



Exploration & Production

GENERAL SPECIFICATION

CIVIL WORKS

GS EP CIV 202

Drainage and underground networks

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03	10/07	Update of references, modification of § 5 and 6
02	10/05	Addition of "EP" root to GS identification
01	09/03	Change of Group name and logo
00	11/01	First issue
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1. Scope

The general specifications define what the COMPANY considers as an acceptable minimum. However some supplies and/or works may present special problems.

In this case, the COMPANY reserves the right to change or supplement the general specifications by means of particular specifications.

The present specification applies to the works and/or supplies for drainage and underground networks. It does not apply to the gas systems, heat distribution, instrumentation and other industrial fluids.

2. Reference documents

The reference documents listed below form an integral part of this General Specification. Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published at the EFFECTIVE DATE of the CONTRACT.

When local national standards, regulations and codes exist, all design, engineering, materials and construction shall conform to their latest requirements, which complete or modify the present specifications.

In case of lack of obligatory local national standards, international norms and standards will be applied.

In case of lack of international norms and standards, national norms and standards listed hereafter will be applied.

In all cases the system adopted shall be coherent, i.e. the various texts shall present no incompatibility. Any dispute shall be resolved by basing works on the most stringent text for the CONTRACTOR and at his expense.

The list of specifications and norms quoted is not exhaustive: the CONTRACTOR shall respect the secondary standards and regulations, which cover the works described in the present specification.

Certain specifications and norms may be indicated with an issue date. This is for information only and on the understanding that the most recent issue shall be used.

Standards

International standards and codes

Reference	Title
IEC 60364	Low voltage electrical installations - Parts 1 to 5

European standards and codes

Reference	Title
EN 1997-1	Eurocode 7 - Calcul géotechnique. Partie 1 - Règles générales (Geotechnical design. Part 1: General rules)
EN 1993 - 4 – 2	Eurocode 9 - Calcul des structures en acier. Partie 4 - 3. Canalisations (Steel structures design - Part 4-3: Piping)
EN 124	Gully tops and manhole tops for vehicular and pedestrian areas. Design requirements, type testing, marking, quality control
EN 295	Vitrified clay pipes and fittings and pipe joints for drain and sewers
EN 512	Fibre-cement products. Pressure pipes and joints
EN 545	Ductile iron pipes, fittings, accessories and their joints for water pipelines. Requirements and tests methods
EN 598	Ductile iron pipes, fittings, accessories and their joints for sewerage applications. Requirements and tests methods
EN ISO 6259-1	Plastics piping and ducting systems. Thermoplastics pipes. Determination of tensile properties
EN 639	Common requirements for concrete pressure pipes including joints and fittings
EN 640	Reinforced concrete pressure pipes and distributed reinforcement concrete pressure pipes (non-cylinder type), including joints fittings
EN 641	Reinforced concrete pressure pipes, cylinder type, including joints and fittings
EN 642	Prestressed concrete pressure pipes, cylinder and non cylinder, including joints, fittings and specific requirement for prestressing steel for pipes
EN 712	Thermoplastics piping systems. End-load bearing mechanical joints between pressure pipes and fittings. Test method for resistance to pull-out under constant longitudinal force
EN 713	Plastics piping systems. Mechanical joints between fittings and polyolefin pressure pipes. Test method for leaktighness under internal pressure of assemblies subjected to bending
EN 714	Thermoplastics piping systems. Non-end-load bearing elastomeric sealing ring type joints between pressure pipes and moulded fittings. Test method for leaktighness under internal hydrostatic pressure with end thrust
EN 715	Thermoplastics piping systems. End-load bearing joints between small diameter pressure pipes and fittings. Test method for leaktighness under internal water pressure, including end thrust

Reference	Title
EN 752	Drain and sewer systems outside buildings)
EN 1610	Construction and testing of drains and sewers
EN 1852-1	Plastics piping systems for non-pressure underground drainage and sewerage. Polypropylene (PP). Part 1: Specifications for pipes, fittings and the system

