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4. REFERENCE CODES & STANDARDS

The coating shall comply in all aspects with the DIN 30670 Standard, 2012 Edition, "Polyethylene coatings on steel pipes and fittings – Requirements and testing"

Reference shall also been made to the latest edition of the following Standards, Codes and Specifications. The latest edition shall be applicable and shall be the edition in force at the date of Tender submission.

| Code /Std. No | Description |
|----------------------|--|
| ASTM D149 | Standard Test Methods of Dielectric Breakdown Voltage and Dielectric Strength of Solid Electrical Insulating Materials at Commercial Frequencies |
| ASTM D257 | Standard Test Methods for DC Resistance or Conductance of Insulating Materials |
| ASTM D543 | Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents |
| ASTM D570 | Standard Test Method for Water Absorption of Plastics |
| ASTM D638 | Standard Test Method for Tensile Properties of Plastics |
| ASTM D792 | Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement |
| ASTM G42 | Standard Test Method for Cathodic Disbonding of Pipeline Coatings Subjected to Elevated Temperatures |
| ASTM G8 | Standard Test Methods for Cathodic Disbonding of Pipeline Coatings |
| ASTM G62 | Standard Test Methods for Holiday Detection in Pipeline Coatings |
| DIN 30670 | Polyethylene coatings on steel pipes and fittings - Requirements and testing |
| DIN 30678 | Polypropylene coatings on steel pipes and fittings – Requirements and testing |
| DIN EN ISO 1133-1 | DIN EN ISO 1133-1 - Plastics - Determination of the melt mass-flow rate (MFR) and melt volume-flow rate (MVR) of thermoplastics - Part 1: Standard method |
| DIN EN ISO 1133-2 | Plastics - Determination of the melt mass-flow rate (MFR) and melt volume-flow rate (MVR) of thermoplastics - Part 2: Method for materials sensitive to time-temperature history and/or moisture |
| ISO 2808 | Paints and Varnishes - Determination of Film Thickness |

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| ISO 8501-1 | Preparation of steel substrates before application of paints and related products - Visual assessment of surface cleanliness - Part 1: Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous coatings |
| ISO 8502-2 | Preparation of steel substrates before application of paints and related products - Tests for the assessment of surface cleanliness - Part 2: Laboratory determination of chloride on cleaned surfaces |
| ISO 8503-2 | Preparation of steel substrates before application of paints and related products - Surface roughness characteristics of blast-cleaned steel substrates - Part 2: Method for the grading of surface profile of abrasive blast-cleaned steel - Comparator procedure |
| ISO 11124-1 | Preparation of Steel Substrates Before Application of Paints and Related Products - Specifications for Metallic Blast-Cleaning Abrasives - Part 1: General Introduction and Classification |
| NACE SP0394 | Application, Performance, and Quality Control of Plant-Applied, Single-Layer Fusion-Bonded Epoxy External Pipe Coating – Item No. 21064 |
| SIS 055900 | Swedish Standard, Preparation of Steel Substrates Before Application of Paints and Related Products – Visual Assessment of Surface Cleanliness |
| API 5L | Specification for Line pipe |
| API RP 5L1 | Recommended Practice for Railroad Transportation of Line pipe |

5. PLANT SCALE AND INSTALLATION

5.1 Plant Capability

VENDOR shall size the coating plant(s) after evaluating the scale of work and the time schedule required for the works. Coating plant(s) shall be installed into yards whose geometry and dimensions allow the execution of a continuous work schedule. For this purpose the VENDOR shall ensure non-stop work will continue even under severely adverse weather conditions, and when required by the CONTRACTOR. VENDOR shall install equipment and plant in roofed and adequately weather-protected areas.

5.2 Plant Operability

Plant, equipment, machinery and other facilities shall be in first-class operating condition and shall provide coating to the requirements of this Specification, with total reliability.

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5.3 Plant site Approvals

VENDOR shall, at his own responsibility and cost, provide and prepare all necessary areas for the storage of pipe and all other materials, for the coating of pipe, for stock-piling and for other temporary installation. For each area, VENDOR shall arrange servitude agreements as required with the relevant Authorities. On work completion, VENDOR shall clean, restore and pay servitude and claims for damages, as applicable.

VENDOR shall, at its own responsibility and cost, provide water and power supply and other utilities and consumable and obtain authorization regarding access roads and other permits required for the execution of works conforming to all the requirements of the governing Authorities.

5.4 Testing Facilities

VENDOR shall, at its own cost, provide a fully equipped laboratory and test facilities with adequate inventory to carry out tests required for the Coating Procedure Qualification and the Production Coating testing. If tests are to be performed outside the coating plant by third parties, the VENDOR shall state so in its offer, giving details of laboratories/locations where such tests are proposed to be carried out. Only certified testing laboratories shall be used and shall be subject to approval by the CONTRACTOR.

6. MATERIALS

6.1 Materials Approval

The basic materials (i.e. fusion bonded epoxy powder, copolymer adhesive and polyethylene compound) shall have proven compatibility as 3LPE external line pipe coatings. VENDOR shall submit to the CONTRACTOR, or CONTRACTOR's Representative, the proposed material data sheets for approval prior to undertaking the works. The group(s) of compatible materials shall be pre-qualified and approved by the CONTRACTOR in accordance with provision of clause 7.4 of this Specification. VENDOR shall obtain prior approval from CONTRACTOR for the suppliers of all materials.

6.2 Materials Certificates

VENDOR shall obtain from the manufacturer(s) of all materials the relevant certificates of material conformity and test results, and the same shall be submitted to CONTRACTOR for approval prior to their use.

6.3 Materials Identification

All materials to be used shall be suitably marked and identifiable with the following minimum information:-

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- Name of the manufacturer.
- Type of material and product designation.
- Batch Number.
- Date of manufacturing / expiry and storage temperature limits.
- Safety data sheets.
- Relevant manufacturing standards and specification.

All materials noted to be without above identification shall be deemed suspect and shall be rejected by CONTRACTOR. Such materials shall not be used for coating and shall be removed from site and replaced by VENDOR at its cost.

6.4 Batch Information for FBE Material

VENDOR shall obtain from the FBE resin manufacturer the information listed below for each batch of powder produced in a 24-hour interval in one continuous run, designated by a specific batch number assigned by the Coating Manufacturer. Standards for comparison shall be provided for each item. The SUPPLIER to check that no changes have been made in the epoxy formulation will use this information.

- Infra Red scan of powder and typical powder scans for comparison. Infra red spectrograph to be made by using a standard Potassium Bromide (KBr) disc.
- Gel time at recommended application temperature.
- Particle size distribution.

Batch numbers shall segregate coating powder during shipment, storage, and handling. Batches shall be used consecutively during coating application and shall not be mixed except when necessary to keep the coating process continuous.

6.5 Coating Materials Storage

Materials shall be stored, handled and transported in accordance with the Coating Manufacturer's written recommendations. Storage time of materials shall not exceed the shelf life recommended by the Coating Manufacturer.

6.6 Material Substitution

VENDOR shall not substitute alternative materials to those approved by the CONTRACTOR, without the written approval by CONTRACTOR, even though the alternative materials may comply with this Specification.

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6.7 Abrasive Materials

Abrasive materials shall comply with ISO 11124-1:1993 and shall be free from contaminations and shall contain less than 100mg/kg chlorides, and less than 0.3% copper. VENDOR shall maintain records to demonstrate that the levels of chlorides and copper are within the specified limits.

6.8 Materials Sequencing

VENDOR shall be required to use all materials on a date received rotation basis, i.e. first in, first used basis.

7. COATING PROPERTIES AND FUNCTIONAL REQUIREMENTS

7.1 Operating Temperature

The pipe coating shall be suitable for the required duty and service conditions.

The coating must be able to withstand a maximum continuous in-service operating temperature of +60°C and still comply with the performance requirements of this Specification. In open storage finished pipe coating shall be able to withstand exposure in sunlight with a daytime coating temperature of up to 80°C for a period of 12 months without any change detrimental to the performance of the coating.

7.2 Environmental Conditions

The coating materials used shall be fully stabilized against the influence of ultraviolet radiation (i.e. sunlight), oxygen in air and heat (due to environmental temperature as specified above). The material shall fully comply with the performance requirements of this Specification after 12 months exposure at any location in India. In evaluating this condition, particular attention shall be paid to elongation, resistance to peeling, and lack of voids under the coating.

7.3 Properties

7.3.1 Properties of Polyethylene Compound

| Sl. No. | Properties | Unit | Requirement | Test Method |
|---------|---|-----------|----------------------|--------------------------|
| i. | Tensile Strength and Elongation (at break) at +25°C | MPa and % | 12.4 min and 600 min | ASTM D 638 |
| ii. | Melt Index | G/10 min | 0.15-0.80 | ASTM D 1238 or DIN 53735 |

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| Sl. No. | Properties | Unit | Requirement | Test Method |
|---------|--|------------------------|----------------------|------------------------------------|
| iii. | Specific gravity at +25°C | g/cm ³ | 0.925-0.95 | ASTM D 792 |
| iv. | Hardness at +25°C | Shore D | 50 min | ASTM D 2240 |
| v. | Water Absorption, 24 hours, +25°C | % | 0.02 max | ASTM D 570 |
| vi. | Volume Resistivity at +25°C | Ohm-cm | 10 ¹⁵ min | ASTM D 257 |
| vii. | Dielectric withstand, 100 Volt/sec rise at +25°C | Volts | 30,000 min | ASTM D 149 |
| viii. | ESC at 100% Igepal Conc. | Hours | 900 min | ASTM D1693 Condition B (F50) |
| ix. | Thermal stability after 100 days at 100% | % change in Melt Index | 35 max | ASTM D1238 or DIN 53735 |
| x. | Resistance to splitting of 50mm cut | Mm | 2 max | Section 10 |

7.3.2 Properties of Epoxy Powder and Adhesive

VENDOR shall select a brand of epoxy powder and adhesive that will achieve the functional requirements and properties of the coating system as specified in section 7.1 and 7.3.3 respectively, of this Specification. At the time of bidding, VENDOR shall furnish a reference list of epoxy powder and adhesive, having such properties, applied by them in similar coating systems.

| Sl. No. | Properties | Unit | Requirement | Test Method |
|---------|---|---------------------|------------------------------------|-------------|
| i. | Coating porosity | % Coating thickness | 33 max total voids at any location | Section 10 |
| ii. | Sieve analysis | % | 95 between 10micron and 100micron | ASTM D1921 |
| iii. | Volatile content after 2 hours at 105°C | % | 0.5% max | Section 10 |

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7.3.3 Properties of Coating System

| Sl. No. | Properties | Unit | Requirement | Test Method |
|---------|---|--------------------------------------|--|-------------|
| i. | Resistance to Indentation at $23 \pm 2^{\circ}\text{C}$ at $70 \pm 2^{\circ}\text{C}$ | mm | 0.1 max 0.3 max | DIN 30670 |
| ii. | Resistance to Impact (Min of 30 impacts. No holiday allowed when tested at 25 KV.) | Nm per mm of coating thickness | 8 min (for NB <200mm) 7 min (for NB \geq 200mm) | DIN 30670 |
| iii. | Resistance to Peeling. Test Method at $20 \pm 5^{\circ}\text{C}$ At $50 \pm 5^{\circ}\text{C}$ | Kg/cm | 5 min 4 min | DIN 30670 |
| iv. | Elongation due to tearing | % | 600 minimum | DIN 30670 |
| v. | Resistance to Thermal Aging | - | Retain 65% of Melt Index | DIN 30670 |
| vi. | Resistance to exposure to Light | - | Retain 65% of Melt Index | DIN 30670 |
| vii. | 48 hour Cathodic Disbondment Test at 65°C | mm radius of disbondment | 8 max | ASTM G42 |
| viii. | Cathodic Disbondment after 28 days, Test method A at $+60^{\circ}\text{C}$ | mm radius of disbondment | 13 max | ASTM G42 |

7.4 Materials Compatibility

Candidate coating materials are shown in Appendix 1. VENDOR may propose to use any other coating material or combination of coating material. The materials brands offered by VENDOR for coating (i.e. epoxy powder, adhesive and the polyethylene compound) shall have proven compatibility. VENDOR shall, in support of its offered coating system, submit at the time of Tender adequate track record demonstrating the compatibility of offered materials. Only CONTRACTOR's approved materials/combination of materials shall be used for coating of pipes.

Repair materials shall be approved epoxy primed heat shrink sleeves, such as Raychem HTLP 80 (refer Section 15).

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8. COATING PROCEDURE AND QUALIFICATION

8.1 Project Report

Following award of the ORDER, the VENDOR shall submit for CONTRACTOR approval, in accordance with the SUPPLY Schedule, a detailed report in the form of a bound manual outlining, but not limited to, the following: -

- a.** Details for plant(s), installations, locations, geometry, dimensions, capacity and production rates(s).
- b.** Facilities in the yard for unloading, handling, transport, production, storage, stockpiling, loading of bare and coated pipes and warehouses for storage of other coating materials.
- c.** Details Organogram of coating equipment and manpower.
- d.** Details of utilities/facilities such as water, power, fuel, access roads and communication etc.

8.2 Proposed Work Procedures

Prior to the commencement of the work, VENDOR shall submit a pipe Coating Procedure Specification (CPS) giving full details of all the characteristics of the proposed coating process. The project specific CPS shall be formulated by VENDOR and submitted for CONTRACTOR's approval in the form of a bound manual. No element of pipe coating shall proceed without written approval from CONTRACTOR of the CPS. The CPS shall include, but not limited to, the following information and proposals: -

- a.** Steel surface preparation, including preheating, removal of steel defects, cleanliness, profile, methods of measurements and consumables.
- b.** Pipe heating, temperatures and control.
- c.** Complete details of raw materials together with quality control and manufacturer's data.
- d.** Application of materials, including characteristics, temperature of application, etc.
- e.** Pipe and coating quenching and cooling, including time and temperature.
- f.** Quality assurance system, Inspection and Testing Plan (ITP) and reporting formats, including instrument and equipment types, makes and uses, etc.
- g.** Detailed method of repair of coating defects duly classified depending upon nature and magnitude of defects and repairs thereof.
- h.** Details of instrument and equipment calibration methods including relevant standards and examples of calibration certificates.
- i.** Complete details and inventory of laboratory and equipment.

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- j. Pipe handling and stock piling procedures.
- k. Sample of recording and reporting formats, including laboratory reports, certificates and requirement as per section 8.0 of this specification.
- l. Complete details of test certificates for raw materials including test methods and standards used.
- m. Test certificates from PE compound manufacturer for tests for thermal aging and aging under exposure to light. These test certificates shall not be older than three years.
- n. Environmental provisions for the storage of raw materials.
- o. Procedure for transferring of pipe identification numbers, paper barcode labels, and applying pipe identification marking.

Following submission of the Inspection and Test Plan for approval, the CONTRACTOR will advise VENDOR of the specific inspection review, witness and HOLD points required by the CONTRACTOR or its Representatives by marking up the ITP.

After approval of the CPS and ITP has been given by CONTRACTOR, procedural changes shall not be made. Unavoidable changes may be executed only after obtaining written approval from CONTRACTOR.

8.3 Coating Procedure Qualification (CPQ)

Prior to commencing production, VENDOR shall, at its own expense, carry out a Coating Procedure Qualification (CPQ) trials at each plant for each pipe diameter and pipe wall thickness to verify its plant, materials, and coating procedures can produce a consistent quality of product conforming to the properties stated in Clause 7.3 of this Specification, other relevant Standards and Specifications, and the material manufacturer's recommendations.

- **Tests on Raw Materials**

VENDOR shall furnish test certificates from the coating materials manufacturer(s) for the following properties for each batch of raw materials used in the procedure qualification tests: -

- a. Polyethylene
 - i. Tensile Strength
 - ii. Melt Index
 - iii. Specific Gravity
 - iv. Hardness

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- v. Water Absorption
- vi. Volume Resistivity
- vii. Dielectric withstands.

b. Epoxy Powder

- i. Gel Time
- ii. Specific Gravity
- iii. Sieve Analysis.

c. Adhesive

- i. Specific gravity
- ii. Melt Index.

• **Tests on Coated Pipes:**

At least 5 (five) test pipes per pipe diameter shall be coated in accordance with the approved coating procedure. Trial coated pipes shall be subjected to procedure qualification testing as described below. All tests shall be witnessed by the CONTRACTOR or the CONTRACTOR's Representative. Where test rings are cut from the pipes, additional test rings shall be supplied to the CONTRACTOR for independent testing as required.

i. Coating Thickness

All pipes shall be subject to coating thickness measurements. Acceptance criteria shall be as per Clause 11.4 of this Specification.

ii. Holiday Testing

All the pipes shall be subject to holiday testing at 25kV and shall meet the criteria identified in Clause 11.5.

iii. Resistance to Indentation

Five samples from different pipes shall be taken. If any one of these samples fails to satisfy the requirements of Clause 7.3.3 of this Specification, then the test shall be repeated on ten more samples. In this case, none of the samples shall be permitted to fail.

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iv. Resistance to Impact

Three test pipes shall be selected for impact test and each test on each pipe is required to meet the requirement of Clause 7.3.3 of this Specification.

v. Resistance to Peeling

Three test pipes shall be selected for peel tests. On each of the selected pipes, three peel tests shall be performed; one at each end and one in the middle of the pipe. None of these samples is permitted to fail the criteria identified in Clause 7.3.3 of this Specification.

vi. Elongation due to Tearing (Ultimate Elongation)

Ten samples each from three coated pipes (i.e. 30 samples in all) shall be tested in accordance with Clause 7.3.3 of this Specification. Only one sample per pipe may fail.

vii. Cathodic Disbondment Test

Two tests shall be conducted in accordance with Clause 7.3.3 of this Specification, one test being performed on each of two test pipes. Tests shall only be performed on samples that have been confirmed to be holiday-free in accordance with test (ii) above.

- Testing Report**

After completion of the above tests, VENDOR shall prepare and issue to CONTRACTOR for approval a detailed report of the above tests including test reports/certificates of all materials and coatings tested.

Only upon written approval from CONTRACTOR, shall VENDOR commence production coating.

- Test Pipes**

On completion of coating qualification tests, coating on all remaining intact test pipes shall be removed at Vendor's cost and the pipes completely recycled as per the approved Coating Procedure Specification.

- Procedure Re-qualification**

VENDOR shall re-establish the requirements of the Coating Procedure Qualification to the full Specification requirements, or to the extent considered necessary by CONTRACTOR, in the event of, but not limited to, the following :-

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- Every time there is a change in the previously qualified Coating Procedure Specification.
- Every time there is a change in the manufacturer for the supply of any of the raw materials.
- Every time the coating yard is shifted from one location to another location.
- Any time when, in CONTRACTOR's opinion, the properties are deemed to be suspect during regular production tests.
- Every time there is a change in pipe diameter.

8.4 Independent Testing

CONTRACTOR reserves the right to conduct any or all the tests required for Coating Procedure Qualification through an independent laboratory or agency, at the cost of VENDOR, when in CONTRACTOR's opinion, the test results are deemed suspect. CONTRACTOR's decision shall be final.

9. PIPE SURFACE PREPARATION

9.1 Pre-Treatment

The pipe shall be preheated prior to blast cleaning to a temperature at least 5°C above the dew point or higher if recommended by the Coating Manufacturer. This is to remove moisture and to identify slivers and surface defects for further treatment.

Pipe shall be handled to prevent any damage to bevels. Ends shall be closed to prevent any abrasives and/or foreign material from entering the pipe's interior during blasting. Any abrasive and/or foreign material entering the pipe shall be removed before and after subsequent coating.

9.2 Surface Contaminants

Unless specified otherwise, the pipes shall be supplied free from mill applied oils or coatings.

All pipes shall be monitored for chloride contamination. Three extracts per day shall be taken from a drip line using the soak method and chloride titration or other approved method. VENDOR shall submit a test procedure to ensure that surfaces are free from chloride, oil and grease contaminants. Chloride contamination of the pipe surface shall not exceed 20 mg/m².

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9.3 Pre Inspection

Prior to pipe cleaning operation, each pipe shall be inspected for split seams, dents, gouges, slivers or other imperfections that would make the pipe unsuitable for use. The Supplier shall report all such imperfections to the CONTRACTOR on receipt, during all stages of the coating process and subsequent handling and load out operations, segregate all pipe containing such defects, and arrange for repair as directed by CONTRACTOR. Surface preparation shall not reduce the pipe wall thickness below the minimum specified for the pipe grade.

9.4 Removal of Surface Contaminants

Any oil, grease, salt or other contaminants detrimental to the formation of a good coating bond or coating quality shall be removed prior to coating application.

Organic contaminants may be removed by the use of non-oil solvents. Gasoline or kerosene shall not be used for this purpose. Visible oil and grease spots shall be removed by solvent wiping. Solvent cleaning shall be in accordance with SSPC-SP1.

Prior to blast cleaning, pipe shall be cleaned to remove residual surface contamination using high-pressure fresh water. Where necessary, and subject to prior approval from CONTRACTOR, if the surface chloride contamination level exceeds 200 mg/m² the pipe may given a phosphate pre-treatment to remove all residual chloride and ferrous salt contamination. VENDOR shall submit a detailed Specification and Phosphate Cleaning Procedure for prior approval of the CONTRACTOR. Excess treatment chemical shall be removed by thorough rinsing with fresh water and the residual chloride monitored in accordance with the CONTRACTOR approved procedure. Two chloride test per day shall be carried out on phosphate treated pipes and the chloride levels shall not exceed 20 mg/m².

9.5 Pipe Blast Cleaning

In case of the presence of moisture on the pipe, the pipes shall be preheated to a temperature of 65°C to 85°C prior to abrasive blast cleaning. An abrasive blast-cleaning machine shall clean the external surface of the pipe. The standard of finish for cleaned pipe shall conform to white metal finish to Sa 2 ½ of Swedish Standard SIS 055900. The surface of the pipe after abrasive shot/grit blasting shall have an anchor pattern of 50 to 75 microns peak to trough height and an angular and open anchor pattern. This shall be measured for each pipe. At least one pipe at the start and end of each shift shall be measured with Testex Press-O-Film replication tape. Remaining pipes may be measured by a suitable instrument, such as Elcometer, providing that the instrument has been calibrated and the results cross-checked with the replication tape.

At no time shall the blast cleaning be performed when the relative humidity exceeds 90% or when the steel temperature is less than 5°C higher than the dew point, unless the pipes are preheated to a temperature of 65°C to 85°C.

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Abrasives shall contain less than 100mg/kg total water soluble salts, less than 0.3% copper and shall be free of moisture.

9.6 Pipe Surface Imperfections

The blast cleaned surface shall not be contaminated with dirt, dust, metal particles, oil, water or any other foreign material, nor shall the surface or its anchor pattern be scarred or burnished. After blast cleaning, all surfaces shall be thoroughly inspected to determine anchor pattern, quality of blasting and identify any surface defects prior to coating application. All surface defects such as slivers, scab, burns, laminations, welds spatters, gouges, scores, indentations, slugs or any other defects considered injurious to the coating integrity shall be reported to CONTRACTOR's Representative and on permission from CONTRACTOR, such defects shall be removed by filing or grinding. The method employed to remove surface defects shall not burnish or destroy the anchor pattern or contaminate the surface. Pneumatic tools shall not be used unless they are fitted with effective air/oil and water traps. Where burnishing results in destruction of anchor pattern, the anchor pattern shall be restored by suitable means.

9.7 Acceptance of Surface Preparation

Upon Completion of the blasting operations, the Vendor's quality control supervisor shall accept the pipe for coating, or return it for recleaning. Where imperfections are considered detrimental to the coating quality, the same shall be reported to CONTRACTOR's Representative for final decision on rejection or recleaning / removal of defects. Recleaning/removal of defects or returning pipe to the yard shall be at the Vendor's cost.

CONTRACTOR's inspector, reserves the right to initiate any of the above actions during periodic inspections for oil, dust, salt, imperfections, lack of white metal finish and unacceptable surface profile.

9.8 Coating Interval

The total allowable elapsed time between completion of the blasting operations and commencement of the coating and heating operations shall be such that no detectable oxidation of the surface occurs. Relative humidity readings shall be recorded every two hours during the blasting operations in the immediate vicinity of the operations. Blast cleaning shall not be performed when the relative humidity exceeds 90% or when the steel temperature is less than 5°C above the dew point. The maximum elapsed time shall not exceed the maximum time as given below:

| Relative Humidity % | Maximum elapsed time |
|----------------------------|-----------------------------|
| 80 to 85 | 2 hours |
| 61 to 79 | 3 hours |

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60 or below

4 hours

Pipes not brought up to the coating application temperatures within these maximum times shall be returned for complete reblasting. Any pipe showing flash rusting shall be reblasted even if the above conditions have not been exceeded.

10. COATING APPLICATION

10.1 Heating of Line Pipe

An induction heater or gas furnace shall be used for heating the pipe. The method shall be capable of maintaining uniform temperature along the total length of the pipe, and shall be such that it shall not contaminate the surface to be coated. Oxidation of the cleaned pipe surfaces prior to coating (in the form of bluing or other apparent oxide formation) is not acceptable.

10.2 Temperature Monitoring

The specified pipe temperature shall be determined using approved temperature-indicating crayons. The specified temperature shall be maintained as it enters and throughout the coating chamber and shall be carefully monitored. If approved Pyrometers are used for continuous temperature monitoring, the Pyrometer shall be calibrated twice every shift and/or as per CONTRACTOR instruction using approved temperature indicating crayons.

The surface temperature during coating application shall not be lower than that required for complete melt, flow-out, wetting of the pipe surface and fusion; nor shall it be higher than that at which optimum polymerisation occurs without premature gelation before completion of fusion, flow-out and wetting. Post-application cure temperature and time shall not be less than that required for full cure of the applied coating.

The pipe temperature shall not be allowed to exceed 260°C. Any pipe or part of pipe heated in excess of 260°C shall be quarantined and may be rejected, subject to inspection by the CONTRACTOR.

Any pipe heated to a temperature exceeding 375°C or that would cause the steel surface to turn blue shall be totally rejected and not used for any coating purpose. The cost of the rejected pipe shall then be deducted from the Vendor's charges.

10.3 Coating Application

The external surface of the cleaned pipe conforming to section 9.0 of this Specification shall be immediately coated with 3-layer extruded polyethylene coating in accordance with the coating application procedures approved by CONTRACTOR, relevant standards and this Specification. In general the procedure shall be as follows: -

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During application, curing, and handling, the coating shall not be physically damaged, nor shall it be contaminated with any foreign material including (without limitation) dirt, metal particles, oil, water, coating debris, excess powder drips, whether airborne or from application equipment or enclosures, cutback rings or pipe handling mechanisms.

For all pipes between DN250 and DN500, the minimum 3LPE coating thickness shall be 2350 microns anywhere on the pipe. The external surface of the pipe shall be heated to a temperature as recommended by the powder manufacturer followed by application of the following three layers:

- i. Electrostatic application of epoxy powder (minimum 150 microns FBE).
- ii. Crystalline Co-polymer Adhesive applied by extrusion (minimum 200 microns thickness).
- iii. Medium density polyethylene coating by extrusion (minimum 2000 microns MDPE).

The coated pipe shall be subsequently quenched and cooled in water for a period that shall sufficiently lower the temperature of pipe coating to allow handling and inspection.

For pipe that has been identified for use at long horizontal directional drills, the thickness of the outer MDPE layer shall be increased by a minimum of 1500 microns, giving a total coating thickness of 3850 microns.

10.4 Air Entrapment

The copolymer adhesive shall be applied by extrusion within the time recommended by the epoxy powder manufacturer and the copolymer adhesive manufacturer.

While applying the coating, VENDOR shall ensure that there is no entrapment of air or void formation along the seam weld (where applicable). VENDOR shall propose a suitable method for achieving this as part of the Coating Application Procedure and the same shall be witnessed for approval by CONTRACTOR.

10.5 Coating Appearance

The resultant coating shall have a uniform appearance and shall be free from air bubbles, wrinkles, holidays, irregularities, discontinuities and separation between layers of FBE/adhesive/PE.

10.6 End Cut Back

Coating materials shall be cut back to 150 mm (tolerance +10 mm, -15 mm) from the ends of the pipe. The cut back shall be perpendicular to the pipe axis.

The MDPE shall be cut so that it is chamfered at an angle of approximately 30° to the pipe surface to facilitate the later application of heat shrink sleeves without the possibility of a void along the shoulder of the line pipe coating. The adhesive shall seal the end of applied coating.

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The pipe end faces, bevels and uncoated external surface of the pipe at pipe ends shall be essentially free of all coating and foreign material.

10.7 Rejection of Coating

Failure to comply with any of the above applicable requirements and of the approved procedure shall be cause for the rejection of the coating and such coating shall be removed in a manner approved by CONTRACTOR at Vendor's cost.

11. INSPECTION AND TESTING

11.1 General

VENDOR shall establish and maintain a comprehensive Quality Assurance system to ensure that all of the requirements of this Specification are met.

The CONTRACTOR reserves the right to require the inspection or testing of the goods or services during any stage of manufacturing at which the quality of the finished goods may be affected, and to undertake inspection or testing of raw materials or purchased components.

The VENDOR at the frequency as defined herein shall perform the following tests and inspections.

11.2 Visual Inspection

Visual inspection of finished coating for colour, blisters, sags, porosity, burns and handling damage during coating, stacking and loading, for each pipe.

11.3 Gel Time Test

To confirm that the epoxy powder has been manufactured, handled, shipped and stored properly, the VENDOR shall perform Gel time test on each batch of powder one week prior to its use, in accordance with the method and acceptance as recommended by the powder manufacturer.

11.4 Thickness Test

- i. The coating thickness shall be determined by taking at least 10 measurements at locations uniformly distributed over the length and periphery of each pipe. In case of welded pipes, five of the above readings shall be made at the apex of the weld seam, uniformly distributed over the length of the coated pipe. All the readings must meet the minimum requirements. However, localised coating thickness of less than the permissible minimum thickness can be tolerated on the condition that it does not attain a total extent of more than 5 cm² per meter length of coated

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pipe, and the actual coating thickness does not drop more than 10% below the permissible minimum coating thickness at these locations.

The frequency of thickness measurement as stated above shall be initially on every pipe, but may be reduced depending upon consistency of results, at the sole discretion of CONTRACTOR's Representative.

- ii. Coated pipes not meeting the above requirements shall be rejected. The VENDOR shall remove the entire coating and the pipe shall be recycled to the cleaning and coating operations as per the approved procedure and shall be to Vendor's cost.

11.5 Holiday Detection

- i. Each coated pipe length shall be checked over 100% of coated surface by means of a "holiday detector" of a type approved by CONTRACTOR for detecting holidays in the finished coating.
- ii. The holiday detector shall be a low pulse D.C. full circle electronic detector with audible alarm and precise voltage control. The set voltage for inspection shall be minimum 25kV.
- iii. VENDOR shall calibrate the holiday detector at least once every 4 hours of production. VENDOR shall have necessary instruments or devices for calibrating the holiday detector.
- iv. Any coated pipe shall be rejected if there is more than 3 (three) holidays on the pipe, or if the area of the one holiday is more than 100cm² in area. Any pipe so rejected shall have the coating removed, and be recycled through the complete cleaning and coating system in accordance with the approved procedure and shall be to Vendor's cost.
- v. A single holiday on a pipe of an area equal or less than 100cm² shall be repaired in accordance with approved procedure and shall be to Vendor's cost.
- vi. Should more than 10% of coated pipes per shift production (typically eight-hour shift) be rejected, VENDOR shall stop production and make a detailed investigation and report on the

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probable cause(s) of the coating failures. Findings of such an investigation shall be submitted to CONTRACTOR for approval prior to recommencing coating.

11.6 Cathodic Disbondment Tests

48 hour cathodic disbondment tests, in accordance with Clause 7.3.3, shall be performed once per shift (maximum 12 hours) for each pipe diameter and wall thickness.

11.7 Peel Test

- i. VENDOR shall conduct a peel test for composite coating as per Clause 7.3.3(iii) of this Specification.
- ii. The frequency of test shall be initially on one pipe in every twenty five (25) pipes coated which may be further reduced to at least 2 (two) per shift depending upon consistently acceptable results, at the sole discretion of CONTRACTOR's representative.

The system shall fail only in the adhesive layer. Failure either adhesive to steel or adhesive to backing shall not be permitted.

- iii. In case the above tests do not comply with the above requirement, VENDOR shall test all the preceding and succeeding coated pipes until the coating is proved acceptable and/or at the discretion of the CONTRACTOR.

11.8 Indentation Resistance Test

- i. VENDOR shall carry out an indentation resistance test as per Clause 7.3.3(i) of this Specification. The frequency of test shall be initially 2 (two) coated pipes per shift which may be further reduced and/or waived depending upon consistent acceptable results, at the sole discretion of CONTRACTOR's representative.
- ii. The samples shall be taken at five equi-distant points along the length of the coated pipe.
- iii. Where the pipe is rejected for lack of indentation resistance, VENDOR shall test the preceding and succeeding pipes coated until the coating is proved acceptable, and/or at the discretion of the CONTRACTOR.
- iv. Rejected coated pipes shall be removed and shall be recycled through the cleaning and coating process in accordance with the approved procedure, at Vendor's cost.

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11.9 Impact Resistance Test

- i. VENDOR shall carry out impact resistance tests as per Clause 7.3.3(ii) of this Specification. Initially the frequency of test shall be two (2) coated pipes per shift, which may be further reduced and/or waived depending upon consistently acceptable results, at the sole discretion of CONTRACTOR's Representative.
- ii. A minimum of 30 impacts, located equidistant along the length of coated pipe, shall be performed.
- iii. Immediately after testing, the test area shall be subjected to holiday detection at the same voltage as used prior to impact resistance test. The pipe shall be rejected if any holiday is noted in the test area.
- iv. Where any coated pipe is rejected for lack of impact resistance, VENDOR shall test the preceding and succeeding pipes coated until the coating is proved acceptable and/or at the discretion of the CONTRACTOR.
- v. Rejected coated pipes shall be recycled through the cleaning and coating process in accordance with the approved procedure, at Vendor's cost.

11.10 Resistance to Splitting Test

VENDOR shall, within 14 days of coating application, take a coating ring sample of length equal to five times pipe diameter and make three 50 ± 3 mm long cuts in the coating parallel to the pipe axis. The cuts shall be through to the steel substrate. The cuts shall essentially be in the middle of the ring sample but shall be separated by 100mm in the longitudinal direction and 100mm in the circumferential direction. The actual length of the cuts shall be measured to ± 0.1 mm.

The prepared ring sample shall be maintained at ambient temperature for 100 days. After 100 days the length of the cuts shall be re measured to ± 0.1 mm. No cut is permitted to have increased its length by more than 2.0mm.

11.11 Epoxy Coating Porosity Test

Fusion bonded epoxy (FBE) coating porosity tests shall be carried out on coated pipe daily and for each batch of FBE powder. A cross section of coating shall be evaluated under a microscope. The porosity, which includes total voids, porosity and foaming, when added over the cross section of any part of the coating shall not to exceed 33% of the thickness of the coating.

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Where the allowable limit is exceeded, additional porosity tests shall be performed. Should the further tests indicate that excessive areas of the coating, in the CONTRACTOR's opinion, contain excess porosity the coating shall be rejected.

11.12 Volatile Content of Epoxy Powder

The volatile content of the FBE powder shall be determined for each batch of powder. VENDOR shall weigh a sample of approximately 1.5g of powder to $\pm 1\text{mg}$ and place a pan containing the powder in a preheated oven at a temperature of 105°C for a period of 2 hours. The pan shall then be removed and placed in a desiccator for 5 minutes while the sample cools. The sample shall then be reweighed immediately and the volatile content of the FBE recorded.

Duplicate tests shall be performed. If the results vary by more than 10%, then two more tests shall be performed. Where three or more of the tests vary by more than 10%, the CONTRACTOR's approval shall be required to continue using the powder.

11.13 Repair of Test Areas

Damages occurring to pipe coating during the above tests shall be repaired in accordance with the approved coating repair procedure and Section 13 of this Specification. Repairs occurring on account of the production tests are excluded from the limitation of three defects per pipe and the limitation of 100cm^2 area.

11.14 Rate for Pipe Rejection

Any pipe coating shall be rejected if there is more than 3 (three) coating repairs on the pipe, or if the area of the repair is more than 100cm^2 in area. Any pipe so rejected shall have the coating removed and the pipe recycled through the complete cleaning and coating system in accordance with the approved coating application procedure, and shall be to Vendor's cost.

11.15 CONTRACTOR's Approval

CONTRACTOR reserves the right to perform inspection and witness test on all activities concerning the pipe coating operations, starting from bare pipe to finished coated pipe, ready for despatch.

VENDOR shall give reasonable notice of time and shall provide, without charge, reasonable access and facilities required for inspection to the CONTRACTOR's Representative. Inspection and tests performed or witnessed by CONTRACTOR's Representative shall in no way relieve the VENDOR's obligation to perform the required inspection and tests.

Where the rate of defective or rejected pipes and/or samples tests are 10% or more for a single shift (typically 8 hours), VENDOR shall be required to stop production and carry out a full and detailed investigation and shall submit the findings to CONTRACTOR for approval. Vendor's shall recommence the production only after receiving written permission from CONTRACTOR.

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Under no circumstances shall any action or omission of the CONTRACTOR's Representative relieve the VENDOR of its responsibility for material and quality of coating produced.

No pipes shall be transported from the coating plants unless authorised in writing by the CONTRACTOR.

12. HANDLING, TRANSPORTATION AND STORAGE

The Supplier shall submit all details on transport, handling and stockpiling procedures for both coated and un coated, including stockpile location and layout, to CONTRACTOR or CONTRACTOR's Representative for approval at least 3 weeks before commencing the work.

12.1 Responsibility for Pipe

The VENDOR shall be fully responsible for the pipe and for the pipe identification marking from the time of "taking over" of bare pipes from the CONTRACTOR at the ships hook until such time that the coated pipes are "handed over" to CONTRACTOR.

At the time of "taking over" of bare pipes, VENDOR shall inspect and record all the relevant details referred to in Clauses 9.3 and 9.6 above in the presence of CONTRACTOR. Damage to the pipes that occur after the VENDOR has taken delivery, such as dents, flats, or damage to the weld ends shall be cut off, removed or repaired and pipes rebevelled as necessary. The cost of this work, as well as that of the pipe lost in cutting and repair shall be to the Vendor's cost. All such works shall only be carried out after Vendor's proposed repair procedure has written approval of the CONTRACTOR.

Prior to commencing coating, VENDOR shall inspect each bare pipe and record any relevant details as per Clauses 9.3 and 9.6. Damage to the bare pipes which occur due to handling / transportation such as dents, flats, or damage to the weld ends, shall be cut off, removed or repaired and pipes rebevelled as necessary, at Vendor's cost.

12.2 Pipe Handling

The VENDOR shall take receipt of bare line pipe from ships hook and shall load and transport the pipe to the coating plant(s).

The VENDOR shall unload, load, stockpile and transport the bare pipes within the coating plant(s) using suitable means and in a manner to avoid damage to pipes.

The VENDOR shall stockpile the bare pipes at the storage area of the coating plant. The VENDOR shall prepare and furnish to CONTRACTOR a procedure/calculation generally in compliance with API RP-5L1 for pipe stacking, which shall be submitted for approval by CONTRACTOR prior to commencement.

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The VENDOR shall load, unload, transport and stockpile the coated pipes within the coating plant site using approved suitable means and in a manner to avoid damage to the pipe and coating. The Vendor's procedure shall be submitted for approval by CONTRACTOR prior to commencement.

Coated pipe shall only be lifted as single pipes.

12.3 Coated Pipes

Coated pipes may be handled by means of slings and belts of proper width (minimum 60mm) made of non-abrasive/non-metallic materials. Use of vacuum lifting equipment is permitted for lifting and handling coated pipe.

Pipes to be stacked shall be separated row by row to avoid coating damage when removing the slings. Use of round sectional slings is prohibited. Forklifts may be used provided that the arms of the forklift are covered with suitable pads, preferably rubber.

12.4 Stacking of Pipes

Bare/coated pipes at all times shall be stacked completely clear from the ground so that the bottom row of pipes remain free from any surface water. The pipes shall be stacked at a slope so that water cannot collect inside the pipe.

The coated pipes may be stacked by placing them on ridges of clean sand and covered with a plastic film, or on wooden supports provided with suitable cover. The supports shall be spaced in such a manner as to avoid permanent bending of the pipes.

Stacks shall be limited to 8 layers and such that the pressure exercised by the pipe's own weight does not cause damage to the coating. VENDOR shall submit calculations for CONTRACTOR's approval in this regard. Each pipe layer shall be separated by means of padded spacers suitably spaced for this purpose and shall be detailed in the VENDOR's handling procedures to be approved by the CONTRACTOR. Stacks shall be suitably secured against collapsing by use of 150mm wide wooden wedges against the outside pipe of each layer. Stacks shall consist of pipe sections having the same diameter and wall thickness.

The weld seam of pipes shall be positioned always in a manner so as not to touch the adjacent pipes.

The ends of the pipes during handling and stacking shall always be protected with bevel protectors.

12.5 Transport Vehicles

The lorries used for transportation shall be equipped with adequate pipe supports, having round hollow beds for each pipe to be placed on the lorry bed. Total width of the supports shall be at least 10% of the pipe length with maximum spacing of 3 metres. The supports shall be lined with heavy

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rubber and shall be spaced in a manner to support equal load from the pipes. The rubber protection must be free from all nails and staples where pipes are in contact.

The second layer and all following layers shall be separated from the other with adequate number of separating layers of protective material such as heavy rubber strips 200mm wide or equivalent, to avoid direct contact between the coated pipes.

Rubber belts or equivalent shall cover all stanchions. Care shall be exercised to properly cover the top of the stanchions and other positions such as reinforcements of the truck body, rivets, etc., to prevent damage to the coated surface.

Final acceptance of coated pipes shall be conditional upon the following: -

1. All pipes shall receive a complete visual inspection for defects.
2. One pipe per truckload shall be selected at random and holiday tested, plus one other pipe nominated by the CONTRACTOR or CONTRACTOR's Representative's representative. If a defect is detected, a further two (2) pipes shall be selected and holiday tested.
3. Holiday testing will be at 25,000 volts.
4. Every defect discovered shall be repaired or the pipe re coated.
5. No coated pipe shall be accepted which has more than three repairs.

12.6 Storage of Coating Materials

Raw coating materials which are susceptible to deteriorating or suffering from damage especially due to humidity, exposure to high thermal excursions or other adverse weather conditions, shall be suitably stored and protected. Deteriorated materials shall not be used and shall be replaced at Vendor's cost.

The materials mentioned above, during loading, unloading, storage and treating should always be handled so as to prevent any damage, alteration and dispersion. When supplied in containers and envelopes, they shall not be dropped or thrown, or removed by means of hooks, both during the transport and handling operations until their complete use.

During unloading, transport and utilisation, any contact with water, earth, crushed stone and any other foreign material shall be carefully avoided.

VENDOR shall strictly follow Manufacturer's instructions regarding storage temperature and conditions. The VENDOR shall provide a climate controlled air-conditioned environment for epoxy powder storage.

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12.7 Additional UV Protection During Pipe Stockpiling

This specification requires the use of UV stabilised polyethylene such that the coating will pass all of the test requirements after 12 months exposure in India. With the present generation UV stabilisers this can be achieved with any colour of PE. If it is likely that the pipe will be stockpiled for longer than 12 months, then a coating of white water-based PVA may be appropriate. However, it should only be applied at the time of stockpiling as it can be easily removed during transport and handling operations.

13. REPAIR OF COATING

VENDOR shall submit and qualify a comprehensive repair system, its methods and materials proposed to be used for executing a coating repair and shall receive approval from CONTRACTOR prior to use. All repairs shall be performed using epoxy primed heat shrink sleeves.

The repair procedure shall cover application over bare pipe and over the trilaminate coating. The minimum adhesion shall meet or exceed the sleeve manufacturer's requirements. Sleeve installers shall be specially trained and qualified by the sleeve manufacturer, and after qualification, be issued with and carry the manufacturer's certification card.

Only approved sleeve installers shall be allowed to perform production repair. One sleeve per installer per week shall be destructively tested. Method of testing shall be subject to approval by the CONTRACTOR or CONTRACTOR's Representative. The adhesion between sleeve and the epoxy and between epoxy and the steel substrate shall be checked using two peel tests. There shall be less than 5% void or adhesive failure and any one area of loss of adhesion is less than 20 mm².


In open storage the repair coating materials must be able to withstand a temperature of at least +80°C, without impairing its serviceability and properties.

Testing of repairs shall be in the same form as testing production coating. All repairs shall result in a coating thickness no less than the parent coating thickness.

All pipe leaving the coating plant, shall have a sound external coating with no holiday or porosity on 100% of the surface.

Defects, repairs and acceptability criteria shall be as follows:-

- Pipes showing porosities or very small damage not detected during holiday test and having a surface area less than 0.5cm² or linear damage (cut) of less than 3 cm, and does not expose bare steel, shall be repaired by applying heat shrink sleeves.

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- Damage to coating by handling such as scratches, cuts, dents, gouges, not detected during holiday test, having a total reduced thickness on the damaged portion of not less than 2.0mm and an area not exceeding 20cm² shall be repaired by applying a heat shrink sleeve.
- Defects exceeding the above sizes or any holidays or exposed steel, exposing the bare metal surface and applying a heat shrink sleeve shall repair not exceeding 300mm.
- Any production pipe containing defects in excess of 3 (three) per pipe, or if the defect length exceeds 300mm (in any direction), shall be stripped and re coated.
- In case of a coating defect close to the coating cut back, VENDOR shall remove the coating throughout the entire circumference of the pipe down to the steel surface and increase the coating cut back length. If the resulting coating cut back exceeds 300mm length, then the coating shall be repaired by the use of a heat shrink sleeve, thereby making up the coating cut back length to 150mm.
- If the defect is more than 400mm from the original coating cut back length, the entire coating shall be removed and the pipe re coated. Alternatively, the pipe end may be cut back and rebevelled and the cost of the lost pipe reimbursed to the CONTRACTOR.

All repairs carried out to coating for whatever reason shall be to the account of the VENDOR.

Cosmetic damages occurring only in the Polyethylene sheathing need not be repaired by exposing up to steel surface, as deemed fit by the CONTRACTOR's Representative. The VENDOR shall establish its repair procedure qualification by testing and shall receive approval from CONTRACTOR prior to use.


Testing of repairs shall be the same as testing for production coating and shall be subject to approval from CONTRACTOR prior to use.

VENDOR shall also demonstrate tests on repaired coating as and when required by CONTRACTOR.

14. MARKING AND PIPE IDENTIFICATION

The VENDOR shall preserve pipe identity by maintaining the identity of each length of pipe. Final markings shall be applied on the outside wall of the pipe at a maximum distance of 500 mm from the end.

Vendor to have a system of properly transferring the original pipe number/heat number (in addition to bar code system) before application of 3LPE coating so that final marking is having the same information without any error.

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The marking shall indicate, but not be limited to, the following information: -

- i. Pipe number, Heat number.
- ii. Coated pipe number.
- iii. Colour band.
- iv. Diameter, wall thickness, weight and length.
- v. Re attach barcode labels from inside of pipe, or replace labels.
- vi. Any other information considered relevant by CONTRACTOR.

VENDOR shall obtain prior approval from CONTRACTOR for the marking procedure to be adopted.

15. PRODUCTION REPORT

VENDOR shall prepare and maintain a detailed production reporting system, which shall provide a detailed history of each pipe length.



The VENDOR shall obtain from the pipe supplier, as a minimum, the following data :-

- Pipe number
- Heat number
- Pipe grade
- Diameter
- Length
- Wall thickness
- Pipe weight.

Prior to acceptance of the pipe at the wharf, the VENDOR in the presence of the CONTRACTOR shall identify and record any minor defects, such as dents, flats or damaged bevels, found during the acceptance inspection. The VENDOR shall be responsible for any subsequent damage to the pipe.

To the records received from the pipe supplier the VENDOR shall add the following information: -

- Details of defect repairs
- Coating material batch numbers
- Pre-qualification tests for raw materials
- Coating procedure qualification tests

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- Coating material balance
- Coated pipe sampling details
- Coated pipe test results
- Coated pipe weight
- Coating defects
- Coating repairs
- Hold points
- Rejected pipe.

The production report shall be submitted to CONTRACTOR every seven (7) days. The report shall be submitted as a single sheet Excel format on a CD.

| | | | | |
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APPENDIX 1

LIST OF ACCEPTABLE COMBINATIONS OF COATING MATERIALS

The following Table provides indicative candidate coating materials. Vendor shall decide their possible options of coating specifications. The OWNER favours the use of FUSABOND 158D adhesive material by DUPONT, since this has proven performance in the field and has been shown to provide good adhesion to a wide range of polyethylene and FBE materials. Alternative resin suppliers for FBE and polyethylene should be approved by DUPONT so that all material suppliers are in agreement with the combinations of coating materials. Notwithstanding this, any combination of materials, including those favoured by the OWNER, shall be subject to the full tender testing and documentation requirements.

| Epoxy Powder (Manufacturer) | Adhesive (Manufacturer) | PE Compound (Manufacturer) |
|--|--|---|
| EP 971197 (JOTUN) SCOTCHKOTE 226N (3M) HGT 53672343 (BASF) | FUSABOND 158D (DUPONT) FUSABOND E MB 206D(DUPONT) OVERAC 18350 (ATOFINA) ME 0420 (BOREALIS) | SCLAIR 35 BP MDPE (NOVACOR) 2006 PBK 35 (LACQTENE) |

The responsibility for suitability for application, performance and compliance to the coating system requirements shall unconditionally lie with the VENDOR whatever combination of coating materials are proposed.



| | | | | |
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STANDARD AUXILIARY PIPING SUPPORTS HOT COLLECTION

| REV. | DATE | DESCRIPTION | PREPARED | CHECKED | APPROVED | AUTHORIZED |
|------|------------|-------------------|----------|---------|----------|------------|
| B | 12.05.2020 | ISSUED FOR DESIGN | HC | PVB | KSJ | JMC |
| A | 17.10.2019 | ISSUED FOR DESIGN | SL | KSJ | TI/KSJ | JMC |
| | | | | | | |



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1. INTRODUCTION:

INDIAN OIL CORPORATION LIMITED (IOCL) has awarded Fax of Acceptance (FOA) dated 29th August 2019 to M/s. Technip India Limited (TPIL) for Consultancy services (PMC/EPCM services) for overall project management, FEED Review / FEED, Detailed Engineering, Procurement & expediting services, Tendering & award, Construction Management & Supervision, Assistance in start-up, Commissioning & performance test runs for installation of a Standby SRU of 525 TPD capacity and execution of Additional tanks for Paradip Refinery, Odisha, India.

2. DEFINITIONS & ABBREVIATIONS

| Abbreviation | Definition /Expanded form |
|---------------------------|--|
| IOCL/ CLIENT | Indian Oil Corporation Limited |
| PMC/ CONSULTANT | Technip India Limited |
| LICENSOR | Party selected by IOCL for process technology ownership for any UNIT |
| CONTRACTOR | Party whose services are obtained for performing the works specified as part of LSTK / packages. |
| EPCM | Engineering, Procurement & Construction Management Services. |
| LSTK | Lump Sum Turn Key portion of the work to be executed by CONTRACTOR |
| FEED | Front End Engineering Design |
| AUTHORISED REPRESENTATIVE | IOCL's/ CONSULTANT's representative authorized to act for and on behalf of them |
| VENDOR | Any third party supplying the equipment/materials for setting up the Plant |
| PROJECT | Indicates Standby SRU and Additional tanks Project, Paradip Refinery |
| UNIT | Indicates any particular portion of the project to be built which can be Process related or Utilities/Offsites related |

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3. SCOPE

This relevant synoptic summary intends to introduce standard supports families' structures and applications. This specification detailed materials and basis technical rules for TECHNIP's standard supports design.

4. REFERENCE DOCUMENTS

- 080557C-000-JSD-1300-0003 : Job Specification for Piping Support Design

5. REFERENCE STANDARD SUPPORT DOCUMENTS

- STC-1391-0010 : WELDED SUPPORTS SERIES
- STC-1392-0010 : CLAMPED SUPPORTS SERIES
- STC-1393-0010 : HANGER&ITEMIZED SUPPORTS SERIES
- STC-1394-0010 : STRUCTURAL SUPPORTS SERIES
- STC-1395-0010 : SMALL BORE SERIES

6. SYMBOLOGY



| <u>WELDED</u> | <u>ELEMENTS</u> |
|---------------|-----------------|
| STC-1391-00 | <u>G</u> UIDE |
| | <u>R</u> ESTING |
| | <u>S</u> TOP |
| | |

| <u>CLAMPED</u> | <u>ELEMENTS</u> |
|----------------|-----------------|
| STC-1392-00 | <u>G</u> UIDE |
| | <u>R</u> ESTING |
| | <u>S</u> TOP |
| | |

| <u>H</u> ANGERS & <u>I</u> TEMIZED <u>S</u> UPPORTS | <u>A</u> CCOUSTIC <u>A</u> TENUATION PAD |
|--|---|
| STC-1393-00 | <u>C</u> ONSTANT SPRING |
| | <u>H</u> IGH TEMP. PAD |
| | <u>S</u> NUBBER |
| | <u>R</u> IGID STRUT |
| | <u>S</u> LIDING PLATE |
| | |
| | <u>T</u> IE-ROD |
| | <u>V</u> ARIABLE SPRING |

| <u>S</u> TRUCTURAL | <u>B</u> EAMS |
|--------------------|-----------------|
| STC-1394-00 | |
| <u>S</u> TRUCTURAL | <u>P</u> LATES |
| STC-1394-00 | <u>R</u> ESTING |
| | |

| <u>S</u> MALL BORE | <u>E</u> LEMENTS |
|---|------------------|
| STC-1395-00 (Only valid for construction at site) | |
| | <u>G</u> UIDE |
| | <u>R</u> ESTING |

| | | | | |
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7. MATERIALS SPECIFICATIONS FOR SUPPORT MEMBERS



The following chapters are valid for Standard Piping Supports Collection “HOT” lines and “COLD” Lines.

| PIPING | | SUPPORT MATCL | SUPPORTING ELEMENTS AS PER ASTM SPECIFICATION | | | | | | | | | | |
|---|-------------------|------------------|--|----------------------|------------------|--|--------------------------|-----------------|----------------------------------|--|-------------------------|----------------------------|-----------|
| | | | ELEMENT WELDED TO PIPE (1) | | | ELEMENT NOT WELDED TO PIPE BUT IN CONTACT WITH PIPING THERMAL FLOW OR INSIDE INSULATION | | | | ELEMENT OUT OF THERMAL FLOW OR COMPLETELY OUTSIDE OF INSULATION (STRUCTURAL & HANGERS SUPPORTS SERIES) (4) | | | |
| MATERIAL | TEMP. (°C) (3) | | PIPE | SHAPES | PLATES & BARS | PIPES | SHAPES | PLATES & BARS | BOLTING (BOLT & NUT) | PIPES | SHAPES PLATE & BARS | BOLTING (BOLT & NUT) | FORGED |
| Carbon Steel | -29 TO 342 | CS | A106 Gr B (A53 Gr B) or as per piping class | A36 / IS-2062 E250BR | | A106 Gr B (A53 Gr B) | A36 / IS-2062 E250BR | | A193 Gr B7 A194 Gr 2H | A106 Gr B (A53 Gr B) | A36 / IS-2062 E250BR | A 193 Gr B7 A 194 Gr 2H | A668 Gr D |
| | 343 TO 427 | CH | | / | A516-60 | | / | A516-60 | | | | | |
| Low Temp Carbon Steel | -45 TO 342 | CL | A333 Gr 6 or as per piping class | / | A516-60 S5 (6) | A333 Gr 6 | / | A 516-60 S5 (6) | A320 Gr L7 A194 Gr 7 | | | | |
| Carbon Steel Galvanized | 10 TO 70 | CG | / | / | / | A106 Gr B (A53GrB) (2) | A36 / IS-2062 E250BR (2) | | A193 Gr B7 (2) A194 Gr 2H (2) | | | | |
| Stainless Steel 304/304L 316/316L 321H 347H | -29 TO 342 | SS | A312-Tp 304 or as per piping class | / | A240 Gr 304 | A106 Gr B (A53 Gr B) | A36 / IS-2062 E250BR (3) | | A193 Gr B8 A194 Gr 8 | | | | |
| | 343 TO 650 | SH | | | | A312-Tp 304 | / | A 240 Gr 304 | A193 Gr B8 A194 Gr 8 | | | | |
| | -198 TO -30 | SL | | | | | | | A320 Gr B8 A194 Gr 8 | | | | |
| Alloy Steel 1.25 Cr – 0.5 Mo | -29 TO 342 | AS | A335 P11 or as per piping class | / | A387-11 | A106 Gr B (A53 Gr B) | A36 / IS-2062 E250BR | | A193 Gr B7 A194 Gr 2H | | | | |
| | 343 TO 650 | AH | | | | A335 P11 | / | A387-11 | A193 Gr B8 A194 Gr 8 | | | | |
| Alloy Steel 2.25 Cr – 1.0 Mo | -29 TO 342 | AS | A335 P11 or as per piping class | / | A387-11 | A106 Gr B (A53 Gr B) | A36 / IS-2062 E250BR | | A193 Gr B7 A194 Gr 2H | | | | |
| | 343 TO 650 | AH | | | | A335 P11 | / | A387-11 | A193 Gr B8 A194 Gr 8 | | | | |

- 1.The material for the pipe support welded to piping shall be the same as, or material equivalent to the material specified for piping.
- 2.Material to be galvanized
- 3.Sheet of isolating material shall be inserted between clamped support and pipe to avoid any direct contact.
- 4.The temperature is based on the alternate design condition or design condition taken from the line list.
- 5.The material of pipes, shapes, plates and bars are in accordance with structure material.
- 6.S5 denotes the supplementary impact test required at minimum temperature for A516-60

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8. HEAT TREATMENT FOR WELDED SUPPORTS



| PIPING | | SUPPORT MATCL | ELEMENT WELDED TO PIPE | | | WELDING HEAT TREATMENT | | | | | |
|---|---------------|------------------|--|----------------------|------------------|------------------------|-----------------------------------|-----------------------|---|---|-------------------|
| MATERIAL | TEMP. (°C) | | PIPE | SHAPES | PLATES & BARS | P no° | PREHEATING | | ADDITIONAL LIMITATIONS REQUIRED FOR EXEMPTION FROM PWHT | | |
| | | | | | | | THICKNESS OF PIPE / SUPPORT | PREHEAT TEMP °C | WELDING THICKNESS | WELDING PROCEDURE (2) | PIPE THICKNESS |
| Carbon Steel | -29 TO 342 | CS | A106 Gr B (A53 Gr B) or as per piping class | A36 / IS-2062 E250BR | | 1 | >25 | 95 | ALL | For T>5mm multiple layer of welds to be used | >25 |
| | 343 TO 427 | CH | | / | A516-60 | | | | | | |
| Low Temp Carbon Steel | -45 TO 342 | CL | A333 Gr 6 or as per piping | / | A516-60 S5 (6) | | | | | | |
| Carbon Steel Galvanized | 10 TO 75 | CG | / | / | / | | - | - | - | - | - |
| Stainless Steel 304/304L 316/316L 321H 347H | -29 TO 342 | SS | A312-Tp 304 or as per piping class | / | A240 Gr 304 | 8 | ALL | NOT REQUIRED | NOT APPLICABLE | NOT APPLICABLE | NOT APPLICABLE |
| | 343 TO 650 | SH | | | | | | | | | |
| | -198 TO -30 | SL | | | | | | | | | |
| Alloy Steel 1.25 Cr – 0.5 Mo | -29 TO 342 | AS | A335 P11 or as per piping class | / | A387-11 | 4 | ALL | 120 | ≤13 | For T>5mm multiple layer of welds to be used | ≤16MM |
| | 343 TO 650 | AH | | | | | | | | | |
| Alloy Steel 2.25 Cr – 1.0 Mo | -29 TO 342 | AS | A335 P11 or as per piping class | / | A387-11 | | | | | | |
| | 343 TO 650 | AH | | | | | | | | | |

NOTES:

1. The requirements of this table are in accordance with those of ASME code B31.3(2016) Tables 330.1.1, 331.1.1, 331.1.2 and 331.1.3
2. T= throat thickness of fillet welds
3. The throat of fillet welds shall be 7/10 of the smaller thickness to be welded.
4. Welding operations may not be performed with an ambient temperature of less than 0°C.
5. Whenever PWHT is a process requirement support-piping welds shall be always post weld heat treated. In all events, heat treatment shall be performed for caustic soda service.
6. For ambient temperature of less than 5°C, preheating shall be carried out without considering required conditions indicated in the table

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9. STANDARD STRUCTURAL ELEMENTS

| I-SHAPE | | CHANNEL | | ANGLE | |
|------------------|-------|------------------|-------|--------------------|--------|
| INDIAN NORM ISMB | CODE | INDIAN NORM ISMC | CODE | INDIAN NORM ISA | CODE |
| ISMB 100 | MB100 | ISMC 100 | MC100 | ISA 30 X 30 X 5 | ISA30 |
| ISMB 150 | MB150 | ISMC 125 | MC125 | ISA 50 X 50 X 6 | ISA50 |
| ISMB 200 | MB200 | ISMC 150 | MC150 | ISA 75 X 75 X 8 | ISA75 |
| ISMB 250 | MB250 | ISMC 200 | MC200 | ISA 100 X 100 X 10 | ISA100 |
| | | ISMC 250 | MC250 | ISA 130 X 130 X 10 | ISA130 |

UK SHAPES

| H-SHAPE | |
|-------------------|-------------|
| UK NORM | CODE |
| UC 152 X 152 X 23 | UC 152 X 23 |
| UC 152 X 152 X 30 | UC 152 X 30 |
| UC 203 X 203 X 46 | UC 203 X 46 |
| UC 254 X 254 X 73 | UC 254 X 73 |

NOTES: This TABLE is a restrictive list of shapes use on STD Supports Drawings.

| | | | | |
|---|----------------------------------|---|---|--------------|
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10. BOLTING AND FORGED PIECES SUPPORT ELEMENTS

| BOLTS(1) | | | | | | | | NUTS | FORG | RODS |
|----------|--------|----|-----|-----|-----|-----|-----|------|------|------|
| M | LENGTH | | | | | | | M | M | DIAM |
| 8 | 40* | | 60* | | | | | 8* | | 8* |
| 10 | 40* | | | 70* | | | | 10* | 10* | 10 |
| 12 | 40 | 50 | 60 | 70 | 80 | | | 12 | 12 | 12 |
| 16 | 40 | 50 | 60 | 70 | 80 | 100 | 130 | 16 | 16 | 16 |
| 20 | | 50 | 60 | 70 | 80 | 90 | 150 | 20 | 20 | 20 |
| 24 | | | 60 | 70 | 100 | 160 | 170 | 24 | 24 | 24 |
| 30 | | | | | | 100 | 170 | 30 | 30 | 30 |
| 33 | | | | | | 100 | 120 | 33 | 33 | 33 |
| 36 | | | | | | 100 | 120 | 36 | 36 | 36 |
| 42 | | | | | | 100 | 120 | 42 | | 42 |
| 48 | | | | | | 100 | 120 | 48 | | 48 |
| 72 | | | | | | 100 | 120 | 72 | | 72 |

11. FLAT BARS AND SHEET STEELS SUPPORT ELEMENTS



| FLAT BARS (2) | | | | | | | PLATES |
|------------------|---------|-----|-----|-----|-----|-----|--------|
| THK | BREADTH | | | | | | THK |
| 2 | 30* | 50 | 60 | 70 | 80 | | 2 |
| 3 | 30* | | | | | | 3 |
| 5 | 30* | 50 | 60 | 100 | | | 5 |
| 10 | 40* | 50 | 60 | 70 | 80 | 90 | 10 |
| | 100 | 110 | 120 | 140 | 150 | 200 | |
| | | | | | | | |
| | | | | | | | 12 |
| 15 | 100 | | | | | | 15 |
| 20 | 100 | | | | | | 20 |

*: SPECIFIC MATERIAL FOR PIPE DIA <2"

(1): BOLTS SHALL BE THREADED TO HEAD

(2): FLAT BAR MAY BE REPLACED BY SHEETS STEEL IF NECESSARY AND CUT ON FIELD

M: BOLT DIAMETER

| | | | | |
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12. WELDING

All welds shall be continuous fillet weld type as per AWS A2.4 except specific indication on drawing (Field Weld, Full penetration Weld.....)



