



**GEOLOGICAL AND GEOTECHNICAL INVESTIGATIONS
AND DESIGNS FOR THESSALONIKI METRO
EXTENSION TO "MACEDONIA" AIRPORT"**

**RFP-355/19
Α.Σ. 82662**

AM DESIGN PRICE LIST

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GENERAL TERMS

The general provisions of Section A' and Section B'/ ch. H', ch. I' and ch. J' of the Regulations of the Pre-estimated Fees for Designs and Provision of Technical and other relevant Scientific Services are applicable in line with Law 4412/2016.

The prices of the Price List items A.19 and B.146 up to B.164 have been estimated by ATTIKO METRO A.E. taking into consideration prior contracts regarding geological and geotechnical investigations and designs.

The prices of items B.165 and B.166 have been estimated by ATTIKO METRO S.A. taking into consideration the relevant collective agreements.

The prices of items B.167 up to B.182 regarding the Water Jet Drilling Works derive from the Unified Price Lists of the Hydraulic Works, as provided for in Decision No. ΔΝΣγ/οικ 35577/ΦΝ466 (FEK 1746/19.05.2017) Regulations for Descriptive Works Price Lists for public works contracts, and include the Overhead and Contractor's Profit percentage.

The prices of this Price List have been adjusted as compared to the Prices of the Regulations for Fees and Services, assuming $\kappa=1,218$, in line with Circular 3 (ΔΝΣ/12546/ΦΝ439.6/19.03.2019) of the Legislative Coordination Department of the Ministry of Infrastructures and Transport.

PRICE LIST ITEMS

A. GEOLOGICAL – HYDRO-GEOLOGICAL – SOIL INVESTIGATIONS AND DESIGNS

Item A.1 Geological Mapping (ΓΛΕ.1)

APPLICATION FORMULA : $A = \kappa \kappa * (\kappa 1 * E^{0.6}) =$

Mapping Scale : 1 : 2.000 $\kappa 1 = \text{factor} : 7220$
E = surface of mapped section in km^2

Application formula: $A = 1.218 * (7220 * E^{0.6})$ €/piece

Item A.2 Geological Longitudinal Profile (ΓΛΕ.3)

Geological Longitudinal Profile in urban environment without any geological mapping data.
(adjustment of item ΓΛΕ.3)

APPLICATION FORMULA: $A = \kappa \kappa * (\kappa 2 * \mu + 3 * \gamma) =$

Mapping Scale: 1 : 400 $\kappa 2 = \text{factor} : 0,85$
M = length of the longitudinal profile and γ = the overall length of boreholes in m

Application formula : $A = 1.218 * (0,85 * \mu + 3 * \gamma)$ €/piece

Item A.3 Geological Sections and Cross-Sections (ΓΛΕ.3)



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RFP-355/19
A.Σ. 82662

PRE-ESTIMATED FEE

Geological sections and cross-sections of an underground project in urban environment.
(adjustment of item ΓΛΕ.3)

APPLICATION FORMULA: $A = \tau\kappa * (\kappa 2 * \mu + 3 * \gamma) =$

Mapping Scale : 1 : 400
 μ = length of sections and cross-sections in m and γ = the overall length of boreholes in m

$\kappa 2$ = factor : 0,85

Application formula: **A = 1,218*(0,85* μ +3* γ) €/piece**

Item A.4 Hydrolithological / Hydrogeological map (ΓΛΕ.4)

APPLICATION FORMULA: $A = 30\% * B =$

B = the fee pertaining to the respective geological map

Application formula : **A = 30%*B €/piece**

Item A.5 Other Special and Auxiliary Thematic Maps (ΓΛΕ.4)

APPLICATION FORMULA: $A = 30\% * B =$

B = the fee pertaining to the respective geological map

Application formula: **A = 30%*B €/piece**

Item A.6 Geological Survey of Slopes (ΓΛΕ.5)

APPLICATION FORMULA : $K = \tau\kappa * (\kappa 3 * M^{0,6})$

$\kappa 3$ = factor M surface of open excavation in m²

Scale	$\kappa 3$
1 : 200	75
1 : 100	95
1 : 50	120
1 : 20	200
1 : 10	210

Application formula : **K = 1,218* $\kappa 3$ *M^{0,6} €/piece**

Item A.7 Rock Quality Designation (RQD) (ΓΛΕ.7)

APPLICATION FORMULA : $RQD = \tau\kappa * 2,0$

Application Price : **RQD = 2,44 €/l.m.**

Item A.8 Tectonic Diagrams - Potential Slip (ΓΛΕ.8)

APPLICATION FORMULA: $T\Delta = \tau\kappa * (700 + (10 * \tau))$

τ = Number of measurements

Application formula : **TΔ = 1,218*(700+(10* τ)) €/piece**



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**RFP-355/19
A.Σ. 82662**

PRE-ESTIMATED FEE

Item A.9 Rock Mass Classifications (ΓΛΕ.9)

APPLICATION FORMULA: $TB = TK * 1.050$

Application Price: **TB = 1.278,90 €/piece**

Item A.10 Recording of Points where Water is Encountered and Ground Investigation Works (ΓΛΕ.10.a)

a) for recording of the remaining points up to the first 200 ones

APPLICATION FORMULA: $TK * 105$

Application Price: **127,89 €/piece**

Item A.11 Measurements at the Points where Water is Encountered and Ground Investigation Works (ΓΛΕ.10.b)

b) for recording of the remaining points beyond the 200 ones

APPLICATION FORMULA: $TK * 90$

Application Price: **109,62 €/piece**

Item A.12 Ground Water level measurements (ΓΛΕ.11)

APPLICATION FORMULA: $TK * 45$

Application Price: **54,81 €/point**

Item A.13 Petrography Analyses (ΓΛΕ.14)

APPLICATION FORMULA: $TK * 170$

Application Price: **207,06 €/piece**

Item A.14 Mineral Analyses (ΓΛΕ.15)

APPLICATION FORMULA: $TK * 200$

Application Price : **243,60 €/piece**

Item A.15 Water Sampling and Dispatch to the Laboratory for Analysis Purposes (ΓΛΕ.34)

APPLICATION FORMULA: $TK * 20$

Application Price: **24,36 €/sample**

Item A.16 Execution of Water Chemical Analysis (ΓΛΕ.35)

APPLICATION FORMULA: $TK * 250$

Application Price: **304,50 €/piece**

Item A.17 Pumping shafts (Investigation Water Jet Boreholes): Scheduling, Monitoring and Evaluation (ΓΛΕ.38)

APPLICATION FORMULA: $TK * 12$



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RFP-355/19
A.Σ. 82662

PRE-ESTIMATED FEE

Application Price: 14,62 €/l.m.

