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**TECHNICAL JOB
SPECIFICATION**

499/6

REVISION 0

DATE 05/04/2011

HIGH PRESSURE (HP) TRANSMISSION SYSTEMS

FENCING

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REVISIONS LOG

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REFERENCE DOCUMENTS

Std Drawing No. STD-0-41-07

ELOT EN ISO 1461

[Hot dip galvanized coatings on fabricated iron and steel articles - Specifications and test methods]

EKTΣ - ΦΕΚ 315Β 1997

«Ελληνικός Κανονισμός Τεχνολογίας Σκυροδέματος»
[Hellenic Concrete Technology Regulation]

EΚΤΧ - ΦΕΚ 381Β 2000

«Ελληνικός Κανονισμός Τεχνολογίας Χαλύβων Οπλισμού Σκυροδέματος»
[Hellenic Reinforcement Technology Regulation]

ΕΚΩΣ – 2000 ΦΕΚ 1329Β

«Ελληνικός Κανονισμός Οπλισμένου Σκυροδέματος»
[Hellenic Reinforced Concrete Regulation]

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1.0 **SCOPE**

This specification covers the delivery and erection of fencing for natural gas pipelines.

For the fencing around land property of line valve stations and M/R Stations the requirements of the following, listed in order of precedence, shall be fulfilled:

- This specification.
- Documents to which reference is made in this specification.
- **ELOT EN ISO 1461.**

2.0 **MATERIALS**

2.1 **POSTS AND FITTINGS FOR THE FENCE**

Precast reinforced concrete posts, with a 45° bent at the top and a cross-section approximately 120 x 120 mm and 3150 mm long shall be used.

Concrete of posts shall be grade C16/20 according to **Hellenic Reinforced Concrete Regulation** and **Hellenic Concrete Technology Regulation**. Reinforcing bars shall be grade S500s according to **Hellenic Reinforced Concrete Regulation**.

Every corner post as well as every third post shall be braced by reinforced concrete brace, 2000 mm long, having the same cross section and reinforcement as that of the post.

Brace shall be connected with the post through an embedded pipe sleeve, DN 20 3/4" dia and a connecting bolt M16 as shown on **Std Dwg No. STD-0-41-07**. Posts shall be delivered with the necessary fittings for fastening braces, tension wire and barbed wire.

All steel fittings and connecting items shall be hot galvanized.

2.2 **FENCE NETTING, TENSION WIRE AND BARBED WIRE**

Fence netting of hot galvanized shall be delivered 2000 mm wide.

The mesh size shall be 50 mm and the wire diameter shall be minimum 3.0 mm grade Fe 360. Zinc thickness shall be 10 microns.

Tension wire shall be of 4 mm hot galvanized wire as per **ELOT EN ISO 1461**. Turnbuckles and lugs shall be of stainless steel.

Barbed wire shall be delivered with 4-pointed barbs per approx. 80 mm and shall be made of hot dip galvanized wire, gauge No. 16 1/2.

All fittings for fixing the tension and barbed wire on the posts shall be made of hot dip galvanized wire, 4 mm diameter embedded in or welded on the posts.

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2.3 GATES

Gateposts shall be delivered as DN 150 steel pipes, with a min. wall thickness of 5.0 mm and 3500 mm long. End sections of steel pipe posts, shall be sealed by means of welding steel plates 10 mm thick.

Braces shall be 50 x 50 x 6 mm angle section steel bars.

Gate framework shall be made from DN 65 steel pipe, with 3.5 mm min wall thickness. The top of the framework shall be equipped with 3 rows of barbed wire, same as that of the fence. Posts, braces and gate framework shall be hot dip galvanized.

Alternatives of a similar quality may be approved by the Owner Representative.

The height of gate frame shall be 2000 mm approx. but the total height of framework including barbs shall be such as to match the height of the fence.

Bracing of 16 mm round section rods shall be used for larger gates (for vehicular traffic).

Gates shall be delivered with inset 50 mm mesh grille of 3 mm round section light metal wire, mounted on a stringer frame of galvanized 10 mm round section bar welded to the gate frame by means of spacers.

Hinges shall be delivered with adjustable pintles and shall be equipped with grease nipples.

Catches shall be provided to hold the gates at open position.

The two leaves of double gates shall be flushed by a steel strip (stopper), when closed.

They shall be equipped with a flush bolt, which prevents the one leaf of the gate to open when the other leaf is closed.

Double gates shall close by means of a hasp made from 50 x 10 x 1200 mm flat bar. The hasp shall be equipped with a handle of 12 mm round section bar and 18 mm holes for a padlock, which shall be operated from the interior of the station only.

The hasp shall be lockable at both open and closed positions.

Gates shall be secured against lifting-off their hinges when are at closed position.

Padlocks shall be delivered for the gates. These shall have cadmium treated loop and 5 keys, and shall form part of the Owner central locking system. The Contractor shall submit to the Owner Representative various types of padlock for approval.

Pedestrian door shall be equipped internally and externally with steel fittings for a padlock with the same key-code as of the gate. The holes shall be 18 mm.

Furthermore, there shall be a latchlock with a brass latchbolt. The lock shall be equipped with a handle of stainless steel.

All steel for gates etc. shall be delivered hot dip galvanized. The Contractor shall submit shop drawings for approval.

Alternatives of a similar quality may be approved by the Owner Representative.

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3.0 INSTALLATION

3.1 ERECTION OF POSTS

Posts shall be erected at equal distance apart in straight lines and all posts shall be vertical.

The necessary site adjustment shall be done along the property line. The concrete posts and concrete braces shall be fixed in concrete foundations of approximate dimensions 500 x 500 x 500 mm while the concrete foundations for steel pipe posts shall be 500 x 500 x 1000 mm approx.

The distance between the posts shall be max. 3000 mm. Braces shall be erected at corner posts and at every third post.

3.2 MOUNTING OF WIRE

The upper edge of wire mesh shall be 2100 mm above ground.

The fence shall be equipped with 3 rows of tension wire at the upper edge, lower edge and mid-height of the fence mesh. The tension wire shall be hot dip galvanized, 4 mm diameter.

The lower edge of wire mesh, together with the lower row of tension wire, shall be 50mm above the concrete curb after alignment and fixing. The concrete curb with cross section 200 x 200 mm approx. shall be grade C12/15. Three rows of barbed wire (with a separation of 250 mm) shall be placed above the fence netting.

3.3 MOUNTING OF GATES

Gateposts shall be embedded 900 mm into the concrete foundations. The lower edge of the foundation shall be 900 mm below ground.

The upper edge of gate and pedestrian door shall be at the same height as the fence.

Stops for double gates shall be cast in concrete foundation. Size of concrete foundation shall be 350 x 350 x 700 mm approx., at a depth of 800 mm.

Stops shall be equipped with catches for holding the gates at open position.

Gates shall be erected vertically and the lower edge shall be approximately 100 mm above ground.

3.4 CONCRETE FOUNDATIONS

Concrete foundations shall be grade C20/25 in accordance with the **Greek Reinforced Concrete Regulation**, i.e. ΕΚΩΣ 2000 ΦΕΚ 1329Β.