Otherwise indicated, throat thickness weld shall be 6mm (refer to AWS A3.OM/A3.0, fig.B.25.)

13. PROTECTION SHIELD

Instead of pipe, rolled plate can be used with equivalent thk as per piping class (with MAX. THK 12.7mm, except contrary indication).

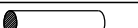

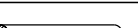

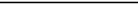

Weld size shall respect requirements specified in codes and project documents.

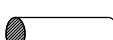


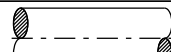


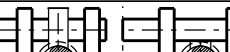
As per ASME Section VIII Div. 1, fig. 13.2 sheet 124, weld throat thickness shall be 0.7 x thinner thickness, but with a minimum of 3mm.

| | | | | | |
|---|---|--|--------------------------------|---------------|--|
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| | | | | | |

14. LIST OF PIPING HOT SUPPORT SERIES COLLECTION SYNOPTICS

| STANDARD HOT PIPING SUPPORTS COLLECTION SYNOPTICS | | |
|--|--|------|
| Document Ref. 080557C-000- STC | Description | Rev. |
| 1390-01 GL 01 | SYNOPTIC FOR CARBON STEEL LINES WITHOUT PWHT | 0 |
| 1390-02 GL 02 | SYNOPTIC FOR CARBON STEEL LINES GALVANIZED | 0 |
| 1390-03 GL 03 | SYNOPTIC FOR CARBON STEEL LINES WITH PWHT | 0 |
| 1390-04 GL 04 | SYNOPTIC FOR CARBON STEEL LINES WITHOUT PWHT FOR HIGH TEMPERATURE SERVICES | 0 |
| 1390-05 GL 05 | SYNOPTIC FOR ALLOY STEEL LINES WITHOUT PWHT | 0 |
| 1390-06 GL 06 | SYNOPTIC FOR ALLOY STEEL LINES WITH PWHT | 0 |
| 1390-07 GL 07 | SYNOPTIC FOR ALLOY STEEL LINES WITHOUT PWHT FOR HIGH TEMPERATURE SERVICES | 0 |
| 1390-08 GL 08 | SYNOPTIC FOR STAINLESS STEEL LINES | 0 |
| 1390-09 GL 09 | SYNOPTIC FOR ALLOY STEEL LINES WITH PWHT FOR HIGH TEMPERATURE SERVICES | 0 |
| 1390-10 GL 10 | SYNOPTIC FOR STAINLESS STEEL LINES FOR HIGH TEMPERATURE SERVICES | 0 |

| UNINSULATED PIPE | SIMPLE REST | GUIDE | STOP | SEMI-ANCHOR | BRACKET / GUIDE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------|--|---|---|---|---|---|------|---|------|------------------------|-----|------|---|------|------------------------|-----|------|---|------|------------------------|-----|-----------------|--|------|-----------------------|--|---------|-------|-----|----------------|----------------|------|-------------------------|--|---------|-------|-----|----------------|
| |  INDICATIVE SUPPORT ONLY FOR DIAM 2" TO 18" |  |  |  |  |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| DIAM | 50 TO 300 2" TO 12" | 350 TO 600 14" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | WR00 | WE01 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 600 2" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | WG01 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 600 2" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | WS01 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 600 2" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | GUIDE + STOP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 150 2" TO 6" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | BRACKET | GUIDE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | SB11 + CS01 | SB13 + CG01 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 200 TO 600 8" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | BRACKET | GUIDE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | SB12 + WR07 | SB14 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| INSULATED PIPE | PIPE SHOE | | GUIDE | STOP | SEMI-ANCHOR | BRACKET / GUIDE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------|---|---|---|--|---|--|---|---------------------------|-----|------|--|------|-------------------------|-----|---------------------|--|------|-------------------------|-----|---------------------|--|------|-------------------------|-----|-----------------|---|------|-----------------------|-----|-----------------------------------|--|---------------------------------|--|------|-------------------------|-----|---------------------------|--|
| |  |  |  |  |  |  |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <table><tr><td>DIAM</td><td>50 TO 600 2" TO 24"</td></tr><tr><td>STD</td><td>WR01</td></tr></table> | DIAM | 50 TO 600 2" TO 24" | STD | WR01 | <table><tr><td>DIAM</td><td>650 TO 1500 26" TO 60"</td></tr><tr><td>STD</td><td>WR14</td></tr></table> | DIAM | 650 TO 1500 26" TO 60" | STD | WR14 | <table><tr><td>DIAM</td><td>50 TO 1500 2" TO 60"</td></tr><tr><td>STD</td><td>PIPE SHOE + WG02</td></tr></table> | DIAM | 50 TO 1500 2" TO 60" | STD | PIPE SHOE + WG02 | <table><tr><td>DIAM</td><td>50 TO 1500 2" TO 60"</td></tr><tr><td>STD</td><td>PIPE SHOE + WS02</td></tr></table> | DIAM | 50 TO 1500 2" TO 60" | STD | PIPE SHOE + WS02 | <table><tr><td>DIAM</td><td>50 TO 1500 2" TO 60"</td></tr><tr><td>STD</td><td>STOP + GUIDE</td></tr></table> | DIAM | 50 TO 1500 2" TO 60" | STD | STOP + GUIDE | <table><tr><td>DIAM</td><td>50 TO 150 2" TO 6"</td></tr><tr><td>STD</td><td>BRACKET SB11 + PIPE SHOE</td></tr><tr><td></td><td>GUIDE SB13 + PIPE SHOE</td></tr></table> | DIAM | 50 TO 150 2" TO 6" | STD | BRACKET SB11 + PIPE SHOE | | GUIDE SB13 + PIPE SHOE | <table><tr><td>DIAM</td><td>200 TO 600 8" TO 24"</td></tr><tr><td>STD</td><td>BRACKET SB12 + WR07</td></tr><tr><td></td><td>GUIDE SB14 + PIPE SHOE</td></tr></table> | DIAM | 200 TO 600 8" TO 24" | STD | BRACKET SB12 + WR07 | |
| DIAM | 50 TO 600 2" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | WR01 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 650 TO 1500 26" TO 60" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | WR14 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 1500 2" TO 60" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | PIPE SHOE + WG02 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 1500 2" TO 60" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | PIPE SHOE + WS02 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 1500 2" TO 60" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | STOP + GUIDE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 150 2" TO 6" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | BRACKET SB11 + PIPE SHOE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | GUIDE SB13 + PIPE SHOE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 200 TO 600 8" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | BRACKET SB12 + WR07 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | GUIDE SB14 + PIPE SHOE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

INSULATED AND UNINSULATED PIPE

VERTICAL STANCHION

STANCHION

TYPE A

DIAM

50 TO 1500
2" TO 60"

STD

WR05

TYPE B

TYPE D

BASE RESTRAINT

GUIDE

STD

GUIDE
STANCHION
+ WG03

STOP

STD

STOP
STANCHION
+ WS03
TYPE A

SEMI-ANCHOR

STD

SEMI-ANCHOR
STANCHION
+ WS03
TYPE B

LUG

LUG ON ELBOW

TYPE A

DIAM

50 TO 600
2" TO 24"

STD

WE08

TYPE B

DOUBLE LUGS

DIAM

50 TO 600
2" TO 24"

STD

WE06

HORIZONTAL LUGS

TYPE A

DIAM

50 TO 600
2" TO 24"

STD

WE07

TYPE B

DIAM

50 TO 600
2" TO 24"

STD

WE07

ADJUSTABLE STANCHION

STANCHION

TYPE A

DIAM

50 TO 600
2" TO 24"

STD

WR09

TYPE B

SHAPE STANCHION

DIAM

50 TO 600
2" TO 24"

STD

WR10

TRUNNION

ELBOW EXTENSION

DIAM

50 TO 600
2" TO 24"

STD

WR06

STANDARD LOAD

TRUNNION

DIAM

50 TO 1500
2" TO 60"

STD

WR07

TYPE H

HANGERS

HC

1 - CONSTANT SPRING

HT

3 - TIE-ROD

HV

4 - VARIABLE SPRING

HR

2 - RIGID STRUTS

REST ON PLATFORMS

CONCRETE

DIAM

50 TO 200
2" TO 8"

STD

WR11

DIAM

250 TO 600
10" TO 24"

STD

WR11

STEEL

DIAM

50 TO 200
2" TO 8"

STD

WR11

DIAM

250 TO 600
10" TO 24"

STD

WR11

STRUCTURAL BEAM

1 - L STRUCT.

2 - T STRUCT.

3 - U STRUCT.

4 - WEDGE / BEAM

5 - SINGLE BRACKET

6 - DOUBLE BRACKET

NOTE

1: SYNOPTICS ARE ONLY GIVEN AS PRINCIPLE.
IN ALL CASES REFER TO STANDARD DRAWINGS
FOR COMPLEMENTARY DETAILS AND SUPPORT MARKS REQUIRED.

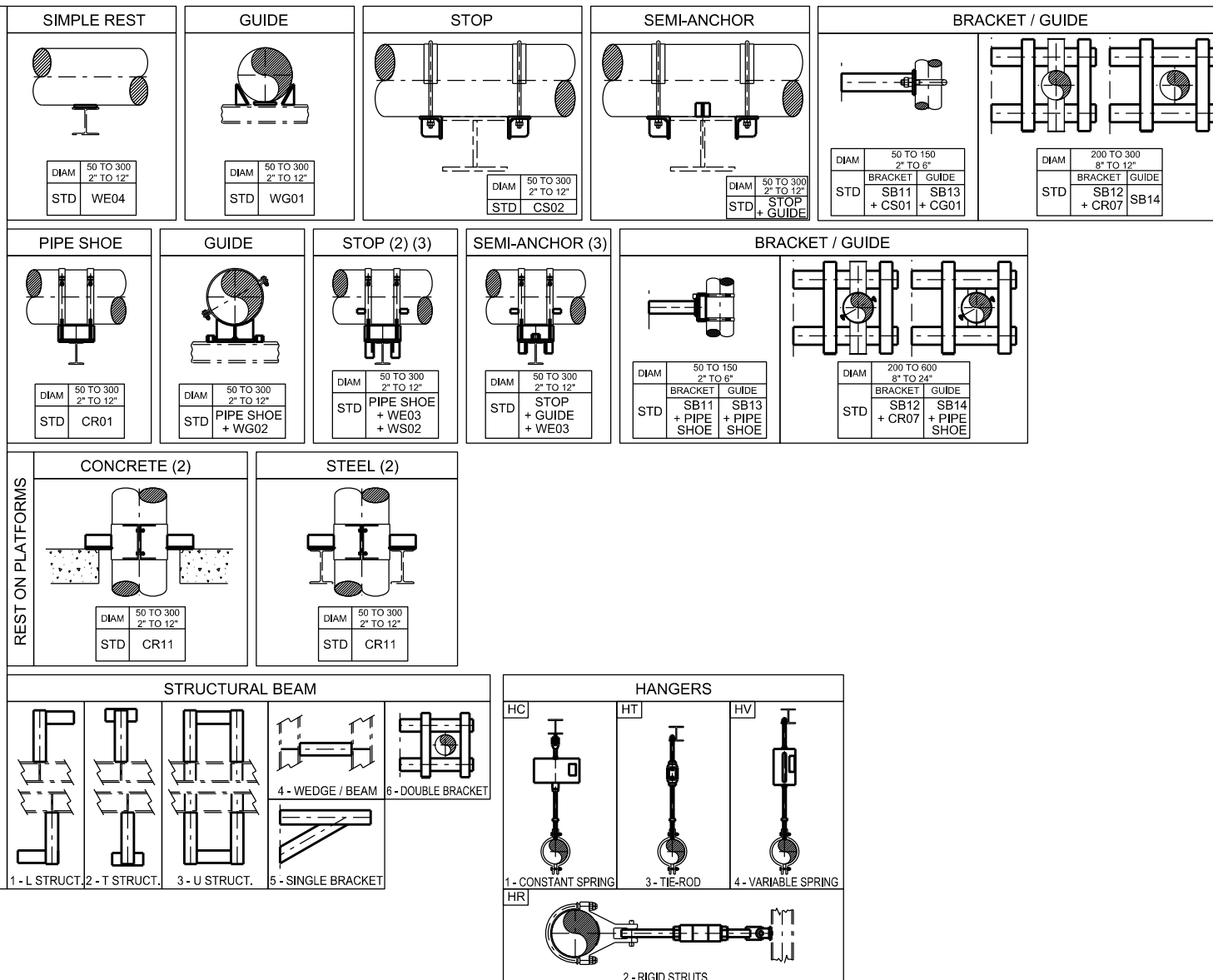
NOTE
1: SYNOPTICS ARE ONLY GIVEN AS PRINCIPLE.
IN ALL CASES REFER TO STANDARD DRAWINGS
FOR COMPLEMENTARY DETAILS AND SUPPORT MARKS REQUIRED.

| APPLICABILITY | |
|---------------|--------------|
| CS | CARBON STEEL |

| TEMPERATURE RANGE [°C] |
|------------------------|
| -29 TO 342 |

| Technip | | CARBON STEEL LINES WITHOUT PWHT | | | GL01 | |
|--|--|------------------------------------|------------------------|-----------------|--------|---|
| STANDARD CONSTRUCTION DRAWING PLANT DESIGN AND PIPING | | XXXXXX | 000 | STC - 1390 - 01 | 1 of 1 | 0 |
| Project | | Unit | Doc. Code & Serial No. | Page | Rev. | |

UNINSULATED PIPE

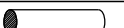

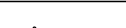
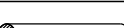
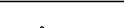



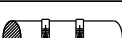
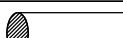


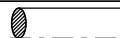



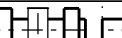

NOTE:
1. SYNOPTICS ARE ONLY GIVEN AS PRINCIPLE.
IN ALL CASES REFER TO STANDARD DRAWINGS
FOR COMPLEMENTARY DETAILS AND SUPPORT MARKS REQUIRED.
2. THIS SUPPORT DESIGN MUST USE A GRIPPED CLAMP.
3. WE03 TO BE WELDED BEFORE GALVANISING.

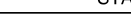
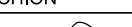
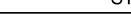

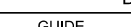
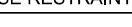
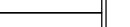
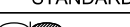

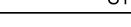
| APPLICABILITY | |
|---------------|-------------------------|
| CG | GALVANIZED CARBON STEEL |


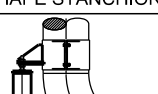





| TEMPERATURE RANGE [°C] |
|------------------------|
| -29 TO 75 |

| Technip | | CARBON STEEL LINES GALVANIZED | | | GL 02 | |
|--|--|----------------------------------|------------------------|-----------------|--------|------|
| STANDARD CONSTRUCTION DRAWING PLANT DESIGN AND PIPING | | XXXXXX | 000 | STC - 1390 - 02 | 1 of 1 | 0 |
| Project | | Unit | Doc. Code & Serial No. | | Page | Rev. |

| UNINSULATED PIPE | SIMPLE REST | | GUIDE | | STOP | | SEMI-ANCHOR | | BRACKET / GUIDE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------|--|--------------------------|---|--------------------------|---|------|---|---|---|------------------------|-----|------|---|------|------------------------|-----|------|---|------|--------------------------|-----|------|---|------|------------------------|-----|-----------------|---|------|--------------------------|-----|-----------------|--|------|-----------------------|-----|-------------------|--|-------------------------|--|------|-------------------------|-----|-------------------|--|
| |  | |  | |  | |  | |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| DIAM | 50 TO 300 2" TO 12" | 350 TO 600 14" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | WR00 | WE01 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 600 2" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | WG01 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 300 2" TO 12" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | CS02 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 350 TO 600 14" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | WS01 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 300 2" TO 12" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | STOP + GUIDE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 350 TO 600 14" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | STOP + GUIDE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 150 2" TO 6" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | BRACKET + CS01 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | GUIDE SB13 + CG01 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 200 TO 600 8" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | BRACKET + WR07 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | GUIDE SB12 + SB14 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| INSULATED PIPE | PIPE SHOE | | GUIDE | | STOP | | SEMI-ANCHOR | | BRACKET / GUIDE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------|---|---|---|---|--|--|---|---|---|------|---|------|------------------------|-----|---------------------|--|------|---------------------------|-----|---------------------|--|------|------------------------|-----|----------------|---|------|---------------------------|-----|----------------|--|------|-------------------------|-----|-----------------|--|------|-----------------------|-----|---------|-------|------------------------|------------------------|---|------|-------------------------|-----|---------|-------|----------------|
| |  |  |  |  |  |  |  |  |  | |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <table><tr><td>DIAM</td><td>50 TO 600 2" TO 24"</td></tr><tr><td>STD</td><td>CR01</td></tr></table> | DIAM | 50 TO 600 2" TO 24" | STD | CR01 | <table><tr><td>DIAM</td><td>650 TO 1500 26" TO 60"</td></tr><tr><td>STD</td><td>WR14</td></tr></table> | DIAM | 650 TO 1500 26" TO 60" | STD | WR14 | <table><tr><td>DIAM</td><td>50 TO 600 2" TO 24"</td></tr><tr><td>STD</td><td>PIPE SHOE + WG02</td></tr></table> | DIAM | 50 TO 600 2" TO 24" | STD | PIPE SHOE + WG02 | <table><tr><td>DIAM</td><td>650 TO 1500 26" TO 60"</td></tr><tr><td>STD</td><td>PIPE SHOE + WG02</td></tr></table> | DIAM | 650 TO 1500 26" TO 60" | STD | PIPE SHOE + WG02 | <table><tr><td>DIAM</td><td>50 TO 600 2" TO 24"</td></tr><tr><td>STD</td><td>WR01 + WS02</td></tr></table> | DIAM | 50 TO 600 2" TO 24" | STD | WR01 + WS02 | <table><tr><td>DIAM</td><td>650 TO 1500 26" TO 60"</td></tr><tr><td>STD</td><td>WR14 + WS02</td></tr></table> | DIAM | 650 TO 1500 26" TO 60" | STD | WR14 + WS02 | <table><tr><td>DIAM</td><td>50 TO 1500 2" TO 60"</td></tr><tr><td>STD</td><td>STOP + GUIDE</td></tr></table> | DIAM | 50 TO 1500 2" TO 60" | STD | STOP + GUIDE | <table><tr><td>DIAM</td><td>50 TO 150 2" TO 6"</td></tr><tr><td rowspan="2">STD</td><td>BRACKET</td><td>GUIDE</td></tr><tr><td>SB11 + PIPE SHOE</td><td>SB13 + PIPE SHOE</td></tr></table> | DIAM | 50 TO 150 2" TO 6" | STD | BRACKET | GUIDE | SB11 + PIPE SHOE | SB13 + PIPE SHOE | <table><tr><td>DIAM</td><td>200 TO 600 8" TO 24"</td></tr><tr><td rowspan="2">STD</td><td>BRACKET</td><td>GUIDE</td></tr><tr><td>SB12 + WR07</td><td>SB14 + PIPE SHOE</td></tr></table> | DIAM | 200 TO 600 8" TO 24" | STD | BRACKET | GUIDE | SB12 + WR07 |
| DIAM | 50 TO 600 2" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | CR01 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 650 TO 1500 26" TO 60" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | WR14 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 600 2" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | PIPE SHOE + WG02 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 650 TO 1500 26" TO 60" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | PIPE SHOE + WG02 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 600 2" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | WR01 + WS02 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 650 TO 1500 26" TO 60" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | WR14 + WS02 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 1500 2" TO 60" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | STOP + GUIDE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 150 2" TO 6" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | BRACKET | GUIDE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | SB11 + PIPE SHOE | SB13 + PIPE SHOE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 200 TO 600 8" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | BRACKET | GUIDE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | SB12 + WR07 | SB14 + PIPE SHOE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

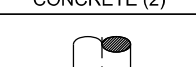
| PIPE | VERTICAL STANCHION | STANCHION | | STANCHION | | | BASE RESTRAINT | | | TRUNNION | STANDARD LOAD | | TRUNNION | STANDARD LOAD | | | | | | | | | | | | | | | | | | | | | | |
|------|---------------------------|---|------|------------------------|-----|------|--|------|---------------------------|----------|---------------|------|----------|--|------|---------------------------|-----|------|---|--|-----|----------------|---|-----|--------------------------|--|-----|--------------------------|---|------|------------------------|-----|------|---|--|------|
| | |  TYPE A <table border="1"><tr><td>DIAM</td><td>50 TO 600 2" TO 24"</td></tr><tr><td>STD</td><td>CR05</td></tr></table> | DIAM | 50 TO 600 2" TO 24" | STD | CR05 |  TYPE D <table border="1"><tr><td>DIAM</td><td>650 TO 1500 26" TO 60"</td></tr><tr><td>STD</td><td>WR05</td></tr></table> | DIAM | 650 TO 1500 26" TO 60" | | STD | WR05 | |  TYPE B <table border="1"><tr><td>DIAM</td><td>650 TO 1500 26" TO 60"</td></tr><tr><td>STD</td><td>WR05</td></tr></table> | DIAM | 650 TO 1500 26" TO 60" | STD | WR05 |  TYPE D |  GUIDE <table border="1"><tr><td>STD</td><td>CR05 + WG03</td></tr></table> | STD | CR05 + WG03 |  STOP <table border="1"><tr><td>STD</td><td>WR05 + WS03 TYPE A</td></tr></table> | STD | WR05 + WS03 TYPE A |  SEMI-ANCHOR <table border="1"><tr><td>STD</td><td>WR05 + WS03 TYPE B</td></tr></table> | STD | WR05 + WS03 TYPE B |  TYPE A <table border="1"><tr><td>DIAM</td><td>50 TO 600 2" TO 24"</td></tr><tr><td>STD</td><td>CR07</td></tr></table> | DIAM | 50 TO 600 2" TO 24" | STD | CR07 |  TYPE B |  TYPE A/B <table border="1"><tr><td>DIAM</td><td>650 TO 1500 26" TO 60"</td></tr><tr><td>STD</td><td>WR07</td></tr></table> | DIAM |
| DIAM | 50 TO 600 2" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | CR05 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 650 TO 1500 26" TO 60" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | WR05 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 650 TO 1500 26" TO 60" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | WR05 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | CR05 + WG03 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | WR05 + WS03 TYPE A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | WR05 + WS03 TYPE B | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 600 2" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | CR07 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 650 TO 1500 26" TO 60" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | WR07 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| INSULATED AND UNINSULATED PIPE | ADJUSTABLE STANCHION | | SHAPE STANCHION (2) | | HANGERS | | | | SPECIAL REQUIREMENT | | | | | | | | | | |
|--------------------------------|---|------|------------------------|-----|---------|--|------|------------------------|---------------------|------|---|---|--|---|--|--|------|------------------------|-----|
| |  TYPE A <table border="1"><tr><td>DIAM</td><td>50 TO 600 2" TO 24"</td></tr><tr><td>STD</td><td>CR09</td></tr></table> | DIAM | 50 TO 600 2" TO 24" | STD | CR09 |  <table border="1"><tr><td>DIAM</td><td>50 TO 600 2" TO 24"</td></tr><tr><td>STD</td><td>CR10</td></tr></table> | DIAM | 50 TO 600 2" TO 24" | STD | CR10 |  HC 1 - CONSTANT SPRING |  HT 3 - TIE-ROD |  HV 4 - VARIABLE SPRING |  2 - RIGID STRUTS | |  <table border="1"><tr><td>DIAM</td><td>50 TO 600 2" TO 24"</td></tr><tr><td>STD</td><td>CE06</td></tr></table> | DIAM | 50 TO 600 2" TO 24" | STD |
| DIAM | 50 TO 600 2" TO 24" | | | | | | | | | | | | | | | | | | |
| STD | CR09 | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 600 2" TO 24" | | | | | | | | | | | | | | | | | | |
| STD | CR10 | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 600 2" TO 24" | | | | | | | | | | | | | | | | | | |
| STD | CE06 | | | | | | | | | | | | | | | | | | |

INS

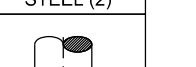
REST ON PLATFORMS

CONCRETE (2)




| | |
|------|------------------------|
| DIAM | 50 TO 600 2" TO 24" |
| STD | CR11 |


STEEL (2)





| | |
|------|------------------------|
| DIAM | 50 TO 600 2" TO 24" |
| STD | CR11 |


STRUCTURAL BEAM



1 - L STRUCT.


2 - T STRUCT.


3 - U STRUCT.

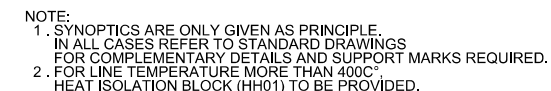

4 - WEDGE / BEAM


5 - SINGLE BRACKET

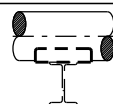
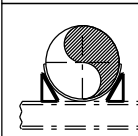
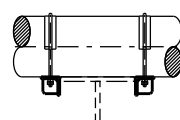
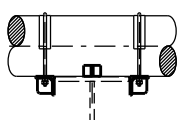
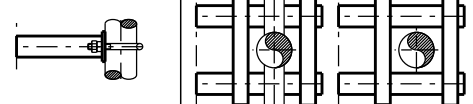
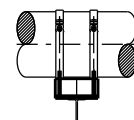
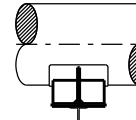
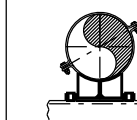
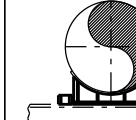
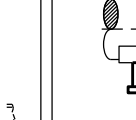
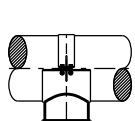
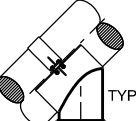
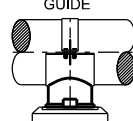
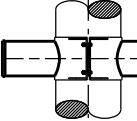
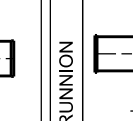
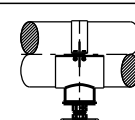
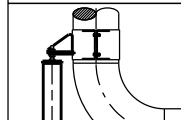
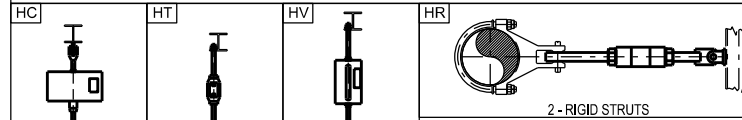

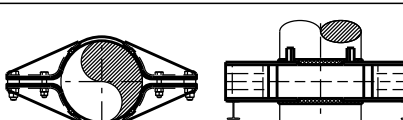
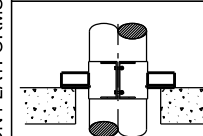
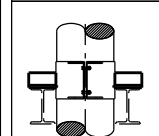
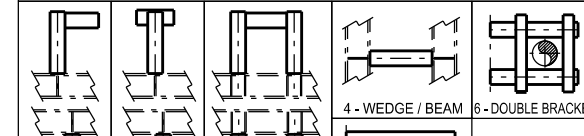

6 - DOUBLE BRACKET

NOTE:
1. SYNOPTICS ARE ONLY GIVEN AS PRINCIPLE.
IN ALL CASES REFER TO STANDARD DRAWINGS
FOR COMPLEMENTARY DETAILS AND SUPPORT MARKS REQUIRED.
2. SUPPORT WE03 SHALL BE USED FOR THESE SUPPORT TYPES.
3. ALL SUPPORTS WELDED TO PIPE SHALL BE PROVIDED WITH PAD
WE01 AND THIS PAD SHALL BE WELDED AT SHOP BEFORE PWHT.

| APPLICABILITY | | TEMPERATURE RANGE [°C] | | CARBON STEEL LINES WITH PWHT | | | GL 03 | | |
|---------------|------------------------|------------------------|--|--|--------|-----|-----------------|--------|---|
| CS | CARBON STEEL WITH PWHT | -29 TO 342 | | STANDARD CONSTRUCTION DRAWING PLANT DESIGN AND PIPING | XXXXXX | 000 | STC - 1390 - 03 | 1 of 1 | 0 |
| Project | | Unit | | Doc. Code & Serial No. | | | Page | | |



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|--------------------------------|---|------------------------|---|--|--|--|---|---|--|---|--|-----------------------------------|---------------------------------|---------------------------|
| UNINSULATED PIPE | SIMPLE REST | | | GUIDE | | STOP | | SEMI-ANCHOR | | BRACKET / GUIDE | | | | |
| |  | | |  | |  | |  | |  | | | | |
| | INDICATIVE SUPPORT ONLY FOR DIAM 2" TO 18" | | | | | | | | | | | | | |
| | DIAM | 50 TO 300 2" TO 12" | 350 TO 600 14" TO 24" | DIAM | 50 TO 600 2" TO 24" | DIAM | 50 TO 300 2" TO 12" | DIAM | 350 TO 600 14" TO 24" | DIAM | 50 TO 150 2" TO 6" | DIAM | 200 TO 600 8" TO 24" | |
| | STD | WR00 | WE01 | STD | WG01 | STD | CS02 | STD | STOP + GUIDE | STD | BRACKET SB11 + CS01 | STD | BRACKET SB12 + WR07 | |
| | | | | | | | | | | | GUIDE SB13 + CG01 | | GUIDE SB14 | |
| INSULATED PIPE | PIPE SHOE | | GUIDE | | STOP | | SEMI-ANCHOR | | BRACKET / GUIDE | | | | | |
| |  | |  | |  | |  | |  | | | | | |
| | DIAM | 50 TO 600 2" TO 24" | DIAM | 650 TO 1500 26" TO 60" | DIAM | 50 TO 600 2" TO 24" | DIAM | 650 TO 1500 26" TO 60" | DIAM | 50 TO 150 2" TO 6" | DIAM | 200 TO 600 8" TO 24" | | |
| | STD | CR01 | STD | WR14 | STD | PIPE SHOE + WG02 | STD | WR01 + WS02 | STD | STOP + GUIDE | STD | BRACKET SB11 + PIPE SHOE | STD | BRACKET SB12 + WR07 |
| | | | | | | | | | | | GUIDE SB13 + PIPE SHOE | | GUIDE SB14 + PIPE SHOE | |
| VERTICAL STANCHION | STANCHION | | STANCHION | | BASE RESTRAINT | | | STANDARD LOAD | | STANDARD LOAD | | | | |
| |  | |  | |  | | |  | |  | | | | |
| | TYPE A | | TYPE D | | TYPE A | | | TYPE B | | TYPE D/E | | | | |
| | DIAM | 50 TO 600 2" TO 24" | DIAM | 650 TO 1500 26" TO 60" | DIAM | 50 TO 600 2" TO 24" | DIAM | 50 TO 600 2" TO 24" | DIAM | 50 TO 600 2" TO 24" | DIAM | 650 TO 1500 26" TO 60" | DIAM | 650 TO 1500 26" TO 60" |
| | STD | CR05 | STD | WR05 | STD | GUIDE CR05 + WG03 | STD | CR07 | STD | CR07 | STD | WR07 | STD | WR07 |
| INSULATED AND UNINSULATED PIPE | STANCHION | | SHAPE STANCHION (2) | | HANGERS | | | | TRUNNION | | SPECIAL REQUIREMENT | | | |
| |  | |  | |  | | | |  | |  | | | |
| | TYPE A | | | | 2 - RIGID STRUTS | | | | TYPE A | | TYPE H | | | |
| | DIAM | 50 TO 600 2" TO 24" | DIAM | 50 TO 600 2" TO 24" | | | | | DIAM | | DIAM | | | |
| | STD | CR09 | STD | CR10 | | | | | STD | | STD | | | |
| REST ON PLATFORMS | CONCRETE (2) | | STEEL (2) | | STRUCTURAL BEAM | | | | | | | | | |
| |  | |  | |  | | | | | | | | | |
| | DIAM | | DIAM | | DIAM | | | | | | | | | |
| | 50 TO 600 2" TO 24" | | 50 TO 600 2" TO 24" | | 50 TO 600 2" TO 24" | | | | | | | | | |
| | STD | | STD | | STD | | | | | | | | | |
| | CR11 | | CR11 | | CR11 | | | | | | | | | |
| APPLICABILITY | | TEMPERATURE RANGE [°C] | | | | | | | | | | | | |
| AS | | ALLOY STEEL | | -29 TO 342 | | | | | | | | | | |
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| UNINSULATED PIPE | SIMPLE REST | GUIDE | STOP | | SEMI-ANCHOR | | BRACKET / GUIDE | |
|------------------|---|---|-----------------------------|-------------------------------|-----------------------------|-------------------------------|--------------------------------|------------------------------|
| | INDICATIVE SUPPORT ONLY FOR DIAM 2" TO 18" | INDICATIVE SUPPORT ONLY FOR DIAM 2" TO 18" | | | | | | |
| | DIAM 50 TO 300 2" TO 12" | DIAM 50 TO 600 2" TO 24" | DIAM 50 TO 300 2" TO 12" | DIAM 350 TO 600 14" TO 24" | DIAM 50 TO 300 2" TO 12" | DIAM 350 TO 600 14" TO 24" | DIAM 50 TO 150 2" TO 6" | DIAM 200 TO 600 8" TO 24" |
| | STD WR00 WE01 | STD WG01 | STD CS02 | STD WS01 | STD STOP + GUIDE | STD STOP + GUIDE | STD SB11 SB13 + CS01 + CG01 | STD SB12 SB14 + WR07 |

| INSULATED PIPE | PIPE SHOE | GUIDE | STOP | SEMI-ANCHOR | BRACKET / GUIDE | |
|----------------|-----------------------------|--------------------------------|-----------------------------|-----------------------------|------------------------------|------------------------------|
| | | | | | | |
| | DIAM 50 TO 600 2" TO 24" | DIAM 650 TO 1500 26" TO 60" | DIAM 50 TO 600 2" TO 24" | DIAM 50 TO 600 2" TO 24" | DIAM 50 TO 150 2" TO 6" | DIAM 200 TO 600 8" TO 24" |
| | STD CR01 | STD WR14 | STD PIPE SHOE + WG02 | STD PIPE SHOE + WG02 | STD SB11 SB13 + PIPE SHOE | STD SB12 SB14 + PIPE SHOE |

| VERTICAL STANCHION | STANCHION | STANCHION | BASE RESTRAINT | | | TRUNNION | STANDARD LOAD | |
|--------------------|-----------------------------|--------------------------------|--------------------|------------------------------|------------------------------|----------|-----------------------------|--------------------------------|
| | TYPE A | TYPE B | GUIDE | STOP | SEMI-ANCHOR | | TYPE A | TYPE B |
| | DIAM 50 TO 600 2" TO 24" | DIAM 650 TO 1500 26" TO 60" | STD CR05 + WG03 | STD WR05 + WS03 TYPE A | STD WR05 + WS03 TYPE B | | DIAM 50 TO 600 2" TO 24" | DIAM 650 TO 1500 26" TO 60" |
| | STD CR05 | STD WR05 | | | | | STD CR07 | STD WR07 |

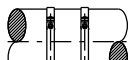



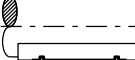

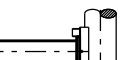

| INSULATED AND UNINSULATED PIPE | STANCHION | SHAPE STANCHION (2) | HANGERS | | | | SPECIAL REQUIREMENT | |
|--------------------------------|-----------------------------|-----------------------------|---------------------|-------------|---------------------|------------------|-----------------------------|------------|
| | TYPE A | | HC | HT | HV | HR | TYPE A | TYPE B |
| | DIAM 50 TO 600 2" TO 24" | DIAM 50 TO 600 2" TO 24" | 1 - CONSTANT SPRING | 3 - TIE-ROD | 4 - VARIABLE SPRING | 2 - RIGID STRUTS | DIAM 50 TO 600 2" TO 24" | STD CE06 |
| | STD CR09 | STD CR10 | | | | | | |

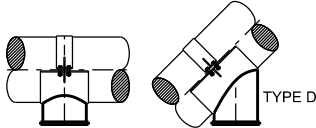
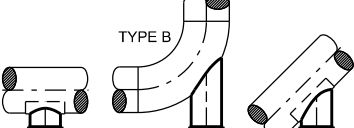
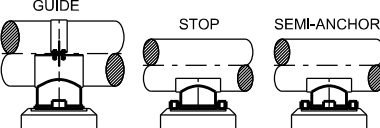
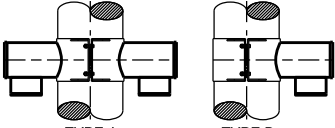
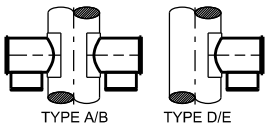
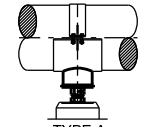
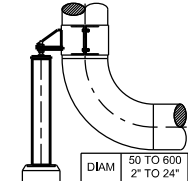
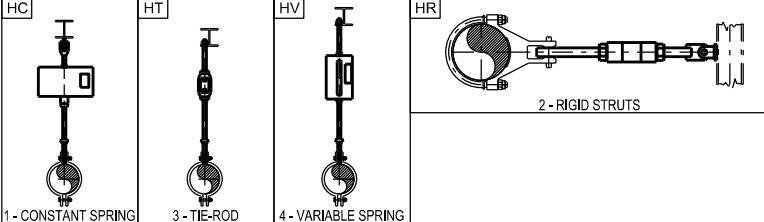
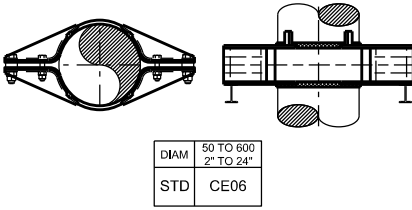
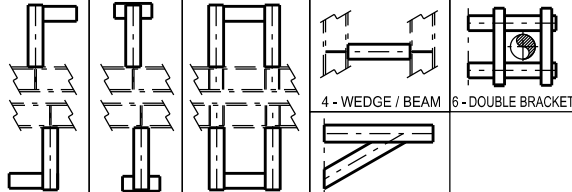
| REST ON PLATFORMS | CONCRETE (2) | STEEL (2) | STRUCTURAL BEAM | | | | |
|-------------------|-----------------------------|-----------------------------|-----------------|---------------|---------------|------------------|--------------------|
| | | | | | | | |
| | DIAM 50 TO 600 2" TO 24" | DIAM 50 TO 600 2" TO 24" | 1 - L STRUCT. | 2 - T STRUCT. | 3 - U STRUCT. | 4 - WEDGE / BEAM | 5 - SINGLE BRACKET |
| | STD CR11 | STD CR11 | | | | | |





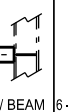
| APPLICABILITY | | TEMPERATURE RANGE [°C] | |
|---------------|-----------------------|------------------------|--|
| AS | ALLOY STEEL WITH PWHT | -29 TO 342 | |

| Technip | | ALLOY STEEL LINES WITH PWHT | | | GL 06 | |
|--|---------|--------------------------------|------------------------|--------|-------|--|
| STANDARD CONSTRUCTION DRAWING PLANT DESIGN AND PIPING | XXXXXX | 000 | STC - 1390 - 06 | 1 of 1 | 0 | |
| | Project | Unit | Doc. Code & Serial No. | Page | Rev. | |

NOTE:
1. SYNOPTICS ARE ONLY GIVEN AS PRINCIPLE.
IN ALL CASES REFER TO STANDARD DRAWINGS
FOR COMPLEMENTARY DETAILS AND SUPPORT MARKS REQUIRED.
2. SUPPORT WE03 SHALL BE USED FOR THESE SUPPORT TYPES.
3. ALL SUPPORTS WELDED TO PIPE SHALL BE PROVIDED WITH PAD
WE01 AND THIS PAD SHALL BE WELDED AT SHOP BEFORE PWHT.

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------|---|---|---|---|--|--|---|---|-----|------|---|------|------------------------|-----|---------------------|--|------|---------------------------|-----|---------------------|---|------|------------------------|---------------------------|-----|----------------|----------------|--|------|-------------------------|-----|-----------------|--|------|-----------------------|--|-----|---------|-------|---------------------|---------------------|--|--|--|------|-------------------------|--|-----|---------|-------|--------------------------|
| INSULATED PIPE | PIPE SHOE (3) | | GUIDE | | STOP | SEMI-ANCHOR | BRACKET / GUIDE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | <table><tr><td>DIAM</td><td>50 TO 600 2" TO 24"</td></tr><tr><td>STD</td><td>CR01</td></tr></table> | DIAM | 50 TO 600 2" TO 24" | STD | CR01 | <table><tr><td>DIAM</td><td>650 TO 1500 26" TO 60"</td></tr><tr><td>STD</td><td>WR14</td></tr></table> | DIAM | 650 TO 1500 26" TO 60" | STD | WR14 | <table><tr><td>DIAM</td><td>50 TO 600 2" TO 24"</td></tr><tr><td>STD</td><td>PIPE SHOE + WG02</td></tr></table> | DIAM | 50 TO 600 2" TO 24" | STD | PIPE SHOE + WG02 | <table><tr><td>DIAM</td><td>650 TO 1500 26" TO 60"</td></tr><tr><td>STD</td><td>PIPE SHOE + WG02</td></tr></table> | DIAM | 650 TO 1500 26" TO 60" | STD | PIPE SHOE + WG02 | <table><tr><td>DIAM</td><td>50 TO 600 2" TO 24"</td><td>650 TO 1500 26" TO 60"</td></tr><tr><td>STD</td><td>WR01 + WS02</td><td>WR14 + WS02</td></tr></table> | DIAM | 50 TO 600 2" TO 24" | 650 TO 1500 26" TO 60" | STD | WR01 + WS02 | WR14 + WS02 | <table><tr><td>DIAM</td><td>50 TO 1500 2" TO 60"</td></tr><tr><td>STD</td><td>STOP + GUIDE</td></tr></table> | DIAM | 50 TO 1500 2" TO 60" | STD | STOP + GUIDE | <table><tr><td>DIAM</td><td colspan="2">50 TO 150 2" TO 6"</td></tr><tr><td rowspan="2">STD</td><td>BRACKET</td><td>GUIDE</td></tr><tr><td>SB11 + PIPE SHOE</td><td>SB13 + PIPE SHOE</td></tr></table> | DIAM | 50 TO 150 2" TO 6" | | STD | BRACKET | GUIDE | SB11 + PIPE SHOE | SB13 + PIPE SHOE | <table><tr><td>DIAM</td><td colspan="2">200 TO 600 8" TO 24"</td></tr><tr><td rowspan="2">STD</td><td>BRACKET</td><td>GUIDE</td></tr><tr><td>SB12 + CR07 + WR01</td><td>SB14 + PIPE SHOE</td></tr></table> | | | DIAM | 200 TO 600 8" TO 24" | | STD | BRACKET | GUIDE | SB12 + CR07 + WR01 |
| DIAM | 50 TO 600 2" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | CR01 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 650 TO 1500 26" TO 60" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | WR14 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 600 2" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | PIPE SHOE + WG02 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 650 TO 1500 26" TO 60" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | PIPE SHOE + WG02 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 600 2" TO 24" | 650 TO 1500 26" TO 60" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | WR01 + WS02 | WR14 + WS02 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 1500 2" TO 60" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | STOP + GUIDE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 150 2" TO 6" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | BRACKET | GUIDE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | SB11 + PIPE SHOE | SB13 + PIPE SHOE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 200 TO 600 8" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | BRACKET | GUIDE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | SB12 + CR07 + WR01 | SB14 + PIPE SHOE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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|---|--|--|---|--|---|--|----------------|--|--|----------|---|--|---------------|--|--|
| INSULATED AND UNINSULATED PIPE | VERTICAL STANCHION | | STANCHION | | STANCHION | | BASE RESTRAINT | | | TRUNNION | STANDARD LOAD | | STANDARD LOAD | | |
| |  <div>TYPE A<div>DIAM 50 TO 600 2" TO 24"</div>STD CR05</div> <div>TYPE D<div>DIAM 650 TO 1500 26" TO 60"</div>STD WR05</div> | |  <div>TYPE A<div>DIAM 650 TO 1500 26" TO 60"</div>STD WR05</div> <div>TYPE B</div> <div>TYPE D</div> | |  <div>GUIDE<div>STD GUIDE CR05 + WG03</div></div> <div>STOP<div>STD STOP WR05 + WS03 TYPE A</div></div> <div>SEMI-ANCHOR<div>STD SEMI-ANCHOR WR05 + WS03 TYPE B</div></div> | | |  <div>TYPE A<div>DIAM 50 TO 600 2" TO 24"</div>STD CR07 +WR01</div> <div>TYPE B</div> | | |  <div>TYPE A/B<div>DIAM 650 TO 1500 26" TO 60"</div>STD WR07 +WR14</div> <div>TYPE D/E</div> | | | | |
| ADJUSTABLE STANCHION | STANCHION | | SHAPE STANCHION (2) | | HANGERS | | | TRUNNION | SPECIAL REQUIREMENT | | | | | | |
| |  <div>TYPE A<div>DIAM 50 TO 600 2" TO 24"</div>STD CR09</div> | |  <div>DIAM 50 TO 600 2" TO 24"</div> STD CR10 | |  <div>HC<div>1 - CONSTANT SPRING</div></div> <div>HT<div>3 - TIE-ROD</div></div> <div>HV<div>4 - VARIABLE SPRING</div></div> <div>HR<div>2 - RIGID STRUTS</div></div> | | | |  <div>DIAM 50 TO 600 2" TO 24"</div> STD CE06 | | | | | | |
| STRUCTURAL BEAM | | | | | | | | | | | | | | | |
|  <div>1 - L STRUCT. 2 - T STRUCT. 3 - U STRUCT. 4 - WEDGE / BEAM 5 - SINGLE BRACKET 6 - DOUBLE BRACKET</div> | | | | | | | | | | | | | | | |

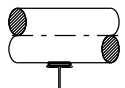


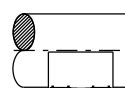

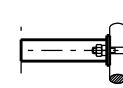
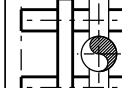

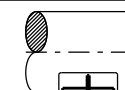


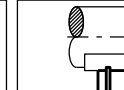
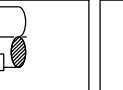

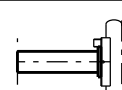
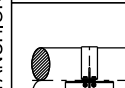
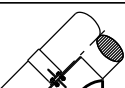


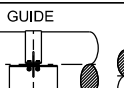


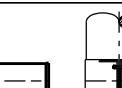
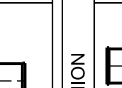
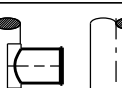

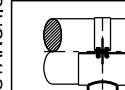
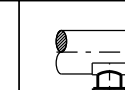

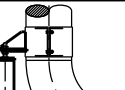
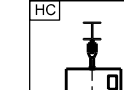
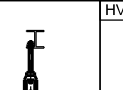

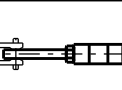



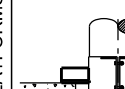
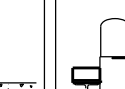
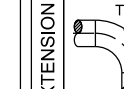
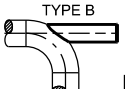
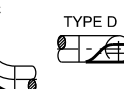


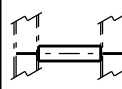
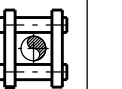


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|--|--|--|--|--|
| STRUCTURAL BEAM | | | | |
|  |  |  |  |  |
| 1 - L STRUCT. | 2 - T STRUCT. | 3 - U STRUCT. | 4 - WEDGE / BEAM | 5 - SINGLE BRACKET |

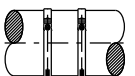



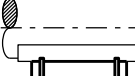

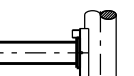
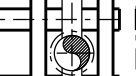
NOTE:
1. SYNOPTICS ARE ONLY GIVEN AS PRINCIPLE.
IN ALL CASES REFER TO STANDARD DRAWINGS
FOR COMPLEMENTARY DETAILS AND SUPPORT MARKS REQUIRED.
2. ALL SUPPORTS WELDED TO PIPE SHALL BE PROVIDED WITH PAD WE01.
3. FOR LINES TEMP MORE THAN 400°C HEAT ISOLATION BLOCK (HH01) TO BE PROVIDED.
4. SUPPORT WE03 SHALL BE USED FOR THESE SUPPORT TYPES.