Item A.18 Trial Pumping: Scheduling, Monitoring, Processing and Evaluation (ΓΛΕ.39)

APPLICATION FORMULA: $\Delta = \tau\kappa * (75 * \Omega * \Sigma)$

Ω = pumping and level return hours

Σ = monitoring points

Application formula: $\Delta = 1,218 * (75 * \Omega * \Sigma)$ €/piece

Item A.19 Classification RMR & GSI of sampling borehole rocky cores

In rock masses with discontinuities to which the MR and GSI classification systems apply, the classification shall follow these systems, as specified in the relevant items. The compensation shall be per borehole for both systems.

Application Price: 69,36 €/piece

Item A.20 Geological Survey Document (ΓΛΕ.17)

APPLICATION FORMULA: $(25\% * A)$

A = Total cost of geological works

Application formula: 25%*A €

Item A.21 Mobilization / Demobilization of Geophysical Survey Equipment (ΓΛΕ.19.1)

APPLICATION FORMULA: $OM = \tau\kappa * (200 + (2,7 * T))$

T = distance in km.

Application formula: OM = 1,218*(200+(2,7*T)) €/piece

Item A.22 Movement of Work Crew for the Execution of Geophysical Surveys from one location to another (ΓΛΕ.20)

APPLICATION FORMULA: $\tau\kappa * 35$

Application Price: 42,63 €/hour

Item A.23 Execution, Processing and Presentation of Geophysical Works' results: tomography method among boreholes (ΓΛΕ.21)

APPLICATION FORMULA: $A = \tau\kappa * \mu * \beta * \pi$

μ = length of the section or of the borehole

β = factor depending on distance δ between the measurement points or the locations of electrodes, geophones and other measurement equipment items to take readings along the section or the borehole (progress rate) and on the length μ of the measurement section

π = method factor

Application formula: A = 1,218* μ * β * π €/piece

Item A.24 Geophysical Report Document (ΓΛΕ.22)

APPLICATION FORMULA: $(20\% * A)$

A = total cost of geophysical surveys carried out in the filed during the design phase for which the subject Report is prepared.

Application formula: 20%*A €

PRE-ESTIMATED FEE

B. FIELD GEOTECHNICAL WORKS - LABORATORY TESTS - GEOTECHNICAL DESIGNS

Item B.1 Mobilization and demobilization of drilling rig. Road transportation (ΓΤΕ.1.1.a)

APPLICATION FORMULA: $\tau\kappa * (1.300 + (7,5 * T))$

T = distance in km.

Application formula: **A = 1,218*(1.300+(7,5*T)) €/piece**

The prices of Items B.2 to B.67 have been re-adjusted in relation to the Regulations Prices for Designs and Services Fees assuming $\tau\kappa = 1,218$

Item B.2 Movement of drilling rig from one borehole location to another (ΓΤΕ.1.2) **103,53 €/hour**

**Item B.3 Supply of water to satisfy the borehole needs (Article 2.3 of Technical Specifications)
Construction of water supply network (ΓΤΕ.1.3.1)** **20,71 €/l.m.**

**Item B.4 Supply of water to satisfy the borehole needs (Article 2.3 of Technical Specifications)
Water Supply Pump (ΓΤΕ.1.3.2)** **12,18 €/hour**

**Item B.5 Supply of water to satisfy the borehole needs (Article 2.3 of Technical Specifications).
Water Tank Truck (ΓΤΕ.1.3.3)** **475,02 €/day**

Item B.6 Drilling Rig Stall (ΓΤΕ.1.4) **103,53 €/hour**

**Item B.7 Rotary Boreholes in formations of clay, silt, sand and rock of hardness up to 4 MOHS etc.
Depths 0-20 m. (ΓΤΕ.1.5.a)** **219,24 €/l.m.**

**Item B.8 Rotary Boreholes in formations of clay, silt, sand and rock of hardness up to 4 MOHS etc..
Depths 20-40 m. (ΓΤΕ.1.5.b)** **247,25 €/l.m.**

**Item B.9 Rotary Boreholes in formations of clay, silt, sand and rock of hardness up to 4 MOHS etc.
Depths 40-60 m. (ΓΤΕ.1.5.c)** **274,05 €/l.m.**

**Item B.10 Rotary Boreholes in formations of clay, silt, sand and rock of hardness up to 4 MOHS etc.
Depths 60-80 m. (ΓΤΕ.1.5.d)** **302,06 €/l.m.**

