

# **EK 29. BORU HATTI MONTAJ UYGULAMA PLANI (PIPELINE ERECTION METHOD STATEMENT) ÖRNEĞİ**

## **ONSHORE PIPELINE ERECTION METHOD STATEMENT**

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### **1. SCOPE**

This Method Statement defines the minimum requirements for the engineering, materials, erection, quality requirements, inspection, testing, documentation, safety implementation of the onshore pipelines.

The work includes the preparation of all procedures, furnishing of labour, materials, tools and equipment and the performance of all operations necessary for safe installation and subsequent operation of the pipeline.

Below listed, detailed installation Method Statements will be prepared and submitted to Client, before the works can be carried out:

- Setting out,
- Fencing,
- Construction of access roads,
- Topsoil strip,
- Earth works and dewatering,
- Trench excavation and backfilling,
- Crossing of existing services,
- Pipe receipt, storage and handling,
- Pipe stringing,
- Pipe welding and NDT,
- Field joint coating and coating repair,
- Pipeline lowering-in,
- Pipeline tie-ins,
- Cathodic Protection, Ground Bed Installation,
- Safety,
- Reinstatement.

The Contractor shall follow the contractual documents including the project specifications, national or international standards, drawings and applicable codes. The latest edition (if not stated otherwise) of these documents, including all parts and amendments, current at the time Contract award, shall apply and form an integral part of this procedure.

The Contractor shall prepare contingency plans for equipment breakdown, which could completely or temporarily stop the installation operations.

## **2. ENGINEERING**

The Contractor shall carry out all site engineering work including review of all documents required for the detailed engineering.

Contractor shall provide clear and detailed engineering calculations and drawings. Drawings showing Contractor's proposed installation methods, sequences and construction aids shall be produced. The calculations and drawings shall address, but not limited to, the following:

- Geotechnical calculations, associated drawings for temporary works such as access roads, trench support systems, if required, piling and dewatering systems,
- Detailed drawings showing the proposed method of crossing construction of existing roads and services,
- Excavation stability calculations,
- Detailed calculations for the pipeline stresses during lowering-in operations,
- Drawing of the site layout, including proposed storage areas of pipes, fittings, excavated material and fuel spillage containment,
- Drawing showing the proposed sequence of the lowering-in/tie-in operations,
- As Built drawings

## **3. INSTALLATION WORKS**

### **3.1 EQUIPMENT**

All equipment required for the performance of the work shall be in full working order and good condition. Stationary mechanical equipment shall be fitted with drip trays at all times. Main equipment to be supplied are: Sideboom pipe layers, welding machines, bevelling machines, excavators, bulldozers, scrapers, cranes, transport equipment.

The lowering-in equipment shall have the capability to safely lower the pipeline into the excavated trench. All equipment proposed shall be in good working condition and will have a valid certification. Machines without current calibration certificates shall not be used. Contractor shall execute the works in a manner consistent with good and safe construction practice.

### **3.2 SITE PREPARATION and FENCING**

Prior to the commencement of the work, Contractor shall carry out a pre-entry survey to agree and record with the Client, the existing condition of areas where work is to be carried out or access to be provided.

Site preparation consists of the setting out, fencing, construction of access roads and topsoil strip. Temporary access roads shall be constructed using compacted well graded granular material. Granular material shall only be obtained from selected and approved quarries with valid licences. Service crossings over roads, pipelines, cables, drains or other services shall be capable of withstanding all construction and further traffic loads. The service shall be clearly fenced off such that access across the service is only used for construction purposes.

Roads shall always be maintained in good condition.

Top soil and other surface materials over the right of way (ROW) area, shall be stripped to a depth of 300 mm or as agreed with Client, over the full width of the site to be affected by the construction works. They will be located either to one side of the working width, in such a way not to affect the further pipe erection works, or to a designated outside storage area. Surface materials shall be kept separate from other spoil and free from the passage of vehicles and plant to facilitate their replacement in the original position after completion of the works.

The working width of ROW shall be decided and graded considering to allow the passage and working of construction vehicles and pipe stringing and laying.

Where necessary, the ground shall be dewatered during earthworks, to avoid the dust problem to the neighbour areas and local residents.

### 3.3 TRENCH EXCAVATION and BACKFILLING

Contractor shall ensure that all works relating to stripping of surface materials, trench excavation and storage of excavated materials is appropriate and keep the excavation to the minimum practical so as to reduce the extent of disturbance.

Slopes of excavations shall be formed to avoid the collapse. For deeper excavations, which cannot be stabilised, specific trench support systems or steel sheet piling might be used. All exposed surfaces shall be maintained in a stable condition to avoid erosion of excavated surfaces and storage areas.

Trenches shall be levelled to provide even and continuous support to the pipeline, and any organic materials, stones, boulders or obstructions shall be removed and disposed.