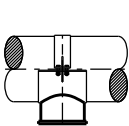
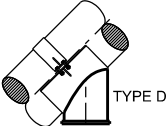

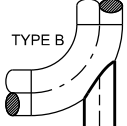

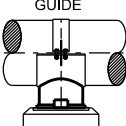
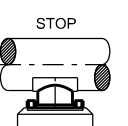
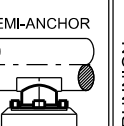
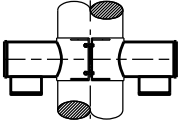
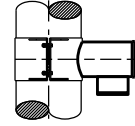
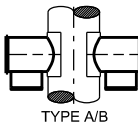
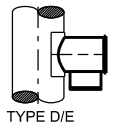

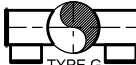
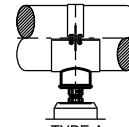
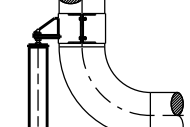
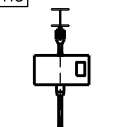

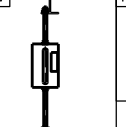
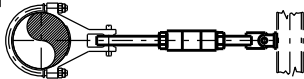

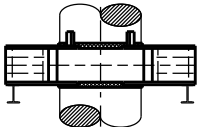
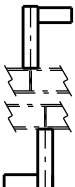
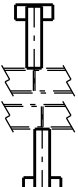
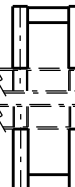
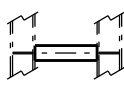
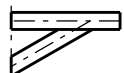
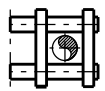
| | |
|---------------|------------------------------|
| APPLICABILITY | |
| AH | ALLOY STEEL HIGH TEMPERATURE |

| |
|------------------------|
| TEMPERATURE RANGE [°C] |
| 343 TO 650 |

| | | | | | | |
|--|--------|---|-----------------|--------|------|--|
| Technip | | ALLOY STEEL LINES WITHOUT PWHT FOR HIGH TEMPERATURE SERVICES | | | GL07 | |
| STANDARD CONSTRUCTION DRAWING PLANT DESIGN AND PIPING | XXXXXX | 000 | STC - 1390 - 07 | 1 of 1 | 0 | |
| Project | Unit | Doc. Code & Serial No. | Page | Rev. | | |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|------------------------|------------------------|------------------------|-----------------|---|---------------------------|---------------------------|------|--|--|------------------------|------------------------|------|---------------------|---|------|---------------------------|---|---------------------|--|------|------------------------|--|----------------|--|----------------|---|------|-------------------------|------|-------------------------|--|------------------------|-----------------------|----------------|------------------------|------------------------|-------------------------|------|---|-------|------------------------|-------|---------------------|------|------------------------|-----|------|
| UNINSULATED PIPE | <div>SIMPLE REST<table><tr><td>DIAM</td><td>50 TO 300 2" TO 12"</td></tr><tr><td>STD</td><td>WE04</td></tr></table></div> | DIAM | 50 TO 300 2" TO 12" | STD | WE04 | <div>PROTECTION SHIELD<table><tr><td>DIAM</td><td>350 TO 600 14" TO 24"</td></tr><tr><td>STD</td><td>WE01</td></tr></table></div> | DIAM | 350 TO 600 14" TO 24" | STD | WE01 | <div>GUIDE<table><tr><td>DIAM</td><td>50 TO 600 2" TO 24"</td></tr><tr><td>STD</td><td>WG01</td></tr></table></div> | DIAM | 50 TO 600 2" TO 24" | STD | WG01 | <div>STOP<table><tr><td>DIAM</td><td>50 TO 600 2" TO 24"</td></tr><tr><td>STD</td><td>WS01</td></tr></table></div> | DIAM | 50 TO 600 2" TO 24" | STD | WS01 | <div>SEMI-ANCHOR<table><tr><td>DIAM</td><td>50 TO 600 2" TO 24"</td></tr><tr><td>STD</td><td>GUIDE +STOP</td></tr></table></div> | DIAM | 50 TO 600 2" TO 24" | STD | GUIDE +STOP | <div>BRACKET / GUIDE<table><tr><td>DIAM</td><td>50 TO 150 2" TO 6"</td></tr><tr><td>STD</td><td>BRACKET + CS01</td></tr></table><table><tr><td>DIAM</td><td>200 TO 600 8" TO 24"</td></tr><tr><td>STD</td><td>BRACKET + WR07</td></tr></table><table><tr><td>GUIDE</td><td>SB13 + CG01</td></tr><tr><td>GUIDE</td><td>SB14</td></tr></table></div> | DIAM | 50 TO 150 2" TO 6" | STD | BRACKET + CS01 | DIAM | 200 TO 600 8" TO 24" | STD | BRACKET + WR07 | GUIDE | SB13 + CG01 | GUIDE | SB14 | | | | | | | | | | | |
| | DIAM | 50 TO 300 2" TO 12" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | WE04 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 350 TO 600 14" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | WE01 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 600 2" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | WG01 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 600 2" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | WS01 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 600 2" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | GUIDE +STOP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 150 2" TO 6" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | BRACKET + CS01 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 200 TO 600 8" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | BRACKET + WR07 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GUIDE | SB13 + CG01 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GUIDE | SB14 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| INSULATED PIPE | <div>PIPE SHOE<table><tr><td>DIAM</td><td>50 TO 600 2" TO 24"</td></tr><tr><td>STD</td><td>CR01</td></tr></table></div> | DIAM | 50 TO 600 2" TO 24" | STD | CR01 | <div>PIPE SHOE<table><tr><td>DIAM</td><td>650 TO 1500 26" TO 60"</td></tr><tr><td>STD</td><td>WR14</td></tr></table></div> | DIAM | 650 TO 1500 26" TO 60" | STD | WR14 | <div>GUIDE<table><tr><td>DIAM</td><td>50 TO 600 2" TO 24"</td></tr><tr><td>STD</td><td>PIPE SHOE + WG02</td></tr></table></div> | DIAM | 50 TO 600 2" TO 24" | STD | PIPE SHOE + WG02 | <div>GUIDE<table><tr><td>DIAM</td><td>650 TO 1500 26" TO 60"</td></tr><tr><td>STD</td><td>PIPE SHOE + WG02</td></tr></table></div> | DIAM | 650 TO 1500 26" TO 60" | STD | PIPE SHOE + WG02 | <div>STOP<table><tr><td>DIAM</td><td>50 TO 600 2" TO 24"</td></tr><tr><td>STD</td><td>WR01 + WS02</td></tr></table><table><tr><td>650 TO 1500 26" TO 60"</td><td>WR14 + WS02</td></tr></table></div> | DIAM | 50 TO 600 2" TO 24" | STD | WR01 + WS02 | 650 TO 1500 26" TO 60" | WR14 + WS02 | <div>SEMI-ANCHOR<table><tr><td>DIAM</td><td>50 TO 1500 2" TO 60"</td></tr><tr><td>STD</td><td>STOP + GUIDE</td></tr></table></div> | DIAM | 50 TO 1500 2" TO 60" | STD | STOP + GUIDE | <div>BRACKET / GUIDE<table><tr><td>DIAM</td><td>50 TO 150 2" TO 6"</td></tr><tr><td>STD</td><td>BRACKET + PIPE SHOE</td></tr></table><table><tr><td>DIAM</td><td>200 TO 600 8" TO 24"</td></tr><tr><td>STD</td><td>BRACKET + WR07</td></tr></table><table><tr><td>GUIDE</td><td>SB13 + PIPE SHOE</td></tr><tr><td>GUIDE</td><td>SB14 + PIPE SHOE</td></tr></table></div> | DIAM | 50 TO 150 2" TO 6" | STD | BRACKET + PIPE SHOE | DIAM | 200 TO 600 8" TO 24" | STD | BRACKET + WR07 | GUIDE | SB13 + PIPE SHOE | GUIDE | SB14 + PIPE SHOE | | | | |
| | DIAM | 50 TO 600 2" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | CR01 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 650 TO 1500 26" TO 60" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | WR14 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 600 2" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | PIPE SHOE + WG02 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 650 TO 1500 26" TO 60" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | PIPE SHOE + WG02 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 600 2" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | WR01 + WS02 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 650 TO 1500 26" TO 60" | WR14 + WS02 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 1500 2" TO 60" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | STOP + GUIDE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 150 2" TO 6" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | BRACKET + PIPE SHOE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 200 TO 600 8" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | BRACKET + WR07 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GUIDE | SB13 + PIPE SHOE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GUIDE | SB14 + PIPE SHOE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| APPLICABILITY | | TEMPERATURE RANGE [°C] | | STAINLESS STEEL LINES | | GL 08 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SS | STAINLESS STEEL | -29 TO 342 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STANDARD CONSTRUCTION DRAWING PLANT DESIGN AND PIPING | | XXXXXX | | 000 | STC - 1390 - 08 | 1 of 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Project | | Unit | | Doc. Code & Serial No. | | Page | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| INSULATED PIPE | PIPE SHOE (4) | | GUIDE | | STOP | SEMI-ANCHOR | BRACKET / GUIDE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| DIAM | 650 TO 1500 26" TO 60" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | WR14 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 600 2" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | PIPE SHOE + WG02 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 650 TO 1500 26" TO 60" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | PIPE SHOE + WG02 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 600 2" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | WR01 + WS02 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | WR14 + WS02 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 1500 2" TO 60" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | STOP + GUIDE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 150 2" TO 6" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | BRACKET + SB11 PIPE SHOE + PIPE SHOE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 200 TO 600 8" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | BRACKET + SB12 PIPE SHOE + CR07 PIPE SHOE + WR01 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | SB14 + PIPE SHOE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

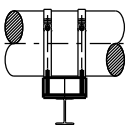
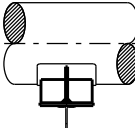

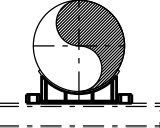
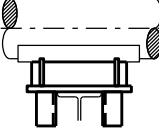
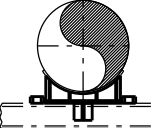
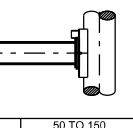
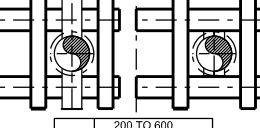
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|------------------------|---|---|--|------------------------|--|------|---|---|------|---------------------------|-----|------|------|---------------------------|-----|------|------|---------------------------|-----|------|---|-----|----------------------|-----|-------------------------------|-----|--------------------------------------|---|------|------------------------|-----|---------------|------|------------------------|-----|---------------|---|------|------------------------|-----|---------------|------|------------------------|-----|---------------|------|---------------------------|-----|---------------|------|---------------------------|
| INSULATED AND UNINSULATED PIPE | VERTICAL STANCHION | STANCHION | | STANCHION | | | BASE RESTRAINT | | | TRUNNION | STANDARD LOAD | | STANDARD LOAD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <div><p>TYPE A</p><table><tr><td>DIAM</td><td>50 TO 600 2" TO 24"</td></tr><tr><td>STD</td><td>CR05</td></tr></table></div> <div><p>TYPE D</p><table><tr><td>DIAM</td><td>50 TO 600 2" TO 24"</td></tr><tr><td>STD</td><td>CR05</td></tr></table></div> | DIAM | 50 TO 600 2" TO 24" | STD | CR05 | DIAM | 50 TO 600 2" TO 24" | STD | CR05 | | <div><p>TYPE A</p><table><tr><td>DIAM</td><td>650 TO 1500 26" TO 60"</td></tr><tr><td>STD</td><td>WR05</td></tr></table></div> <div><p>TYPE B</p><table><tr><td>DIAM</td><td>650 TO 1500 26" TO 60"</td></tr><tr><td>STD</td><td>WR05</td></tr></table></div> <div><p>TYPE D</p><table><tr><td>DIAM</td><td>650 TO 1500 26" TO 60"</td></tr><tr><td>STD</td><td>WR05</td></tr></table></div> | DIAM | 650 TO 1500 26" TO 60" | STD | WR05 | DIAM | 650 TO 1500 26" TO 60" | STD | WR05 | DIAM | 650 TO 1500 26" TO 60" | STD | WR05 | <div><p>GUIDE</p><table><tr><td>STD</td><td>GUIDE CR05 + WG03</td></tr></table></div> <div><p>STOP</p><table><tr><td>STD</td><td>STOP WR05 + WS03 TYPE A</td></tr></table></div> <div><p>SEMI-ANCHOR</p><table><tr><td>STD</td><td>SEMI-ANCHOR WR05 + WS03 TYPE B</td></tr></table></div> | STD | GUIDE CR05 + WG03 | STD | STOP WR05 + WS03 TYPE A | STD | SEMI-ANCHOR WR05 + WS03 TYPE B | <div><p>TYPE A</p><table><tr><td>DIAM</td><td>50 TO 600 2" TO 24"</td></tr><tr><td>STD</td><td>CR07 +WR01</td></tr></table></div> <div><p>TYPE B</p><table><tr><td>DIAM</td><td>50 TO 600 2" TO 24"</td></tr><tr><td>STD</td><td>CR07 +WR01</td></tr></table></div> | DIAM | 50 TO 600 2" TO 24" | STD | CR07 +WR01 | DIAM | 50 TO 600 2" TO 24" | STD | CR07 +WR01 | <div><p>TYPE A/B</p><table><tr><td>DIAM</td><td>50 TO 600 2" TO 24"</td></tr><tr><td>STD</td><td>CR07 +WR01</td></tr></table></div> <div><p>TYPE D/E</p><table><tr><td>DIAM</td><td>50 TO 600 2" TO 24"</td></tr><tr><td>STD</td><td>CR07 +WR01</td></tr></table></div> <div><p>TYPE H</p><table><tr><td>DIAM</td><td>650 TO 1500 26" TO 60"</td></tr><tr><td>STD</td><td>WR07 +WR14</td></tr></table></div> <div><p>TYPE G</p><table><tr><td>DIAM</td><td>650 TO 1500 26" TO 60"</td></tr><tr><td>STD</td><td>WR07 +WR14</td></tr></table></div> | DIAM | 50 TO 600 2" TO 24" | STD | CR07 +WR01 | DIAM | 50 TO 600 2" TO 24" | STD | CR07 +WR01 | DIAM | 650 TO 1500 26" TO 60" | STD | WR07 +WR14 | DIAM | 650 TO 1500 26" TO 60" |
| DIAM | 50 TO 600 2" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | CR05 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 600 2" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | CR05 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 650 TO 1500 26" TO 60" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | WR05 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 650 TO 1500 26" TO 60" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | WR05 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 650 TO 1500 26" TO 60" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | WR05 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | GUIDE CR05 + WG03 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | STOP WR05 + WS03 TYPE A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | SEMI-ANCHOR WR05 + WS03 TYPE B | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 600 2" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | CR07 +WR01 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 600 2" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | CR07 +WR01 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 600 2" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | CR07 +WR01 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 600 2" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | CR07 +WR01 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 650 TO 1500 26" TO 60" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | WR07 +WR14 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 650 TO 1500 26" TO 60" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | WR07 +WR14 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ADJUSTABLE STANCHION | STANCHION | SHAPE STANCHION (2) | | HANGERS | | | | SPECIAL REQUIREMENT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <div><p>TYPE A</p><table><tr><td>DIAM</td><td>50 TO 600 2" TO 24"</td></tr><tr><td>STD</td><td>CR09</td></tr></table></div> | DIAM | 50 TO 600 2" TO 24" | STD | CR09 | <div><p>SHAPE STANCHION (2)</p><table><tr><td>DIAM</td><td>50 TO 600 2" TO 24"</td></tr><tr><td>STD</td><td>CR10</td></tr></table></div> | DIAM | 50 TO 600 2" TO 24" | STD | CR10 | <div><p>HC</p><p>1 - CONSTANT SPRING</p></div> <div><p>HT</p><p>3 - TIE-ROD</p></div> <div><div><p>HV</p><p>4 - VARIABLE SPRING</p></div><div><p>HR</p><p>2 - RIGID STRUTS</p></div></div> | <div><table><tr><td>DIAM</td><td>50 TO 600 2" TO 24"</td></tr><tr><td>STD</td><td>CE06</td></tr></table></div> <div></div> | DIAM | 50 TO 600 2" TO 24" | STD | CE06 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 600 2" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | CR09 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 600 2" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | CR10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 600 2" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | CE06 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STRUCTURAL BEAM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <div><p>1 - L STRUCT.</p></div> | | <div><p>2 - T STRUCT.</p></div> | | <div><p>3 - U STRUCT.</p></div> | | <div><p>4 - WEDGE / BEAM</p></div> <div><p>5 - SINGLE BRACKET</p></div> | | <div><p>6 - DOUBLE BRACKET</p></div> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

NOTE:
1. SYNOPTICS ARE ONLY GIVEN AS PRINCIPLE.
IN ALL CASES REFER TO STANDARD DRAWINGS
FOR COMPLEMENTARY DETAILS AND SUPPORT MARKS REQUIRED.
2. SUPPORT WE03 SHALL BE USED FOR THESE SUPPORT TYPES.
3. ALL SUPPORTS WELDED TO PIPE SHALL BE PROVIDED WITH PAD
WE01 AND THIS PAD SHALL BE WELDED AT SHOP BEFORE PWHT.
4. FOR LINE TEMP MORE THAN 400°C HEAT ISOLATION BLOCK (HH01) TO BE PROVIDED.

| APPLICABILITY | |
|---------------|--|
| AH | ALLOY STEEL HIGH TEMPERATURE WITH PWHT |

| TEMPERATURE RANGE [°C] |
|------------------------|
| 343 TO 650 |

| Technip | | ALLOY STEEL LINES WITH PWHT FOR HIGH TEMPERATURE SERVICES | | | GL09 | |
|--|--|--|------------------------|-----------------|--------|------|
| STANDARD CONSTRUCTION DRAWING PLANT DESIGN AND PIPING | | XXXXXX | 000 | STC - 1390 - 09 | 1 of 1 | 0 |
| Project | | Unit | Doc. Code & Serial No. | | Page | Rev. |

| INSULATED PIPE | PIPE SHOE (3) | | GUIDE | | STOP | | SEMI-ANCHOR | | BRACKET / GUIDE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------|--|---|-------|------------------------|------|------|--|--|-----------------|---------------------------|-----|------|--|---|------|------------------------|-----|---------------------|--|--|------|---------------------------|-----|---------------------|---|--|------|------------------------|-----|----------------|--|--|------|-------------------------|-----|-----------------|--|---|------|-----------------------|-----|---------------------------|--|-------------------------|--|---|------|-------------------------|-----|-----------------------------|--|
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| DIAM | 50 TO 600 2" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | CR01 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 650 TO 1500 26" TO 60" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | WR14 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 600 2" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | PIPE SHOE + WG02 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 650 TO 1500 26" TO 60" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | PIPE SHOE + WG02 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 600 2" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | WR01 + WS02 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 1500 2" TO 60" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | STOP + GUIDE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 50 TO 150 2" TO 6" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | BRACKET + PIPE SHOE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | GUIDE + PIPE SHOE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIAM | 200 TO 600 8" TO 24" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STD | BRACKET + CR07 + WR01 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | GUIDE + PIPE SHOE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

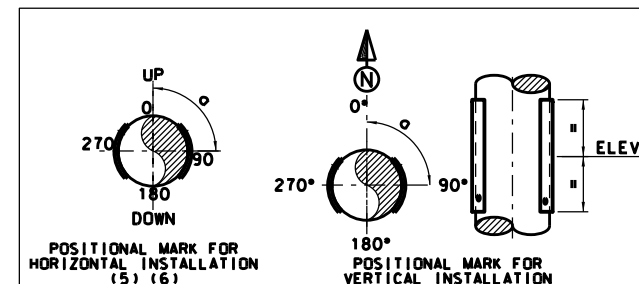
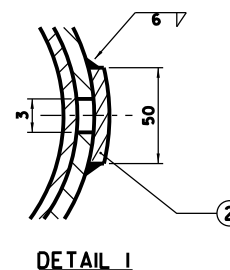
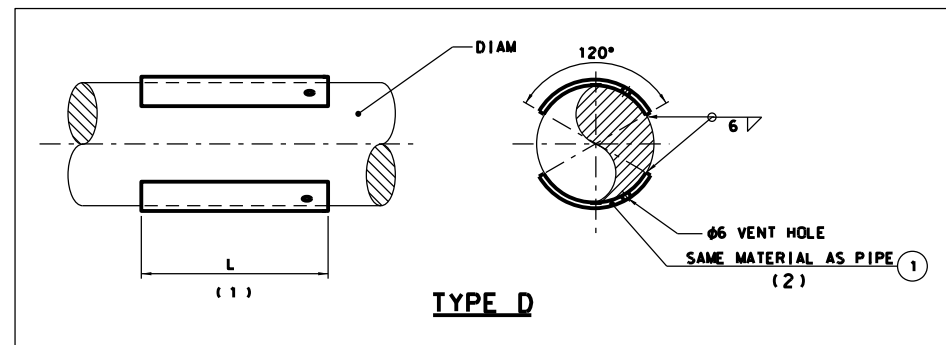
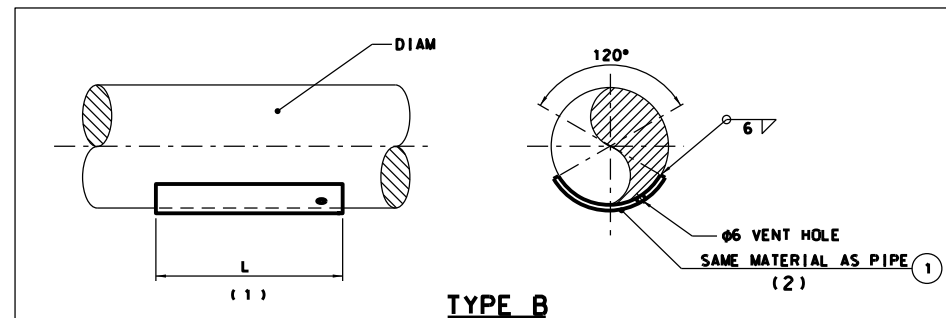
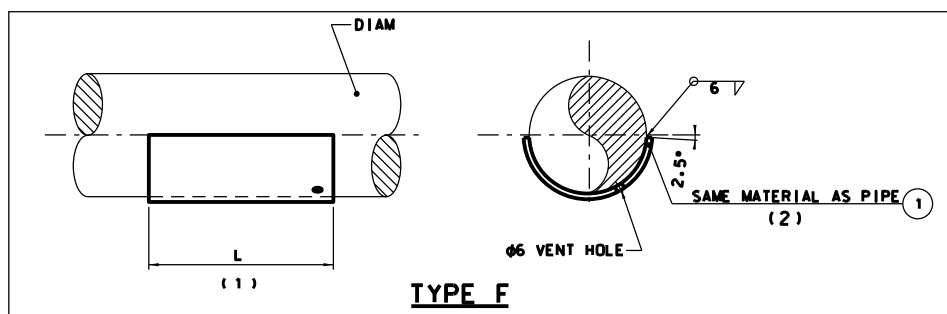
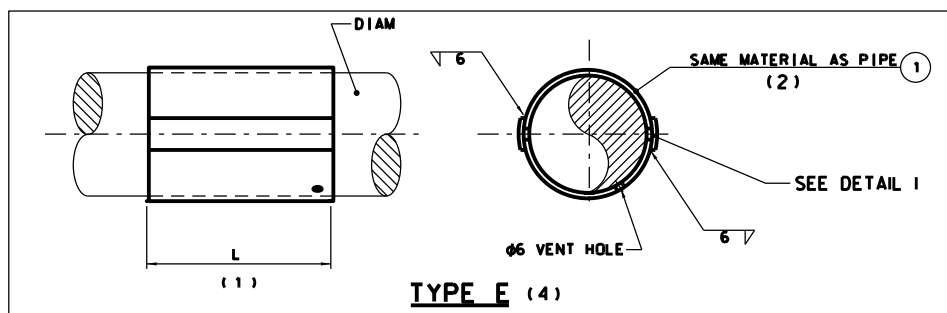
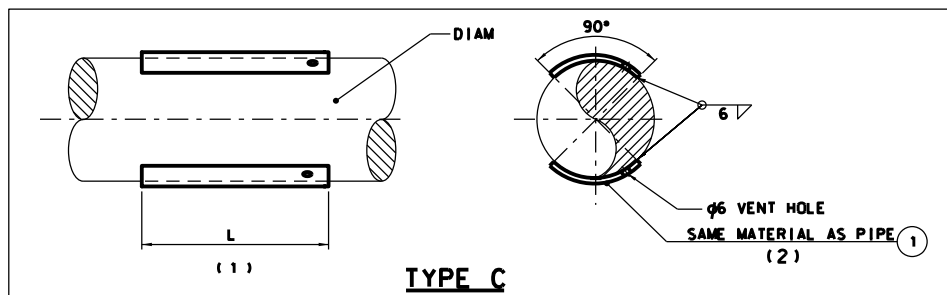
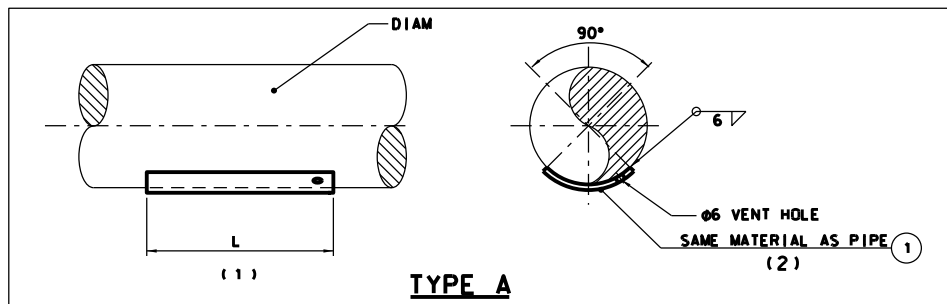
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|--|---|--|--|--|---|---|--|----------|---------------------|---------------|--|---------------|--|
| INSULATED AND UNINSULATED PIPE | VERTICAL STANCHION | STANCHION | | STANCHION | | BASE RESTRAINT | | | TRUNNION | STANDARD LOAD | | STANDARD LOAD | |
| | TYPE A TYPE D DIAM 50 TO 600 2" TO 24" STD CR05 | TYPE A TYPE B TYPE D DIAM 650 TO 1500 26" TO 60" STD WR05 | GUIDE STOP SEMI-ANCHOR STD GUIDE CR05 + WG03 STD STOP WR05 + WS03 TYPE A STD SEMI-ANCHOR WR05 + WS03 TYPE B | TYPE A TYPE B DIAM 50 TO 600 2" TO 24" STD CR07 + WR01 | TYPE A/B TYPE D/E DIAM 650 TO 1500 26" TO 60" STD WR07 + WR14 | | | | | | | | |
| ADJUSTABLE STANCHION | STANCHION | SHAPE STANCHION (2) | | HANGERS | | | | TRUNNION | SPECIAL REQUIREMENT | | | | |
| TYPE A DIAM 50 TO 600 2" TO 24" STD CR09 | DIAM 50 TO 600 2" TO 24" STD CR10 | HC 1 - CONSTANT SPRING | HT 3 - TIE-ROD | HV 4 - VARIABLE SPRING | HR 2 - RIGID STRUTS | DIAM 50 TO 600 2" TO 24" STD CE06 | | | | | | | |
| STRUCTURAL BEAM | | | | | | | | | | | | | |
| 1 - L STRUCT. 2 - T STRUCT. 3 - U STRUCT. 4 - WEDGE / BEAM 5 - SINGLE BRACKET 6 - DOUBLE BRACKET | | | | | | | | | | | | | |

NOTE:
1. SYNOPTICS ARE ONLY GIVEN AS PRINCIPLE.
IN ALL CASES REFER TO STANDARD DRAWINGS
FOR COMPLEMENTARY DETAILS AND SUPPORT MARKS REQUIRED.
2. ALL SUPPORTS WELDED TO PIPE SHALL BE PROVIDED WITH PAD WE01.
3. FOR LINES TEMP MORE THAN 400°C HEAT ISOLATION BLOCK (HH01) TO BE PROVIDED.
4. SUPPORT WE03 SHALL BE USED FOR THESE SUPPORT TYPES.

| APPLICABILITY | |
|---------------|----------------------------------|
| SH | STAINLESS STEEL HIGH TEMPERATURE |

| TEMPERATURE RANGE [°C] |
|------------------------|
| 343 TO 650 |

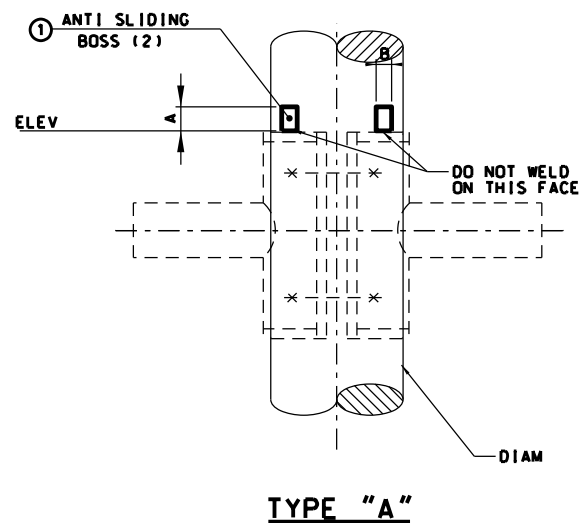
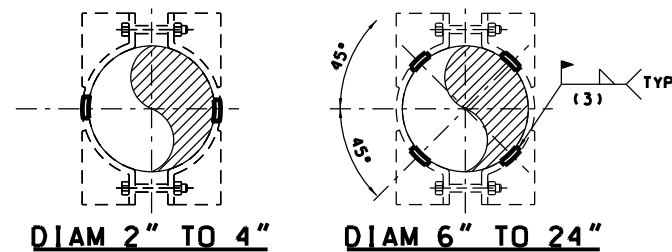
| Technip | | STAINLESS STEEL LINES FOR HIGH TEMPERATURE SERVICES | | | GL 10 | |
|--|--|--|-----|------------------------|--------|------|
| STANDARD CONSTRUCTION DRAWING PLANT DESIGN AND PIPING | | XXXXXX | 000 | STC - 1390 - 10 | 1 of 1 | 0 |
| Project | | Unit | | Doc. Code & Serial No. | | Page |
| | | | | | | Rev. |



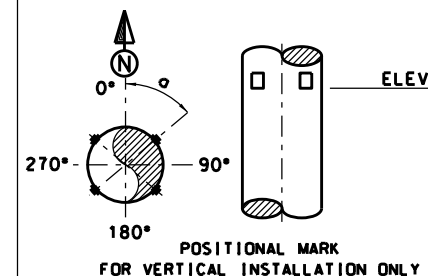
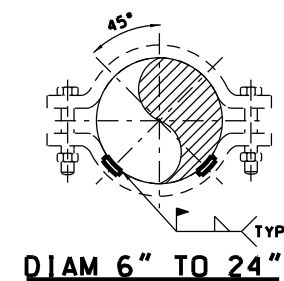
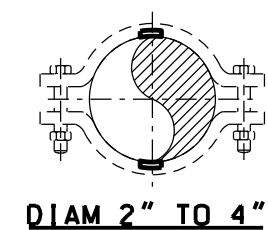
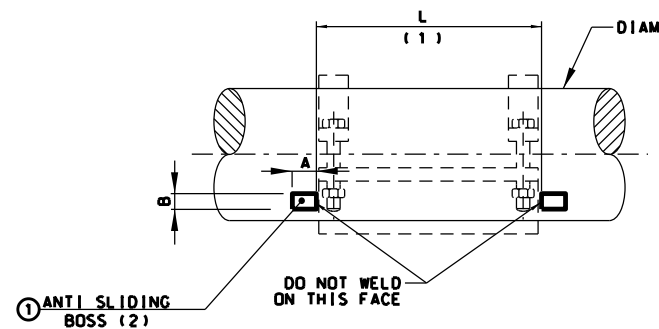
NOTES:

1. L MAX. = 950.
2. MATERIAL AND SCH. AS PER PIPING CLASSES WITH MAX. THK=12.7mm, EXCEPT SPECIAL REQUIREMENT
3. DELETED
4. USE WHEN REQUIRED BY STRESS CALCULATION.
5. LOOKING TO FLOW FLUID DIRECTION.
6. TO BE INDICATED ONLY IF DIFFERENT OF 180°.

| | | | | | | | | | |
|--|------|------|---|-----|---|------|---|--|-------|
| Support Mark | | | | | Positional Mark | | | | |
| WE01 | DIAM | TYPE | L | SCH | MATCL | ELEV | a | | |
| <i>Technip</i> | | | | | PROTECTION, SHIELD, FOR DIAM 2" TO 60" | | | | WE 01 |
| STANDARD CONSTRUCTION DRAWING PLANT DESIGN AND PIPING | | | | | XXXXXXXXXXXX 000 STC1391-01 1 of 1 0 | | | | |
| Project | | | | | Unit Doc. Code & Serial No. Page Rev | | | | |



| TABLE "1" | | |
|------------|-----|----|
| DIAM | A | B |
| 2" TO 6" | 50 | 50 |
| 8" TO 14" | 80 | 60 |
| 16" TO 20" | 100 | 70 |
| 24" | 120 | 80 |



NOTES:

1. DIMENSIONS L TO BE DEFINED IN FIELD ACCORDING TO CLAMP DIMENSIONS.
2. MATERIAL AND SCH. AS PER PIPING CLASSES WITH MAX. THK = 12.7mm EXCEPT SPECIAL REQUIREMENT
3. DIMENSION OF WELD SHALL BE 0.7 OF PIPE THICKNESS.

| ① | BEARING | 2/4 | CUT FROM SAME PIPE (2) | / | / | / | / | / | / | / | / | |
|------|-------------|------|------------------------|----|----|----|----|----|----|----|----|--|
| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH | |

Support + Mark

Positional Mark

| | | | | |
|------|------|------|-----|-------|
| WE03 | DIAM | TYPE | SCH | MATCL |
|------|------|------|-----|-------|

| | |
|------|---|
| ELEV | a |
|------|---|

Technip

SHEAR LUG BEARING
FOR DIAM 2" TO 24"

WE 03

STANDARD CONSTRUCTION DRAWING PLANT DESIGN AND PIPING

| | | | | | |
|---|------------|------|------------------------|--------|------|
| G | XXXXXXXXXX | 000 | STC 1391-03 | 1 of 1 | 0 |
| | Project | Unit | Doc. Code & Serial No. | Page | Rev. |

EXISTING STEEL SURFACE

FLAT BAR 50x5

4 TYP

L

(SEE TABLE "1")

FLAT BAR 50x5 1

L1

L1

4 TYP

EXISTING STEEL SURFACE

| DIAM | L | L1 |
|------------|-----|-----|
| 2" | 80 | 40 |
| 3" | 100 | 60 |
| 4" | 100 | 100 |
| 6" TO 8" | 150 | 150 |
| 10" TO 12" | 200 | 200 |
| 14" TO 24" | 200 | 200 |

DIAM

ROUND-OFF EDGES

50

EXISTING STEEL SURFACE

FLAT BAR 50x5

4

L1

(SEE TABLE "1")

| | | | | | | | | | | | |
|----------------------------------|--------|---|---------------|--------|----------------|----|---------|----------------|----|----------|---------------------|
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| <input type="radio"/> | | | | | | | | | | | |
| <input type="radio"/> | | | | | | | | | | | |
| <input checked="" type="radio"/> | WEDGE | - | FLAT BAR 50x5 | A36 | A36 | / | A36 (G) | A36 | / | A240-304 | A240-304 |
| ITEM DESCRIPTION QTY. | DETAIL | | | CS (1) | CH | CL | CG | AS | AH | SS | SH |
| | | | | | | | | MATCL | | | |

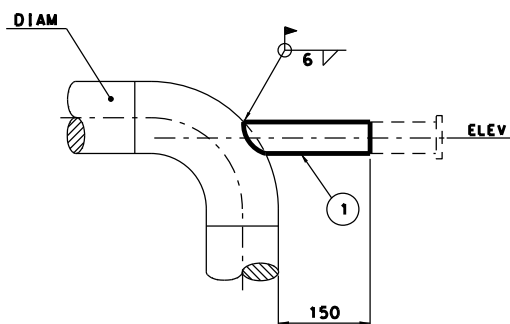
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|------|------|------|-------|
|------|------|------|-------|

WEDGE
FOR DIAM 2" TO 24"

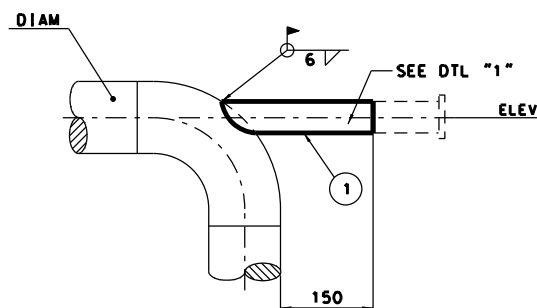
WE 04

STANDARD CONSTRUCTION DRAWING
PLANT DESIGN AND PIPING

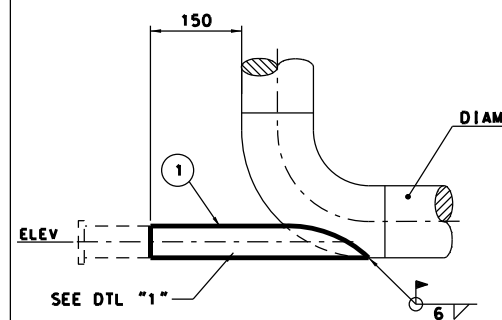
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|---|------------|------|------------------------|--------|------|
| G | XXXXXXXXXX | 000 | STC 1391-04 | 1 of 1 | 0 |
| | Project | Unit | Doc. Code & Serial No. | Page | Rev. |



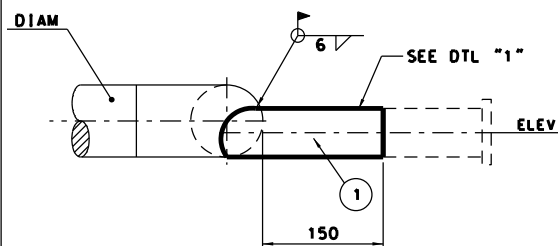
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(2)



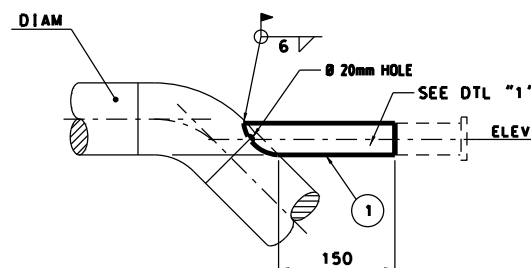
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(2)



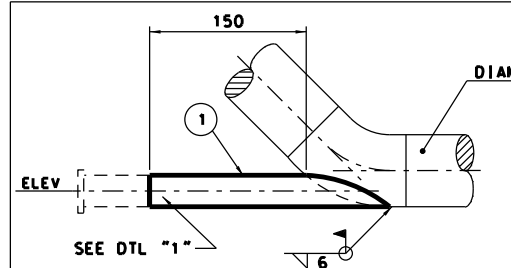
TYPE C
(2)



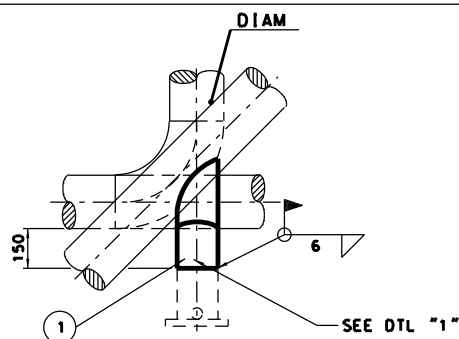
TYPE D
(2)



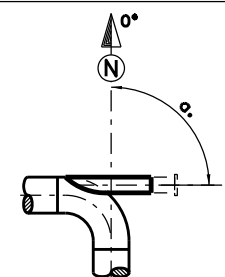
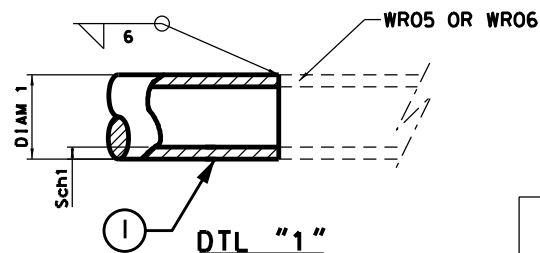
TYPE E
(2)



TYPE F
(2)



TYPE G
(1)



DUMMY ORIENTATION FOR HORIZONTAL INSTALLATION ONLY.

NOTES:

1. SUPPORT TO BE USED IN JUNCTION WITH SUPPORT WR05.
2. SUPPORT TO BE USED IN JUNCTION WITH SUPPORT WR06.
3. MATCH PER PIPING CLASSES EXCEPT SPECIFIC REQUIREMENT.
4. SPECIFY BY NOTE ON ISOMETRIC IN CASE OF WELDING BEFORE TREATMENT OR ANY OTHER REASONS.

Support + Mark

| WE05 | DIAM | DIAM1 | TYPE | SCH | SCH1 | MATCL |
|------|------|-------|------|-----|------|-------|
|------|------|-------|------|-----|------|-------|

Positional Mark

| | |
|------|----|
| ELEV | a. |
|------|----|

Technip

SPOOL PIECE FOR DUMMY LEG AND
TRUNNION ON BEND FOR DIAM 2" TO

WE 05

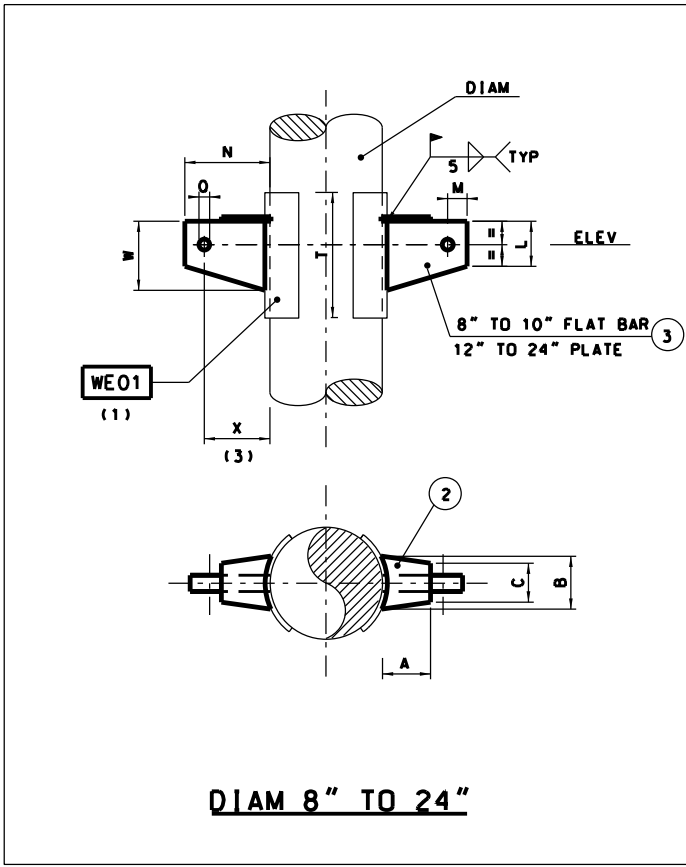
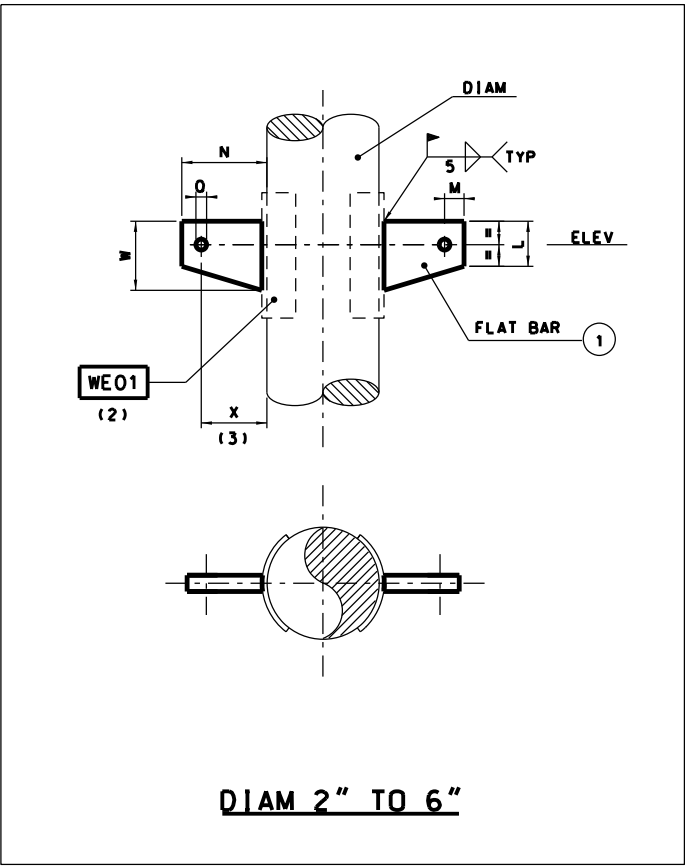
STANDARD CONSTRUCTION DRAWING PLANT DESIGN AND PIPING

| | | | | |
|------------|------|------------------------|--------|------|
| XXXXXXXXXX | 000 | STC 1391-05 | 1 of 1 | 0 |
| Project | Unit | Doc. Code & Serial No. | Page | Rev. |

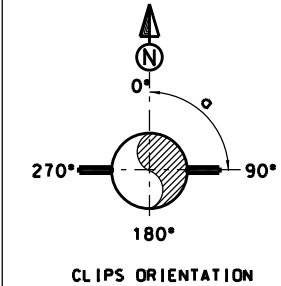
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| <input type="radio"/> | | | | | | | | | | | | |
| <input checked="" type="radio"/> | SPOOL PIECE | 1 | PIPE DIAM (3) | / | / | / | / | / | / | / | / | |
| ITEM DESCRIPTION QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH | MATCL (3) | | |

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00005TC13912P100.004



| TABLE "1" | | | | | | | | | |
|------------|-----------------|-----|----|----|-----|-----|-----|-----|-----|
| DIAM | CLIP | L | M | O | T | W | A | B | C |
| 2" TO 3" | FLAT BAR 200x10 | 60 | 25 | 14 | / | 200 | / | / | / |
| 4" TO 6" | FLAT BAR 200x10 | 60 | 30 | 18 | / | 200 | / | / | / |
| 8" TO 10" | FLAT BAR 200x10 | 60 | 35 | 22 | 300 | 200 | 175 | 175 | 80 |
| 12" TO 14" | PLATE THK 20 | 100 | 40 | 27 | 350 | 300 | 200 | 200 | 100 |
| 16" TO 18" | PLATE THK 20 | 100 | 50 | 33 | 350 | 300 | 200 | 200 | 100 |
| 20" TO 24" | PLATE THK 20 | 100 | 60 | 39 | 350 | 300 | 200 | 200 | 100 |




NOTES:

1. FOR 8" TO 24" PROTECTION SHIELD SHALL BE USED.

2. FOR 2" TO 6" PROTECTION SHIELD ONLY IF REQUIRED BY DESIGNER.

3. X MAXIMUM = 400

| Support Mark | Positional Mark |
|-------------------|-----------------|
| WE06 DIAM X MATCL | ELEV a |



DOUBLE CLIPS ON VERTICAL PIPE
FOR DIAM 2" TO 24"

WE06

STANDARD CONSTRUCTION DRAWING
PLANT DESIGN AND PIPING

XXXXXXXXXXXX 000

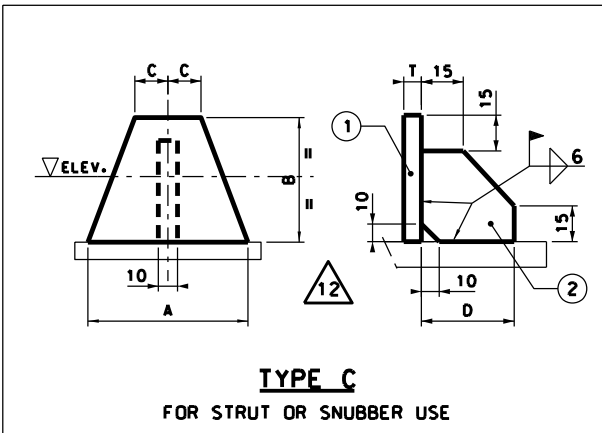
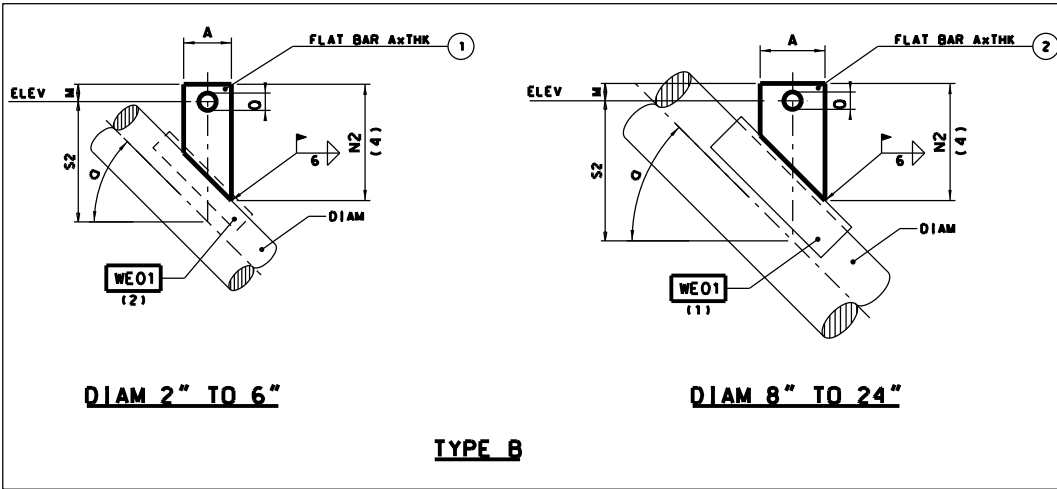
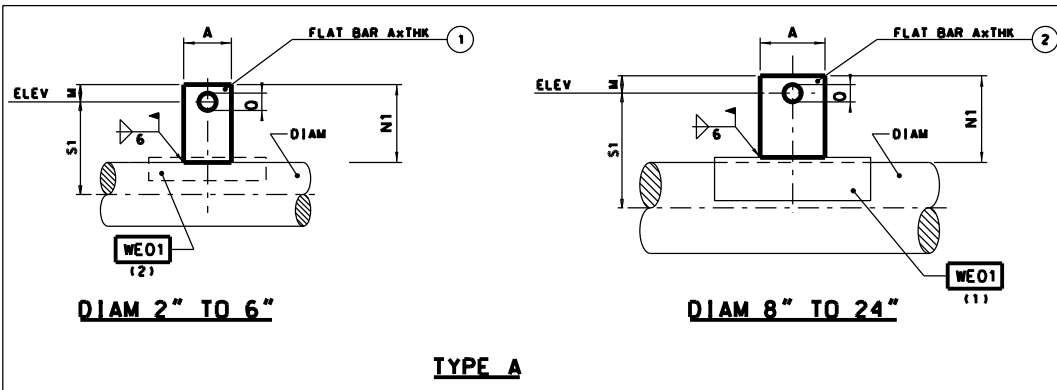
STC 1391-06 1 of 1

0

Project Unit Doc. Code & Serial No. Page Rev.

| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH |
|------|-------------|------|-------------------|-----|---------|---------|----|---------|---------|----------|----------|
| ③ | CLIP | 2 | FLAT BAR OR PLATE | A36 | A387-11 | A516-60 | / | A36 | A387-11 | A36 | A240-304 |
| ② | GUSSET | 2 | PLATE-THK.10 | A36 | A387-11 | A516-60 | / | A36 | A387-11 | A36 | A240-304 |
| ① | CLIP | 2 | FLAT BAR | A36 | A387-11 | A516-60 | / | A387-11 | A387-11 | A240-304 | A240-304 |

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| GUSSETS DIMENSIONS | | | | | |
|--------------------|-----|-----|----|-----|----|
| DIAM | A | B | C | D | T |
| 2" | 70 | 80 | 30 | 30 | 10 |
| 3" | 70 | 100 | 30 | 30 | 10 |
| 4" | 90 | 100 | 30 | 60 | 10 |
| 6" | 120 | 120 | 35 | 60 | 10 |
| 8" | 160 | 120 | 35 | 100 | 10 |
| 10" | 160 | 120 | 35 | 100 | 10 |
| 12" | 210 | 140 | 40 | 110 | 15 |
| 14" | 260 | 160 | 40 | 130 | 15 |
| 16" | 260 | 160 | 40 | 130 | 15 |
| 18" | 260 | 160 | 60 | 160 | 15 |
| 20" | 300 | 160 | 60 | 180 | 15 |
| 22" | 300 | 160 | 60 | 180 | 15 |
| 24" | 300 | 160 | 60 | 180 | 15 |

| TBL "1" | | | | | | | | |
|---------|----|-----|--------|----|-----|-----|--------|-----------------|
| DIAM | M | N1 | N2 (4) | O | S1 | S2 | AxTHK | MAX. LOADS [KN] |
| 2" | 30 | 120 | 220 | 18 | 120 | 202 | 60x10 | 10.00 |
| 3" | 30 | 120 | 220 | 18 | 135 | 224 | 60x10 | |
| 4" | 30 | 120 | 220 | 18 | 147 | 241 | 60x10 | |
| 6" | 35 | 140 | 246 | 22 | 189 | 294 | 60x10 | 15.00 |
| 8" | 35 | 140 | 246 | 22 | 215 | 331 | 100x10 | |
| 10" | 35 | 140 | 246 | 22 | 242 | 369 | 100x10 | |
| 12" | 40 | 160 | 260 | 27 | 282 | 399 | 100x15 | 25.00 |
| 14" | 40 | 160 | 260 | 27 | 298 | 422 | 100x15 | |
| 16" | 40 | 160 | 260 | 27 | 323 | 457 | 100x15 | |
| 18" | 50 | 180 | 280 | 33 | 359 | 504 | 100x20 | 40.00 |
| 20" | 50 | 180 | 280 | 33 | 382 | 539 | 100x20 | |
| 22" | 60 | 200 | 300 | 39 | 420 | 585 | 100x20 | |
| 24" | 60 | 200 | 300 | 39 | 445 | 621 | 100x20 | 60.00 |

NOTES:

1. FOR 8" TO 24" PROTECTION SHIELD SHALL BE USED
2. FOR 2" TO 6" PROTECTION SHIELD ONLY IF REQUIRED BY SUPPORT DESIGNER.
3. DELETED
4. DIM "N2" GIVEN ONLY FOR LINE WITH $\alpha = 45^\circ$

Support Mark

WE07 DIAM TYPE MATCL

Positional Mark

ELEV

Technip

CLIP ON HORIZONTAL PIPE
FOR DIAM 2" TO 24"

WE07

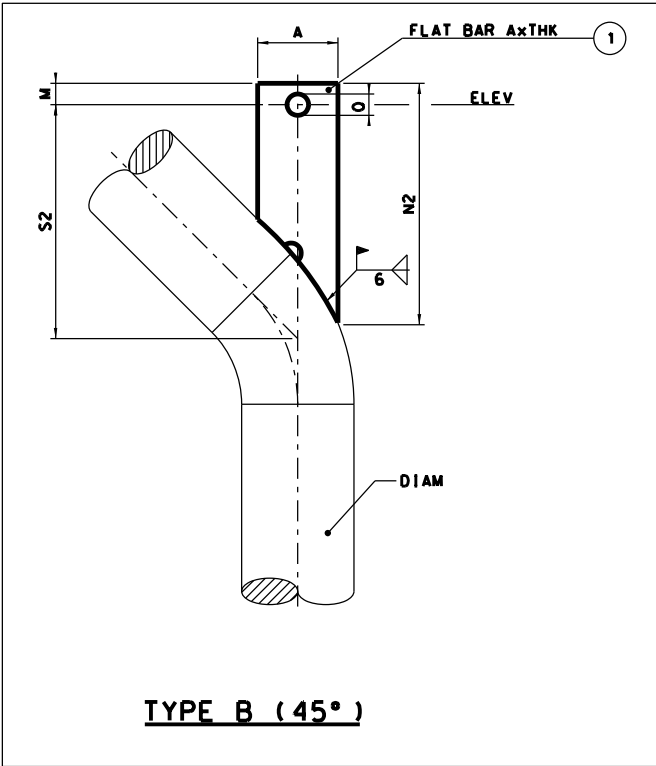
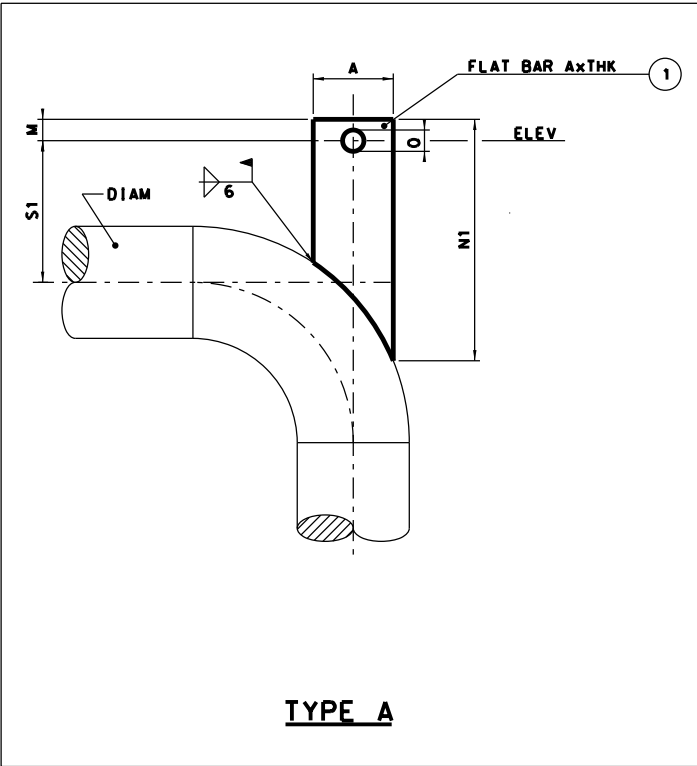
STANDARD CONSTRUCTION DRAWING
PLANT DESIGN AND PIPING

XXXXXXXXXXXX 000 STC 1391-07 1 of 1 0
Project Unit Doc. Code & Serial No. Page Rev.

| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH |
|------|-------------|------|----------------|-----|---------|---------|----|---------|---------|----------|----------|
| ② | CLIP | 1 | FLAT BAR AxTHK | A36 | A387-11 | A516-60 | / | A36 | A387-11 | A36 | A240-304 |
| ① | CLIP | 1 | FLAT BAR AxTHK | A36 | A387-11 | A516-60 | / | A387-11 | A387-11 | A240-304 | A240-304 |

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| TABLE "1" | | | | | | | | | |
|-----------|----|-----|-----|----|-----|-----|-----|-----|-----------------|
| DIAM | M | N1 | N2 | O | S1 | S2 | A | THK | MAX. LOADS (KN) |
| 2" | 30 | 121 | 120 | 18 | 60 | 100 | 40 | 10 | 10.00 |
| 3" | 30 | 183 | 175 | 18 | 100 | 150 | 70 | 10 | |
| 4" | 30 | 278 | 240 | 18 | 150 | 200 | 100 | 10 | |
| 6" | 35 | 272 | 273 | 22 | 150 | 285 | 100 | 10 | 15.00 |
| 8" | 35 | 240 | 257 | 22 | 150 | 310 | 100 | 10 | |
| 10" | 35 | 291 | 299 | 22 | 120 | 350 | 150 | 10 | |
| 12" | 40 | 301 | 298 | 27 | 120 | 385 | 150 | 15 | |
| 14" | 40 | 370 | 354 | 27 | 120 | 415 | 200 | 15 | 25.00 |
| 16" | 40 | 354 | 348 | 27 | 100 | 450 | 200 | 15 | |
| 18" | 50 | 368 | 358 | 33 | 100 | 490 | 200 | 20 | |
| 20" | 50 | 514 | 520 | 33 | 150 | 600 | 300 | 20 | 40.00 |
| 22" | 60 | 526 | 530 | 39 | 150 | 650 | 300 | 20 | |
| 24" | 60 | 529 | 546 | 39 | 150 | 700 | 300 | 20 | 60.00 |

| | | | | | | | | | | | | | | | | | | | |
|-------|-------------|------|------------------|-----|---------|---------|----|---------|---------|----------|----------|--|--|--|--|--|--|--|--|
| ○ | | | | | | | | | | | | | | | | | | | |
| ○ | | | | | | | | | | | | | | | | | | | |
| ○ | | | | | | | | | | | | | | | | | | | |
| ① | CLIP | 1 | FLAT BAR A x THK | A36 | A387-11 | A516-60 | / | A387-11 | A387-11 | A240-304 | A240-304 | | | | | | | | |
| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH | | | | | | | | |
| MATCL | | | | | | | | | | | | | | | | | | | |

NOTES:

Support Mark

WE08

DIAM

TYPE

MATCL

Positional Mark

ELEV

Technip

CLIP ON ELBOWS
FOR DIAM 2" TO 24"

WE08

STANDARD CONSTRUCTION DRAWING
PLANT DESIGN AND PIPING

XXXXXXXXXXXX 000

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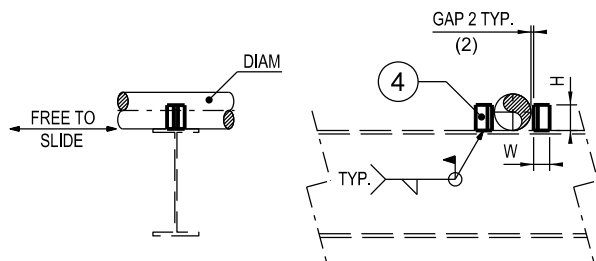
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Unit

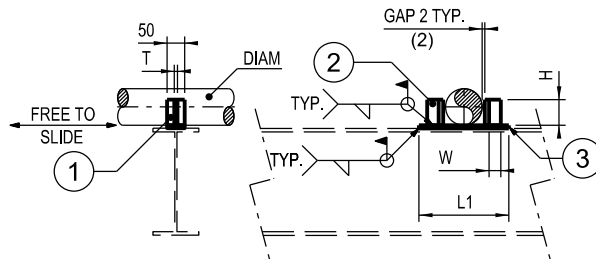
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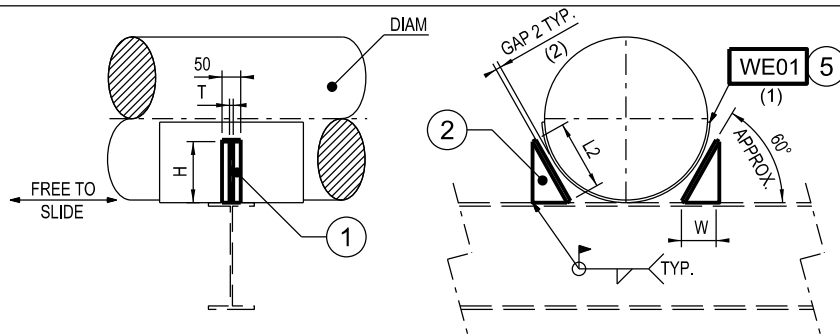
Rev.



