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**TECHNICAL JOB  
SPECIFICATION**

**499/9**

**REVISION 0**

**DATE 05/04/2011**

# **HIGH PRESSURE (HP) TRANSMISSION SYSTEMS**

## **CONSTRUCTION OF DRAINS**

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**QUALITY ASSURANCE PAGE**

**CHANGES LOG**

**REVISIONS LOG.**

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### REFERENCE DOCUMENTS

- Std Drawing No. STD-1-43-01  
[Drainage and Sewer Pit]
- Hellenic Regulation for Concrete Sewer Pipes (ΦΕΚ 253B/24.4.84).
- ΠΕΤΕΠ 08-06-01-00 (ΥΠΕΧΩΔΕ)  
«Δίκτυα Βαρύτητας από Τσιμεντοσωλήνες»  
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- ELOT EN 124  
[Gully tops and manhole tops for vehicular and pedestrian areas - Design requirements, testing, marking and quality control]
- ELOT EN 476  
[General requirements for components used in discharge pipes, drains and sewers for gravity systems]
- ELOT EN 1610  
[Construction and testing of drains and sewers]
- ELOT EN 12201  
[Plastics piping systems for water supply - Polyethylene (PE)]
- ISO 4435  
[Plastics piping systems for non-pressure underground drainage and sewerage - Unplasticized poly(vinyl chloride) (PVC-U)]

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## 1.0 SCOPE

This specification covers materials and works for installation of drains at Line Valve Scraper Stations for the natural gas transmission lines.

For the installation of drains, the following requirements, listed in order of precedence shall be fulfilled:

- this specification
- Hellenic Regulation for Concrete Sewer Pipes (**ΦΕΚ 253B/24.4.84**).
- **ΠΕΤΕΠ 08-06-01-00** (ΥΠΕΧΩΔΕ) «Δίκτυα Βαρύτητας από Τσιμεντοσωλήνες» Ministry of Public Works- Concrete drainage pipes

## 2.0 MATERIALS

### 2.1 **CONCRETE PIPES FOR DRAINS AND CLEAN SEWER**

Pipes of mass concrete shall be as per **ΠΕΤΕΠ 08-06-01-00** (ΥΠΕΧΩΔΕ) «Δίκτυα Βαρύτητας από Τσιμεντοσωλήνες» Ministry of Public Works- Concrete drainage pipes.

### 2.2 **PLASTIC PIPES**

Plastic pipes shall be unplasticized polyvinyl chloride (PVC-U) pipes for underground drainage networks manufactured according to **ELOT EN 476 or ISO 4435**.

### 2.3 **MANHOLES AND GULLIES**

Manholes shall be made of reinforced concrete.

Manhole dimensions, concrete grade, reinforcement, etc. shall be according to **Std Dwg. No. STD-1-43-01**.

Manholes shall be watertight.

Gullies shall be tight and shall have connecting branch, 100 mm water trap, and 400 mm sediment collector.

### 2.4 **MATERIAL FOR JOINTS**

Ring seals in accordance with Manufacturer standards shall be used for PVC pipes. Concrete pipe joints shall be sealed with rubber gaskets as per **ΠΕΤΕΠ 08-06-01-00**.

### 2.5 **COVERS AND GRIDS**

According to **ELOT EN 124**. Cover and frame of 1.2 m manholes shall be cast iron.

Grid bearing on 0.3 m gully: City-gutter grid with safety lock, heavy duty. Gully cover to be heavy duty grating.

## 3.0 CONSTRUCTION

### 3.1 **EXCAVATION**

Before commencing excavation Contractor must take into consideration the drainage system of the station and where this is required, the ground inclinations and submit for review and approval a relevant study with an application drawing. Surface materials and humus etc shall be stored in separate piles for later reinstatement.

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Pipelines and cables which are exposed during the excavation shall be secured against damage and frost by means of adequate support and insulation.

No conduits or drains may be disconnected without the Supervisor's permission.

Care shall be taken during excavation near trees, so that the roots will be cut to the least extent necessary.

If by Contractor's mistake, the excavation is too deep, the bottom shall be filled with sand up to the correct elevation and shall be thoroughly compacted without any extra cost to the Owner.

### **3.2 LAYING AND ASSEMBLING**

Pipelines shall be laid on a leveling layer of 100- 150 mm thick sand. Normal laying and support conditions are to be anticipated, in accordance with contractual codes & documents.

Drain pipes shall be surrounded by a filter material or suitable drainage gravel of the following composition:

- no more than 15% shall pass the 0.125 mm sieve.
- more than 15% shall be withheld by 2 mm sieve.

This material shall be at least 100 mm thick and it shall be subject to approval by the Supervisor.

Assembling of concrete and PVC pipes shall be made with ring seal joints, using rings supplied by the pipe supplier for the pipe type and size in question.

Before the joint is made, care shall be taken that both the spigot (tongue) end and the socket (groove, bell) end are clean and undamaged. The rubber ring shall be positioned in accordance with the Supplier's instructions and may not be twisted or set askew on the pipe.

In order to achieve the tightness prescribed, care shall be taken during the assembly of pipes so that the insertion takes place when the pipe is in the correct position and parallel to the pipe axis. The pipe may never be wriggled into place.

The rings shall be kept free of frost and protected against sunshine.

### **3.3 BACKFILLING**

Backfilling of the trench shall take place immediately after the pipe laying has been approved.

For concrete pipes, the backfill shall be spread successively on both sides of the pipes and shall be compacted in maximum 0.15 m thick loose layers and shall, all along the trench, be carefully compacted so that there is friction against the sides of the trench. Compaction shall therefore be continued after the shoring, if any, has been removed.

For PVC pipes, a protective layer of 100 mm sand shall be laid over the top of the pipe.

After backfilling and laying of the protective layer, further backfilling shall take place.

At roads, the backfill shall be compacted so that it attains the same carrying capacity as the ground beside the trench.

During compaction of the material above the pipe, such a method shall be chosen that in consideration of the strength of the pipe and the immediate earth cover, no overloading of the pipe shall take place.

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Furthermore in case of traffic with heavy equipment in or above the trench, security shall be provided so that the pipe shall not be overloaded.

**3.4 SUPPLEMENTARY WORKS**

Before completion the drainage system shall be rinsed thoroughly with water. Covers and grids shall be cleaned from earth, concrete, etc. and shall be adjusted to the height of the surrounding ground or pavement surface. Settlement within the guarantee period shall be repaired and necessary reinstatement shall be made by Contractor, without any extra cost to the Owner.