1.2 In addition, ATV DIN 18299 "General regulations for construction work of any kind", sections 1 to 5 shall apply. In the event of contradictions, the regulations of ATV DIN 18380 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

2.1 General

If the intended use requires it, materials and components must be corrosion protected.

Mechanical components and heat exchangers must be provided with type and performance plates. Signage on components, e.g. signs, scales, instructions, must be in German and in accordance with the "Law on Units in Metrology"

and the time determination (EinhZeitG)". For the most common substances and components, the DIN standards and other requirements are listed below.

2.2 Technical rules

2.2.1 Steam Systems Technical Rules for Steam Boilers (TRD)

2.2.2 Liquid Fuels TRGS 509, Technical Rules for Hazardous Substances — Storage of Liquid and Solid Hazardous Substances in Fixed Containers and Filling and Emptying Points for Transportable Containers2)

2.2.3 Gaseous Fuels DVFG TRF 2012, Technical Rules for Liquefied Petroleum Gas3) DVGW G 600, Technical Rules for Gas Installations3)

2.2.4 District heating AGFW guidelines4)

2.3 Components

2.3.1 Pipes, e.g. copper pipes in accordance with DIN EN 1057 "Copper and copper alloys — Seamless round copper pipes for water and gas pipes for sanitary installations and heating systems", may also be used with factory-applied thermal insulation or plastic sheathing.

2.3.2 Electrical measuring instruments must comply with accuracy class E-1.5 according to DIN EN 60051-1 (VDE 0411-51-1) "Direct-acting indicating analogue electrical measuring instruments and their accessories — Part 1: Definitions and general requirements for all parts".

2.3.3 Control cabinets must comply with at least protection class IP 43 according to DIN EN 60529 (VDE 0470-1) "Degrees of protection by enclosures (IP code)".

2.3.4 When using components for connection to building automation, the guidelines of the VDI 38131 series and VDI 38141) "Building Automation (GA)" must be observed.

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 The components of heating systems and water heating systems must be coordinated with each other in such a way that the required performance is achieved, operational safety is ensured and economical and economical operation is possible. Corrosion processes and stone formation must be limited to a large extent. This applies in particular to heat generators, heating equipment, exhaust systems, intended fuels or types of energy and the properties of the energy source. Influences from temperature, pressure, exhaust gases and the like must be taken into account.

3.1.2 The Contractor shall provide the Client with all information necessary for the unhindered installation and proper operation of the system prior to the commencement of the installation work. According to the planning documents and calculations of the client, the contractor must provide the assembly and workshop planning required for the execution and, if necessary, coordinate it with the client. These include, in particular,

- Assembly plans,
- Workshop drawings,
- Ladders
- Fundamentpläne.

The Contractor shall provide the Client with the information on the dimensions of the built-in parts,

- current consumption and, if applicable, the starting current of the electrical components and,
- other requirements for installation

The documents required for the execution and to be handed over by the client (see § 3 para. 1 VOB/B) include, in particular:

- Execution plans as floor plans, functional and string diagrams as well as sections with dimensional information,
- Plant design with control schemes,
- Slot and breakthrough plans,
- Calculations for heating and cooling load with associated pipe network and pump designs, the energetic verification and the essential energy-related characteristics on which the system expenditure figure is based,
- Performance data for heat generators and heat exchangers,
- Information on sound, heat and fire protection.

3.1.3 When reviewing the planning documents and calculations supplied by the Client (see Section 3 (3) VOB/B), the Contractor shall, inter alia, pay particular attention to the nature and function of the system:

- the heating load,
- the heat output of the heat generators and heating surfaces,
- the cross-sections and designs of the exhaust pipes, the safety devices,
- the pipeline cross-sections, pump designs and network hydraulics,
- the measuring, control and regulation equipment,
- sound insulation,
- thermal insulation,
- fire protection,
- the airtightness of the building envelope.

3.1.4 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- Inconsistencies in the planning documents and calculations provided by the client (see § 3 para. 3 VOB/B),
- recognisably defective workmanship, failure to complete on time or the absence of foundations, slots and openings,
- inadequate measures for sound, heat and fire protection,
- unsuitable design of the flue gas systems and unsuitable cross-section of the flue gas pipes as well as the air-conducting and installation shafts,
- insufficient connected load for energy sources,
- insufficient space for the components or for their transport to the installation site,
- insufficient conditions for the absorption of reaction forces,
- lack of reference points,
- unsuitable conditions resulting from the weather or indoor climate (see section 3.1.5),

- changes to the prerequisites on which the planning was based that have become known to the contractor.

3.1.5 In the event of unsuitable conditions resulting from the weather or the indoor climate, e.g. temperatures below 5 °C when laying plastic composite pipes in roll form, special measures must be taken in consultation with the Client. If services are required for this, these are special services (see section 4.2.33).

3.1.6 If the pipeline routing is left to the Contractor, the Contractor must draw up an execution plan and coordinate it with the Client before execution so that the necessary foundation, slot, breakthrough and assembly plans can be drawn up. These services are special services (see section 4.2.1).

3.1.7 In the event of changes that could impair existing electrical protective measures on existing systems, e.g. installation of insulating pieces, the Contractor must inform the Client that an approved electrician must check whether the planned work will impair the protective measures.

3.1.8 The Contractor shall arrange for the permits and plant-specific technical acceptances required for the execution.

3.1.9 Chiseling, milling and drilling work on the structure may only be carried out in consultation with the Client.

3.1.10 If occurring reaction forces have to be dissipated into the structure, the forces must be determined by the Contractor and notified to the Client before the performance of the service.

3.2 Requirements

3.2.1 General

The Technical Rules listed in Section 2 shall apply to the execution, and in particular:

DIN 4703-3	Space radiators — Part 3: Conversion of the standard heat output
DIN 4755	Oil firing systems — Technical rules for oil firing installations (TRÖ) — Testing
DIN EN 12977-1	Solar thermal installations and their components — Custom-made installations — Part 1: General requirements for solar installations for heating drinking water and solar combined installations
DIN EN 14336	Heating Systems in Buildings — Installation and Acceptance of Hot Water Heating Systems

When designing multivalent systems, particular attention must be paid to the mutual coordination of the heating and control equipment.

3.2.2 Safety devices

DIN 4754 (all parts)	Heat transfer systems with organic heat transfer fluids

3.2.3 Energy supply systems

TRwS 791-1	Technical Rules for Substances Hazardous to Water (TRwS) — Heating Oil Consumer Installations — Part 1: Construction, Operational Requirements and Decommissioning of Heating Oil Consumer Plants5) Technical Connection Conditions of Local Supply Companies.

3.2.4 Exhaust systems

DIN V 18160-1	Flue Systems — Part 1: Design and Execution

3.2.5 Piping

The pipes must be laid in such a way that they can expand without causing damage. Pipes running side by side and over each other and crossing each other must not touch each other, even when expanded.

The pipelines must also be laid in such a way that service doors, control flaps and the like are freely accessible and operated. Detachable joints whose tightness is not permanently guaranteed must be accessible. In the case of pipe penetrations through ceilings and walls, the concerns of sound, heat, humidity and fire protection as well as airtightness must be taken into account. Required services are special services (see section 4.2.10).

Underground pipelines must be laid in accordance with DIN EN 1610 "Laying and testing of sewers and sewers".

3.2.6 Valves and pumps

Valves with the same functions must be designed of the same type.

3.2.7 Measuring, control and regulation equipment

3.2.7.1 Actuators of the control sections of functionally independent equipment which are installed in systems that are not part of the contractual service must be agreed by the Contractor with the person responsible for the system in question.

3.2.7.2 Transmitters must be installed at suitable locations in such a way that the measured value is correctly recorded.

3.2.7.3 Display devices must be easy to read, and devices to be operated must be easily accessible and operable.

3.2.7.4 The Contractor shall provide a specialist who is familiar with systems of this kind during the testing and commissioning of the electrical cabling carried out by him and the control and regulation system he has constructed. If the electrical cabling or the measurement and control technology is not part of the contractual services, the secondment of a skilled worker during the test or commissioning is a special service (see section 4.2.16).

3.2.8 Space heating surfaces

3.2.8.1 Radiators shall be connected to the pipes in such a way that they are easily detachable, drainable and removable. Radiators and their fittings must be easily accessible.

3.2.9 Underfloor heating

DIN EN 1264-1	Heating and cooling systems integrated into rooms with water flow — Part 1: Definitions and symbols
DIN EN 1264-4	Room-integrated heating and cooling systems with water flow — Part 4: Installation

3.2.10 Insulation and fire protection

Parts of the system that are to receive sheathing/insulation must be installed in such a way that this service can be carried out properly.

3.2.11 Sound insulation

If noise protection measures are to be carried out on the system, they must comply with the requirements of DIN 4109-1 "Noise protection in building construction - Part 1: Minimum requirements".

3.3 Notification, Permission, Approval and Examination

The contractor shall make available to the Client the drawings and other documents and certificates required for the officially prescribed notifications or applications in accordance with the number prescribed for the notification, permit or approval obligation. This shall not apply if the test regulations for plant components permit permanent identification instead of a certificate.

3.4 Pressure test

3.4.1 The Contractor shall subject the system to a pressure test after installation and before closing the wall slits and wall and ceiling openings and, if necessary, before the application of the screed or any other covering.

3.4.2 Water heating and water heating systems shall be tested in accordance with DIN EN 14336 "Heating systems in buildings — Installation and acceptance of hot water heating systems". The hydraulic pressure test as well as the pneumatic pressure test are permitted.

3.4.3 Steam installations shall be tested at a pressure corresponding to the response pressure of the safety valve. In addition, the Technical Rules for TRD Series 500 steam boilers must be observed.

3.4.4 Reports of the pressure tests must be drawn up. They must show:

- Date of the inspection,
- System data such as installation location, maximum permissible operating pressure, related to the lowest point of the system,
- Test pressure, related to the response pressure of the safety valve,
- duration of the application of the test pressure,

- Confirmation that the system is leak-proof and that no permanent deformation has occurred on any component.

3.5 Setting up the system

3.5.1 The Contractor shall adjust the system components in such a way that the planned functions and services are performed and the statutory provisions are met. The hydraulic balancing must be carried out with the calculated setting values in such a way that all heat consumers are supplied with heating water according to their heating load when operating as intended, e.g. even after room temperature has been lowered or the heating system is interrupted.

3.5.2 The adjustment is to be made for acceptance.

3.5.3 The operating and maintenance personnel for the system must be instructed once by the contractor.

3.6 Acceptance

A completeness and function test must be carried out for acceptance, but a function measurement must only be carried out by special arrangement.

3.6.1 Completeness check

The completeness check consists of the following individual checks:

- Comparison of the delivery with the service description both in terms of scope and materials and, if applicable, properties and spare parts,
- Testing for compliance with technical and regulatory requirements,
- Checking whether all the documents necessary for the operation of the system are available.

3.6.2 Functional Testing

The functional test of the entire system is to be carried out as part of a trial operation. It includes:

- the safety devices,
- the heat generators and the heating surfaces, the control and switching devices.

Mud flaps and filters must be cleaned after trial operation.

3.7 Documents to be supplied

The Contractor shall prepare the following documents and hand them over to the Client at the latest upon acceptance after the following sorting:

- Electrical overview circuit diagrams and connection diagrams in accordance with DIN EN 61082-1 (VDE 0040-1) "Electrical engineering documents — Part 1: Rules";
- compilations of the most important technical data;
- copies of the prescribed test and manufacturer certificates, proof of usability, specialist contractor declarations;

- all operating and maintenance instructions required for safe and economical operation, in particular in accordance with DIN EN 12170 "Heating systems in buildings — Operating, maintenance and operating instructions — Heating systems requiring qualified operating personnel" and DIN EN 12171 "Heating systems in buildings — Operating, maintenance and operating instructions — Heating systems that do not require qualified operating personnel";
- Pressure test protocols;
- Protocol on the briefing of maintenance and operating personnel;
- Protocol on exhaust gas measurement.

The documents are to be handed over to the client in paper form, 3 copies, in German. Terms, abbreviations, abbreviations, etc. may be used in accordance with the normative regulations.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Examination of the Client's documents in accordance with Section 3.1.3.

4.1.2 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on is not higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.1.3 Compensation of stepped or inclined standing surfaces of scaffolding up to 40 cm difference in height, e.g. via stairs or ramps.

4.1.4 Type and Performance Plates.

4.1.5 Connections, wall and ceiling penetrations without special requirements, except for services according to section 4.2.10.

4.1.6 Attachment of brackets and brackets, except for services under section 4.2.12.

4.1.7 Protection of components and equipment from contamination and damage caused by work on heating and central water heating systems as well as heat distribution systems by loosely covering, hanging or wrapping, except for protective measures according to section 4.2.31.

4.1.8 Submission of prefabricated surface and color samples.

4.1.9 Completion of components in several operations to enable work by other contractors, provided that one's own services can be provided continuously in the course of similar work. If these conditions are not met, they are special services according to section 4.2.32.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 Planning services such as design, execution and approval planning as well as the planning of slots and openings.

4.2.2 Marking of openings if their execution is not included in the Contractor's scope of services.

4.2.3 Special measures for sound insulation and vibration damping of system components against the building.

4.2.4 Provision of recreation and storage rooms if the Client does not provide rooms that can be easily locked.

4.2.5 Assembly, conversion and dismantling as well as provision of scaffolding for the services of other entrepreneurs.

4.2.6 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on is higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.2.7 Erection, conversion and dismantling as well as provision of scaffolding with a stepped or inclined footprint, e.g. over stairs or ramps, if compensation of more than 40 cm is required.

4.2.8 Making slots and openings.

4.2.9 Adaptation of plant components to services performed by other contractors that are not carried out to measure.

4.2.10 Connections, wall and ceiling penetrations with special requirements, e.g. airtightness, gastightness, watertightness.

4.2.11 Rosettes on wall and ceiling ducts.

4.2.12 Special fastening structures, e.g. abutments, pipeline anchor points, pipe bearings with sliding or roller elements, supporting shells, support scaffolding.

4.2.13 Function, designation and information signs.

4.2.14 Manufacture of foundations for pumps, tanks and other plant components.

4.2.15 Integration, connection and drilling to existing pipelines, shafts and plant components.

4.2.16 Checking the electrical wiring and the measuring, control and regulation system as well as assigning a specialist during the commissioning of the measuring and control system, if the services were not carried out by the Contractor.

4.2.17 Supply of the operating materials and media required for pressure testing, commissioning and trial operation.

4.2.18 Services for provisional measures for the operation of the system or parts of the system before acceptance on the order of the client, e.g. heating the screed ready for covering.

4.2.19 Operation of the installations or parts of installations.

4.2.20 Additional pressure testing as well as additional filling — including with antifreeze — and emptying of the pipes for reasons for which the Client is responsible.

4.2.21 Special tests, e.g. testing of soldered seams, welds, airtightness of the building envelope.

4.2.22 Water analyses and expert opinions.

4.2.23 Expenses for prescribed plant-specific, technical acceptance tests.

4.2.24 Repeated instruction of operating and maintenance personnel (see section 3.5.3).

4.2.25 Functional measurement according to section 3.6, including its documentation.

4.2.26 Creation of as-built plans, functional and string diagrams.

4.2.27 Documentation of hydraulic balancing with the help of measuring instruments and comparison with the mathematically determined settings in accordance with Section 3.5.1.

4.2.28 Flushing of pipelines and plant components, including their documentation, including the provision of the necessary equipment and operating fluids.

4.2.29 Provision of additional data that goes beyond the information provided in VDI 38131) and VDI 38141).

4.2.30 Special measures for fire protection during welding and soldering work, e.g. setting up a fire watch.

4.2.31 Special protection of building and plant components as well as furnishings, e.g. masking of windows, doors, floors, coverings, stairs, wood, roof surfaces, finished surfaces, dust-proof masking of sensitive equipment and technical equipment, dust protection walls, emergency roofs, laying of hardboard or building protection films from 0.2 mm thick.

4.2.32 Completion of components in several operations to enable work by other contractors, insofar as one's own services cannot be provided continuously in the course of similar work (see section 4.1.9).

4.2.33 Measures to protect against unsuitable conditions resulting from the weather or indoor climate in accordance with section 3.1.5.

4.2.34 Measures for fire, sound, heat, humidity and radiation protection, insofar as they go beyond the services under Section 3.

4.2.35 Cleaning the substrate of coarse soiling, e.g. plaster residues, mortar residues, paint residues, oil, insofar as this has not been caused by the Contractor.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

The determination of the performance — regardless of whether it is carried out according to drawings or measurements — shall be based on

- the dimensions of the manufactured plants or plant components, parts lists may be consulted,
- for surface heating systems, e.g. underfloor heating, which are billed according to the area measure:
    - on surfaces with limiting components, the dimensions of the occupied areas up to the boundary, unplastered, uninsulated, unclad components,
    - on surfaces without limiting components, the dimensions of the occupied areas.

The simplifying rules, such as over-measurement rules and individual regulations, are to be used to determine performance.

5.2 Determination of dimensions/quantities

5.2.1 In the case of billing according to the length measure, pipelines are measured in the central axis. Pipe bends are measured up to the intersection of the central axes. Fittings, pipe bends and fittings are additionally calculated.

5.2.2 In the case of billing by mass, this is to be calculated according to the following principles:

5.2.2.1 The following are to be taken into account:

- for steel sheets and strip steel 7.85 kg/m2 per 1 mm thickness,
- in the case of standardised profiles, the dimensions according to the specifications in the DIN standards,
- for other profiles, the mass according to the information in the manufacturer's profile books.

5.2.2.2 The following are not taken into account in the calculation of the mass: fasteners, e.g. screws, rivets, weld metal.

5.2.2.3 In the case of galvanised components or galvanised structures, 5 % shall be added to the masses determined in accordance with the above principles on account of the increase in weight due to galvanisation.

5.3 Overmeasurement rules

The following are measured:

5.3.1 When billed according to area

- for underfloor heating, recesses ≤ 2.5 m2.

5.3.2 When billing according to length

- Fittings
- Bends
- Fittings, fittings and connectors.

5.4 Individual provisions

No regulations.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Gas, water and drainage systems within buildings

DIN 18381

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the description of services must state in particular:

0.1 Information on the construction site

0.1.1 Main wind direction.

0.1.2 Construction of excavations.

0.1.3 Surrounding buildings.

0.1.4 Type of waterproofing von Bauwerken und Bauwerksteilen, z. B. Wannen ausbildung von Kellern.

0.1.5 Construction of the floor and roof structure, insulation and sealing.

0.1.6 Type and scope of protective measures in accordance with VDE regulations.

0.1.7 Type, location, dimensions and design as well as dates for the erection and dismantling of scaffolding on site.

0.1.8 Terrain heights and height of the backwater level.

0.1.9 Type and location of the necessary drainage points to be made available to accommodate drainage points from third-party trades.

0.2 Information on the execution

0.2.1 Number, type, location, dimensions, materials and design of the equipment to be manufactured.

0.2.2 Scope of the installation of the electrical cables internal to be carried out by the Contractor, including placement on the terminals.

0.2.3 Type and requirements, e.g. thermal energy requirements, of other components not part of the contractual service.

0.2.4 Required pressure levels for plant components.

0.2.5 Provision of permits, tests and acceptances, e.g. tank inspections in accordance with the Industrial Safety Ordinance (BetrSichV), facilities for radioactive wastewater.

0.2.6 Non-destructive testing of high-pressure pipelines and pipelines that are difficult to access.

0.2.7 Number, type and dimensions of samples and pattern constructions. Place of attachment

0.2.8 Type and scope of services for winter construction.

0.2.9 Protection of building and plant components, furnishings and the like.

0.2.10 Information on the implementation of a hygiene concept.

0.2.11 Special requirements for wall and ceiling penetrations.

0.2.12 Requirements for fire, sound, heat, moisture and radiation protection, energy efficiency and airtightness of the building envelope. The nature and extent of the measures required.

0.2.13 Requirements for the cables to be laid on the raw floor.

0.2.14 Requirements for the thermal insulation of pipes laid on the raw floor.

0.2.15 Special physical and chemical stresses to which substances and components are exposed after installation.

0.2.16 Type and extent of corrosion protection measures (see sections 2.1 and 3.1.1) and measures to prevent stone formation (see section 3.1.1).

0.2.17 Results of the water analysis for the assessment of the corrosion chemical behaviour in accordance with DIN 50930-6 "Corrosion of metals — Corrosion of metallic materials inside pipelines, containers and apparatus in the event of corrosion load by water — Part 6: Assessment methods and requirements with regard to hygienic suitability in contact with drinking water" and DIN EN 12502 (all parts) "Corrosion protection of metallic materials".