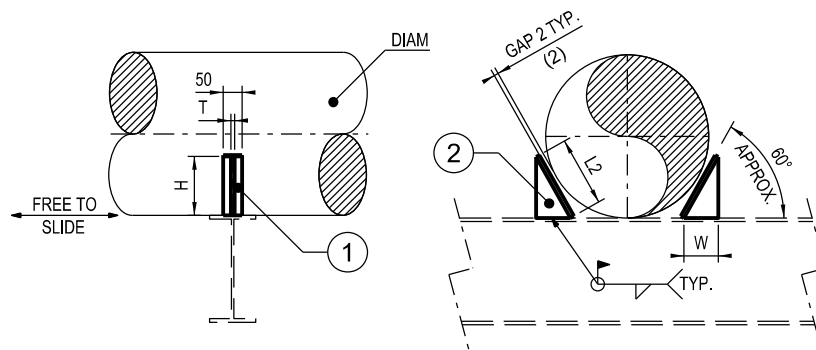
TYPE A
DIAM ND 40 TO 100 - DIAM 1 1/2" TO 4"



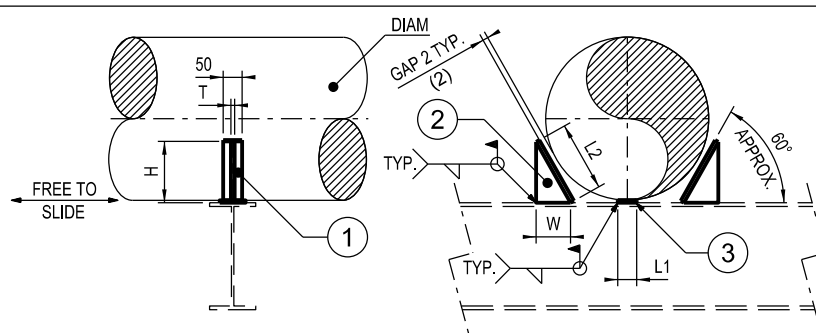
TYPE B
DIAM ND 40 TO 100 - DIAM 1 1/2" TO 4"



TYPE C
DIAM ND 350 TO 600 - DIAM 14" TO 24"



TYPE A
DIAM ND 150 TO 300 - DIAM 6" TO 12"



TYPE B
DIAM ND 150 TO 300 - DIAM 6" TO 12"

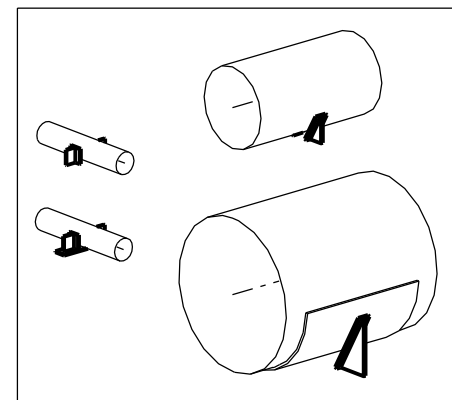
| DIAM | Max.Load (kN) |
|------|---------------|
| 2" | 1 |
| 4" | 8 |
| 6" | 15 |
| 8" | 30 |
| 10" | 40 |
| 12" | 50 |
| 14" | 60 |
| 16" | 70 |
| 18" | 80 |
| 20" | 125 |
| 24" | 130 |

NOTES:

1. FOR DIAM ND 350 TO 600 - DIAM 14" TO 24" PROTECTION SHIELD SHALL BE USED.
2. MAXI GAP TO VERIFY AT INSTALLATION.
3. FOR SS WITH WE01, TYPE A SHALL BE USED

| TABLE 2 | |
|---------|------|
| MATCL | TYPE |
| CS-CL | A-C |
| AS | A-C |
| CG | B |
| SS(3) | B-C |

| TABLE 1 | | | | | | |
|---------|--------|-----|-----|-----|----|-----|
| DIAM ND | Inch | H | L1 | L2 | T | W |
| | | | | | | |
| 40 | 1 1/2" | 40 | 200 | / | 5 | 50 |
| 50 | 2" | 40 | 200 | / | 5 | 50 |
| 80 | 3" | 60 | 240 | / | 5 | 50 |
| 100 | 4" | 80 | 260 | / | 5 | 50 |
| 150 | 6" | 90 | 60 | 100 | 5 | 50 |
| 200 | 8" | 90 | 60 | 100 | 5 | 50 |
| 250 | 10" | 105 | 60 | 120 | 10 | 60 |
| 300 | 12" | 105 | 60 | 120 | 10 | 60 |
| 350 | 14" | 140 | 60 | 160 | 10 | 80 |
| 400 | 16" | 140 | 60 | 160 | 10 | 80 |
| 450 | 18" | 175 | 60 | 200 | 10 | 100 |
| 500 | 20" | 190 | 60 | 220 | 10 | 110 |
| 550 | 22" | 210 | 60 | 240 | 10 | 120 |
| 600 | 24" | 230 | 60 | 260 | 10 | 130 |



| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | SH | |
|------|-------------------|------|-----------------|-----|----|-----|---------|-----|----------|--|
| 5 | PROTECTION SHIELD | 1 | REFER TO WE01 | / | / | / | / | / | / | |
| 4 | SHAPE | 2 | HALF MB 100 | A36 | / | A36 | / | A36 | / | |
| 3 | WEDGE | 1 | FLAT BAR 50 x 5 | A36 | / | A36 | A36 (G) | A36 | A240-304 | |
| 2 | STIFFENER | 2 | FLAT BAR W x T | A36 | / | A36 | A36 (G) | A36 | A240-304 | |
| 1 | GUIDE PLATE | 2 | FLAT BAR 50 x T | A36 | / | A36 | A36 (G) | A36 | A240-304 | |
| | | | | CS | CH | CL | CG | AS | SH | |

MATCL

Support Mark

| | | | |
|------|------|------|-------|
| WG01 | DIAM | TYPE | MATCL |
|------|------|------|-------|

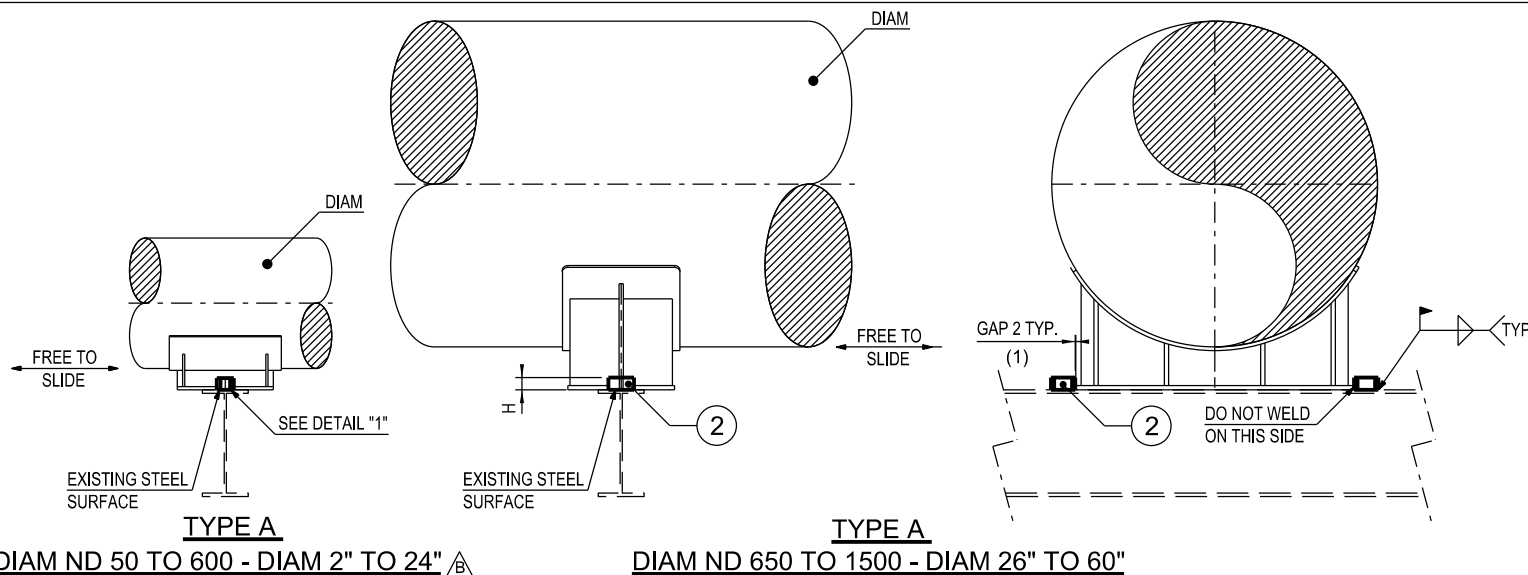
Technip

**GUIDE ON UNINSULATED PIPE
FOR DIAM 1 1/2" TO 24"**

WG01

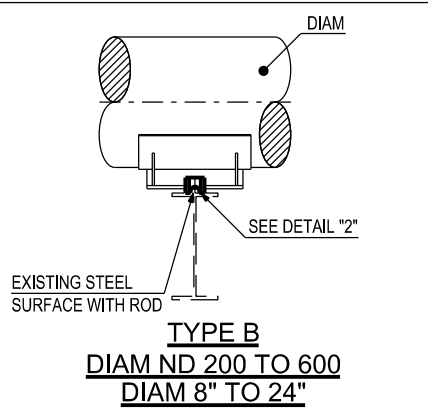
STANDARD CONSTRUCTION DRAWING
PLANT DESIGN AND PIPING

| | | | | |
|---------|------|------------------------|--------|------|
| XXXXXX | 000 | STC - 1391 - 09 | 1 of 1 | 1 |
| Project | Unit | Doc. Code & Serial No. | Page | Rev. |

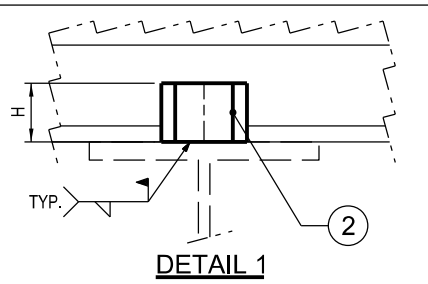


TYPE A
DIAM ND 50 TO 600 - DIAM 2" TO 24" ⚠

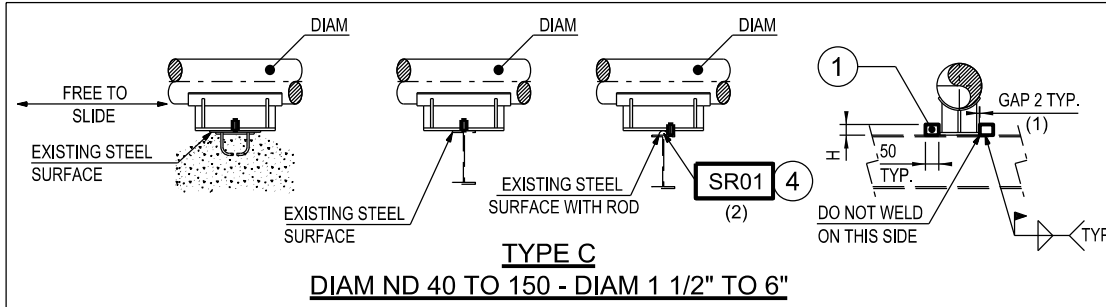
TYPE A
DIAM ND 650 TO 1500 - DIAM 26" TO 60"



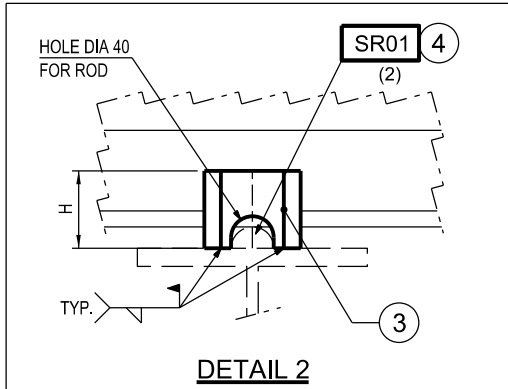
TYPE B
DIAM ND 200 TO 600
DIAM 8" TO 24"



DETAIL 1

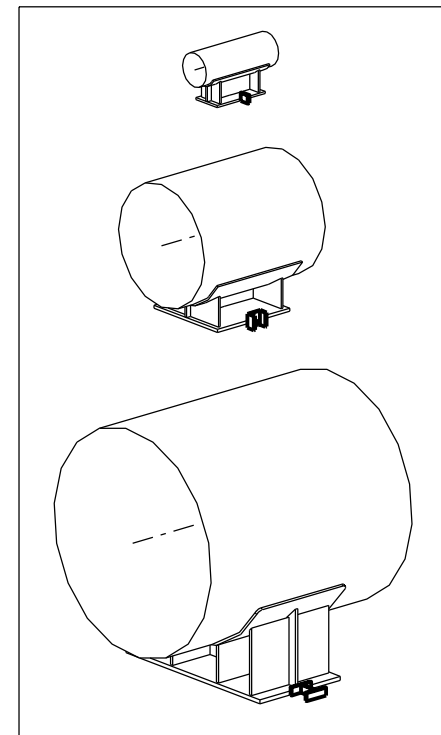


TYPE C
DIAM ND 40 TO 150 - DIAM 1 1/2" TO 6"



DETAIL 2

| TABLE | | |
|-------|------------|-----------|
| SIZE | SHAPE | load (KN) |
| 1 | Flat Bar | 1 |
| 2 | HALF MB100 | 30 |
| 3 | MC 100 | 70 |
| 4 | MB150 | 100 |
| 5 | MB 200 | 130 |



- NOTES:
1. MAXI GAP TO VERIFY AT INSTALLATION.
 2. REFERENCE TO OTHER SUPPORT. IT WILL BE INDICATED ON ISOMETRIC.
 3. FOR TYPE A AND C H MIN = 40
 4. FOR TYPE B H MIN = 60

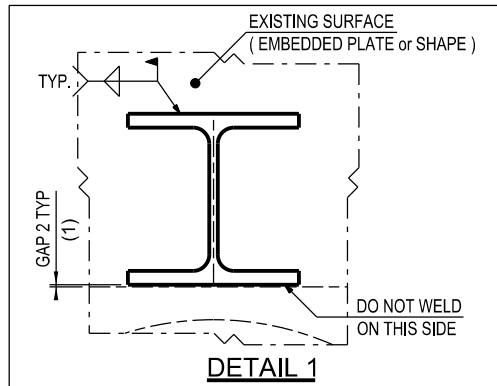
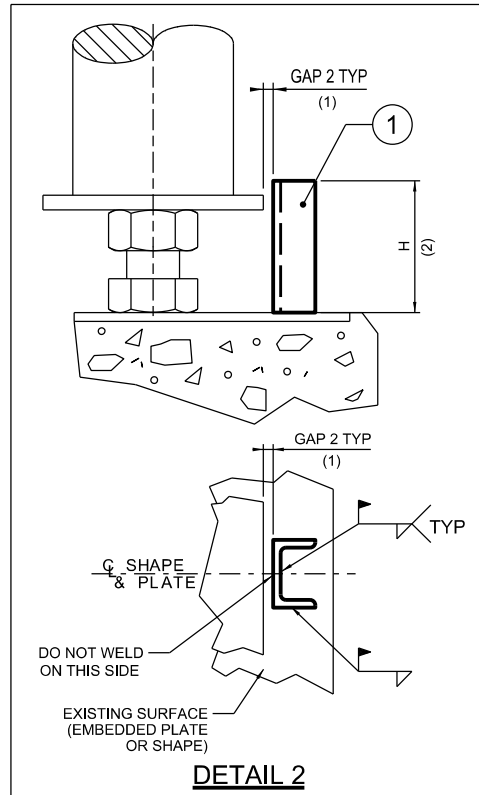
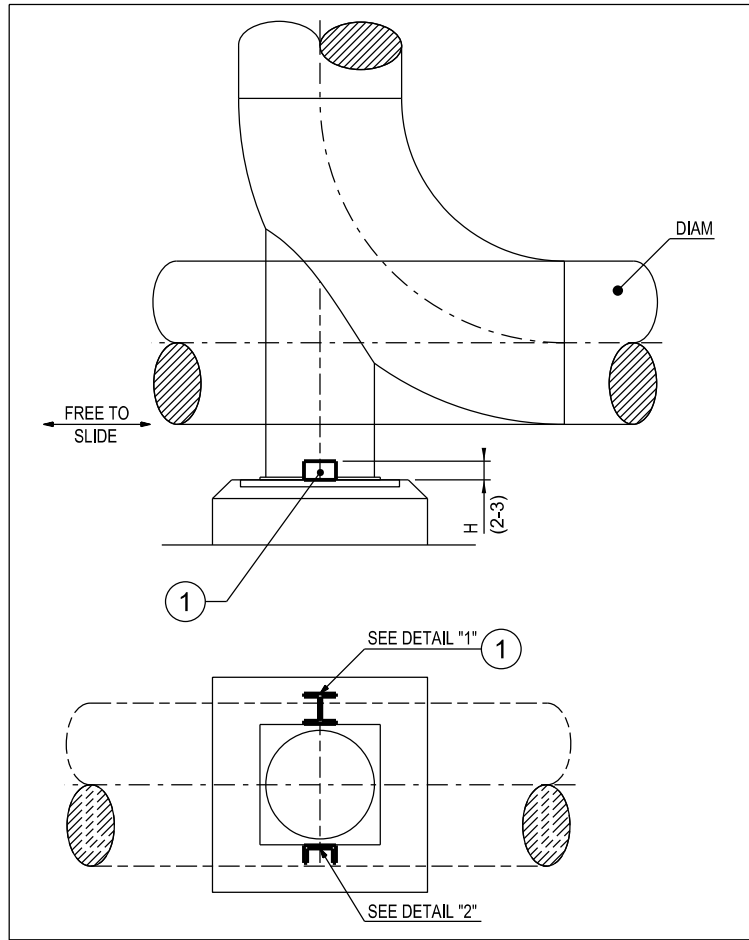
Support Mark

| | | | | |
|------|------|------|------|---|
| WG02 | DIAM | TYPE | SIZE | H |
|------|------|------|------|---|

| | | | | | | | | | | | | |
|------|-------------|------|-------------------------|-----|-----|-----|-----|-----|-----|-----|-----|----|
| ④ | ROD | 1 | REFER TO SR01 | / | / | / | / | / | / | / | / | |
| ③ | GUIDE | 2 | SHAPE CHANNEL SEE TABLE | A36 | A36 | A36 | A36 | A36 | A36 | A36 | A36 | |
| ② | GUIDE | 2 | SHAPE SEE TABLE | A36 | A36 | A36 | A36 | A36 | A36 | A36 | A36 | |
| ① | GUIDE | 2 | FLAT BAR 50 x 10 | A36 | A36 | A36 | A36 | A36 | A36 | A36 | A36 | |
| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH | SL |

MATCL

| | | | | | | | |
|--|--|---|------------------------|-----------------|--------|------|--|
| Technip | | GUIDE ON PIPE SHOES FOR DIAM 1 1/2" TO 60" | | | WG02 | | |
| STANDARD CONSTRUCTION DRAWING PLANT DESIGN AND PIPING | | XXXXXX | 000 | STC - 1391 - 10 | 1 of 1 | 1 | |
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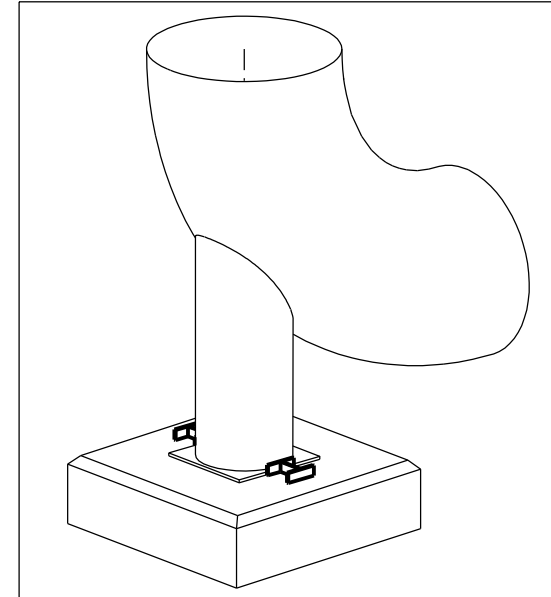


NOTES:
1. MAXI GAP TO VERIFY AT INSTALLATION.
2. H = 50 FOR FIXED STANCHION. TO BE SPECIFIED FOR ADJUSTABLE STANCHIONS.
3. H = 250 MAXI.

Support Mark

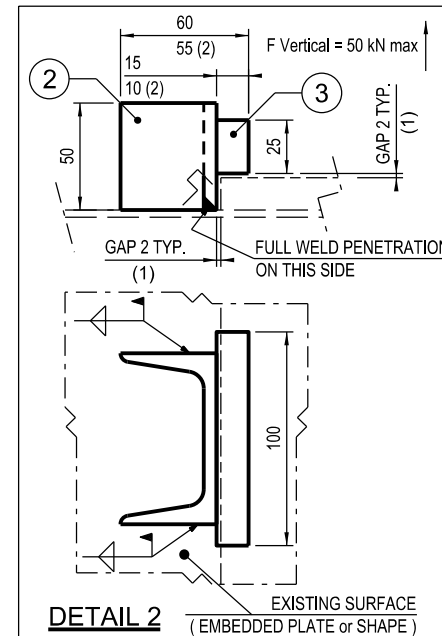
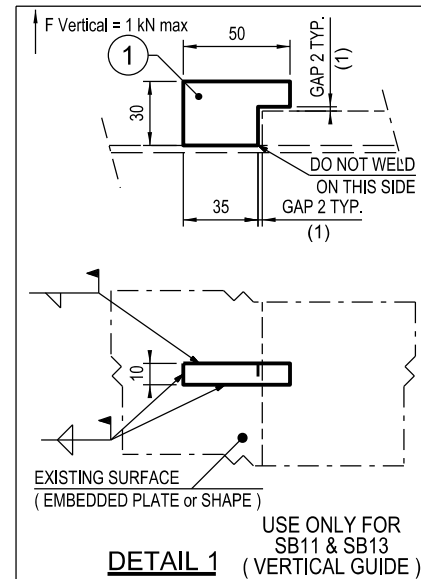
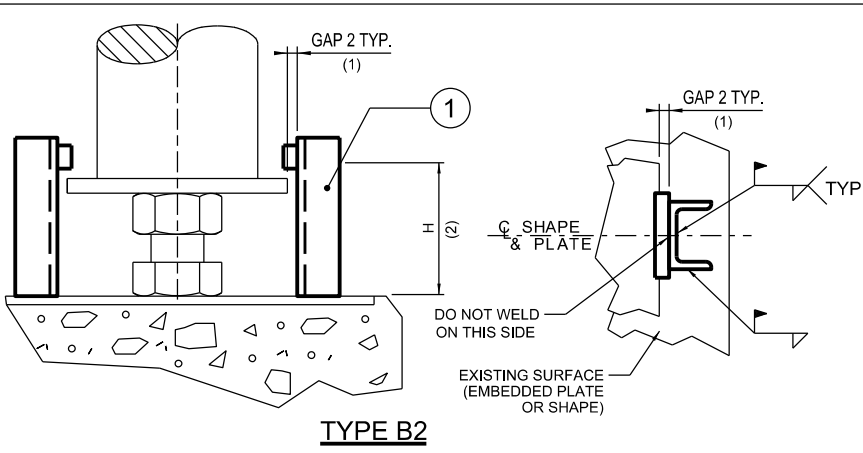
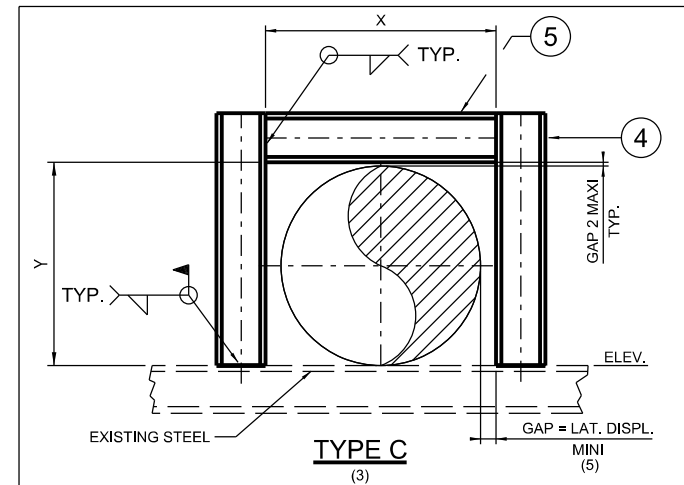
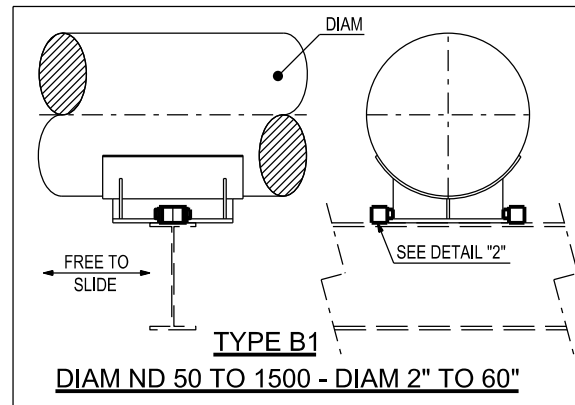
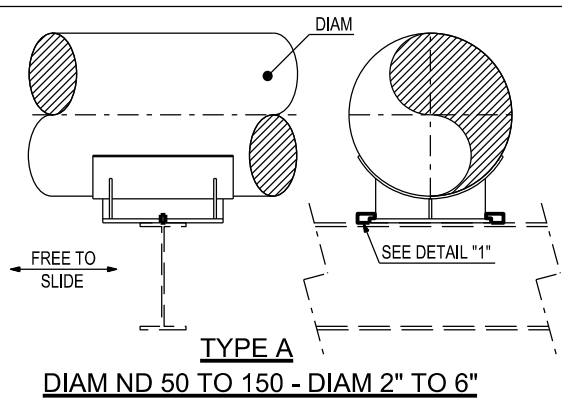
WG03 SIZE H

| TABLE | | |
|-------|------------|-----------|
| SIZE | SHAPE | load (KN) |
| 1 | HALF MB100 | 30 |
| 2 | MC 100 | 70 |
| 3 | MC150 | 100 |
| 4 | MB 200 | 130 |

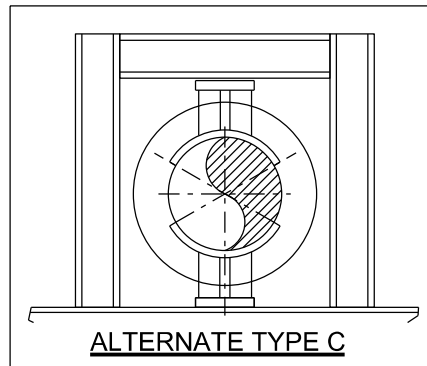
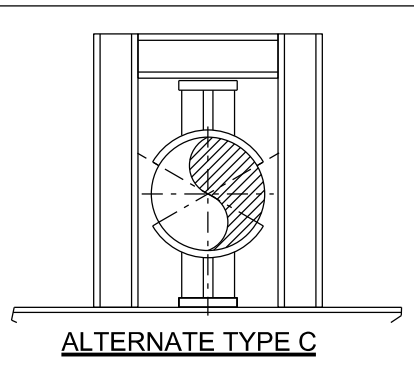


| | | | | | | | | | | | | |
|------|-------------|------|-----------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|
| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH | SL |
| 1 | GUIDE | 2 | SHAPE SEE TABLE | A36 | A36 | A36 | A36 | A36 | A36 | A36 | A36 | A36 |
| | | | | MATCL | | | | | | | | |

| | | | | | | |
|--|--|---|------------------------|-----------------|--------|------|
| Technip | | GUIDE ON VERTICAL STANCHION FOR DIAM 2" TO 60" | | | WG03 | |
| STANDARD CONSTRUCTION DRAWING PLANT DESIGN AND PIPING | | XXXXXX | 000 | STC - 1391 - 11 | 1 of 1 | 1 |
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| TABLE | | |
|-------|------------|-----------|
| SIZE | SHAPE | load (kN) |
| 1 | Flat Bar | 1 |
| 2 | HALF MB100 | 30 |
| 3 | MC 100 | 70 |
| 4 | MB150 | 100 |
| 5 | MB 200 | 130 |

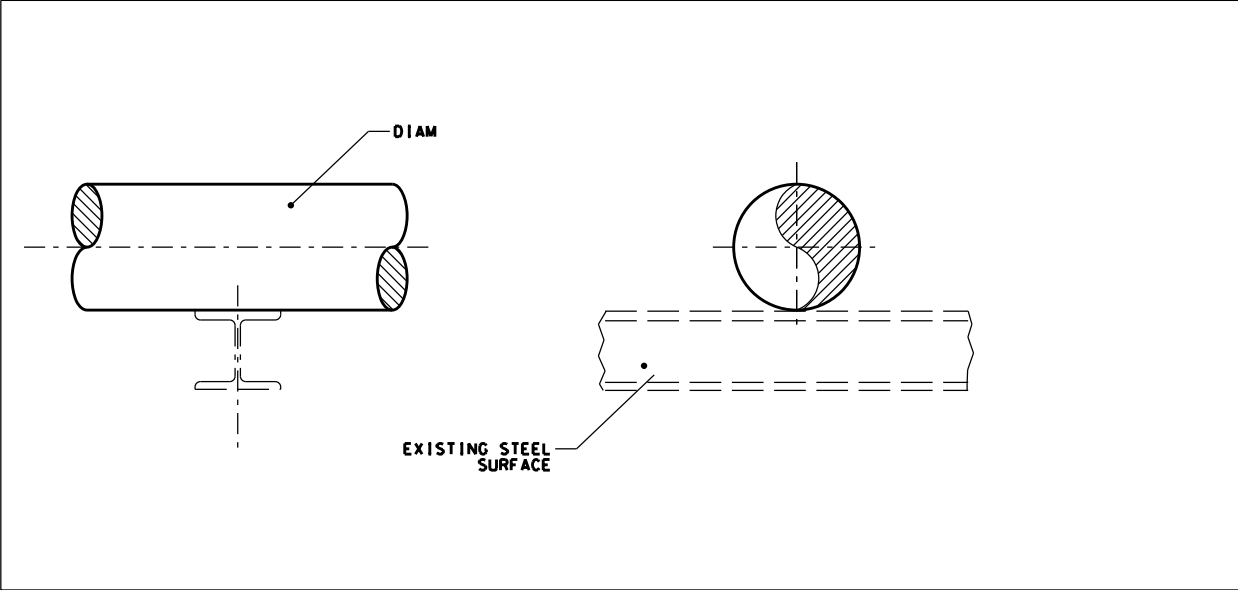


- NOTES:
1. MAXI GAP TO VERIFY AT INSTALLATION.
 2. DIMENSION ONLY REQUIRED FOR TYPE B2.
 3. FOR SHAPE SELECTION, REFER TO SB06.
 4. DIMENSIONS TO SPECIFY ONLY FOR TYPE C.
 5. LATERAL GAP TO SPECIFY ON ISOMETRIC.

| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH | SL |
|------|-------------|------|------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|----|
| 5 | HOLD DOWN | 1 | SHAPE (NOTE 3) | A36 | A36 | A36 | A36 | A36 | A36 | A36 | A36 | |
| 4 | GUIDE | 2 | SHAPE (NOTE 3) | A36 | A36 | A36 | A36 | A36 | A36 | A36 | A36 | |
| 3 | HOLD DOWN | 2 | PLATE | A36 | A36 | A36 | A36 | A36 | A36 | A36 | A36 | |
| 2 | GUIDE | 2 | SHAPE SEE TABLE | A36 | A36 | A36 | A36 | A36 | A36 | A36 | A36 | |
| 1 | GUIDE | 2 | 10 mm THK PLATE SEE DETAIL 1 | A36 | A36 | A36 | A36 | A36 | A36 | A36 | A36 | |
| | | | | CS | CH | CL | CG | AS | AH | SS | SH | SL |

| | |
|--------------|----------------------|
| Support Mark | (2) (4) (4) |
| WG04 | DIAM TYPE SIZE H X Y |

| Technip | | HOLD DOWN GUIDE FOR DIAM 2" TO 60" | | | WG04 | |
|---|--|------------------------------------|------------------------|-----------------|--------|------|
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| Project | | Unit | Doc. Code & Serial No. | | Page | Rev. |

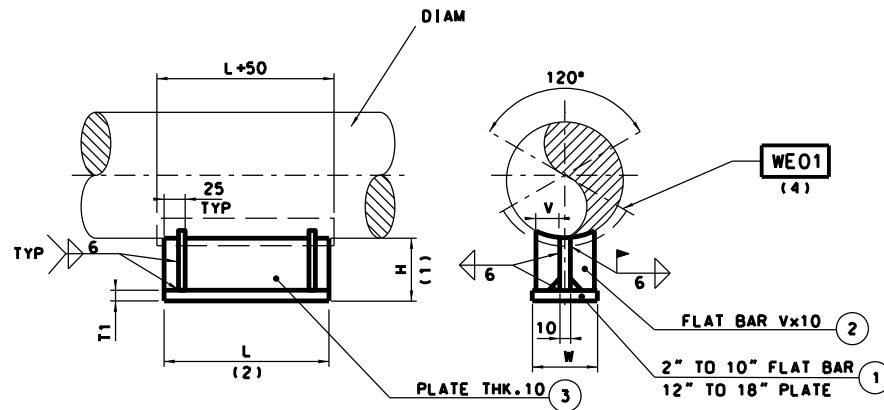


ONLY REST ON EXISTING BEAM OR PLATE

NOTES:
1. THIS STANDARD IS TO INDICATE CONTACT SUPPORT POINT ON ISOMETRIC.

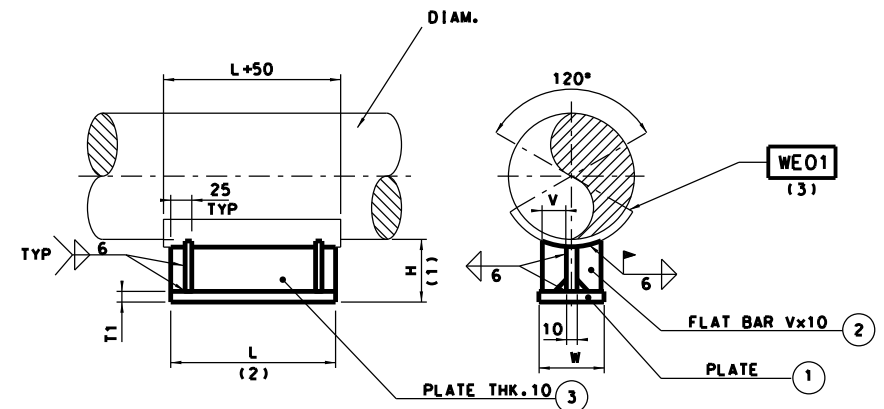
Support Mark
WROO

| | | | | | |
|----------------|---|------------|------------------------|-------------------|-------------|
| Technip | ONLY REST ON EXISTING BEAM OR PLATE FOR DIAM. 2" to 18" | | | | WROO |
| | STANDARD CONSTRUCTION DRAWING PLANT DESIGN AND PIPING | XXXXXXXXXX | 000 | STC1391-32 1 of 1 | 0 |
| Project | | Unit | Doc. Code & Serial No. | Page | Rev. |



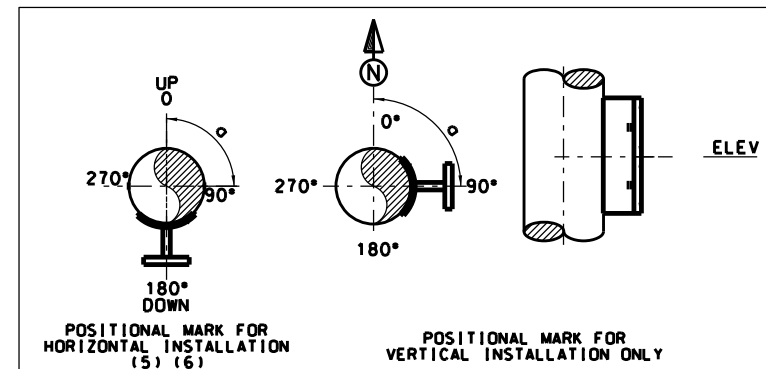
NOTE: ITEM (2) WILL NOT BE USED FOR 2" - 3"

TYPE A - DIAM 2" TO 18"



TYPE B - DIAM 20" TO 24"

| TABLE "1" | | | | |
|------------|----|-----|-----|--|
| DIAM | T1 | W | V | |
| 2" | 10 | 100 | - | |
| 3" | 10 | 100 | - | |
| 4" | 10 | 100 | 40 | |
| 6" | 10 | 150 | 60 | |
| 8" TO 10" | 10 | 200 | 80 | |
| 12" TO 14" | 10 | 250 | 100 | |
| 16" TO 18" | 15 | 350 | 150 | |
| 20" TO 24" | 15 | 450 | 200 | |



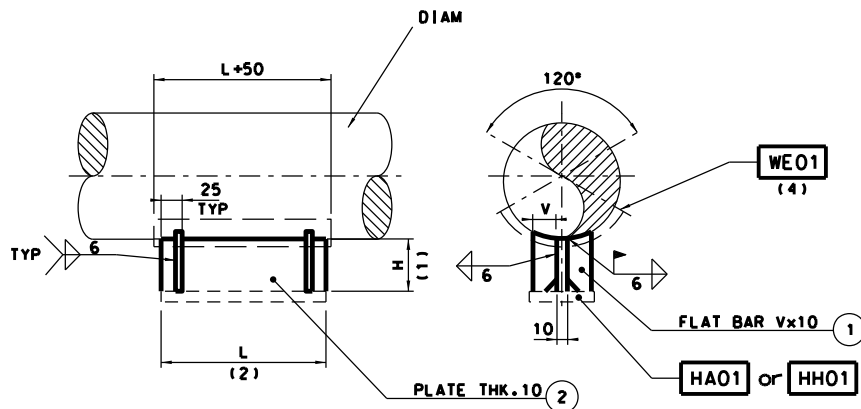
* GENERAL NOTE
SUPPORT MATCL: AS - SS
FOR LINES CLASSIFIED AS "AS - SS" WHEN THE STANDARD SUPPORT WR01 IS WELDED ON
THE PROTECTION SHIELD WE01 ALL COMPONENTS OF THE WR01 SHALL BE ON CARBON STEEL A36

NOTES:

1. H MAX = 300. H DIMENSION SHALL BE ADJUSTED AT ERECTION BEFORE WELDING.
2. L = 300 TO 900, WITH STEP 100.
3. FOR 20" TO 24" PROTECTION SHIELD SHALL BE USED.
4. FOR 2" TO 18" PROTECTION SHIELD ONLY IF REQUIRED BY DESIGNER, WILL BE INDICATED ON ISOMETRIC.
5. LOOKING TO FLOW FLUID DIRECTION.
6. TO BE INDICATED ONLY IF DIFFERENT OF 180°.

| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS * | AH | SS * | SH |
|------|-------------|------|-------------------|-----|---------|---------|----|---------|---------|----------|----------|
| (3) | STANCHION | 1 | PLATE THK. 10 | A36 | A387-11 | A516-60 | / | A387-11 | A387-11 | A240-304 | A240-304 |
| (2) | RIB | 4 | FLAT BAR Vx10 | A36 | A387-11 | A516-60 | / | A387-11 | A387-11 | A240-304 | A240-304 |
| (1) | BASE PLATE | 1 | FLAT BAR OR PLATE | A36 | A36 | A36 | / | A36 | A36 | A36 | A36 |

| Support Mark | | | | | | Positional Mark | |
|--|------|------|---|---|-------|---|----------------------------------|
| WR01 | DIAM | TYPE | H | L | MATCL | ELEV | α |
| Technip | | | | | | VARIABLE HEIGHT SHOES FOR DIAM 2" TO 24" | |
| STANDARD CONSTRUCTION DRAWING PLANT DESIGN AND PIPING | | | | | | XXXXXXX 000 | STC 1391-13 1 of 2 0 |
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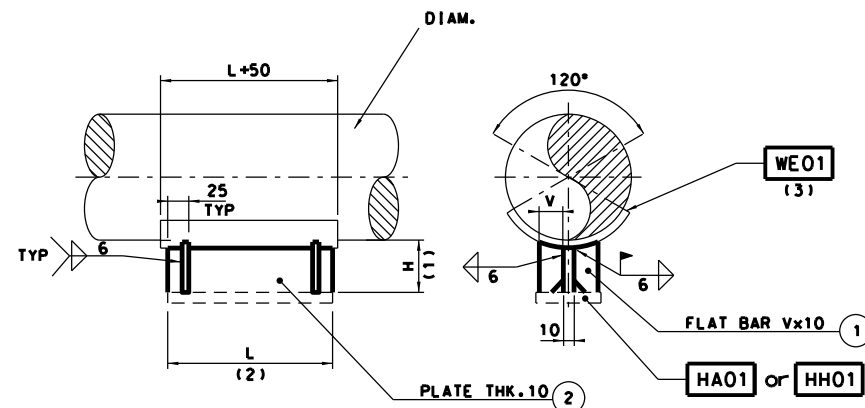
NOTE: ITEM (2) WILL NOT BE USED FOR 2" & 3"

TYPE C - DIAM 2" TO 18"
TO BE USE WITH "HA01" or "HH01"

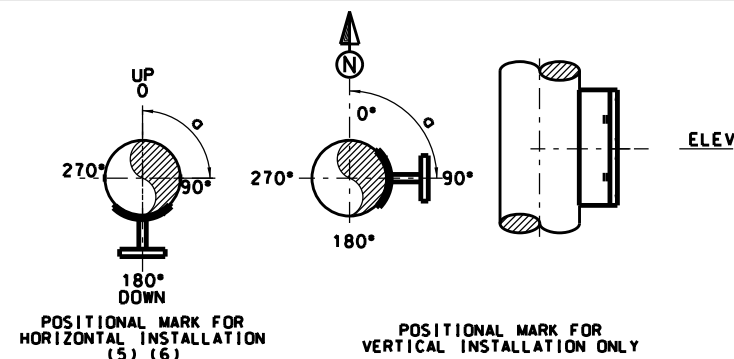
TABLE "1"

| DIAM | V |
|------------|-----|
| 2" | - |
| 3" | - |
| 4" | 40 |
| 6" | 60 |
| 8" TO 10" | 80 |
| 12" TO 14" | 100 |
| 16" TO 18" | 150 |
| 20" TO 24" | 200 |

* GENERAL NOTE
SUPPORT MATCL: AS - SS
FOR LINES CLASSIFIED AS "AS - SS" WHEN THE STANDARD SUPPORT WR01 IS WELDED ON THE PROTECTION SHIELD WE01 ALL COMPONENTS OF THE WR01 SHALL BE ON CARBON STEEL A36



TYPE D - DIAM 20" TO 24"
TO BE USE WITH "HA01" or "HH01"



- NOTES:
1. H MAX = 300. H DIMENSION SHALL BE ADJUSTED AT ERECTION BEFORE WELDING.
 2. L = 300 TO 900. WITH STEP 100.
 3. FOR 20" TO 24" PROTECTION SHIELD SHALL BE USED.
 4. FOR 2" TO 18" PROTECTION SHIELD ONLY IF REQUIRED BY DESIGNER. WILL BE INDICATED ON ISOMETRIC.
 5. LOOKING TO NORTH OR EAST DIRECTION.
 6. TO BE INDICATED ONLY IF DIFFERENT OF 180°.
 7. DELETED.

Support Mark

Positional Mark

WR01 DIAM TYPE H L MATCL

ELEV a

Technip

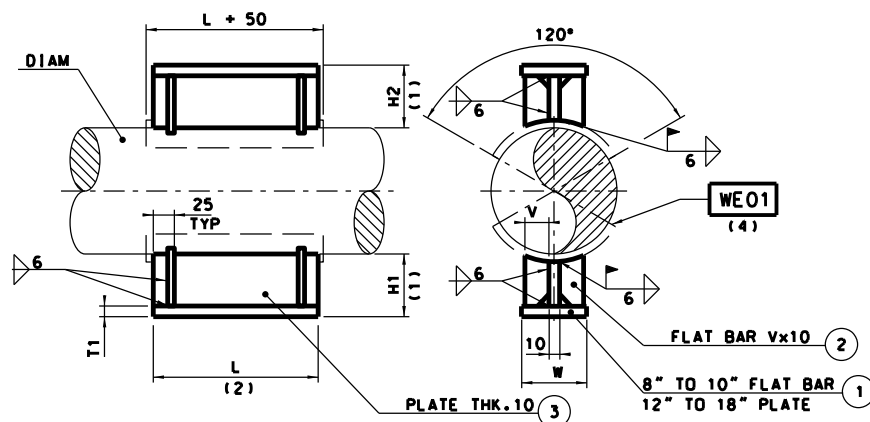
VARIABLE HEIGHT SHOES
FOR DIAM 2" TO 24"

WR01

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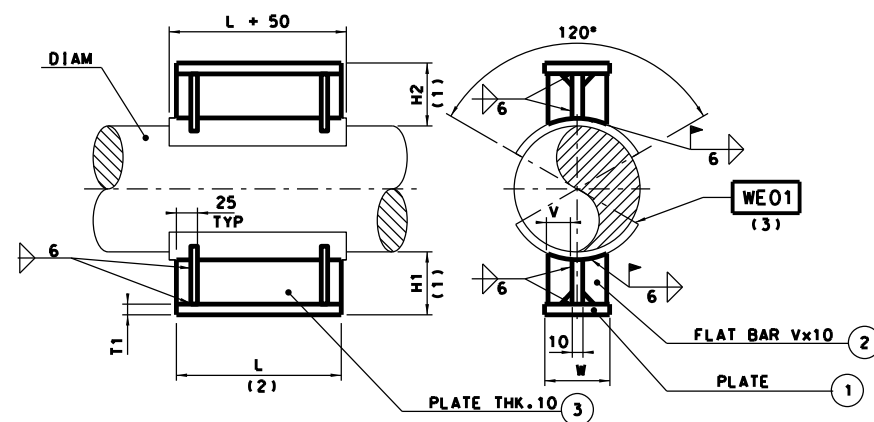
| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS * | AH | SS * | SH |
|------|-------------|------|---------------|-----|---------|---------|----|---------|---------|----------|----------|
| (2) | STANCHION | 1 | PLATE THK. 10 | A36 | A387-11 | A516-60 | / | A387-11 | A387-11 | A240-304 | A240-304 |
| (1) | RIB | 4 | FLAT BAR Vx10 | A36 | A387-11 | A516-60 | / | A387-11 | A387-11 | A240-304 | A240-304 |



H MAX. = 200 FOR 2" TO 6"
H MAX. = 300 FOR 8" TO 18"

NOTE: ITEM (2) WILL NOT BE USED FOR 2" AND 3"

DIAM 2" TO 18"

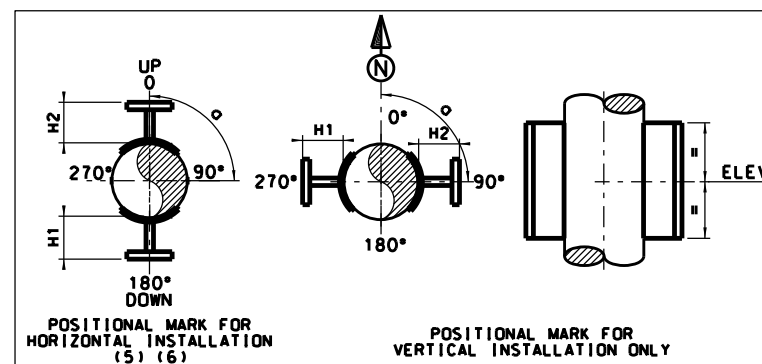


H MAX. = 300

DIAM 20" TO 24"

| TABLE "1" | | | | |
|------------|----|-----|-----|--|
| DIAM | T1 | W | V | |
| 2" | 10 | 100 | - | |
| 3" | 10 | 100 | - | |
| 4" | 10 | 100 | 40 | |
| 6" | 10 | 150 | 60 | |
| 8" TO 10" | 10 | 200 | 80 | |
| 12" TO 14" | 10 | 250 | 100 | |
| 16" TO 18" | 15 | 350 | 150 | |
| 20" TO 24" | 15 | 450 | 200 | |

* GENERAL NOTE
SUPPORT MATCH: AS - SS
FOR LINES CLASSIFIED AS "AS - SS" WHEN THE STANDARD SUPPORT WR03 IS WELDED ON
THE PROTECTION SHIELD WE01 ALL COMPONENTS OF THE WR03 SHALL BE ON CARBON STEEL A36



NOTES:

- H1 AND H2 DIMENSION SHALL BE ADJUSTED AT ERECTION BEFORE WELDING.
- L = 300 TO 900. WITH STEP 100.
- FOR 20" TO 24" PROTECTION SHIELD SHALL BE USED.
- FOR 2" TO 18" PROTECTION SHIELD ONLY IF REQUIRED BY DESIGNER. WILL BE INDICATED ON ISOMETRIC.
- LOOKING TO FLOW FLUID DIRECTION.
- TO BE INDICATED ONLY IF DIFFERENT OF 180°.

Support Mark

Positional Mark

WR03 DIAM H1 H2 L MATCH

ELEV α

| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS * | AH | SS * | SH | NI | NL |
|------|-------------|------|-------------------|-------|---------|---------|----|---------|---------|----------|----------|----|----|
| ③ | STANCHION | 2 | PLATE THK. 10 | A36 | A387-11 | A516-60 | / | A387-11 | A387-11 | A240-304 | A240-304 | | |
| ② | RIB | 8 | FLAT BAR Vx10 | A36 | A387-11 | A516-60 | / | A387-11 | A387-11 | A240-304 | A240-304 | | |
| ① | BASE PLATE | 2 | FLAT BAR OR PLATE | A36 | A36 | A36 | / | A36 | A36 | A36 | A36 | | |
| | | | | CS | CH | CL | CG | AS * | AH | SS * | SH | NI | NL |
| | | | | MATCH | | | | | | | | | |

Technip

DOUBLE VARIABLE HEIGHT SHOES
FOR DIAM 2" TO 24"

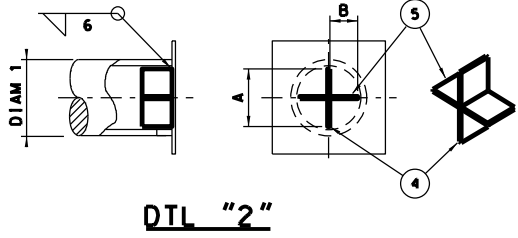
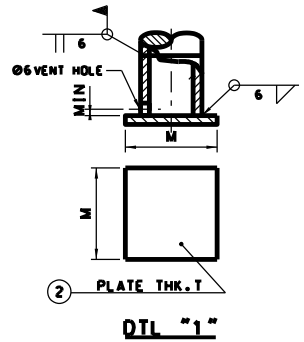
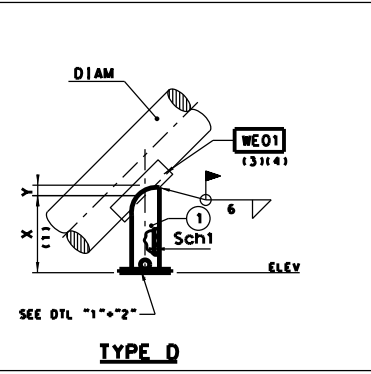
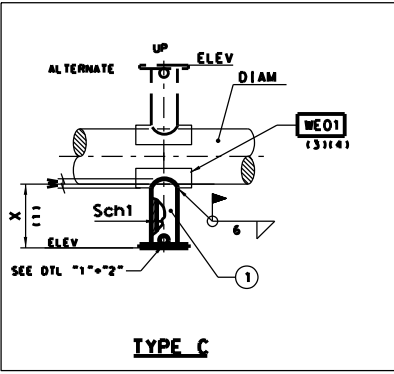
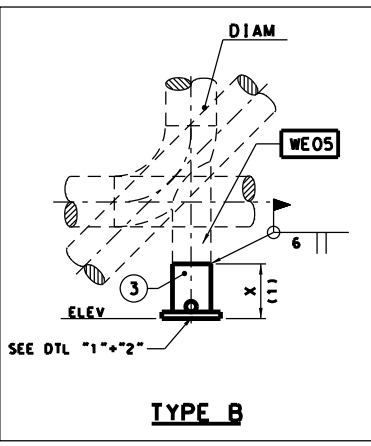
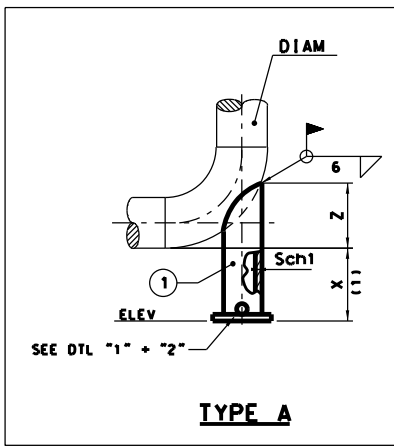
WR03

STANDARD CONSTRUCTION DRAWING
PLANT DESIGN AND PIPING

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| TABLE "1" | | | | | | | | |
|-----------|-------------------|-----|-----|-------|-------|-------|-----|----|
| DIAM | DIAM ₁ | A | B | W (6) | Y (6) | Z (6) | M | T |
| 2" | 1½" | / | / | 12 | 48 | 71 | 100 | 10 |
| 3" | 2" | / | / | 12 | 60 | 93 | 100 | 10 |
| 4" | 3" | / | / | 21 | 89 | 137 | 150 | 10 |
| 6" | 4" | / | / | 22 | 114 | 186 | 150 | 10 |
| 8" | 6" | / | / | 39 | 168 | 272 | 210 | 10 |
| 10" | 6" | / | / | 29 | 168 | 291 | 210 | 10 |
| 12" | 8" | / | / | 43 | 219 | 370 | 250 | 10 |
| 14" | 10" | / | / | 60 | 273 | 472 | 350 | 10 |
| 16" | 12" | / | / | 80 | 324 | 557 | 400 | 10 |
| 18" | 14" | / | / | 80 | 356 | 614 | 400 | 10 |
| 20" | 16" | 275 | 135 | 96 | 407 | 699 | 450 | 10 |
| 22" | 16" | 275 | 135 | 84 | 407 | 712 | 450 | 10 |
| 24" | 16" | 275 | 135 | 75 | 407 | 732 | 450 | 10 |
| 26" | 16" | 275 | 135 | 75 | 220 | 1250 | 450 | 10 |
| 28" | 16" | 275 | 135 | 75 | 220 | 1250 | 450 | 10 |
| 30" | 16" | 275 | 135 | 75 | 220 | 1250 | 450 | 10 |
| 32" | 16" | 275 | 135 | 75 | 220 | 1250 | 450 | 10 |
| 34" | 16" | 275 | 135 | 75 | 220 | 1250 | 450 | 15 |
| 36" | 18" | 275 | 135 | 75 | 250 | 1400 | 500 | 15 |
| 38" | 18" | 275 | 135 | 75 | 250 | 1400 | 500 | 15 |
| 40" | 20" | 375 | 185 | 75 | 260 | 1650 | 550 | 15 |
| 42" | 20" | 375 | 185 | 75 | 260 | 1650 | 550 | 15 |
| 44" | 20" | 375 | 185 | 75 | 260 | 1650 | 550 | 15 |
| 46" | 24" | 375 | 185 | 90 | 320 | 1850 | 650 | 15 |
| 48" | 24" | 375 | 185 | 90 | 320 | 1850 | 650 | 15 |
| 50" | 24" | 375 | 185 | 90 | 320 | 1850 | 650 | 20 |
| 52" | 26" | 575 | 285 | 100 | 350 | 2050 | 700 | 20 |
| 54" | 26" | 575 | 285 | 100 | 350 | 2050 | 700 | 20 |
| 56" | 28" | 575 | 285 | 110 | 390 | 2200 | 750 | 20 |
| 58" | 28" | 575 | 285 | 110 | 390 | 2200 | 750 | 20 |
| 60" | 30" | 575 | 285 | 120 | 400 | 2250 | 850 | 20 |



NOTES:
1. X DIMENSION FROM 200 TO 800 TO BE ADJUSTED AT ERECTION EXCEPT FOR HORIZONTAL RIGID STRUT INSTALLATION WHERE X=300 Max. IN THIS CASE DETAIL "2" SHALL BE USED.
2. DELETED.
3. FOR 20" TO 60" PROTECTION SHIELD SHALL BE USED.
4. FOR 2" TO 18" PROTECTION SHIELD ONLY IF REQUIRED BY DESIGNER. WILL BE INDICATED ON ISOMETRIC.
5. MATCL AND SCH. PER PIPING CLASSES EXCEPT SPECIFIC REQUIREMENT.
6. WILL BE ADJUSTED ON SITE.

| | | | | | | | | | | | | | |
|------|---------------|------|--------------------|-----|-----|-----|----|----------|----------|----------|----------|--|--|
| ⑤ | REINFORCEMENT | 2 | PLATE 150x8 Thk5mm | A36 | A36 | A36 | / | A36 | A36 | A36 | A36 | | |
| ④ | REINFORCEMENT | 1 | PLATE 150x8 Thk5mm | A36 | A36 | A36 | / | A36 | A36 | A36 | A36 | | |
| ③ | SPOOL | 1 | PIPE DIAM1 S.STD | / | / | / | / | A106 GrB | A106 GrB | A106 GrB | A106 GrB | | |
| ② | BASE | 1 | PLATE THK.T | A36 | A36 | A36 | / | A36 | A36 | A36 | A36 | | |
| ① | DUMMY | 1 | PIPE DIAM1 | (S) | (S) | (S) | / | / | / | / | / | | |
| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH | | |

Support Mark
WR05 | DIAM | DIAM1 | TYPE | X | SCH | SCH1 | MATCL | ELEV

Positional Mark
WR05

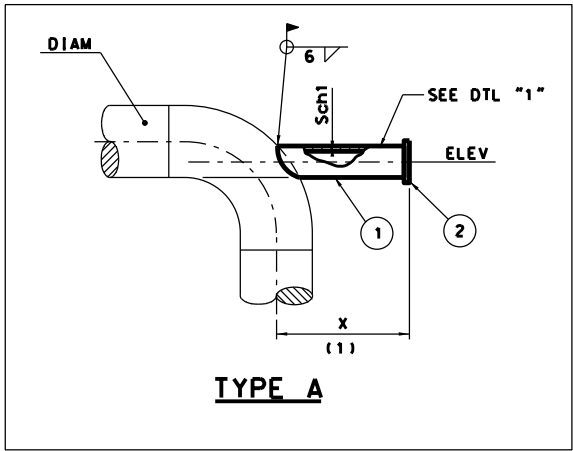
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VERTICAL DUMMY LEG
FOR DIAM 2" TO 60"

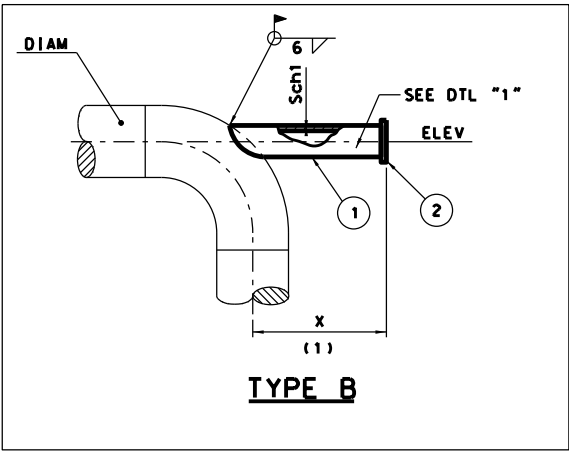
STANDARD CONSTRUCTION DRAWING
PLANT DESIGN AND PIPING

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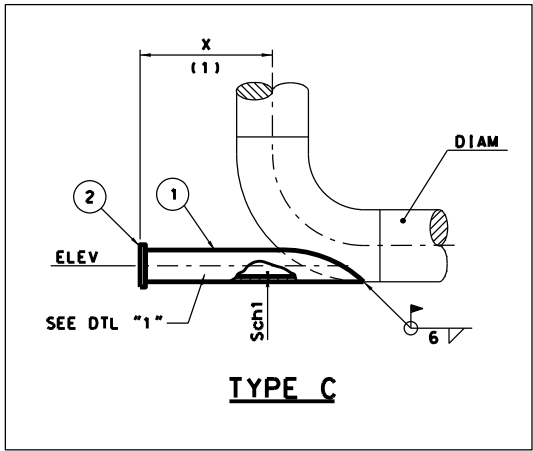
Project Unit Doc. Code & Serial No. Page Rev.