Suitable excavated material, other than surface materials, if suitable for backfill, shall be stock piled at one side of the trench and after pipe laying works completed, backfilled to the trench.

Pipe will be covered by soft sand at 200 mm layers to protect the pipe coating from any damage. It shall be thoroughly compacted by hand rammers.

The marker tape shall be laid after 400 mm of backfill above top of pipe shall have the warning "GAS/OIL PIPELINE BELOW".

After laying marker tape, the remaining excavated material shall be returned to the trench at 300 mm layers and thoroughly compacted by mechanical vibrators/rammers.

No vegetable or other perishable material shall be filled into the trench. Special care shall be taken to prevent stones or other debris which may cause damage to the pipeline corrosion coating from coming into contact with the pipe.

Where it is considered by Client, that the excavated material is unsuitable as backfill, suitable material from the nearest source accepted by Client shall be imported, in sufficient quantities to cover the pipe to the required depth.

Whole excavations shall be kept clear of water during the progress of the works. Silting or contamination of ditches, drains or ground water shall be avoided.

Well point de-watering and stabilising equipment shall be used when required and after agreed with Client.

It is the responsibility of Contractor to positively locate all known services within the working areas, by hand dug trial pits.

Excavation shall be carried out in accordance with the "Trench Excavation and Backfilling Method Statement".

Exposed lengths of pipelines and cables shall be supported at all times and particular care shall be taken to support the trench sides, to avoid the damage to services.

Road and rail crossings shall be installed in accordance with the drawings.

Reinforced concrete protective slabs shall be placed over the pipeline, at service crossings. The concrete slabs shall be a minimum of 150 mm thick and shall extend beyond the pipe, for at least 150 mm on either side. The slabs shall extend at least three meters either side of the service being crossed and shall be separated from the pipeline by at least 150 mm of fine grained material. Slab settlement shall be minimised by careful selection of backfill material and thorough material compaction.

On completion of backfilling operations, permanent surface warning tiles shall be placed on the pipelines to indicate their points of intersection with other services.

Drainage systems shall be installed within the construction area if necessary to protect existing waterways and to control storm water runoff.

The systems shall be designed to discharge water to a collecting pits. If required, oil separator and/or sediment traps shall be installed in the drains, to prevent the contamination of ground water.

### 3.4 PIPELINE CONSTRUCTION

**Pipe Storage and Handling:** The handling of all materials, fittings and equipment (i.e. loading, hauling, unloading, racking, storing, assembling) shall be performed in a safe manner, such that they shall be protected from damage or loss. Contractor shall repair or replace all materials; fittings or other equipment damaged and/or lost resulting from its operations.

Pipe being transported shall be carried in shaped cradles or trailers, lined with protective rubber or similar sheeting. Pipes shall be adequately secured in such a manner as to prevent damage to the pipes and/or anti-corrosion coating.

In order to prevent damage, pipes and fittings shall not be placed directly on the ground but shall be raised on proper timbers.

**Pipe Stringing:** Pipes shall be offloaded and strung along the route of the pipeline, not parallel or perpendicular to trench direction but with some degrees angle. At intervals, sufficient gaps shall be left between pipes to allow access across the working width as required. Pipes and fittings shall not be placed directly onto the ground.

**Pipe Welding and NDT:** Welding and NDT shall be carried out in accordance with “Welding Method Statement”.

The inside of each pipe and fitting shall be examined for cleanliness and all foreign matter shall be removed by having a brush type cleaning disc, pulled through each length just before fit up. End protection caps shall be retained in position, as long as practicable.

The pipeline shall at all times be kept free of foreign material and water, and when work is not in progress, the open ends of pipes, fittings and pipeline shall be securely capped.

**Field Joint Coating/Coating Repair:** Prior to lowering the pipeline into the trench, the weld joints with missing coating will be coated as per specifications and the pipeline shall be holiday detected. Any coating repairs required, shall be carried out in accordance with the specification.

**Pipeline Lowering-in:** The pipeline shall be lowered into the trench as soon as possible after the trench has been excavated. Special care shall be shown to ensure that the pipe coatings will not be damaged during the lowering-in and also the pipeline is not laid in an overstressed condition. Any damage to the pipe coating indicated by holiday detection prior to, or during the lowering operation shall be repaired as early as possible.

**Cathodic Protection :** The cathodic protection system shall be installed as per the specification and related standards.

**Pipe tracking and identification:** Contractor shall have and follow a pipe tracking system and a Pipeline Weld Log.

This log shall be daily recorded by the Contractor and reviewed by the Client’s representative. This log shall include the following information as a minimum for each joint.

- Field joint number,
- Pipe number,
- Weld number,
- Weld details,
- Details of any repairs,
- Joint lengths,
- Cumulative length,
- Pipeline kilometre post coordinates,
- Anode installations.

