



**“ARCHAEOLOGICAL WORKS AND PUBLIC  
UTILITY ORGANIZATIONS NETWORK  
RELOCATIONS – ATHENS METRO LINE 4,  
SECTION A’ ALSOS VEIKOU GOUDI”**

**RFP-322/17  
(Α.Σ. 66925)**

**MATERIALS AND WORKMANSHIP  
SPECIFICATIONS**

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**GENERAL**

The document “Materials and Workmanship Specifications” includes the requirements of ΑΤΤΙΚΟ ΜΕΤΡΟ S.A. (AM) concerning the technical specifications for the materials to be incorporated in the Project and the works to be executed in the framework of this Project.

The articles of this document cover scopes of the permanent structures (e.g. PUO networks pipes), the temporary structures (e.g. retaining of trenches’ slopes) and/or the auxiliary installations and elements (e.g. worksite fencings) necessary for the execution of the Project.

The numbering of the articles of the Material and Workmanship Specifications follow the numbering system established by AM in its projects.

On the basis of the Ministerial Decision # ΔΙΠΑΔ/ΟΙΚ/273/17-07.2012 (ΦΕΚ 2221/Β/30.07.2012), the approved Greek Technical Specifications (EΤΕΡ) shall necessarily apply to the pertinent scopes of the Project. As regards those scope of works not covered by the applicable EΤΕΡ, applicable shall be the articles utilized by AM, which have AM’s own paragraph-presentation system and which have been updated for the current project.

In addition, on the basis of Circular #26 ΔΙΠΑΔ/ΟΙΚ/356/04.10.2012, paragraph 13, during the preparation of the Material and Workmanship Specifications for the tendering of this Project AM has added, on as needed basis, a Chapter Β - “Supplementary Requirements” to the articles where respective EΤΕΡs are applicable. This Chapter contains supplementary terms and it makes reference only to the affected paragraphs of EΤΕΡs, presenting also the respective additions, modifications or corrections.

It is hereby reminded that by virtue of Ministerial Decisions No. ΔΚΠ/οικ./1211/01.08.2016, ΔΙΠΑΔ/ΟΙΚ/469/23.09.13, ΔΙΠΑΔ/οικ./628/07.10.2014 & ΔΙΠΑΔ/οικ./667/30.10.2014, the mandatory implementation of 68 has been suspended.

It is stressed that on the basis of Circular #17 ΔΚΠ/ΟΙΚ./1322/07.09.2016, the application of 70 provisional Greek Technical Specifications is proposed in replacement of the 68 EΤΕΡs, whose obligatory application has been suspended, in line with the aforementioned Decisions.

It is stressed, that each time the Unified Price Lists of Works make reference to the subject Greek Technical Specifications, consideration shall be made to the provisional Technical Specifications of Annexes of Circular No. 17 ΔΚΠ/ΟΙΚ./1322/07.09.2016, instead.

During the preparation of the articles of this document, consideration was made to the applicable Standards, Regulations, etc. Wherever in the applicable EΤΕΡ/PETEP



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references are made to earlier Standards, Regulations, etc. these were updated accordingly.

During the execution of the Project, a Material Submission Sheet (MSS) shall be submitted for each material proposed to be utilized by the Contractor, whether it concerns permanent or temporary structures, in line with the provisions of the articles of this document and Article GS0200 “Design Requirements” of the General Specifications.

With regard to the articles on works herein, the Contractor must submit to AM for approval, prior to the commencement of the works, a Method Statement and the corresponding Safe Work Method, in line with the provisions of the articles of this document and Article GS0750 “Health and Safety Specifications” of the General Specifications.