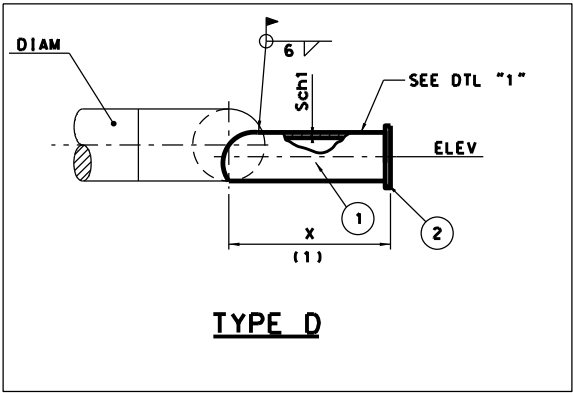
TYPE A



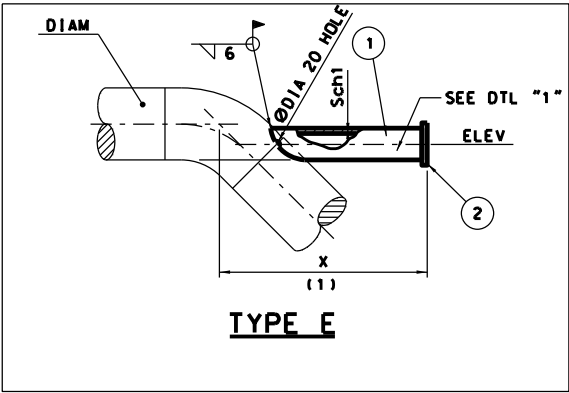
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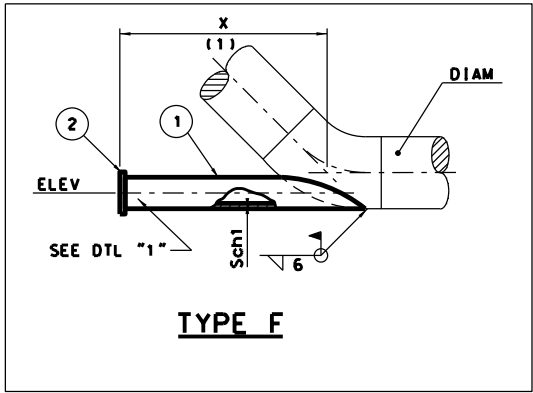
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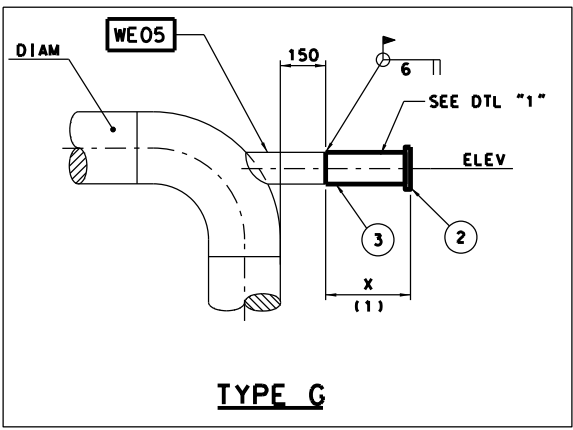
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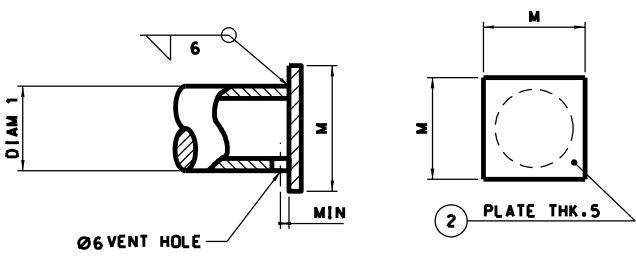
TYPE E



TYPE F

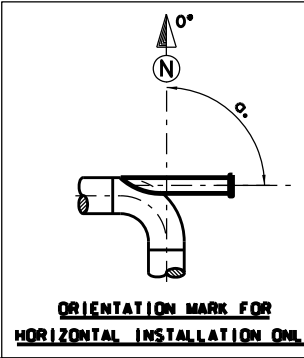


TYPE G



DTL "1"

| TABLE "1" | | |
|-----------|--------|-----|
| DIAM | DIAM1 | M |
| 2" | 1 1/2" | 60 |
| 3" | 2" | 70 |
| 4" | 3" | 100 |
| 6" | 4" | 125 |
| 8" | 6" | 180 |
| 10" | 6" | 180 |
| 12" | 8" | 230 |
| 14" | 10" | 300 |
| 16" | 12" | 335 |
| 18" | 14" | 385 |
| 20" | 16" | 440 |
| 22" | 16" | 440 |
| 24" | 16" | 440 |



ORIENTATION MARK FOR
HORIZONTAL INSTALLATION ONLY

NOTES:

1. X DIMENSION SHALL BE FROM 400 TO 800 TO BE ADJUSTED AT ERECTION IF NECESSARY.
2. MATCL AND SCH. PER PIPING CLASSES EXCEPT SPECIFIC REQUIREMENT
3. DELETED.

| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH |
|------|-------------|------|------------------|-----|-----|-----|----|----------|----------|----------|----------|
| 3 | SPOOL DUMMY | 1 | PIPE DIAM1 S.STD | / | / | / | / | A106 GrB | A106 GrB | A106 GrB | A106 GrB |
| 2 | COVER | 1 | PLATE THK 5 | A36 | A36 | A36 | / | A36 | A36 | A36 | A36 |
| 1 | DUMMY | 1 | PIPE DIAM1 | (2) | (2) | (2) | / | / | / | / | / |

Support Mark

WR06 | DIAM | DIAM1 | TYPE | X | SCH | SCH | MATCL

Positional Mark

ELEV | a

Technip

HORIZONTAL DUMMY LEG ON BEND
FOR DIAM 2" TO 24"

WR06

STANDARD CONSTRUCTION DRAWING
PLANT DESIGN AND PIPING

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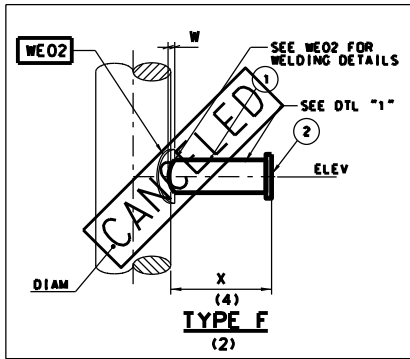
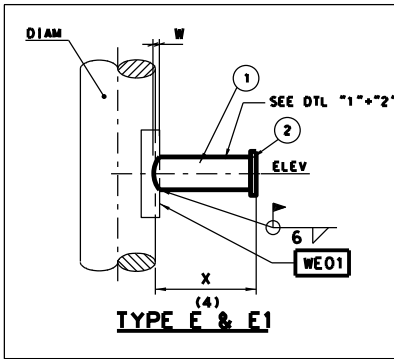
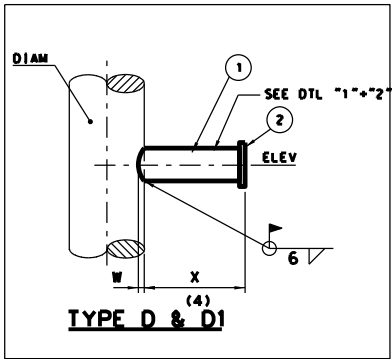
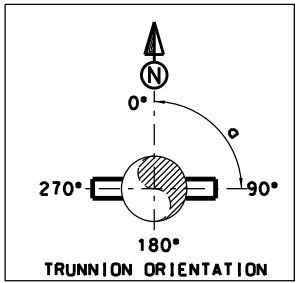
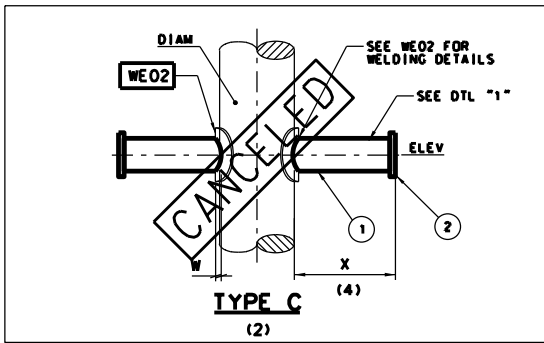
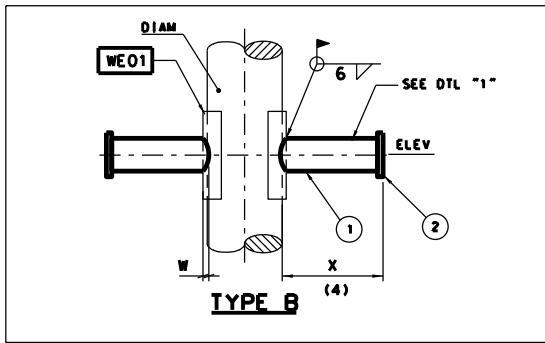
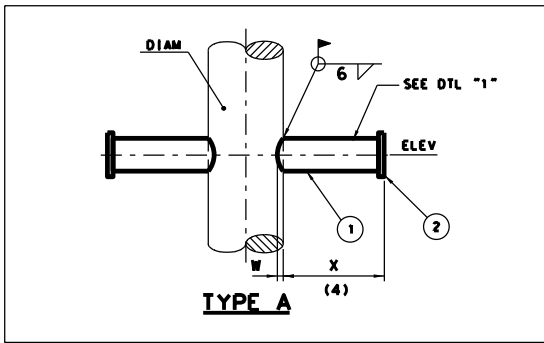
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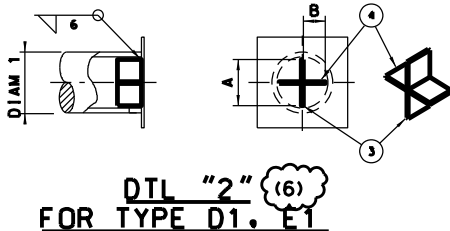
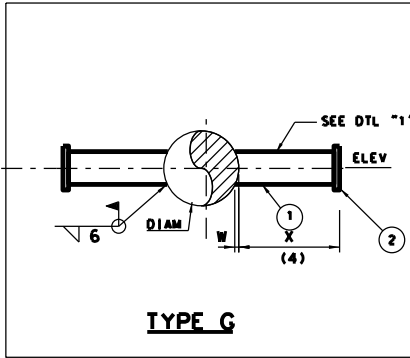
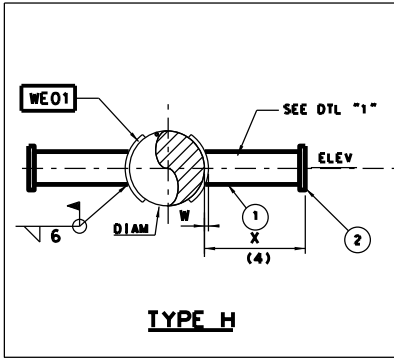
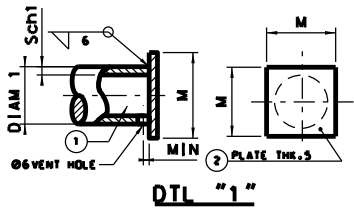
Page

Rev.



| TABLE "1" | | | |
|-----------|--------|-----|----|
| DIAM | DIAM1 | M | W |
| 2" | 1 1/2" | 60 | 12 |
| 3" | 2" | 70 | 12 |
| 4" | 3" | 100 | 21 |
| 6" | 4" | 125 | 22 |
| 8" | 6" | 180 | 39 |
| 10" | 6" | 180 | 29 |
| 12" | 8" | 230 | 43 |
| 14" | 10" | 300 | 60 |
| 16" | 12" | 335 | 80 |
| 18" | 14" | 385 | 80 |
| 20" | 16" | 440 | 96 |
| 22" | 16" | 440 | 84 |
| 24" | 16" | 440 | 75 |

| TABLE "2" | | |
|-----------|-----|-----|
| DIAM1 | A | B |
| 1 1/2" | / | / |
| 2" | | |
| 3" | | |
| 4" | 125 | 60 |
| 6" | | |
| 8" | | |
| 10" | 205 | 100 |
| 12" | | |
| 14" | | |
| 16" | 275 | 135 |
| 16" | | |



- NOTES:
1. DELETED.
 2. DELETED
 3. DELETED.
 4. X DIMENSIONS FROM 200 TO 800 TO BE ADJUSTED AT ERECTION IF NECESSARY.
 5. MATCL AND SCH. PER PIPING CLASSES EXCEPT SPECIFIC REQUIREMENT.
 6. USED IN CASE OF HORIZONTAL LOADS ON TRUNNION.

| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH |
|------|---------------|------|-------------------|-----|-----|-----|----|-----|-----|-----|-----|
| ④ | REINFORCEMENT | 2 | PLATE 150x8 THK.5 | A36 | A36 | A36 | / | A36 | A36 | A36 | A36 |
| ③ | REINFORCEMENT | 1 | PLATE 150x4 THK.5 | A36 | A36 | A36 | / | A36 | A36 | A36 | A36 |
| ② | COVER | 1 | PLATE THK. 5 | A36 | A36 | A36 | / | A36 | A36 | A36 | A36 |
| ① | DUMMY | 1 | PIPE DIAM1 (5) | / | / | / | / | / | / | / | / |

Support Mark

WR07

DIAM

DIAM1

TYPE

X

SCH

SCH1

MATCL

Positional Mark

ELEV

a

Technip

TRUNNION ON PIPE
FOR DIAM 2" TO 60"

WR07

STANDARD CONSTRUCTION DRAWING
PLANT DESIGN AND PIPING

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Unit

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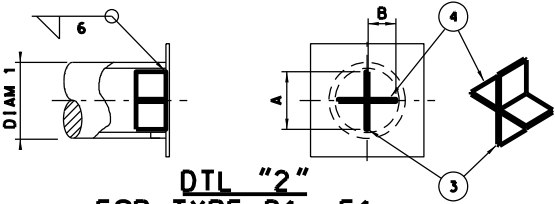
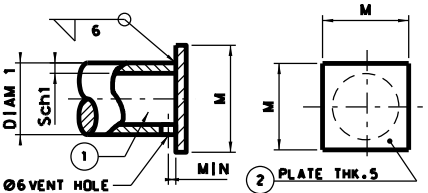
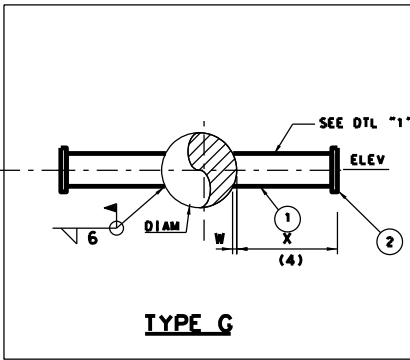
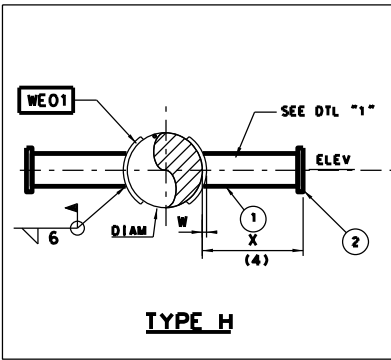
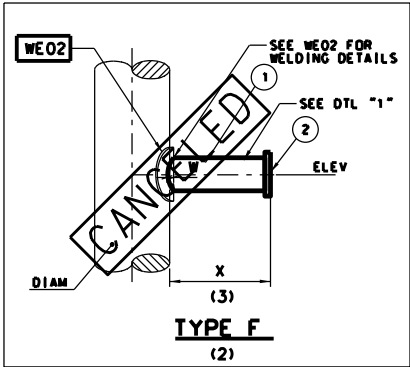
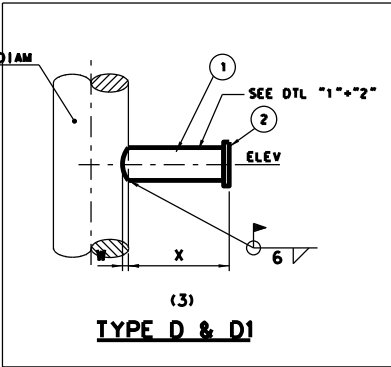
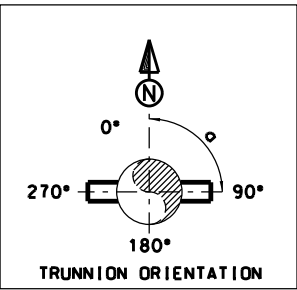
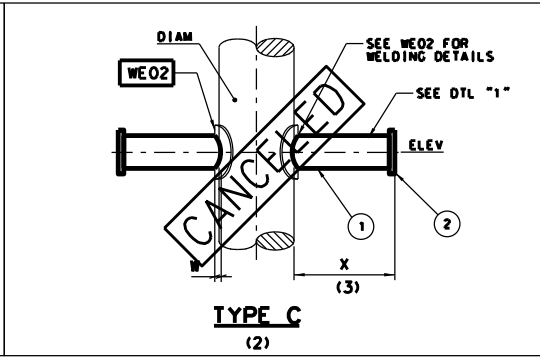
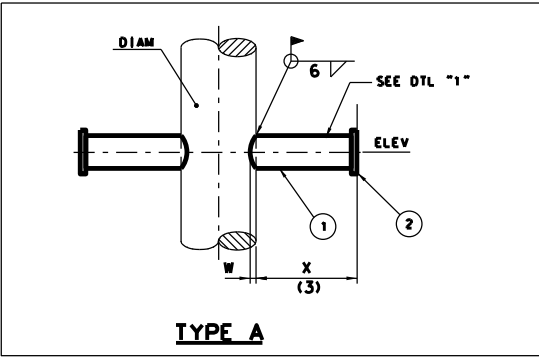
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| TABLE "1" | | | |
|-----------|-----------|-----|-----|
| DIAM | DIAM1 (5) | W | M |
| 26" | 16" | 75 | 450 |
| 28" | 16" | 75 | 450 |
| 30" | 16" | 75 | 450 |
| 32" | 16" | 75 | 450 |
| 34" | 16" | 75 | 450 |
| 36" | 18" | 75 | 500 |
| 38" | 18" | 75 | 500 |
| 40" | 20" | 75 | 550 |
| 42" | 20" | 75 | 550 |
| 44" | 20" | 75 | 550 |
| 46" | 24" | 90 | 650 |
| 48" | 24" | 90 | 650 |
| 50" | 24" | 90 | 650 |
| 52" | 26" | 100 | 700 |
| 54" | 26" | 100 | 700 |
| 56" | 28" | 110 | 750 |
| 58" | 28" | 110 | 750 |
| 60" | 30" | 120 | 800 |

| TABLE "2" | | |
|-----------|-----|-----|
| DIAM1 | A | B |
| 16" | 275 | 135 |
| 16" | | |
| 16" | | |
| 16" | | |
| 16" | | |
| 18" | | |
| 18" | | |
| 20" | 375 | 185 |
| 20" | | |
| 20" | | |
| 24" | | |
| 24" | | |
| 24" | | |
| 26" | 575 | 285 |
| 26" | | |
| 28" | | |
| 28" | | |
| 28" | | |
| 30" | | |



DTL "2"
FOR TYPE D1, E1

NOTES:

1. DELETED.
2. DELETED.
3. X DIMENSIONS FROM 200 TO 800 TO BE ADJUSTED AT ERECTION IF NECESSARY
4. MATCL AND SCH. PER PIPING CLASSES EXCEPT SPECIFIC REQUIREMENT.
5. IF DIAM 1 NOT EQUAL TO TABLE A SPECIAL SUPPORT HAS TO BE DESIGNED.

Support Mark

WR07 DIAM DIAM1 TYPE X SCH SCH1 MATCL

Positional Mark

ELEV a

| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH |
|------|---------------|------|-------------------|-----|-----|-----|----|-----|-----|-----|-----|
| ④ | REINFORCEMENT | 2 | PLATE 150x8 THK.5 | A36 | A36 | A36 | / | A36 | A36 | A36 | A36 |
| ③ | REINFORCEMENT | 1 | PLATE 150x4 THK.5 | A36 | A36 | A36 | / | A36 | A36 | A36 | A36 |
| ② | COVER | 1 | PLATE THK. 5 | A36 | A36 | A36 | / | A36 | A36 | A36 | A36 |
| ① | DUMMY | 1 | PIPE DIAM1 (4) | / | / | / | / | / | / | / | / |

STANDARD CONSTRUCTION DRAWING
PLANT DESIGN AND PIPING

TRUNNION ON PIPE
FOR DIAM 2" TO 60"

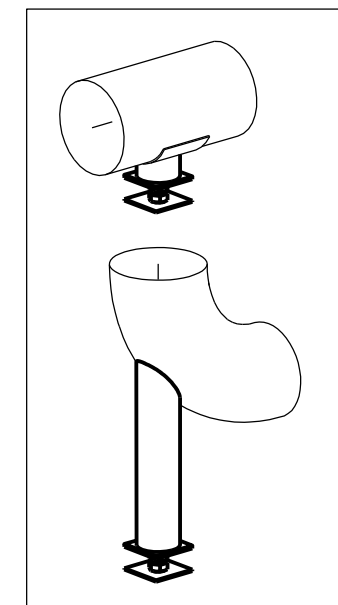
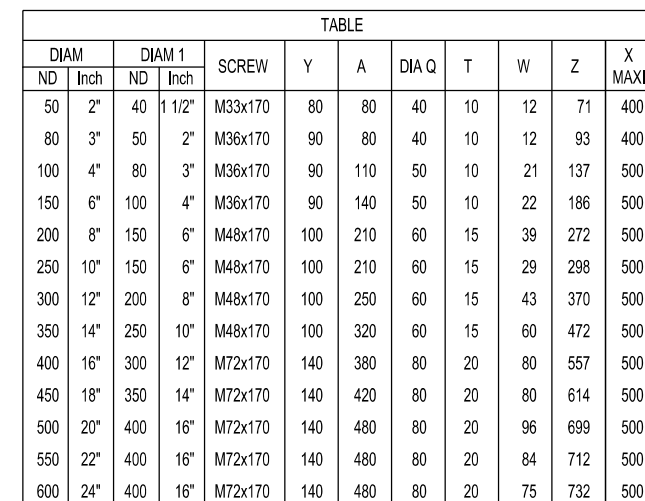
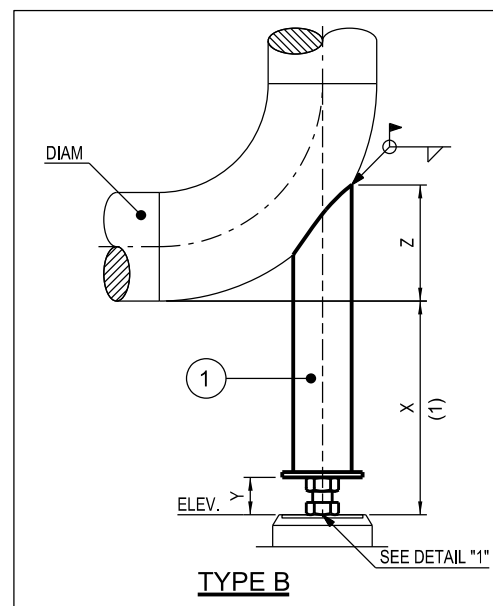
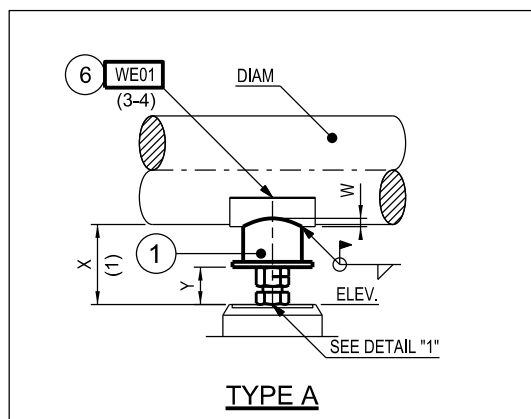
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NOTES:

1. $X_{\text{mini}} = 300 / \text{MAXI}$ SEE TABLE BY STEPS OF 100 TO BE ADJUSTED AT ERECTION IF NECESSARY.
2. MATCL AND SCH. AS PER PIPING CLASSES EXCEPT SPECIFIC REQUIREMENT.
3. PROTECTION SHALL BE PROVIDED FOR WHITE AS AND SS LINE. TRIMMION MATERIAL SHALL BE CS WITH STD SCHEDULE.
4. REFERENCE TO OTHER SUPPORT, IT WILL BE INDICATED ON ISOMETRIC.
5. TYPE C SHALL BE USED FOR AH-SH LINES.

Positional Mark

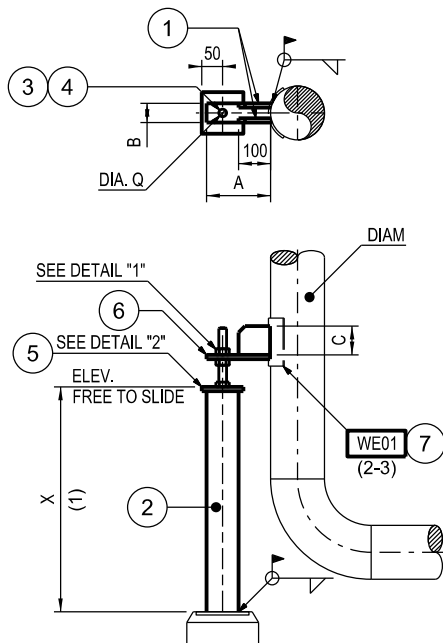
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ADJUSTABLE STANCHION
FOR DIAM 2" TO 24"

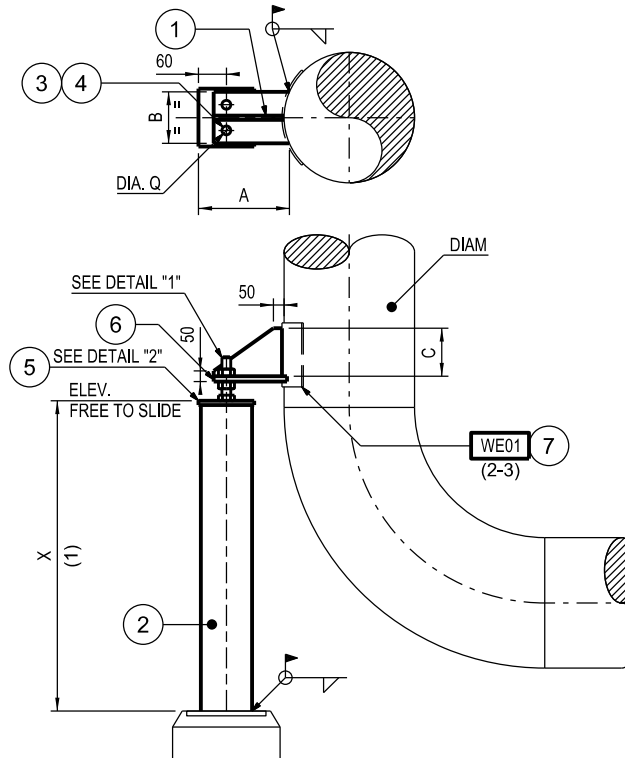
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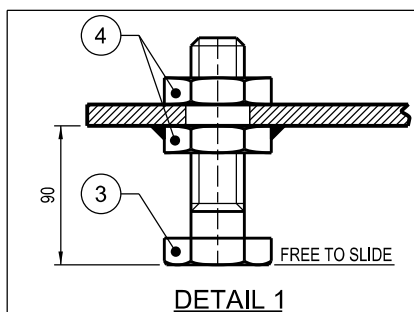
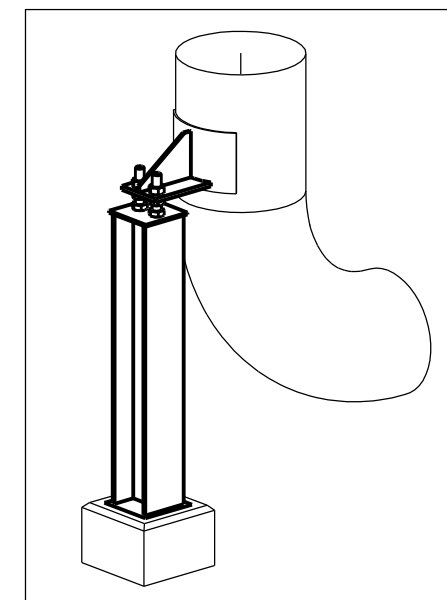
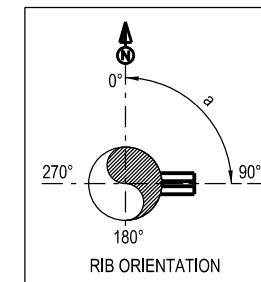


DIAM ND 50 TO 150 - DIAM 2" TO 6"

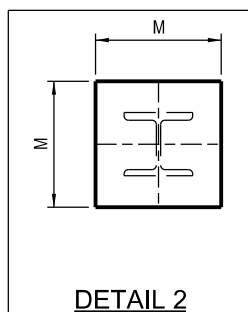


DIAM ND 200 TO 600 - DIAM 8" TO 24"

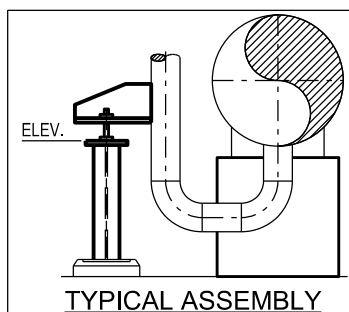
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|------------|------------|-------|-----|-----|-----|-----|--------|---------|-----------|--|
| DIAM | | SHAPE | A | B | C | M | DIA. Q | SCREW | X MAXI | |
| ND | Inch | | | | | | | | | |
| 50 TO 150 | 2" TO 6" | MB100 | 200 | 60 | 100 | 130 | 26 | M24x170 | 1000 | |
| 200 TO 300 | 8" TO 12" | MB150 | 290 | 160 | 150 | 180 | 32 | M30x170 | 1250 | |
| 350 TO 450 | 14" TO 18" | MB200 | 310 | 200 | 200 | 220 | 38 | M36x170 | 1500 | |
| 500 TO 600 | 20" TO 24" | MB250 | 330 | 240 | 250 | 260 | 44 | M42x170 | 1750 | |



DETAIL 1



DETAIL 2



TYPICAL ASSEMBLY

NOTES:

1. X = MAXI SEE TABLE BY STEPS OF 100 TO BE ADJUSTED AT ERECTION IF NECESSARY.
2. FOR DIAM ND 50 TO 150 - DIAM 2" TO 6" PROTECTION SHIELD ONLY IF REQUIRED BY DESIGNER IT WILL BE INDICATED ON ISOMETRIC.
3. FOR PWHT; AS; AH; SS; SH LINES, PROTECTION SHIELD ALWAYS REQUIRED.

| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH | | |
|------|-------------------|------|-----------------|---------|---------|---------|----|---------|---------|---------|----------|--|--|
| 7 | PROTECTION SHIELD | 1 | REFER TO WE01 | / | / | / | / | / | / | / | / | | |
| 6 | PLATE | 1 | PLATE Thk. 10 | A36 | A387-11 | A516-60 | / | A36 | A387-11 | A36 | A240-304 | | |
| 5 | BASE | 1 | PLATE Thk. 10 | A36 | A36 | A36 | / | A36 | A36 | A36 | A36 | | |
| 4 | NUT | 2/4 | | A194-2H | A194-2H | A194-2H | / | A194-2H | A194-8 | A194-2H | A194-8 | | |
| 3 | SCREW | 1/2 | SEE TABLE | A193-B7 | A193-B7 | A193-B7 | / | A193-B7 | A193-B8 | A193-B7 | A193-B8 | | |
| 2 | STANCHION | 1 | SHAPE SEE TABLE | A36 | A36 | A36 | / | A36 | A36 | A36 | A36 | | |
| 1 | RIB | 1/2 | PLATE C x 10 | A36 | A387-11 | A516-60 | / | A36 | A387-11 | A36 | A240-304 | | |
| | | | | CS | CH | CL | CG | AS | AH | SS | SH | | |

Support Mark

WR10 DIAM X MATCL

Positional Mark

ELEV a

Technip

**WELDED ADJUSTABLE STANCHION
FOR DIAM 2" TO 24"**

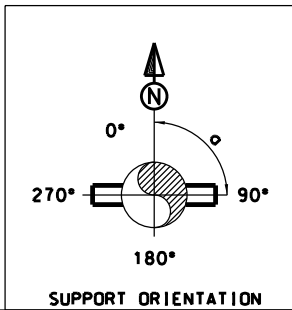
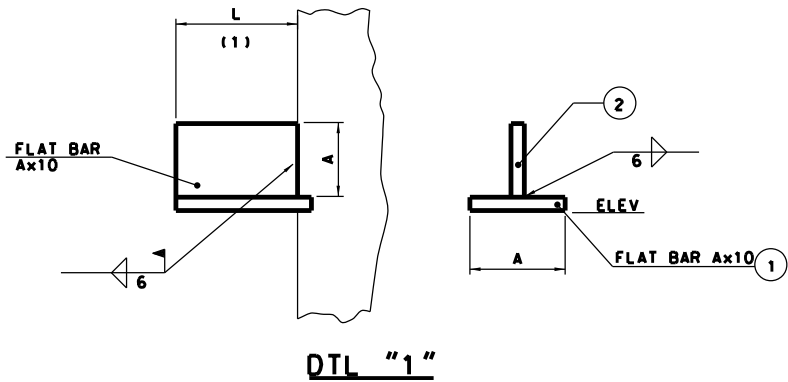
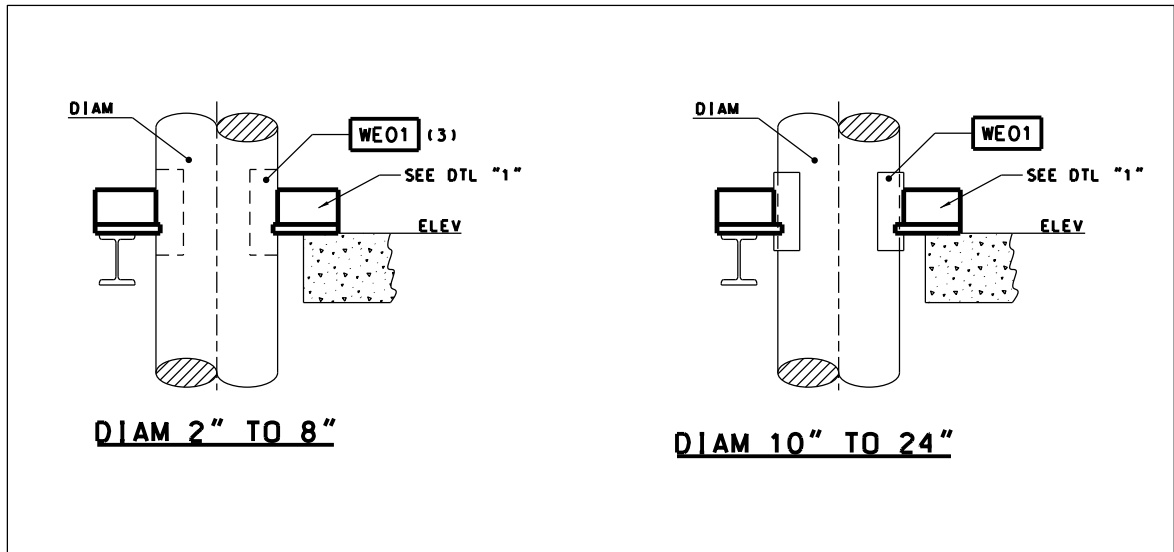
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STANDARD CONSTRUCTION DRAWING
PLANT DESIGN AND PIPING

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00005TC139124P100.004




| TABLE "1" | |
|------------|------------------|
| DIAM | FLAT BAR Ax10 |
| 2" TO 6" | 50x10 |
| 8" TO 18" | 100x10 |
| 20" TO 24" | 150x10 |

NOTES:

1. L DIMENSION FROM 150 TO 300 WITH STEP 50.
2. DELETED.
3. FOR 2" TO 8" PROTECTION SHIELD ONLY IF REQUIRED BY SUPPORT DESIGNER.

| Support Mark | Positional Mark |
|-------------------------|-----------------|
| WR11 DIAM L MATCL | ELEV a |

| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH |
|------|-------------|------|---------------|-----|---------|---------|----|---------|---------|----------|----------|
| 2 | STIFFENER | 2 | FLAT BAR Ax10 | A36 | A387-11 | A516-60 | / | A387-11 | A387-11 | A240-304 | A240-304 |
| 1 | PLATE | 2 | FLAT BAR Ax10 | A36 | A387-11 | A516-60 | / | A387-11 | A387-11 | A240-304 | A240-304 |



VERTICAL SUPPORT ON PLATFORMS
FOR DIAM 2" TO 24"

WR11

STANDARD CONSTRUCTION DRAWING
PLANT DESIGN AND PIPING

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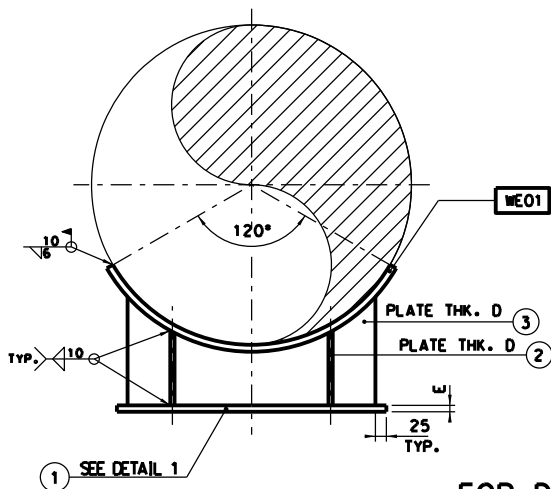


| | | |
|------|------|-------|
| WR13 | DIAM | MATCL |
|------|------|-------|

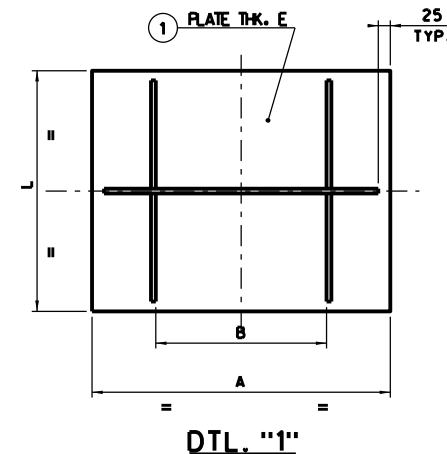
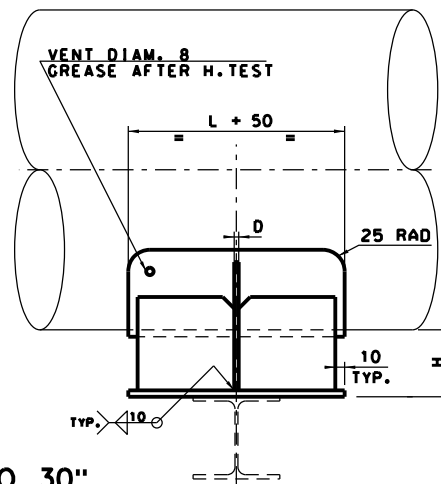
WR 13

| | | | | |
|---------|------|------------------------|--------|------|
| XXXXXXX | 000 | STC 1391-26 | 1 of 1 | 0 |
| Project | Unit | Doc. Code & Serial No. | Page | Rev. |

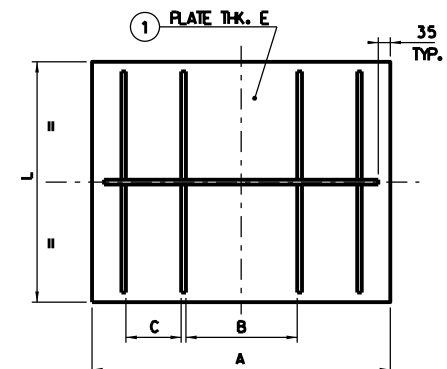
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FOR DIAM 26" TO 30"

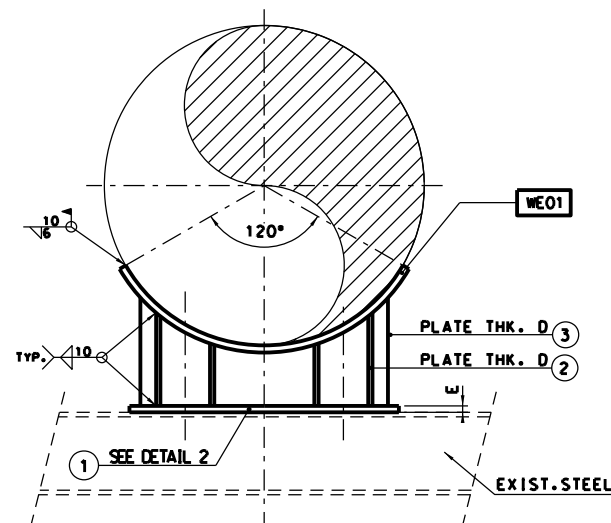


DTL. "1"

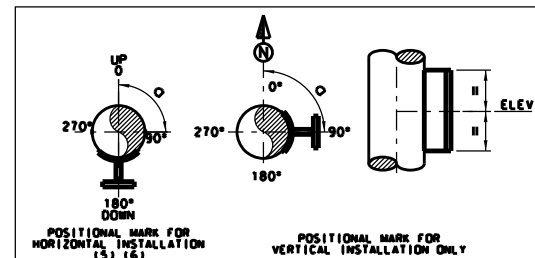
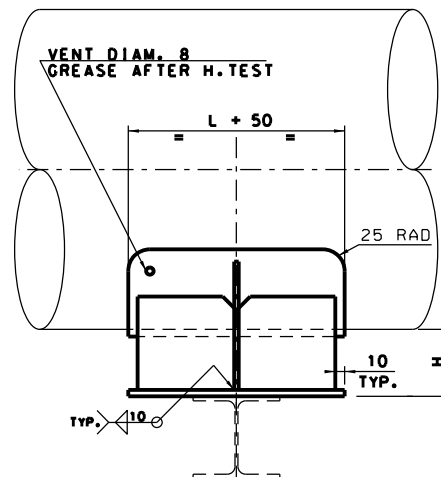


DTL. "2"

| DIAM | A | B | C | D | E |
|------|------|-----|-----|----|----|
| 26" | 550 | 315 | / | 15 | 15 |
| 28" | 600 | 340 | / | 15 | 15 |
| 30" | 650 | 365 | / | 15 | 15 |
| 32" | 750 | 220 | 160 | 15 | 15 |
| 34" | 750 | 240 | 170 | 15 | 15 |
| 36" | 800 | 255 | 180 | 15 | 15 |
| 38" | 850 | 265 | 190 | 15 | 15 |
| 40" | 900 | 280 | 200 | 15 | 15 |
| 42" | 950 | 300 | 210 | 15 | 15 |
| 44" | 950 | 310 | 220 | 15 | 20 |
| 46" | 1000 | 330 | 230 | 15 | 20 |
| 48" | 1050 | 345 | 240 | 20 | 20 |
| 50" | 1100 | 360 | 255 | 20 | 20 |
| 52" | 1150 | 370 | 265 | 20 | 20 |
| 54" | 1200 | 385 | 275 | 20 | 20 |
| 56" | 1250 | 400 | 285 | 20 | 20 |
| 60" | 1300 | 430 | 310 | 20 | 20 |



FOR DIAM 32" TO 60"



TYPE : A **FOR GAS LINE**

NOTES:

1. L = 300, 500, 700 or 900
2. H = 100 TO 300. FOR LINE WITH SLOPE : H + INDICATING EXACT HEIGHT OF THE SHOE.
3. DELETED.
4. DELETED.
5. LOOKING TO FLOW FLUID DIRECTION.
6. TO BE INDICATED ONLY IF DIFFERENT OF 180°.

| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH |
|------|-------------|--------|--------------|-----|---------|---------|----|-----|---------|-----|----------|
| ③ | RIB | 1 | PLATE THK. D | A36 | A387-11 | A516-60 | / | A36 | A387-11 | A36 | A240-304 |
| ② | RIB | 4 or 8 | PLATE THK. D | A36 | A387-11 | A516-60 | / | A36 | A387-11 | A36 | A240-304 |
| ① | BASE | 1 | PLATE THK. E | A36 | A36 | A36 | / | A36 | A36 | A36 | A36 |

Support Mark

WR14 | DIAM | TYPE | H | L | MATCL

Positional Mark

ELEV | a

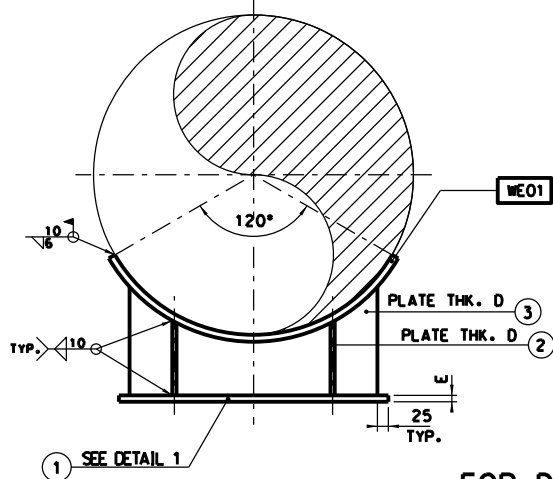
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WELDED SHOES
FOR DIAM 26" TO 60"

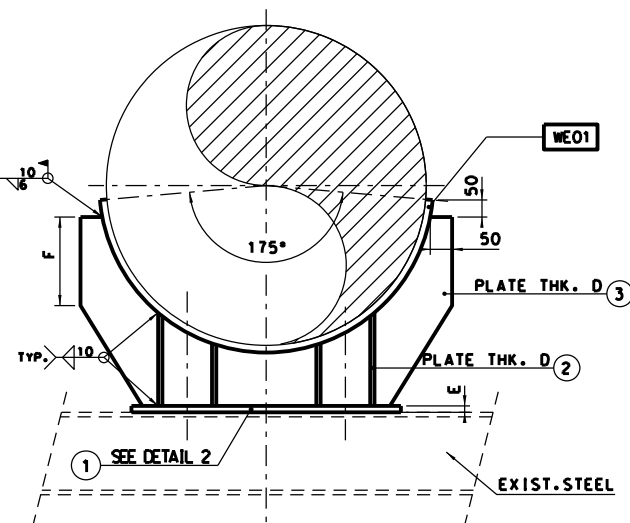
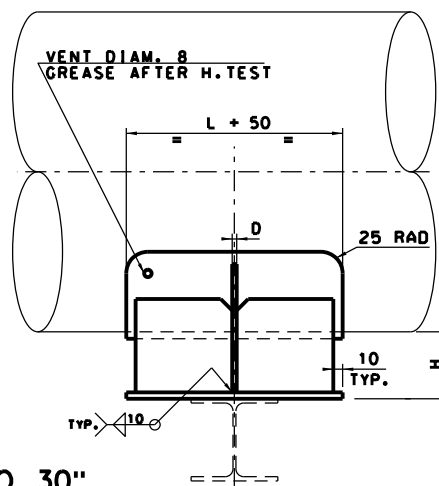
WR14

STANDARD CONSTRUCTION DRAWING
PLANT DESIGN AND PIPING

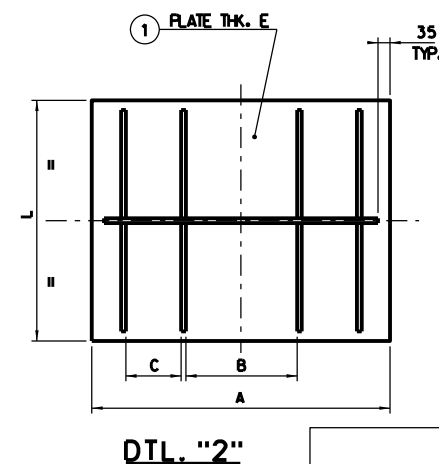
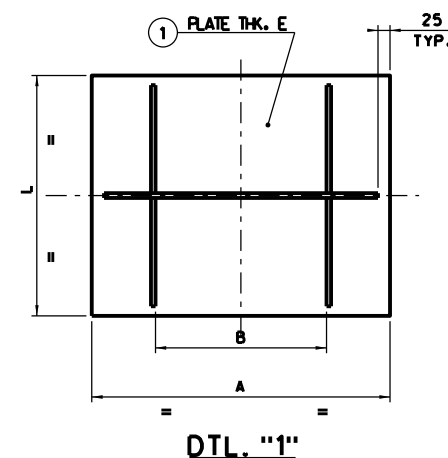
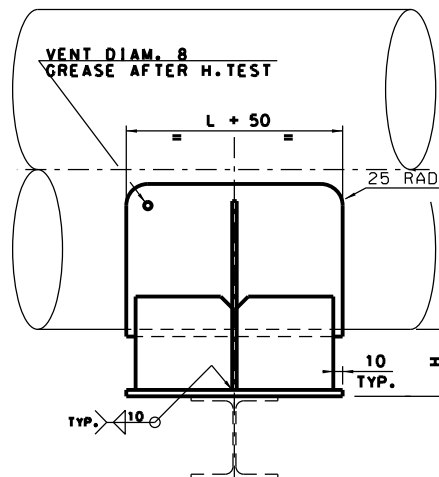
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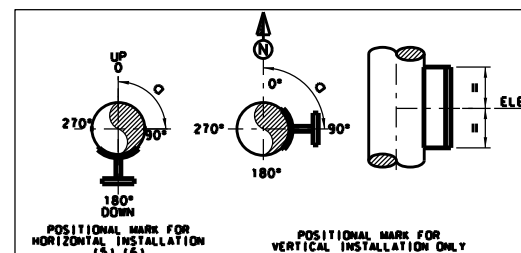
FOR DIAM 26" TO 30"



FOR DIAM 32" TO 60"



| DIAM | A | B | C | D | E | F |
|------|------|-----|-----|----|----|-----|
| 26" | 550 | 315 | / | 15 | 15 | / |
| 28" | 600 | 340 | / | 15 | 15 | / |
| 30" | 650 | 365 | / | 15 | 15 | / |
| 32" | 750 | 220 | 160 | 15 | 15 | 200 |
| 34" | 750 | 240 | 170 | 15 | 15 | 200 |
| 36" | 800 | 255 | 180 | 15 | 15 | 200 |
| 38" | 850 | 265 | 190 | 15 | 15 | 250 |
| 40" | 900 | 280 | 200 | 15 | 15 | 250 |
| 42" | 950 | 300 | 210 | 15 | 15 | 250 |
| 44" | 950 | 310 | 220 | 15 | 20 | 300 |
| 46" | 1000 | 330 | 230 | 15 | 20 | 300 |
| 48" | 1050 | 345 | 240 | 20 | 20 | 300 |
| 50" | 1100 | 360 | 255 | 20 | 20 | 300 |
| 52" | 1150 | 370 | 265 | 20 | 20 | 350 |
| 54" | 1200 | 385 | 275 | 20 | 20 | 350 |
| 56" | 1250 | 400 | 285 | 20 | 20 | 350 |
| 60" | 1300 | 430 | 310 | 20 | 20 | 350 |



TYPE : B FOR LIQUID LINE

NOTES:

1. L = 300, 500, 700 or 900
2. H = 100 TO 300. FOR LINE WITH SLOPE : H + INDICATING EXACT HEIGHT OF THE SHOE.
3. DELETED.
4. FOR 46" TO 60" FULL WRAP MUST BE USED IF PIPE THICKNESS IS LESS THAN 12.7mm.
5. LOOKING TO FLOW FLUID DIRECTION.
6. TO BE INDICATED ONLY IF DIFFERENT OF 180°.

Support Mark

WR14 | DIAM | TYPE | H | L | MATCL

Positional Mark

ELEV | a

| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH |
|------|-------------|------|--------------|-----|---------|---------|----|-----|---------|-----|----------|
| ③ | RIB | 1 | PLATE THK. D | A36 | A387-11 | A516-60 | / | A36 | A387-11 | A36 | A240-304 |
| ② | RIB | 4or8 | PLATE THK. D | A36 | A387-11 | A516-60 | / | A36 | A387-11 | A36 | A240-304 |
| ① | BASE | 1 | PLATE THK. E | A36 | A36 | A36 | / | A36 | A36 | A36 | A36 |

MATCL

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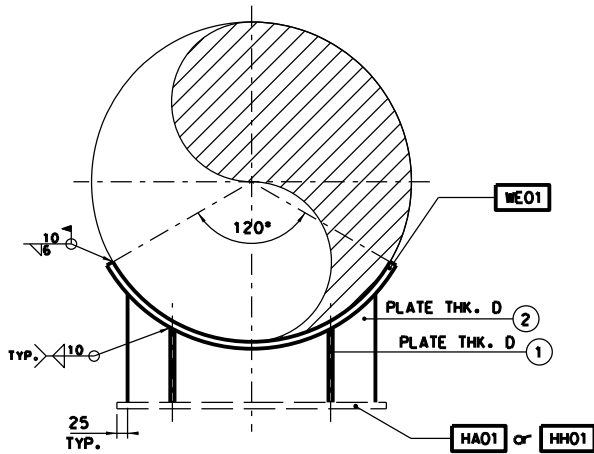
WELDED SHOES
FOR DIAM 26" TO 60"

WR14

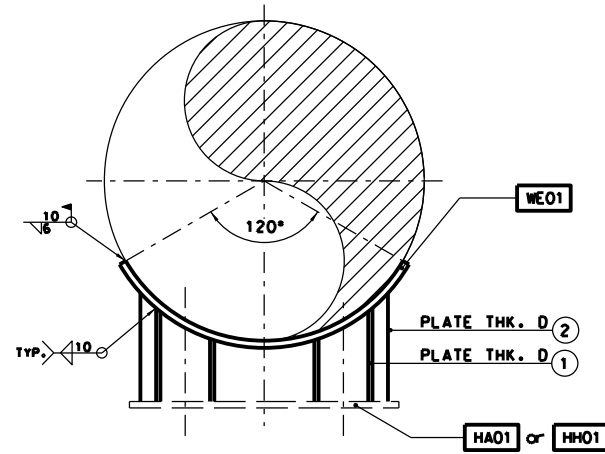
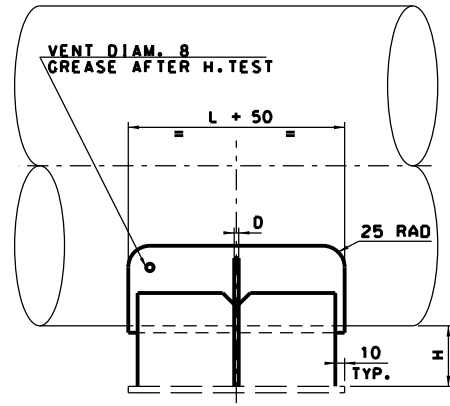
STANDARD CONSTRUCTION DRAWING
PLANT DESIGN AND PIPING

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Project Unit Doc. Code & Serial No. Page Rev.

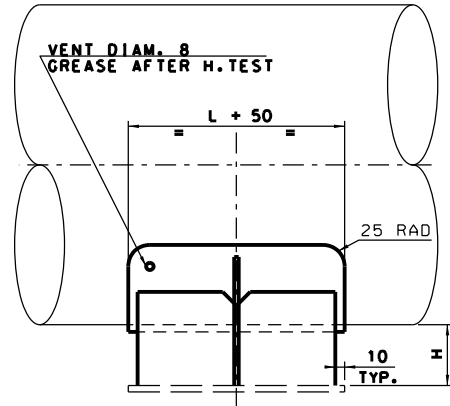
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FOR DIAM 26" TO 30"



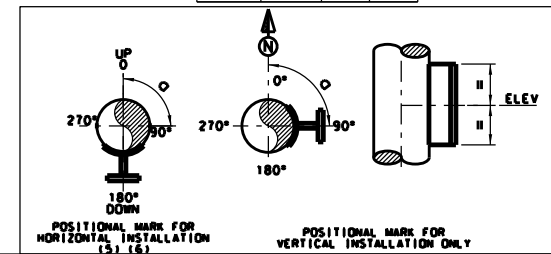
FOR DIAM 32" TO 60"



TYPE : C

FOR GAS LINE
TO BE USE WITH "HA01" or "HH01"

| DIAM | B | C | D |
|------|-----|-----|----|
| 26" | 315 | / | 15 |
| 28" | 340 | / | 15 |
| 30" | 365 | / | 15 |
| 32" | 220 | 160 | 15 |
| 34" | 240 | 170 | 15 |
| 36" | 255 | 180 | 15 |
| 38" | 265 | 190 | 15 |
| 40" | 280 | 200 | 15 |
| 42" | 300 | 210 | 15 |
| 44" | 310 | 220 | 15 |
| 46" | 330 | 230 | 15 |
| 48" | 345 | 240 | 20 |
| 50" | 360 | 255 | 20 |
| 52" | 370 | 265 | 20 |
| 54" | 385 | 275 | 20 |
| 56" | 400 | 285 | 20 |
| 60" | 430 | 310 | 20 |



- NOTES:
1. L = 300, 500, 700 or 900
 2. H = 100 TO 300. FOR LINE WITH SLOPE : H + INDICATING EXACT HEIGHT OF THE SHOE.
 3. DELETED.
 5. LOOKING TO FLOW FLUID DIRECTION.
 6. TO BE INDICATED ONLY IF DIFFERENT OF 180°.

| Support Mark | Positional Mark |
|--------------------------|-----------------|
| WR14 DIAM TYPE H L MATCL | ELEV a |

| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH |
|------|-------------|--------|--------------|-----|---------|---------|----|-----|---------|-----|----------|
| 2 | RIB | 1 | PLATE THK. D | A36 | A387-11 | A516-60 | / | A36 | A387-11 | A36 | A240-304 |
| 1 | RIB | 4 or 8 | PLATE THK. D | A36 | A387-11 | A516-60 | / | A36 | A387-11 | A36 | A240-304 |

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WELDED SHOES
FOR DIAM 26" TO 60"

WR14

STANDARD CONSTRUCTION DRAWING
PLANT DESIGN AND PIPING

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STC 1391-27

3 of 4

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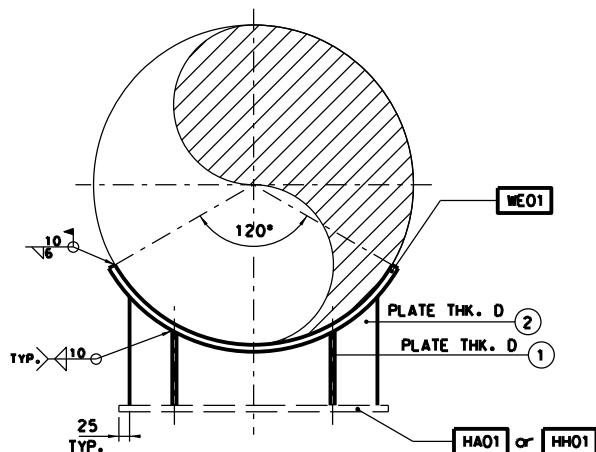
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Unit

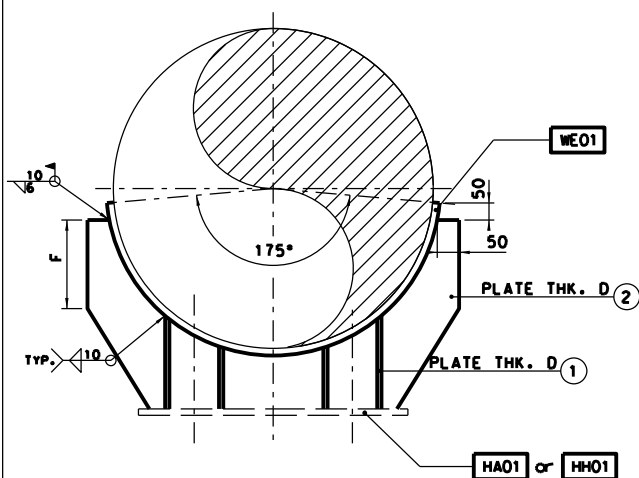
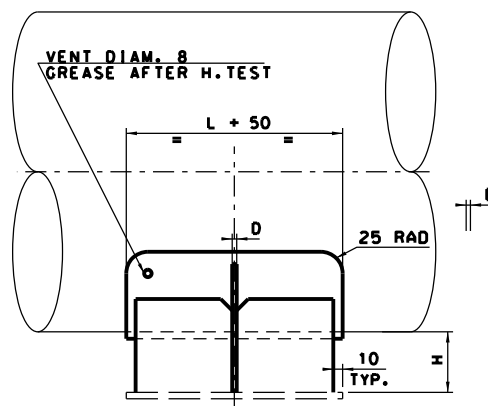
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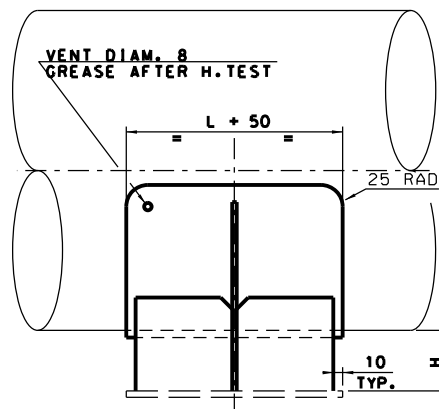
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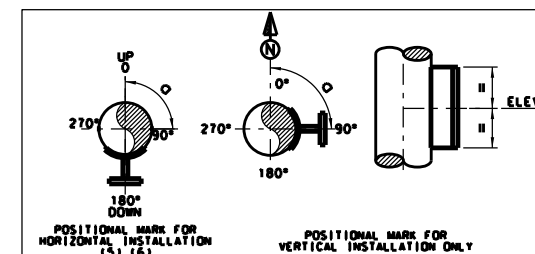
FOR DIAM 26" TO 30"



FOR DIAM 32" TO 60"



| DIAM | B | C | D | F |
|------|-----|-----|----|-----|
| 26" | 315 | / | 15 | / |
| 28" | 340 | / | 15 | / |
| 30" | 365 | / | 15 | / |
| 32" | 220 | 160 | 15 | 200 |
| 34" | 240 | 170 | 15 | 200 |
| 36" | 255 | 180 | 15 | 200 |
| 38" | 265 | 190 | 15 | 250 |
| 40" | 280 | 200 | 15 | 250 |
| 42" | 300 | 210 | 15 | 250 |
| 44" | 310 | 220 | 15 | 300 |
| 46" | 330 | 230 | 15 | 300 |
| 48" | 345 | 240 | 20 | 300 |
| 50" | 360 | 255 | 20 | 300 |
| 52" | 370 | 265 | 20 | 350 |
| 54" | 385 | 275 | 20 | 350 |
| 56" | 400 | 285 | 20 | 350 |
| 60" | 430 | 310 | 20 | 350 |



TYPE : D

**FOR LIQUID LINE
TO BE USE WITH "HA01" or "HH01"**

NOTES:

1. L = 300-500-700 or 900
2. H = 100 TO 300. FOR LINE WITH SLOPE : H + INDICATING EXACT HEIGHT OF THE SHOE.
3. DELETED.
4. FOR 46" TO 60" FULL WRAP MUST BE USED IF PIPE THICKNESS IS LESS THAN 12.7mm.
5. LOOKING TO FLOW FLUID DIRECTION.
6. TO BE INDICATED ONLY IF DIFFERENT OF 180°.

