The Aesthetics of the Athens Metro Stations

I. Tzouvadakis¹, D. V. Batsos²

¹ Assistant Professor NTUA, Athens, Greece
² Architect Engineer, PhD candidate NTUA, Athens, Greece

ABSTRACT

The Athens Metro has been in operation since 2000. Currently, the Athens Metro consists of a transportation network of 26 kilometers with 25 stations, serving the urban area of Athens basin. According to different construction methods followed due to the nature of the project, the Athens Metro stations can be divided into two types; i.e. cut-and-cover stations and stations constructed using the underground boring methods (local investigation of the tunnel). The Athens Metro stations can also be described as stations of two periods. The stations of the first period have been constructed during the first phase of the Project, i.e. when the Base Project was put to tender, while the stations of the second period belong to those of the phase of the extensions. In the planning of the new stations, a different architectural concept was followed, while new parameters and ideas were introduced. In the framework of this report, the architecture of the stations is considered through analysis of the parameters affecting the building installations of the project. On a selective basis, consideration is also made of several operational parameters, which, in our point of view, are basic, leading to interventions in the planning and construction of the facilities’ underground and surface areas, thus ensuring harmonious integration thereof in the surface urban web of the city.

1. INTRODUCTION

The areas located in the immediate vicinity of the Metro stations constitute, on the one hand, an entrance-exit gate to / from the terminations of a functional network and, on the other hand, a pole which lends itself to information, meeting and exchange opportunities. In this way, these areas may instantly become receptors of spontaneous expression and human contact – this is the social dimension of the project, which certainly affects both the wider area, as well as the area inside the stations. Consequently, a reciprocal relationship is formed thereon where human activities and architectural forms affect each other. This link uniting several activities constitutes a distinct unit of special architectural form, which is enriched by alternating images influencing the visitors-users and those working in the Metro system and having a positive impact on them. In the 25 Stations, currently in operation in the Athens Metro network, the “hidden” city and our cultural heritage are revealed through the coexistence of significant archaeological finds and the works of art of contemporary Greek artists. Certainly, this effort was not initiated by any contractual or legal obligation on the part of ATTIKO METRO S.A; instead, it is the outcome of the particular importance given on improving the quality of life in the capital of Greece. In parallel with the creation of special areas intended for revealing the most significant archaeological finds, ATTIKO METRO S.A. implemented a program (for the first time ever implemented in a public work in Greece) in the framework of which works of art of distinguished Greek artists adorn almost all Stations of the Athens Metro System.
Worldwide famous Greek artists, taking into consideration the numerous possibilities offered by the network, created works of art especially designed for each individual station. In this way, the wealth of our cultural heritage is highlighted through the new metropolitan railway of Athens, acting as a contemporary museum.

2. FACTORS INFLUENCING THE ARCHITECTURAL FORM OF THE STATIONS

2.1 Construction methods

The Athens Metro is an entirely underground project. It’s underground construction ensures rapid transportation of the citizens in the wider area of the capital, relieving them from heavy traffic conditions. During the construction of the Metro underground stations and tunnels, modern methods have been used ensuring safe, workmanlike and rapid completion of the project. The construction methods, which were used individually or in combination, where feasible, with emphasis placed on the geological parameters and the on site conditions of the surrounding area, are the ones presented below, i.e.:

- Excavation using the Tunnel Boring Machine - TBM
- Excavation using the Open Face Shield - OFS
- Excavation using the Earth Pressure Balance Shield - EPB
  
  This method was used for the boring of tunnels in soils with poor mechanical properties, the excavation of certain Metro stations, i.e. PANEPISTIMIO, AKROPOLI, AMBELOKIPI, MONASTIRAKI, OMONIA and for the excavation of the deepest section of SYNTAGMA Station.
- Cut and Cover (C/C) Method.
  
  This method was pre-eminently used for the excavation of the project’s stations. In rare cases, this method was used for the boring of tunnels in locations where problems where were encountered due to poor mechanical properties of the soil. Many sections of the Athens Metro network have been constructed using this method, such as SEPOLIA, ATTIKI, LARISSA, METAXOURGHI, SYNGROY-FIX, NEOS KOSMOS, AGHIOS IOANNIS, DAFNI Stations – Line 2 – as well as ETHNIKI AMYNA, KATEHAKI, PANORMOU, MEGARO MOUSSIKIS, EVANGELISMOS, SYNTAGMA (the Line 2 Station located at a smaller depth) Stations. The tunnel sections between ATTIKI and LARISSA Stations and AGHIOS DIMITRIOS and AGHIOS ANTONIOS Stations (Line 2 extension), HALANDRI and DOUKISSIS PLAKENTIAS Stations (Line 3) and DAFNI - AGHIOS DIMITRIOS tunnel section were also constructed using the Cut and Cover Method.
- Cover and Cut Method. It is a variation of the Cut and Cover Method.
  