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**Π1000            DIVERSIONS OF PUBLIC UTILITY ORGANIZATION (PUO) NETWORKS**

Applicable shall be the following ETEPs, namely

ETEP 02-05-00-00 “Management of excavation materials and exploitation of dumping sites”

ETEP 08-01-03-01 “Trench excavations for utility networks”

ETEP 08-01-04-01 “Trenchless utilities installation with soil displacement methods”

ETEP-02-04-00-00 “Excavations for foundation works”

ETEP 15-02-01-01 “Demolition of members of concrete structures by mechanical means”

ETEP 08-10-01-00 “Work-site water pumping”

ETEP 08-10-02-00 “Wastewater and sludge pumping”

ETEP 08-10-03-00 “Dewatering with well points”

ETEP 08-01-03-02 “Underground utilities trench backfilling”

ETEP 11-02-02-00 “Retaining structures with steel-sheet piles”

ETEP 08-03-02-00 “Underdrain filters with graded aggregates”

ETEP 01-01-01-00 “Concrete production and transport”

ETEP 01-01-02-00 “Concrete casting”

ETEP 01-01-03-00 “Concrete curing”

ETEP 01-01-04-00 “Work site concrete batching plants”

ETEP 01-01-05-00 “Concrete compaction by vibration”

ETEP 01-01-07-00 “Mass concrete”

ETEP 01-03-00-00 “ Scaffolding”

ETEP 01-04-00-00 “Concrete formwork”

ETEP 08-05-02-02 “Waterstops for concrete joints”

ETEP 08-05-02-05 “Concrete structures joint sealing using elastomeric materials”



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ETEP 02-07-05-00 “Lining of road embarkment slopes and filling of road islands with horticultural soil”

ETEP 08-07-01-01 “Grey cast iron gully tops”

PETEP 08-07-01-05 “Manhole steps”

ETEP 08-07-01-04 “Ductile iron gully tops”

PETEP 08-06-02-02 “Pressurized u-PVC pipe networks for sewage”

ETEP 08-06-08-01 “Warning tape above buried utilities”

PETEP 08-06-07-02 “Cast iron gate valves”

ETEP 08-06-07-03 “Cast iron butterfly valves”

ETEP 08-06-07-07 “Double orifice air relief valves”

ETEP 08-06-07-05 “Pipeline components dismantling joints”

PETEP 08-06-08-03 “Retrofitting of concrete paving slabs along constructed underground utility”

PETEP 08-06-08-04 “Retrofitting of kerbs and gutters along constructed underground utility”

ETEP 08-06-08-06 “Prefabricated concrete manholes”

As far as Natural Gas Networks are concerned, the following shall be applicable:

- **Ministerial Decision (M.D.) Δ3/A/22925/2006** (FEK 1810/B’/12.12.2006) Regulations about the installation of overflow pipes and natural gas meter / operation pressure up to 4 bars
- **Ministerial Decision (M.D.) Δ3/A/17013/2006** (FEK 1552/B’/24.10.2006) Regulations about natural gas distribution steel networks / design pressure 19 bars
- **Ministerial Decision (M.D.) Δ3/A/14715/2006** (FEK 1552/B’/24.10.2006) Regulations about natural gas distribution poly-ethylene networks / maximum operation pressure 4 bars.



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**Π1001 TEMPORARY CONNECTIONS WITH PUO NETWORKS**

**1 GENERAL**

**1.1 Description of Works**

1.1.1 Upon his installation at the worksite, the Contractor shall provide all materials and equipment while he shall also execute the works required for the supply, installation and maintenance of the temporary Public Utility Organization (PUO) networks throughout the execution of the Project.

1.1.2 The Contractor shall design, supply and install the temporary facilities related to the power supply, water supply, telecommunications and sanitation of the worksites.

1.1.3 The Contractor shall undertake all actions and shall bear all expenses for obtaining the relevant permits from the PUO Networks Organizations, including the connection and disconnection expenses, as well as for the supply, installation, maintenance and removal of the materials, as required. All expenses related to the temporary connections with the PUO networks and the consumption expenses shall be borne by the Contractor.

**1.2 TEMPORARY POWER SUPPLY**

Temporary power connection shall be provided throughout the duration of the Project for the operation of the electrical equipment and the temporary lighting in all worksites and facilities of the Contractor and the Service.

1.2.1 Immediately after the Project award, the necessary actions shall be undertaken towards the Public Power Corporation (PPC), so that sufficient time is given for scheduling the electrical connection at the worksite areas.