0.2.18 Type, dimensions, scope and design of the thermal insulation and insulation against condensation.

0.2.19 Type and extent of temporary arrangements, e.g. for temporary supply and disposal.

0.2.20 Early or subsequent production of parts of the service. Dates of completion and commissioning, if necessary in stages.

0.2.21 interfaces to other trades.

0.2.22 Information on building automation, e.g. interfaces, interface definition.

0.2.23 Type and scope of services for cross-trade commissioning.

0.2.24 Type and scope of the documents to be provided and handed over before assembly or for as-built documentation, e.g.:

- functional and strand schemes; As-built plans of the installations constructed;
- Parts list, containing all measuring, control and regulation devices (MSR);
- Circuit diagram and, if applicable, function diagram of the control system in accordance with DIN EN 60848 "GRAFCET, Specification language for function diagrams of the sequence control";
- Functional description including the control system with presentation of the control schemes;
- Protocols of the final adjustments and measurements carried out in the course of the adjustment work;
- Spare parts;
- Calculation of energy requirements; Calculation of networks and setting values;
- Charts and characteristic curve fields;
- Information lists for I&C systems in DDC technology (see guidelines of the VDI 3814 series "Building Automation (GA)".

0.2.25 Carrying out functional measurements.

0.2.26 Type, procedure and scope of pressure and leak tests to be carried out for pipelines and details of components and apparatus to be removed and reinstalled as well as to be sealed.

0.2.27 Type, method and scope of flushing of pipes of drinking water installations, in particular

- Length and nominal diameter of the basement distribution pipes,
- Number and nominal diameter of the risers,
- Number of floors,
- Number of tapping points,
- the type of tapping points such as surface-mounted or concealed taps, concealed cisterns and the like,
- Location of the connection point for wastewater disposal.

2.28 Art, Verfahren und Umfang des Spülens von Entwässerungsleitungen oder Anlagenteilen nach Abschnitt 4.2.22 insbesondere

- Length and nominal diameter of the pipes to be flushed,
- Possibilities of draining the rinsing water.

0.2.29 Type, procedure and extent of disinfection of pipes of drinking water installations in accordance with section 4.2.27.

0.2.30 Offer of a maintenance contract

0.2.31 Type and scope of the planning documents and calculations to be supplied to the Contractor for the assessment and execution of the installations.

0.2.32 Attack and treatment of aggressive and contaminated media.

0.2.33 Possibilities for absorbing forces of suspended components and apparatus.

0.2.34 Type and scope of condition assessments of existing gas, water and drainage pipes and plant components.

0.2.35 Type and extent of marking of pipelines.

0.2.36 Location of the connections for fittings and drains, e.g. in the tile grid.

0.2.37 Component production according to the execution plan or according to local measurements.

0.2.38 Type, nature and strength of the substrate, e.g. steel, concrete, plastered or unplastered masonry, wood. Intended wall and floor coverings.

0.2.39 Number, type, dimensions and design of terminations and connections to adjacent components, e.g. airtight connections.

0.2.40 Type, position, dimensions and design of movement, structure and component joints.

0.2.41 Number, type, position and dimensions of recesses to be made or closed.

0.2.42 Number, type, location, dimensions and masses of fittings and fittings.

0.2.43 Number, type and location of sampling points in the drinking water supply.

0.2.44 Design and division of areas as well as grid and joint formation.

0.2.45 Number, type, location, dimensions and nature of sloping, curved or otherwise shaped surfaces.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this ATV are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in the case of

Section 3.7 if the required documents are not to be delivered in 3 copies in paper form and in German, but are to be handed over in larger quantities or in another form, e.g. drawings under glass, on data carriers.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units are to be provided as follows:

0.5.1 Measure of length (m), separated by type and dimensions, for

- Supporting shells,
- Piping
- Fastening rails,
- drainage channels, including their cover,
- Filling of joints,
- Flushing of pipelines,
- Disinfection of pipelines,
- Pressure, leakage and condition tests.

0.5.2 Number (St), separated by type and size, for

- Pipe bends, fittings, fasteners and fasteners including welding, soldering and sealing material in pipelines,
- detachable fasteners, e.g. sleeves, screw connections, flange connections,
- mounting elements and pipe extensions,
- Compensating and extension pieces for wall-mounted fittings,
- Pipeline fittings, safety and safety devices, measuring and metering devices as well as motion compensators and insulating pieces,
- Connection hoses,
- Connections to other pipe materials, plant components and devices,
- Additional tests of the weld and soldered seams, e.g. ultrasonic tests,
- Fittings up to a length of 50 cm in drainage pipes,
- Drainage objects, e.g. floor drains, sewage lifting stations, scrapers, drainage channels
- Manholes and covers,
- Wall and ceiling penetrations with special requirements,
- Individual fastenings of pipelines,
- Abutments, pipeline anchor points, pipe bearings with sliding or roller elements, support shells, brackets, support scaffolding,
- distributors, collectors,
- Drilling,
- prefabricated installation elements or units, shoring and other Constructions for pre-wall installations,
- Sanitary facilities, fittings, gas appliances, pumps, control and shut-off devices, inspection frames and similar plant components,
- Function, designation and information signs,
- Components for sound insulation measures, e.g. for structure-borne sound insulation,
- Components for fire protection measures,
- Flushing of tapping points,
- Disinfection of tapping points,
- special pressure tests of equipment and fittings.

0.5.3 Mass (kg, t), separated by type and dimensions, for special fastening structures, e.g. load-bearing structures, fixed points.

1 Scope of application

1.1 ATV DIN 18381 "Gas, water and drainage systems within buildings" applies to the manufacture of gas, water and drainage systems within buildings and other structures.

1.2 ATV DIN 18381 does not apply to

- drainage sewer work (see ATV DIN 18306 "Drainage sewer work") and
- pressure pipeline work outside buildings (see ATV DIN 18307 "Pressure pipeline work outside buildings").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18381 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

2.1 General If the intended use requires it, materials and components must be corrosion protected.

Mechanical components and heat exchangers must be provided with type and performance labels. Signage on components, e.g. signs, scales, instructions, must be in German and in accordance with the "Law on Units in Metrology and Time Determination (Units and Time Determination – EinhZeitG)".

For the most common substances and components, the DIN standards and other requirements are listed below.

DIN 1986-4	Drainage systems for buildings and land — Part 4: Uses of sewage pipes and fittings of various materials
DIN 1986-100	Drainage systems for buildings and land — Part 100: Provisions in connection with DIN EN 752 and DIN EN 12056
DIN 1988-200	Technical Rules for Drinking Water Installations — Part 200: Installation Type A (Closed System) — Design, Components, Apparatus, Materials; Technical rules of the DVGW
DIN 1988-600	Technical Rules for Drinking Water Installations — Part 600: Drinking Water Installations in Connection with Fire Extinguishing and Fire Protection Systems — Technical Rules of the DVGW
DIN EN 12056-1	Gravity drainage systems within buildings — Part 1: General and implementation requirements
DVGW G 600,	Technical Rules for Gas Installations2)
DVFG-TRF 2012,	Technical Rules for Liquefied Gas2)

2.2 Measuring, control and regulation equipment, building automation

2.2.1 Electrical measuring instruments shall comply with accuracy class E-1.5 in accordance with DIN EN 60051-1 (VDE 0411-51-1) "Direct-acting analogue electrical measuring instruments and their accessories — Part 1: Definitions and general requirements for all parts".

2.2.2 Control cabinets must comply with at least protection class IP 43 according to DIN EN 60529 (VDE 0470-1) "Protection classes by enclosures (IP code)".

2.2.3 When using components for connection to building automation, the guidelines of the VDI 3813 and VDI 3814 series "Building Automation (GA)"1) must be observed.

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 The components of gas, water and drainage systems must be coordinated with each other in such a way that the required performance is achieved, operational safety is ensured and economical and economical operation is possible. Hygienic requirements must be met and corrosion processes and stone formation must be limited to a large extent.

3.1.2 The Contractor shall provide the Client with all information necessary for the unhindered installation and proper operation of the installations prior to the commencement of the assembly work. According to the planning documents and calculations of the client, the contractor must provide the assembly and workshop planning required for the execution and, if necessary; with the client.

These include, in particular:

- Assembly plans,
- Workshop drawings,
- Ladders
- Fundamentpläne.

The Contractor shall provide the Client with information in good time on the

- Dimensions of the built-in parts,
- current consumption and, if necessary, the starting current of the electrical components and
- other requirements for installation.

The documents required for the execution and to be handed over by the contracting authority (see § 3 para. 1 VOB/B) include, in particular:

- Execution plans as floor plans, functional and string diagrams as well as sections with dimensional information,
- Plant design with control schemes,
- Slot and breakthrough plans,

- Calculations and associated pipe network and pump designs and designs of other components, the energy verification and the essential energy-related characteristics on which the plant cost figure is based,
- Performance data of components of the plant, in particular those components which are manufactured by other trades, e.g. drinking water heaters,
- Information on sound, heat and fire protection.

3.1.3 When reviewing the planning documents and calculations supplied by the Client (see Section 3 (3) VOB/B), the Contractor shall, inter alia, pay particular attention to the nature and function of the installations:

- the appropriate design and sufficient cross-section of the flue, supply air and exhaust air systems, e.g. for the combustion air or the combustion air compound,
- the safety equipment,
- the pipeline cross-sections, pump designs and mains hydraulics,
- the measuring, control and regulation equipment,
- sound insulation, □ thermal insulation,
- fire protection,
- the airtightness of the building envelope.

3.1.4 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- Inconsistencies in the planning documents and calculations provided by the client (see § 3 para. 3 VOB/B),
- Recognisably defective workmanship, non-timely completion or lack of foundations, slots and openings,
- Insufficient measures for sound, heat and fire protection,
- unsuitable design of the flue gas systems and unsuitable cross-section of the exhaust pipes as well as the supply air and exhaust air shafts,
- insufficient connected load for energy sources,
- insufficient space for the components or for their transport to the installation site,
- insufficient conditions for the absorption of reaction forces,
- lack of reference points,
- unsuitable conditions resulting from the weather or indoor climate (see section 3.1.5),
- changes in the conditions on which the planning was based which have become known to the contractor.

3.1.5 In the event of unsuitable conditions resulting from the weather or the indoor climate, e.g. temperatures below 5 °C when bonding plastic pipes, special measures must be taken in consultation with the Client. If services are required for this purpose, these are special services (see section 4.2.38).

3.1.6 If the pipeline routing is left to the contractor, the contractor must draw up implementation plans for this purpose. These must be agreed with the client before execution so that the necessary foundation, slot, breakthrough and assembly plans can be drawn up. These services are special services (see section 4.2.1).

3.1.7 In the event of changes that could impair existing electrical protective measures on existing installations, e.g. the installation of insulating pieces, the Contractor shall inform the Client that an approved electrician must check whether the planned work will impair the protective measures.

3.1.8 The Contractor shall arrange for the approvals and **acceptances required for the execution.**

3.1.9 Chiseling, milling and drilling work on the building may only be carried out in agreement with the Client.

3.1.10 If reaction forces that occur must be diverted into the structure, the forces must be determined by the contractor and notified to the client before the performance is carried out.

3.2 Requirements

3.2.1 General

The Technical Rules listed in Section 2 shall apply to the execution, as well as

3.2.1.1 Drinking water installations

DIN 1988 (all parts)	Technical Rules for Drinking Water Installations (TRWI)
DIN EN 806 (all parts)	Technical rules for drinking water installations
DIN EN 1717	Protection of drinking water against contamination in drinking water installations and general requirements for safety devices for the prevention of drinking water contamination by backflow — Technical rule of the DVGW
DVGW W 551	Drinking water heating and drinking water piping systems — Technical measures to reduce legionella growth — Design, construction, operation and rehabilitation of drinking water installations2)

3.2.1.2 Drainage systems

DIN 1986 (alle Teile)	Drainage systems for buildings and land
DIN EN 1610	Laying and Testing of Sewer Pipes and Sewerways
DIN EN 12056 (all parts)	Gravity drainage systems within buildings

3.2.1.3 Facilities for supply and disposal

Technical connection conditions (TAB) of the local supply and disposal companies.

3.2.2 Insulation and fire protection Parts of the system that are to be sheathed/insulated must be installed in such a way that this service can be carried out properly.

3.2.3 Sound insulation If noise protection measures are to be carried out on the system, they must comply with the requirements of DIN 4109-1 "Sound insulation in building construction - Part 1: Minimum requirements".

3.2.4 Notification, Permission, Approval and Examination

The contractor shall make available to the Client the drawings and other documents and certificates required for the officially prescribed notifications or applications in accordance with the number prescribed for the notification, permit or approval obligation. This shall not apply if the test regulations for plant components permit permanent identification instead of a certificate.

3.3 Measuring, control and regulation equipment, building automation

3.3.1 Actuators of the control sections of functionally independent devices which are installed in installations which are not part of the contractual service shall be agreed by the Contractor with the person responsible for the installation in question

3.3.2 Transmitters must be installed at suitable locations in such a way that the measured value is correctly recorded.

3.3.3 Display devices must be easy to read, and devices to be operated must be easily accessible and operable.

3.3.4 The Contractor shall provide a specialist who is familiar with systems of this type during the testing and commissioning of the electrical cabling carried out by him and the control and regulation system he has constructed. If the electrical cabling or control technology is not part of the contractual services, the secondment of a skilled worker during the test or commissioning is a special service (see section 4.2.16).

3.4 Pressure test

3.4.1 The Contractor shall subject the system to a pressure test after installation and before closing the wall slits and wall and ceiling openings and, if necessary, before the application of the screed or any other covering.

3.4.2 The pressure test must be carried out in accordance with the applicable regulations, depending on the type of system and the materials of the pipelines and plant components to be tested.

3.4.3 Reports of the pressure tests shall be drawn up. From them must emerge

- Date of the exam,
- System data such as installation location, operating medium,
- Test pressure and test medium, □ Duration of exposure to the test pressure,
- Confirmation that the system is leak-proof and that no permanent deformation has occurred on any component.

3.5 Setting up the system

3.5.1 The Contractor shall adjust the plant components in such a way that the planned functions and services are performed and the statutory provisions are met.

The balancing of flow rates, e.g. hydraulic balancing in the case of drinking water circulation systems, shall be carried out with the calculated setting values in such a way as to ensure proper operation.

3.5.2 The operating and maintenance personnel for the plant must be instructed once by the contractor.

3.6 Acceptance

A completeness and function test must be carried out for acceptance, but a function measurement must only be carried out by special arrangement.

3.6.1 Completeness check

The completeness check consists of the following individual checks:

- Comparison of the delivery with the specifications both in terms of scope and materials and, if applicable, properties and spare parts,
- Testing for compliance with technical and official regulations,
- Checking that all the documents necessary for the operation of the plant are available.

3.6.2 Functional Testing

The functional test of the entire system must be carried out as part of commissioning. According to the requirements of the individual case, it includes:

- the safety and protective equipment,
- the hygiene requirements,
- the control and switching devices.

3.7 Documents to be supplied

The Contractor shall prepare the following documents and hand them over to the Client at the latest upon acceptance according to the following sorting: Electrical overview circuit diagrams and connection diagrams in accordance with DIN EN 61082-1 (VDE 0040-1) "Electrical Engineering Documents — Part 1: Rules",

- compilations of the most important technical data,
- Copies of the prescribed test and manufacturer certificates, proof of usability, specialist contractor declarations,
- all operating and maintenance instructions necessary for safe and economical operation,
- Protocols on pressure and leak testing of drinking water and gas pipelines,
- Protocol on the briefing of maintenance and operating personnel,
- Protocol on exhaust gas measurement.

The documents must be handed over to the Client in paper form, 3 copies, in German. Terms, abbreviations, abbreviations, etc. may be used in accordance with the normative regulations.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Examination of the Client's documents in accordance with Section 3.1.3.

4.1.2 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on is not higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.1.3 Compensation of stepped or inclined standing surfaces of scaffolding up to 40 cm in height, e.g. via stairs or ramps. 4.1.4 Type and performance plates.

4.1.5 Connections, wall and ceiling penetrations without special requirements, except for services according to section 4.2.9.

4.1.6 Attachment of brackets and brackets, except for services under section 4.2.11.

4.1.7 Protection of components and installations against contamination and damage during work on gas, water and drainage installations by loose covering, hanging or wrapping, except for the protective measures referred to in section 4.2.36.

4.1.8 Submission of prefabricated surface and color samples.

4.1.9 Completion of components in several operations to enable work by other contractors, provided that one's own services can be provided continuously in the course of similar work. If these conditions are not met, they are special benefits according to section 4.2.37.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 Planning services such as design, execution and approval planning as well as the planning of slots and openings.

4.2.2 Marking of openings if their execution is not included in the Contractor's scope of services.

4.2.3 Services for special measures for sound insulation and vibration damping of system components against the building structure.

4.2.4 Assembly, conversion and dismantling as well as provision of scaffolding for the services of other contractors.

4.2.5 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on is higher than 3.50 m above the standing area of the scaffolding required for this purpose

4.2.6 Assembly, conversion and dismantling as well as provision of scaffolding with a stepped or inclined footprint, e.g. via stairs or ramps, if compensation of more than 40 cm is required.

4.2.7 Provision of recreation and storage rooms if the Client does not provide rooms that can be easily locked.

4.2.8 Making Slots and Openings.

4.2.9 Connections, wall and ceiling penetrations with special requirements, e.g. airtightness, gas-tightness, watertightness.

4.2.10 Rosettes on wall and ceiling penetrations.

4.2.11 Special fastening structures, e.g. abutments, pipe line anchor points, pipe bearings with sliding or roller elements, support shells, supporting scaffolding.

4.2.12 Manufacture of foundations for pumps, tanks and other plant components.

4.2.13 Integration, connection and drilling to existing pipelines, shafts and plant components.

4.2.14 Adaptation of plant components to services performed by other contractors that are not carried out to measure.

4.2.15 Function, designation and information signs

4.2.16 Checking the electrical wiring of the measuring, control and regulation system as well as assigning a specialist during the commissioning of the measuring and control system, if the services have not been carried out by the Contractor.

4.2.17 Preparation of connections, fittings and drains in the joint cutting of tiles or other coverings.

4.2.18 Filling of the joints between sanitary fittings and adjacent components and sealing of penetrations, e.g. fitting connections, with elastic Stoffen.

4.2.19 Leistungen für provisorische Measures for the operation of the plant or parts of the plant before acceptance on the order of the client, e.g. partial commissioning of wastewater lifting System.

4.2.20 Condition check of existing gas, water and drainage pipes.

4.2.21 Pressure and leak tests of drainage pipes, including their documentation.

4.2.22 Flushing of drainage pipes or plant components, including documentation that is not part of the contractual service, including the provision of the necessary equipment and operating fluids.

4.2.23 Supply of the operating materials and media required for pressure testing, flushing of drinking water pipes, commissioning and trial operation.

4.2.24 Additional pressure tests as well as additional filling and emptying of the pipes for reasons for which the Contractor is not responsible.

4.2.25 Flushing of drinking water systems or parts thereof, including documentation.

4.2.26 Special tests, e.g. testing of soldered seams, welds, airtightness of the building envelope.

4.2.27 Disinfection of drinking water installations, including the necessary operating materials and cleaning agents, as well as their disposal. 4.2.28 Water analyses and expert opinions.

4.2.29 Expenses for prescribed plant-specific, technical acceptance tests

4.2.30 Repeated instruction of operators and maintenance personnel (see section 3.5.2).

4.2.31 Functional measurements in accordance with Section 3.6, including their documentation.

4.2.32 Provision of additional data beyond those provided in the guidelines of the VDI 38131 and VDI 38141 series.

4.2.33 Manufacture of sample equipment and constructions as well as models.

4.2.34 Preparation of as-built plans, functional and string diagrams.

4.2.35 Documentation of hydraulic balancing with the help of measuring instruments and comparison with the mathematically determined settings in accordance with Section 3.5.1.

4.2.36 Special protection of building and plant components as well as furnishings, e.g. masking of windows, doors, floors, coverings, stairs, wood, roof surfaces, surface-finished parts, dust-proof masking of sensitive equipment and technical equipment, dust protection walls, emergency roofs, laying of hardboard or building protection films from 0.2 mm thick.

4.2.37 Completion of components in several operations to enable work by other contractors to be carried out insofar as the company's own services cannot be performed continuously in the course of similar work (see section 4.1.9).

4.2.38 Measures to protect against unsuitable conditions resulting from weather or indoor climate in accordance with Section 3.1.5

4.2.39 Measures for fire, sound, heat, humidity and radiation protection, insofar as they go beyond the services provided in Section 3.