PRE-ESTIMATED FEE

Item B.11 Rotary Boreholes in sand-gravels or pebbles and in fractured rocks using RQD < 25%. Depths 0-20 m. (ΓΤΕ.1.6.a)	372,71	€/l.m.
Item B.12 Rotary Boreholes in sand-gravels or pebbles and in fractured rocks using RQD < 25% Depths 20-40 μ. (ΓΤΕ.1.6.b)	418,99	€/l.m.
Item B.13 Rotary Boreholes in sand-gravels or pebbles and in fractured rocks using RQD < 25% Depths 40-60 m. (ΓΤΕ.1.6.c)	466,49	€/l.m.
Item B.14 Rotary Boreholes in sand-gravels or pebbles and in fractured rocks using RQD < 25% Depths 60-80 m. (ΓΤΕ.1.6.d)	512,78	€/l.m.
Item B.15 Rotary Boreholes in rocks of hardness over 4 MOHS. Depths 0-20 m. (ΓΤΕ.1.7.a)	306,94	€/l.m.
Item B.16 Rotary Boreholes in rocks of hardness over 4 MOHS. Depths 20-40 m. (ΓΤΕ.1.7.b)	345,91	€/l.m.
Item B.17 Rotary Boreholes in rocks of hardness over 4 MOHS. Depths 40-60 m. (ΓΤΕ.1.7.c)	383,67	€/l.m.
Item B.18 Rotary Boreholes in rocks of hardness over 4 MOHS. Depths 60-80 m. (ΓΤΕ.1.7.d)	422,65	€/l.m.
Item B.19 Re-drilling of cemented borehole. Depths 0-20 m. (ΓΤΕ.1.8.a)	109,62	€/l.m.
Item B.20 Re-drilling of cemented borehole. Depths 20-40 m. (ΓΤΕ.1.8.b)	123,02	€/l.m.
Item B.21 Re-drilling of cemented borehole. Depths 40-60 m. (ΓΤΕ.1.8.c)	137,63	€/l.m.
Item B.22 Re-drilling of cemented borehole. Depths 60-80 m. (ΓΤΕ.1.8.d)	151,03	€/l.m.
Item B.23 Rotary Boreholes without Sampling. Depths 0-20 m. (ΓΤΕ.1.9.a)	153,47	€/l.m.



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PRE-ESTIMATED FEE

Item B.24 Rotary Boreholes without Sampling. Depths 20-40 m. (ΓΤΕ.1.9.b)	172,96	€/ l.m.
Item B.25 Rotary Boreholes without Sampling. Depths 40-60 m. (ΓΤΕ.1.9.c)	192,44	€/ l.m.
Item B.26 Rotary Boreholes without Sampling. Depths 60-80 m. (ΓΤΕ.1.9.d)	210,71	€/ l.m.
Item B.27 Additional compensation for borehole expansion (ΓΤΕ.1.13)	152,25	€/ l.m.
Item B.28 Remaining piping of rotary, sampling or non-sampling boreholes (ΓΤΕ.1.15)	66,99	€/ l.m.
Item B.29 Filling of drilling hole with cement grout (ΓΤΕ.1.16)	182,70	€/cubic meter
Item B.30 Dry Sampling in boreholes - item ΓΤΕ.1.5 Depth 0-20 m. (ΓΤΕ.1.17.a)	65,77	€/piece
Item B.31 Dry Sampling in boreholes - item ΓΤΕ.1.5 Depth 20-40 m. (ΓΤΕ.1.17.b)	74,30	€/ piece
Item B.32 Dry Sampling in boreholes - item ΓΤΕ.1.5 Depth 40-60 m. (ΓΤΕ.1.17.c)	82,82	€/ piece
Item B.33 Dry Sampling in boreholes - item ΓΤΕ.1.5 Depth 60-80 m. (ΓΤΕ.1.17.d)	90,13	€/ piece
Item B.34 Dry Sampling in boreholes - Item ΓΤΕ.1.6 Depth 0-20m. (ΓΤΕ.1.18.a)	112,06	€/ piece
Item B.35 Dry Sampling in boreholes - Item ΓΤΕ.1.6 Depth 20-40 m. (ΓΤΕ.1.18.b)	125,45	€/ piece
Item B.36 Dry Sampling in boreholes - Item ΓΤΕ.1.6 Depth 40-60 m. (ΓΤΕ.1.18.c)	140,07	€/ piece
Item B.37 Dry Sampling in boreholes - item ΓΤΕ.1.6 Depth 60-80 m. (ΓΤΕ.1.18.d)	153,47	€/ piece
Item B.38 Additional compensation for drilling using split sampler in combination with 3-step diamond bits of slow advance in the boreholes of Item ΓΤΕ.1.5 Depths 0-20 m. (ΓΤΕ.1.20.a)	109,62	€/l.m.

PRE-ESTIMATED FEE

<p>Item B.39 Additional compensation for drilling using split sampler in combination with 3-step diamond bits of slow advance in the boreholes of item ΓΤΕ.1.5 Depths 20-40 m. (ΓΤΕ.1.20.b)</p>	<p>123,02</p>	<p>€/l.m.</p>
<p>Item B.40 Additional compensation for drilling using split sampler in combination with 3-step diamond bits of slow advance in the boreholes of item ΓΤΕ.1.5 Depths 40-60 m. (ΓΤΕ.1.20.c)</p>	<p>137,63</p>	<p>€/l.m.</p>
<p>Item B.41 Additional compensation for drilling using split sampler in combination with 3-step diamond bits of slow advance in the boreholes of item ΓΤΕ.1.5 Depths 60-80 m. (ΓΤΕ.1.20.d)</p>	<p>151,03</p>	<p>€/l.m.</p>
<p>Item B.42 Additional compensation for drilling using split sampler in combination with 3-step diamond bits of slow advance in the boreholes of item ΓΤΕ.1.6 Depths 0-20 m. (ΓΤΕ.1.21.a)</p>	<p>186,85</p>	<p>€/l.m.</p>
<p>Item B.43 Additional compensation for drilling using split sampler in combination with 3-step diamond bits of slow advance in the boreholes of Item ΓΤΕ.1.6 Depths 20-40 m. (ΓΤΕ.1.21.b)</p>	<p>209,50</p>	<p>€/l.m.</p>
<p>Item B.44 Additional compensation for drilling using split sampler in combination with 3-step diamond bits of slow advance in the boreholes of Item ΓΤΕ.1.6 Depths 40-60m (ΓΤΕ.1.21.c)</p>	<p>232,64</p>	<p>€/l.m.</p>
<p>Item B.45 Additional compensation for drilling using split sampler in combination with 3-step diamond bits of slow advance in the boreholes of item ΓΤΕ.1.6 Depths 60-80 m.. (ΓΤΕ.1.21.d)</p>	<p>255,78</p>	<p>€/l.m.</p>
<p>Item B.46 Additional compensation for drilling using split sampler in combination with 3-step diamond bits of slow advance in the boreholes of item ΓΤΕ.1.7 Depths 0-20 m. (ΓΤΕ.1.22.a)</p>	<p>153,47</p>	<p>€/l.m.</p>
<p>Item B.47 Additional compensation for drilling using split sampler in combination with 3-step diamond bits of slow advance in the boreholes of item ΓΤΕ.1.7 Depths 20-40 m. (ΓΤΕ.1.22.b)</p>	<p>172,96</p>	<p>€/l.m.</p>