1.2.2 Power distribution systems shall be installed for temporary power supply, in line with PPC regulations, paying special attention to the requirements related to facilities in wet areas.

**1.3 TEMPORARY WATER SUPPLY**

1.3.1 The Contractor shall provide temporary potable water supply in the worksite areas.

1.3.2 Immediately after the Project award, the necessary actions shall be undertaken towards the Water Supply and Sewage Corporation, so



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that sufficient time is given for scheduling water supply to the worksite areas and to the Contractor’s and the Service’s facilities.

**1.4 TEMPORARY SANITARY FACILITIES**

1.4.1 The Contractor shall provide temporary sanitary facilities for the laborers, the other staff, the visitors and the Service’s personnel in the worksite areas.

1.4.2 The type and the number of the sanitary facilities shall comply with the hygiene regulations.

1.4.3 The Contractor is obliged to ensure the cleanliness of the aforementioned facilities.

1.4.4 The Service reserves its right to instruct the Contractor – at any stage throughout the execution of the works – to provide at his own expense additional or different sanitary facilities at street or underground level, if the number of the workers increases or if unsanitary conditions emerge for any reason whatsoever.

1.4.5 Upon relocation or removal of the subject facilities, all areas shall be disinfected.

**1.5 TEMPORARY TELEPHONE FACILITIES**

1.5.1 Immediately after the Project award, the Contractor is obliged to proceed with all necessary actions towards telephone service providers, so that sufficient time is ensured for scheduling the telephone connection to the worksite areas before works commence in each different worksite area.

1.5.2 The Contractor shall install temporary telephone connections for the worksite offices of the Service, as specified elsewhere in the contract.

1.5.3 The Contractor shall install temporary telephone connections for his worksite offices, depending on his needs. It is clarified that no worksite area shall be equipped with available current telephone lines.

**1.6 TEMPORARY CONNECTIONS WITH OTHER PUO NETWORKS**

1.6.1 In the framework of his contractual obligations the Contractor shall provide for the installation of any other temporary PUO networks that become necessary for the execution of the works and shall proceed to all relevant actions towards the pertinent Organizations, at no extra charge.

1.6.2 Relevant Standards / Specifications



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Applicable shall be the specifications of the pertinent PUOs.

1.6.3 Submission of data to ATTIKO METRO

The submission of data is not required.

**2 PRODUCTS**

**2.1 Materials**

The materials to be used for the temporary PUO connections shall be the ones specified in the above para. 1.6.2.

**3 EXECUTION OF WORKS**

Works shall be executed and measured in line with the provisions of the specifications in the above paragraph 1.6.2.





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**Π1002            TEMPORARY FENCING OF WORKSITE**

**1                    GENERAL**

**1.1                Description of Work**

1.1.1            The Contractor shall fence all worksites, including excavations, with temporary fences, which shall conform to the safety regulations and shall protect the surrounding areas from inconvenience caused by the execution of the works. In addition, the Contractor shall build fenced and safe pedestrian passageways at any point considered to be dangerous to the safety of pedestrians. The fencing shall consist in corrugated steel sheets fixed on structural steel framing and a base made of reinforced concrete. The pedestrian passageways shall be fenced on both sides, by means of wooden boards; they shall be covered and equipped with floors at locations specified by ATTIKO METRO (AM).

Project Information Signs

The Contractor is obliged to install information signs to be placed on metal structure in each worksite of the Project and at locations to be indicated by AM; he shall place two signs in each station and one sign in each shaft.

The said signs shall be approximately 4.00m high and 3.00m wide, they shall bear the title of the Project, the names of the Project Owner and Contractor, the budget and other data according to AM suggestions and they shall adhere to the provisions of the European Regulations 1303/2013/(Annex 7), the Commission Implementing Regulation 821/2014 about rules for the application of Regulation (EU) No 1303/2013, as well as Law 4314/2014 integrating the European Regulations into the Greek Law.

1.1.2            The reinforced concrete base of the fences shall be adequately sized to keep floodwater outside the excavation limits.