4.2.40 Cleaning the substrate of coarse soiling, e.g. plaster residues, mortar residues, paint residues, oil, insofar as this was not caused by the Contractor.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

5.1.1 The determination of the performance — regardless of whether it is carried out according to drawings or measurements — shall be based on:

- the dimensions of the manufactured plants or plant components. Parts lists may be consulted.

The simplifying rules, such as overmeasurement rules and individual regulations, are to be applied for the determination of performance.

5.2 Determination of dimensions/quantities

5.2.1 In the case of billing according to the length measure, pipelines are measured in the central axis. Pipe bends are measured up to the intersection of the central axes. Fittings, pipe bends and fittings are additionally calculated.

5.2.2 In the case of billing by mass, this is to be calculated according to the following principles:

5.2.2.1 It should be taken into account

- for steel sheets and strip steel 7.85 kg/m2 per 1 mm thick,
- in the case of standardised profiles, the dimensions according to the specifications in the DIN standards,
- for other profiles, the mass according to the information in the manufacturer's profile books.

5.2.2.2 The following are not taken into account in the calculation of the mass: fasteners, e.g. screws, rivets, weld metal.

5.2.2.3 In the case of galvanised components or galvanised structures, 5 % shall be added to the masses determined in accordance with the above principles on account of the increase in weight resulting from galvanisation.

5.3 Overmeasurement rules

The following are overmeasured:

When billed according to length

- Fittings
- Bends
- Fittings, fittings and connectors.

5.4 Individual provisions

No regulations.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Electrical, security and information technology systems DIN 18382

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 Type and location of the technical installations of the trades involved.

0.1.2 Type and location as well as conditions for the provision of telecommunications connections and equipment for the transmission of data.

0.1.3 Type, location, dimensions and design as well as dates for the erection and dismantling of scaffolding on site.

0.1.4 Type and extent of transport routes for all major plant components on the construction site and in the building, e.g. for control cabinets.

0.2 Information on the execution

0.2.1 On-site provision of scaffolding, lifting platforms and the like.

0.2.2 Type of construction of the building, e.g. type of wall blocks, wood, steel or reinforced concrete skeleton, exterior plaster, roof covering, as well as thickness of the walls and ceilings.

0.2.3 Number, type and scope of the planning documents provided by the Client, including a list of interfaces.

0.2.4 Requirements for the exchange of digitized data and documents.

0.2.5 Nature and scope of fire protection requirements, including negative requirements.

0.2.6 Type and scope of technical data of the networks and installations.

0.2.7 Connection points and connection conditions of networks and installations.

0.2.8 Business premises, rooms and facilities of a special type and use for which special provisions exist.

0.2.9 Location and design of switchgear and distribution systems.

0.2.10 Connection points and connected loads, conditions for electrical equipment.

0.2.11 Type and Scope of Surge Protections.

0.2.12 The number, type, location, dimensions and design of cables, cables, laying systems and components and the method of laying and installing them.

0.2.13 Number, type, location and design of vibration damping of components. 0.2.14 Type of mounting substrate.

0.2.15 Number, type and scope of assembly and work planning in accordance with guideline VDI 6026 Part 1 "Documentation in technical building equipment — Contents and quality of planning, execution and revision documents".

0.2.16 Indication of scales for detailed plans. 0.2.17 Number, type and dimensions of samples. Place of installation.

0.2.18 Test requirements, insofar as they deviate from DIN EN, VDE and IEC standards and regulations.

0.2.19 Number, type and scope of measurements required, e.g. illuminance, sound level, speech intelligibility.

0.2.20 Type and Scope of Admissions.

0.2.21 Number, type and scope of audit documents/documentation.

0.2.22 Requirements to be specified in a special maintenance contract regarding the type and scope of the maintenance to be offered by the Contractor during the duration of the limitation period for the claims for defects.

0.2.23 Indication of whether a maintenance contract should be offered beyond the expiry of the limitation period.

0.2.24 Specifications resulting from the expert reports.

0.3 Details in case of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 Deviating regulations may be considered in particular in section 3.2.3 if empty conduits are to be laid with tension wires

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units are to be provided as follows

0.5.1 Area (m2), separated by type and dimensions, for

- Photovoltaics and protective covers

0.5.2 Dimension of length (m), separated by type and dimensions, for

- Cross-section or diameter for cables, lines, pipes and laying systems,
- Laying method of design, for cables, pipes, pipes and laying systems.

0.5.3 Number (pcs), separated by type and dimensions, for

- Electrical equipment and components, e.g. luminaires, installation equipment, distributors, cover gratings, consoles, substructures, fire barriers, photovoltaics,
- Data points, functions and software,
- Measuring
- Audit documents,
- Training and instruction.

0.5.4 Mass (kg, t), separated by type and dimensions for

- Vergussmasse,
- Substructures
- Fire barriers

0.5.5 Combined billing (md, mWo, mMt, Std (pieces × days), StWo, StMt) for

- Provision, maintenance, operation, e.g. construction power supply, temporary measures and
- Protective cover.

0.5.6 Volume (l) broken down by substance, for

- Fuel
- Operating fluids, e.g. coolants, lubricants.

1 Scope of application

1.1 ATV DIN 18382 "Electrical, security and information technology systems" applies to the design of medium and low voltage systems up to 20 kV, lighting systems, communication systems, hazard alarm systems, transmission networks in buildings and associated non-independent outdoor facilities.

1.2 ATV DIN 18382 "Electrical, safety and information technology systems" does not apply to

- Devices and factory-ready equipment combinations,
- Earthing and lightning protection systems (see ATV DIN 18384 "Lightning protection, surge protection and earthing systems"),
- Building automation (see ATV DIN 18386 "Building automation"),
- Fire protection work including fire sealing (see ATV DIN 18421 "Insulation and fire protection work on technical systems").
- for independent electrical cable and wire systems in outdoor areas (see ATV DIN 18322 "Cable line civil engineering work").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18382 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

For the most common substances and components, the DIN standards and other requirements are listed below.

DIN EN 50178 (VDE 0160)	Equipment of high-voltage systems with electronic equipment
DIN EN 50334 (VDE 0293-334)	Marking of the wires of cables and wires by printing
DIN EN 50849 (VDE 0828-1)	Electrocoastal Notfallwarnsysteme
DIN EN 60079 (VDE 0170) (all parts)	Hazardous Areas
DIN EN 60445 (VDE 0197)	Basic and safety rules for the human-machine interface — Marking of connections of electrical equipment, connected conductor ends and conductors
DIN VDE 0293-1 (VDE 0293-1)	Marking of the cores of power cables and insulated power lines with nominal voltages up to 1 000 V — Part 1: Supplementary national specifications
DIN VDE 0293-308 (VDE 0293-308)	Marking of the wires of cables/wires and flexible wires by colours

2.1 Substances and components for which there are European and international standards must comply with the quality and dimensional specifications.

2.2 Substances and components that require authorisation under European regulatory requirements must be authorised and comply with the provisions of their authorisation.

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 In particular, the DIN standards listed below and other requirements apply to the execution:

DIN 5035 (all parts)	Lighting with artificial light
DIN 14675 (all parts)	Fire alarm systems
DIN 14676 (all parts)	Smoke detectors for residential buildings, apartments and rooms with apartment-like use
DIN 18014	Foundation earthing rods — Planning, execution and documentation
DIN 18015 (all parts)	Electrical installations in residential buildings
DIN EN 1838	Applied lighting technology — Emergency lighting
DIN EN 12464 (all parts)	Lighting and lighting — Lighting of workplaces
DIN EN 50110 (VDE 0105) (all parts)	Operation of electrical installations
DIN EN 50130 (VDE 0830) (all parts)	Alarm Mounts
DIN EN 50172 (VDE 0108-100)	Safety Lighting Systems
DIN EN 50173 (VDE 0800-173) (all parts)	Information technology — Application-neutral communication cable systems
DIN EN 50174 (VDE 0800-174) (all parts)	Information technology — Installation of communication cabling
DIN EN 50178 (VDE 0160)	Equipment of high-voltage systems with electronic equipment
DIN EN 50310 (VDE 0800-2-310)	Telecommunications Potential Compensation Systems for Buildings and Other Structures
DIN EN 50346	Information technology — Installation of communication cabling — Testing of installed cabling
DIN EN 50522 (VDE 0101-2)	Grounding of high-voltage systems with nominal alternating voltages above 1 kV
DIN EN 50565 (VDE 0298-565) (all parts)	cables and wires — Guide for the use of cables and insulated wires with a nominal voltage not exceeding 450/750 V (U0/U)

DIN EN 50600 (VDE 0801-600) (all parts)	Information technology — Equipment and infrastructures of data centres
DIN EN 50700 (VDE 0800-700)	Information technology — Site cabling as part of the optical access network of optical broadband networks
DIN EN 50849 (VDE 0828-1)	Electrocoastal Notfallwarnsysteme
DIN EN 60079 (VDE 0170) (all parts)	Hazardous Areas
DIN EN 60728 (VDE 0855) (all parts)	Cable networks for television signals, sound signals and interactive services
DIN EN 60865-1 (VDE 0103) (all parts)	Short-circuit currents — Calculation of the effect — Part 1: Definitions and calculation methods
DIN EN 60909 (VDE 0102) (all parts)	Short-circuit currents in three-phase networks
DIN EN 61082-1 (VDE 0040-1)	Electrical Engineering Documents — Part 1: Rules
DIN EN 61355-1 (VDE 0040-3)	Classification and marking of documents for installations, systems and equipment — Part 1: Rules and tables for classification
DIN EN 61660 (VDE 0102) (all parts)	Short-circuit currents — Short-circuit currents in DC self-consumption systems in power plants and switchgear
DIN EN 61918 (VDE 0800-500)	Industrial communication networks — Installation of communication networks in industrial plants
DIN EN 61936-1 (VDE 0101-1)	High-voltage installations with nominal alternating voltages above 1 kV — Part 1: General provisions
DIN EN 62023 (VDE 0040-6)	Structuring of technical information and documentation
DIN EN 62744 (VDE 0040-9)	Representation of object states by means of graphic symbols
DIN EN 82079-1 (VDE 0039-1)	Preparation of instructions for use — Structure, content and presentation — Part 1: General principles and detailed requirements
DIN ISO/IEC 14763-3 (VDE 0800-763-3)	Information technology — Installation and operation of site cabling — Part 3: Measurement of fibre optic cabling
DIN VDE 0100 (VDE 100) (all parts)	Erection of low-voltage installations
DIN VDE 0105 (VDE 0105) (all parts)	Operation of electrical systems
DIN VDE 0184 (VDE 0184)	Overvoltages and protection in case of overvoltages in low-voltage high-voltage installations with alternating voltages — General basic information

DIN VDE 0701-0702 (VDE 0701-0702)	Testing after repair, modification of electrical equipment — Repeat testing of electrical equipment — General requirements for electrical safety
DIN VDE 0800-3 (VDE 0800-3)	Information technology — Part 3: Safety of installations with remote power supply
DIN VDE 0833 (VDE 0833) (all parts)	Hazard alarm systems for fire, burglary and robbery
DIN VDE 0834 (VDE 0834) (all parts)	Call systems in hospitals, nursing homes and similar facilities
DIN V VDE V 0166 (VDE V 0166)	Installation of electrical installations in areas endangered by substances with explosive properties
DIN V VDE V 0800-2 (VDE V 0800-2)	Information technology — Part 2: Equipotential bonding and earthing (additional specifications)
DIN VDE V 0826 (VDE V 0826) (all parts)	Monitoring systems
DIN VDE V 0827 (VDE V 0827) (all parts)	Emergency and Hazard Systems

3.1.2 The documents necessary for the execution and to be handed over by the Client (see § 3 para. 1 VOB/B) include, if applicable, in particular:

- System/function description,
- Execution plans (arrangement plans) with registered electrical, safety and information technology components
- Fire protection certificate, fire protection concept if applicable,
- technical connection conditions for networks and installations, e.g. supply network operators, licensed reception centres, fire brigade, police,
- Cable and power consumption lists with all electrical parameters of the electrical components provided by the customer,
- Interface lists
- ‚Single-pole circuit diagram with load list according to DIN EN 61439-1 (VDE 0660-600-1) "Low-voltage switchgear and switchgear assemblies — Part 1: General specifications",
- Short-circuit and selectivity calculation,
- Fault reporting and fault reporting forwarding concepts,
- Overview circuit diagrams, separate for electrical, safety and information technology systems
- Specifications for the designation/addressing concept,
- Expert reports,
- As-built measurement protocols of the initial acceptance/repeat inspection.

3.1.3 When reviewing the planning documents and calculations supplied by the Client (see Section 3 (3) VOB/B), the Contractor shall pay particular attention to the completeness of the documents, inter alia with regard to the nature and function of the plant.

3.1.4 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- Inconsistencies in the planning documents and calculations provided by the client (see § 3 Section 3 VOB/B)
- Poor execution or late completion or lack of on-site services, e.g. recesses,
- Insufficient space for the electrical components.

3.1.5 The Contractor shall prepare the planning documents and calculations of the Client on the basis of the components offered and shall provide them to the Client as Montage- und Work plans in accordance with DIN EN 61082 (VDE 0040-1) and the guideline VDI 6026 Part 1 are to be submitted for approval before execution. These include, where applicable, in particular:

- Execution plans (arrangement plans) with registered electrical, safety and information technology components,
- Circuit diagrams three-pole,
- Structural drawings of the switchgear assemblies,
- Data point/function lists,
- Connection tables, e.g. terminal diagrams, implementation of the interface list,
- Overview circuit diagrams, separate for electrical, safety and information technology systems.

3.2 Construction of electrical installations

3.2.1 The necessary length allowances for proper cable and line connections must be provided.

3.2.2 The components must be designed to be corrosion-protected and protected from moisture.

3.2.3 Empty conduits must be laid without tension wires.

3.2.4 Chiseling, milling and drilling work on the structure may only be carried out in agreement with the Client. Such masonry work must comply with DIN EN 1996-1-1 'Eurocode 6: Design and construction of masonry structures — Part 1-1: General rules for reinforced and unreinforced masonry' and DIN EN 1996-1-1/NA 'National Annex — Nationally determined parameters — Eurocode 6: Design and construction of masonry structures — Part 1-1: General rules for reinforced and unreinforced masonry'.

3.3 Commissioning, instruction

3.3.1 Prior to commissioning, the Contractor shall ensure that the installations or parts of installations erected by the Contractor provide the required functions and services and comply with the statutory provisions.

3.3.2 The Contractor shall carry out an operability test and an inspection in accordance with the applicable standards and regulations on the systems it has erected before commissioning.

3.3.3 The commissioning and, if necessary, the adjustment of the system erected by the Contractor must be carried out.

3.3.4 The operator (plant manager) appointed by the Client must be instructed by the Contractor once in the operation and function of the systems constructed. The instruction must be documented.

3.4 Documentation, acceptance

3.4.1 For the safe and efficient operation of the system and installed components, the Contractor shall hand over the necessary operating and maintenance instructions, necessary documentation as well as care and cleaning instructions. 3.4.2 Der Auftragnehmer hat im within the scope of its scope of services and to hand them over to the Client in an orderly and updated form at the latest with the request for acceptance. These include, in particular:

- Execution plans (arrangement plans) with registered electrical, safety and information technology components,
- Overview circuit diagrams, separate for each electrical, safety and information technology system
- Circuit diagrams three-pole,
- Structural drawings of the switchgear assemblies,
- Descriptions of systems/functions,
- Connection tables, e.g. terminal diagrams, implementation of the interface list,
- Data point/function lists, e.g. fault reporting and fault reporting scheme,
- Software documentation, e.g. on bus systems, PLCs,
- Protocols of installation tests according to DIN VDE 0100-600 (VDE 0100-600) "Erection of low-voltage installations — Part 6: Tests",
- Commissioning and adjustments,
- Measurement protocols of the electrical, safety and information technology system,
- Spare parts/parts lists,
- Operating instructions, maintenance instructions, operating diaries and test books for the operation of the system
- Protocols on the instructions of the operator of the plants,
- Prescribed work and test certificates,
- Installer's declaration,
- building inspection certificates,
- Declarations of conformity for individual components.

The documents are to be handed over to the Client in paper form, in triplicate, in German, structured for each attachment. Terms, abbreviations, abbreviations, etc. may be used in accordance with the normative regulations.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the installation site is not higher than 3.50 m above the standing surface of the scaffolding required for this purpose.

4.1.2 Compensation of stepped or inclined standing surfaces of scaffolding up to 40 cm difference in height, e.g. via stairs or ramps.

4.1.3 Completion of components in several operations to enable work by other contractors, provided that the company's own services can be provided continuously in the course of

similar assembly work. If these conditions are not met, they are special services according to section 4.2.4.

4.1.4 Protection of components and plant components against contamination and damage during electrical work by loose covering, hanging or wrapping, except for protective measures referred to in section 4.2.5

4.1.5 Submission of a maximum of 3 samples per design-relevant component, e.g. installation equipment, luminaires.

4.1.6 Drilling, chiseling and milling work for the insertion of dowels and for the installation of installations, e.g. flush-mounted, switch and junction boxes.

4.1.7 Plastic dowels, fastening clamps.

4.1.8 Permanent type and designation plates, regulated by law or standard, legibility according to DIN 1450 "Writings — Legibility", e.g. fire detector designation, cable designation, circuit marking.

4.1.9 Trial operation of plants and plant components on site.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 Assembly, conversion and dismantling as well as provision of scaffolding for the services of other contractors.

4.2.2 Erection, conversion and dismantling as well as provision of scaffolding for own services, provided that the assembly site is higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.2.3 Erecting, converting, dismantling and maintaining scaffolding with a stepped or inclined footprint, e.g. via stairs or ramps, if compensation of more than 40 cm is required.

4.2.4 Completion of components in several operations to enable work by other contractors to be carried out insofar as the company's own services cannot be provided continuously in the course of similar assembly work (see section 4.1.3)

4.2.5 Special protection of building and plant components as well as furnishings, e.g. masking of windows, doors, floors, coverings, stairs, wood, roof surfaces, finished surfaces, dust-proof masking of sensitive equipment and technical equipment, dust protection walls, emergency roofs, laying of hardboard or building protection films from 0.2 mm thick

4.2.6 Making, affixing or incorporating samples.

4.2.7 Provision of recreation and storage rooms if the Client does not provide rooms that can be easily locked.

4.2.8 Planning services, such as design, execution or approval planning, conduit and recess planning.

4.2.12 Befestigungen für erhöhte Anforderungen, z. B. für Brandschutz

4.2.13 Marking of recesses if their execution is not included in the Contractor's scope of services.

4.2.14 Making and closing recesses, e.g. slots, feedthroughs.

4.2.15 Permanent type and designation plates beyond the legal and normative requirements, e.g. derivative designation, distribution designation.

4.2.16 Services for provisional measures for the premature operation of the plant or plant components before acceptance according to the Client's order, including the necessary maintenance services.

4.2.17 Operation of the plant or parts of the plant before acceptance according to the instructions of the Client, including the necessary maintenance services.

4.2.18 Services beyond section 4.1.9, e.g. factory acceptance.

4.2.19 Supply of the fuels necessary for commissioning, adjustment and trial operation.

4.2.20 Documents and examinations whose scope exceeds the scope required in Section 3.4.2.

4.2.21 Cross-system operating instructions.

4.2.22 Illuminance measurement with documentation by entry in the execution plan (layout plan

4.2.23 Instruction and training beyond section 3.3.4

4.2.24 Project-specific programs and data on data carriers with appropriate access authorization, source code and licenses.

4.2.25 Preparation of a maintenance plan with indication of the required repeat inspections/maintenance intervals.

4.2.9 Preparation of as-built plans/documents of existing plants and plant components.

4.2.10 Erection of special fastening structures, e.g. brackets, supporting scaffolding.

4.2.11 Services beyond section 4.1.7, e.g. metal anchors, heavy-duty anchors.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

The determination of the performance — regardless of whether it is carried out according to drawings or measurements — shall be based on the dimensions of the plant components of the manufactured plants.

If the performance is determined from drawings, execution plans (layout plans), parts and occupancy lists, updated function lists and system logs may be consulted.

The simplifying rules, such as deduction and overmeasurement rules, are to be used to determine performance.

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

The determination of the performance — regardless of whether it is carried out according to drawings or measurements — shall be based on the dimensions of the plant components of the manufactured plants.

If the performance is determined from drawings, execution plans (layout plans), parts and occupancy lists, updated function lists and system logs may be consulted.

The simplifying rules, such as deduction and overmeasurement rules, are to be used to determine performance.

If the performance is determined from drawings, execution plans (layout plans), parts and occupancy lists, updated function lists and system logs may be consulted.

The simplifying rules, such as deduction and overmeasurement rules, are to be used to determine performance.