Support Mark

WR14 | DIAM | TYPE | H | L | MATCL

Positional Mark

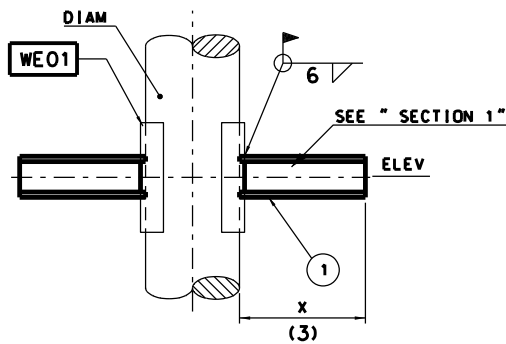
ELEV | a

| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH |
|------|-------------|--------|--------------|-----|---------|---------|----|-----|---------|-----|----------|
| ② | RIB | 1 | PLATE THK. D | A36 | A387-11 | A516-60 | / | A36 | A387-11 | A36 | A240-304 |
| ① | RIB | 4 or 8 | PLATE THK. D | A36 | A387-11 | A516-60 | / | A36 | A387-11 | A36 | A240-304 |

| | | | | | |
|--|--|-------------------------------------|-----|----------------------------------|--------|
| Technip | | WELDED SHOES FOR DIAM 26" TO 60" | | WR14 | |
| STANDARD CONSTRUCTION DRAWING PLANT DESIGN AND PIPING | | XXXXXXXXXXXX | 000 | STC 1391-27 | 4 of 4 |
| Project | | Unit | | Doc. Code & Serial No. Page Rev. | |

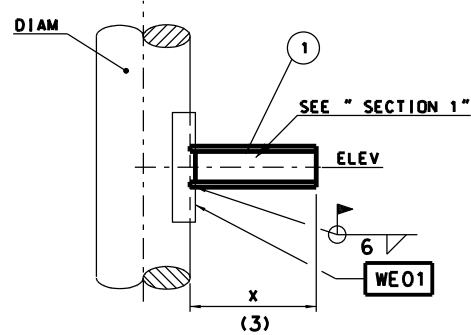
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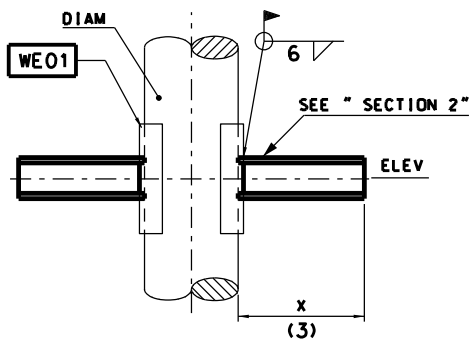
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(2)



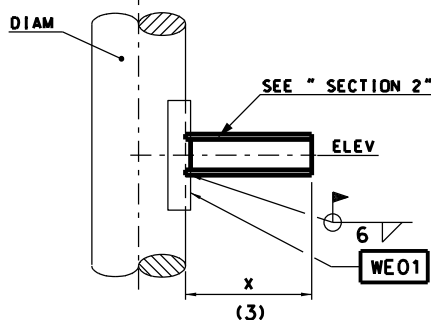
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(2)



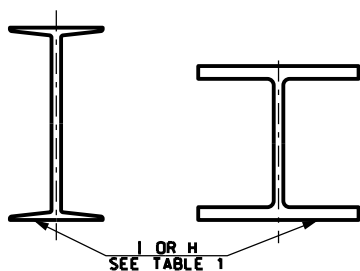
TYPE C

(2)

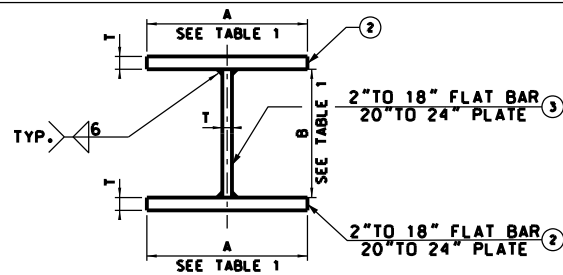


TYPE D

(2)



SECTION 1

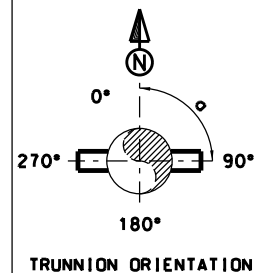


SECTION 2

| TABLE "1" | | | | |
|-----------|-------|------|------|------|
| DIAM | SHAPE | A mm | B mm | T mm |
| 2" | I10 | 50 | 100 | 5 |
| 3" | I10 | 50 | 100 | |
| 4" | I12 | 60 | 100 | |
| 6" | I12 | 60 | 100 | |
| 8" | H12 | 120 | 100 | 10 |
| 10" | H12 | 120 | 100 | |
| 12" | H16 | 150 | 150 | |
| 14" | H16 | 150 | 150 | |
| 16" | H20 | 200 | 150 | 12 |
| 18" | H20 | 200 | 150 | |
| 20" | H24 | 240 | 200 | |
| 22" | H24 | 240 | 200 | |
| 24" | H24 | 240 | 200 | |

TABLE "2"

| MATCL | TYPE |
|--------------------------|--------|
| CS | A OR B |
| CH, CL, AS AH, SS, SH | C OR D |



NOTES:

1. DELETED.
2. PROTECTION SHIELD SHALL BE USED FOR ALL DIAMETER.
3. X DIMENSIONS FROM 200 TO 400 AND SHALL BE APPROVED BY A STRESS VALIDATION.

Support Mark

WR15 DIAM TYPE SHAPE X MATCL

Positional Mark

ELEV a

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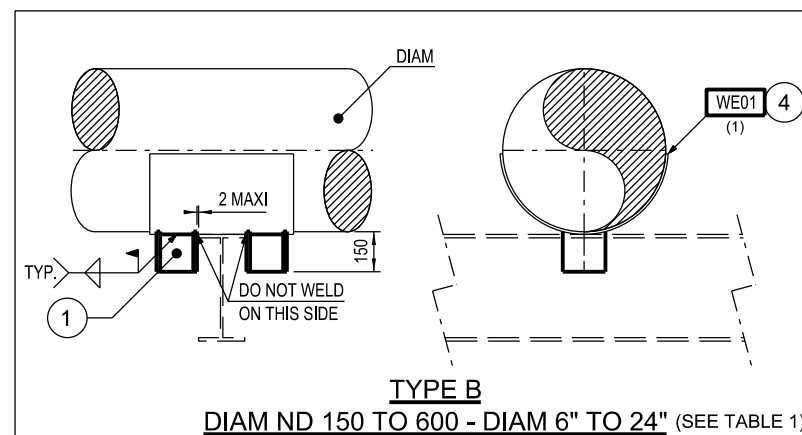
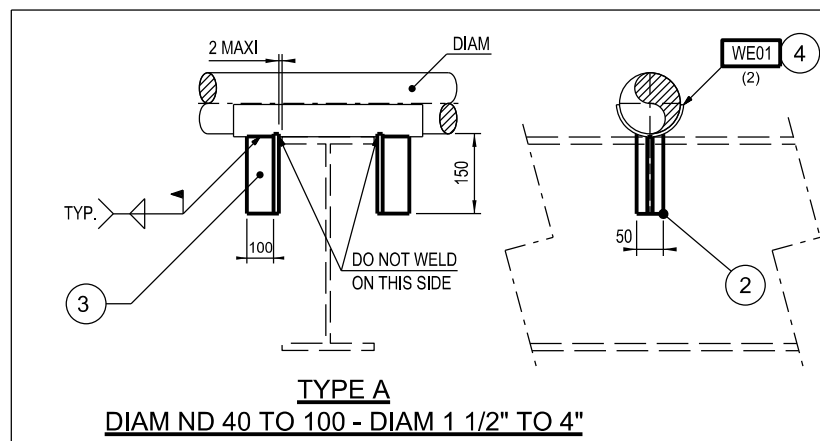
SHAPE ON VERTICAL PIPE
FOR DIAM 2" TO 24"

WR15

STANDARD CONSTRUCTION DRAWING
PLANT DESIGN AND PIPING

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| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH |
|------|----------------|------|---------------|-----|---------|---------|----|---------|---------|----------|----------|
| 3 | FLAT BAR/PLATE | 1/2 | SEE TABLE "1" | / | A387-11 | A516-60 | / | A387-11 | A387-11 | A240-304 | A240-304 |
| 2 | FLAT BAR/PLATE | 2/4 | SEE TABLE "1" | / | A387-11 | A516-60 | / | A387-11 | A387-11 | A240-304 | A240-304 |
| 1 | SHAPE | 1/2 | SEE TABLE "1" | A36 | / | / | / | / | / | / | / |



| TABLE 1 | | |
|---------|------------------|-----------|
| SIZE | SHAPE | Load (KN) |
| 1 | PLATE + STIFFNER | 30 |
| 2 | HALF MB200 | 60 |
| 3 | MB200 | 130 |

NOTES:
1. FOR DIAM ND 350 TO 600 - DIAM 14" TO 24" PROTECTION SHIELD SHALL BE REQUIRED.
2. FOR SS,SH,AS,AH AND PWHT LINES PROTECTION SHIELD SHALL BE REQUIRED FOR ALL DIAMETERS.
3. MAXI GAP TO VERIFY AT ERECTION.

| | | | | | | | | | | | | |
|------|-------------------|------|----------------------------------|-----|----|----|-----|-------|----|----|----|--|
| (4) | PROTECTION SHIELD | 1 | REFER TO WE01 | / | | | / | / | | | | |
| (3) | STIFFENER | 2 | PLATE 100 x 10 SEE TABLE 1 | A36 | | | A36 | A36 | | | | |
| (2) | FLAT BAR | 2 | PLATE BAR 50 x 10 SEE TABLE 1 | A36 | | | A36 | A36 | | | | |
| (1) | SHAPE | 2 | SEE TABLE 1 | A36 | | | A36 | A36 | | | | |
| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH | |
| | | | | | | | | MATCL | | | | |

Support Mark

| WS01 | DIAM | TYPE | SIZE |
|------|------|------|------|
|------|------|------|------|

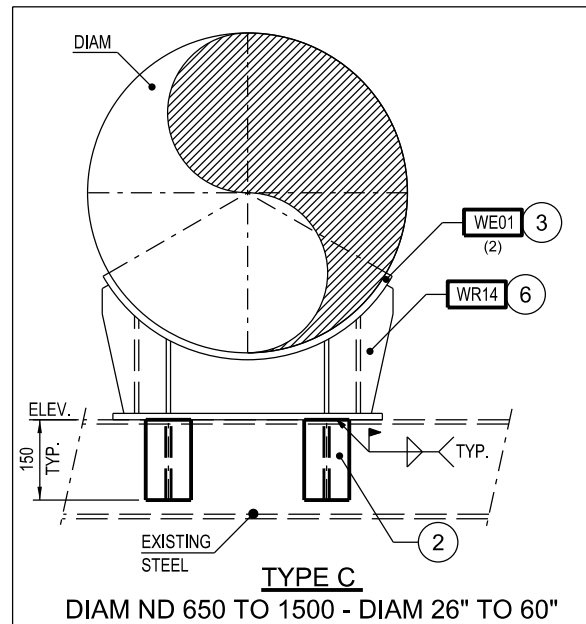
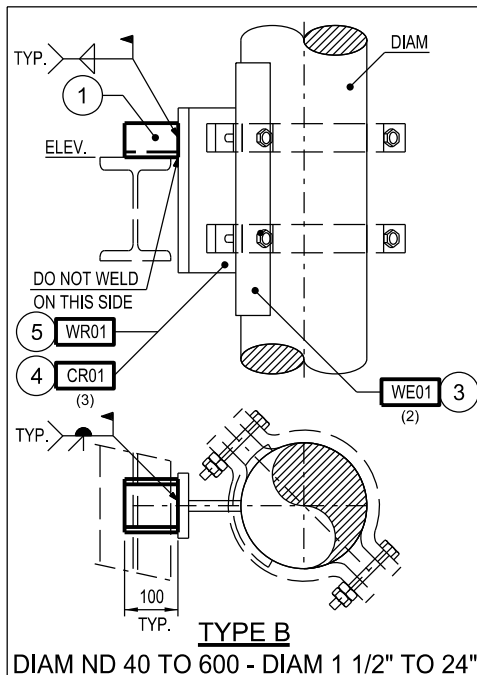
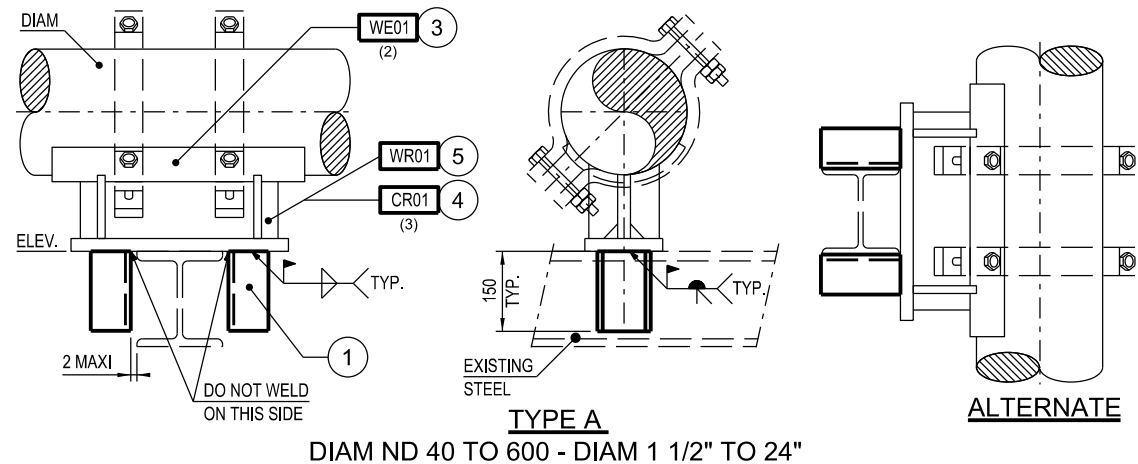
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STOP ON UNINSULATED PIPE
FOR DIAM 1 1/2" TO 24"

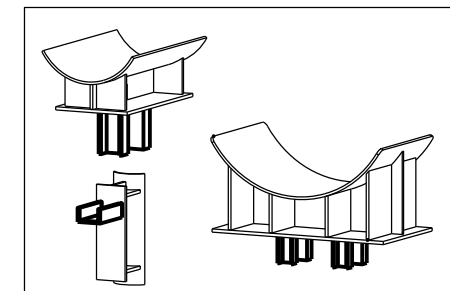
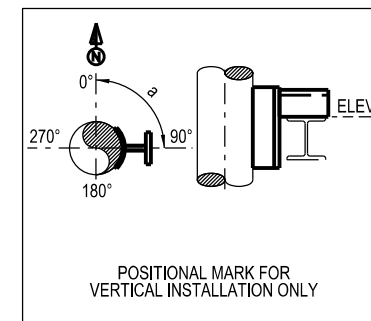
WS01

STANDARD CONSTRUCTION DRAWING
PLANT DESIGN AND PIPING

| | | | | |
|---------|------|------------------------|--------|------|
| XXXXXX | 000 | STC - 1391 - 29 | 1 of 1 | 1 |
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| TABLE 1 | | |
|---------|------------|-----------|
| SIZE | SHAPE | Load (KN) |
| 1 | HALF MB100 | 30 |
| 2 | MC 100 | 70 |
| 3 | MB 150 | 100 |
| 4 | MB 200 | 130 |



- NOTES:
1. STOP TO USE IN CONJUNCTION WITH REQUIRED PIPE SHOE.
 2. PROTECTION SHIELD SHALL BE USED FOR PWHT AS, AH, SS, SH AND FOR ALL PIPE DIAM ND 350 TO 1500 - DIAM 14" TO 60" ON OTHER LINES.
 3. WE03 SHALL BE USED FOR PIPE SHOE WITH CLAMP.

| | | | | | | | | | | | | |
|------|-------------------|------|---------------|-----|-----|-----|-----|-----|-----|-----|-----|----|
| 6 | SHOE | 1 | REFER TO WR14 | / | / | / | / | / | / | / | / | |
| 5 | SHOE | 1 | REFER TO WR01 | / | / | / | / | / | / | / | / | |
| 4 | SHOE | 1 | REFER TO CR01 | / | / | / | / | / | / | / | / | |
| 3 | PROTECTION SHIELD | 1 | REFER TO WE01 | / | / | / | / | / | / | / | / | |
| 2 | SHAPE | 4 | SEE TABLE | A36 | A36 | A36 | A36 | A36 | A36 | A36 | A36 | |
| 1 | SHAPE | 1/2 | SEE TABLE | A36 | A36 | A36 | A36 | A36 | A36 | A36 | A36 | |
| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH | SL |

MATCL

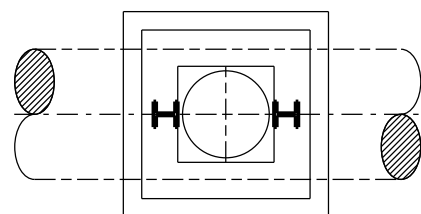
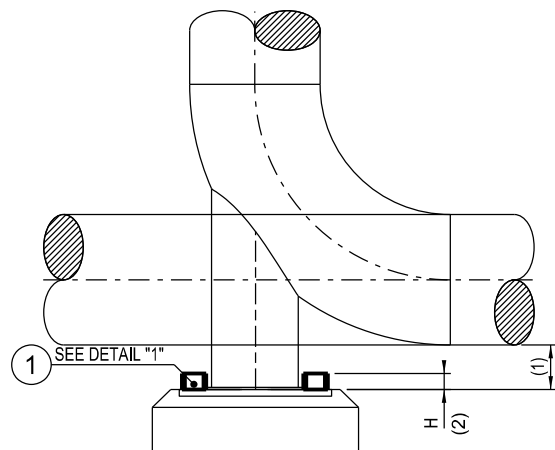
Support Mark

WS02 DIAM TYPE SIZE

Positional Mark

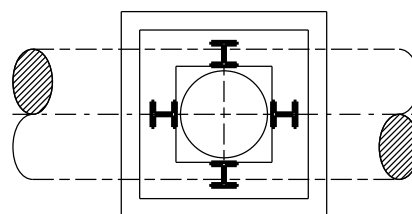
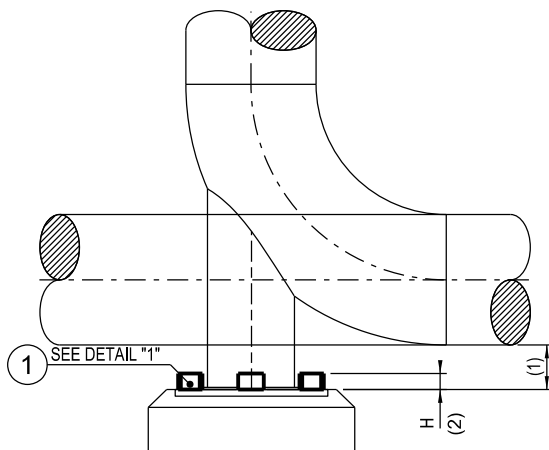
ELEV a

TechnipSTOP ON PIPE SHOES
FOR DIAM 1 1/2" TO 60"**WS02**STANDARD CONSTRUCTION DRAWING
PLANT DESIGN AND PIPINGXXXXXX
Project000
UnitSTC - 1391 - 30
Doc. Code & Serial No.1 of 1
Page1
Rev.

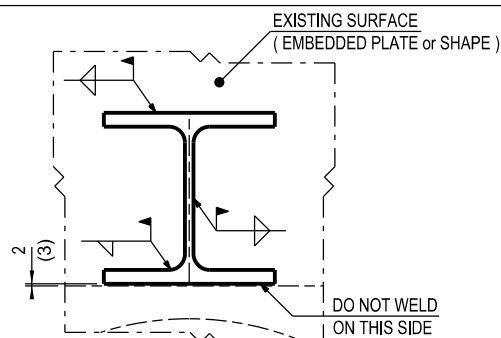


FREE TO
SLIDE

TYPE A
AXIAL STOP



TYPE B
SEMI ANCHOR



DETAIL 1

| | | | | | | | | | | | | | |
|----------------------------------|-------------|------|-----------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
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| <input type="radio"/> | | | | | | | | | | | | | |
| <input type="radio"/> | | | | | | | | | | | | | |
| <input checked="" type="radio"/> | SHAPE | 2/4 | SEE TABLE | A36 | A36 | A36 | A36 | A36 | A36 | A36 | A36 | A36 | A36 |
| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH | SL | |
| | | | | MATCL | | | | | | | | | |

NOTES:

1. 800 MAXI.
2. H = 50 FOR FIXED STANCHION. TO BE SPECIFIED FOR ADJUSTABLE STANCHION.
3. GAP = 2 MAXI UNLESS SPECIFIED.
4. FOR DIAM ND 50 & 80 - DIAM 2" & 3" HOLD DOWN TO BE USED IN ONLY ONE DIRECTION.

Support Mark

| | | | |
|------|------|------|---|
| WS03 | TYPE | SIZE | H |
|------|------|------|---|

Technip

STOP FOR STANCHION
FOR DIAM 2" TO 60"

WS03

STANDARD CONSTRUCTION DRAWING
PLANT DESIGN AND PIPING

| |
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| XXXXXX |
| Print |

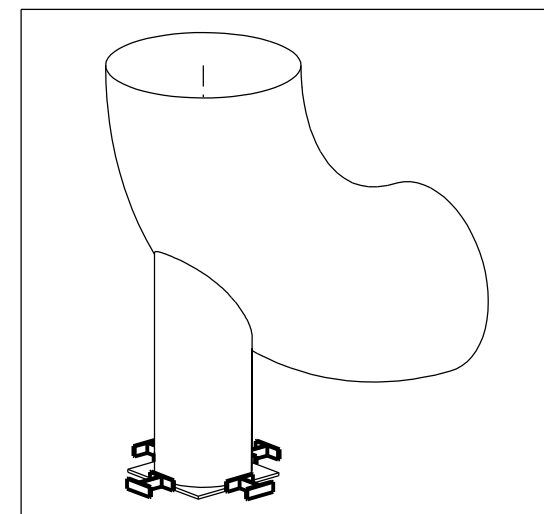
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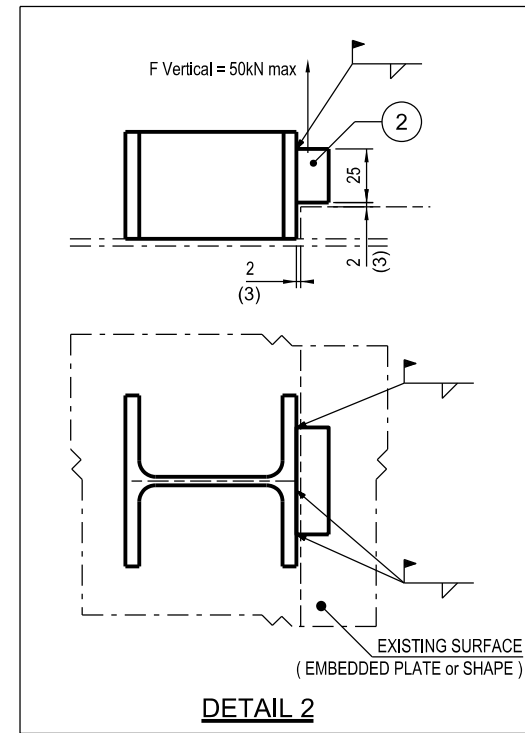
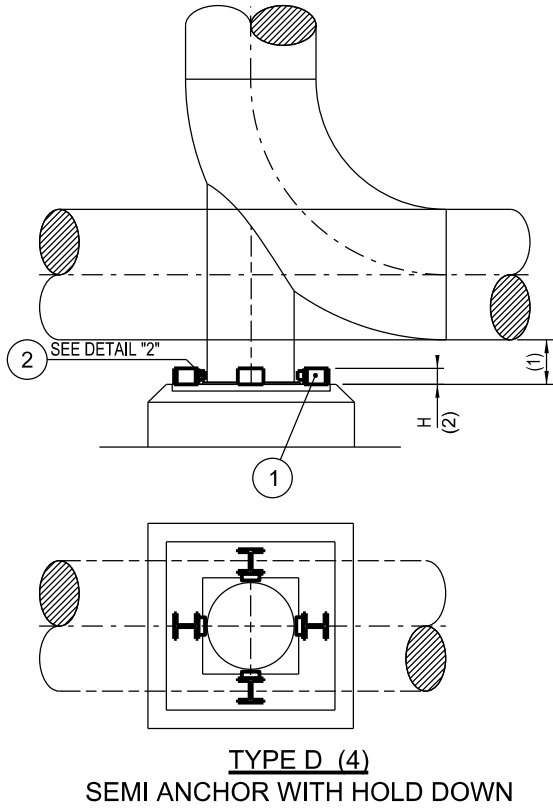
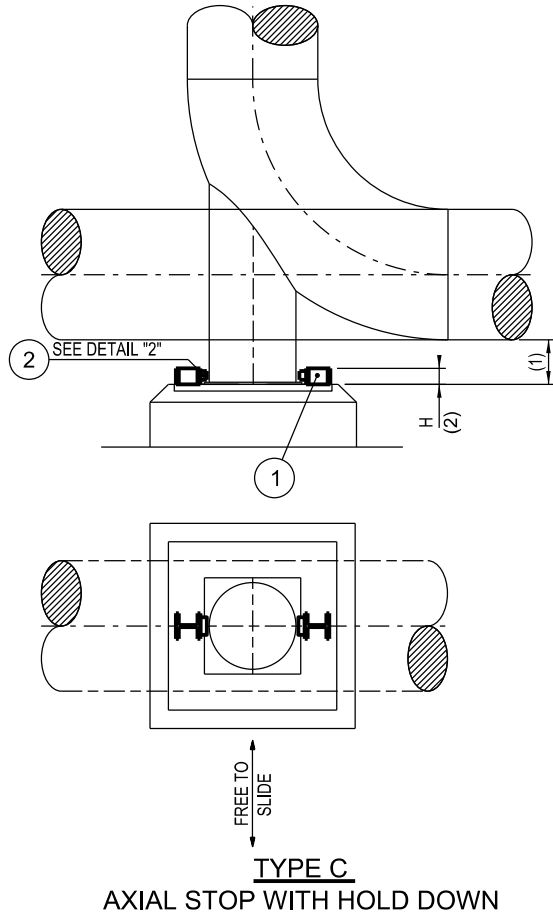
STC - 1391 - 31

1 of 2

1

| TABLE | | |
|-------|------------|-----------|
| SIZE | SHAPE | Load (KN) |
| 1 | HALF MB100 | 30 |
| 2 | MC 100 | 70 |
| 3 | MC 150 | 100 |
| 4 | MB 200 | 130 |





NOTES:

Support Mark

WS03 TYPE SIZE H

| | | | | | | | | | | | | | |
|------|-------------|------|---------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| ○ | | | | | | | | | | | | | |
| ○ | | | | | | | | | | | | | |
| ② | HOLD DOWN | 2/4 | PLATE 100 x 15 | A36 | A36 | A36 | A36 | A36 | A36 | A36 | A36 | A36 | |
| ① | SHAPE | 2/4 | SEE TABLE SHEET 1/2 | A36 | A36 | A36 | A36 | A36 | A36 | A36 | A36 | A36 | |
| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH | SL | |

MATCL

Technip

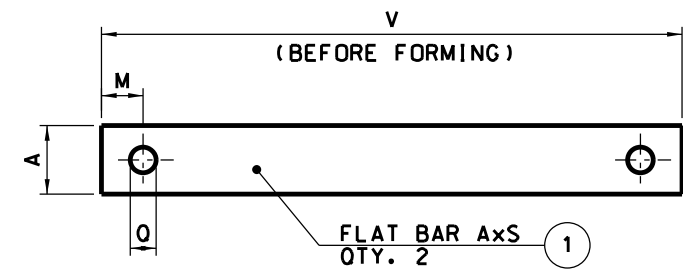
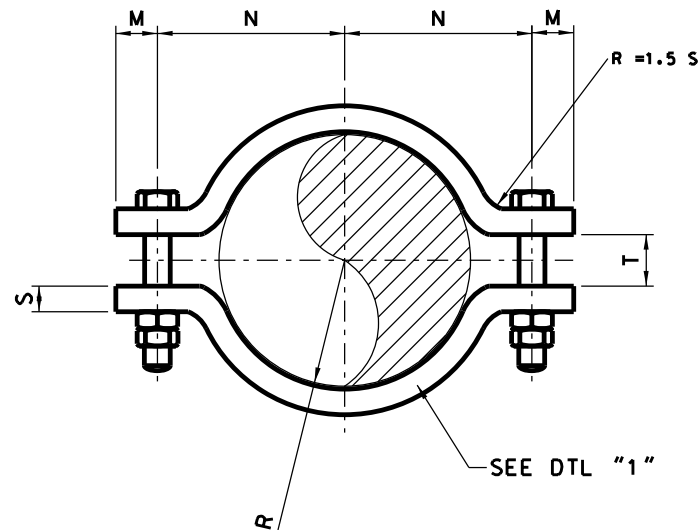
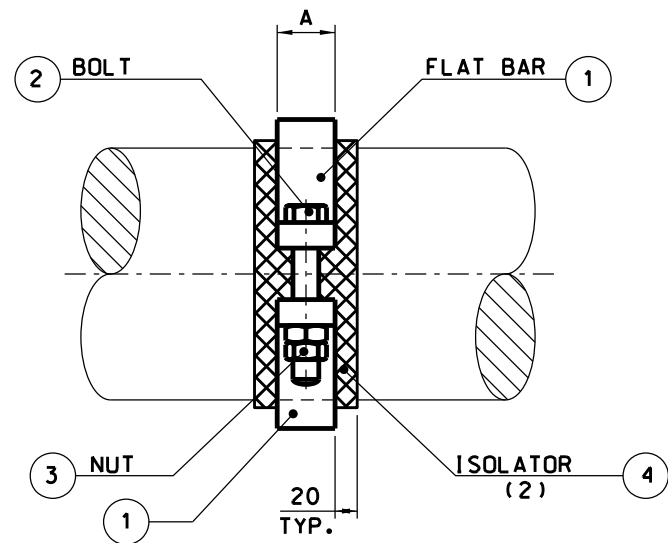
STANDARD CONSTRUCTION DRAWING
PLANT DESIGN AND PIPING

STOP FOR STANCHION
FOR DIAM 2" TO 60"

WS03

| | | | | |
|---------|------|------------------------|--------|------|
| XXXXXX | 000 | STC - 1391 - 31 | 2 of 2 | 1 |
| Project | Unit | Doc. Code & Serial No. | Page | Rev. |

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DTL "1"

TO BE USED IN CONJUNCTION
WITH OTHER SUPPORT
(AS CRO1 AS EXAMPLE).

NOTES:

1. APPROXIMATE LENGHT FOR HALF CLAMP BEFORE FORMING.
2. A SHEET OF ELASTOMERIC ISOLATOR TYPE "CORFLEX" SHALL BE INSERTED BETWEEN CLAMP AND PIPE. LIMITE OF TEMPERATURE IS 210 °C.

| | | | | | | | | | | | | | |
|-------|-------------|------|----------------|---------|---------|---------|----------|---------|---------|---------|----------|--|--|
| ④ | ISOLATOR | 1 | | (2) | / | (2) | NEOPRENE | (2) | / | (2) | (2) | | |
| ③ | NUT | 4 | SEE TABLE "1" | A194 2H | A194 2H | A194 2H | A194 2H | A194 2H | A194 8 | A194 2H | A194 8 | | |
| ② | BOLT | 2 | SEE TABLE "1" | A193 B7 | A193 B7 | A320 L7 | A193 B7 | A193 B7 | A193 B8 | A193 B7 | A320 B8 | | |
| ① | STRIP | 2 | FLAT BAR A x S | A36 | A387-11 | A516-60 | A36 | A36 | A387-11 | A36 | A240-304 | | |
| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH | | |
| MATCL | | | | | | | | | | | | | |

Support + Mark

CE01 DIAM MATCL

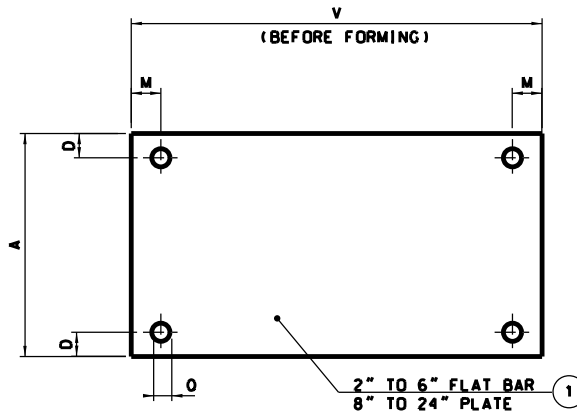
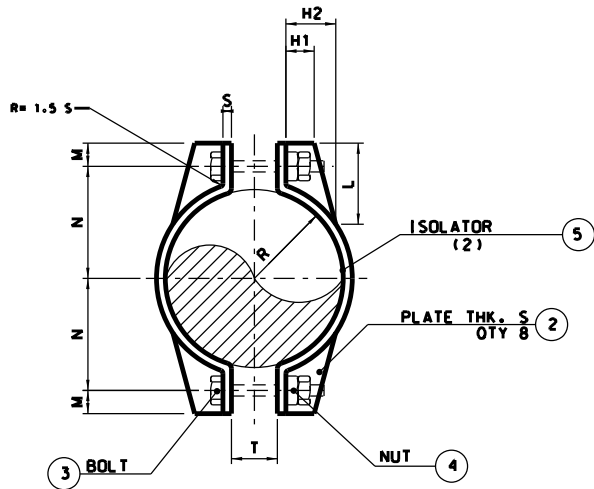
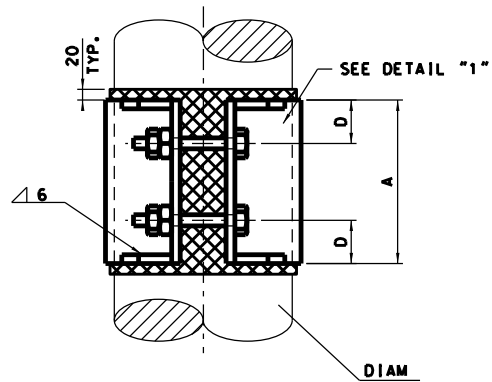
Technip

CLAMP FOR HORIZONTAL PIPE
FOR DIAM 2" TO 24"

CE01

STANDARD CONSTRUCTION DRAWING
PLANT DESIGN AND PIPING

XXXXXXXXXX 000 STC 1392-01 1 of 1 0
Project Unit Doc. Code & Serial No. Page Rev.



DTL "1"

TABLE "1"

| DIAM | BOLT | A | D | H1 | H2 | L | M | N | O | R WITHOUT ISOLATOR | R WITH ELASTOMERIC BAND | S | T | V (1) |
|------|--------|-----|----|----|-----|-----|----|-----|----|--------------------------|-------------------------------|----|----|----------|
| 2" | M12x50 | 200 | 40 | 5 | 15 | 60 | 25 | 60 | 14 | 30 | 32 | 5 | 12 | 205 |
| 3" | | 200 | 40 | 5 | 20 | 60 | 25 | 75 | 14 | 45 | 47 | 5 | 12 | 255 |
| 4" | | 200 | 40 | 10 | 35 | 60 | 25 | 85 | 14 | 57 | 59 | 5 | 12 | 290 |
| 6" | | 200 | 40 | 10 | 50 | 80 | 25 | 115 | 14 | 84 | 86 | 5 | 12 | 375 |
| 8" | M16x70 | 300 | 55 | 20 | 80 | 100 | 30 | 155 | 18 | 110 | 112 | 10 | 16 | 505 |
| 10" | | 300 | 55 | 35 | 95 | 100 | 30 | 185 | 18 | 137 | 139 | 10 | 16 | 590 |
| 12" | | 300 | 55 | 45 | 105 | 100 | 30 | 220 | 18 | 162 | 164 | 10 | 16 | 700 |
| 14" | | 300 | 60 | 55 | 115 | 100 | 30 | 235 | 18 | 178 | 180 | 10 | 16 | 750 |
| 16" | | 350 | 60 | 65 | 125 | 100 | 30 | 275 | 18 | 203 | 205 | 10 | 16 | 860 |
| 18" | | 350 | 60 | 75 | 135 | 100 | 30 | 300 | 18 | 229 | 231 | 10 | 16 | 910 |
| 20" | M20x80 | 400 | 70 | 85 | 150 | 120 | 35 | 330 | 22 | 254 | 256 | 10 | 20 | 1040 |
| 22" | | 400 | 70 | 85 | 155 | 120 | 35 | 355 | 22 | 280 | 282 | 10 | 20 | 1120 |
| 24" | | 400 | 70 | 95 | 165 | 120 | 35 | 380 | 22 | 305 | 307 | 10 | 20 | 1200 |

NOTES:

1. APPROXIMATE LENGTH FOR HALF CLAMP BEFORE FORMING.
2. A SHEET OF ELASTOMERIC ISOLATOR BAND Type "CORFLEX" SHALL BE INSERTED BETWEEN CLAMP AND PIPE.
LIMIT OF TEMPERATURE IS 210°C

Support Mark

CE02 DIAM MATCL

Technip

CLAMP FOR TRUNNIONS & CLIPS
FOR DIAM 2" TO 24"

CE02

STANDARD CONSTRUCTION DRAWING
PLANT DESIGN AND PIPING

XXXXXXXXXX 000 STC 1392-02 1 of 1 0
Project Unit Doc. Code & Serial No. Page Rev.

| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH |
|------|-------------|------|-------------------|---------|---------|----------|---------|---------|---------|---------|----------|
| 5 | ISOLATOR | 1 | (2) | / | (2) | NEOPRENE | (2) | / | (2) | (2) | |
| 4 | NUT | 8 | SEE TABLE "1" | A194 2H | A194 2H | A194 2H | A194 2H | A194 2H | A194 8 | A194 2H | A194 8 |
| 3 | BOLT | 4 | SEE TABLE "1" | A193 87 | A193 87 | A320 L7 | A193 87 | A193 87 | A193 88 | A193 87 | A320 88 |
| 2 | STIFFENER | 8 | PLATE THK. S | A36 | A387-11 | A516-60 | A36 | A36 | A387-11 | A36 | A240-304 |
| 1 | STRIP | 2 | FLAT BAR OR PLATE | A36 | A387-11 | A516-60 | A36 | A36 | A387-11 | A36 | A240-304 |

| | | | | |
|--|------|--|------|---------------------------------|
| Support Mark | | | | |
| CE03 | DIAM | MATCL | | |
| <i>Technip</i> | | CLAMP FOR DUMMY LEGS FOR DIAM 2" TO 24" | | CE03 |
| STANDARD CONSTRUCTION DRAWING PLANT DESIGN AND PIPING | | XXXXXXXXXXXX | 000 | STC 1392-03 1 of 1 0 |
| | | Project | Unit | Doc. Code & Serial No. Page Rev |

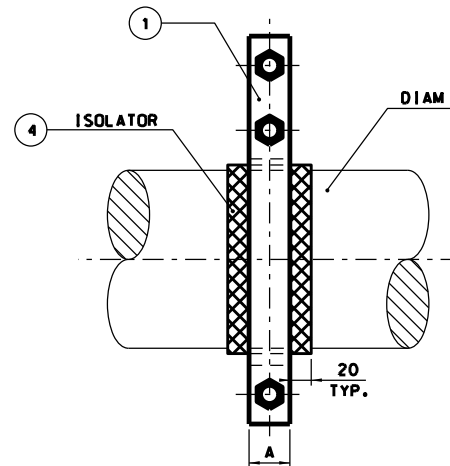
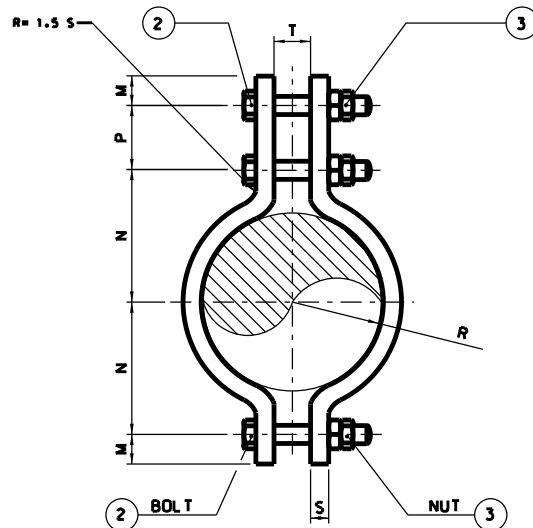
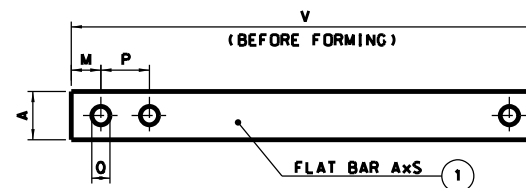


TABLE "1"

| DIAM | BOLT | A | M | N | P | Q | R | S | T | V (1) |
|------|--------|----|----|-----|----|----|-----|----|----|----------|
| 2" | M12x50 | 50 | 25 | 60 | 70 | 14 | 30 | 5 | 12 | 275 |
| 3" | | 50 | 25 | 75 | 70 | 14 | 45 | 5 | 12 | 325 |
| 4" | | 50 | 25 | 85 | 70 | 14 | 57 | 5 | 12 | 365 |
| 6" | | 50 | 25 | 115 | 70 | 14 | 84 | 5 | 12 | 445 |
| 8" | M16x70 | 60 | 30 | 155 | 70 | 18 | 110 | 10 | 16 | 575 |
| 10" | | 60 | 30 | 185 | 80 | 18 | 137 | 10 | 16 | 670 |
| 12" | | 60 | 30 | 220 | 80 | 18 | 162 | 10 | 16 | 780 |
| 14" | | 60 | 30 | 235 | 80 | 18 | 178 | 10 | 16 | 830 |
| 16" | | 60 | 30 | 275 | 80 | 18 | 203 | 10 | 16 | 940 |
| 18" | | 60 | 30 | 300 | 80 | 18 | 229 | 10 | 16 | 1020 |
| 20" | M20x80 | 70 | 35 | 330 | 90 | 22 | 254 | 10 | 20 | 1130 |
| 22" | | 70 | 35 | 355 | 90 | 22 | 280 | 10 | 20 | 1210 |
| 24" | | 70 | 35 | 380 | 90 | 22 | 305 | 10 | 20 | 1290 |



DTL "1"

NOTES:

1. APPROXIMATE LENGTH FOR HALF CLAMP BEFORE FORMING.
2. A SHEET OF ELASTOMERIC ISOLATOR BAND Type "CORFLEX" SHALL BE INSERTED BETWEEN CS CLAMP AND SS PIPE. LIMIT OF TEMPERATURE IS 210°C
3. DELETED
4. SUPPLY BY VENDOR.

Support Mark

CE05 DIAM MATCL

| | | | | | | | | | | | | | |
|------|-------------|------|----------------|---------|---------|---------|----------|---------|---------|---------|----------|--|--|
| ④ | ISOLATOR | 1 | | (2) | / | (2) | NEOPRENE | (2) | / | (2) | / | | |
| ③ | NUT | 6 | SEE TABLE "1" | A194 2H | A194 2H | A194 2H | A194 2H | A194 2H | A194 8 | A194 2H | A194 8 | | |
| ② | BOLT | 3 | SEE TABLE "1" | A193 87 | A193 87 | A320 L7 | A193 87 | A193 87 | A193 88 | A193 87 | A320 88 | | |
| ① | STRIP | 2 | FLAT BAR A x S | A36 | A387-11 | A516-60 | A36 | A36 | A387-11 | A36 | A240-304 | | |
| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG (3) | AS | AH | SS (2) | SH | | |

MATCL

Technip

CLAMP ON HORIZONTAL PIPE
FOR DIAM 2" TO 24"

CE05

STANDARD CONSTRUCTION DRAWING
PLANT DESIGN AND PIPING

XXXXXXXXXXXX 000 STC 1392-05 1 of 1 0
Project Unit Doc. Code & Serial No. Page Rev.

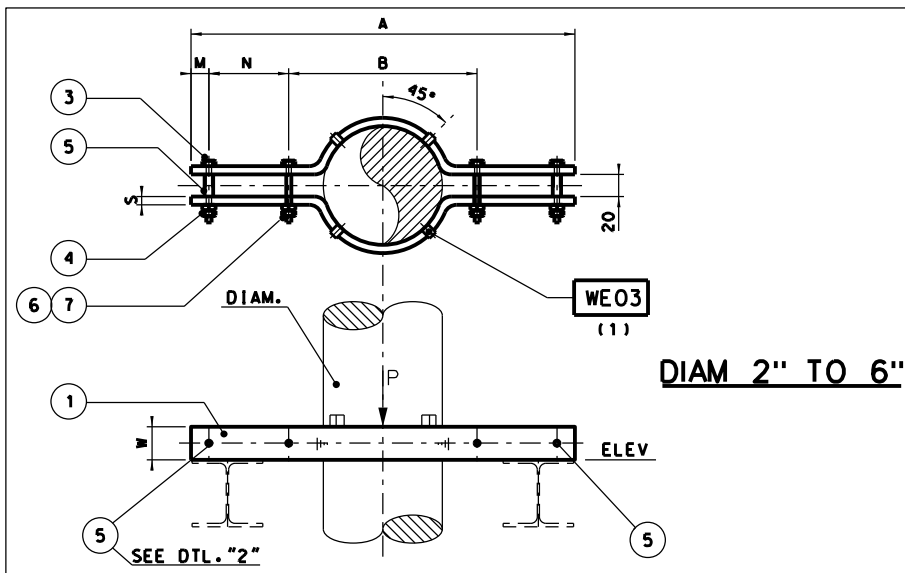
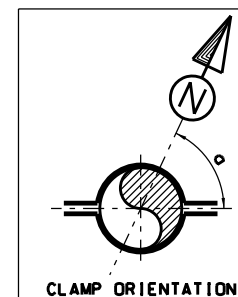
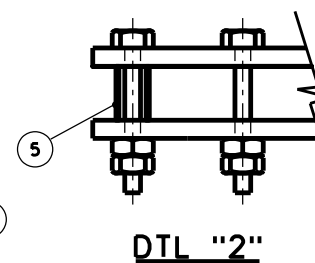
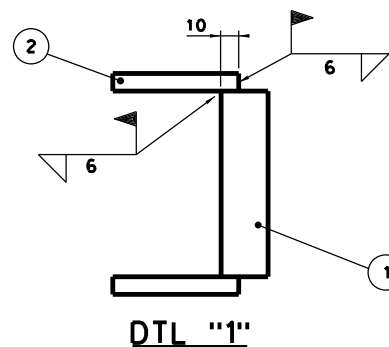
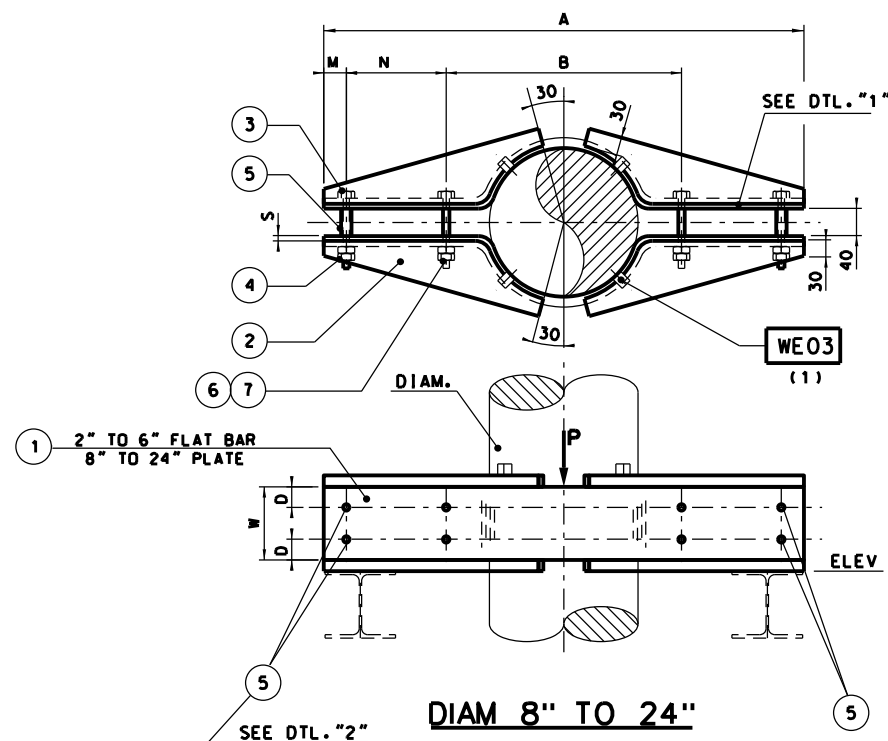


TABLE "1"

| DIAM | BOLT1 | BOLT2 | A | B | D | M | N | S | W |
|------|---------|---------|------|-----|----|----|-----|----|-----|
| 2" | M12x80 | M12x80 | 380 | 150 | - | 40 | 75 | 10 | 70 |
| 3" | M12x80 | M12x80 | 415 | 185 | - | 40 | 75 | 10 | 70 |
| 4" | M12x80 | M12x80 | 440 | 210 | - | 40 | 75 | 10 | 100 |
| 6" | M20x100 | M16x100 | 520 | 290 | - | 40 | 75 | 15 | 100 |
| 8" | M24x130 | M16x130 | 970 | 460 | 35 | 50 | 205 | 20 | 130 |
| 10" | M24x130 | M16x130 | 1120 | 510 | 35 | 50 | 255 | 20 | 160 |
| 12" | M30x150 | M20x150 | 1120 | 550 | 45 | 50 | 230 | 25 | 160 |
| 14" | M40x150 | M24x150 | 1120 | 610 | 45 | 50 | 205 | 25 | 160 |
| 16" | M40x160 | M24x160 | 1270 | 660 | 55 | 50 | 255 | 25 | 200 |
| 18" | M40x180 | M24x180 | 1270 | 710 | 55 | 50 | 230 | 35 | 200 |
| 20" | M40x180 | M24x180 | 1420 | 760 | 65 | 50 | 280 | 35 | 220 |
| 22" | M40x180 | M24x180 | 1420 | 810 | 65 | 50 | 255 | 35 | 220 |
| 24" | M40x180 | M24x180 | 1420 | 864 | 65 | 50 | 228 | 35 | 250 |

| | | | | | | | | | | | | | |
|-------|-------------|------|----------------------|---------|---------|---------|----|---------|---------|----------|----------|--|--|
| ⑦ | NUT2 | 4/8 | SEE TABLE "1" | A194 2H | A194 2H | A194 2H | / | A194 2H | A194 8 | A194 2H | A194 8 | | |
| ⑥ | BOLT2 | 2/4 | SEE TABLE "1" | A193 87 | A193 87 | A320 L7 | / | A193 87 | A193 88 | A193 87 | A320 88 | | |
| ⑤ | SEPARATOR | 2/4 | PIPE 1 1/2" SCH. STD | A53-B | A53-B | A53-B | / | A53-B | A53-B | A53-B | A53-B | | |
| ④ | NUT1 | 4/8 | SEE TABLE "1" | A194 2H | A194 2H | A194 2H | / | A194 2H | A194 2H | A194 2H | A194 2H | | |
| ③ | BOLT1 | 2/4 | SEE TABLE "1" | A193 87 | A193 87 | A193 87 | / | A193 87 | A193 87 | A193 87 | A193 87 | | |
| ② | STIFFENER | 4 | PLATE THK. 10 | A36 | A387-11 | A516-60 | / | A36 | A387-11 | A240-304 | A240-304 | | |
| ① | STRIP | 2 | FLAT BAR OR PLATE | A36 | A387-11 | A516-60 | / | A36 | A387-11 | A240-304 | A240-304 | | |
| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH | | |
| MATCL | | | | | | | | | | | | | |



NOTES:

1. SHEAR LUG BEARING MUST BE INDICATED ON ISOMETRIC

Support Mark

CE06 DIAM MATCL

Positional Mark

ELEV a

TechnipTIE RISER CLAMP ON VERTICAL PIPE
FOR DIAM 2" TO 24"

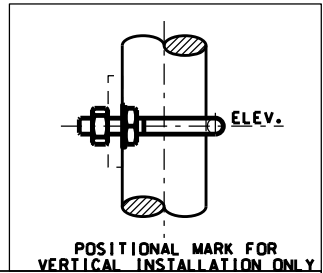
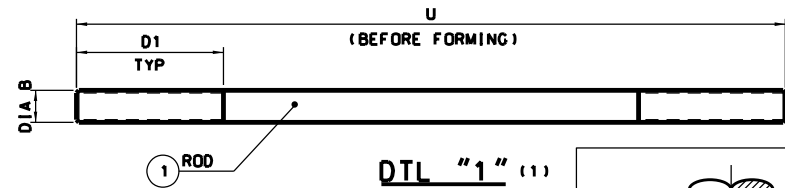
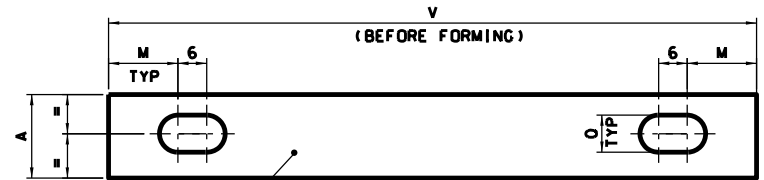
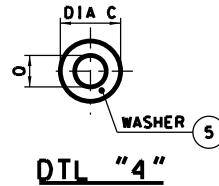
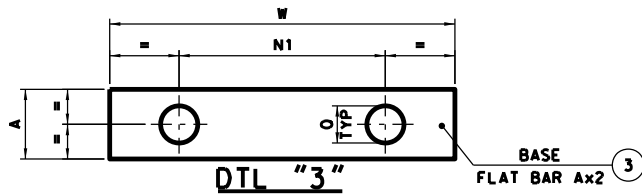
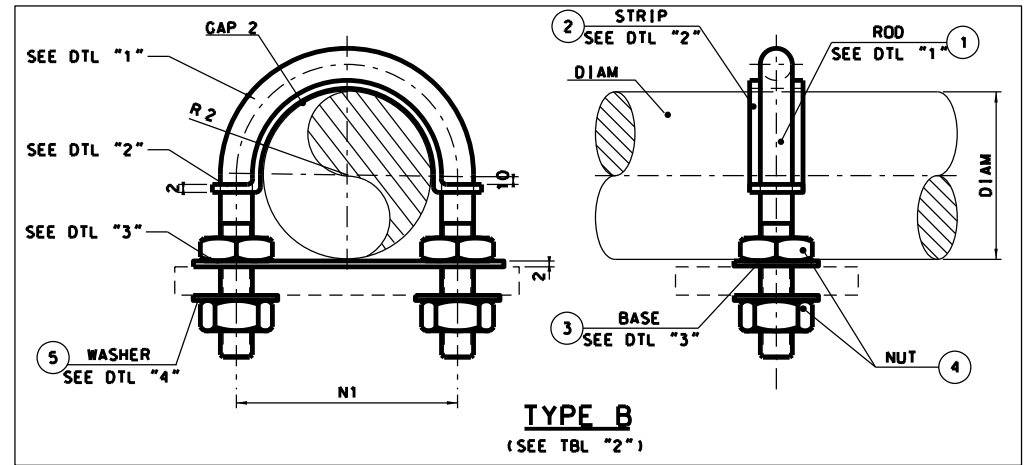
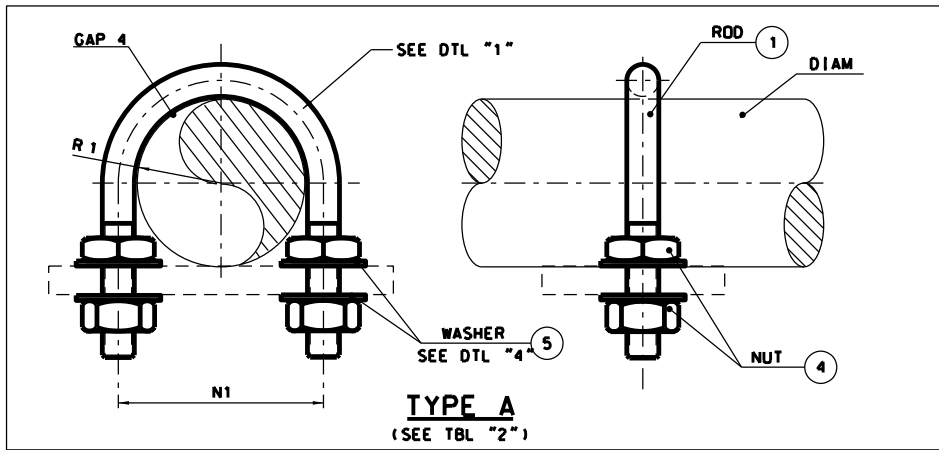
CE06

STANDARD CONSTRUCTION DRAWING
PLANT DESIGN AND PIPING

XXXXXXXXXXXX 000 STC 1392-06 1 of 1 0

Project Unit Doc. Code & Serial No. Page Rev.