PRE-ESTIMATED FEE

Item B.48 Additional compensation for drilling using split sampler in combination with 3-step diamond bits of slow advance in the boreholes of item ΓΤΕ.1.7 Depths 40-60 m. (ΓΤΕ.1.22.c)	192,44	€/l.m.
Item B.49 Additional compensation for drilling using split sampler in combination with 3-step diamond bits of slow advance in the boreholes of item ΓΤΕ.1.7 Depths 60-80 m.. (ΓΤΕ.1.22.d)	210,71	€/l.m.
Item B.50 Undisturbed Sample (ΓΤΕ.1.23)	63,34	€/piece
Item B.51 Standpipe piezometer (ΓΤΕ.1.24)	40,19	€/l.m.
Item B.52 Supply and connection of Casagrande porous tip (ΓΤΕ.1.25)	66,99	€/piece
Item B.53 Supply and installation of waterproof cable for measurements in electric piezometer (ΓΤΕ.1.26)	8,53	€/l.m.
Item B.54 Supply and installation of electric piezometer and its protective cover (ΓΤΕ.1.27)	755,16	€/piece
Item B.55 Piezometer, inclinometer head (ΓΤΕ.1.29)	213,15	€/piece
Item B.56 Casagrande piezometer underground sealing (ΓΤΕ.1.30)	228,98	€/piece
Item B.57 Supply and installation of inclinometer pipes (ΓΤΕ.1.31)	60,90	€/piece
Item B.58 Boring of investigation shaft, trench (ΓΤΕ.1.33)	36,54	€/cubic meter
Item B.59 Boring of investigation shaft for revealing underground ducts (ΓΤΕ.1.34)	365,40	€/piece
Item B.60 Obtaining disturbed samples from a shaft (ΓΤΕ.1.35)	20,71	€/piece
Item B.61 Obtaining undisturbed samples from a shaft (ΓΤΕ.1.36)	63,34	€/piece
Item B.62 Obtaining surface undisturbed samples - 30x30x40 cm. (ΓΤΕ.1.46)	133,98	€/piece
Item B.63 Obtaining surface undisturbed Shelby samples (ΓΤΕ.1.47) (ΓΤΕ.1.47)	63,34	€/piece
Item B.64 Obtaining surface undisturbed samples using core barrel (ΓΤΕ.1.48)	65,77	€/piece
Item B.65 Standard Penetration Test (ΓΤΕ.1.49)	53,59	€/piece
Item B.66 LEFRANC or MAAG Injection test (ΓΤΕ.1.50)	103,53	€/piece
Item B.67 LUGEON Injection test (ΓΤΕ.1.51)	219,24	€/piece



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RFP-355/19
A.Σ. 82662

PRE-ESTIMATED FEE

Item B.68 Mobilization / demobilization of instruments and work crew for the execution of on site soil-mechanics and rock-mechanics tests. Road transportation (ΓΤΕ.1.52.a).

APPLICATION FORMULA: $\tau\kappa * (200 + (2,7 * T))$

T = distance in km.

Application formula: A = 1,218*(200+(2,7*T)) €/piece

The prices of Items B.69 to B.73 have been re-adjusted in relation to the Regulations Prices for Designs and Services Fees assuming $\tau\kappa = 1,218$

Item B.69 Determination of soil density - on-site disturbed sampling method (ΓΤΕ.1.53)	63,34	€/sample
Item B.70 Determination of soil density - on-site undisturbed sampling method (ΓΤΕ.1.54)	95,00	€/sample
Item B.71 Determination of soil density using the cone method (ΓΤΕ.1.55)	63,34	€/sample
Item B.72 Determination of California Bearing Ratio (CBR) (ΓΤΕ.1.56)	110,84	€/sample
Item B.73 Plate load test of soil (ΓΤΕ.1.57)	618,74	€/sample

Item B.74 Mobilization / demobilization of static penetrometer. Road transportation (ΓΤΕ.1.61.a)

APPLICATION FORMULA: $\tau\kappa * (250 + (7,5 * T))$

T = distance in km :

Application formula: A = 1,218*(250+(7,5*T)) €/piece

The prices of Items B.75 to B.145 have been re-adjusted in relation to the Regulations Prices for Designs and Services Fees assuming $\tau\kappa = 1,218$

Item B.75 Static Penetrometer Stall (ΓΤΕ.1.62)	104,75	€/hour
Item B.76 Movement of the static penetrometer from one measurement location to the other (ΓΤΕ.1.63)	104,75	€/hour
Item B.77 Static penetrometer test. Depth 0-20 m. (ΓΤΕ.1.64.a)	567,59	€/sample
Item B.78 Static penetrometer test. Depth 20-30 m. (ΓΤΕ.1.64.b)	710,09	€/sample
Item B.79 Static penetrometer test. Depth >30 m. (ΓΤΕ.1.64.c)	851,38	€/sample