5.2 Determination of dimensions/quantities

5.2.1 Cables, wires, pipes and laying systems shall be measured on a room- and section-by-room basis according to the length actually laid in the central axis, including the required length allowances. Waste is not taken into account.

5.2.2 Cables and wires shall be measured using the equipment label, e.g. circuit, data link, loop, line.

5.2.3 Components, data points, functions and software are calculated per piece.

5.3 Overmeasurement rules

Electrical components and electrical equipment, e.g. installation equipment, are measured. These are also calculated separately.

5.4 Individual provisions

No regulations

Annex A

Definitions

- **Non-independent outdoor facilities** are electrical systems that are supplied, controlled or switched directly from the building, e.g. path lighting, communication equipment.
- **Independent outdoor facilities** are electrical systems that are independently supplied, controlled or switched, e.g. street lighting.
- **As-built plans/documents** reflect the status before the start of the work.
- **Execution plan (layout plan)** contains drawings in which the relative or absolute positions of components in the floor plan and/or as a wall view and their designation are shown. These include, for example, routes, openings, installation equipment, luminaires.
- **Audit documents** reflect the status after completion of the work.
- **Devices and factory-ready device combinations** (within the meaning of this standard) are components/plant components that are supplied by the manufacturer ready for connection and for which manufacturer's certificates or declarations of conformity are available.

VOB Part C:

General Technical Terms and Conditions of Contract for Construction Services (ATV) Lightning Protection,

Surge protection and earthing systems DIN 18384

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 Type and location of the technical installations of the trades involved.

0.1.2 Type and location as well as conditions for the provision of telecommunications connections and equipment for the transmission of data.

0.1.3 Type, location, dimensions and design as well as dates for the erection and dismantling of scaffolding on site.

0.2 Information on the execution

0.2.1 On-site provision of scaffolding, lifting platforms and the like.

0.2.2 Type of construction of the building, e.g. type of wall blocks, wood, steel or reinforced concrete skeleton, exterior plaster, roof covering, as well as thickness of the external walls and ceilings.

0.2.3 Number, type and scope of the planning documents provided by the Client, including a list of interfaces.

0.2.4 Requirements for the exchange of digitized data and documents.

0.2.5 Nature and scope of fire protection requirements, including negative requirements.

0.2.6 Type and scope of technical data of the networks and installations.

0.2.7 Type, location and extent of the connection points and connection conditions of the networks and installations.

0.2.8 Type, scope, location and dimensions of pipes and components as well as the way they are laid and installed.

0.2.9 Design of connections to structures.

0.2.10 Type, extent and location of larger metal parts on and in the building, e.g. covers, skylights, vents, gutters and downpipes, bulkhead plates, roof stands, heating, gas and water pipes and electrical cables in the attic or directly under the roof with distance from the ridge, electrically conductive roof structures, elevator systems, antenna systems.

0.2.11 Type and circumference of the metal water and gas pipes in the ground, including the depth and course of the installation, indicating the type of connection of the individual pipe lengths, e.g. welding and socket.

0.2.12 Type, extent and location of existing high-voltage installations under, on or above the building.

0.2.13 Type, extent and location of existing lightning protection, surge and earthing systems, including the material used.

0.2.14 Type and scope of earthing options, e.g. foundation earthing, surface earthing, deep earthing, plate earthing, specifying the ground conditions.

0.2.15 Number, type and scope of assembly and work planning in accordance with guideline VDI 6026 Part 1 "Documentation in technical building equipment — Contents and quality of planning, execution and revision documents".

0.2.16 Specification of scales for detailed plans.

0.2.17 Test requirements, insofar as they deviate from DIN-EN, DIN-VDE and DIN-IEC standards and regulations.

0.2.18 Number, type and scope of the required measurements.

0.2.19 Type and Scope of Admissions.

0.2.20 Number, type and scope of audit documents/documentation.

0.2.21 Requirements to be specified in a special maintenance contract regarding the type and scope of the maintenance to be offered by the Contractor during the period of limitation for the claims for defects.

0.2.22 Indication of whether a maintenance contract should be offered beyond the expiry of the limitation period.

0.2.23 Specifications resulting from the expert reports.

0.3 Details of deviations from the ATVs

0.3.1 If regulations other than those provided for in this GTC are to be made, these must be clearly and individually stated in the service description.

0.3.2 No deviating regulations.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units are to be provided as follows:

0.5.1 Area (m2), separated by material, type and dimensions, for

- Plate earthing and
- Protective cover.

0.5.2 Length (m), separated by material, type and dimensions, for

- cross-section or diameter for round wires, strips, ropes, conductors, cables and wires,
- Laying method of execution.

0.5.3 Number (pcs), separated by material, type and dimensions, for

- Components, e.g. safety rods, connectors, terminals, connectors, arresters, ground entry, surge protection devices,
- Data points, features and software,
- Measuring
- audit documents,
- Schulungen und Einweisungen.

0.5.4 Mass (kg, t), separated by type and dimensions for

- Vergussmasse,
- Substructures
- Fire partitions.

0.5.5 Combined billing (md, mWo, mMt, Std (piece × days), StWo, StMt) for

- Provision, maintenance, operation, e.g. temporary measures and protective covers.

1 Scope of application

1.1 ATV DIN 18384 "Lightning protection, surge protection and earthing systems" applies to the design of lightning protection, surge protection and earthing systems in and outside buildings and associated non-independent outdoor facilities.

1.2 ATV DIN 18384 "Lightning protection, surge protection and earthing systems" does not apply to:

- Electrical cable and wire systems for independent outdoor facilities (see ATV DIN 18322 "Cable line civil engineering work"),

- Electrical cable and wire systems (see ATV DIN 18382 "Electrical, security and information technology systems"),
- Fire protection work, e.g. partitioning (see ATV DIN 18421 "Insulation and fire protection work on technical installations").

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18384 take precedence.

2 Materials, Components

In addition to ATV DIN 18299, Section 2, the following applies:

For the most common materials and components, the DIN standards and other requirements are listed below.

DIN 18014	Foundation earthing rods — planning, execution and documentation
DIN VDE 0100-540 (VDE 0100-540)	Installation of low-voltage installations — Part 5-54: Selection and installation of electrical equipment — Earthing systems and protective conductors
DIN VDE 0151 (VDE 0151)	Materials and minimum dimensions of earthing with regard to corrosion
DIN VDE 0618-1 (VDE 0618-1)	Equipment for equipotential bonding — Equipotential bonding rail (PAS) for the main equipotential bonding
DIN EN 60099 (VDE 0675) (all parts)	Surge arrester
DIN EN 60143 (VDE 0560-4x) (all parts)	Series capacitors for high-voltage systems DIN EN 60255-127 (VDE 0435-3127) Measuring relays and protective devices — Part 127: Functional standard for over/under voltage protection
DIN EN 60947-1 (VDE 0660-100)	Low-voltage switchgear and controlgear — Part 1: General requirements
DIN EN 61643-11 (VDE 0675-6-11)	Low-voltage surge protection devices — Part 11: Surge protection devices for use in low-voltage installations — Requirements and tests
DIN EN 61643-21 (VDE 0845-3-1)	Low voltage surge protection devices — Part 21: Surge protection devices for use in telecommunications and signal processing networks — Performance requirements and test methods

DIN EN 61643-311 (VDE 0845-5-11)	Components for Low Voltage Surge Protection Devices — Part 311: Performance Requirements and Test Circuits and Methods for Gas Discharge Arresters
DIN EN 62305-1 (VDE 0185-305-1)	Lightning protection — Part 1: General principles
DIN EN 62561 (VDE 0185-561) (all parts)	Lightning Protection System Components (LPSC)

2.1 Substances and components for which there are European and international standards must comply with the quality and dimensional specifications.

2.2 Substances and components that require approval according to European official regulations must be approved and comply with the provisions of their approval.

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 In particular, the DIN standards listed below and other requirements apply to the execution:

DIN 18014	Foundation earthing rods — Planning, execution and documentation
DIN 18015 (all parts)	Electrical installations in residential buildings
DIN VDE 0100-410 (VDE 0100-410)	Erection of low-voltage installations — Part 4-41: Protective measures — Protection against electric shock
DIN VDE 0100-443 (VDE 0100-443)	Erection of low-voltage installations — Part 4-44: Protective measures — Protection against interference voltages and electromagnetic disturbances — Section 443: Protection against transient overvoltages due to atmospheric influences or switching operations
DIN VDE 0100-534 (VDE 0100-534)	Erection of low-voltage installations — Part 5-53: Selection and installation of electrical equipment — Disconnection, switching and control — Section 534: Surge protection devices (SPDs)
DIN VDE 0100-540 (VDE 0100-540)	Erection of low-voltage installations — Part 5-54: Selection and installation of electrical equipment — Earthing systems and protective conductors

DIN VDE 0100-560 (VDE 0100-560)	Erection of low-voltage installations — Part 5-56: Selection and installation of electrical equipment — Equipment for safety purposes
DIN VDE 0100-712 (VDE 0100-712)	Construction of low-voltage installations — Part 7-712: Requirements for business premises, rooms and installations of a special kind — Photovoltaic (PV) power supply systems
DIN VDE 0100-717 (VDE 0100-717)	Erection of low-voltage installations — Part 7-717: Requirements for business premises, rooms and installations of a special kind — Portable or transportable units
DIN VDE 0184 (VDE 0184)	Overvoltages and protection against overvoltages in low-voltage high-voltage installations with alternating voltages — General basic information

- DIN V VDE V 0140-479-4 Execution plans (arrangement plans) with registered components for lightning protection, surge protection and earthing systems,
- Fire protection certificate, fire protection concept if applicable,
- technical connection conditions for networks and installations,
- Results of risk management, designation of the protection class, calculation of the separation distance and safety rods,
- Execution plans (arrangement plans) with registered components for lightning protection, surge protection and earthing systems,
- Fire protection certificate, fire protection concept if applicable,
- technical connection conditions for networks and installations,
- Results of risk management, designation of the protection class, calculation of the separation distance and safety rods,
- Cable and line lists with building entrances/exits,
- Interface lists,
- Single-pole circuit diagrams with power specifications,
- Overview circuit diagrams, separate for electrical, safety and information technology systems,
- Specifications for the designation/addressing concept,
- Expert reports,
- Current as-built measurement protocols of the initial acceptance/repeat inspection.

3.1.3 When reviewing the planning documents and calculations supplied by the Client (see Section 3 (3) VOB/B), the Contractor shall pay particular attention to the completeness of the documents, inter alia with regard to the nature and function of the system.

3.1.4 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- Inconsistencies in the planning documents and calculations provided by the client, e.g. separation distances (see § 3 para. 3 VOB/B),

- Poor execution or late completion or lack of on-site services, e.g. facades, roofing, civil engineering work,
- insufficient space for the components.

3.1.5 The Contractor shall prepare the Client's planning documents and calculations on the basis of the components offered and hand them over to the Client for approval as assembly and work plans in accordance with DIN EN 61082 (VDE 0040-1) "Electrical Engineering Documents — Part 1: Rules" and the VDI 6026 Part 1 guideline before execution. These include, where applicable, in particular:

- Execution plans (arrangement plans) with registered components for lightning protection, surge protection and earthing systems,
- Circuit diagrams three-pole,
- Structural drawings of the switchgear assemblies,
- Data point/function lists,
- Connection tables, e.g. implementation of the interface list,
- Overview circuit diagrams, separate for electrical, safety and information technology systems.

3.2 Construction of lightning protection, surge protection and earthing systems

3.2.1 The necessary length allowances for the proper connections and connections of e.g. round wires, strips, ropes, conductors, cables and wires must be provided.

3.2.2 The components must be designed to be corrosion-protected.

3.2.3 Chiseling, milling and drilling work on the structure may only be carried out in agreement with the Client. For such work on masonry, DIN EN 1996-1-1 'Eurocode 6: Design and construction of masonry structures — Part 1-1: General rules for reinforced and unreinforced masonry' and DIN EN 1996-1-1/NA 'National Annex — Nationally determined parameters — Eurocode 6: Design and construction of masonry structures — Part 1-1: General rules for reinforced and unreinforced masonry'.

3.3 Commissioning, instruction

3.3.1 Prior to commissioning, the Contractor shall ensure that the installations or parts of installations erected by the Contractor provide the required functions and services and comply with the statutory provisions. To this end, operability tests and tests in accordance with the applicable standards and regulations must be carried out and documented before commissioning.

3.3.2 The commissioning and, if necessary, the measurement of the system erected by the Contractor must be carried out and documented.

3.3.3 The operator (plant manager) appointed by the Client must be instructed by the Contractor once in the operation and function of the systems constructed. The instruction must be documented.

3.4 Documentation, acceptance

3.4.1 For the safe and efficient operation of the system and installed components, the Contractor shall hand over the necessary operating and maintenance instructions, necessary documentation as well as care and cleaning instructions.

3.4.2 The Contractor shall prepare the necessary documents within the scope of its scope of services and hand them over to the Client in an orderly and updated form at the latest with the request for acceptance. These include, in particular:

- Execution plans (arrangement plans) with registered components for lightning protection, surge protection and earthing systems,
- Overview circuit diagrams, separately for each electrical, safety and information technology system,
- Circuit diagrams three-pole,
- Structural drawings of the switchgear assemblies,
- Photo documentation with clearly assignable detailed shots of connection points, e.g. to main earthing rails, connection parts of the lightning protection system,
- Descriptions of systems/functions,
- Connection tables, e.g. implementation of the interface list,
- Data point/function lists, e.g. fault reporting and fault reporting forwarding scheme,
- Protocols of the earthing system according to DIN 18014 "Foundation earthing - Planning, execution and documentation",
- Protocols of lightning protection work according to DIN EN 62305-3 Supplement 3 (VDE 0185-305-3 Supplement 3), "Lightning protection — Part 3: Protection of structural installations and persons — Supplement 3: Additional information for the inspection and maintenance of lightning protection systems",
- Commissioning and measurements,
- Spare parts/parts lists,
- Operating instructions, maintenance instructions, operating diaries and test books for the operation of the system,
- Protocols on the instructions of the operator of the facility,
- prescribed work and test certificates,
- Installer's declaration,
- general building authority approvals or general construction technique approvals,
- Declarations of conformity for individual components.

The documents are to be handed over to the Client in paper form, in triplicate, in German, structured for each attachment. Terms, abbreviations, abbreviations, etc. may be used in accordance with the normative regulations.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the installation site is not higher than 3.50 m above the standing surface of the scaffolding required for this purpose.

4.1.2 Compensation of stepped or inclined standing surfaces of scaffolding up to 40 cm difference in height, e.g. via stairs or ramps.

4.1.3 Completion of components in several work steps to enable work by other contractors, insofar as the company's own services can be provided continuously in the course of similar assembly work. If these conditions are not met, they are special services according to section 4.2.4.

4.1.4 Protection of components and equipment from contamination and damage during work by loose covering, hanging or wrapping, except for protective measures in accordance with section 4.2.5.

4.1.5 Drilling work for the insertion of dowels.

4.1.6 Plastic dowels, fastening clamps.

4.1.7 Permanent type and designation plates, regulated by law or standard, legibility according to DIN 1450 "Fonts — Legibility", e.g. cable designation, circuit marking, except for services according to section 4.2.14.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 Assembly, conversion and dismantling as well as provision of scaffolding for the services of other contractors.

4.2.2 Erection, conversion and dismantling as well as provision of scaffolding for own services, provided that the assembly site is higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.2.3 **Erecting, converting, dismantling and maintaining scaffolding with a stepped or inclined** footprint, e.g. via stairs or ramps, if compensation of more than 40 cm is required.

4.2.4 Completion of components in several work steps to enable work by other contractors, insofar as the company's own services cannot be provided continuously in the course of similar assembly work (see section 4.1.3).

4.2.5 Special protection of building and plant components as well as furnishings, e.g. masking of windows, doors, floors, coverings, stairs, wood, roof surfaces, surface-finished parts, dust-proof masking of sensitive equipment and technical equipment, dust protection walls, emergency roofs, laying of hardboard or building protection films from 0.2 mm thick.

4.2.6 Provision of recreation and storage rooms if the Client does not provide rooms that can be easily locked.

4.2.7 Planning services, such as design, execution or approval planning, conduit and recess planning.

4.2.8 Preparation of as-built plans/documents of existing plants and plant components.

4.2.9 Erection of special fastening structures, e.g. brackets, supporting scaffolding.

4.2.10 Services beyond section 4.1.6, e.g. metal anchors, heavy-duty anchors.

4.2.11 Fasteners for increased requirements, e.g. for external thermal insulation composite systems.

4.2.12 Marking of recesses if their execution is not included in the Contractor's scope of services.

4.2.13 Making and closing recesses, e.g. slots, feedthroughs.

4.2.14 Permanent type and designation plates beyond the legal and normative requirements, e.g. derivative designation, distribution designation.

4.2.15 Services for provisional measures for the premature operation of the plant or parts of the plant prior to acceptance as ordered by the Client, including the necessary maintenance services.

4.2.16 Operation of the plant or parts of the plant before acceptance according to the instructions of the Client, including the necessary maintenance services.

4.2.17 Instruction beyond Section 3.3.3.

4.2.18 Documents and examinations whose scope exceeds the scope required in Section 3.4.2.

4.2.19 Operating instructions prepared across systems.

4.2.20 Project-specific programs and data on data carriers with appropriate access authorization, source code and licenses.

4.2.21 Preparation of a maintenance plan with indication of the required repeat inspections/maintenance intervals.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

The determination of the performance — regardless of whether it is carried out according to drawings or measurements — shall be based on the dimensions of the plant components of the manufactured plants. If the performance is determined from drawings, execution plans (layout plans), parts and occupancy lists, updated function lists and system logs may be consulted. The simplifying rules, such as deduction and overmeasurement rules, are to be used to determine performance.

5.2 Determination of dimensions/quantities

5.2.1 Round wires, strips, ropes, conductors, cables and wires shall be measured according to the length actually laid in the central axis, including the required length allowances, using the equipment marking, e.g. measuring point, circuit. Waste is not taken into account.

5.2.2 Data points, functions and software are calculated per piece.

5.3 Overmeasurement rules

Electrical components and electrical equipment, e.g. installation equipment, are measured. These are also calculated separately.

5.4 Individual provisions

No regulations.

Appendix A

Definitions

- **Non-independent outdoor facilities** are electrical systems that are supplied, controlled or switched directly from the building, e.g. path lighting, communication equipment.
- **Independent outdoor facilities** are electrical systems that are independently supplied, controlled or switched, e.g. street lighting.
- **As-built plans/documents** reflect the status before the start of the work.
- **Execution plan (layout plan)** contains drawings in which the relative or absolute positions of components in the floor plan and/or as a wall view and their designation are shown. These include, for example, safety gears, conductors, disconnection points, connectors, terminals, connectors, ring earths, components of surge protection devices.
- **Audit documents** reflect the status after completion of the work

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Elevator systems, escalators and moving walks as well as conveyor systems DIN 18385

Issue September 2016

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 et seq. EU or §§ 7 et seq. VS VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 Building use, e.g. residential building, hotel, department store, shopping centre, administrative building, hospital, industrial and warehouse building.

0.1.2 Location, type, design and dimensions of the structural system, e.g. shaft size, dimensions of the underpass (shaft pit) and the crossing (shaft head) as well as the engine room, support distance of escalators and moving walks, conveying height, conveying length.

0.1.3 Load-bearing capacity of ceilings and floors, access routes, transport routes for all major plant components.

0.1.4 On-site sound, heat and fire protection measures.

0.2 Information on the execution

0.2.1 Type, design, arrangement and dimensions of the elevator systems, escalators and moving walks as well as conveyor systems, e.g. elevator groups, car dimensions, loading or

multi-sided loading, type and dimensions of the doors, nominal width of the steps or pallets, barrier-free design, angle of inclination of the escalators or moving walks.

0.2.2 Required performance, e.g.

- Rated load,
- Rated speed,
- Power supply
- Number and location of the stops,
- Transported.

0.2.3 Requirements for

- Elektroinstallation,
- number of trips per hour,
- Holding accuracy,
- alternative use, e.g. as a fire brigade lift, bed lift, lift for industrial trucks, car lift.

0.2.4 Type of drive, e.g. rope, hydraulics, and arrangement of the engine.

0.2.5 Requirements for fire, sound, heat, humidity and radiation protection.

0.2.6 Type and extent of corrosion protection for metal components.

0.2.7 Type and location of the operating and signal elements.

0.2.8 Type, design and dimensions of cars, portals and perimeter frames.

0.2.9 Type of control, range of functions.

0.2.10 Type, degree of protection and laying of the electrical cables and differentiation from services provided by other contractors.