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| TABLE "1" FOR TYPE A - B | | | | | | | | | | | | | |
|--------------------------|----|-----|-------|-------|----|-----|-----|----|-----|-----|------|------|-----|
| DIAM | A | D1 | DIA B | DIA C | M | N1 | NUT | O | R1 | R2 | U | V | W |
| 2" | 50 | 70 | 12 | 24 | 20 | 80 | M12 | 14 | 32 | 34 | 280 | 195 | 120 |
| 3" | 50 | 70 | 12 | | 20 | 110 | M12 | 14 | 47 | 49 | 347 | 242 | 150 |
| 4" | 50 | 70 | 12 | | 20 | 134 | M12 | 14 | 59 | 61 | 404 | 280 | 175 |
| 6" | 50 | 70 | 12 | | 20 | 188 | M12 | 14 | 86 | 88 | 549 | 365 | 230 |
| 8" | 60 | 80 | 16 | 30 | 30 | 244 | M16 | 18 | 112 | 114 | 697 | 469 | 305 |
| 10" | 60 | 80 | 16 | | 30 | 298 | M16 | 18 | 139 | 141 | 842 | 553 | 360 |
| 12" | 60 | 80 | 16 | | 30 | 348 | M16 | 18 | 164 | 166 | 980 | 632 | 410 |
| 14" | 70 | 90 | 20 | 37 | 30 | 384 | M20 | 22 | 180 | 182 | 1077 | 684 | 450 |
| 16" | 70 | 90 | 20 | | 30 | 434 | M20 | 22 | 205 | 207 | 1195 | 763 | 495 |
| 18" | 70 | 90 | 20 | | 30 | 486 | M20 | 22 | 231 | 233 | 1337 | 844 | 545 |
| 20" | 80 | 110 | 24 | 44 | 35 | 540 | M24 | 26 | 256 | 258 | 1502 | 935 | 610 |
| 22" | 80 | 110 | 24 | | 35 | 590 | M24 | 26 | 281 | 283 | 1620 | 1013 | 660 |
| 24" | 80 | 110 | 24 | | 35 | 642 | M24 | 26 | 307 | 309 | 1762 | 1095 | 710 |

| TBL "2" | |
|------------|------|
| MATCL | TYPE |
| CS, CH, CL | A |
| AS, AH | A |
| SS, SH, CG | B |

NOTES:

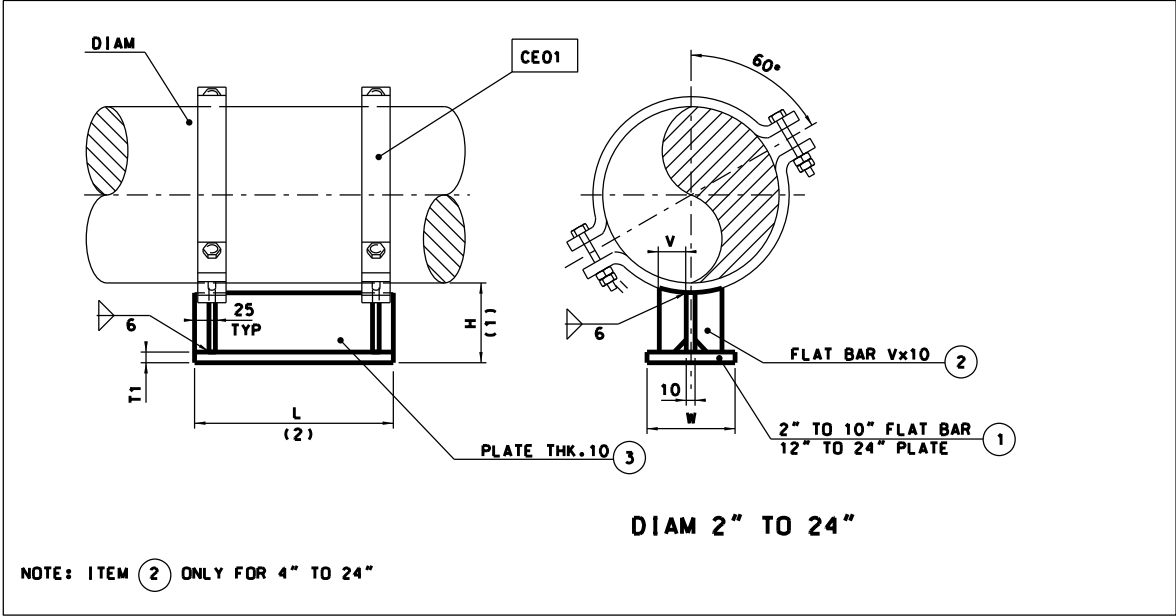
1. U-BOLT DIMENSIONS ARE ONLY FOR REFERENCE.
DIMENSIONS MAY BE ALSO DEFINED ACCORDING TO MANUFACTURER CATALOGS.

| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH |
|------|-------------|------|---------------|---------|---------|---------|---------|---------|---------|----------|----------|
| 5 | WASHER | 2/4 | DIA C | A36 | A36 | A36 | / | A36 | A36 | / | / |
| 4 | NUT | 4 | SEE TABLE "1" | A194 2H | A194 2H | A194 2H | A194 2H | A194 2H | A194 8 | A194 2H | A194 8 |
| 3 | BASE | 1 | FLAT BAR Ax2 | / | / | / | A36 (C) | / | / | A240-304 | A240-304 |
| 2 | STRIP | 1 | FLAT BAR Ax2 | / | / | / | A36 (C) | / | / | A240-304 | A240-304 |
| 1 | U-BOLT | 1 | ROD DIA B | A193 B7 | A193 B7 | A320 L7 | A193 B7 | A193 B7 | A193 B8 | A193 B7 | A320 B8 |

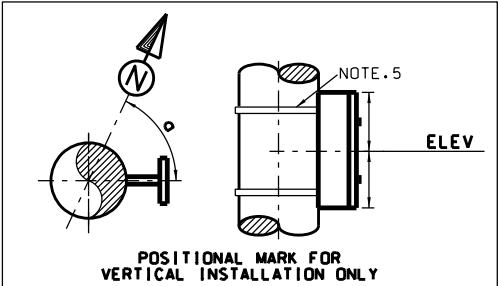
| Support Mark | | | | Positional Mark | | | |
|--|------|------|-------|---------------------------------------|--|--|------|
| CG01 | DIAM | TYPE | MATCL | ELEV | | | |
| Technip | | | | NO GRIPPED U-BOLT FOR DIAM 2" TO 24" | | | CG01 |
| STANDARD CONSTRUCTION DRAWING PLANT DESIGN AND PIPING | | | | XXXXXXXXXXXX 000 STC1392-09 1 of 1 0 | | | |
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| TABLE "1" | | | |
|------------|----|-----|-----|
| DIAM | T1 | W | V |
| 2" TO 3" | 10 | 100 | - |
| 4" | 10 | 100 | 40 |
| 6" | 10 | 150 | 60 |
| 8" TO 10" | 10 | 200 | 80 |
| 12" TO 14" | 10 | 250 | 100 |
| 16" TO 18" | 15 | 350 | 150 |
| 20" TO 24" | 15 | 450 | 200 |



NOTES:

1. H MAX = 200. H DIMENSION MUST BE CHECKED AFTER CLAMP WELDING.
2. L = 300 TO 900. WITH STEP 100
3. DELETED
4. MAXI OPERATING 210° C.
5. FOR VERTICAL LINE WE03 Type A . SHALL BE USED

| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS(4) | SH |
|------|-------------|------|----------------|-----|---------|----|-----|-----|---------|-------|----------|
| 3 | STANCHION | 1 | PLATE THK. 10 | A36 | A387-11 | / | A36 | A36 | A387-11 | A36 | A240-304 |
| 2 | RIB | 4 | FLAT BAR Vx10 | A36 | A387-11 | / | A36 | A36 | A387-11 | A36 | A240-304 |
| 1 | BASE PLATE | 1 | FLAT BAR/PLATE | A36 | A36 | / | A36 | A36 | A36 | A36 | A36 |

Support Mark

CR01

DIAM

H

L

MATCL

Positional Mark

ELEV

a

Technip

VARIABLE HEIGHT SHOES
FOR DIAM 2" TO 24"

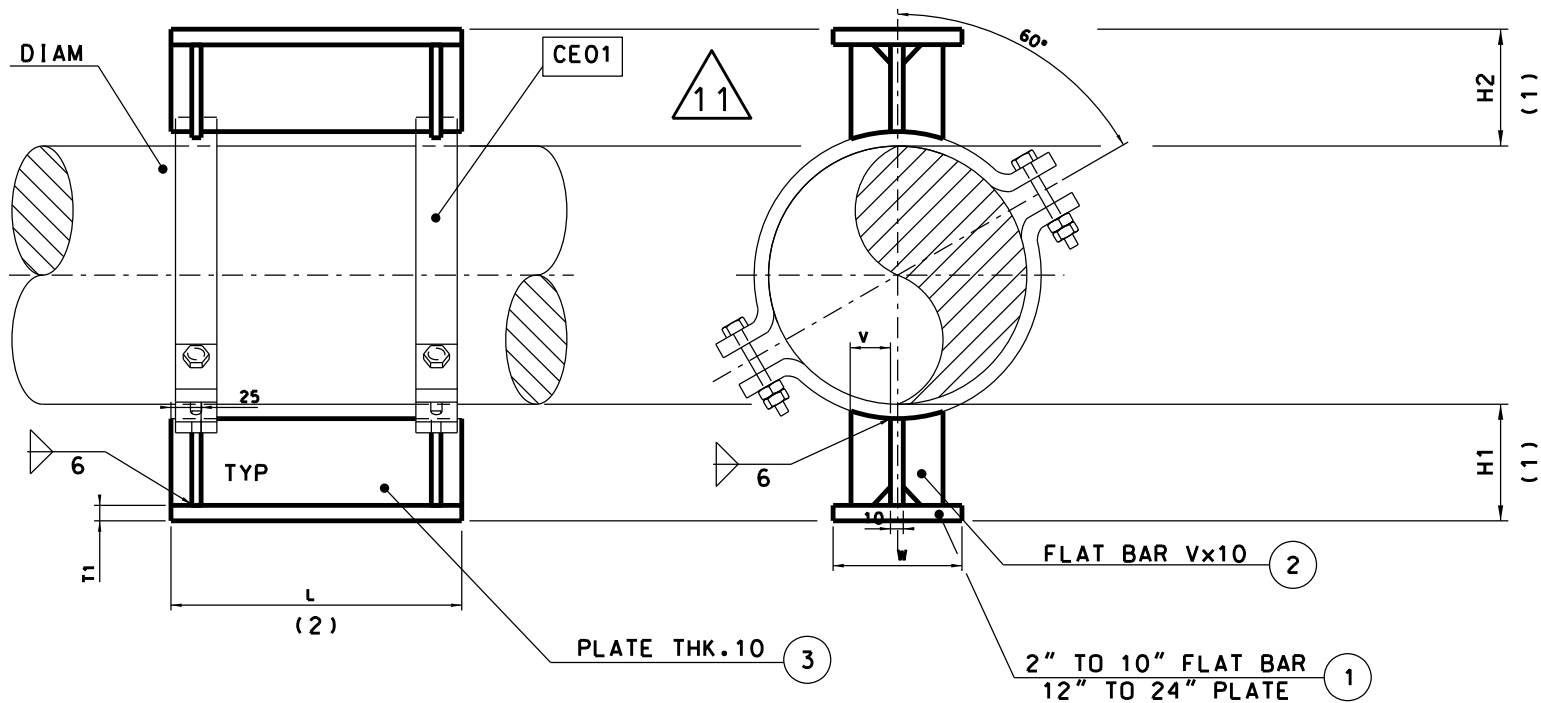
CR01

STANDARD CONSTRUCTION DRAWING
PLANT DESIGN AND PIPING

XXXXXXXXXXXX 000 STC 1392-10 1 of 1 0

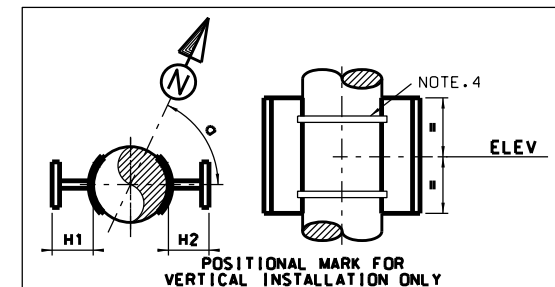
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DIAM 2" TO 24"

| TABLE "1" | | | |
|------------|----|-----|-----|
| DIAM | T1 | W | V |
| 2" TO 3" | 10 | 100 | - |
| 4" | 10 | 100 | 40 |
| 6" | 10 | 150 | 60 |
| 8" TO 10" | 10 | 200 | 80 |
| 12" TO 14" | 10 | 250 | 100 |
| 16" TO 18" | 15 | 350 | 150 |
| 20" TO 24" | 15 | 450 | 200 |



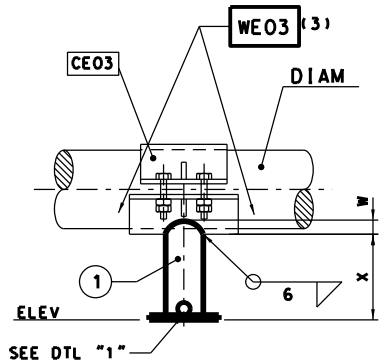
NOTES:

1. H1 AND H2 MAX = 200. H DIMENSION MUST BE CHECKED AFTER CLAMP WELDING.
2. L = 300 TO 900. WITH STEP 100
3. DELETED
4. FOR VERTICAL LINE WE03 Type A . SHALL BF USED

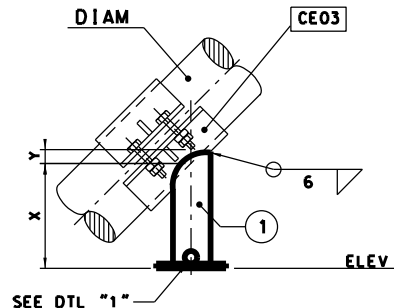
| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH |
|------|-------------|------|-------------------|-----|---------|---------|-----|-----|---------|-----|----------|
| 3 | STANCHION | 2 | PLATE THK. 10 | A36 | A387-11 | A516-60 | A36 | A36 | A387-11 | A36 | A240-304 |
| 2 | RIB | 8 | FLAT BAR Vx10 | A36 | A387-11 | A516-60 | A36 | A36 | A387-11 | A36 | A240-304 |
| 1 | BASE PLATE | 2 | FLAT BAR OR PLATE | A36 | A36 | A36 | A36 | A36 | A36 | A36 | A36 |

| Support Mark | | | | Positional Mark | | | |
|--|------|----|----|--|-------|------|---|
| CR03 | DIAM | H1 | H2 | L | MATCL | ELEV | a |
| Technip | | | | DOUBLE VARIABLE HEIGHT SHOES FOR DIAM 2" TO 24" | | | |
| STANDARD CONSTRUCTION DRAWING PLANT DESIGN AND PIPING | | | | XXXXXXX 000 STC 1392-12 1 of 1 0 | | | |
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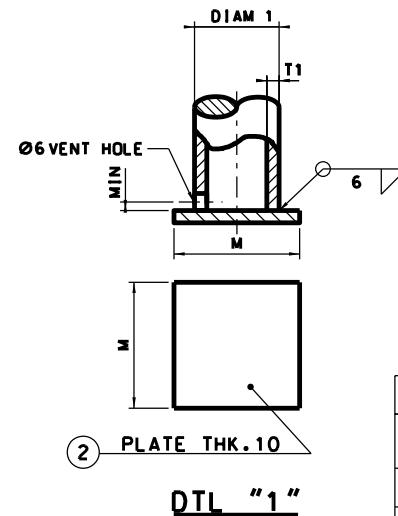
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TYPE A
DIAM 2" TO 24"



TYPE B
DIAM 2" TO 24"



| TBL "2" | |
|----------------|-----|
| MATCL | T1 |
| CG, CS, CH, CL | STD |
| AS, AH, SS | STD |
| SH | 40S |

| TBL "1" | | | | | |
|---------|--------|----|-----|-----|-----|
| DIAM | DIAM 1 | W | Y | Z | M |
| 2" | 1 1/2" | 12 | 48 | 71 | 100 |
| 3" | 2" | 12 | 60 | 93 | 100 |
| 4" | 3" | 21 | 89 | 137 | 150 |
| 6" | 4" | 22 | 114 | 186 | 150 |
| 8" | 6" | 39 | 168 | 272 | 210 |
| 10" | 6" | 29 | 168 | 291 | 210 |
| 12" | 8" | 43 | 219 | 370 | 250 |
| 14" | 10" | 60 | 273 | 472 | 300 |
| 16" | 12" | 80 | 324 | 557 | 350 |
| 18" | 14" | 80 | 356 | 614 | 400 |
| 20" | 16" | 96 | 467 | 699 | 450 |
| 22" | 16" | 84 | 407 | 712 | 450 |
| 24" | 16 | 75 | 407 | 732 | 450 |

NOTES:

1. X DIMENSION FROM 200 TO 800 ADJUSTED AT ERECTION.
2. DELETED
3. WE03 MUST BE USED FOR STOP AND ANCHOR AND INDICATED ON ISOMETRIC

Support Mark

Positional Mark

CR05 DIAM DIAM1 TYPE X MATCL ELEV

Technip

VERTICAL DUMMY LEG
FOR DIAM 2" TO 24"

CR05

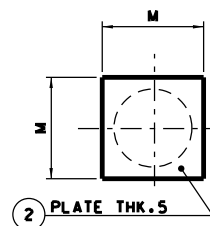
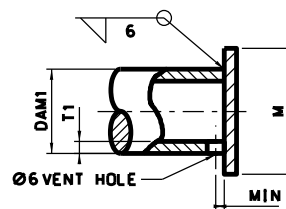
STANDARD CONSTRUCTION DRAWING
PLANT DESIGN AND PIPING

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Project Unit Doc. Code & Serial No. Page Rev.

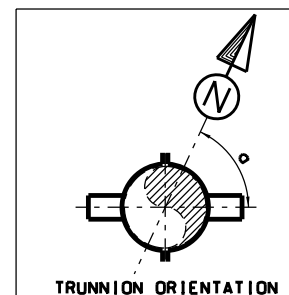
| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH |
|------|-------------|------|-------------------|-----------|-----------|--------|-----------|-----------|----------|-----------|------------|
| 2 | BASE | 1 | PLATE THK.10 | A36 | A36 | A36 | A36 | A36 | A36 | A36 | A36 |
| 1 | DUMMY | 1 | PIPE DIAM1 SCH T1 | A106 Gr B | A106 Gr B | A333-6 | A106 Gr B | A106 Gr B | A335-P11 | A106 Gr B | A312-Tp304 |



| TBL "2" | |
|-------------|-----|
| MATCL | T1 |
| CG,CS,CH,CL | STD |
| AS, AH, SS | STD |
| SH | 40S |



DTL "1"



1. X DIMENSION SHALL BE FROM 200 TO 800
ADJUSTED AT ERECTION IF NECESSARY.
2. DELETED.
3. DO NOT USE WE03 ON GALVANIZED CARBON STEEL

[illegible]

Support + Mark

Positional Mark

| CR07 | DIAM | DIAM1 | TYPE | X | MATCL | ELEV | a |
|------|------|-------|------|---|-------|------|---|
|------|------|-------|------|---|-------|------|---|

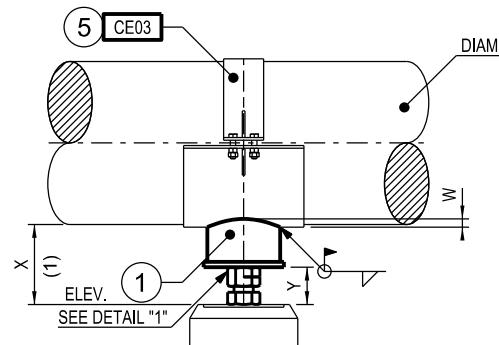
Technip

TRUNNION
FOR DIAM 2" TO 24"

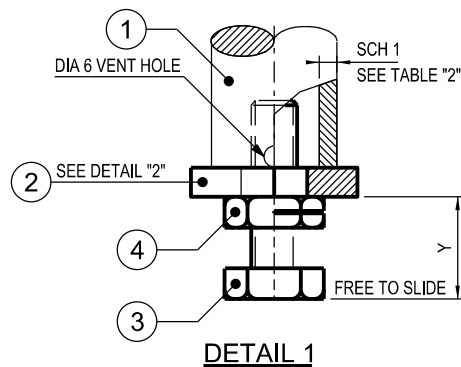
CR07

STANDARD CONSTRUCTION DRAWING
PLANT DESIGN AND PIPING

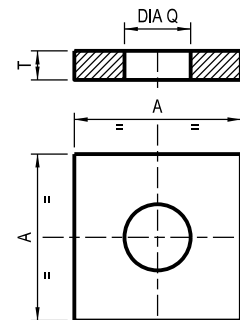
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| XXXXXXX | 000 | STC 1392-16 | 1 of 1 | 0 |
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TYPE A
ND 50 TO 600 / DIAM 2" TO 24"



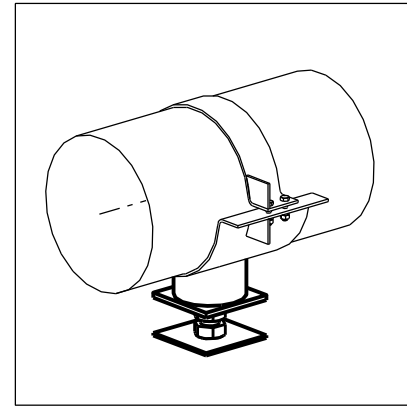
DETAIL 1



DETAIL 2

| TABLE 1 | | | | | | | | | | |
|---------|------|-------|--------|---------|-----|-----|----------|----|----|---|
| DIAM | | DIAM1 | | SCREW | Y | A | DJA Q | T | W | Z |
| ND | Inch | ND | Inch | | | | | | | |
| 50 | 2" | 40 | 1 1/2" | M33x170 | 80 | 80 | 40 | 10 | 12 | |
| 80 | 3" | 50 | 2" | M36x170 | 90 | 80 | 40 | 10 | 12 | |
| 100 | 4" | 80 | 3" | M36x170 | 90 | 110 | 50 | 10 | 21 | |
| 150 | 6" | 100 | 4" | M36x170 | 90 | 110 | 50 | 10 | 22 | |
| 200 | 8" | 150 | 6" | M48x170 | 100 | 200 | 60 | 15 | 39 | |
| 250 | 10" | 150 | 6" | M48x170 | 100 | 200 | 60 | 15 | 29 | |
| 300 | 12" | 200 | 8" | M48x170 | 100 | 250 | 60 | 15 | 43 | |
| 350 | 14" | 250 | 10" | M48x170 | 100 | 250 | 60 | 15 | 60 | |
| 400 | 16" | 300 | 12" | M72x170 | 140 | 300 | 80 | 20 | 80 | |
| 450 | 18" | 350 | 14" | M72x170 | 140 | 300 | 80 | 20 | 80 | |
| 500 | 20" | 400 | 16" | M72x170 | 140 | 300 | 80 | 20 | 96 | |
| 550 | 22" | 400 | 16" | M72x170 | 140 | 300 | 80 | 20 | 84 | |
| 600 | 24" | 400 | 16" | M72x170 | 140 | 300 | 80 | 20 | 75 | |

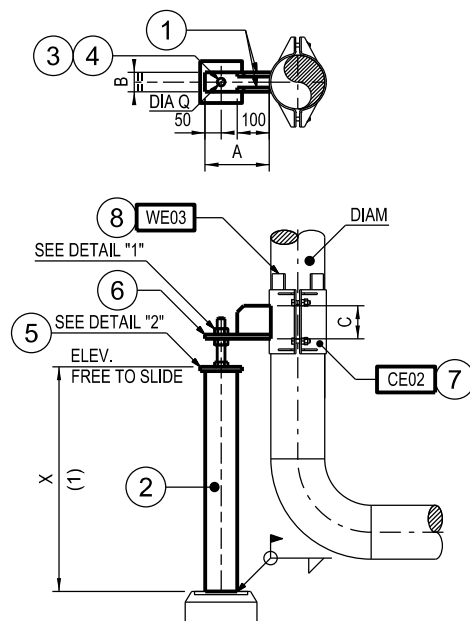
| TABLE 2 | |
|-------------|-------|
| MATCL | SCH.1 |
| CG-CS-CH-CL | STD |
| AH-AS-SS | STD |
| SH | 40S |



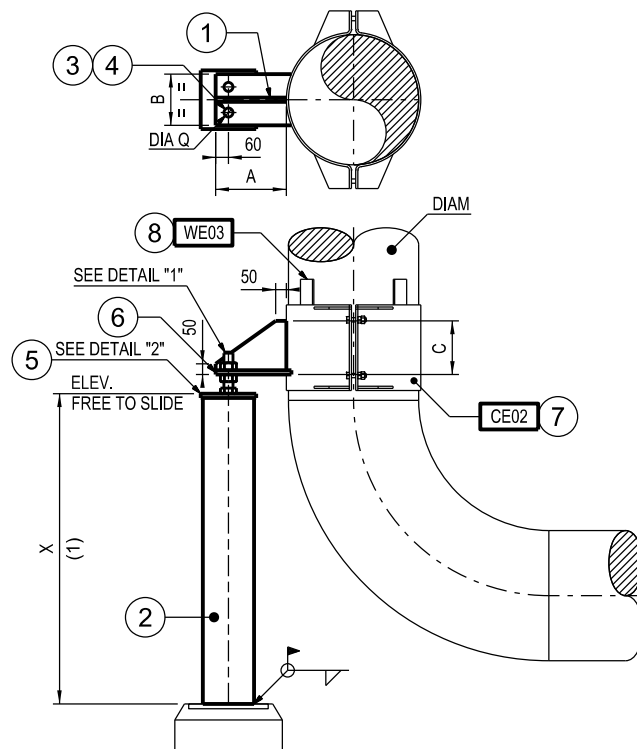
NOTES:
1. X = 300 TO 500 TO BE ADJUSTED AT ERECTION.
2. LIMIT OF TEMPERATURE IS 300°C REFER TO CE03.

| | | | | | | | | | | | | | |
|------|-------------|------|-------------------|-----------|-----------|-----------|-----------|-----------|----------|-----------|----------|--|--|
| 6 | | | | | | | | | | | | | |
| 5 | CLAMP | 1 | REFER TO CE03 (2) | / | / | / | / | / | / | / | / | | |
| 4 | LOCK NUT | 1 | SEE TABLE 1 | A194-2H | A194-2H | A194-2H | A194-2H | A194-2H | A194-2H | A194-2H | A194-2H | | |
| 3 | SCREW | 1 | SEE TABLE 1 | A193-B7 | A193-B7 | A193-B7 | A193-B7 | A193-B7 | A193-B7 | A193-B7 | A193-B7 | | |
| 2 | BASE | 1 | PLATE Thk, T | A36 | A36 | A36 | A36 | A36 | A36 | A36 | A36 | | |
| 1 | STANCHION | 1 | DIAM 1 SCH.1 | A106 Gr B | A106 Gr B | A106 Gr B | A106 Gr B | A106 Gr B | A335-P11 | A106 Gr B | A312-304 | | |
| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH | | |

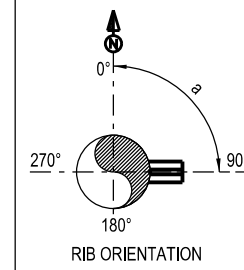
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|---|--|--|--|--|---|-----|-----------------|--------|---|
| Support Mark | | | | | Positional Mark | | | | |
| CR09 | | | | | ELEV | | | | |
| Technip | | | | | ADJUSTABLE STANCHION FOR DIAM 2" TO 24" | | | | |
| STANDARD CONSTRUCTION DRAWING PLANT DESIGN AND PIPING | | | | | XXXXXX | 000 | STC - 1392 - 18 | 1 of 1 | 1 |
| Project | | | | | Unit | | | | |
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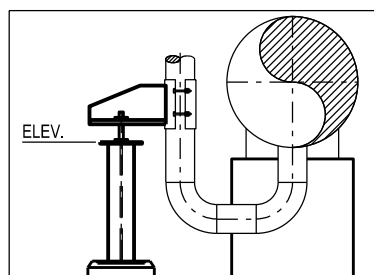
ND 50 TO 150 / DIAM 2" TO 6"



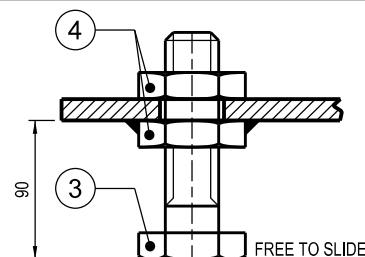
ND 200 TO 600 / DIAM 8" TO 24"



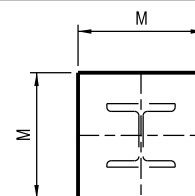
| TABLE | | | | | | | | | |
|-------|------|-------|-----|-----|-----|-------|-------|---------|------|
| DIAM | LEG | A | B | C | M | DIA Q | SCREW | X | MAXI |
| ND | Inch | | | | | | | | |
| 50 | 2" | MB100 | 200 | 60 | 100 | 130 | 26 | M24x170 | 1000 |
| 80 | 3" | MB100 | 200 | 60 | 100 | 130 | 26 | M24x170 | 1000 |
| 100 | 4" | MB100 | 200 | 60 | 100 | 130 | 26 | M24x170 | 1000 |
| 150 | 6" | MB100 | 200 | 60 | 100 | 130 | 26 | M24x170 | 1000 |
| 200 | 8" | MB150 | 290 | 160 | 150 | 180 | 32 | M30x170 | 1250 |
| 250 | 10" | MB150 | 290 | 160 | 150 | 180 | 32 | M30x170 | 1250 |
| 300 | 12" | MB150 | 290 | 160 | 150 | 180 | 32 | M30x170 | 1250 |
| 350 | 14" | MB200 | 310 | 200 | 200 | 220 | 38 | M36x170 | 1500 |
| 400 | 16" | MB200 | 310 | 200 | 200 | 220 | 38 | M36x170 | 1500 |
| 450 | 18" | MB200 | 310 | 200 | 200 | 220 | 38 | M36x170 | 1500 |
| 500 | 20" | MB250 | 330 | 240 | 250 | 260 | 44 | M42x170 | 1750 |
| 550 | 22" | MB250 | 330 | 240 | 250 | 260 | 44 | M42x170 | 1750 |
| 600 | 24" | MB250 | 330 | 240 | 250 | 260 | 44 | M42x170 | 1750 |



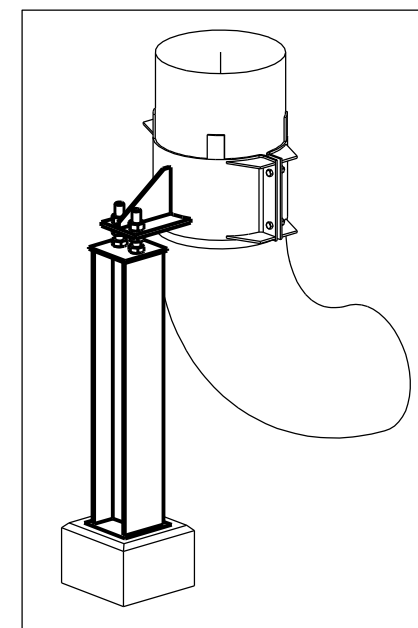
TYPICAL ASSEMBLY



DETAIL 1



DETAIL 2



NOTES:
1. X = MAXI SEE TABLE BY STEPS OF 100 TO BE ADJUSTED AT ERECTION IF NECESSARY.
2. LIMIT OF TEMPERATURE IS 300°C REFER TO CE02.

| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH |
|------|--------------|------|-------------------|---------|---------|---------|---------|---------|---------|---------|----------|
| 8 | ANTI SLIDING | 1 | REFER TO WE03 | / | / | / | / | / | / | / | / |
| 7 | CLAMP | 1 | REFER TO CE02 (2) | / | / | / | / | / | / | / | / |
| 6 | PLATE | 1 | PLATE Thk. 10 | A36 | A516-60 | A516-60 | A36 | A36 | A387-11 | A36 | A240-304 |
| 5 | BASE | 1 | PLATE Thk. 10 | A36 | A36 | A36 | A36 | A36 | A36 | A36 | A36 |
| 4 | NUT | 2/4 | SERIAL H | A194-2H | A194-2H | A194-2H | A194-2H | A194-2H | A194-2H | A194-2H | A194-2H |
| 3 | SCREW | 1/2 | SEE TABLE | A193-B7 | A193-B7 | A193-B7 | A193-B7 | A193-B7 | A193-B7 | A193-B7 | A193-B7 |
| 2 | LEG | 1 | SEE TABLE | A36 | A36 | A36 | A36 | A36 | A36 | A36 | A36 |
| 1 | RIB | 1/2 | PLATE C x 10 | A36 | A516-60 | A516-60 | A36 | A36 | A387-11 | A36 | A240-304 |

Support Mark

CR10 DIAM X MATCL

Positional Mark

ELEV a

Technip

CLAMPED ADJUSTABLE LEG
FOR DIAM 2" TO 24"

CR10

STANDARD CONSTRUCTION DRAWING
PLANT DESIGN AND PIPING

XXXXXX

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1

Project

Unit

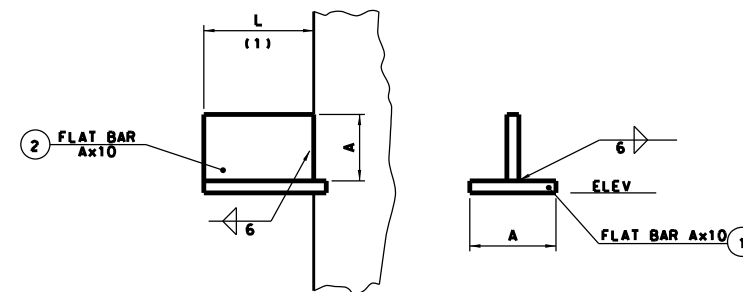
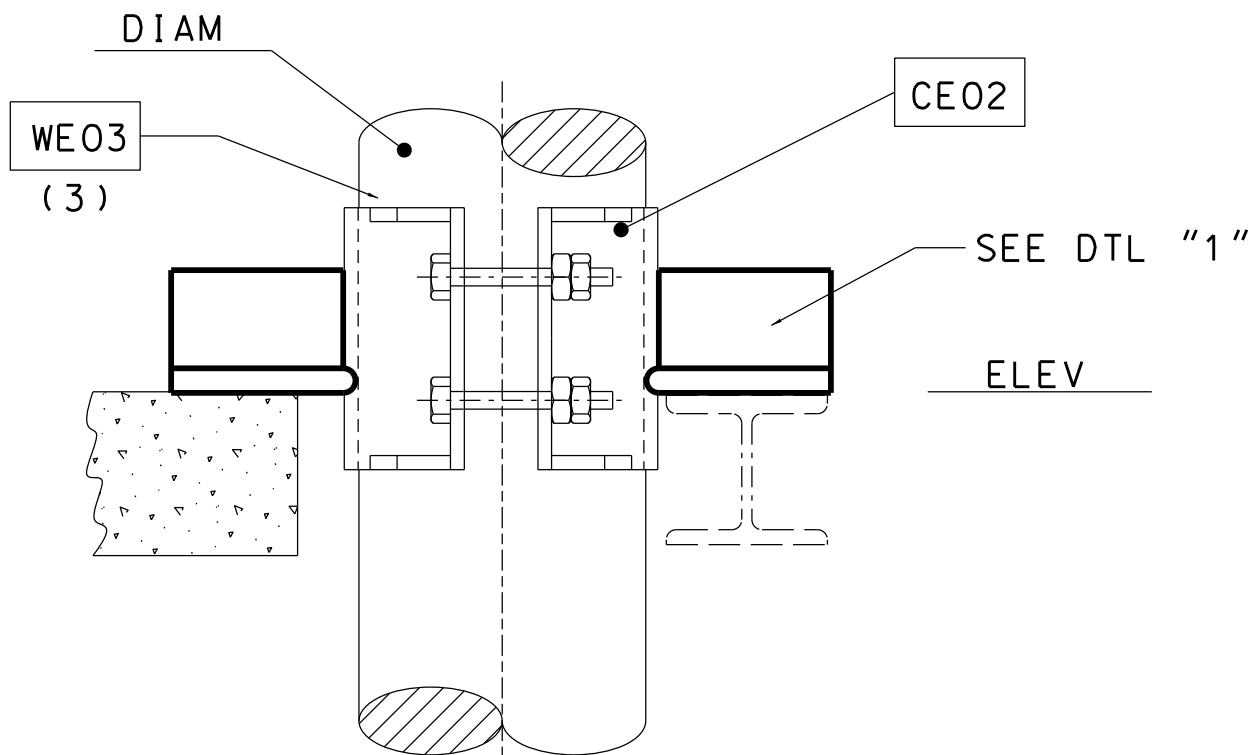
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DTL "1"

DIAM 2" TO 24"

TABLE "1"

| DIAM | Ax10 |
|------------|--------|
| 2" TO 6" | 50x10 |
| 8" TO 18" | 100x10 |
| 20" TO 24" | 150x10 |

| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH |
|------|-------------|------|-----------------|-----|---------|---------|-----|-----|---------|-----|----------|
| 2 | STIFFENER | 2 | FLAT BAR A x 10 | A36 | A387-11 | A516-60 | A36 | A36 | A387-11 | A36 | A240-304 |
| 1 | PLATE | 2 | FLAT BAR A x 10 | A36 | A387-11 | A516-60 | A36 | A36 | A387-11 | A36 | A240-304 |

MATCL

NOTES:

1. L DIMENSION SHALL BE FROM 150 TO 300 WITH STEP 50 ADJUSTED AT ERECTION IF NECESSARY.
2. DELETED
3. DO NOT USE WE03 ON GALVANIZED CARBON STEEL LINES.

Support Mark

CR11 DIAM L MATCL

Positional Mark

ELEV a

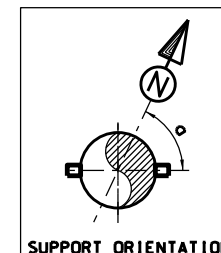
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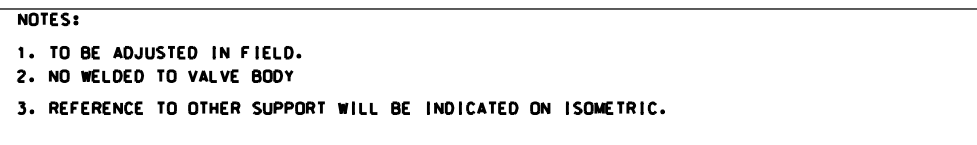
VERTICAL SUPPORT ON PLATFORMS
FOR DIAM 2" TO 24"

CR11

STANDARD CONSTRUCTION DRAWING
PLANT DESIGN AND PIPING

XXXXXXXXXX 000 STC 1392-20 1 of 1 0
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| | | |
|------|------|-------|
| CR13 | DIAM | MATCL |
|------|------|-------|

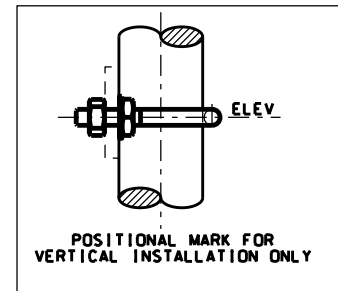
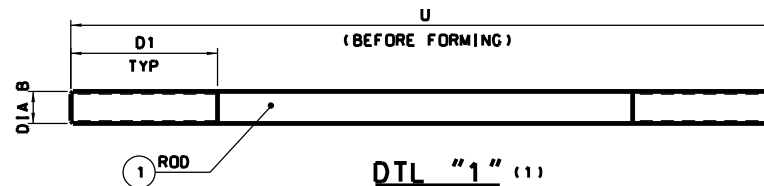
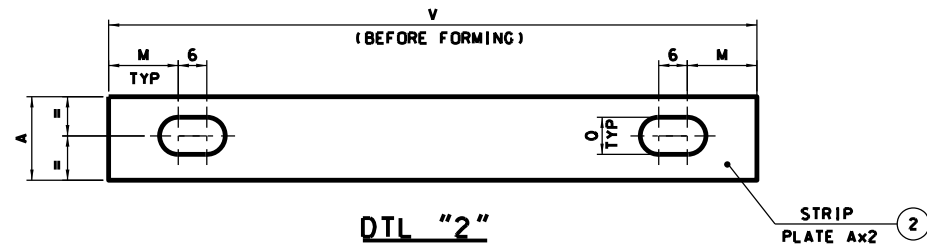
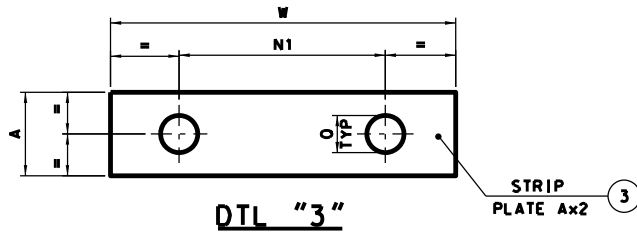
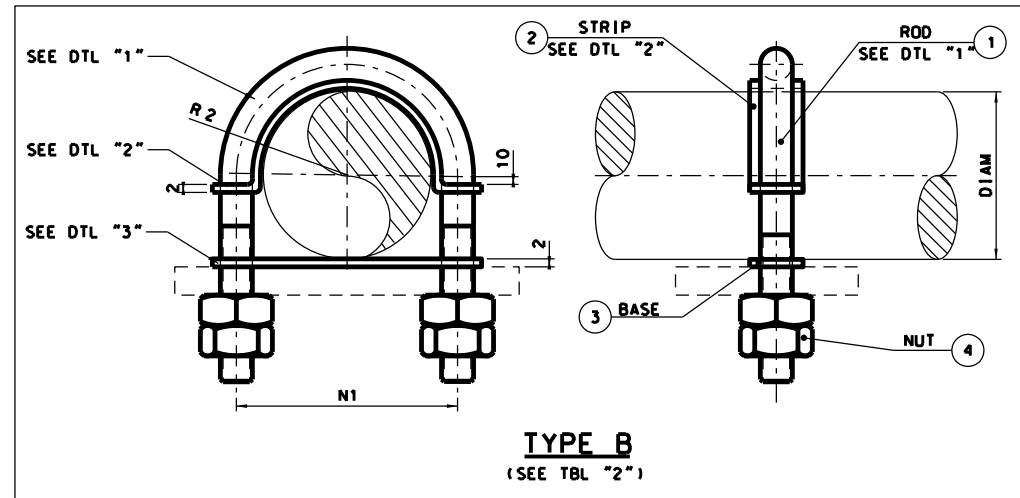
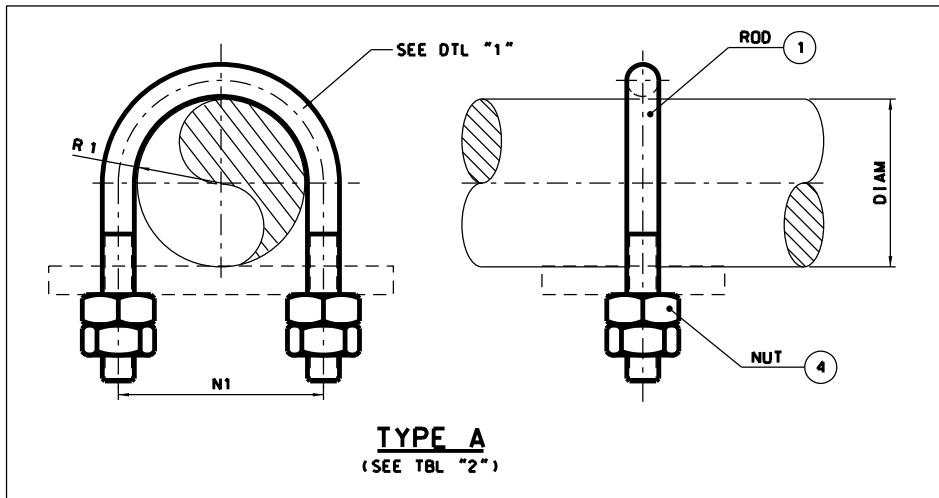
CR13

| | | | | |
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| | | | | | | | | | | | | | |
|------|-------------|------|---------------|-------|---------|---------|-----|-----|---------|-----|----------|--|--|
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| ① | GUSSET | 2 | FLAT BAR 50x5 | A36 | A387-11 | A516-60 | A36 | A36 | A387-11 | A36 | A240-304 | | |
| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH | | |
| | | | | MATCL | | | | | | | | | |

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| TABLE "1" FOR TYPE A - B | | | | | | | | | | | | |
|--------------------------|-----|-----|-------|----|-----|-----|----|-----|-----|------|------|-----|
| DIAM | A | D1 | DIA B | M | N1 | NUT | 0 | R1 | R2 | U | V | W |
| 2" | 50 | 70 | 12 | 20 | 80 | M12 | 14 | 32 | 34 | 280 | 195 | 120 |
| 3" | 50 | 70 | 12 | 20 | 110 | M12 | 14 | 47 | 49 | 347 | 242 | 150 |
| 4" | 50 | 70 | 12 | 20 | 134 | M12 | 14 | 59 | 61 | 404 | 280 | 175 |
| 6" | 50 | 70 | 12 | 20 | 188 | M12 | 14 | 86 | 88 | 549 | 365 | 230 |
| 8" | 60 | 80 | 16 | 30 | 244 | M16 | 18 | 112 | 114 | 697 | 469 | 305 |
| 10" | 60 | 80 | 16 | 30 | 298 | M16 | 18 | 139 | 141 | 842 | 553 | 360 |
| 12" | 60 | 80 | 16 | 30 | 348 | M16 | 18 | 164 | 166 | 980 | 632 | 410 |
| 14" | 100 | 90 | 20 | 30 | 384 | M20 | 22 | 180 | 182 | 1077 | 684 | 445 |
| 16" | 100 | 90 | 20 | 30 | 434 | M20 | 22 | 205 | 207 | 1195 | 763 | 495 |
| 18" | 100 | 90 | 20 | 30 | 486 | M20 | 22 | 231 | 233 | 1337 | 844 | 545 |
| 20" | 100 | 110 | 24 | 35 | 540 | M24 | 26 | 256 | 258 | 1502 | 935 | 610 |
| 22" | 100 | 110 | 24 | 35 | 590 | M24 | 26 | 281 | 283 | 1620 | 1013 | 660 |
| 24" | 100 | 110 | 24 | 35 | 642 | M24 | 26 | 307 | 309 | 1762 | 1095 | 710 |

| TBL "2" | |
|------------|------|
| MATCL | TYPE |
| CS, CH, CL | A |
| AS, AH | A |
| SS, SH, CG | B |

NOTES:

1. U-BOLT DIMENSIONS ARE ONLY FOR REFERENCE DIMENSIONS MAY BE ALSO DEFINED ACCORDING TO MANUFACTURER CATALOGS.

| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH |
|------|-------------|------|---------------|---------|---------|---------|---------|---------|---------|----------|----------|
| ④ | NUT | 4 | SEE TABLE "1" | A194 2H | A194 2H | A194 2H | A194 2H | A194 2H | A194 8 | A194 2H | A194 8 |
| ③ | BASE | 1 | PLATE Ax2 | - | - | - | A36 (C) | - | - | A240-304 | A240-304 |
| ② | STRIP | 1 | PLATE Ax2 | - | - | - | A36 (C) | - | - | A240-304 | A240-304 |
| ① | U-BOLT | 1 | ROD DIA B | A193 B7 | A193 B7 | A320 L7 | A193 B7 | A193 B7 | A193 B8 | A193 B7 | A320 B8 |

| Support Mark | | | | Positional Mark | | | |
|--|------|------|-------|---------------------------------------|--|--|------|
| CS01 | DIAM | TYPE | MATCL | ELEV | | | |
| Technip | | | | GRIPPED U-BOLT FOR DIAM 2" TO 24" | | | CS01 |
| STANDARD CONSTRUCTION DRAWING PLANT DESIGN AND PIPING | | | | XXXXXXXXXXXX 000 STC 1392-23 1 of 1 0 | | | |
| Project | | | | Unit Doc. Code & Serial No. Page Rev. | | | |

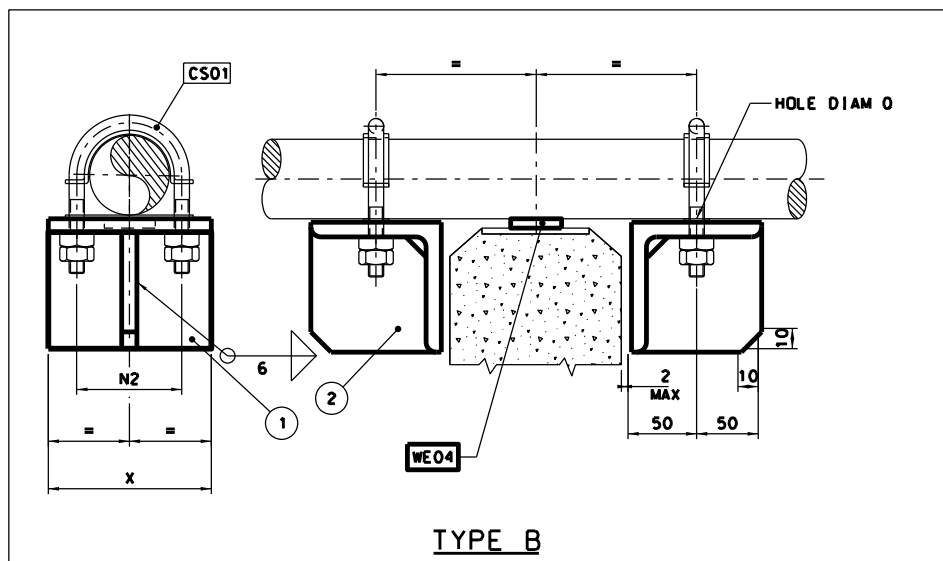
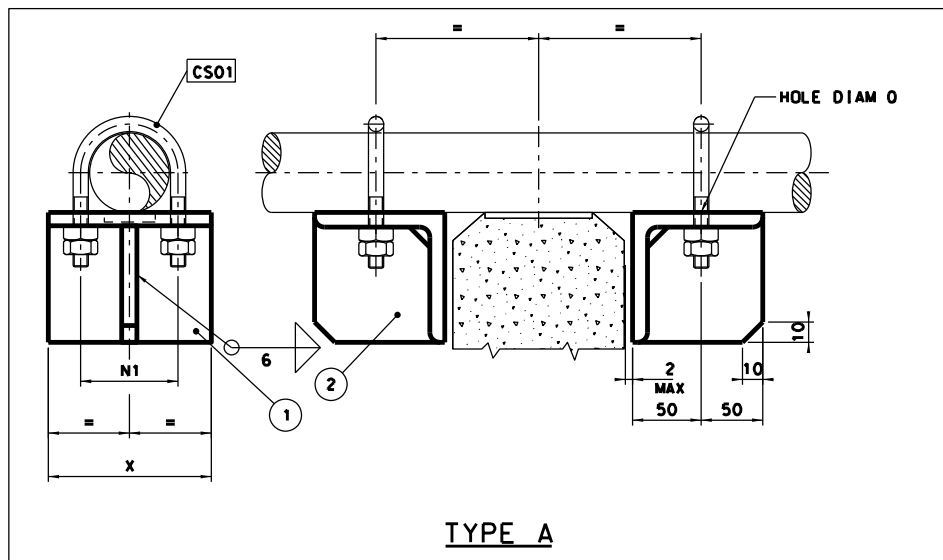


TABLE "1"

| TABLE "1" | | | | |
|-----------|-----|-----|----|-----|
| DIAM | N1 | N2 | O | X |
| 2" | 76 | 80 | 14 | 135 |
| 3" | 106 | 110 | 14 | 165 |
| 4" | 130 | 134 | 14 | 190 |
| 6" | 184 | 188 | 14 | 245 |
| 8" | 240 | 244 | 18 | 320 |
| 10" | 294 | 298 | 18 | 370 |
| 12" | 344 | 348 | 18 | 420 |

TBL "2"

| TBL "2" | |
|---------|------|
| MATCL | TYPE |
| CS, AS | A |
| CG, SS | B |

NOTES:

1. DELETED.

Support + Mark

| CS02 | DIAM | TYPE | MATCL |
|------|------|------|-------|
|------|------|------|-------|

Technip

STOP ON UNINSULATED PIPE
FOR DIAM 2" TO 12"

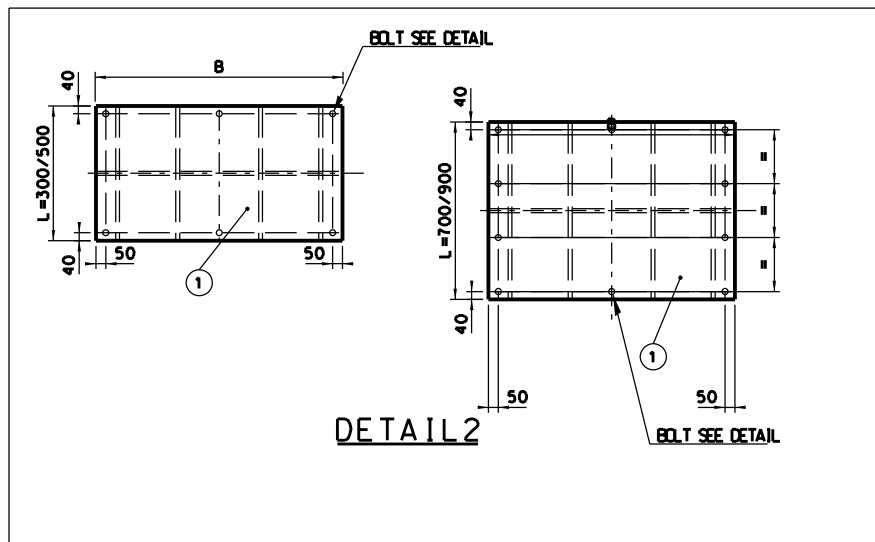
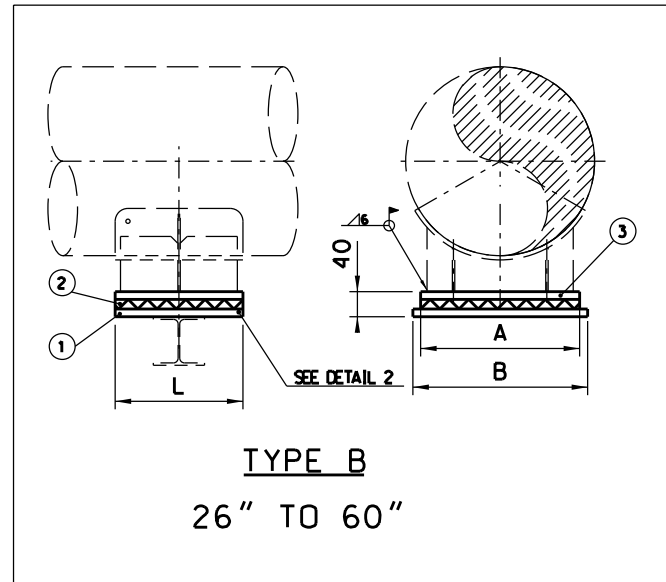
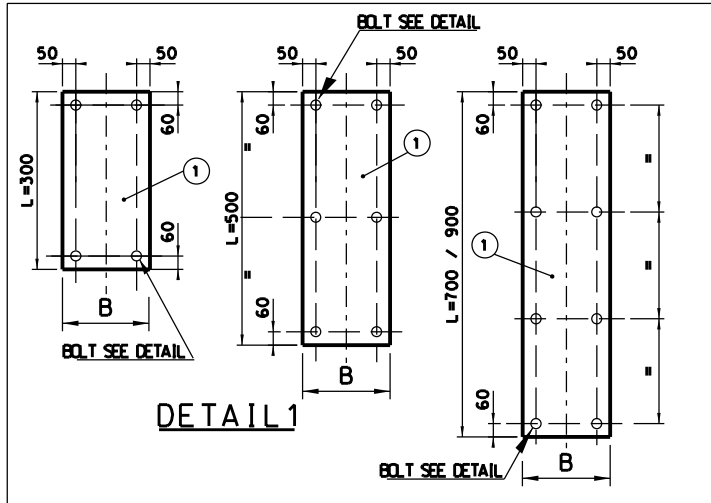
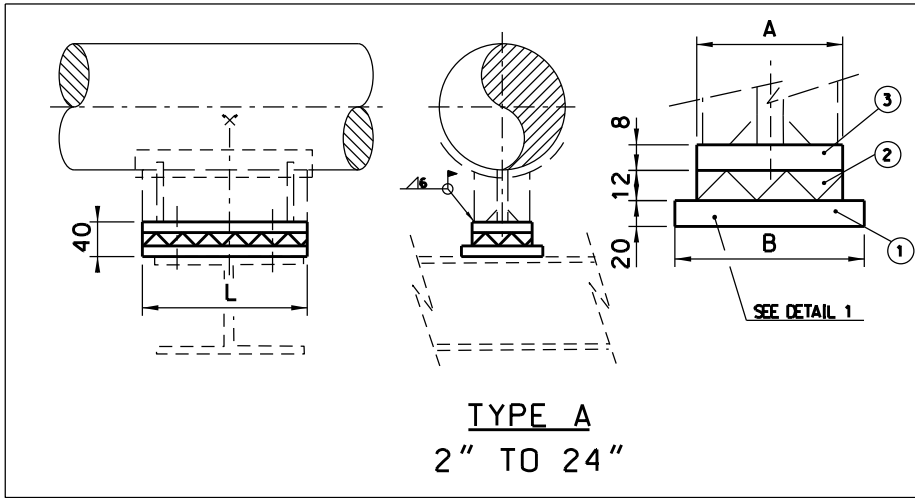
CS02

STANDARD CONSTRUCTION DRAWING PLANT DESIGN AND PIPING

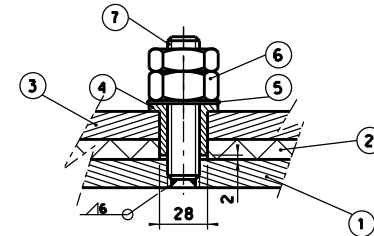
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| XXXXXXX | 000 | STC 1392-24 | 1 of 1 | 0 |
| Project | Unit | Doc. Code & Serial No. | Page | Rev. |

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| PIPE SIZE | A | B |
|-------------|-----|-----|
| 1/2"-1 1/8" | 160 | 200 |
| 2" | 160 | 200 |
| 3" | 160 | 200 |
| 4" | 160 | 200 |
| 6" | 160 | 200 |
| 8" | 200 | 240 |
| 10" | 200 | 240 |
| 12" | 250 | 290 |
| 14" | 250 | 290 |
| 16" | 350 | 390 |
| 18" | 350 | 390 |
| 20" | 450 | 490 |
| 22" | 450 | 490 |
| 24" | 450 | 490 |



| PIPE SIZE | A | B |
|-----------|------|------|
| 26" | 550 | 590 |
| 28" | 600 | 640 |
| 30" | 650 | 690 |
| 32" | 750 | 790 |
| 34" | 750 | 790 |
| 36" | 800 | 840 |
| 38" | 850 | 890 |
| 40" | 900 | 940 |
| 42" | 950 | 990 |
| 44" | 950 | 990 |
| 46" | 1000 | 1040 |
| 48" | 1050 | 1090 |
| 50" | 1100 | 1140 |
| 52" | 1150 | 1190 |
| 54" | 1200 | 1240 |
| 56" | 1250 | 1290 |
| 60" | 1300 | 1340 |

NOTES:

1. QUANTITY DEPENDS OF SIZE. REFER TO DETAILS.
2. DELETED.
3. FABREEKA PAD 12mm OR EQUIVALENT.

Support Mark

HA01 DIAM TYPE L

Technip

ACOUSTIC ATTENUATION PAD
FOR DIAM 2" TO 60"

HA01

STANDARD CONSTRUCTION DRAWING
PLANT DESIGN AND PIPING

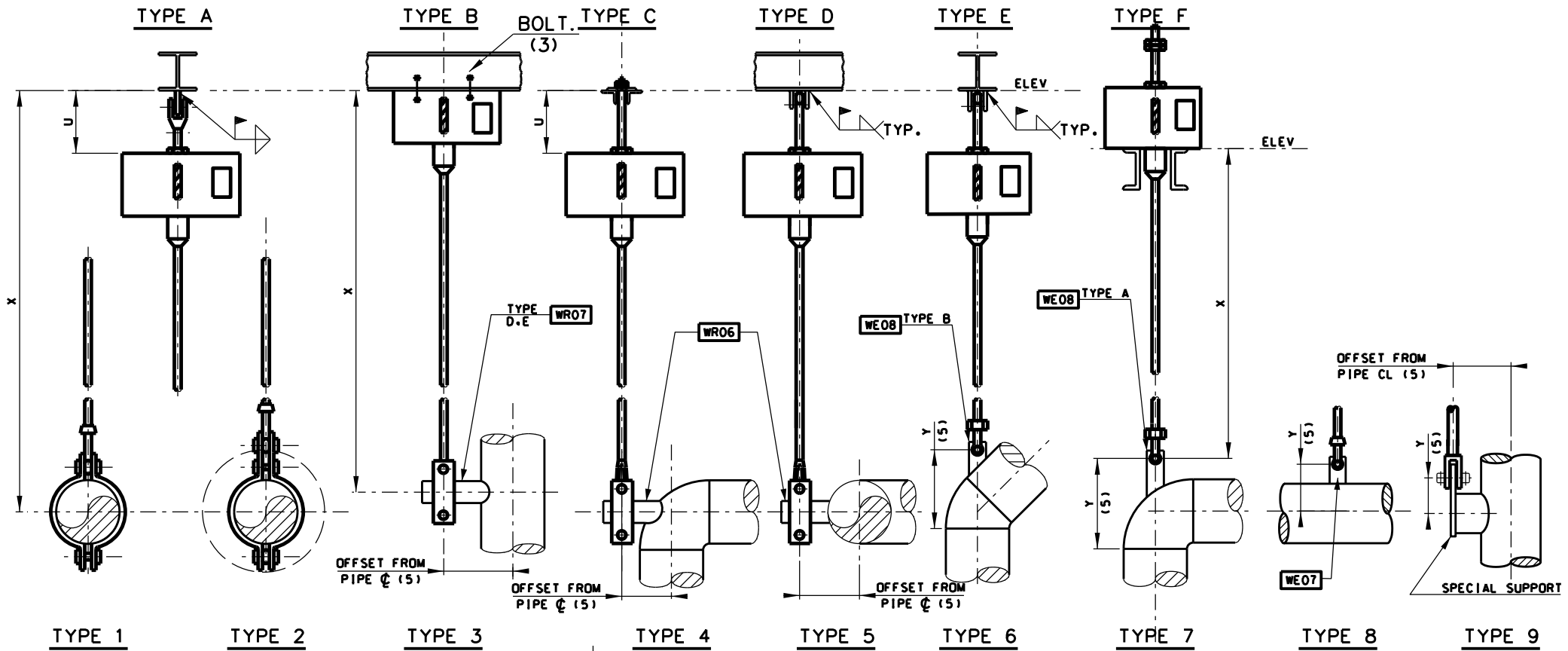
XXXXXXXXXX 000 STC 1393-15 1 of 1 0
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| | | | | | | | | | | | | | |
|------|--------------|------|---------------|---------|---------|---------|----|---------|---------|---------|---------|--|--|
| 7 | STUD BOLT | (1) | M24x100 | A193 B7 | A193 B7 | A320 L7 | / | A193 B7 | A193 B8 | A193 B7 | A320 B8 | | |
| 6 | NUT H/HM | (1) | M24 | A194 2H | A194 2H | A194 2H | / | A194 2H | A194 B | A194 2H | A194 B | | |
| 5 | WASHER PLATE | (1) | DIA.50x4 | A36 | A36 | A36 | / | A36 | A36 | A36 | A36 | | |
| 4 | RED. WASHER | (1) | BY VENDOR (3) | / | / | / | / | / | / | / | / | | |
| 3 | PLATE | 1 | PLATE AxL | A36 | A36 | A36 | / | A36 | A36 | A36 | A36 | | |
| 2 | ACOUSTIC PAD | 1 | BY VENDOR (3) | / | / | / | / | / | / | / | / | | |
| 1 | BASE PLATE | 1 | PLATE BxL | A36 | A36 | A36 | / | A36 | A36 | A36 | A36 | | |
| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH | | |

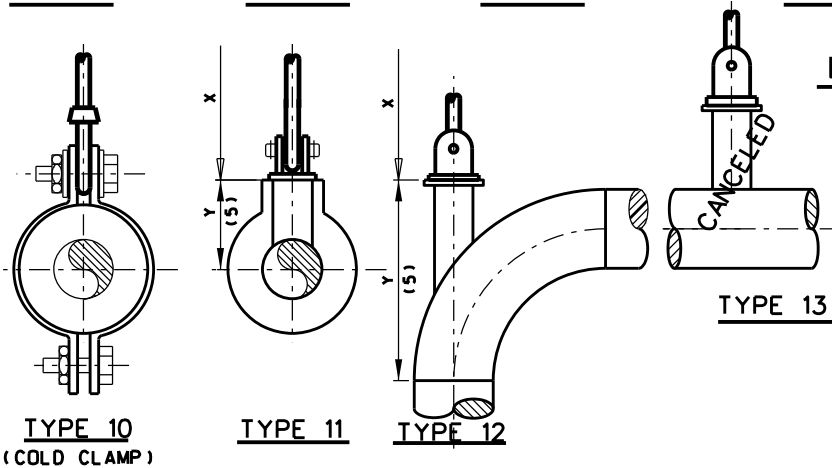
MATCL

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UPPER CONNECTION



LOWER CONNECTION



NOTES:

1. SPRING HANGER ASSEMBLY SUPPLY BY MATERIAL REQUISITION
2. FOR DETAIL SPECIFICATION, SEE SPRING HANGER DATA SHEETS ON MATERIAL REQUISITION
3. BOLT INCLUDED ON THE MATERIAL REQUISITION
4. DELETED.
5. ONLY USEFUL IN SUPPORT MODELER AND SP3D.