1.1.3            The fencing shall be equipped with reflective or illuminated signs in order to be visible by the public during night hours.

1.1.4            The Contractor shall also fence the areas outside the worksite containing plants and trees.

1.1.5            The orientation of the entrances to the Worksite areas shall be such that the entrances are facing downstream in view of reducing the risk of the Worksite being flooded from runoff of the surrounding upstream areas.

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**1.2 Reference Standards**

Regarding timber:

- ELOT EN14080 Timber structures. Glued laminated timber and glued solid timber. Requirements
- ELOT EN14081 Timber structures. Strength graded structural timber with rectangular cross section
- ELOT EN313 Plywood. Classification and terminology
- ELOT EN314 Plywood. Bonding Quality
- ELOT EN636 Plywood. Specifications.
- ELOT EN13986 Wood-based panels for use in construction. Characteristics, evaluation of conformity and marking
- ELOT EN14374 Timber structures. Structural laminated veneer lumber. Requirements

Regarding structural steel:

- ELOT EN 10025 Hot rolled products of structural steels
- ELOT EN 10219 Cold formed welded structural hollow sections of non-alloy and fine grain steels

Regarding steel plates:

- ELOT EN10346 Continuously hot-dip coated steel flat products for cold forming
- ELOT EN14782 Self-supporting metal sheet for roofing, external cladding and internal lining. Product specification and requirements.

Non Pre-stressed Bolts in accordance with the European Standards:

Bolts

- ELOT EN ISO 4014 Hexagon head bolts. Product grades A and B
- ELOT EN ISO 4016 Hexagon head bolts. Product grade C
- ELOT EN ISO 4017 Fasteners. Hexagon head screws. Product grades A and B
- ELOT EN ISO 4018 Hexagon head screws. Product grade C

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Nuts

- ELOT EN ISO 4032 Hexagon regular nuts (style 1). Product grades A and B
- ELOT EN ISO 4034 Hexagon regular nuts (style 1). Product grade C.

Washers

- ELOT EN ISO 7089 Plain washers. Normal series. Product grade A
- ELOT EN ISO 7090 Plain washers, chamfered. Normal series. Product grade A
- ELOT EN ISO 7091 Plain washers. Normal series. Product grade C.

**1.3**

**Submittals**

The Contractor shall prepare drawings regarding the fencing for submission and approval by AM. These drawings shall contain details concerning the kind and type of the fence, the location and the type of the gates, the protection measures to be introduced for the reduction of dust and noise (see Article on Environmental Impact), the inflow of rain water deriving from upstream areas into the trench, as well as the safety of the pedestrian passageways where sidewalks are discontinued resulting from the installation of a worksite or due to traffic arrangements (see Article for Diversions and Traffic arrangements).

Moreover, upon completion of the fencing of each worksite area, the Contractor shall submit to AM a survey of the fencing limit with measurement of the entire surface occupied for worksite areas.

**2**

**PRODUCTS**

**2.1**

**Timber**

Where timber is used, the following shall apply:

Structural pine and/or laminated wood shall be used.

Laminated wood (plywood, boarding) shall be appropriate for structural use, with weatherproof construction.

Minimum wood thickness:

- Boards: 20 mm
- Planks: 45 mm
- Laminated wood board: 20 mm for floors and sheds
- 10 mm for walls.

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**2.2** Structural Steel

Structural steel (steel profiles, hot rolled bars, anchoring slabs, etc.) of the frame shall comply with the mechanical and chemical characteristics stipulated in Specification ELOT EN 10025, whereas concave cross-sections shall comply with ELOT EN 10025 for an at least S 235 quality.

**2.3** Corrugated Sheets

Corrugated sheets shall be made of steel with trapezoid ribs as per ELOT EN 14782. Their thickness shall be 0.50mm as a minimum, they shall be hot dipped galvanized with at least 140gr zinc /m<sup>2</sup> of sheet and a mat surface without further treatment.