0.2.11 Special equipment, e.g. remote monitoring, fire and evacuation equipment, fire brigade circuits, shaft smoke extraction systems.

0.2.12 Operating and environmental conditions, e.g. temperature and humidity influences, especially in the case of systems standing in front of or in the façade as well as free-standing.

0.2.13 Energy efficiency requirements, e.g. according to DIN EN ISO 25745-2 "Energy efficiency of lifts, escalators and moving walks — Part 2: Energy calculation and classification of lifts".

0.2.14 Requirements of the responsible energy supply company or the client, e.g. with regard to possible grid reactions, possible limitation of the starting current and the output.

0.2.15 Number, type, location and duration of use as a construction hoist including commissioning in accordance with the Industrial Safety Ordinance, emergency call, emergency service, maintenance and overhaul services after use as a construction hoist.

0.2.16 Type and extent of protective measures for use as a construction hoist.

0.2.17 Re-commissioning in accordance with the Industrial Safety Ordinance after termination of use as a construction hoist.

0.2.18 Requirements to be specified in a special maintenance contract regarding the type and scope of the maintenance to be offered by the Contractor during the period of limitation for the claims for defects.

0.2.19 Type and scope of documents to be submitted in addition to Section 3.4, e.g.

- Test certificates for electromagnetic compatibility (EMC),
- Test certificate for sound insulation,
- Test certificate for the behaviour of lifts in the event of fire,
- Documents in accordance with DIN EN 81-28 'Safety rules for the design and installation of lifts — Lifts for the transport of passengers and goods — Part 28: Remote emergency call for passenger and freight lifts',
- Proof of energy efficiency class.

0.3 Details of deviations from the ATVs

If regulations other than those provided for in this ATV are to be made, these must be clearly and individually stated in the service description.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, section 0.4.

0.5 Billing Units

In the bill of quantities, the billing units shall be provided as follows: Number (St), separated by type and technical data, for each complete, operational installation.

1 Scope of application

1.1 ATV DIN 18385 "Elevator systems, escalators and moving walks as well as conveyor systems" applies to stationary systems for the transport of persons or goods between specified access or stop points.

1.2 ATV DIN 18385 does not apply to operational conveyor systems that can be separated from the structural system without impairing completeness or usability and are intended for independent use.

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18385 take precedence.

2 Fabrics, components

No supplementary regulation to ATV DIN 18299, Section 2.

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 Immediately after placing the order, the Contractor shall provide the Client with all information necessary for the smooth installation and proper operation of the installation. According to the planning documents and calculations of the client, the contractor must provide the assembly and workshop planning required for the execution and, if necessary, coordinate it with the client. These include, in particular:

- Asset drawings,
- Specifications for static and dynamic loads.

The Contractor shall provide the Client with information in good time on the

- current consumption and, if applicable, the starting current of the electrical components,
- other requirements for installation.

3.1.2 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- Inconsistencies in the planning documents and calculations provided by the client (see § 3 para. 3 VOB/B),
- recognisably defective workmanship, non-timely completion or the lack of
  - Foundations
  - sufficient underpass or crossing,
  - slits and openings,
  - sound and heat insulation,
- unsuitable design and/or unsuitable cross-sections of the shafts,
- insufficient connected load for the energy supply,
- insufficient space for the components,
- insufficient conditions for the absorption of reaction forces,
- missing height reference points per floor,
- changes in the prerequisites on which the planning was based, which are known to the contractor.

3.1.3 The Contractor shall provide the documents required for the official approvals and acceptances and shall cooperate in the official acceptance.

3.2 Requirements

The following systems are subject to the Machinery Directive 2006/42/EC1) and the Lift Directive 2014/33/EU2)

3.2.1 Elevator systems, escalators and moving walks

The following apply to the construction of the elevator systems, escalators and moving walks:

DIN EN 12015	Electromagnetic Compatibility — Product Family Standard for Elevators, Escalators and Moving Walks - Interference Emission
DIN EN 12016	Electromagnetic compatibility — Product family standard for elevators, escalators and moving walks - Immunity

DIN EN 13015	Maintenance of Elevators and Escalators — Rules for Maintenance Instructions

3.2.2 Elevator systems

3.2.2.1 The following shall apply to the execution:

DIN EN 81-3	Safety rules for the design and installation of lifts — Part 3: Electrically and hydraulically operated small goods lifts
DIN EN 81-20	Safety rules for the design and installation of lifts — Lifts for the carriage of passengers and goods — Part 20: Passenger and freight lifts
DIN EN 81-21	Safety rules for the design and installation of lifts — Lifts for the carriage of passengers and goods — Part 21: New passenger and freight lifts in existing buildings
DIN EN 81-22	Safety rules for the design and installation of lifts — Lifts for the carriage of passengers and goods — Part 22: Electrically operated lifts with inclined track
DIN EN 81-28	Safety rules for the design and installation of lifts — Lifts for the carriage of passengers and goods — Part 28: Remote emergency call for passenger and freight lifts
DIN EN 81-31	Safety rules for the design and installation of lifts — Lifts for the carriage of goods — Part 31: Walkable goods lifts
DIN EN 81-40	Safety rules for the design and installation of lifts — Special lifts for the transport of passengers and goods — Part 40: Inclined stair lifts and platform lifts with inclined track for persons with disabilities
DIN EN 81-41	Safety rules for the design and installation of lifts — Special lifts for the carriage of passengers and goods — Part 41: Vertical platform lifts for persons with reduced mobility
DIN EN 81-50	Safety rules for the design and installation of lifts — Tests — Part 50: Design rules, calculations and tests of elevator components

If the client has not specified which of the rules and regulations is to be applied, the selection is left to the contractor in compliance with the applicable legal and official provisions (see § 4 para. 2 VOB/B).

3.2.2.2 The following shall also apply to doors:

DIN 18090	Lifts — Shaft swing doors and folding doors for shafts with walls of fire resistance class F 90DIN 18091 Lifts — Sliding shaft doors for shafts with walls of fire resistance class F 90
DIN 18092	Lifts — Vertical sliding doors for small goods lifts in shafts with walls of fire resistance class F 90
DIN EN 81-58	Safety rules for the design and installation of lifts — Verification and test methods — Part 58: Test of fire resistance of landing doors

3.2.2.3 The following shall also apply to sound insulation:

VDI 2566 Part 1	Sound insulation for elevator systems with engine compartment3)
VDI 2566 Part 2	Sound insulation for elevator systems without engine compartment3)

3.2.2.4 The following shall also apply to special designs:

DIN EN 81-70	Safety rules for the design and installation of lifts — Special applications for passenger and freight lifts — Part 70: Accessibility of lifts for persons, including persons with disabilities
DIN EN 81-71	Safety rules for the design and installation of lifts — Special applications for passenger and freight lifts — Part 71: Protective measures against deliberate destruction
DIN EN 81-72	Safety rules for the design and installation of lifts — Special applications for passenger and freight lifts — Part 72: Firefighter lifts
DIN EN 81-73	Safety rules for the design and installation of lifts — Special applications for passenger and freight lifts — Part 73: Behaviour of lifts in the event of fire
DIN EN 81-77	Safety rules for the design and installation of lifts — Special applications for passenger and goods lifts — Part 77: Lifts under seismic conditions
DIN EN 627	Rules for Data Acquisition and Remote Monitoring of Elevators, Escalators and Moving Walks

3.2.2.5 Energy efficiency

DIN EN ISO 25745-2	Energy efficiency of lifts, escalators and moving walks — Part 2: Energy calculation and classification of lifts

3.2.3 Escalators and moving walks

The following apply to the execution:

DIN EN 115-1	Safety of escalators and moving walks — Part 1: Design and installation
DIN EN 115-2	Safety of escalators and moving walks — Part 2: Rules for increasing the safety of existing escalators and moving walks

3.2.4. Advantages

The following apply to the execution:

DIN EN 619	Continuous Conveyors and Systems — Safety and EMC Requirements for Mechanical Conveying Devices for General Cargo
DIN EN 1570-1	Safety Requirements for Lift Tables — Part 1: Lift Tables Serving Up to Two Fixed Stops

DIN EN 1570-2	Safety requirements for lift tables — Part 2: Lift tables for lifting goods approaching more than 2 stops of a building and whose lifting speed does not exceed 0.15 m/s

3.3 Corrosion protection work

The services also include surface preparation and the application of a base coat.

3.4 Documents to be supplied

The Contractor shall hand over to the Client all the necessary documents in accordance with Section 3.1.3 as well as the operating and maintenance instructions required for the safe and economical operation of the system in accordance with the Lift Directive 2014/33/EU2) Annex 1 Section 6 at the latest at the time of acceptance.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Provision of assembly aids and anchoring elements to be installed on site.

4.1.2 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on or clad is not higher than 3.50 m above the standing surface of the scaffolding required for this purpose.

4.1.3 Compensation of stepped or inclined standing surfaces of scaffolding up to 40 cm difference in height, e.g. via stairs or ramps.

4.1.4 Installation of dowels, anchoring and fastening elements for installation, shaft lighting and switchgear.

4.1.5 Marking with prescribed type and information plates.

4.1.6 Provision of technical personnel and required test weights for testing in accordance with the Industrial Safety Ordinance.

4.1.7 Instruction of the Client's commissioned employee in accordance with the Industrial Safety Ordinance.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 Provision of recreation and storage rooms if the Client does not provide rooms that can be easily locked.

4.2.2 Assembly, conversion and dismantling as well as provision of scaffolding for the services of other contractors.

4.2.3 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on or clad is higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.2.4 Erection, conversion and dismantling as well as provision of scaffolding with a stepped or inclined footprint, e.g. over stairs or ramps, if compensation of more than 40 cm is required.

4.2.5 Subsequent installation of anchoring elements and assembly aids.

4.2.6 Coating of primed parts.

4.2.7 Masonry, concrete, plastering and other construction work on elevator shafts and engine rooms, e.g. casting of landing door frames

4.2.8 Coating of building parts, e.g. shaft pits, engine rooms.

4.2.9 Precautions for the dissipation of power losses, e.g. by installing fans.

4.2.10 Heating of the shaft and engine room.

4.2.11 Additional measures during and after the use of facilities as construction hoists, including the necessary maintenance and repair services.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

The determination of the performance — regardless of whether it is carried out according to drawings or measurements — shall be based on the equipment manufactured.

5.2 Determination of quantities

Elevator systems, escalators and moving walks as well as conveyor systems must each be billed as a unit, separately according to the respective technical data of the systems.

5.3 Overmeasurement regulations

No regulations.

5.4 Individual provisions

No regulations.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Building automation — DIN 18386

Issue September 2019

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 Type and location of the technical installations of the service areas involved.

0.1.2 Type and location as well as conditions for the provision of telecommunications connections and equipment for the transmission of data.

0.1.3 Type, location, dimensions and design as well as dates for the erection and dismantling of scaffolding on site.

0.2 Information on the execution

0.2.1 Connections of third-party systems.

0.2.2 Number, type and dimensions of samples. Place of installation.

0.2.3 Number, type, location, dimensions and design of the components for the management and operating equipment.

0.2.4 Number, type, location, dimensions and design of the components for the automation equipment and the switchgear and distribution systems.

0.2.5 Visualization and Operating Concepts.

0.2.6 The number, type, location and dimensions of cables, wires, pipes and components of laying systems and the method of their installation.

0.2.7 Requirements for electromagnetic compatibility and overvoltage, explosion and equipment protection.

0.2.8 Requirements from the fire protection concept, e.g. functional links with smoke extraction systems.

0.2.9 Dates for the delivery of the information and documents in accordance with sections 3.1.3 and 3.5 as well as for the beginning and end of the contractual services. If applicable, the delivery and scope of the schedules to be drawn up by the contractor, e.g. network plans.

0.2.10 Number, type, location and dimensions of temporary measures, e.g. for the operation of the plant or parts of the system before acceptance.

0.5.2.1 System components of the hardware such as management equipment and their peripherals,

- communication units, e.g. modems and data interface units,
- Automation equipment and its components,
- local priority control devices, e.g. input and output units,
- application-specific automation devices, e.g. individual room controllers, boiler controllers,
- Operating and programming equipment,
- sensors, e.g. sensors,
- actuators, e.g. control valves,
- Control modules, e.g. local priority operating devices, manual controls, safety circuits, coupling modules.

0.5.2.2 Components such as

- Control cabinet housings including accessories,
- Special accessories, e.g. control cabinet ventilation and control cabinet cooling,
- locking systems,
- function, designation and information signs,
- feed-ins,
- Power modules,
- Overcurrent protection assemblies,
- Power supply assemblies,
- units provided on site, e.g. frequency converters.

0.5.2.3 Functions, including software and services, separated by performance characteristics in accordance with DIN EN ISO 16484-3 "Building automation systems (GA) — Part 3: Functions", for

- Input and output functions: switching, setting, reporting, measuring, counting,
- Processing functions: monitoring, controlling, regulating, calculating, optimising,
- management functions, e.g. record-keeping, archiving and statistical analysis,
- Visualization and operating functions, e.g. human-system communication.

0.5.2.4 Functions including software and services, separated by performance characteristics in accordance with VDI 3813 Part 2 "Building automation (GA) — Room automation functions (RA functions)1), for

- Sensor and actuator functions,
- Control and display functions (local),
- Application functions,
- management and operating functions,
- shared, communicative input and output functions (between external systems).

1 Scope of application

1.1 ATV DIN 18386 "Building automation" applies to the manufacture of systems for measuring, controlling, regulating, managing and operating technical systems.

1.2 ATV DIN 18386 does not apply to functionally independent equipment, e.g. chiller controls, burner controls, elevator controls.

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18386 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies: The most common substances and components are listed in DIN EN 60529 (VDE 0470-1) "Degrees of protection by enclosures (IP code)". Control cabinets must at least comply with protection class IP 43 according to DIN EN 60529 (VDE 0470-1).

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 General

3.1.1 The following apply to the manufacture of building automation systems:

DIN EN ISO 16484-1	Building automation systems (GA) — Part 1: Project planning and execution
DIN EN ISO 16484-2	Building automation systems (GA) — Part 2: Hardware
DIN EN ISO 16484-3	Building automation systems (GA) — Part 3: Functions
VDI 3813 Part 2)	Building Automation (GA) — Room Automation Functions (RA Functions)
VDI 3814 Part 2.1)	Building Automation (GA) — Planning — Requirements Planning, Operator Concept and Specifications

VDI 3814 Part 2.2) Building Automation (GA) — Planning — Planning Content, System Integration and Interfaces

3.1.2 The building automation facilities and systems must be coordinated with each other in such a way that the required functions are performed, operational safety is ensured and efficient operation is possible.

3.1.3 The documents required for execution and to be handed over by the Client (see § 3 para. 1 VOB/B) include, in particular:

- Function lists in accordance with DIN EN ISO 16484-3 and VDI 3813 Part 21) in the case of connection of third-party systems with information in accordance with VDI 3814 Part 2.11) and VDI 3814 Part 2.21) ,
- Plant schemes,
- Functional flow diagrams or descriptions,
- Compilation of target values, limit values and operating times,
- Execution plans,
- Data on the design of actuators and actuators,
- Power consumption of electrical components,
- Addressing concept,
- Fire protection concept,
- Fault reporting and fault reporting forwarding concepts,
- Visualization concept.

3.1.4 According to the planning documents and calculations of the Client, the Contractor shall provide the assembly and workshop drawings required for the execution and, if necessary, coordinate them with the Client. These include, in particular:

- Automation diagrams with representation of the essential functions on the basis of the plant diagrams according to plant planning,
- Circuit diagrams according to DIN EN 61082-1 (VDE 0040-1) "Electrical engineering documents — Part 1: Rules",
- Automation station occupancy plans including addressing,
- Overview plan with entry of the locations of the operating equipment and information focal points,
- Function
- Assembly plans with installation locations of the field devices,
- Cable lists with function assignment and performance information,
- Bom.

3.1.5 The Contractor shall provide the Client with all information necessary for the unhindered installation and proper operation of the system prior to the commencement of the installation work.

3.1.6 When reviewing the planning documents and calculations supplied by the Client (see Section 3 (3) VOB/B), the Contractor shall, inter alia, pay particular attention to the nature and function of the system:

- completeness of the function lists, completeness of the design data and parameters,
- Function
- Measuring range data of measuring and limit sensors,

- Plant schemes,
- Addressing concept,
- Visualization concept,
- Operating concept,
- Design of hydraulic actuators,
- fire protection requirements.

3.1.7 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- inconsistencies in the planning documents and calculations provided by the contracting authority (see section 3.1.6),
- insufficient space for the components,
- insufficient surge protection,
- interference from electromagnetic fields,
- obviously defective execution, non-timely completion or lack of necessary on-site preliminary work.

3.1.8 Chiseling, milling and drilling work on the structure may only be carried out in agreement with the Client.

3.1.9 Display devices must be easy to read, and devices to be operated must be easily accessible and operable.

3.1.10 Equipment to be inspected and maintained must be accessible.

3.2 Notification, Permission, Approval and Examination

The contractor must make available to the Client in good time the drawings and other documents as well as certificates required for the officially prescribed notifications or applications in accordance with the number prescribed for the notification, permit or approval obligation. This shall not apply if the test regulations for plant components permit permanent identification instead of a certificate.

3.3 Commissioning and adjustment

3.3.1 The plant components must be adjusted in such a way that the required functions and services are provided and the legal requirements are met. To do this, all physical inputs and outputs must be checked individually, the specified parameters must be set and the required input, output and processing functions must be ensured.

3.3.2 The commissioning and adjustment of the plant and plant components must be carried out, if necessary, together with those responsible for the service areas involved. Commissioning and adjustment must be documented by protocols with measured and setting values.

3.3.3 The operating personnel for the system must be instructed once by the contractor. The instruction must be documented.

3.4 Acceptance test

3.4.1 An acceptance test consisting of a completeness and function test must be carried out.

3.4.2 The functional test includes in particular:

- Examination of the protocols of commissioning and adjustment,

- Random testing of automation functions, e.g. control, safety, optimization and communication functions,
- random individual checks of messages, switching commands, measured values, control commands, counting values, derived and calculated values,
- Checking system response times,
- Checking the system's own monitoring,
- Testing of system behavior after mains failure and mains return.

3.5 Documents to be supplied

The Contractor shall prepare the following documents within the scope of its scope of services and hand them over to the Client in an orderly and updated form at the latest upon acceptance:

- Automationsschemata,
- Circuit diagrams in accordance with DIN EN 61082-1 (VDE 0040-1),
- Automation station occupancy plans including addressing,
- Connection circuit diagram according to DIN EN 61082-1 (VDE 0040-1),
- Overview plan with entry of the locations of the operating equipment and information focal points,
- Bom
- Function
- Protocols of commissioning and adjustment, □ All operating instructions and maintenance instructions required for safe and economical operation,
- Spare parts
- project-specific programs and data on data carriers,
- Protocol on the instruction of the operating personnel,
- prescribed work and test certificates, □ target values, limit values and operating times,
- Plant schemes,
- function lists,
- Cable lists with function assignment and power specifications.

The documents shall be presented in one colour and in triplicate, and drawings and lists shall also be available in single copies or on data carriers at the Client's option. The project-specific programs and data must be delivered in duplicate on data carriers.

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Marking of the recesses, even if they are made by another contractor.

4.1.2 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the assembly site is not higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.1.3 Compensation of stepped or inclined standing surfaces of scaffolding up to 40 cm difference in height, e.g. via stairs or ramps.

4.1.4 Drilling, chiseling and milling work for the insertion of dowels and for the installation of installations, e.g. flush-mounted boxes.

4.1.5 Delivery and affixing of type and performance plates.

4.1.6 Completion of components in several work steps to enable work by other contractors, insofar as the company's own services can be provided continuously in the course of similar assembly work. If these conditions are not met, they are special benefits according to section 4.2.16.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 Planning services such as design, execution or approval planning, conduit and recess planning.

4.2.2 Provision of recreation and storage rooms if the Client does not provide rooms that can be easily locked.

4.2.3 Assembly, conversion and dismantling as well as provision of scaffolding for services provided by other contractors.

4.2.4 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the installation site is higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.2.5 Erection, conversion and dismantling as well as provision of scaffolding with a stepped or inclined footprint, e.g. via stairs or ramps, if compensation of more than 40 cm is required.

4.2.6 Delivery and installation of special fastening structures, e.g. brackets, support scaffolding.

4.2.7 Checking the electrical wiring and pneumatic piping of the control or regulation system not carried out by the Contractor.