  The Cover and Cut Method was only used in SYNTAGMA Station (Line 2), due to the particularity of the area.

2.2 Selection of the platforms

Numerous parameters, either individual or a combination thereof, are those determining the final selection of the type of the station platforms – center or lateral -, in terms of their operation and shape. Both platform types are encountered in the Athens Metro with the lateral platforms being the predominant ones. Lateral platforms are the result of the basic design concept and the boring of single tunnels of double track. The Thessaloniki Metro is based on an entirely different philosophy with two independent single-track tunnels, where all stations shall have a central platform. Terminal stations lend themselves to the use of a central platform, without, however, this option being the only possible one.
Central platform stations are, for example, ETHNIKI AMYNA, AGHIOS DIMITRIOS and MONASTIRAKI Stations. The way in which the platforms are used in every station is shown on the aforementioned Stations Construction Method Schematic Representation.

Fig. 1. The diagram shows in a schematic and classified manner the Metro Stations construction methods together with certain basic characteristics thereof, which are of decisive importance when determining the stations’ form.

2.3 Location of Stations in the urban environment

The urban relief and its particular characteristics, gradients, elevations, and land uses, such as squares, un-built green areas, vicinity to parks and historic and cultural heritage related monuments influence architects during the conception of the Station’s form and art program.

This is the case of EVANGELISMOS, AKADIMIAS, AGHIOS ANTONIOS, DOUK. PLAKENTIAS, etc. Stations.
2.4 Classification and Identity of Stations

The METRO is a basic transportation project, which aims at serving both citizens and the city by contributing to the city’s prosperity, social and environmental upgrading, known as “quality of life”. For achieving this target, the Metro system must serve densely populated areas by connecting busy city spots (such as Hospitals, Universities, cultural centers, shopping centers and recreation areas), where a vast majority of people from several remotely located areas gather due to the services provided therein. If people were to use other transportation modes instead of the Metro for reaching these destinations, the city would be further congested, with all the related adverse consequences. Depending on the Station location into the urban web, the pioneers of the Base Project planning have classified the stations into four categories, i.e.:

- Typical stations
- Prestige stations
- Terminal stations and
- Transfer stations

The philosophy applicable to the specific project at the time was extremely “Doric”. Special importance and consideration was given to the principles of operability (e.g. lighting, ventilation, study of passenger flows), safety of the passengers in the event of fire, addressing intentional damage to the facilities, station evacuation and selection of materials based on the easy-maintenance and vandal-proof criteria.

This philosophy was integrated into the tender documents and was later implemented. With regard to the Lines and Stations identity (identification), the colors selected were used in the same way in which the green color had been used for Line 1 (the existing ISAP line); the blue colour was selected for Line 2 (DOUK. PLAKENTIAS, PENTAGONO – EGALEO - PIRAEUS) and red for Line 3 (ANTHOUPOLI – AGHIOS DIMITRIOS – ELLINIKO - PERISTERI). The colors used were also followed in the furniture (seats, etc.) and at certain finishes in the Stations.

2.5 Two separate Generations of Stations

The first architectural designs were prepared in France by OLYMPIC METRO CONSORTIUM, which had been awarded the Tender for the Base Project. This Tender was conducted based on tender documents drafted by Greek engineers (architects, civil engineers, mechanical engineers, etc.) in cooperation with English consultants of the London Underground.

The initial tender documents included no architectural specification whatsoever and thus, the architectural approach of the project was entrusted to the initiative of those participating in the tender and therefore, it was practically depending on the type of the proposed tunnel (single, double tunnel, etc.).

The entire architectural design of the Consortium was submitted to and examined by a special small-membered group of engineers of several disciplines, which initially formed the Special Department of OAS (Urban Transport Organization), subsequently of ISAP S.A. (Athens – Piraeus Electrical Railways) for a period of ten years and then of the Ministry of Public Works. The entire process lasted many years and the project was often put to question by the political leadership, a fact causing a great delay in the completion of the project due to extended periods of inactivity.