**2.4** Concrete Base of Fencing

The bases shall be made of class at least C16/20 concrete as per the relevant specification of this document. The concrete base shall have a minimum height of 40 cm for protection against flood.

**2.5** Advertising Signs

Where advertising signs are required, these shall be made of a flat steel sheet of a minimum sheet of 1mm.

**3 EXECUTION**

The fencing shall be constructed in accordance with the approved drawings. The worksite area should be fenced along the perimeter at ground level, except for the locations where access to the worksite is required. At the locations in question, openings should be covered through locking doors of the same height with the fencing. AM reserves the right to suggest on site the extension of the fencing, in case AM deems that this is advisable for safety reasons. Throughout the duration of the Project, the Contractor shall maintain the fencing for ensuring a flawless and continuous operation. When the fencing is no longer required due to the completion of the works foreseen by this Contract and if AM concurs, the Contractor shall proceed with the dismantling of the fencing and the area shall be reinstated as per the provisions of the contractual documents.

**3.1** Steel Fencing

The steel fencing shall be made of hot dip galvanized steel corrugated panels 1.90m high, where provision has been made for openings intended for the installation of steel doors made of the same material

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in accordance with the approved by AM drawings. Steel fencing may be either fixed (type A) or mobile (type B).

**3.2** Fixed Fencing (Type A)

The base of the panels shall be made of reinforced concrete and the steel supports of the bearing structure shall be anchored in the concrete with anchoring slabs and expansion anchors or shall be embedded inside the concrete base at a depth of 350mm minimum or as required by the Calculation Note. The base of the concrete shall offer cover to the supports at the perimeter and underneath for at least 50mm. All minor fixing materials (screws, nuts, washers, bolts) shall be galvanized.

The steel frame shall be painted using two coats of antirust paint to be selected by AM.

**3.3** Mobile fencing (Type B)

Panels and steel supports shall be embedded into mobile bases made of concrete of a size capable to avert overturning. The concrete reinforcement shall be such as to avoid cracks.

**3.4** Wooden Fencing (Type C)

This type of fencing shall protect pedestrians’ passageways at points where sidewalks are discontinued, at points where flora needs to be protected and at any other points to be indicated by AM. Wooden fencing shall be suitable for painting and decoration purposes, as approved by AM, and shall be 1,50m high to the side of the road. At points where advertising panels are necessary, these shall be installed at the top of the fencing. The frame of the fencing shall be adjustable in both calculations and drawings, for it to be capable to withstand additional loads. Wherever there is the risk of falling items to the passing by citizens, passageways must be protected by means of wooden sheds. Wooden floors shall be made of planks or laminated wood boards, without gaps and at the locations to be indicated by AM. All minor materials for fixing purposes (bolts, nuts, washers and screws) shall be galvanized and shall not protrude from the finished surfaces of the connected members of the structure.

**3.5** Fencing intended for the construction of formworks situated adjacent to traffic (Type D)

Formworks situated adjacent to traffic shall be protected by safe fencing means. This type of fencing shall withstand loads of 75KN/m, without allowing vehicles or safety barriers to be in contact with any part of the formwork. Special solutions shall be selected depending on

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the *in-situ* conditions. For instance, fencing type B situated in curbs made of concrete.

**3.6** Fencing intended for the protection of trees or planted areas

The Contractor shall protect all areas having trees or plants within the worksite area. These areas shall be surrounded by means of fencing of a type and height to be approved by AM, so as to preclude the entrance of unauthorized persons. Special solutions shall be selected depending on the particular conditions of the worksite.

**4** ***IN-SITU* QUALITY CONTROLS**

Fencing and gates shall be regularly inspected by the Contractor and any damage shall be repaired immediately.

Fencing shall be kept clean by the Contractor and free of labels, signs, advertisements, etc., unless otherwise indicated by AM. It is stressed that only AM is entitled to install labels, signs, advertisements, etc.

**5** **DISMANTLING OF FENCING**

When fencing and gates are no longer required, since the works of this Contract will have been completed, they shall be dismantled and the area shall be reinstated at its prior condition, inline with the provisions of the contract documents.