PRE-ESTIMATED FEE

Item B.80 Penetrometer test using piezocone. Depth 0-20 m. (ΓΤΕ.1.65.a)	680,86	€/sample
Item B.81 Penetrometer test using piezocone. Depth 20-30 m. (ΓΤΕ.1.65.b)	852,60	€/sample
Item B.82 Penetrometer test using piezocone. Depth >30 μ. (ΓΤΕ.1.65.c)	1.021,90	€/sample
Item B.83 VANE TEST (ΓΤΕ.1.66)	224,11	€/sample
Item B.84 Pressure-meter test (ΓΤΕ.1.67)	437,26	€/sample
Item B.85 Preparation of soil samples in dry condition for laboratory tests (ΓΤΕ.2.1)	15,83	€/piece
Item B.86 Determination of water content (ΓΤΕ.2.2)	12,18	€/piece
Item B.87 Determination of bulk density (ΓΤΕ.2.3)	31,67	€/piece
Item B.88 Determination of particle density (ΓΤΕ.2.4)	38,98	€/piece
Item B.89 Determination of liquid limit, plastic limit and plasticity index (ΓΤΕ.2.5)	47,50	€/piece
Item B.90 Determination of particle size distribution - sieving (ΓΤΕ.2.6)	47,50	€/piece
Item B.91 Determination of particle size distribution - sieving – determination of fines (ΓΤΕ.2.7)	15,83	€/piece
Item B.92 Determination of particle size distribution - hydrometer or pipette (ΓΤΕ.2.8)	69,43	€/piece
Item B.93 Organic substances in soil using dry combustion (ΓΤΕ.2.9)	26,80	€/piece
Item B.94 Determination of Organic matters in soils by wet combustion (ΓΤΕ.2.10)	73,08	€/piece
Item B.95 Soil moisture / density relation, per RPOCTOR analysis - standard or modified (ΓΤΕ.2.11)	73,08	€/piece
Item B.96 California Bearing Ratio (CBR) in laboratory (ΓΤΕ.2.12)	172,96	€/piece
Item B.97 Incremental loading oedometer test (ASTM D 2435) (ΓΤΕ.2.13.a)	140,07	€/piece

PRE-ESTIMATED FEE

Item B.98 Incremental loading oedometer test – controlled loading rate (ASTM D 4186) (ΓΤΕ.2.13.b)	140,07	€/piece
Item B.99 Unconfined compression test (ΓΤΕ.2.14)	43,85	€/piece
Item B.100 Unconsolidated undrained triaxial test. Specimen diameter D = 1 1/2" (ΓΤΕ.2.15.a)	56,03	€/point
Item B.101 Unconsolidated undrained triaxial test on water saturated soils – undrained conditions (with pore water pressure measurements, (CUPP). Specimen diameter D = 1 1/2" (ΓΤΕ.2.16.a)	141,29	€/point
Item B.102 Consolidated triaxial test on water saturated soils – drained conditions (CD). Specimen diameter D = 1 1/2" (ΓΤΕ.2.17.a)	191,23	€/point
Item B.103 Direct shear tests – without consolidation (ΓΤΕ.2.18)	52,37	€/point
Item B.104 Direct shear tests – with consolidation (undrained) (ΓΤΕ.2.19)	71,86	€/point
Item B.105 Direct shear tests – with consolidation (drained) (ΓΤΕ.2.20)	85,26	€/point
Item B.106 Constant head permeability test (ΓΤΕ.2.21)	66,99	€/piece
Item B.107 Variable head permeability test (ΓΤΕ.2.22)	49,94	€/piece
Item B.108 Determination of permeability in oedometer test (ΓΤΕ.2.23)	13,40	€/piece
Item B.109 Direct shear tests - Determination of residual shear strength in shear test apparatus (ΓΤΕ.2.24)	164,43	€/point
Item B.110 Direct shear tests - Determination of residual shear strength in ring shear apparatus (ΓΤΕ.2.25)	99,88	€/point
Item B.111 Incremental loading oedometer test – swelling test (ΓΤΕ.2.26)	54,81	€/piece
Item B.112 Cylinders' preparation for rock samples (ΓΤΕ.2.27)	66,99	€/piece
Item B.113 Natural moisture in rock samples (ΓΤΕ.2.28)	17,05	€/piece
Item B.114 Porosity and density determination (ΓΤΕ.2.29)	34,10	€/piece
Item B.115 Determination of unconfined compression strength (ΓΤΕ.2.30)	49,94	€/piece
Item B.116 Unconfined compression test with determination of elastic modulus & Poisson index (ΓΤΕ.2.31)	218,02	€/piece

PRE-ESTIMATED FEE

Item B.117	Determination of point load strength (ΓΤΕ.2.32)	36,54	€/piece
Item B.118	Determination of triaxial compression strength (ΓΤΕ.2.33)	114,49	€/piece
Item B.119	Determination of hardness using SCHMIDT hammer (L) (ΓΤΕ.2.34)	24,36	€/piece
Item B.120	Determination of shear strength of natural and artificial discontinuities (ΓΤΕ.2.35)	263,09	€/piece
Item B.121	Determination of slake durability index (ΓΤΕ.2.36)	82,82	€/piece
Item B.122	Indirect tensile test (Brazilian test) (ΓΤΕ.2.37)	49,94	€/piece
Item B.123	Cerchar Abrasiveness Test (ΓΤΕ.2.40)	64,55	€/cycle
Item B.124	Soil sampling (ΓΤΕ.2.54)	24,36	€/piece
Item B.125	Content in calcium carbonate (ΓΤΕ.2.55)	36,54	€/sample
Item B.126	Determination of sulphates and Ions concentration (ΓΤΕ.2.56)	58,46	€/sample
Item B.127	Determination of Chlorides concentration in soils (ΓΤΕ.2.57)	43,85	€/sample
Item B.128	Determination of pH (ΓΤΕ.2.58)	18,27	€/sample
Item B.129	Soil solution preparation (ΓΤΕ.2.59)	109,62	€/piece
Item B.130	Cadmium determination (ΓΤΕ.2.60)	48,72	€/sample
Item B.131	Lead determination (ΓΤΕ.2.61)	48,72	€/sample
Item B.132	Nickel determination (ΓΤΕ.2.62)	48,72	€/sample
Item B.133	Chromium determination (ΓΤΕ.2.63)	48,72	€/sample
Item B.134	Mercury determination (ΓΤΕ.2.64)	73,08	€/sample
Item B.135	Copper determination (ΓΤΕ.2.65)	42,63	€/sample
Item B.136	Zinc determination (ΓΤΕ.2.66)	42,63	€/sample
Item B.137	Total Petroleum Hydrocarbon (TPH) determination (ΓΤΕ.2.67)	121,80	€/sample
Item B.138	Determination of other heavy metals (ΓΤΕ.2.68)	60,90	€/sample
Item B.139	Chemical Oxygen Demand (COD) determination (ΓΤΕ.2.69)	38,98	€/sample
Item B.140	Total Organic Carbon (TOC) determination (ΓΤΕ.2.70)	85,26	€/sample



