ΜΕΤΡΟ ΘΕΣΣΑΛΟΝΙΚΗΣ
ΑΤΤΙΚΟ ΜΕΤΡΟ Α.Ε.

TITLE OF THE TENDER: **"PROCUREMENT, INSTALLATION AND COMMISSIONING OF THE SIGNALING & AUTOMATIC TRAIN CONTROL (ATC) SYSTEM AND OF THE AUTOMATIC TRAIN SUPERVISION (ATS) SYSTEM IN THE THESSALONIKI METRO EXTENSION TO KALAMARIA"**
RFP-335/18, Α.Σ. 59046

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TECHNICAL DESCRIPTION

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1. INTRODUCTION

This document provides the Bidders with the Technical Description of the Project pertaining to the installation of the train signaling and control systems (ATC), including the Automatic Train Supervision System (ATS), for the Thessaloniki Metro Extension to Kalamaria (henceforth referred to as "the Project"); it also provides information related to the systems' design, characteristics and implementation.

2. GENERAL OVERVIEW OF THE KALAMARIA EXTENSION PROJECT

2.1 Description of the Kalamaria Extension Project

The Kalamaria Extension Project consists in an underground line approximately 4.77km long. The Civil Works commence at K.P. 0+091.1 (track 1 – all K.Ps referred to in this document concern track 1, unless otherwise noted) and terminate at K.P. 4+737.79 at the end of Mikra forestation. The trackwork commences at K.P. 0+00 within the trumpet shaft of Patrikiou Station (25 Martiou Street) of Thessaloniki Metro Base Project at the end of the existing turnout and it terminates at the end of the forestation at K.P. 4+736.79. The line commences and follows Solonos Street, past Patrikiou Station (25 Martiou Street), it moves mainly to the south, it follows Kritis, Moschonission, Mitropoliti Kydonion and Pontou Streets and it terminates at Pontou Street just before the rainwater collection pit at the junction of Pontou and Ikaron Streets, which constitutes the end of the Project.

The project includes two single-line tunnels, five (5) stations, five (5) shafts, three (3) crossovers - two of which are integrated into Mikra Station – and one (1) Forestation.

A general layout plan of the line is enclosed herewith.

The 5 stations of the Kalamaria Extension are the following:

- Nomarchia
- Kalamaria
- Aretsou
- Nea Krini
- Mikra

The shafts:

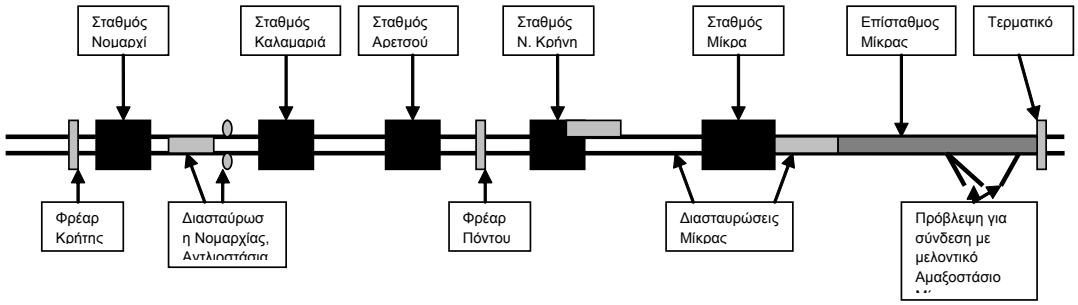
- Kritis Shaft
- Pontou Shaft
- Pumping Station 1
- Pumping Station 2
- Terminal Shaft

The crossovers of the Kalamaria Extension are the following:

- Nomarchia
- 1st Mikra Crossover and 2nd Mikra Crossover (integrated before and past Mikra Station)

In the framework of another contract, a provision has been made for the construction of a depot (Mikras Depot) adjacent and past Mikra. In the future, the line will be connected with Mikra Depot at Mikra forestation, as shown in the respective drawings.