Support Mark

HC01 ITEM ELEV

Technip

SINGLE CONSTANT SPRING HANGER

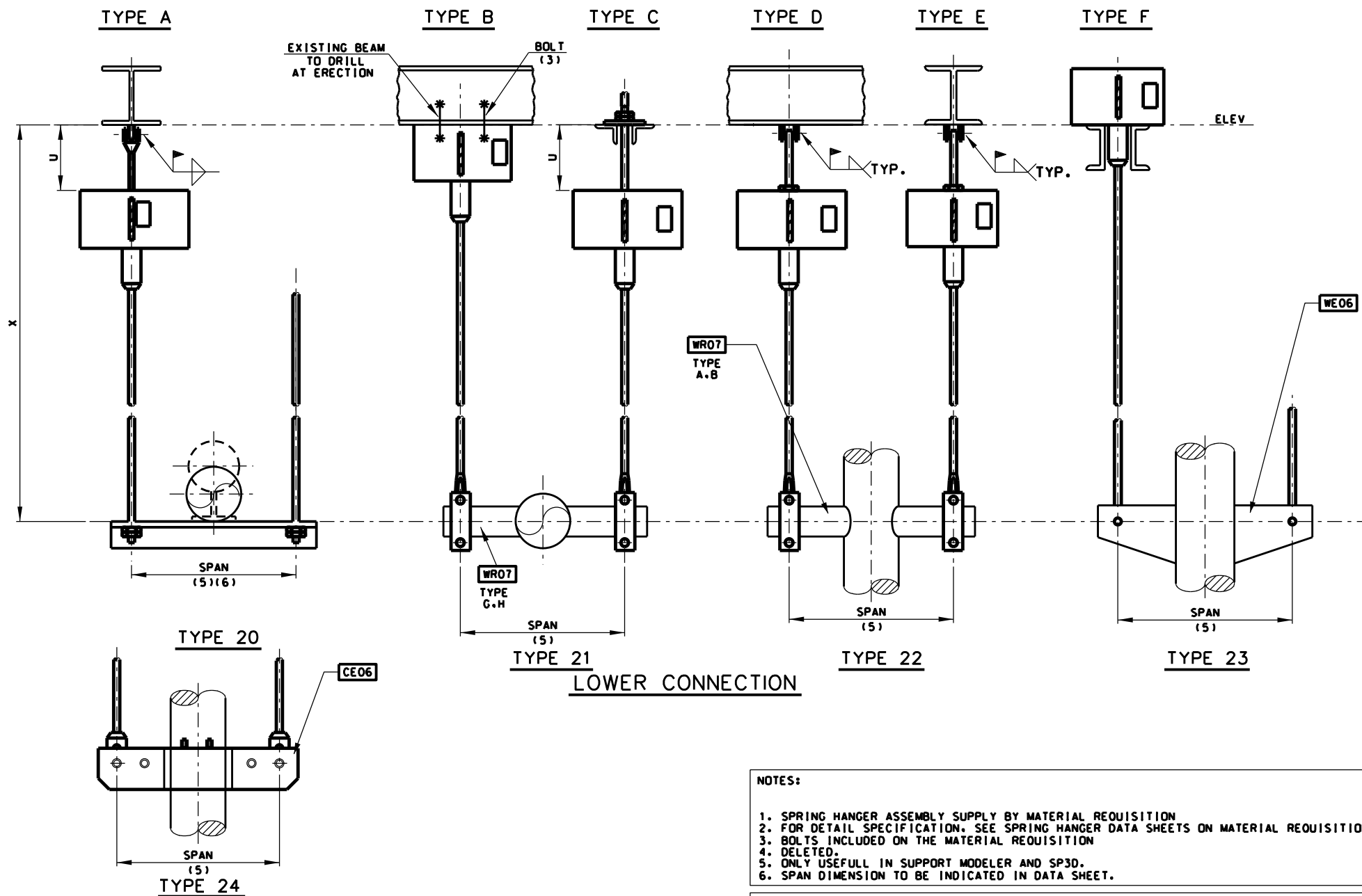
HC01

STANDARD CONSTRUCTION DRAWING
PLANT DESIGN AND PIPING

XXXXXXXXXX 000 STC1393-01 1 of 1 0
Project Unit Doc. Code & Serial No. Page Rev.

| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH |
|------|---------------|------|-------------|----|----|----|----|----|----|----|----|
| 1 | SPRING HANGER | 1 | SEE NOTE 2. | | | | | | | | |

UPPER CONNECTION



NOTES:

1. SPRING HANGER ASSEMBLY SUPPLY BY MATERIAL REQUISITION
2. FOR DETAIL SPECIFICATION, SEE SPRING HANGER DATA SHEETS ON MATERIAL REQUISITION
3. BOLTS INCLUDED ON THE MATERIAL REQUISITION
4. DELETED.
5. ONLY USEFULL IN SUPPORT MODELER AND SP3D.
6. SPAN DIMENSION TO BE INDICATED IN DATA SHEET.

Support + Mark

Positional Mark

| HC02 | ITEM | ELEV |
|------|------|------|
|------|------|------|

ELEV

Technip

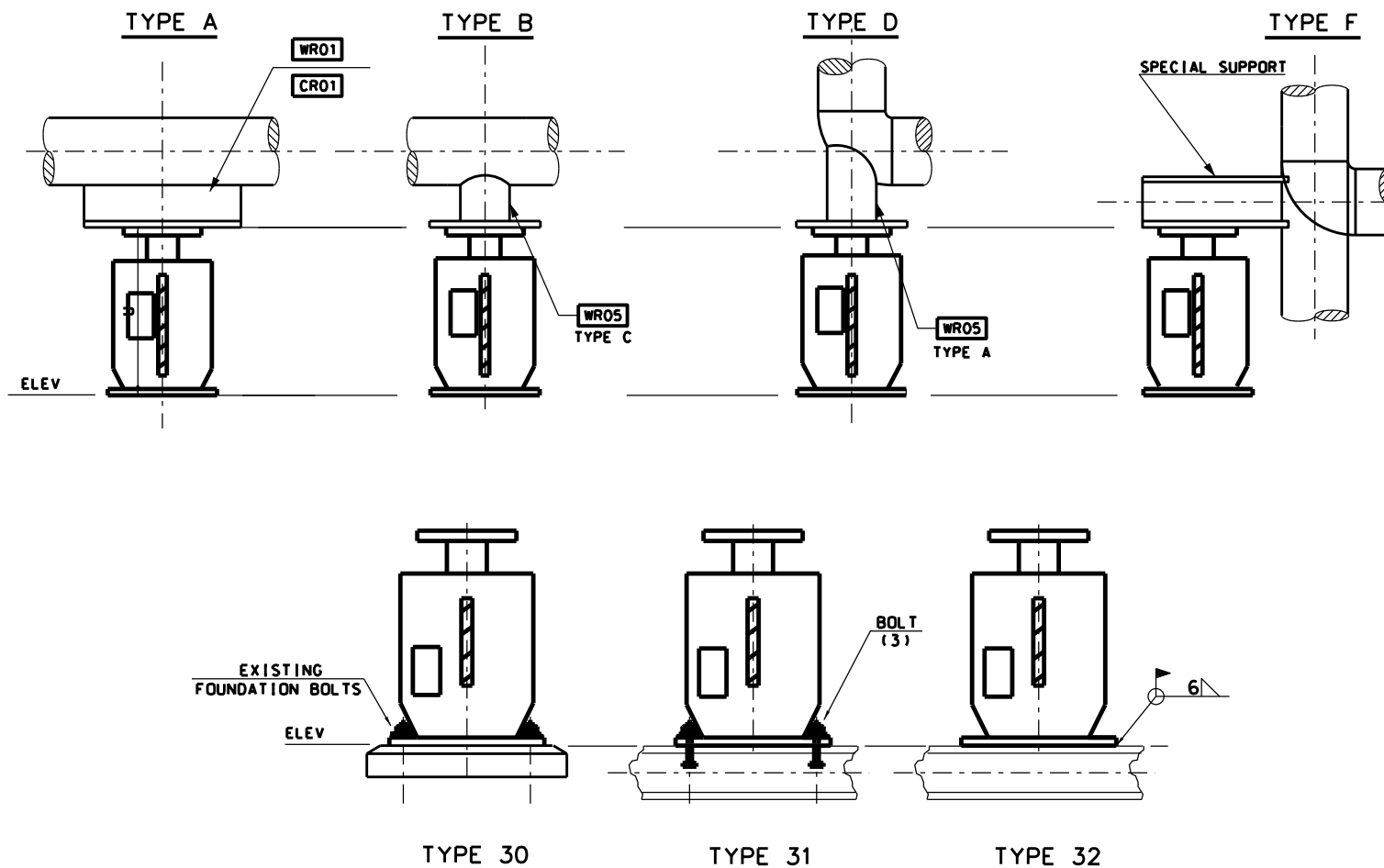
DOUBLE CONSTANT SPRING HANGER HC02

STANDARD CONSTRUCTION DRAWING PLANT DESIGN AND PIPING

| | | | | | |
|---|------------|------|------------------------|--------|------|
| G | XXXXXXXXXX | 000 | STC 1393-02 | 1 of 1 | 0 |
| | Project | Unit | Doc. Code & Serial No. | Page | Rev. |

| | | | | | | | | | | | | | | | | |
|------------------|---------------|--------|-------------|-------|----|----|----|----|----|----|----|--|--|--|--|--|
| ○ | | | | | | | | | | | | | | | | |
| ○ | | | | | | | | | | | | | | | | |
| ○ | | | | | | | | | | | | | | | | |
| ① | SPRING HANGER | 2 | SEE NOTE 2. | | | | | | | | | | | | | |
| ITEM DESCRIPTION | QTY. | DETAIL | | CS | CH | CL | CG | AS | AH | SS | SH | | | | | |
| | | | | MATCL | | | | | | | | | | | | |

UPPER CONNECTION



LOWER CONNECTION

NOTES:

1. SPRING HANGER ASSEMBLY SUPPLY BY MATERIAL REQUISITION
2. FOR DETAIL SPECIFICATION, SEE SPRING HANGER DATA SHEETS ON MATERIAL REQUISITION
3. BOLT INCLUDED ON THE MATERIAL REQUISITION
4. DELETED.
5. FOR EACH TYPE, PTFE PAD SHALL BE SUPPLIED TOGETHER WITH THE SPRING HANGER AND SPECIFIED IN DATA SHEET.

Support + Mark

Positional Mark

| HC03 | ITEM | ELEV |
|------|------|------|
|------|------|------|

ELEV

Technip

SINGLE CONSTANT SPRING BASE

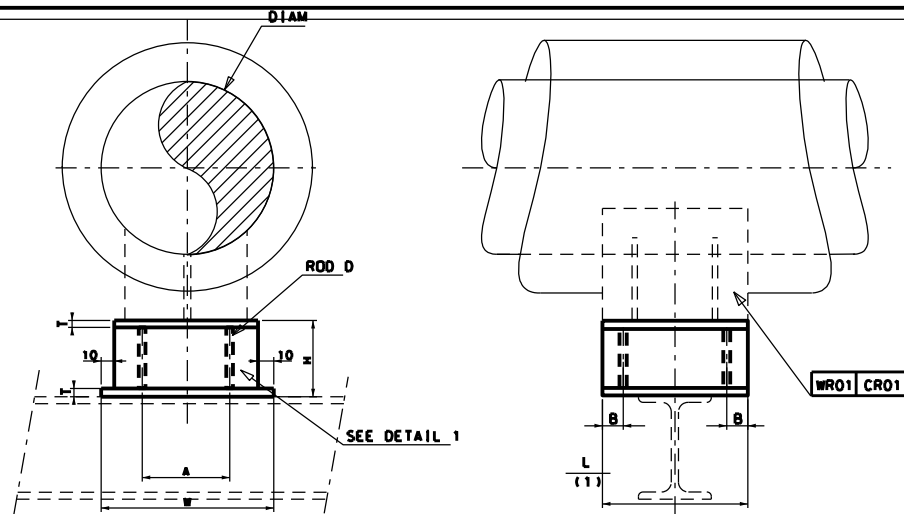
HCO₃

STANDARD CONSTRUCTION DRAWING
PLANT DESIGN AND PIPING

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| XXXXXXX | 000 | STC 1393-03 | 1 of 1 | 0 |
| Project | Unit | Doc. Code & Serial No. | Page | Rev. |

| | | | | | | | | | | | | | |
|------|---------------|------|-------------|-------|----|----|----|----|----|----|----|--|--|
| ○ | | | | | | | | | | | | | |
| ○ | | | | | | | | | | | | | |
| ○ | | | | | | | | | | | | | |
| ① | SPRING HANGER | 1 | SEE NOTE 2. | | | | | | | | | | |
| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH | | |
| | | | | MATCL | | | | | | | | | |

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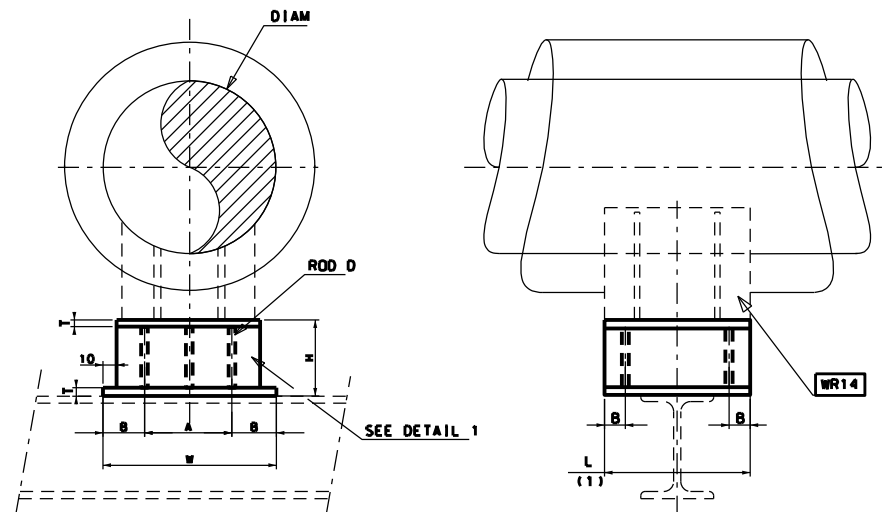


DIAM 2" TO 24"

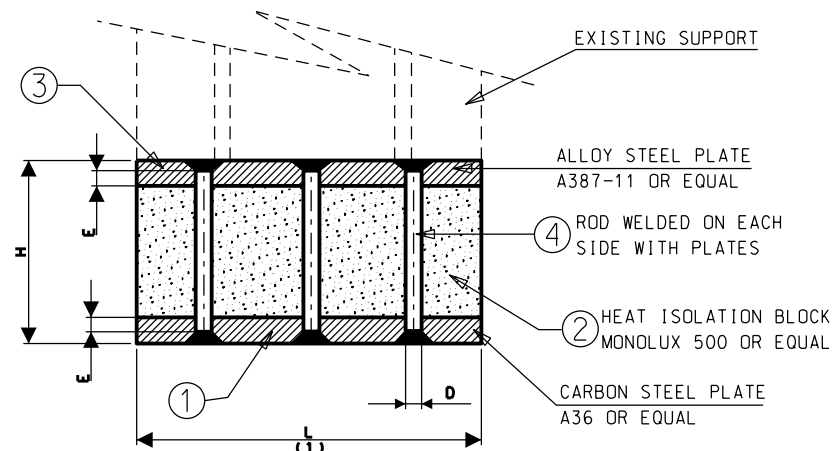
| DIAM | A | W | B | H | T | D | E | MAX ALLOW. VERTICAL LOAD (KN) |
|-----------|------|------|----|----|----|----|----|----------------------------------|
| 1"-1 1/2" | 60 | 120 | 40 | 70 | 10 | 10 | | 54 |
| 2"-4" | 60 | 120 | 40 | 70 | 10 | 10 | | 54 |
| 6" | 90 | 170 | 40 | 70 | 10 | 10 | 5 | 54 |
| 8"-10" | 120 | 220 | 40 | 70 | 10 | 16 | 8 | 138 |
| 12"-14" | 150 | 270 | 40 | 70 | 10 | 16 | 8 | 138 |
| 16"-18" | 250 | 370 | 50 | 70 | 10 | 20 | 10 | 173 |
| 20"-24" | 350 | 470 | 50 | 70 | 10 | 20 | 10 | 173 |
| 26" | 450 | 570 | 50 | 80 | 15 | 20 | 10 | 260 |
| 28" | 500 | 620 | 50 | 80 | 15 | 20 | 10 | 260 |
| 30" | 550 | 670 | 50 | 80 | 15 | 20 | 10 | 260 |
| 32" | 600 | 770 | 75 | 80 | 15 | 25 | 12 | 405 |
| 34" | 600 | 770 | 75 | 80 | 15 | 25 | 12 | 405 |
| 36" | 650 | 820 | 75 | 80 | 15 | 25 | 12 | 405 |
| 38" | 700 | 870 | 75 | 80 | 15 | 25 | 12 | 405 |
| 40" | 750 | 920 | 75 | 80 | 15 | 25 | 12 | 405 |
| 42" | 800 | 970 | 75 | 80 | 15 | 25 | 12 | 405 |
| 44" | 800 | 970 | 75 | 80 | 15 | 25 | 12 | 405 |
| 46" | 850 | 1020 | 75 | 90 | 20 | 25 | 12 | 405 |
| 48" | 900 | 1070 | 75 | 90 | 20 | 25 | 12 | 405 |
| 50" | 950 | 1120 | 75 | 90 | 20 | 25 | 12 | 405 |
| 52" | 1000 | 1170 | 75 | 90 | 20 | 25 | 12 | 405 |
| 54" | 1050 | 1220 | 75 | 90 | 20 | 25 | 12 | 405 |
| 56" | 1100 | 1270 | 75 | 90 | 20 | 25 | 12 | 405 |
| 60" | 1150 | 1320 | 75 | 90 | 20 | 25 | 12 | 405 |

| | | | | | | | | | | | |
|------------------|----------------|--------|---------|----|----|----|---------|----|---------|----|--|
| ④ ROD | 4/6 ROD | / | A193-88 | / | / | / | A193-88 | / | A193-88 | | |
| ③ PLATE | 1 PLATE THK. T | / | A387-11 | / | / | / | A387-11 | / | A387-11 | | |
| ② ISOLATION | 1 MONOLUX 500 | / | / | / | / | / | / | / | / | | |
| ① PLATE | 1 PLATE THK. T | / | A36 | / | / | / | A36 | / | A36 | | |
| ITEM DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH | |

MATCL



DIAM 26" TO 60"



DETAIL 1

NOTES:

1. L=300 TO 900 WITH STEP 100
2. HEAT ISOLATION BLOCK SHALL BE USED FOR LINES WITH OPERATING TEMPERATURE OVER 400°C

Support Mark

HH01 DIAM L

Technip

HEAT ISOLATION BLOCK
FOR DIAM 2" TO 60"

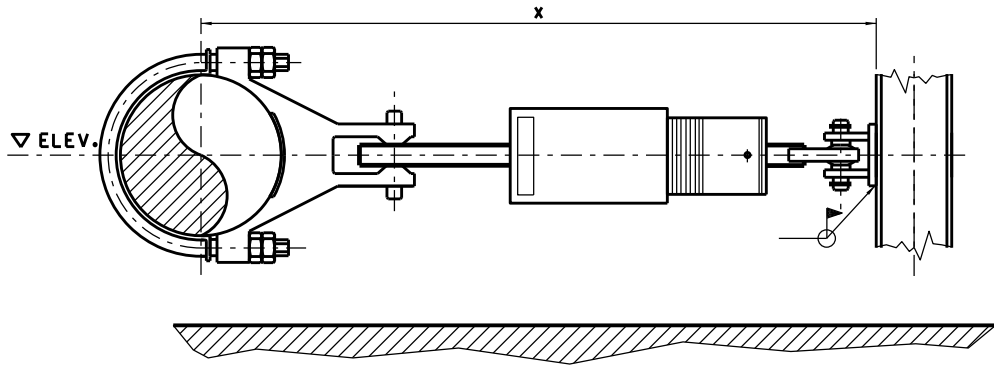
HH01

STANDARD CONSTRUCTION DRAWING
PLANT DESIGN AND PIPING

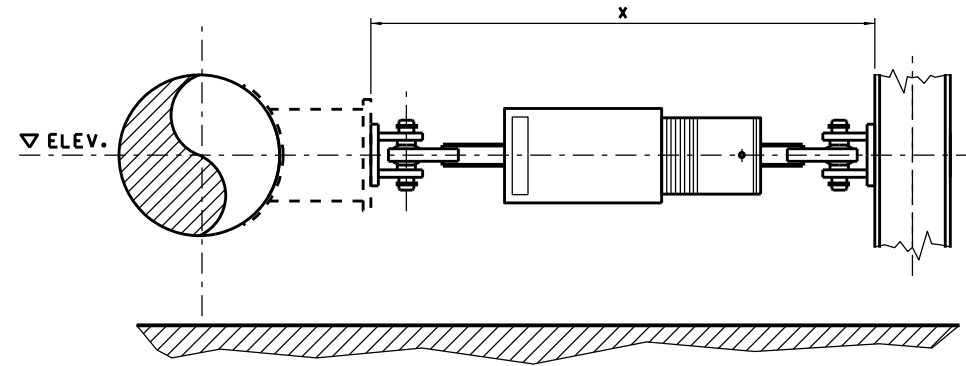
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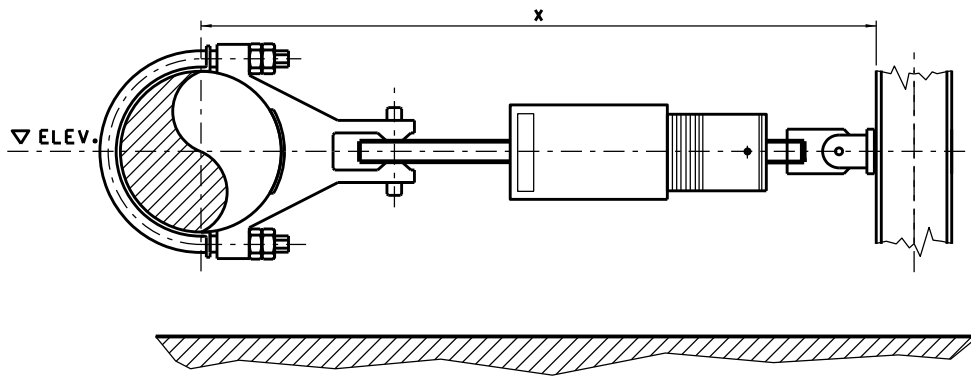
TYPE A1



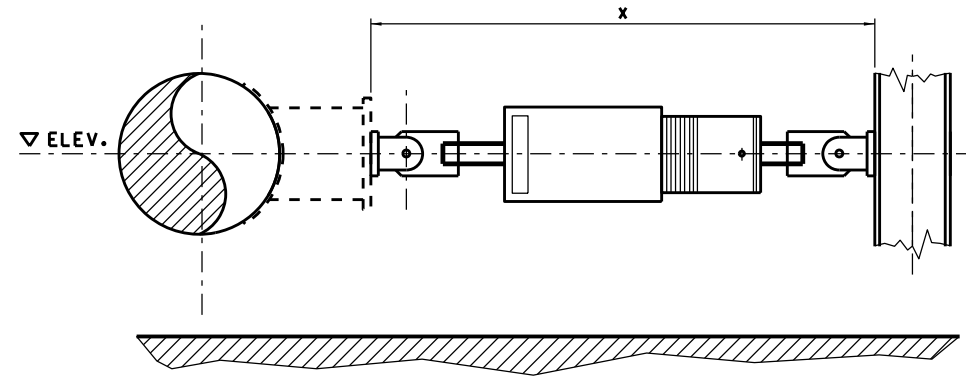
TYPE B1



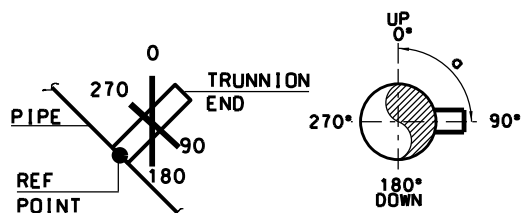
TYPE A2



TYPE B2

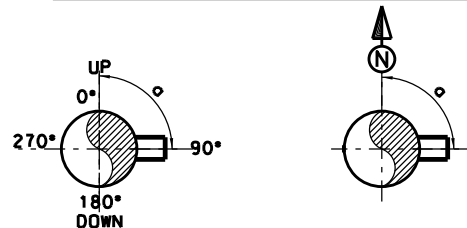


CONNECTION ON TRUNNION



STRUT ORIENTATION FOR
HORIZONTAL TRUNNION
(4)

CONNECTION DIRECTLY ON PIPE



STRUT ORIENTATION FOR
HORIZONTAL PIPE OR LEG
(3)

STRUT ORIENTATION FOR
VERTICAL PIPE OR LEG

NOTES:

1. SNUBBER ASSEMBLY SUPPLY BY MATERIAL REQUISITION
2. FOR DETAIL SPECIFICATION SEE SNUBBER DATA SHEETS .
3. MINIMUM REQUIRED LENGTH SHALL BE DEFINED PER SUPPLIER CATALOGUE RECOMMENDATIONS AND DATA SHEETS.
4. LIMIT OF USING ON COLD LINES : REFER TO SNUBBER DATA SHEETS
5. CONNECTION DIRECTLY ON PIPE LOOKING TO FLOW FLUIDT DIRECTION.
6. CONNECTION ON TRUNNION LOOKING TO REFERENCE POINT OF TRUNNION.

Support Mark

Positional Mark

HN01 ITEM ELEV. a

Technip

SINGLE SNUBBER

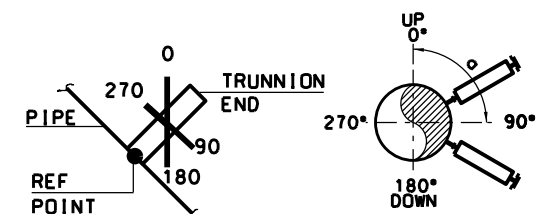
HN01

STANDARD CONSTRUCTION DRAWING
PLANT DESIGN AND PIPING

XXXXXXXXXX 000 STC 1393-12 1 of 1 0
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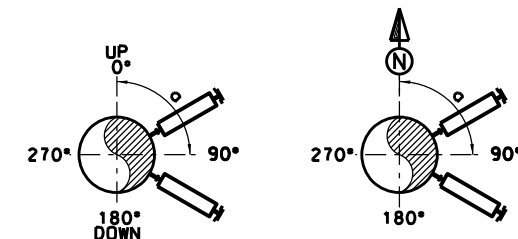
| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH |
|------|------------------|------|-------------|----|----|----|----|----|----|----|----|
| 1 | SNUBBER ASSEMBLY | 1 | SEE NOTE 2. | | | | | | | | |

CONNECTION ON TRUNNION



STRUT ORIENTATION FOR HORIZONTAL TRUNNION (6)

CONNECTION DIRECTLY ON PIPE



STRUT ORIENTATION FOR HORIZONTAL PIPE (5)

STRUT ORIENTATION FOR
VERTICAL PIPE OR LEG

1. SNUBBER ASSEMBLY SUPPLY BY MATERIAL REQUISITION
2. FOR DETAIL SPECIFICATION, SEE SNUBBER DATA SHEETS.
3. MINIMUM REQUIRED LENGTH SHALL BE DEFINED PER SUPPLIER CATALOGUE RECOMMENDATIONS AND DATA SHEETS.
4. LIMIT OF USING ON COLD LINES : REFER TO SNUBBER DATA SHEETS.
5. CONNECTION DIRECTLY ON PIPE LOOKING TO FLOW FLUID DIRECTION.
6. CONNECTION ON TRUNNION LOOKING TO REFERENCE POINT OF TRUNNION.

| HN02 | ITEM | ELEV. | d |
|------|------|-------|---|
|------|------|-------|---|

DOUBLE SNUBBERS

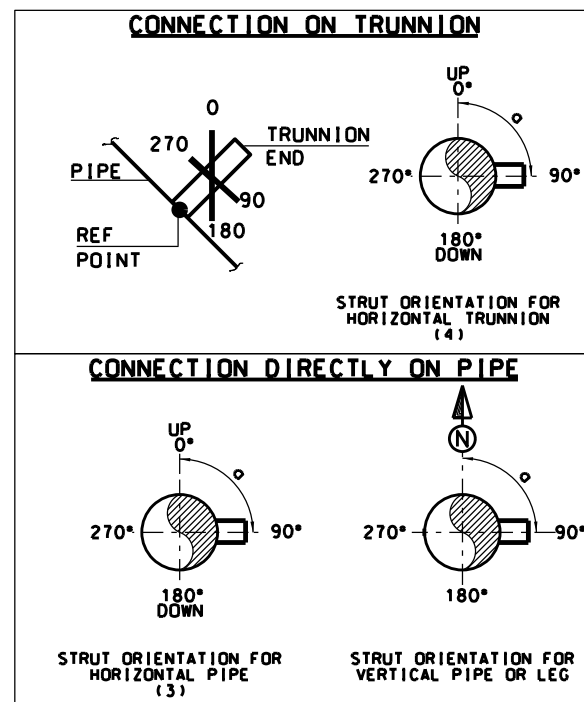
HN02

STANDARD CONSTRUCTION DRAWING PLANT DESIGN AND PIPING

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|---------|------|------------------------|------|------|
| XXXXXXX | 000 | STC 1393-13 1 | of 1 | 0 |
| Project | Unit | Doc. Code & Serial No. | Page | Rev. |

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|----------------------------------|------------------|------|-------------|-------|----|----|----|----|----|----|----|--|
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| <input type="radio"/> | | | | | | | | | | | | |
| <input checked="" type="radio"/> | SNUDDER ASSEMBLY | 101 | SEE NOTE 2. | | | | | | | | | |
| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH | |
| | | | | MATCL | | | | | | | | |

| ① | SHUDDER ASSEMBLY | 1 | SEE NOTE 2. | | | | | | | | | | | | | | | | |
|------|------------------|------|-------------|-------|----|----|----|----|----|----|----|--|--|--|--|--|--|--|--|
| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH | | | | | | | | |
| | | | | MATCL | | | | | | | | | | | | | | | |



- NOTES:
1. RIGID STRUTS ASSEMBLY SUPPLY BY MATERIAL REQUISITION
 2. FOR DETAIL SPECIFICATION, SEE RIGID STRUTS DATA SHEETS ON MATERIAL REQUISITION
 3. CONNECTION DIRECTLY ON PIPE LOOKING TO FLOW FLUID DIRECTION.
 4. CONNECTION ON TRUNNION LOOKING TO REFERENCE POINT OF TRUNNION.

| <input type="radio"/> | | | | | | | | | | | | |
|----------------------------------|-------------|------|-------------|-------|----|----|----|----|----|----|----|--|
| <input type="radio"/> | | | | | | | | | | | | |
| <input type="radio"/> | | | | | | | | | | | | |
| <input checked="" type="radio"/> | STRUTS | 1 | SEE NOTE 2. | | | | | | | | | |
| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH | |
| | | | | MATCL | | | | | | | | |

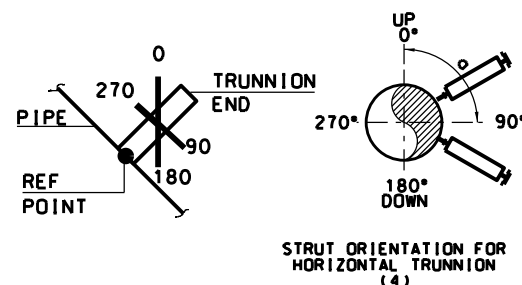
| | |
|--------------|-----------------|
| Support Mark | Positional Mark |
| HR01 | ITEM |
| ELEV | a |

| | | |
|--|---------------------|---------------------------------------|
| <i>Technip</i> | SINGLE RIGID STRUTS | HR01 |
| STANDARD CONSTRUCTION DRAWING PLANT DESIGN AND PIPING | XXXXXXXXXXXX 000 | STC 1393-04 1 of 1 0 |
| | Project | Unit Doc. Code & Serial No. Page Rev. |

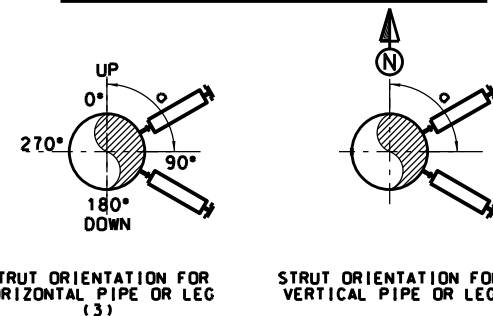


TYPE D

CONNECTION ON TRUNNION



CONNECTION DIRECTLY ON PIPE



1. RIGID STRUTS ASSEMBLY SUPPLY BY MATERIAL REQUISITION
2. FOR DETAIL SPECIFICATION, SEE RIGID STRUTS DATA SHEETS ON MATERIAL REQUISITION
3. CONNECTION DIRECTLY ON PIPE LOOKING TO FLOW FLUID DIRECTION.
4. CONNECTION ON TRUNNION LOOKING TO REFERENCE POINT OF TRUNNION.

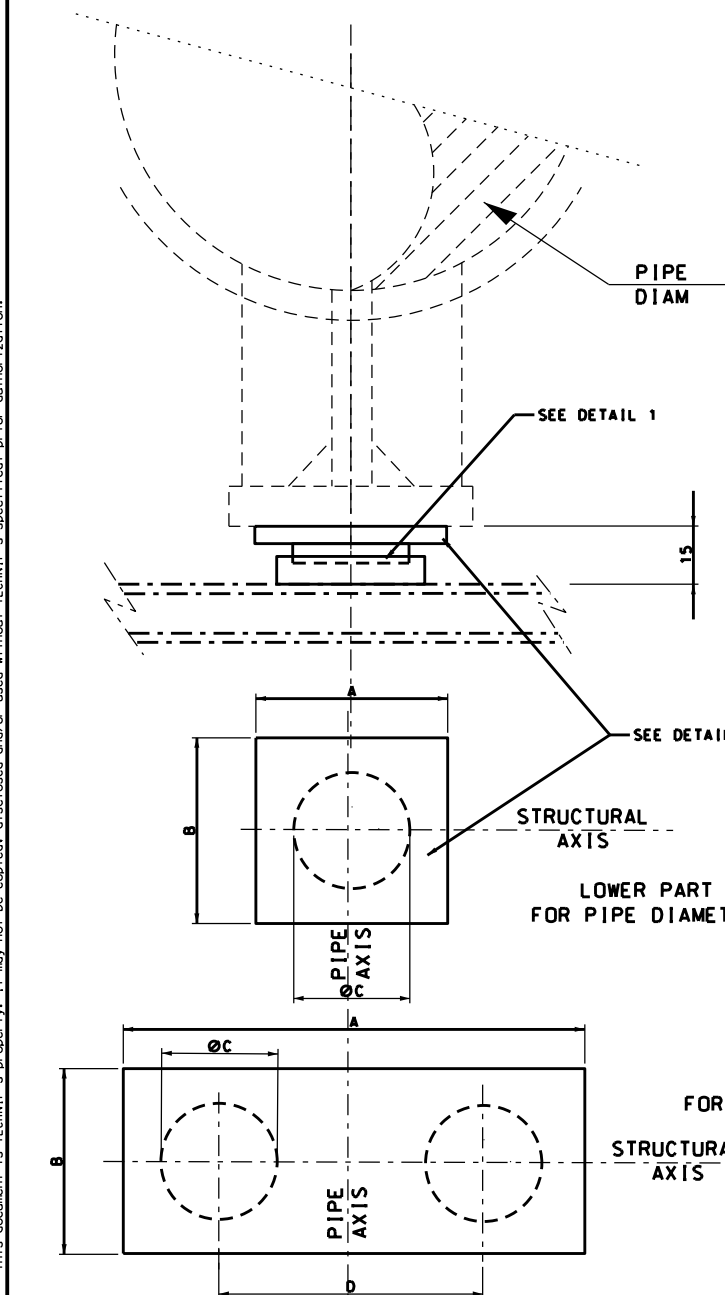
| | |
|------|---|
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HR02

| | | | | | |
|---|------------|------|------------------------|------|------|
| G | XXXXXXXXXX | 000 | STC 1393-05 1 | of 1 | 0 |
| | Project | Unit | Doc. Code & Serial No. | Page | Rev. |

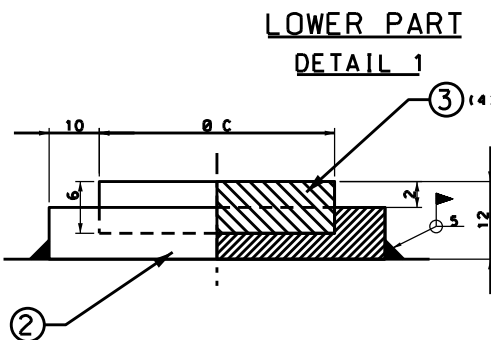
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LOWER PART Qty= 1
FOR PIPE DIAMETER ≤ 24 "

LOWER PART Qty= 2
FOR PIPE DIAMETER > 24 " (2)

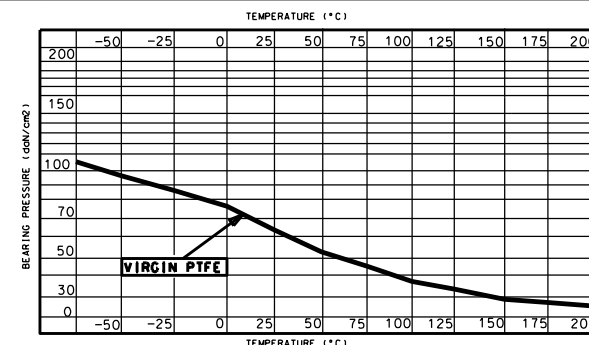
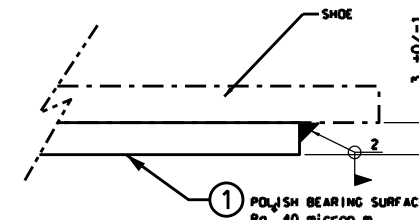


| TBL 1 | |
|-------------|------------------|
| Ø C (mm) | MAX LOAD (KN) |
| 50 | 14 |
| 80 | 35 |
| 120 | 79 |
| 160 | 140 |

LOADS AT AMBIENT
TEMPERATURE (25° C)

| STAINLESS STEEL PLATE DIMENSIONS (2)(3) | | | |
|--|-------------------------|-----|----------|
| PIPE DIA. | STD WRO1 (L=300) (1) | | STD WRO5 |
| | A | B | AxB |
| 2" | 80 | 280 | 80x80 |
| 3" | 80 | 280 | 80x80 |
| 4" | 80 | 280 | 130x130 |
| 6" | 130 | 280 | 130x130 |
| 8" | 180 | 280 | 180x180 |
| 10" | 180 | 280 | 180x180 |
| 12" | 230 | 280 | 230x230 |
| 14" | 230 | 280 | 330x330 |
| 16" | 330 | 280 | 380x380 |
| 18" | 330 | 280 | 380x380 |
| 20" | 430 | 280 | 430x430 |
| 22" | 430 | 280 | 430x430 |
| 24" | 430 | 280 | 430x430 |

UPPER PART DETAIL 2



BEARING PRESSURE MUST BE CHECKED ACCORDING
TEMPERATURE TAKEN AT BASE OF PIPE SHOE

NOTES:

- UPPER PLATE SHALL BE ADJUSTED CONSIDERING THE SUPPORT BASE PLATE.
- FOR OTHER SHOE LENGTH OR LONGIT. PIPE DISPLACEMENT ABOVE 50mm, SS PLATE SHALL BE INCREASED BY STEP 100mm AND SPECIFIED ON DATA SHEET SP 1384 01.
- ALL DIMENSIONS ARE TO BE CHECKED AND SPECIFIED ON DATA SHEET SP 1384 01 ACCORDING TO EFFECTIVES LOADS AND DISPLACEMENTS.
- PTFE TO BE REMOVED BEFORE WELDING
- DELETED
- DELETED
- DELETED

Support Mark

HS01 ITEM DIAM A B Ø C D

| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH |
|------|-----------------------|------|--------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 3 | INSERT. PLATE | 1/2 | | VIRGIN PTFE | VIRGIN PTFE | VIRGIN PTFE | VIRGIN PTFE | VIRGIN PTFE | VIRGIN PTFE | VIRGIN PTFE | VIRGIN PTFE |
| 2 | CASING | 1/2 | | A36 | A36 | A36 | A36 | A36 | A36 | A36 | A36 |
| 1 | STAINLESS STEEL PLATE | 1 | | SS | SS | SS | SS | SS | SS | SS | SS |

MATCL

Technip

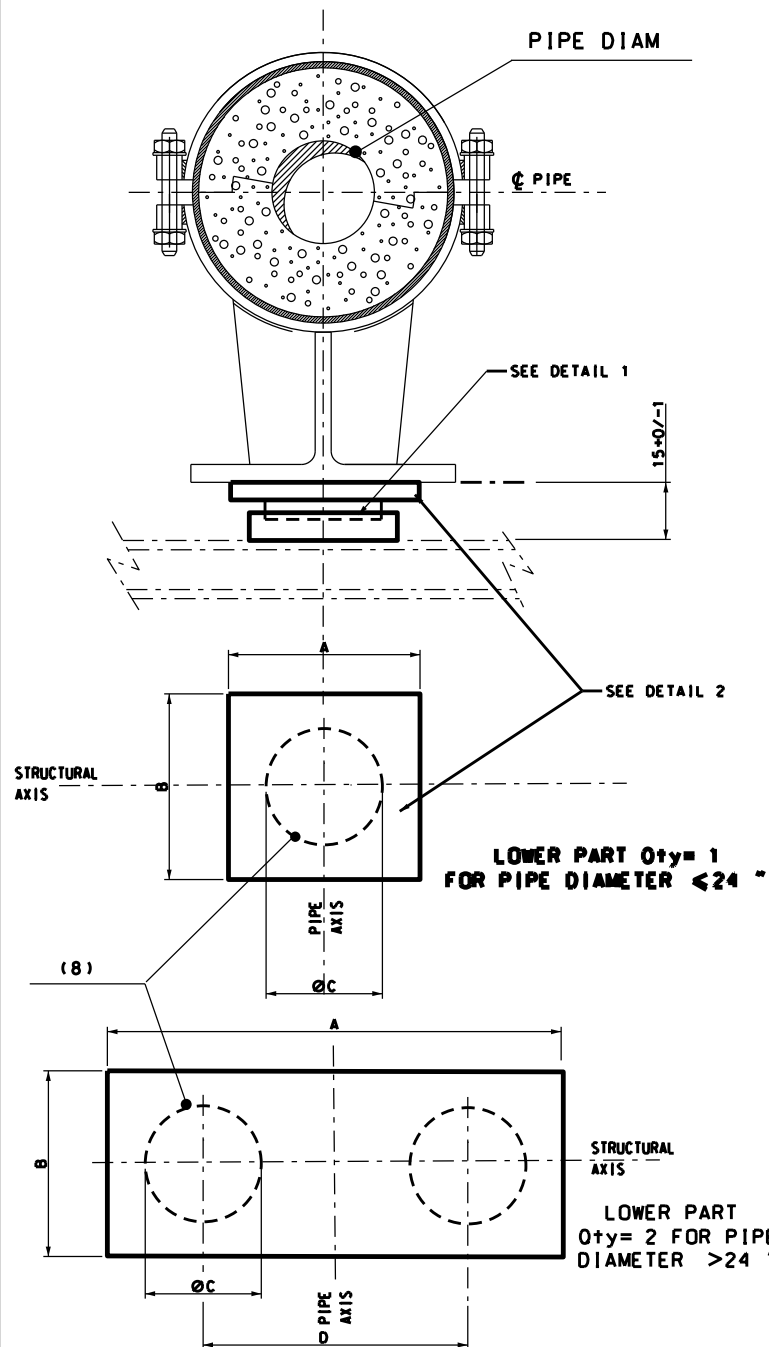
ANTIFRICTION SLIDING PLATES

HS01

STANDARD CONSTRUCTION DRAWING
PLANT DESIGN AND PIPING

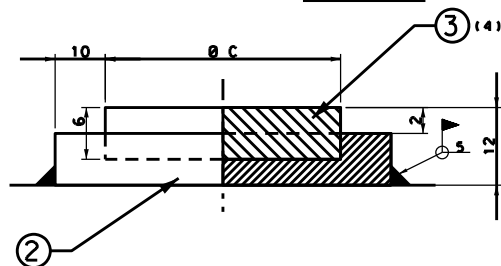
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| PIPE DIA. | INSUL. THK | CR61/CR62(3)(5) | |
|-----------|------------|-----------------|-----|
| | | A | B |
| 14" | < 25 | 280 | 380 |
| | < 50 | 280 | 380 |
| | < 80 | 330 | 380 |
| | < 100 | 330 | 380 |
| | < 130 | 370 | 380 |
| | < 150 | 370 | 380 |
| | < 180 | 400 | 380 |
| | < 200 | 400 | 380 |
| 16" | < 25 | 280 | 380 |
| | < 50 | 280 | 380 |
| | < 80 | 280 | 380 |
| | < 100 | 370 | 380 |
| | < 130 | 400 | 380 |
| | < 150 | 400 | 380 |
| | < 180 | 430 | 380 |
| | < 200 | 430 | 380 |
| 18" | < 25 | 330 | 380 |
| | < 50 | 330 | 380 |
| | < 80 | 370 | 380 |
| | < 100 | 370 | 380 |
| | < 130 | 430 | 380 |
| | < 150 | 430 | 380 |
| | < 180 | 470 | 380 |
| | < 200 | 470 | 380 |
| 20" | < 25 | 370 | 380 |
| | < 50 | 370 | 380 |
| | < 80 | 430 | 380 |
| | < 100 | 470 | 380 |
| | < 130 | 470 | 380 |
| | < 150 | 510 | 380 |
| | < 180 | 510 | 380 |
| | < 200 | 550 | 380 |
| 24" | < 25 | 430 | 380 |
| | < 50 | 430 | 380 |
| | < 80 | 430 | 380 |
| | < 100 | 470 | 380 |
| | < 130 | 470 | 380 |
| | < 150 | 510 | 380 |
| | < 180 | 510 | 380 |
| | < 200 | 550 | 380 |

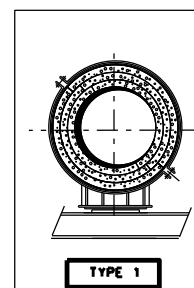
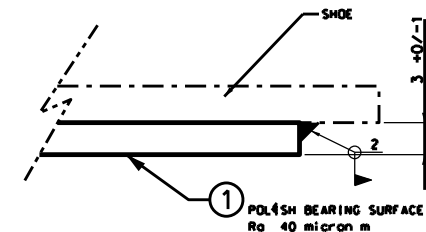
LOWER PART DETAIL 1



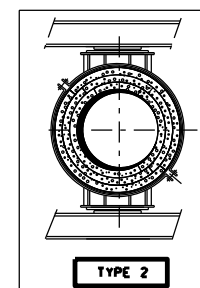
| TBL 1 | |
|---------|---------------|
| ØC (mm) | MAX LOAD (KN) |
| 50 | 14 |
| 80 | 35 |
| 120 | 79 |
| 160 | 140 |

LOADS AT AMBIENT TEMPERATURE (25° C)

UPPER PART DETAIL 2



TYPE 1



TYPE 2

NOTES:

1. SLIDING PLATES ARE REQUIRED FOR PIPE DIA. 14" AND ABOVE EXCEPT STRESS ANALYSIS REQUEST.
2. STAINLESS STEEL PLATES SHALL BE ADJUSTED CONSIDERING THE SUPPORT BASE PLATE.
3. ALL DIMENSIONS ARE TO BE CHECKED AND SPECIFIED ON DATA SHEET SP 1384 01 ACCORDING TO EFFECTIVE LOADS AND DISPLACEMENTS.
4. PTFE TO BE REMOVED BEFORE WELDING..
5. FOR OTHER SHOE LENGTH OR LONGIT. PIPE DISPLACEMENT ABOVE 50mm, SS PLATE SHALL BE INCREASED BY STEP 100mm AND SPECIFIED ON DATA SHEET SP 1384 01.
6. DELETED
7. DELETED
8. DELETED

Support Mark

| HS02 | ITEM | DIAM | TYPE | A | B | Ø C | D |
|------|------|------|------|---|---|-----|---|
|------|------|------|------|---|---|-----|---|

Technip

ANTIFRICTION SLIDING PLATES
ON COLD LINES (UNDER/UPPER)

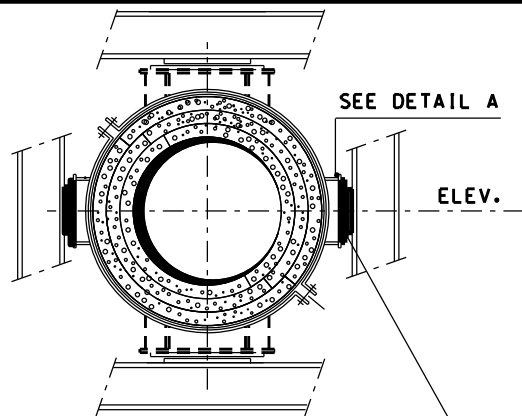
HS02

STANDARD CONSTRUCTION DRAWING
PLANT DESIGN AND PIPING

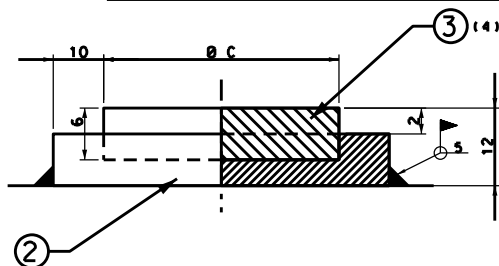
XXXXXXXXXX 000 STC 139-19 1 of 1 0
Project Unit Doc. Code & Serial No. Page Rev.

| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH |
|------|-----------------------|------|--------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|----|
| 3 | INSERT. PLATE | 1/2 | | VIRGIN PTFE | VIRGIN PTFE | VIRGIN PTFE | VIRGIN PTFE | VIRGIN PTFE | VIRGIN PTFE | VIRGIN PTFE | |
| 2 | CASING | 1/2 | | A36 | A36 | A36 | A36 | A36 | A36 | A36 | |
| 1 | STAINLESS STEEL PLATE | 1 | | SS | SS | SS | SS | SS | SS | SS | |

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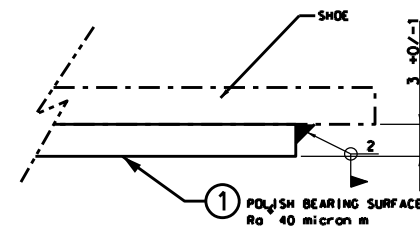
SIDE PART (WELDED ON STRUCTURAL PART)



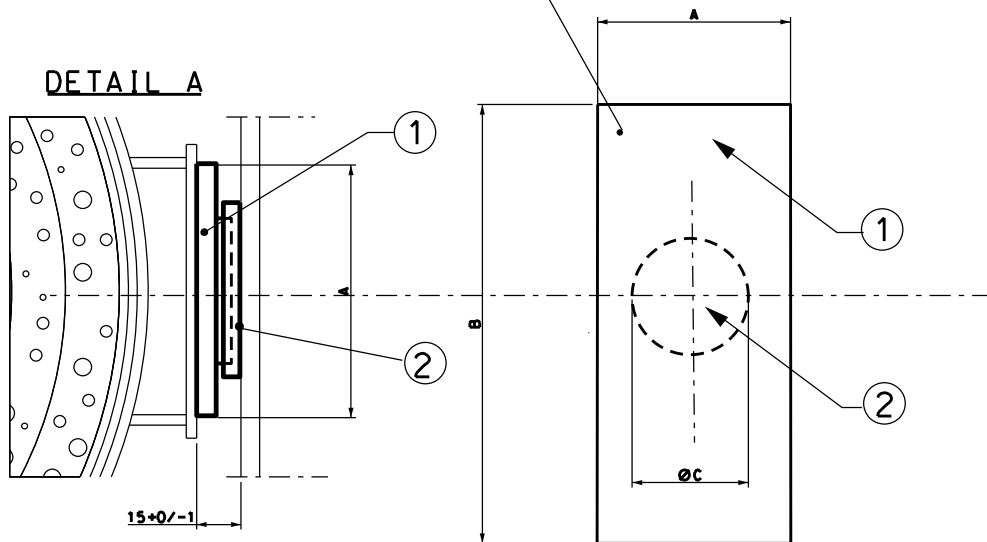
| TBL 1 (4) | |
|------------|------------------|
| ØC (mm) | MAX LOAD (KN) |
| 50 | 14 |
| 80 | 35 |
| 120 | 79 |
| 160 | 140 |

LOADS AT AMBIENT
TEMPERATURE (25° C)

SIDE PART (WELDED ON PIPE SHOE)



DETAIL A



| STAINLESS STEEL DIMENSIONS (3) |
|-----------------------------------|
| A X B |
| 100 X 300 |
| 160 X 300 |
| 160 X 400 |
| 200 X 500 |
| 200 X 600 |
| 250 X 500 |
| 250 X 600 |

NOTES:

- SLIDING PLATES ARE REQUIRED FOR PIPE DIA. 14" AND ABOVE EXCEPT STRESS ANALYSIS REQUEST.
- STAINLESS STEEL PLATES SHALL BE ADJUSTED CONSIDERING THE SUPPORT BASE PLATE.
- ALL DIMENSIONS ARE TO BE CHECKED AND SPECIFIED ON DATA SHEET SP 1384 01 ACCORDING TO EFFECTIVE LOADS AND DISPLACEMENTS.
IF OTHER LENGTHS REQUIRED, STEP SHALL BE BY 100.
- PTFE TO BE REMOVED BEFORE WELDING
- DELETED
- DELETED
- DELETED

Support Mark

HS03 ITEM DIAM A B Ø C

Support Mark

ELEV

| ITEM | DESCRIPTION | QTY. | DETAIL | CS | CH | CL | CG | AS | AH | SS | SH |
|------------------------------|-----------------------|------|--------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 3 | INSERT PLATE | 2 | | VIRGIN PTFE | VIRGIN PTFE | VIRGIN PTFE | VIRGIN PTFE | VIRGIN PTFE | VIRGIN PTFE | VIRGIN PTFE | VIRGIN PTFE |
| 2 | CASING | 2 | | A36 | A36 | A36 | A36 | A36 | A36 | A36 | A36 |
| 1 | STAINLESS STEEL PLATE | 2 | | SS | SS | SS | SS | SS | SS | SS | SS |
| ITEM DESCRIPTION QTY. DETAIL | | | | CS | CH | CL | CG | AS | AH | SS | SH |

MATCL

Technip

ANTI FRICTION SLIDING PLATES ON
COLD LINES (FOR HEAVY AXIAL LOADS)

HS03

STANDARD CONSTRUCTION DRAWING
PLANT DESIGN AND PIPING

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