PRE-ESTIMATED FEE

Item B.141 Polycycle Aromatic Hydrocarbon (PAH) determination (ΓΤΕ.2.71)	292,32	€/sample
Item B.142 Polychlorinated Biphenyl (PCB) determination (ΓΤΕ.2.72)	231,42	€/sample
Item B.143 Benzene, toluene, ethyl benzene and xylenes (BTEX) determination (ΓΤΕ.2.73)	170,52	€/sample
Item B.144 Trichloroethylene determination (ΓΤΕ.2.74)	170,52	€/sample
Item B.145 Vinylchloride determination (ΓΤΕ.2.75)	170,52	€/sample

Item B.146 Undisturbed sample using PITCHER SAMPLER

Obtaining an undisturbed soil sample using the "PITCHER" sampler that consists of an external core barrel with a cutter set of 11.6cm in diameter and an internal thin metal sampler with spring, which, during the drilling process, precedes or follows the carot barrel, depending on the soil hardness. The internal diameter of the sampling tube is ~73mm and the sample can reach the length of up to ~80 cm. Sampling is achieved through the rotation of the carot barrel by 100-200 rpm and simultaneous downwards pressure.

Application Price: **38,32** €/l.m.

Item B.147 Pumping Test - Piezometer AIR-LIFT method

Performed at already installed piezometers, in order to execute pumping tests, obtain and record measurements, design the required diagrams and proceed to the final presentation of results and diagrams in reports. When drafting this item, it is assumed that pumping tests are executed in six boreholes in one day.

Application Price: **292,54** €/piece

Item B.148 Decontamination - cleaning of the drill rig for environmental purposes when moving it from one location to the other

It concerns the decontamination and cleaning of the drill rigs and fittings that have performed drilling activities, for environmental purposes and pollution control; this way, the drill rigs will be able to move from one control location to another.

Application Price: **488,00** €/piece

Item B.149 Photographs of the Laboratory Tests samples

The photographs of the laboratory test samples are obtained in line with paragraph 10.4 of the Technical Scope. All photographs shall be digital, colored, of at least 10Mega-pixels resolution, 3/4 height/width, in JPEG, of high quality and low compression, of 32 million colors, 24 bits/pixel, while the sensor of the camera shall be of less than 30Mega-pixels per cm².

Each photograph shall provide the following information:

1. time and date the photograph was taken;
2. the appropriate item for length scale (scale meter, coin, etc.);
3. the colorimetric scale;
4. the borehole code and the sampling depth..



**GEOLOGICAL AND GEOTECHNICAL
INVESTIGATIONS AND DESIGNS FOR
THESSALONIKI METRO EXTENSION TO
“MACEDONIA” AIRPORT”**

RFP-355/19
A.Σ. 82662

PRE-ESTIMATED FEE

Application Price: 0,12 €/piece

Item B.150 Surface reinstatement in pre-excavation pit or investigation trench

In order to reinstate the area where the pre-excavation pit or the investigation trench was bored, using all kinds of material that may be required (concrete, asphalt layer, sidewalk slabs, marbles, tiles, paving blocks, balustrades, grass, etc.)

Application Price: 29,70 €/piece

Item B.151 Topographic Survey (x, y, z coordinates) of borehole and location securing

X, Y & Z coordinates of each "As Built" borehole location. The ΣΑΜΘ coordinates' systems shall be used. Location Securing: distances from three characteristic fixed points, measured using a tape measure and marked on the extract of the topographical base map.

Application Price: 77,67 €/piece

Item B.152 Sample in sealed tube for natural moisture content test

Soil material obtained from the borehole which is sealed immediately into a glass tube by means of an air-tight cover and which is dispatched on the same day to the laboratory for natural moisture content test.

Application Price: 6,48 €/piece

Item B.153 Onsite VOC Test with PID

Analysis using a portable photo ionizer.

Application Price: 11,17 €/piece

Item B.154 Determination of organic material using calcination loss

For reasons of determining the organic substance of the soil, i.e. obtaining the sample, drying it, spalling, passing it through the appropriate sieve and its weighing.

Application Price: 19,01 €/piece

Item B.155 Determination of organic substances in soil using wet combustion

For reasons of determining the organic substance of the soil, i.e. obtaining the sample, drying it, spalling, passing it through the appropriate sieve, weighing it, executing the appropriate chemical reactions, awaiting for reaction and dialysis; the entire procedure shall be performed twice in view of finally calculating the organic substance, in accordance with Specification AASHTO T - 194

Application Price: 83,85 €/piece

Item B.156 Determination Test: Phenol

Extraction and Mixing using 4-animo antipyrine. Photometric analysis.

Application Price: 72,05 €/piece

Item B.157 Determination Test: CN

Soil samples are extracted in an alkaline method before their acidic decomposition to create hydrogenous cyanide salt. This reacts with chloramine-T and is analysed using color measurement or ion chromatograph.



**GEOLOGICAL AND GEOTECHNICAL
INVESTIGATIONS AND DESIGNS FOR
THESSALONIKI METRO EXTENSION TO
"MACEDONIA" AIRPORT"**

**RFP-355/19
A.Σ. 82662**

PRE-ESTIMATED FEE

Application Price: **72,05 € /piece**

Item B.158 Determination Test: D.O.C.

Determination in line with 2003/33/EC. Extraction per prEN 14039.

Application Price: **24,01 € /piece**

Item B.159 Determination Test: T.D.S.