4.2.8 Drilling, chiseling and milling work for the fastening of brackets and brackets. Making and closing recesses.

4.2.9 Delivery and fixing of function, designation and information signs.

4.2.10 Supply of the operating materials necessary for commissioning, adjustment and trial operation.

4.2.11 Services for provisional measures for the premature operation of the plant or parts of the system prior to acceptance as ordered by the Client, including the necessary maintenance services.

4.2.12 Operation of the plant or parts of the plant before acceptance according to the instructions of the Client, including the necessary maintenance services.

4.2.13 Training measures and instruction beyond the services in accordance with Section 3.3.3.

4.2.14 Preparation of as-built plans.

4.2.15 Assumption of fees for officially prescribed acceptance tests.

4.2.16 Completion of components in several operations to enable work by other contractors, insofar as the company's own services cannot be provided continuously in the course of similar assembly work (see section 4.1.6).

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

The determination of the performance — regardless of whether it is carried out according to drawings or measurements — shall be based on the dimensions of the plant components of the manufactured plants. If the performance is determined from drawings, parts and occupancy lists, updated function lists and system logs may be consulted.

5.2 Determination of dimensions/quantities

5.2.1 Cables, wires, pipes and components of laying systems shall be calculated according to the length actually laid.

5.2.2 Functions including software are calculated by piece, in accordance with the function lists according to DIN EN ISO 16484-3 and VDI 3813 Part 21).

5.3 Overmeasurement rules

No regulations.

5.4 Individual provisions

No regulations.

VOB Part C:

General Technical Contract Conditions for Construction Services (ATV)

Insulation and fire protection work on technical systems DIN 18421

Issue September 2016

Content

0 Notes for the preparation of the service description

These notes supplement ATV DIN 18299 "General regulations for construction work of any kind", section 0. Compliance with these instructions is a prerequisite for a proper service description in accordance with §§ 7 et seq., §§ 7 EU et seq. or §§ 7 VS ff. VOB/A.

The information does not become part of the contract.

According to the requirements of the individual case, the specifications must state in particular:

0.1 Information on the construction site

0.1.1 Location of the system components to which insulation is to be applied or fire protection work is to be carried out, separated according to e.g. height above work floor, storeys.

0.1.2 Type, location, dimensions and design as well as dates for the erection and dismantling of on-site scaffolding.

0.2 Information on the execution

0.2.1 Type, dimensions and materials of the system components to be insulated, e.g. material numbers, and their corrosion protection, as well as the system components on which fire protection work is to be carried out.

0.2.2 Type, thickness and quality of insulation materials in accordance with DIN 4140 "Insulation work on operational systems in industry and in technical building equipment — Execution of heat and cold insulation".

0.2 Information on the execution

0.2.1 Type, dimensions and materials of the system components to be insulated, e.g. material numbers, and their corrosion protection, as well as the system components on which fire protection work is to be carried out.

0.2.2 Type, thickness and quality of insulation materials in accordance with DIN 4140 "Insulation work on operational systems in industry and in technical building equipment — Execution of heat and cold insulation".

0.2.13 In the case of insulation: number, type, location and dimensions of

- flattening,
- doubling for flanges of air ducts,
- doubling for brackets,
- Snippets
- Apertures, rosettes,
- Bow
- Lids
- Inserts
- End point designs of sheathing and fire protection cladding, e.g. bump caps,
- bracket mold caps,
- Hoods
- trouser pieces,
- Clip
- Fold
- conical arch,
- Konussen,
- Kreisringen,
- Sheath constrictions,
- fittings,
- rain deflectors,
- Stirnseiten,
- Trim
- load-bearing structures,
- Separation of sheathing and fire protection cladding,
- transition pieces,
- connections to adjacent components (floor, ceiling, wall) for cladding,
- Individual sections < 2 m in length, e.g. for fire protection work,
- Individual areas < 5 m2, e.g. for fire protection work,
- Fire protection elements, e.g. inspection flaps, bushings,
- Fire protection sleeves on each side of the wall and ceiling.

0.2.14 In the case of fire protection measures: the number, type, location and dimensions of the components to be protected, the recesses to be closed and the built-in parts, suspensions and special constructions.

0.2.15 Number, type, location, dimensions and design of terminations and connections to adjacent components.

0.2.16 Protection of components or equipment, furnishings and the like.

0.2.17 Vorgezogenes oder nachträgliches Herstellen von Teilen der Leistung.

0.3 Details of deviations from the ATVs

If regulations other than those provided for in this ATV are to be made, these must be clearly and individually stated in the service description.

0.4 Individual information on fringe benefits and special benefits

No supplementary regulation to ATV DIN 18299, Section 0.4.1.

0.5 Billing Units

In the bill of quantities, the billing units, separated according to material types, layer thicknesses and types of coating, are to be provided as follows:

0.5.1 Measure of length (m), separated by diameter, circumference or cross-sectional shape, for

- insulation layers and sheathing on pipelines and suspensions,
- Shielding of heating and cooling zones for trace heating and trace cooling or for expansion joints,
- fillings of the joint spaces between penetrations, built-in parts and the like and adjacent opening soffits, e.g. between fire dampers and soffits,
- Fire protection systems on pipes and air ducts,
- Doubling for flanges of air ducts.

0.5.2 Area dimension (m2), separated by type of installation, dimensions and settlement groups according to Table 1 for

- Insulation layers and sheathing on □ flat surfaces,
  - straight air ducts,
  - bends and other fittings on air ducts,
  - apparatus, containers, columns and tanks,
  - collectors and distributors,
- Shielding of heating and cooling zones for trace heating and trace cooling or for expansion joints,
- caps and hoods with a surface area > 1 m2,
- Fire partitions with an area > 1 m2.

Table 1 — Settlement groups

for angular air ducts and their fittings, e.g. end bottoms, end covers, dividers and overlaps, fittings, baffles (air deflectors)

No.	Air ducts	Moldings	Largest edge length of the cross-section without insulation Mm
	Payroll Groups		
1	L 1	F 1	Up to 500
2	L 2	F 2	Over 500 to 1000
3	L 3	F 3	Over 1000 to 1500
4	L 4	F 4	Over 1500 to 2000
5	L 5	F 5	Over 2000

0.5.3 Volume dimensions (m3), separated by type of system and dimensions, for foam, bulk, tamping and fire protection insulation in slots, shafts and pipe ducts, as well as in cavities on apparatus, containers, columns and tanks.

0.5.4 Number (pcs), separated according to diameters, lengths, circumferences, arc radii or arc angles and other factors influencing the power expenditure, e.g. special cross-sectional shapes of connections or penetrations, nozzles extending at different angles for

- flattening,
- doubling for flanges on air ducts,
- doubling of brackets,
- Snippets
- Apertures, rosettes,
- Bow
- Lid
- Insets
- End point designs of sheaths and cladding, e.g. bump caps,
- bracket mold caps,
- hoods with a surface area ≤ 1 m2,
- trouser pieces,
- caps with a surface area ≤ 1 m2,
- Kinks
- conical arches,
- Cones,
- circular rings,
- Sheath constrictions,
- Fittings,
- rain deflectors,
- Stirnseiten,
- Trim
- load-bearing structures,
- Separation of the sheathing and fire protection cladding,
- transition pieces,
- Connections to adjacent components (floor, ceiling, wall) for cladding,

- Individual sections < 2 m in length, e.g. for fire protection work,
- Individual areas < 5 m2, e.g. for fire protection work,
- Fire protection elements, e.g. inspection flaps, bushings,
- Fire protection sleeves on each wall and ceiling side,
- Fire partitions with an area < 1 m2, differentiated according to individual sizes, e.g.:
  - ≤ 0.01 m2;
  - > 0.01 m2 ≤ 0.025 m2;
  - > 0.025 m2 ≤ 0.05 m2;
  - > 0.05 m2 ≤ 0.075 m2;
  - > 0.075 m2 ≤ 0.1 m2;
  - > 0.1 m2 ≤ 0.25 m2;
  - > 0.25 m2 ≤ 0.5 m2;
  - > 0.5 m2 ≤ 0.75 m2;
  - > 0.75 m2 < 1.00 m2.

1 Scope of application

1.1 ATV DIN 18421 "Insulation and fire protection work on technical installations" applies to

- insulation and fire protection work on production and distribution systems in industry and technical building equipment, e.g. on apparatus, containers, columns, tanks, steam generators, pipelines, ventilation systems, heating, air conditioning and cold and hot water systems,
- insulation and fire protection work in cold and air-conditioned rooms,
- Fire protection work on electrical and smoke extraction systems as well as
- Fire protection work for partitions in ceiling and wall openings.

1.2 ATV DIN 18421 does not apply to insulation and fire protection work

- on buildings and structures as well as
- in the control area of nuclear power plants.

1.3 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5 applies. In the event of contradictions, the regulations of ATV DIN 18421 take precedence.

2 Fabrics, components

In addition to ATV DIN 18299, Section 2, the following applies:

2.1 For the most common substances and components, the DIN standards and other requirements are listed below.

DIN 4140	Insulation work on industrial and technical building equipment — Execution of heat and cold insulation
DIN 4102 (all parts)	Fire behaviour of building materials and components
DIN EN 13501 (all parts)	Classification of construction products and construction methods with regard to their reaction to fire

2.2 The thermal conductivity with the mean temperature as the reference temperature and the bulk density of the insulation materials must be proven at the request of the client by means of a test certificate from a suitable testing body.

3 Execution

In addition to ATV DIN 18299, Section 3, the following applies:

3.1 Insulation work must be carried out in accordance with DIN 4140.

3.2 Fire protection constructions must be designed in accordance with their proof of usability.

3.3 In particular, the following may be considered as concerns pursuant to Section 4 (3) VOB/B:

- Missing requirements according to DIN 4140 or for compliance with the provisions of the proof of usability, e.g. in the case of pipe penetrations where the required distances of the suspensions according to the proof of usability of the fire barrier are not observed.

3.4 In the event of unsuitable conditions resulting from the weather or the indoor climate, e.g. temperatures below 10 °C during in-situ foam work, special measures must be taken in consultation with the Client. If services are required for this, these are special services (see section 4.2.2).

3.5 The insulation system is designed to follow the contours, i.e. the outer surface of the insulation can only be as flat as the surface of the object. If compensatory work is to be carried out in consultation with the client, these are special services (see section 4.2.16).

4 Ancillary services, special services

4.1 Ancillary services are in addition to ATV DIN 18299, Section 4.1, in particular:

4.1.1 Cleaning of the substrate, except for services according to section 4.2.3.

4.1.2 Protection of building and plant components against contamination and damage during insulation or fire protection work by loose covering, hanging or wrapping, except for protective measures according to section 4.2.4.

4.1.3 Completion of insulation or fire protection systems in several work steps to enable work by other contractors, insofar as the company's own services can be provided continuously in the course of similar insulation or fire protection work. If these conditions are not met, they are special services according to section 4.2.6.

4.1.4 Erection, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on is not higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.1.5 Compensation of stepped or inclined standing surfaces of scaffolding up to 40 cm difference in height, e.g. via stairs or ramps.

4.1.6 Vorlegen vorgefertigter Muster.

4.1.7 Compilations of the product/safety data sheets of the products used.

4.1.8 Copies of the prescribed test and manufacturer certificates, proof of usability, specialist contractor declarations.

4.2 Special services are in addition to ATV DIN 18299, Section 4.2, e.g.:

4.2.1 Provision of recreation and storage rooms if the Client does not provide rooms that can be easily locked.

4.2.2 Protection against unsuitable conditions resulting from the weather or the indoor climate in accordance with section 3.4, e.g. enclosing or heating of systems during the execution of insulation or fire protection work.

4.2.3 Cleaning the substrate of coarse soiling, e.g. plaster residues, mortar residues, paint residues, oil, insofar as this was not caused by the Contractor.

4.2.4 Special protection of building and plant components as well as furnishings, e.g. masking of windows, doors, floors, coverings, stairs, wood, roof surfaces, surface-finished parts, dust-proof masking of sensitive equipment and technical equipment, dust protection walls, emergency roofs, laying of hardboard or building protection films from a thickness of 0.2 mm.

4.2.5 Subsequent application of parts of the insulation, e.g. over weld seams, to temporary suspensions and supports, insofar as this is not the Contractor's responsibility.

4.2.6 Completion of insulation or fire protection systems in several work steps to enable work by other contractors, insofar as the company's own services cannot be provided continuously in the course of similar insulation or fire protection work (see section 4.1.3).

4.2.7 In the case of insulation, the manufacture and installation of

- Brackets for supporting structures,
- Structures or fastenings for sheathing on air ducts that are not sheathed on all sides,
- Touch protection,
- Sheathing with neither circular nor angular cross-section,
- Separations, insofar as they are necessary for technical reasons, e.g. in the case of penetrations or installation difficulties,
- funnel-shaped formations of the upper circular ring including the seams as a double rebate or gear corrugated profile,
- Cap supports,
- Sheath constrictions and circular rings.

4.2.8 Services for heating, cooling, sound and fire protection if the minimum distances according to DIN 4140 are not observed.

4.2.9 Preparation of building physics and static verifications.

4.2.10 Identification by function, designation and information signs.

4.2.11 Preparation of documentation that goes beyond the services of Section 4.1.7 and Section 4.1.8.

4.2.12 Auf-, Um- und Abbau sowie Vorhalten von Gerüsten für Leistungen anderer Unternehmer.

4.2.13 Assembly, conversion and dismantling as well as provision of scaffolding for own services, provided that the area to be worked on is higher than 3.50 m above the standing area of the scaffolding required for this purpose.

4.2.14 Erection, conversion and dismantling as well as provision of scaffolding with a stepped or inclined footprint, e.g. via stairs or ramps, if compensation of more than 40 cm is required.

4.2.15 Manufacture and attachment or installation of patterns, sample surfaces, sample constructions.

4.2.16 Compensation for deviations from the cladding component if the insulation system is not to be designed to follow the contours.

5 Billing

In addition to ATV DIN 18299, Section 5, the following applies:

5.1 General

The determination of the performance — regardless of whether it is carried out according to drawings or measurements — must be based on the dimensions of the manufactured products.

- insulation layers,
- sheathing,
- in the case of insulation with sheathing, the dimensions of the sheathing,
- Fire protection coatings,
- Fire protection clothing,
- Shielding of heating and cooling zones for trace heating and trace cooling or for expansion joints,
- caps and hoods.

The simplifying rules, such as over-measurement rules and individual regulations, are to be used to determine performance.

5.2 Determination of dimensions/quantities

5.2.1 If the performance is determined from drawings, parts lists may be consulted.

5.2.2 Lengths shall be measured in the direction of the axis in the largest length in each case, e.g. in the case of pipelines and round air ducts over the outer arch, in the case of angular air ducts over the outer edge, in the case of cones over the length of the largest sheath line, in the case of joint fillings, e.g. on fire dampers along the soffit.

5.2.3 In the case of end points, the length of e.g. the pipe insulation, including its sheathing, is measured to the middle of the flange pair, the screw connection or the weld seam. The same applies to installations with individual lengths > 300 mm.

5.2.4 In the case of conical pipes, half the length of conical pipes is assigned to the dimensions and insulation thicknesses or sheathing circumferences of the subsequent pipes.

5.2.5 In the case of bundles of pipes whose pipes are individually insulated, the insulation of each individual pipe shall be calculated, and the common sheathing shall be calculated once. The same applies to fire protection clothing.

5.2.6 In the case of pipe bundles whose pipes are not individually insulated, the insulation of the pipe bundle and the joint sheathing shall be taken into account. The same applies to fire protection clothing.

5.2.7 In the case of invoicing on the basis of surface area, the largest surface area of the finished sheathing or insulation shall be used in the case of external insulation. In the case of interior insulation, the area to be insulated is taken as a basis before the insulation materials are applied. The same applies to fire protection clothing.

5.2.8 The surfaces of circular ends without their cylindrical parts shall be determined as follows:

Plane front:	$A = 0.079\ 6\ U^2$
Front side in funnel shape ($h : d_a \leq 1 : 10$):	$A = 0.082\ U^2$
Flat curved front side in spherical shape (*since* ≤ 10 m):	$A = 0.082\ U^2$
Flat curved front side in dome shape ($d_a > 10$ m):	$A = 0.079\ 6\ U^2 + 3.14\ h^2$
High-domed front side in hemispherical shape:	$A = 0.159\ 1\ U^2$
High-domed front side in zeppelin form:	$A = 0.109\ U^2$

In doing so,

A the area of the front (m^2);

since the outer diameter of the front (m);

U the outer circumference of the face (m);

h the height of the funnel or dome (m)

5.3 Overmeasurement rules

The following are measured:

5.3.1 In the case of billing according to the length measure:

- Interruptions of insulation layers, sheathing and fire protection cladding with individual lengths ≤ 300 mm, e.g. by walls, ceilings, steel beams and other structural parts,
- Interruptions of the insulation layers, sheathing and fire protection cladding with individual lengths ≤ 300 mm due to installations, e.g. pumps, shut-offs, valves,
- Flange, screw and welded connections.

5.3.2 In the case of billing according to the size of the area:

- Recesses and cut-outs ≤ 0.5 m2 individual area1) ,
- cut-outs that can only be worked out during or after assembly, regardless of their size,
- penetrations in fire partitions,

- Flanges on ventilation air ducts.

5.3.3 If billed according to room size:

- volume of pipes with an external diameter of ≤ 12 cm or other pipes with a cross-section of ≤ 125 cm2,
- Penetrations in fire partitions.

5.3.4 The following are overmeasured:

- flattening,
- Mounts
- Snippets
- Apertures/rosettes,
- Bow
- Lid
- Insets
- trouser pieces,
- Kinks
- conical arches,
- Cones,
- circular rings,
- Sheath constrictions,
- Fittings,
- rain deflectors,
- Trim
- load-bearing structures,
- Separation of sheathing and fire protection cladding,
- Transition pieces.

5.4 Individual provisions

5.4.1 Insulation layers with sheathing

In the case of insulation layers with sheathing, the dimensions of the sheathing are calculated.

5.4.2 Calculated separately

Regardless of whether they are overmeasured, the following are calculated separately:

- flattening,
- Mounts
- doubling,
- Snippets
- Apertures, rosettes,
- Bow
- Lid
- Insets
- End point designs of sheaths and cladding, e.g. bump caps,
- trouser pieces,
- Kinks
- conical arches,

- Cones,
- circular rings,
- Sheath constrictions,
- Fittings,
- rain deflectors,
- End faces,
- Trim
- load-bearing structures,
- Separation of sheathing and fire protection cladding,
- transition pieces,
- Connections to adjacent components (floor, ceiling, wall) for cladding.

5.4.3 Caps

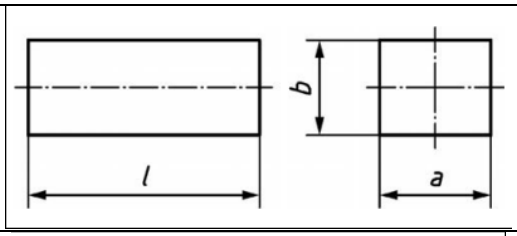
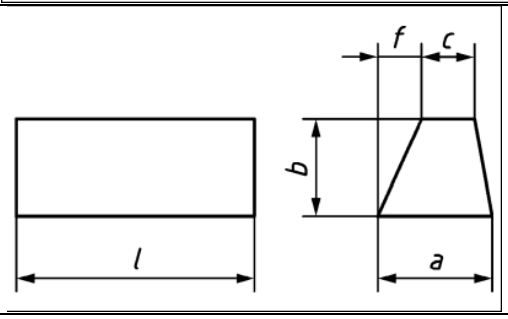
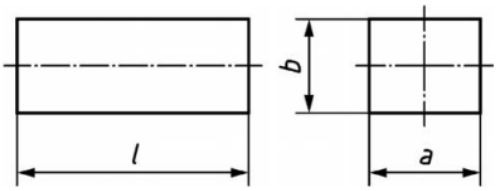
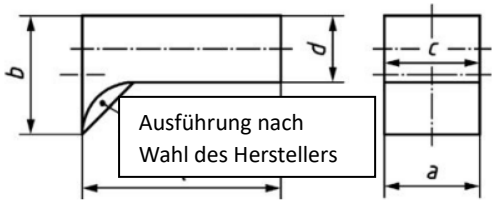
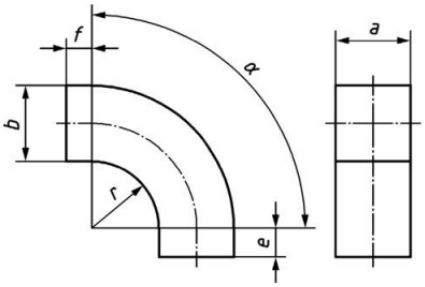
With flange caps, two cut-outs are part of the performance. In the case of instrument caps, three cut-outs are part of the performance. Each additional section is calculated separately.