French standards and codes

Reference	Title
CCTG Fascicule n° 70	Canalisations d'assainissement et ouvrages annexes Drainage pipes and auxiliary works
CCTG Fascicule n° 71	Fourniture et pose de conduites d'adduction et de distribution d'eau Supply and installation of water pipes
Circulaire n° 77.284	Instruction technique relative aux réseaux d'assainissement des agglomérations Technical instruction related to the drainage systems of towns
NF A 48-902	Foundry products. Ductile iron pipes for pressure pipelines. Centrifugal cement mortar internal lining. Composition controls of freshly applied mortar
NF EN 10224	Steel tubes. Welded tubes intended to be coated or protected for use in water piping systems. Dimensions. Technical delivery conditions
NF C 15-100	Low voltage electrical installations
NF P 16-341	Drainage, sewerage. Precast concrete cylindrical pipes, steel reinforced or not reinforced for sewerage networks without pressure. Definitions, specifications, testing methods, marking, basis for acceptance
EN 1916	Concrete pipes and fittings, unreinforced, steel fibre and reinforced
NF P 16-345-2	Concrete pipes and fittings, unreinforced, steel fibre and reinforced - Part 2 : national specification
NF P 16-342	Drainage, sewerage. Precast concrete elements of manholes for sewerage networks. Definitions specifications, testing methods, marking, basis for acceptance

Reference	Title
EN 1917	Concrete manholes and inspection chambers, unreinforced, steel fibre and reinforced
NF P16-346-2	Concrete manholes and inspection chambers, unreinforced, steel fibre and reinforced - Part 2 : National specification
NF -DTU 60.31	Building works - Unplasticized polyvinyl chloride piping installation - Cold water under pressure - Technical specifications
NF -DTU 60.33	Building works - Unplasticized polyvinyl chloride piping installations - Waste water drainage - Technical specifications
NF P 98-050	Products in manufactured concrete. Prefabricated telecommunications chambers in reinforced concrete. Definitions, characteristics, specifications, tests, marking
NF S 61-213	Pillar fire hydrants
NF -EN 1329	Plastics. Un-plasticized pipes and fittings for domestic water drainage installations. Specifications
NF T 54-030	Plastics. Un-plasticized fittings for domestic water drainage installations. Specifications
EN 12201	Plastics. Polyethylene pipes for drinking water supply networks. Specifications and test methods
NF T 54-071	Plastics. Low density polyethylene PE 32 pipes for drinking water services. Specifications and test methods
NF T 54-951	

American standards and codes

Reference	Title
AASHTO HDG	Highway drainage guidelines
ASTM A 716	Specification for Ductile Iron Culvert Pipe
ASTM A 758/A 758M	Specification for Wrought carbon Steel Butt-Welding Piping Fittings with Improved Notch Toughness
ASTM A 760/A 760M	Specification for Corrugated Steel Pipe, Metallic-Coated for Sewers and Drains
ASTM A 796	Practice for Structural design of Corrugated Steel Pipe, Pipe-Arches, and Arches for Storm and Sanitary Sewers and Other Buried Applications
ASTM A 807/A 807M	Practice for Installing of Corrugated Steel Structural Plate Pipe, for Sewers and Other Applications
ASTM A 862	Practice for Application of Bituminous (Asphalt) Coatings to Corrugated Steel Sewer and Drainage Pipe
ASTM A 888RA	Specification for Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drains, Waste, and Vent Piping Applications
ASTM C 12	Practice for Installing Vitrified Clay Pipe Lines

Reference	Title
ASTM C 76	Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
ASTM C 118M	Specification for Concrete Pipe for Irrigation and Drainage
ASTM C 444M	Specification for Perforated Concrete Pipe
ASTM C 506M	Specification for Reinforced Concrete Arch Culvert, Storm Drain, and Sewer Pipe
ASTM C 507M	Specification for Reinforced Concrete Elliptical Culvert, Storm Drain, and Sewer Pipe (Metric)
ASTM C 508	Specification for Asbestos-Cement Underdrain Pipe
ASTM C 654M	Specification for Porous Concrete Pipe (Metric)
ASTM C 655M	Specification for Reinforced Concrete D-Load Culvert, Storm Drain, and Sewer Pipe (Metric)
ASTM C 891	Practice for Installing of Underground Precast Concrete Utility Structures
ASTM C 924	Practice for Testing concrete Pipe Sewer Lines by Low-Pressure Air Test Method (Metric)
ASTM C 969	Practice for Infiltration and Exfiltration Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines
ASTM C 1091	Test Methods for Hydrostatic Infiltration and Exfiltration Testing of Vitrified Clay Pipe Lines
ASTM C 1103	Practice for Joint Acceptance Testing of Installed Concrete Pipe Sewer Lines
ASTM C 1119	Test Method for Vacuum Drainage of Asbestos-Cement Mixes
ASTM C 1214	Test Method for Concrete Pipe Sewer Lines by Negative Air Pressure (Vacuum) Test Method
ASTM C 1244	Test Method for Concrete Sewer Manholes by Negative Air Pressure (Vacuum) Test
ASTM D 2321	Practice for Underground Installation of Flexible Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
ASTM D 2665	Specification for Poly(Vinyl Chloride)(PVC) Plastic Drain, Waste and Vent Pipe and Fittings
ASTM D 3311	Test Method for Flexibility of Hot-melt Adhesive by Mandrel Bend Test Method
ASTM D 4491	Test Method for Water Permeability of Geotextiles by Permittivity
ASTM D 4716	Test Method for Determining the (in-Plane) Flow Rate Per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head
ASTM D 4833	Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products