The system shall be capable of rapid identification of records and adequate means for correlation between this data and the general documentary records of the work.

**Ground markers** shall be erected at all track, road and watercourse crossings, field boundaries and elsewhere as required to identify the pipeline(s) and indicate its position.

### 3.5 REINSTATEMENT

Reinstatement works to all disturbed areas shall be carried out in accordance with the requirements of the Contract, to the complete satisfaction of Client.

Reinstatement works shall be completed in accordance with a programme developed by the Contractor and accepted by the Client prior to work commence. Seeding and planting shall, if necessary, be delayed until the appropriate season.

Where land has been graded to a lower elevation, to facilitate the passage of construction equipment, to minimise pipe bending or for any other reason, then such land shall be restored to its original contour, unless otherwise agreed by Client or the landowner.

Areas used for storage area and/or site facilities, shall be cleared and all temporary works and construction debris shall be removed and disposed of off-site. Following re-contouring of the construction site and restoration of surface materials, all work shall be performed manually. After restoration of surface materials, access to all vehicles, plant and equipment will not be allowed, except light equipment required for stabilisation.

All spoil heaps shall be levelled and the land shall be reinstated to its original condition.

The landfill shall be reinstated with material previously excavated from the area.

The fencing, indicating the work area shall be removed after the completion of all operations.

Roads, tracks and footpaths shall be permanently reinstated to a condition equivalent to that existing before the commencement of the works and to the requirements of the Contract and the satisfaction of Client.

Dykes, sheet piling, channels and other temporary works installed during the construction of the pipeline shall be removed and areas will be restored to their original condition.

In the absence of any specific information, the restoration shall be carried out in a manner satisfactory to Client.

All auxiliary structures such as bridges, culverts, sheet piling, posts, signs, temporary parking areas, etc. which were erected or installed by Contractor as temporary measures, shall be removed, unless acceptance of Client has been obtained.

Any damage which occurs during the removal of any Temporary Works to the pipe, adjacent facilities, or adjoining land, shall be repaired or reinstated to the satisfaction of Client.

#### **4. SAFETY**

Contractor shall conduct his work in accordance with the Health, Safety and Environment (HSE) requirements of the Contract.

Contractor shall undertake the work with due care, in compliance with Client's requirements, which include, but are not limited to the following:

- Traffic congestion shall be minimised,
- Agreed transport routes at ROW and out of ROW to be established,
- Road access shall be limited and controlled,
- Parking areas shall be identified prior to commencement of the work and controlled,
- In agreement with the Client, accommodation place for workers and staff will be arranged at Site or off the Site,
- Contractor will arrange a safe and appropriate transport between accommodation and the work place,
- Where accommodation is provided, the facilities will be regularly checked as part of a health and safety inspection,
- Appropriate safety and warning signs shall be used to give warning of pipeline works and hazards,
- Dust, noise and vibration limits will be controlled in accordance with legislation, planning consents and with due concern for the local authorities and residents,
- The construction site will be regularly checked as part of a health and safety inspection,
- A restriction on working hours except for critical work may be imposed,
- Appropriate measures shall be taken for disposal of rubbish and under no circumstances shall rubbish be left uncontrolled,
- The temporary site facilities will be subject to health and safety inspection ,
- Compliance with Client's permit to work system is mandatory,
- Contractor will comply with permits for treatment and discharge of pipeline hydrotest water,
- Emergency arrangements shall be in place in case of an accident at Site,
- First aid and medical facilities will be available at Site.

## 5. DOCUMENTATION

Throughout the pipeline installation activities, accurate records shall be kept and transmitted directly to Client's office on a daily basis. These reports shall include, but not be limited to, the following:

- Date and location of pipeline activities for each discipline (trench excavation, pipe weld, joint coating, laying, backfill, etc.)
- Log of activities
- Personnel available on site
- Equipment available on site
- Outline of any equipment failures
- Number of Pipe Joints welded (total and daily)
- Length of pipeline (total and daily) laid
- Cumulative length and length of line left to complete
- A brief description of present progress and weather
- Summary of any repairs made to equipment or to the pipeline
- Outline of any other problems encountered.
- Accidents/LTI Reporting
- Comments

Upon completion of the work, an as-built survey shall be carried out and recorded on as-built drawings.

Satisfactory results shall be documented prior to acceptance of the work.

Final documentation shall describe the as-built status and shall include, but not limited to the following:

- NDT reports
- List of qualified welders
- Weld radiographs
- Weld repair reports
- Pipe tracking records
- Consumables test certificates
- As-built survey including weld / pipe / welder number, pipe level and position etc.
- Land damage records.
- Restatement drawings and photographs.
- As-built drawings
- Permanent material certificates
- Daily logs/reports