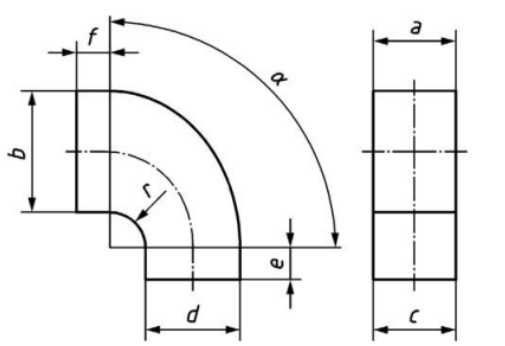
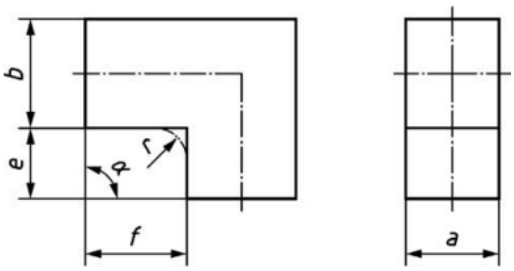
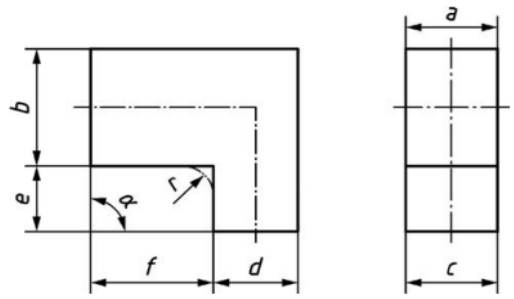
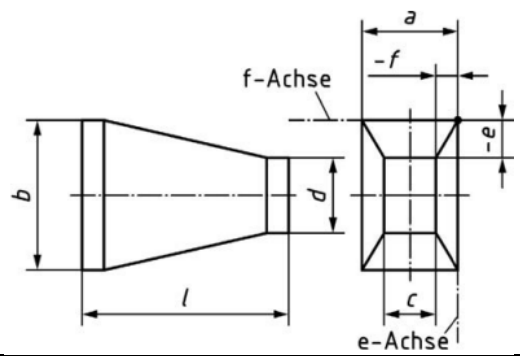
5.4.4 Air ducts and independent fire ducts

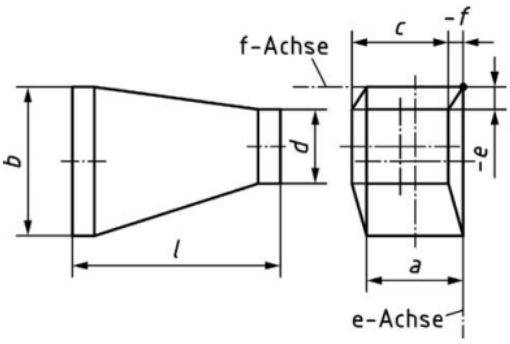
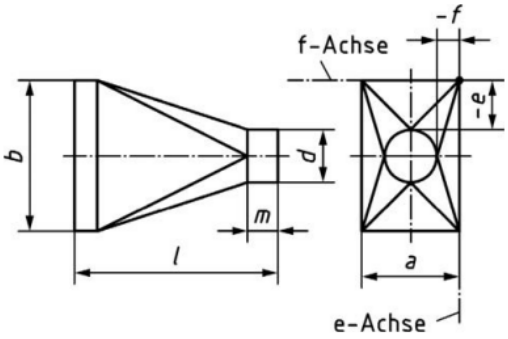
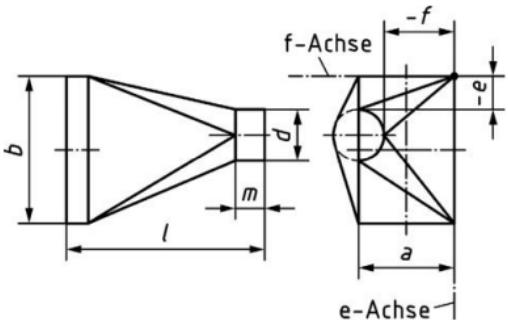
Moulded parts according to Table 2 as well as moulded parts of the billing groups F 1 to F 5 according to Table 1 (see section 0.5.2) with a determined surface area of < 1 m2 without insulation are calculated with 1 m2. The formulas in Table 2 shall be used to determine the circumference and length.

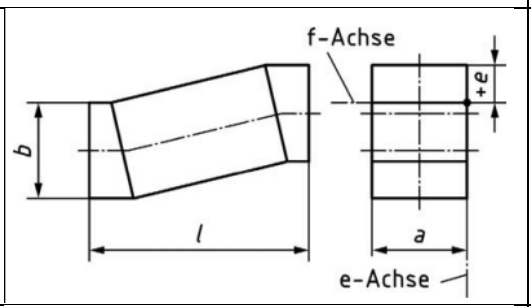
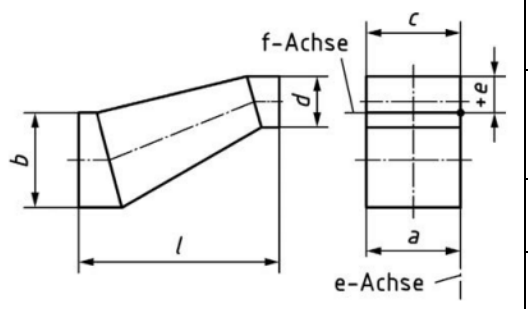
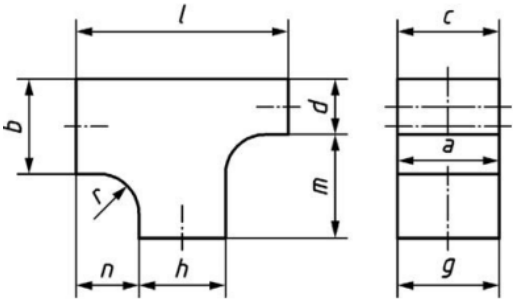
Table 2 — Air ducts and their fittings, largest circumferences, lengths and areas, including insulation

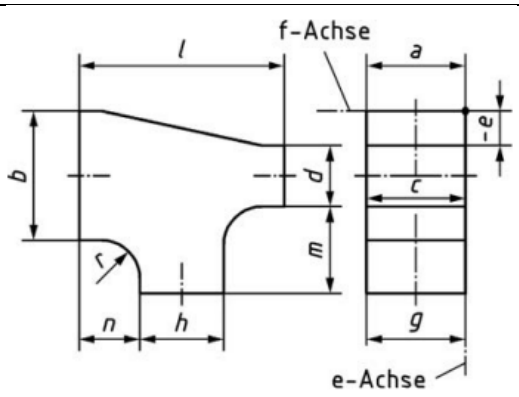
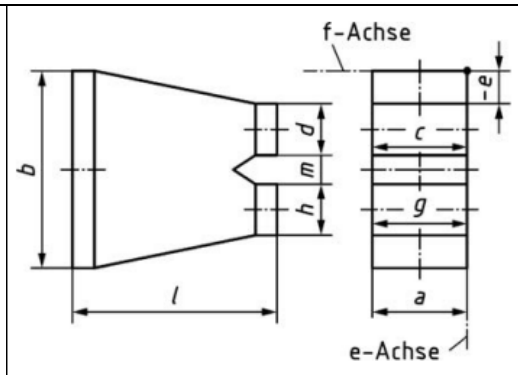
Dimensions in mm

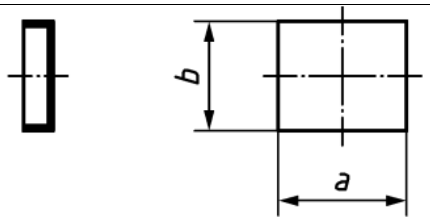
No.	Naming abbreviations Size	Presentation, dimensions Section view from the left	Largest Scope Umax bLargest Scope Umax b	Longest Length a bis c bzw. Ø d lmax b
1	Air line L l > 900		2(a + b)	l for pass lengths: l + 200
2	Trapezoidal air duct TL f = fmax		$a + c + \sqrt{b^2 + f^2} + \sqrt{(a - c - f)^2 + b^2}$	l
3	Air line part LT l ≤ 900		2(a + b)	l
4	Transition Nozzle SU l ≤ 900 c = a		2(a + b)	$\sqrt{\left(l^2 + (b - d)^2\right)}$
5	ATV DIN 18379:2016-09, Zeile 5 ist für Dämmung nicht zutreffend.			
6	Bow, symmetrical BS e ≤ 500 f ≤ 500		2(a + b)	$\frac{\alpha\pi(r + b)}{180} + e + f$

No.	Naming abbreviations Size	Presentation, dimensions Section view from the left	Largest Scope Umax b	Longest Length a bis c bzw. Ø d lmax b
7	Gene Transition BA c = a and ≤ 500 f ≤ 500		**Condition b ≥ d:**	
			2(a + b)	$\frac{\alpha\pi(r+b)}{180} + e + f$
			Condition b < d:	
			2(c + d)	$\frac{\alpha\pi(r+d)}{180} + e + f$
8	Angle (knee), symmetrical WS r = 0c e ≤ 500 f ≤ 500		2(a + b)	2b + e + f
9	Angle (knee) transition WA r = 0c and ≤ 500 f ≤ 500		**Condition b ≥ d:**	
			2(a + b)	b + d + e + f
			Condition b < d:	
			2(c + d)	b + d + e + f
10	d Transition, symmetrical US $e = \frac{b-d}{2}$ $f = \frac{a-c}{2}$		**Condition a + b ≥ c + d:**	**Condition e ≥ f:**
			2(a + b)	$\sqrt{(l^2 + e^2)}$
			Condition A + B < C + D:	**Condition E < f:**
			2(c + d)	$\sqrt{(l^2 + f^2)}$

No.	Naming abbreviations Size	Presentation, dimensions Section view from the left	Largest Scope Umax b	Longest Length a bis c bzw. Ø d lmax b
11	d Transition, asymmetrical Astronomical unit		**Condition** **a + b ≥ c + d:**	**Condition** **b – d + e ≥ e:** $\sqrt{l^2+(b-d+e)^2}$
			2(a + b)	**Bedingung** **b – d + e < e:** $\sqrt{(l^2+e^2)}$
			Condition **a + b < c + d:**	**Bedingung** **a – c + f ≥ f** $\sqrt{l^2+(a-c+f)^2}$
			2(c + d)	**Condition** **a – c + f < f:** $\sqrt{(l^2+f^2)}$
12	d Pipe Transition, Symmetrical RS $e=\frac{b-d}{2}$ $f=\frac{a-d}{2}$	 l_p nach DIN EN 1506	**Condition** **a + b ≥ 2 πd/2 :**	**Condition** **e ≥ f:**
			2(a + b)	$\sqrt{(l^2+e^2)}$
			Condition **a + b < 2 πd/2 :**	**Condition** **e < f:**
			πd	$\sqrt{(l^2+f^2)}$
13	d Pipe Transition, Asymmetrical RA	 l_p nach DIN EN 1506	**Condition** **a + b ≥ 2 πd/2 ::**	**Condition** **b – d + e ≥ e:** $\sqrt{l^2+(b-d+e)^2}$
			2(a + b)	**Condition** **b – d + e < e:** $\sqrt{(l^2+e^2)}$
			Condition **a + b < 2 πd/2 :**	**Condition** **a – d + f ≥ f** $\sqrt{l^2+(a-d+f)^2}$
			πd	**Condition** **a – d + f < f:** $\sqrt{(l^2+f^2)}$

No.	Naming abbreviations Size	Presentation, dimensions Section view from the left	Largest Scope $^{U}max\ ^{b}$	Longest Length a bis c bzw. Ø d $^{lmax\ b}$
14	d Floor, symmetrical ES f = 0		2(a + b)	$\sqrt{(l^2+e^2)}$
15	d Floor transition EA c = a f = 0		**Condition b ≥ d:**	**Condition b – d + e ≥ e:**
			2(a + b)	$\sqrt{l^2+(b-d+e)^2}$
			Condition b < d:	**Bedingung b – d + e < e:**
			2(c + d)	$\sqrt{(l^2+e^2)}$
16	T-Piece top straight TG g = c = a		**a) durchgehendes Teil**	
			Condition a + b ≥ c + d:	l
			2(a + b)	
			Condition a + b < c + d:	
			2(c + d)	
			b) abzweigendes Teil	
			2(g + h)	**Condition d + m – b ≥ m:**
				d + m – b
				Condition d + m – b < m:
				m
			The surfaces of a) and b) are added.	

No.	Naming abbreviations Size	Presentation, dimensions Section view from the left	Largest Scope $^{U}max\ ^{b}$	Longest Length a bis c bzw. Ø d $^{lmax\ b}$
17	d T-piece, slanted at the top TA g = c = a		**a) durchgehendes Teil**	
			Condition b ≥ d	$\sqrt{(l^2+e^2)}$
			2(a + b)	
			Bedingung b < d:	
			2(c + d)	
			b) abzweigendes Teil	
			2(g + h)	**Condition d + m – b – e ≥ m:**
				d + m – b – e
				Condition d + m – b – e < m:
				m
			The surfaces of a) and b) are added.	
18	d Trouser Piece HS g = c = a f = 0 m ≥ 2 Flange Height		**Condition b ≥ d + m + h:**	**Condition b – h – m – d + e ≥ e:**
			2(a + b)	$\sqrt{l^2+(b-h-m-d+e)^2}$
			Condition b < d + m + h:	**Condition b – h – m – d + e < e:**
			2(c + d + m + h)	$\sqrt{(l^2+e^2)}$

No.	Naming abbreviations Size	Presentation, dimensions Section	view from the left	Square measure A
19	Boden BO			a · b
Floor BO		Combination, e.g. of air duct and moulded part or of moulded parts with each other, factory-mounted on a frame and supplied as a single part.		The surface area is determined by adding the surfaces of the parts belonging to the combination.
Special moulded part SO		Moulded parts that cannot be classified in the table due to their design.		The surface is to be determined on the basis of the above formulas.
Sliding nozzles, air diffusers, air diffuser boxes, cut-outs for air diffusers, openings and lids for technical and hygienic work in air duct systems.				Billing is to be carried out according to number (St).

a For air ducts L (l > 900 mm) the billing groups L apply, for all other components the billing groups F 1 to F 5 of Table 1 (in Section 0.5.1).
b If several calculation formulas are given for Umax and lmax, the formulas which give the largest dimensions for you and l are to be used for the calculation of the surface area .
c Unless specifically specified.
d The coordinate center is always in the upper right corner of the left cross-section. For the result of the comparison conditions , the calculated values are to be used without signs.

VOB Procurement and Contract Regulations for Construction Services Part C: General Conditions of Technical Contracts for Construction Services (ATV) DIN 18451 - Scaffolding Work

German Construction Contract Procedures (VOB) Part C: General Technical Specifications in Construction Contracts (ATVs) Scaffolding work

German Building Specifications (VOB) Part C: General technical clauses for the execution of building scaffolding (ATV)

Prologue

This document was prepared by the German Public Procurement and Contracts Commission for Construction Services (DVA).

Changes

The following changes have been made compared to DIN 18451:2016-09:

a) has the document been technically revised in order to adapt it to the evolution of the manufacturing process**?**

(b) references to standards have been updated — from 2023-04.

Previous versions

DIN 18451: 1965-06, 1970-05, 1979-10, 1988-09, 1992-12, 1998-05, 2000-12, 2002-12, 2006-10, 2010-04, 2012-09, 2015-08, 2016-09

Regulatory references

The following documents refer to the text in such a way that some parts of them or all of their content are requirements of this document. In the case of dated references, only the version quoted shall apply

DIN 1960, VOB Procurement and Procurement Regulations for Construction Services — Part A: General provisions for the award of construction services

DIN 1961, VOB Procurement and Contract Regulations for Construction Services — Part B: General Terms and Conditions of Contract for the Performance of Construction Services

DIN 4074 (all parts), Wood sorting according to bearing capacity

DIN 4420-1, Working and protective scaffolding — Part 1: Protective scaffolding — Performance requirements, design, manufacture and design

DIN 4420-3, Working and protective scaffolding — Part 3: Selected types of scaffolding and their standard designs

DIN 4426, Maintenance equipment for construction installations — Safety requirements for workplaces and traffic routes — Planning and execution

DIN 18299, VOB Procurement and Procurement Regulations for Construction Services — Part C: General Conditions of Technical Contracts for Construction Services (ATV) — General Regulations for Construction Work of All Kinds

DIN 18920, Vegetation technology in landscaping — Protection of trees, plant populations and vegetation areas during construction work

DIN EN 39, System-independent steel tubes for use in work supports and scaffolding — Technical terms and conditions of delivery

DIN EN 74-1, Couplings, centering bolts and base plates for work scaffolding and support towers — Part 1: Pipe fasteners — Requirements and test methods

DIN EN 1004-1, Mobile work platforms of prefabricated components — Part 1: Materials, dimensions, load assumptions and safety requirements

DIN EN 1004-2, Mobile work platforms — Part 2: Rules and specifications for establishing instructions for assembly and use

DIN EN 1065, Steel brackets with sliding device — Product specifications, design and verification by calculation and testing

DIN EN 1263 (all parts), Temporary construction of buildings — Safety nets

DIN EN 12810 (all parts), façade scaffolding made of prefabricated parts

DIN EN 12811 (all parts), Temporary structures for buildings

DIN EN 12812, Support — Requirements, design and design

DIN EN 12813, Temporary structures — Column towers made of prefabricated components — Special design methods

DIN EN 16508, Temporary structures for structures — Enclosure structures — Performance requirements, design, workmanship and design

Content

0 Notes on preparing the service description

These notes supplement ATV DIN 18299 "General Regulations for Construction Work of All Kinds", section 0. Compliance with these instructions is a prerequisite for the correct

description of the service in accordance with §§ 7 et seq., §§ 7 EU et seq. and §§ 7 VS ff. VOB/A.

The information does not form part of the contract.

Depending on the requirements of the individual case, the specifications must indicate in particular:

0.1 Information about the construction site

0.1.1 Type and condition of spaces and points reserved for scaffolding for load-bearing or load-bearing, e.g. load-bearing capacity of the base surface and components available for load absorption or transport**.**

0.1.2 Restrictions on the location and size of the pavilion space.
0.1.3 the type and extent of existing development in the areas to be cleared for the scaffolding.
0.1.4 Other people's land use.
0.1.5 Construction of construction wells.
0.1.6 Aggravating circumstances, e.g. fittings and openings to be bridged, installation on roofs and stairs.
0.1.7 Transport difficulties, e.g. due to unpaved roads, narrow steps and walkways, transport through small openings.
0.1.8 Information on the length and nature of horizontal and vertical transport routes from the point of unloading to the scaffolding contact area.
0.1.9 Walkability and resistance to breaks of parts and ceilings.
0.1.10 Type, location and carrying capacity of anchorage points for protective nets and personal protective equipment**.**
0.1.11 Dimensions of the surfaces and components to be constructed, in particular with regard to horizontal and vertical structures with projections and recesses, cornices, cantilever plates and the like, in all phases of construction and including corresponding height specifications for the construction phases. If available, lifting and sectional drawings or digital models of the surfaces and components to be constructed.
0.1.12 Type and nature of anchor soil.
0.1.13 Restrictions on the position of anchorage points, e.g. on the protection of monuments.
0.1.14 Information on anchorage points available in situ, e.g. fixed anchorage devices.
0.1.15 Connections and anchors to adjacent structures.
0.1.16 Information on the necessary public law permits and measures taken on site, e.g. to provide a place for public traffic and traffic on site.

0.1.17 Nature, location and dimensions of contact surfaces for lifting and access technology.

0.2 Detailed rules for implementation

0.2.1 Number, location, dimensions and design of the scaffolding, e.g. standing scaffolding oriented lengthwise or area, support scaffolding, suspended scaffolding, suspended platforms or climbing platforms. In the case of weatherproof roofs, additional roof step and roof overhangs.

0.2.2Distance between the structure and the scaffolding covering, especially in the case of heat-insulating composite systems and multilayer façade structures, if deviations from technical regulations, as well as necessary protective equipment, e.g. scaffolding extensions, internal railings.

0.2.3Number, arrangement and height of scaffolding and corner drawings.

0.2.4 the number, type, location, dimensions and intended use of stairways, scaffolding, staircases, lifts and similar ladders.

0.2.5 Intended use, description of the operations to be performed from the scaffolding.

0.2.6 Information on load and width categories or system widths required widening and, where appropriate, clear height categories.