GENERAL LAYOUT DRAWING



2.2 Ridership Requirements

The system shall be dimensioned for 18,000 passengers, as a minimum, per hour and per direction, the headway being 90 seconds. In addition, the design/planning of the Project shall take into account the foreseen ridership in each station, as provided for in detail in the Planning Manual of the main project of the Extension to Kalamaria. It is further stressed that the ridership forecasts have also taken into consideration the future extensions of the system.

2.3 Provisions for Future Extensions

The scope of the Project also includes provisions (along with the relevant infrastructure) for a future further extension of the line towards the Airport and connection with Mikra Depot.

3. SCOPE OF THE PROJECT

3.1 Description of the Scope

The scope of the Project concerns the physical and operational extension of the Signalling and the ATC System foreseen for the Base Project, which also includes the ATS System, by 4.8km, lengthwise, with 5 new stations of the Metro Line from Thessaloniki to Kalamaria.

The works for the extension and upgrading of the ATC and ATS Systems shall not downgrade the existing operation of the Base Project trains and stations.

The scope of the contract shall also include all relevant works required for the installation and operation of the overall Signalling and ATC system in all 15 new trains that will be required for the operation of the both Base Project and Extension to Kalamaria. Finally, the Contract shall also include all necessary works to be required for modifying or upgrading or supplementing the Signalling System and Train Control and the Automatic Train Supervision (ATS) System of the Base Project.

The scope of works shall also include the modifications/additions - utilizing additional items of equipment (hardware) and software – to the Signalling and Train Control System on the 18 trains of the Base Project, as these are described in the relevant article concerning the Automatic Train Protection (ATP) System.

Since the scope of the Project includes both the extension of the Signalling system of the Base Project and the new trains, as well as modifications to the initial 18 trains, which (initial and new trains) shall circulate in the entire network and in the depot, this specification covers all requirements of the signalling system in the line, in the stations, in the Depot and in the trains of Thessaloniki Metro network, regardless of the geographical location of the new hardware and software, wherever its installation may be deemed necessary.

It is stressed that, in the Base Project, the terminal station at the western end of the Line is the New Railway Station (NRS); however, there is always the possibility for SINTRIVANI Station to be assigned as the temporary terminal station for the Partial Operation of the section Pylea – Sintrivani. This must be taken seriously into consideration during design and implementation stages, to the extent that this concerns and affects the operation of the Signalling, the ATC System and the ATS System in the Extension to Kalamaria and the consequent analysis, designs, simulations and, finally, the operation itself.

3.2 Obligations of the Contractor

The Contractor shall be responsible for the following:

- Preparation of the Final Design (FD) and the Detailed Final Design (DFD) of the Project, including all additional investigations, simulations and designs, if any, required for this preparation, ensuring the required coordination among the structural, architectural, E/M and railway requirements.
- Coordination of designs in combination with other Contractors, as required, and coordination of the modifications to the Operations Control Centre (OCC) at Pylea Depot, both as regards design issues and implementation issues.
- Preparation of the required designs, in order to ensure the fully compatible incorporation of this Project into the Metro network under construction and the OCC.
- Ensuring the unobstructed and safe access of the E/M and railway equipment both during its installation and during the Project's operation and maintenance.