Determination in line with 2003/33/EC. Extraction per ENV 13370

Application Price: **16,01 € /piece**

Item B.160 Triaxial test K₀ consolidated with OCR measurement (OCR) α. D= 1 1/2"

For the determination of the K₀ as a function of the OCR on a triaxial device of an earth sample - sampler diameter D-having previously been consolidated half the value of the local normal stresses using an estimated value of K₀ for the material and its OCR, the exercise of tensile loading up to the area of normally consolidated materials and, subsequently, the execution of the loading-unloading cycle at successive steps, including the formation of the sampling and its placement on the device, the exercise of the lateral pressure, of the necessary adjustment of the deformation velocity, measurement, calculations and the surveys of the results, taking into consideration Specification E105-86 Soil Engineering Laboratory Tests (ASTM D2850, D4767).

Application Price: **293,92 € /point**

Item B.161 CK₀U triaxial test in compression and pore water pressure measurement a. D= 1 1/2"

For the determination of the characteristics of the shear strength on a triaxial device of one soil sample - sampler diameter D -having been pre-consolidated - and measurement of the pore pressure (CUPP), i.e., for the formation of the sample, placing on the device, saturation, the exercise of the pressures for consolidation, the consolidation time, adjustment of the loading velocity, measurement of the deformations, the pore loading and pressure, calculations, survey and restoration of the device at its initial position, as foreseen in specification E105-86 Soil Engineering Laboratory Tests (ASTM D2850, D4767).The determination of the humid density and natural moisture shall also be included in the entire procedure.

Application Price: **176,35 € /point**

Item B.162 CK₀U triaxial test in tension and pore water pressure measurement a. D= 1 1/2"

For the determination of the characteristics of the shear strength on a triaxial device of one soil sample - sampler diameter D -having been pre-consolidated and measurement of the pore pressure (CUPP), for the formation of the sample, the positioning on the device, saturation, the exercise of pressures for consolidation, the consolidation time, adjustment of the loading velocity, the measurement of the deformations, of the pore loading and pressure, the calculations, the survey and the restoration of the device at its initial position, as foreseen in the specification E105-86 Soil Engineering Laboratory Tests (ASTM D2850, D4767).

The tensile test is exercised similarly with the compression test apart from the fact that the undrained shear strength shall be effected upon increase of the horizontal stress until failure against perpendicular. The determination of the humid density and natural moisture shall be included in the entire procedure.

Application Price: **176,35 € /point**



**GEOLOGICAL AND GEOTECHNICAL
INVESTIGATIONS AND DESIGNS FOR
THESSALONIKI METRO EXTENSION TO
"MACEDONIA" AIRPORT"**

**RFP-355/19
A.Σ. 82662**

PRE-ESTIMATED FEE

Item B.163 Coordination Test

For the determination of the dynamic parameters of the soils, such as the shear modulus, the Young modulus, etc. - in minor deformations - in cylinder compact undisturbed soil samples with vibration, and, as per the remaining items, in line with Specification ASTM D4015-87.

Application Price: 822,97 €/piece

Item B.164 Recycling Triaxial Loading Test

For the determination of the shear modulus and the Young modulus in cylinder compact, on a triaxial device and, as per the remaining items, in line with Specification ASTM D3999-91.

Application Price: 1.410,81 €/piece

Item B.165 Employment of a archaeologist in the supervision of excavation works, further to the Archaeological Department request

Daily fee for the employment of an archaeologist in the supervision of excavation works, further to the Archaeological Department request (including the employer's cost).

Application Price: 80,00 €/day

Item B.166 Employment of a Specialised Archaeology Labourer

Hourly fee for the employment of a specialized archaeology labourer (including the employer's cost).

Application Price: 7,75 €/hour

The prices of Items B.167 up to B.182 for the Water-Jet Drillings come from the Unified Price Lists for Hydraulic Works, as these are provided in Decision No. ΔΝΣγ/οικ.35577/ΦΝ466 (FEK 1746/19-05-2017) Regulations for Descriptive Works Price Lists for public works contracts. The following unit prices include the Contractor's Overhead (OH) and Profit (P) percentage.

Item B.167 Trial pumping works from water-jet drilling using a pomona pumping set (Price List Item 15.03, Revision Item HDR 7103)

Trial pumping works from water-jet drilling using a pomona pumping set, already installed, of a diameter up to Φ 20" (D500 mm); pumping capacity 400 lt/sec from a depth of 50 m, in line with ΕΤΕΠ 08-09-06-00 "Trial pumping works from water-jet drilling".

Recording and presentation of data is included.

Price per hour of effected pumping work (h).

Application Price: 36,46 €/hour

Item B.168 Water pumping from a water-jet drilling using an air-lift device (Price List Item 15.04, Revision Item HDR 7104)

Trial pumping works from water-jet drilling using an air-lift device, already installed, in line with ΕΤΕΠ 08-09-06-00 "Trial pumping works from water-jet drilling".

Recording and presentation of data is included.

Price per hour of effected pumping work (h).

Application Price: 18,29 €/hour



PRE-ESTIMATED FEE

Item B.169 Development of a water-jet drilling using a water-jet device (Price List Item 15.05, Revision Item HDR 7105)

Works for the development of a water-jet drilling, using a water-jet high-pressure device, already installed, in line with ΕΤΕΠ 08-09-05-00 "Cleaning and development of a water-jet drilling"
Price per hour of operation of the device (h).

Application Price: **14,63 € /hour**

Item B.170 Gravel filter for the water-jet drilling (Price List Item 15.14, Revision Item HDR 7115)

Construction of a gravel filter for the water-jet drilling at the ring between the hole's surface and the outer slope of the perforated liner.

The supply of calibrated material and its installation at the perimeter of the filters of the water-jet drillings is included.

Measurement on the basis of the theoretical cross-section of the ring.

Price per cubic meter (m³).