Reference	Title
ASTM D 5013	Practices for Sampling Wastes from Pipes and Other Point Discharges
ASTM D 5141	Test Method for Determining Filtering Efficiency and Flow Rate of Geotextile for Silt Fence Application Using Site-Specific Soil
ASTM D 5493	Test Method for Permittivity of Geotextiles Under Load
ASTM D 5496	Practice for in Field Immersion Testing of Geosynthetics
ASTM D 5567	Test Method for Hydraulic Conductivity Ratio (HCR) Testing of Soil/Geotextile Systems
ASTM D 6088	Practice for Installation of Geocomposite Pavement Drains
ASTM F 405	Specification for Corrugated Polyethylene (PE) Tubing and Fittings
ASTM F 645	Guide for Selection, Design, and Installation of Thermoplastic Water Pressure Piping Systems
ASTM F 667	Specification for Large Diameter Corrugated Polyethylene Tubing and Fittings
ASTM F 758	Specification for Smooth Wall Poly(Vinyl Chloride)(PVC) Plastic Underdrain Systems for Highway, Airport and Similar Drainage
ASTM F 892	Specification for Polyethylene (PE) Corrugated Pipe with Smooth Interior and Fittings
ASTM F 949	Specification for Poly(Vinyl Chloride)(PVC) Corrugated Sewer Pipe with Smooth Interior and Fittings
ASTM F 1412	Specification for Polyolefin Pipe and Fittings for Corrosive Waste Drainage System
ASTM F 1417	Test for Installation Acceptance of Plastic Gravity Sewer Lines Using Low-Pressure Air
ASTM F 1668	Guide for Construction Procedures for Buried Plastic Pipe

British standards and codes

Reference	Title
BS 1196	Specification for clayware field drain pipes and junctions
BS 1247	Manhole steps
BS 1832	Specification for compressed asbestos fibre jointings
BS 2633	Specification for class 1 arc welding of ferritic steel pipework for carrying fluids
BS 2782	Method of testing thermoplastics pipes, fittings and valves
BS EN 1452	Specification for unplasticized polyvinyl (PVC-U) pressure pipes for cold potable water

Reference	Title
BS EN 588-1	Fibre-Cement Pipes for Sewers and Drains Part 1: Pipes, Joints and Fittings for Gravity Systems
BS EN 588-2	Fibre Cement Pipes for Drains and Sewers - Part 2: Manholes and Inspection Chambers
BS 3974	Specification for pipes supports
BS 4346	Joints and fittings for use with unplasticized PVC pressure pipes
BS 437	Specification for cast iron spigot and socket drain pipes and fittings
BS 4508	Thermally insulated underground pipelines
BS 460	Specification for cast iron rain water goods
BS EN 639	Common requirements for concrete pressure pipes including joints and fittings
BS EN 642	Prestressed concrete pressure pipes, cylinder and non-cylinder, including joints, fittings and specific requirement for prestressing steel for pipes
BS 4660	Thermoplastics ancillary fittings of nominal sizes 110 and 160 for below ground gravity drainage and sewerage
BS 13598-1	Plastics piping systems for non-pressure underground drainage and sewerage Unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE) Part 1: Specifications for ancillary fittings including shallow inspection chambers
BS EN ISO 1167-1	Thermoplastics pipes, fittings and assemblies for the conveyance of fluids Determination of the resistance to internal pressure Part 1: General method
BS EN ISO 1167-2	Thermoplastics pipes, fittings and assemblies for the conveyance of fluids Determination of the resistance to internal pressure Part 2: Preparation of pipe test pieces
BS 4962	Specification for plastic pipes and fittings for use as subsoil field drains
BS EN 124	Gully Tops and Manhole Tops for Vehicular and Pedestrian Areas - Design Requirements, Type Testing, Marking, Quality Control
BS 5114	Specification for performance requirements for joints and compression fittings for use with PE pipes
BS 5254	Specification for PE waste pipes and fitting (ext. diam. 34.6 mm, 41 mm and 54.1 mm)
BS EN 1541-1	Plastics Piping Systems for Soil and Waste Discharge (Low and High Temperature) within the Building Structure - Polypropylene (PP) - Part 1: Specifications for Pipes, Fittings and the System
BS EN 10224	Non-alloy steel tubes and fittings for the conveyance of water and other aqueous liquids Technical delivery conditions