0.2.7 In the case of protective scaffolding, the classification of entrapment layers and protective walls.

0.2.8 In the case of scaffolding and supports, the load envisaged.

0.2.9 In the case of shelters, altitude, visibility and type of cover.

0.2.10 Equipment for transporting materials and components, e.g. lift arms, folding platforms.

0.2.11 Special requirements and loads, e.g. from individual loads, lifts, hoists, rubble pipelines, special lining, material storage.

0.2.12 Special type of anchorage and anchorage points. Number, type and location of fixed scaffolding anchors. Observance of certain mesh dimensions. Type and design of anchorage in heat-insulating composite systems as well as in multilayer substrates, e.g. anchoring to the ventilation shell, bracket anchors, through holes.

0.2.13 Information on the stability of scaffolding, e.g. supports for independent scaffolding, ballasts and cargo services.

0.2.14 Type of scaffolding lining, e.g. tarpaulins, nets and their intended use.

0.2.15 Scaffolding for special structures and fittings, e.g. chimneys, roof structures, machinery.

0.2.16 Assembly and dismantling in whole or in parts

0.2.17 Start and expected duration of the transfer of the financial year.

0.2.18 Transfer of use in whole or in part.

0.2.19 Modifications to be made to the scaffold by the contractor upon transfer of use.

0.2.20 Early or later production of parts of the service, e.g. conversion, partial dismantling.

0.2.21 Protection of structural or plant elements, furniture and the like.

0.2.22 Type and extent of corrosion protection required for steel components incorporated in the structure to be scaffolded (see point 2.3), e.g. anchorage elements.

0.2.23 Specifications resulting from structural engineering verifications as well as expert reports (e.g. static, fireproof, heat and sound insulation as well as hazardous substances).

0.3 Details in case of deviation from the ATV

0.3.1 If regulations other than those provided for in this ATV are to be adopted, these must be clearly and individually stated in the service description.

0.3.2 Derogating regulations may be considered in particular in the case of:

Section 3.4 if not all work layers are to be equipped with scaffolding in the case of standing scaffolding oriented lengthwise (façade scaffolding) and in the case of standing scaffolding with area-oriented scaffolding layers (spatial scaffolding) and movable scaffolding, more than one working layer shall be fitted with scaffolding**;**

Section 3.5 if scaffolding is to be coated

Section 3.6, if the contractor is to lower the support,

Section 3.10, if anchorage elements, e.g. pins, must be removed from the structure to be installed when dismantling the scaffolding,

Section 3.10, if the openings created by the anchorage element are to be closed by the contractor,

point 5.4.3 if other arrangements for transfer of use are to be envisaged.

0.4 Individual information on extras and special benefits

There is no supplemental regulation to ATV DIN 18299, section 0.4.

0.5 Charging units

In the quantity account, the units of invoicing must be provided as follows:

0.5.1 Area (m2), separated by type of construction and intended use, for

— Standing scaffolding with layers of scaffolding oriented lengthwise (façade scaffolding), additionally separated according to load and width categories,
— scaffolding of specially designed structures and fittings,

— suspended scaffolding, suspended and climbing platforms,
— Weather protection roofs, support scaffolding for weather protection roofs,
— Support
— Scaffolding.

0.5.2 Volume dimensions (m3), separated according to type of construction, intended use and loads, for

— Standing scaffolding with surface-oriented scaffolding (spatial scaffolding),
— Load-bearing scaffolding.

0.5.3 Measure of length (m), divided according to type and intended use, for

— Protective scaffolding, e.g. safety scaffolding, roof scaffolding, roof guards and pedestrian tunnels,
— suspended scaffolding,
— support scaffolding,
— Catwalks
—Scaffolding stairs and stairway towers (height measurement),
— Bridging
— Internal railings, side guards,
— Extension of scaffolding,
— load diversion services, e.g. horizontal, vertical or diagonal supports and base extensions.

0.5.4 Number (pcs), broken down by type and intended use, for

— Standing scaffolding with layers of scaffolding oriented lengthwise (façade scaffolding), additionally separated according to load and width categories,
— Standing scaffolding with surface-oriented scaffolding (space scaffolding), additionally separated according to loads,
— protective scaffolding,
— suspended scaffolding, suspended and climbing platforms,
— movable scaffolding,
— Weather protection roofs, support scaffolding for weather protection roofs,
— Support towers, support towers,
— Bridging
— scaffolding stairs and staircases, staircases,

— Special scaffolding structures, e.g. in lift shafts, for turret structures, covers, fences, scaffolding of specially designed structures and fittings,
— fixed scaffolding anchors,
— special anchorage elements, e.g. special scaffolding anchors,
— Uncoated scaffolding extensions, e.g. arms,
— Cargo services, e.g. horizontal, vertical or diagonal supports and base extensions.

0.5.5 Pricing units combined with time unit for transfer of use (m2Wo, m3Wo, mWo, StWo)

— In the event of a transfer of use, the charging unit must also be marked with a time unit.

1 Scope

1.1 ATV DIN 18451 "Scaffolding Works" applies to assembly, conversion and disassembly as well as to use of scaffolding and platforms required as auxiliary structures for the execution of building works of any kind.

1.2 In addition, ATV DIN 18299 "General regulations for construction work of all kinds", sections 1 to 5, applies. In case of contradictions, the regulations of ATV DIN 18451 prevail.

2. Fabrics, accessories

In addition to ATV DIN 18299, section 2, the following applies:

2.1 The service also includes recharging and removal of related materials and components.

2.2 For the most common substances and ingredients, DIN standards and other requirements are listed below.
DIN 4074 (all parts) Wood sorting according to bearing capacity
DIN 4420-1 Working and protective scaffolding — Part 1: Protective scaffolding — Performance requirements, design, manufacture and design
DIN 4420-3 Working and protective scaffolding — Part 3: Selected types of scaffolding and their standard designs
DIN 4426 Civil engineering maintenance equipment — Safety requirements for workplaces and traffic routes — Design and execution
DIN EN 39 Non-systemic system steel pipes for use in work supports and scaffolding — Technical delivery conditions
DIN EN 74-1 Couplings, centering bolts and base plates for work scaffolding and support towers — Part 1: Pipe fasteners — Requirements and test methods

DIN EN 1004-1 Mobile working platforms of prefabricated components — Part 1: Materials, dimensions, load assumptions and safety requirements
DIN EN 1004-2 Mobile work platforms — Part 2: Rules and specifications for drawing up assembly and use instructions
DIN EN 1065 Steel Brackets with Expandable Device — Product Identification, Design and Verification by Calculation and Testing
DIN EN 1263 (all parts) Temporary construction of buildings — Safety nets
DIN EN 12810 (all parts) Facade scaffolding made of prefabricated parts
DIN EN 12811 (all Parts Temporary construction of buildings
DIN EN 12812 Support — Requirements, design and design

DIN EN 12813 Temporary structures — Column towers made of prefabricated elements — Special design methods

DIN EN 16508 Temporary construction of buildings — Fencing structures — Performance requirements, design, construction and dimensioning
2.3 The steel anchorage elements incorporated into the structure to be installed shall be protected at least from corrosion.

3.Implementation
In addition to ATV DIN 18299, section 3, the following applies:
3.1 Endangered trees, plant populations and vegetation areas must be protected; DIN 18920 "Germination Technology in Landscaping — Protection of Trees, Stands of Plants and Vegetation Areas During Construction Measures" must be observed. Such protective measures are special services (see section 4.2.1).
3.2 The following shall apply to scaffolding:
— in the case of work scaffolding, protective scaffolding, e.g. safety scaffolding, roof scaffolding, roof protectors and movable scaffolding, DIN 4420-1 and DIN 4420-3 and DIN EN 12810 (all parts) and DIN EN 12811 (all parts),
— in the case of support scaffolding, DIN EN 12812,
— for enclosure constructions DIN EN 16508,
— in the case of mobile work platforms, DIN EN 1004-1 and DIN EN 1004-2.

3.3 In particular, concerns can be taken into account under Section 4(3) of the VOB/B:
— greater soil unevenness,
— non-carrier or frozen substrate,
— lack or insufficient anchorage capacity,
— lack of levelling and levelling of the ground for support,
— Inadequate equipment and safety of traffic areas, e.g. access roads, work preparation areas, storage areas for scaffolding
— lack of licences to use public transport facilities,
— inappropriate conditions due to weather and indoor climatic conditions, e.g. wind, ice, slippery snow, heavy rain, heat.

3.4 In the case of standing scaffolding with layers of scaffolding oriented lengthwise (façade scaffolding), all working mats shall be equipped; in the case of standing scaffolding with layered scaffolding oriented to the area (space scaffolding) and movable scaffolding, a working layer shall be equipped with scaffolding.

3.5 Scaffolding shall be produced without scaffolding.

3.6 Lowering the support is not the responsibility of the contractor. The contractor must deliver to the customer the operating instructions for the descent system

3.7 The scaffold shall be in a condition suitable for use in accordance with the contract for remuneration. It shall be kept in such condition for the duration of the contract (see section 4.1.8).

3.8 The Customer must ensure that scaffolding is handled with care and care and that everything that may lead to change or deterioration of the scaffolding no longer covered by conventional use is omitted, e.g. removal or damage to scaffolding components, removal of protective devices.

3.9 If the scaffolding parts are damaged or lost during the period of availability for use, the Contractor must notify the Customer in writing without delay, at the latest before dismantling the scaffolding.

3.10 Anchor elements, e.g. pins, which have been installed in the structure to be constructed must remain there after the scaffolding has been dismantled and the opening created by the anchor element will not be closed by the contractor.

4 Ancillary services, special services

4.1 In addition to ATV DIN 18299, section 4.1, ancillary services are in particular:

4.1.1 Protection of building elements and installations and their access against damage during the assembly, alteration and dismantling of scaffolding.

4.1.2 Submission of type-approvals or approvals.

4.1.3 Delivery of instructions for use (use plan).

4.1.4 Installation of base plates and installation of support boards under the base points of scaffolding for work and protection scaffolding.

4.1.5 Construction of a staircase per scaffolding up to 50 m long for each additional 50 m length of scaffolding or part thereof, construction of an additional staircase

4.1.6 Installation of the anchorage elements necessary for fixing the scaffolding and removal of those parts which must not remain in the structure in accordance with paragraph 3.10 when dismantling the scaffolding, except for services in accordance with paragraph 4.2.21.

4.1.7 One-time instructions of the customer or a person designated by him and delivery of operating instructions for the delivery of descent systems, climbing platforms, lifts and mobile work platforms.

4.1.8 Testing, maintenance and repair of the scaffolding with regard to technical wear.

4.2 In addition to ATV DIN 18299, section 4.2, special services include:

4.2.1 Cleaning of the area for staging areas of scaffolding. Protection and pruning of plants and trees.

4.2.2 Obtaining the necessary permits under public law, e.g. in accordance with the Building Law, the Highway Code, the Water Law, the Commercial Law.

4.2.3 Assumption of fees and costs for the building permit, for the receipt of the scaffolding and for the permits in accordance with section 4.2.2.
4.2.4 Road safety work for the regulation, management and safety of public road traffic.

4.2.5 Costs for the use of building parts and land of third parties.

4.2.6 Preparation of technical verifications as well as static calculations and drawings required for verification, except for services in accordance with section 4.1.2.

4.2.7 Elimination of substrate defects.

4.2.8 Construction and removal of auxiliary foundations.

4.2.9 Protection against damage to buildings, parts of buildings, installations and their accesses when using scaffolding.

4.2.10 Construction of further ladders beyond the number required by point 4.1.5.

4.2.11 Erection of staircase scaffolding, staircases, lifts and transport platforms.

4.2.12 Erection of part and dismantling of the scaffolding.

4.2.13 Cladding scaffolding and measures to absorb additional loads.

4.2.14 Scaffolding extensions and protective devices, e.g. for safety and roof scaffolding

4.2.15 Changes to scaffolding made in accordance with the contract, as well as restoration of the contractual term in case of improper use or impact, e.g. unauthorized changes, misuse, damage (see sections 3.7 and 3.8).

4.2.16 Inspections, maintenance and repairs going beyond the services specified in section 4.1.8, e.g. in the case of longer periods of non-use, scaffolding changes and natural disasters.

4.2.17 Erection of self-contained scaffolding.

4.2.18 Bridging, ballast and services for cargo diversion measures.

4.2.19 Removal of formwork that is not part of the contractor's service

4.2.20 Displacement of scaffolding anchorages.

4.2.21 Installation of permanent scaffolding anchors. Installation and removal of special anchorage elements.

4.2.22 Closing recesses and anchor holes.

4.2.23 Cleaning and cleaning of scaffolding from coarse contaminants, waste and residues of all kinds, where proper dismantling, storage or reuse is not possible without these preliminary services.

4.2.24 Removal of ice and snow on scaffolding and weather protection roofs.

4.2.25 Additional directives if they go beyond the provisions of point 4.1.7.

5 Account
In addition to ATV DIN 18299, section 5, the following applies:
5.1 General

5.1.1 According to points 5.1.5 and 5.1.6, the determination of performance – regardless of whether it is carried out according to drawings, digital models or measurements – must be based on the technically required dimensions on the outside of the scaffolding construction.

5.1.2 Assembly, modification, dismantling and transfer of use shall be invoiced separately.

5.1.3 Pricing shall be made separately according to the type of scaffolding and the agreed intended use. In the case of combined types of scaffolding, the corresponding type of scaffolding shall be calculated in accordance with points 5.2.1 to 5.2.7.

5.1.4 Scaffolding additions, e.g. scaffolding, scaffolding extensions, protective devices, bridges, scaffolding stairs and stairway towers shall be invoiced separately and separately from scaffolding.

5.1.5 A scaffolding surface is defined as areas resulting from the technically required lengths and heights of the scaffolding on the external sides of the scaffolding construction.

5.1.6 Technically required lengths and heights are those specified by technical building regulations, technical regulations and regulations, as well as dimensions resulting from specifications from structural engineering tests (e.g. static, fire protection and sound insulation

5.1.7 The height of scaffolding shall be calculated on the basis of their standing area.

5.1.8 The standing surface of the scaffolding is the area covered by the scaffold between the points of introduction of loads from the scaffold into the structure, subsoil or independent scaffolding or supporting structures.

5.1.9 In addition, simplification rules, such as overmeasurement rules and individual regulations, should be applied to determine benefits.

5.2 Determination of dimensions/quantities

5.2.1 Standing scaffolding with layers of scaffolding oriented lengthwise (façade scaffolding) When pricing upright scaffolding oriented lengthwise (façade scaffolding), the scaffolding area shall be calculated as follows:

5.2.1.1 The length shall be calculated as the longest horizontal unfolding on the scaffold outside the scaffold, at least 2,5 m. The length may be derived, for example, from the specified width category and the specified distance between the structure and the scaffolding deck.

5.2.1.2 The height shall be calculated from the stationary area of the scaffolding to the upper deck surface, plus 2 m.

5.2.1.3 If the scaffolding is erected or dismantled in parts in terms of height, the height per section shall be calculated from the base of the scaffolding to the upper floor of the scaffolding, plus 2 m and minus the height dimension of the section previously calculated. If scaffolding is erected or dismantled lengthwise into sections, the subsection shall be calculated in accordance with paragraph 5.2.1.1.

5.2.2 Standing scaffolding with area-oriented scaffolding layers (spatial scaffolding)

5.2.2.1 In the case of subsidence of standing scaffolding with layered scaffolding oriented to the area (space scaffolding) depending on the dimensions of the space, the lengths and widths of the scaffolding shall be calculated at the greatest horizontal growth on the outer sides of the scaffolding. The lengths and widths required to carry out the work or resulting from the scaffolding system shall be decisive for this.

5.2.2.2 The height shall be calculated from the base of the scaffolding continuously to the maximum deck area plus 2 m.

5.2.3 Suspended scaffolding

5.2.3.1 In the case of subsidence of suspended scaffolding with layers of scaffolding oriented lengthwise according to area measurements, the length on the outer sides of the scaffolding and the height from the top of the lowest deck surface to the maximum load application point of the suspended scaffolding, at least up to the maximum deck area plus 2 m, shall be calculated.

5.2.3.2 When pricing suspended scaffolding with area-oriented scaffolding according to area measurements, deck dimensions shall be calculated. The lengths and widths required by the scaffolding system or those resulting from the scaffolding system shall be decisive for this.

5.2.4 Suspended and climbing platforms

If the suspended and climbing platforms are priced according to the measure of the area, the area is calculated as follows:

5.2.4.1 The length shall be calculated to be the technically required length of the tent of at least 2,5 m.

5.2.4.2 The height shall be calculated from the top of the lower platform layer to the position of the upper tent plus 2 m.

5.2.5 Support

5.2.5.1 Where support is priced according to the size of the room, the length and width of the scaffolding shall be calculated at the largest horizontal growth on the outside of the scaffolding. The lengths and widths required by the scaffolding system or those resulting from the scaffolding system shall be decisive for this. The formwork surfaces shall be considered as covering surfaces.

5.2.5.2 In the case of bridge support, the width between the outer edges of the superstructure, the length between the abutments without removing intermediate piers and columns shall be calculated**.**

5.2.5.3 The support height shall be calculated from the base of the scaffolding to the top of the scaffolding support layer.

5.2.6 Weather protection roofs, support scaffolding

5.2.6.1 Weatherproof roofs and their support scaffolding shall be calculated separately.

5.2.6.2 When pricing support scaffolding for weather protection roofs according to the dimensions of the area, the visible areas of the technically required scaffolding shall be taken as a basis. The corresponding length shall be calculated on its maximum unfolding, measured on the outside of the scaffolding, and the height from the base to the top of the supports for the protective roof

5.2.6.3 If weather protection roofs are charged according to the measure of area, the roof area of the protective roof shall be calculated.

5.2.7 Scaffolding additions

5.2.7.1 The widening of scaffolding by means of brackets for the installation and conversion of fittings shall be charged in addition to scaffolding according to the measure of length, e.g. for cornices, niches, gutters. For the determination of the length dimension, the technically required length shall be calculated at the largest growth at the free end of the deck of the scaffolding extension.

5.2.7.2 The widening of scaffolding, e.g. by means of scaffolding panels, for the installation and conversion of fittings shall be charged in addition to scaffolding, e.g. for roof overhangs, niches and balconies. In the case of metered area pricing, the technically required length of scaffolding openings and the height from the stand surface to the upper pavement area shall be calculated; plus 2 m. In the case of pricing according to the length measure, the technically required length of the scaffolding openings is calculated.

5.2.7.3 Protective devices, e.g. additional lateral protection, safety scaffolding, roof scaffolding, protective roof, pedestrian tunnel, shall be priced according to the length additional to the scaffolding. By way of derogation from point 5.1.1, the technically required length of the protective device for determining the measurement of length shall be calculated.

5.2.7.4 When determining the dimensions of the scaffolding lining, the dimensions of the actual cladding area shall be taken as a basis.

5.2.7.5 When determining bridging and cantilever dimensions, e.g. in the case of openings, roofs, parts of buildings, extensions, passages, the technically required length between external load application points shall be calculated on the basis of the measure of length.

5.2.7.6 When determining the dimensions of components for cargo transport, e.g. for horizontal, vertical and diagonal supports or mesh beams, the technically required length of the components between load application points shall be calculated at the time of billing according to the length measure.

5.2.7.7 If scaffolding stairs and stair towers are charged according to the construction height, the height from the staging area of the stairs to the upper exit plus 2 m shall be calculated.

5.3 Overmeasurement rules

5.4.1 Single aperture scaffolding

In the case of scaffolding of small surfaces and components and in the case of single-span scaffolding, the length shall be calculated at least 2,5 m when invoiced according to the area measure. The height is calculated from the base of the scaffolding to the upper deck surface, plus 2 m

5.4.2 Scaffolding of specially designed structures and components

When pricing scaffolding for specially designed structures and fittings, e.g. tower tops, pylons, wind turbine foundations, according to the area measure, the length at the largest horizontal growth on the outer sides of the scaffold and the height from the upright surface of the scaffolding to the maximum deck surface plus 2 m shall be calculated.

5.4.3 Transfer of use

5.4.3.1 The transfer of use shall commence on the contractually agreed date, in the case of early use on the day of the first use. This shall also apply to the transfer of use in parts.

5.4.3.2 The transfer of use ends with the release in text form by the Customer for dismantling by the Contractor, but not earlier than three working days after receipt of the notice of release by the Contractor.

5.4.3.3 The duration of the transfer of the use – except for support scaffolding – shall be calculated per week or part thereof. In the case of a different agreed settlement unit for the transfer of use (e.g. m2Mo), the calculation shall be made per unit of time or part thereof.

5.4.3.4 In the case of support, the duration of the maintenance period, consisting of supply at the earliest on the scheduled date, as well as assembly time, customer use and dismantling time, shall be calculated according to calendar days.