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**Π1003 TEMPORARY DRAINAGE OF TRENCHES**

In relation to the subject works, the Greek Technical Specifications (GTS) in force apply. Namely:

- a) ELOT TS 1501-08-01-03-01:2009  
Trench Excavations for Utility Networks
- b) ELOT TS 1501-08-06-08-06:2009  
Prefabricated Concrete Manholes
- c) ELOT TS 1501-08-07-01-04:2009  
Ductile Iron Gully Tops
- d) ETEP 08-10-01-00  
Work-site water pumping
- e) ETEP 02-05-00-00  
Management of excavation materials and exploitation of dumping sites.

The following Provisional National Technical Specifications (PETEP) also apply.

- a) PETEP 08-01-03-02  
Underground Utilities Trench Backfilling
- b) PETEP 08-06-02-02  
Pressurized u-PVC Pipe Networks for Sewage
- c) PETEP 08-06-08-03  
Retrofitting of Concrete Paving Slabs along Constructed Underground Utility
- d) PETEP 08-06-08-04  
Retrofitting of Curbs and Gutters along Constructed Underground Utility
- e) PETEP 08-07-01-05  
Manhole Steps
- f) PETEP 02-02-01-00  
General Excavations



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**Π1004 NOT APPLICABLE**



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**Π1005 STEEL STRUTS & WALES**

**1 GENERAL**

**1.1 Description**

1.1.1 This Article applies to steel struts and wales used as temporary support elements of open cut excavations.

1.1.2 The work shall include the provision of struts and wales and their installation on site in accordance with the construction drawings. The installation work shall include positioning with the use of any possible scaffolds or hoisting means required, as well as the appropriate connections and fixings. Strut preloading will be required where excavation wall movement is to be minimized. It will be prescribed in the design, and will be shown in a tabulated form on the construction drawings.

**1.2 Reference standards**

- ELOT EN 10025, Hot Rolled Products of Non-alloy Structural Steel
- ELOT EN 10219 Cold formed welded structural hollow sections of non-alloy and fine grain steels
- ELOT EN ISO 15609-1: Specifications and Approval of Welding Procedures for Metallic Materials– Welding Procedure Specification – Part 1: Arch Welding
- ELOT EN ISO 15614-01: Specifications and Control of Suitability of Welding Procedures for Metallic Materials – Welding Procedure Test – Part 1: Welding by means of arch and gas for steel materials and welding by means of arch for nickel and nickel-alloys
- ELOT EN ISO 9606-1: Qualification testing of welders -- Fusion welding -- Part 1: Steels
- Eurocode 3, Design of Steel Structures
- ELOT EN 1090: Execution of steel structures and aluminium structures (Only for industrially manufactured struts).

**1.3 Submittals**

The Contractor shall submit to ATTIKO METRO for approval a Method Statement, as per the General Specifications - Design Requirements, which shall include all the data related to the methods, personnel and equipment to be employed, a risk assessment and the appropriate safety measures proposed. At the same time, Material Submittal Sheets (MSS), as per the General Specifications - Design Requirements, shall be submitted. These shall include the

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conformance certificates of the materials used and the equipment proposed, the test results and all data referred to in detail in the different parts of this Article.

### **2 MATERIALS**

#### **2.1 Struts, wales**

2.1.1 The struts and wales shall be made of steel sections of size and shape described in the construction drawings. Steel grade shall be at least S235 according to ELOT EN 10025, and in all cases, this will derive from the Detailed Final Design.

2.1.2 All materials shall be transported and stored in the worksite in a way to be properly protected against corrosion, harmful chemical agents, etc. Struts and wales shall be laid on special jigs or trestles to retain their alignment.

#### **2.2 Connection/support elements**

The struts / wales connecting and supporting elements (flat jacks or other hydraulic jacks, steel plates, wedges, etc.) shall be those described in the DFD construction drawings and as required by the local conditions.

The bolts, nuts and washers shall be in accordance with the applicable European standards. The bolts shall be bolted using calibrated tool, with the torque recommended in the above standards or the manufacturer’s specifications.