- Manufacturing of the equipment.
- Supply of equipment.
- Factory Acceptance Tests (FAT) of the equipment.
- Delivery of the equipment.
- Installation of the equipment.
- Coordination and cooperation with other Contractors for the proper and prompt completion of all facilities.
- Equipment Installation Tests (IT), the tests of individual systems (SAT), the tests of integrated systems (SIT), the equipment performance tests (SPT), as well as the participation of the equipment in the trial operation tests on the new extension, using the rolling stock either foreseen by the Base project or the new rolling stock required in cooperation with other Contractors involved.
- Modifications and upgrading as regards equipment, systems, documentation, drawings and software to be set in operation in the Base Project and which are required for the operational incorporation of the Project into the Metro network and the OCC.
- Commissioning of the entire E/M and railway equipment, subsystems and systems, in full compliance with the equipment of the Metro network under construction.
- Cooperation with other Contractors of the Project during the testing, trial operation and assessment of RAMS (Reliability, Availability, Maintainability and Safety) to be carried out both by them and this Contractor.
- Cooperation with Thessaloniki Metro Operations Company and the compliance with its regulations and procedures both during the execution of the Project (as regards the access to and execution of works in areas under the jurisdiction of the Operations Company) and during the Testing and Trial Operation period.
- Guarantee of the Project for three (3) years following the issuance of the Completion Certificate, on condition that the Contractor would have submitted the Final Measurement of Works within two (2) months from this Measurement.
- Training of the Operations and Maintenance Personnel, so that this personnel can effectively and safely handle and maintain the system and repair any eventual damage.
- Inspection and "corrective" maintenance of the Project systems at regular intervals, i.e. repair/restoration of bad workmanship, damage, failures etc. for the entire guarantee period.

Moreover, the Contractor:

- Shall provide samples, if required, of the materials/E/M equipment utilized and, in particular, any item required for the training of the technical personnel as regards issues related to maintenance and restoration of damage.

- Shall ensure access to AM, during design, construction, testing and commissioning.
- Shall ensure that every equipment item in operation shall be reliable, suitable and safe for the operation and maintenance personnel, as well as for the remaining equipment.
- Shall coordinate the modification designs concerning the OCC and the equivalent technical rooms, as well as the testing and commissioning of the central equipment to be installed both by this Contractor and by other Contractors.
- Shall coordinate the interfaces between the systems falling under his scope of work, the systems on the existing trains of the Base Project and the systems of the eventually different trains to be required in order to meet the needs of Kalamaria Extension, as required.
- Shall provide, in a comprehensible format, every necessary documentation, drawings, flow charts and software lists for each programmable equipment item (on a per case basis), design data and any kind of E/M data, as well as other supporting manuals, to facilitate the Project Owner in the operation, maintenance, identification of problems, modification and development of the Metro system.
- Shall provide the necessary spare parts, special tools (e.g. programming devices), testing tools and equipment application software programs and official software permits for the systems to be installed.
- Shall provide the necessary installation, operation and maintenance manuals, as required.
- Shall design and organize the operation and maintenance of the system, as regards the scope of works included in the Contract.
- Shall provide the appropriate space for training (where required).
- Shall provide samples, if required, of the applied materials/E/M equipment, in particular, as required for the training of the technical staff on issues pertaining to maintenance and damage restoration.
- Shall be responsible for tests carried out to measure the Performance/ Reliability/ Availability/ Maintenability/Safety/(RAMS) during the warranty period (where required).
- Shall see to the issuance of safety certificates, where required, and shall provide the entire equipment and documentation for the execution of the aforementioned tests.

3.3 Project Log

The Contractor's obligations also include the preparation of the Project Log and its submission to AM, in accordance with the stipulations of the relevant article of the Conditions of Contract (CC).

3.4 Spare parts of E/M Equipment

The Contractor shall supply all spare parts required for the smooth and continuous operation of the Metro system, as set in the Specifications Documents.

3.5 Warrantee

During the good performance warrantee period, as set in article 17.1 of the Conditions of Contract (CC), the Contractor is obligated to regularly inspect the Project and keep it in a perfect condition, execute all works concerning repairs, correction of defects, bad workmanship, re-construction, repair of defects or other faults that may emerge in the Project and are not due to standard use, in accordance with article 17 of the CC and the Specifications requirements.

The cost of the above shall be borne by the Contractor and shall be included in the Lump Sum Price of his Financial Offer.

4. KALAMARIA EXTENSION DRAWING ATTACHED HERETO