Application Price: **54,75 € /cubic meter**

Item B.171 Relocation of the drilling rig of 146 mm and installation on its operation location:

**Dismantling and loading of the 146 mm drilling rig
(Price List Item 15.17.01, Revision Item HDR 7119.1)**

Lump Sum Price (LSP)

Application Price: **60,77 € /piece**

Item B.172 Relocation of the drilling rig of 146 mm and installation on its operation location:

**Unloading and installation of the 146 mm drilling rig
(Price List Item 15.17.02, Revision Item HDR 7119.2)**

Lump Sum Price (LSP)

Application Price: **60,77 € /piece**

Item B.173 Relocation of the pomona pumping set up to Φ 20" and installation on its operation location:

**Dismantling and loading of the pomona pumping set up to Φ 20"
(Price List Item 15.18.01, Revision Item HDR 7120.1)**

Lump Sum Price (LSP)

Application Price: **60,77 € /piece**

Item B.174 Relocation of the pomona pumping set up to Φ 20" and installation on its operation location:

**Unloading and installation of the pomona pumping set up to Φ 20"
(Price List Item 15.18.02, Revision Item HDR 7120.2)**

Lump Sum Price (LSP)

Application Price: **96,76 € /piece**



**GEOLOGICAL AND GEOTECHNICAL
INVESTIGATIONS AND DESIGNS FOR
THESSALONIKI METRO EXTENSION TO
"MACEDONIA" AIRPORT"**

**RFP-355/19
A.Σ. 82662**

PRE-ESTIMATED FEE

Item B.175 Relocation of AIR LIFT και WATER JET device for pumping purposes:

**Dismantling and loading of AIR LIFT Device
(Price List Item 15.19.01, Revision Item HDR 7121.1)**

Lump Sum Price (LSP)

Application Price: 60,77 €/piece

Item B.176 Relocation of AIR LIFT και WATER JET device for pumping purposes:

**Unloading and installation of AIR LIFT Device.
(Price List Item 15.19.02, Revision Item HDR 7120.2)**

Lump Sum Price (LSP)

Application Price: 96,76 €/piece

**Item B.177 Boring of Water-jet drilling of Φ 17 1/2" (D450 mm) in loose rocks
(Price List Item 15.20, Revision Item YΔP 7122)**

Boring of water-jet drilling of a diameter of Φ 17 1/2" (D450 mm), at any depth, in loose rocks of hardness up to 4 Mohs utilizing a rotating water-jet rig already installed at the drilling location, in line with the design and ETEP 08-09-01-00 "Boring of water-jet drillings".

Sampling of the drilling material and the recording and presentation of the drilling information (water level, stratigraphy, etc.), the utilization of bentonite (if required) and the consumption of the drilling liquids are included.

Price per drilling linear meter (l.m.).

Application Price: 42,60 €/l.m.

**Item B.178 Boring of Water-jet drilling of Φ 17 1/2" (D450 mm) in hard rocks
(Price List Item 15.21, Revision Item HDR 7123)**

Boring of water-jet drilling of a diameter of Φ 17 1/2" (D450 mm), at any depth, in hard rocks of hardness over 4 Mohs utilizing a rotating water-jet rig already installed at the drilling location, in line with the design and ETEP 08-09-01-00 "Boring of water-jet drillings".

Sampling of the drilling material and the recording and presentation of the drilling information (water level, stratigraphy, etc.), the utilization of bentonite (if required) and the consumption of the drilling liquids are included.

Price per drilling linear meter (l.m.).

Application Price: 73,16 €/l.m.

**Item B.179 Perforated steel liner of diameter Φ 18" (D450 mm) and 6mm thick
(Price List Item 15.24, Revision Item HDR 7126)**

Supply, delivery and installation into the water-jet drilling, at any depth, of a perforated steel liner of a diameter of Φ 18" (D 450 mm) with longitudinal seam and a sheet 6 mm thick; steel quality S235J.

Filling of the void between the perforated liner and the drilling hole with concrete is included.

In case of perforated liners of a different diameter or of a different sheet thickness, then the application prices derive in proportion with the product (liner perimeter x sheet thickness).

Price per perforated liner linear meter (l.m.).

Application Price: 73,16 €/l.m.



**GEOLOGICAL AND GEOTECHNICAL
INVESTIGATIONS AND DESIGNS FOR
THESSALONIKI METRO EXTENSION TO
"MACEDONIA" AIRPORT"**

**RFP-355/19
A.Σ. 82662**

PRE-ESTIMATED FEE

**Item B.180 Galvanized Steel pipe diameter Φ 10'' (D250 mm) and 6mm thick
(Price List Item 15.25, Revision Item HDR 7127)**

Supply, delivery on site and installation into the water-jet drilling of a galvanized steel pipe with longitudinal seam of an inner diameter of Φ 10" (D 250 mm) and 6 mm thick.

The unit price includes the special items for the connection of the pipes, the galvanized steel guides and the configuration of the piping.

In case of galvanized pipes of a different diameter or of a different sheet thickness, then the application prices derive in proportion with the product pipe perimeter x sheet thickness).

Price per linear meter (l.m.).

Application Price:

60,77 l.m.

**Item B.181 Galvanized Steel Standpipe diameter Φ 10'' and 6mm thick
(Price List Item 15.26, Revision Item HDR 7128)**

Supply, delivery on site and installation into the drilling of a galvanized standpipe of a diameter of Φ 10" (D 250 mm) with holes of Φ 3 mm at a standard arrangement over 20% of the surface of the slope (approximately 20 holes per linear meter) and springs on either side.

The unit price includes the special items for the connection of the pipes, the galvanized steel guides and the configuration of the piping.

In case of galvanized pipes of a different diameter or of a different sheet thickness, then the application prices derive in proportion with the product (pipe perimeter x sheet thickness).

Price per standpipe linear meter (l.m).

Application Price:

67,26 €/l.m.

**Item B.182 Water-jet drilling port
(Price List Item 15.27, Revision Item HDR 7129)**

Metal water-jet drilling port, in line with the detailed drawings of the design.

Measurement on the basis of a weighing note or detailed calculations.

Price per kilogram (kg).

Application Price:

5,43 €/kg

Item B.183 Geotechnical Surveys Evaluation Report (ΓΜΕ.1.3)

APPLICATION FORMULA: $(15\% * \Gamma)$

Γ = Pre-estimated cost of the overall geotechnical surveys (field and laboratory)

Application formula:

15%* Γ €