Welding of steel elements shall be performed according to Standards ELOT EN ISO 15609-01, ELOT EN ISO 15614-01. The Welders’ suitability will be certified through Standard ELOT EN ISO 9606-1.

### **3 EXECUTION**

#### **3.1 Installation and removal**

3.1.1 All installation and removal works of struts and wales, as well as their connection by bolting or welding shall be performed as shown on the approved construction drawings. These drawings shall describe the phases of strut and wale placing, the type of connections to be used, the phases of wale removal phases, if required, etc.  
The wales will be constructed in a way that they will be in functional contact with the structural elements they support so as to safely transmit the anticipated loads.



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For excavations where the wall movement may affect adjacent structures, the preload will be, as a minimum, 90% of the maximum anticipated loading.

3.1.2 Monitoring of the struts, including axial force and its fluctuations, shall be performed during all excavation phases and be communicated to ATTIKO METRO, as per the requirements of the specifications.

3.1.3 The quality class of the bolts and nuts shall be selected on the basis of their mechanical properties, as indicated in the approved construction drawings. The washer quality class shall be in conformance with the quality of bolts in use.

**3.2 On site quality controls**

The Contractor’s responsible engineer shall inspect the quality of materials and works related to the installation of struts and wales according to the design drawings and the individual articles of this Specification.

Geomechanical and structural monitoring shall be in accordance with the relevant Article of the Design Specifications.

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**Π1006 ROADWORKS**

The applicable National (Greek) Technical Specifications (ETEP) for Roadworks are presented in the following table:

ETEP Code	ETEP Title
ELOT TS 1501 02-01-01-00	Works zone grubbing and clearing
ELOT TS 1501 15-02-01-01	Demolition of members of concrete structures by mechanical means
ELOT TS 1501 02-07-05-00	Lining of road embankment slopes and filling of road islands with horticultural soil
ELOT TS 1501 02-07-01-00	PETEP - Construction of embankments with suitable excavation or borrow materials
ELOT TS 1501 02-07-03-00	PETEP - Transition embankments
ELOT TS 1501 11-02-04-00	Prestressed anchors
ELOT TS 1501 12-03-03-04	Tunnel support with simple fully grouted bolts (SN dowels)
ELOT TS 1501 11-01-01-00	Bored, in-situ cast concrete piles
ELOT TS 1501 01-01-01-00	Concrete production and transportation
ELOT TS 1501 01-01-02-00	Concrete casting
ELOT TS 1501 01-01-03-00	Concrete curing
ELOT TS 1501 01-01-04-00	Work site concrete batching plants
ELOT TS 1501 01-01-05-00	Concrete compaction by vibration
ELOT TS 1501 01-01-07-00	Mass concrete
ELOT TS 1501 01-03-00-00	Scaffolding
ELOT TS 1501 01-04-00-00	Concrete formwork
ELOT TS 1501 01-05-00-00	Configuration of cast in-situ concrete final surfaces without plastering

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ELOT TS 1501 01-02-01-00	Steel reinforcement for concrete
ELOT TS 1501 08-05-01-04	Protective coatings of hydraulic concrete structures using in-situ or ready-mixed cement mortars
ELOT TS 1501 08-05-01-02	Waterproofing of concrete structures using asphaltic membranes
ELOT TS 1501 08-05-02-02	Waterstops for concrete joints
ELOT TS 1501 05-02-01-00	Kerbs, gutters and roadside concrete lined drainage ditches
ELOT TS 1501 05-02-02-00	Paving slabs and cobblestones for pedestrian areas
ELOT TS 1501 08-03-03-00	Geotextiles for underdrains
ELOT TS 1501-05-02-05-00	Road anti-glare systems
ELOT TS 1501-05-03-11-01	Asphalt pre-coating
ELOT TS 1501-05-03-12-04	Skid resistant asphalt slurry wearing course
ELOT TS 1501-05-03-14-00	Milling of asphalt concrete pavements
ELOT TS 1501-05-04-01-00	Removal of pavement markings
ELOT TS 1501-05-04-02-00	Horizontal pavement markings
ELOT TS 1501-05-04-03-00	Retroreflecting road studs
ELOT TS 1501-05-04-05-00	Removal and/or repositioning of traffic signs and webs
ELOT TS 1501-05-04-07-00	Traffic signs mounting and support systems
ELOT TS 1501-05-05-05-00	Expropriation zone markers

Moreover, the applicable Provisional National Technical Specifications (PETEP) for Roadworks are presented in the following table:

PETEP Code	PETEP Title
PETEP 05-02-01-00	Curbs, gutters and roadside trenches
PETEP 05-02-02-00	Paving slabs and cobblestones for pedestrian areas
PETEP 05-02-04-00	Sound barriers
PETEP 05-03-03-00	Road pavement layers with unbound

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	aggregates
PETEP 05-03-11-04	Asphalt concrete layers of continuous granular grading (closed type)
PETEP 05-03-12-01	Skid resistant asphalt concrete wearing course
PETEP 05-03-16-00	Full depth road pavement reclamation with cold in-situ recycling and addition of foamed asphalt
PETEP 05-04-07-00	Traffic signs mounting and support systems
PETEP 05-07-01-00	Infrastructure for road lighting
PETEP 05-07-02-00	Road lighting superstructure

Moreover, applicable are the following ETEPs which are not included in Government’s Gazette (FEK) B’ 2221/2012.

ETEP Code	ETEP Title
ELOT TS 1501-05-04-02-00	Horizontal signage
ELOT TS 1501-05-04-06-00	Standard signs
ELOT TS 1501-05-05-01-00	Road safety parapet walls
ELOT TS 1501-05-05-02-00	Removal or re-installation of steel safety parapet walls
ELOT TS 1501-05-05-03-00	Road restraint systems



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**Π1007 SLAB / STONE PAVING OF SIDEWALKS AND SQUARES**

All aforementioned works conform with the requirements of the following Provisional National Technical Specification (PETEP):

**A. Greek Technical Specification**

Applicable shall be the PETEP in force:

- 05-02-02-00 Slab / Stone paving of sidewalks and squares.
- 08-06-08-03 Retrofitting of concrete paving slabs along constructed underground utility
- 08-06-08-04 Retrofitting of kerbs and gutters along constructed underground utility.

**B. Additional Requirements**

In application of para 13 of Ministerial Decision No. DIPAD/oik/356/04.10.2012, the following additional requirements of ATTIKO METRO apply; these requirements are quoted below, per individual chapter of the respective PETEP 05-02-02-00 Paving slabs and cobblestones for pedestrian areas.

1. The designs concerning slab / stone paving of sidewalks and squares must make reference to the class of the materials, as per the aforementioned Standards.



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**Π1008 RETAINING WORKS FOR TRENCH SLOPES**

The Greek Technical Specifications (ETEP) and the Supplementary Technical Specifications (PETEP) on retaining works for trench slopes, as these are presented in the following table, shall apply.

<b>ETEP/ PETEP CODE</b>	<b>ETEP/ PETEP TITLE</b>
PETEP - 01-01-01-00	Concrete production and transportation
ELOT TS 1501- 01-01-02-00	Concrete casting
PETEP 01-01-03-00	Concrete curing
PETEP 01-02-01-00	Steel reinforcement for concrete
ELOT TS 1501- 01-04-00-00	Concrete formwork
ELOT TS 1501- 08-01-03-01	Trench excavations for utility networks
PETEP 08-01-03-02	Underground utilities trench backfilling
ELOT TS 1501- 11-01-01-00	Bored, in-situ cast concrete piles
ELOT TS 1501- 11-01-02-00	Driven piles
ELOT TS 1501- 11-01-03-00	Micro-piles
ELOT TS 1501- 11-02-02-00	Retaining structures with steel-sheet piles
ELOT TS 1501- 11-02-04-00	Prestressed anchors
ELOT TS 1501- 12-03-03-04	Tunnel support with simple fully grouted bolts (SN dowels)