The Architectural Division of the Special Department (which, for a number of years, consisted of one architect only) made several proposals over time for architectural improvement of the stations; however, all these proposals “stumbled over” the fact that any changes made to the drawings of the

---

1 There are three persons with particular vision and faith in the feasibility of the project who acted as a catalyst in the creation and evolution of the project. We believe that reference to those persons constitutes an obligation of ours. These are persons are: Leonidas Kikiras, Chairman of ISAP and, subsequently, of ATTIKO METRO; Nikolaos Damas, Manager of ATTIKO METRO Special Department, and Aristidis Bithas, Civil Engineer, having an in-depth knowledge of all aspects and details of the project from the time of the feasibility designs (Smith designs) until the scheduling of the lines of the extensions.
Consortium would be of high cost. As a result, architectural interventions had, in practice, a “stage-setting” character applicable to a certain station gauge rather than embodying a clear architectural concept of a project with all the relevant significant consequences that an architectural concept entails. In our point of view, the only significant architectural intervention for which the Special Department fought a real battle, out of which it came out as a winner showing the adequate persistence over time, was that of a PSN friendly Metro system, i.e. a system accessible to persons with special needs (mainly mobility impaired persons). The special documentation used from other contemporary systems of Europe and the construction of ISAP Station by the Special Department in the area of Tavros also contributed in this target being achieved. The PSN facilities with which this station was equipped were such so as to convince the authorities concerned of the necessity of having the relevant measures being taken. Nevertheless, the relevant specifications were intentionally not introduced into the initial contract for not excessively increasing the budget of the project, and, therefore, for not missing the opportunity of this project being co-funded by the European Union. All parties concerned were waiting for the voting of the relevant Law, according to which all new facilities, including those of the Metro System, should necessarily be accessible by all Persons with Special Needs.

At the end of the 80’s, the compilation of the tender documents was completed and an International Tender for the Athens Metro was announced. As of this time, 18 years of experience were gained in the fields of design and the construction of a project whose magnitude and complexity were of a remarkable range for Greece.

Thus, the first 20 “living rooms” of the base project, or the so-called “First Generation” Stations, are functional enough; however, their prevailing characteristic is their conservatism, arising from strict adherence to the tender documents, mainly as regards typical stations, due to the effort for achieving the best possible offer on the part of the Consortia/ Joint Ventures participating in the Tender.

At this point, it should be stated that the current image of the Stations is not the one that the contracting Consortium had provided for in its offer. Throughout the long history of the project, the image of the Stations, in terms of quality, was greatly enhanced mainly on the initiative of ATTIKO METRO S.A. Management and thus, certainly, with the relevant additional cost.

During the valuable time period that elapsed until the commissioning of the Base Project, ATTIKO METRO S.A. Engineers gained knowledge, experience and self-confidence, assets later utilized for facing the new challenge of the extensions. Thus, the “New Generation” of Stations was created. These stations present the characteristics stated below:

- they are spacious and impressive to a memorable extent;
- they meet in full the needs of the PSN passengers, contributing thus to the social dimension of the project
- they constitute works of art of a remarkable identity and
- they have been created by ATTIKO METRO S.A. architects, a fact which means that they express the architects’ sentiment.

2.6 Social responsibility

One of the most impressive characteristics of the Athens Metro, which influenced the aesthetics of the stations, was the special provision made for the Persons with Special Needs (PSN). The Metro Stations aim at meeting in full the needs of wheelchair users and semi-ambulant users. The relevant services provided are the ones presented below (Table 1.).

Following completion of the Metro construction works, ATTIKO METRO A.E. proceeded with the implementation of significant intervention works for re-development and reconfiguration of several areas where metro works had been executed. The reconfiguration works concerned mainly the areas of the Municipality of Athens and other municipalities located along the route of the Metro lines. In this way, the Stations’ surrounding area was enhanced and every-day life in these areas become more human.
Table 1. Services provided For Semi-Ambulant Users and for Wheelchair Users. Source: Attiko Metro S.A.

<table>
<thead>
<tr>
<th>Services provided for Semi-Ambulant Users</th>
<th>Services provided for Wheelchair Users</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Stripes on the First and Last Riser of the Stairs</td>
<td>- PSN Equipped Lifts at All Stations</td>
</tr>
<tr>
<td>- Extended Handrail beyond the first and last risers of each stair by 1 meter</td>
<td>- Pre-recorded Announcements at the lift cabins</td>
</tr>
<tr>
<td>- Direction Indicators &amp; Emergency Push Buttons for the Interruption of the Escalators Operation</td>
<td>- Intercommunication with the Station Master at the lifts cabins</td>
</tr>
<tr>
<td>- Platform Edge - Additional Warning Stripping - Change in the floor surface texture</td>
<td>- Ramps for Level Changes</td>
</tr>
<tr>
<td>- Signs and Graphics - Improved Legibility</td>
<td>- Emergency Telephones at Concourse and Platform Levels</td>
</tr>
<tr>
<td>- Signs and Graphics showing the facilities provided</td>
<td>- Widening of the corridors at the exits of the lifts and installation of an additional control panel at low level.</td>
</tr>
<tr>
<td>- Lighting Level Improvements</td>
<td>- Accessible Administrative Area at the Depots</td>
</tr>
<tr>
<td>- Accessible Seats on Platform</td>
<td>- Toilets for wheelchair users in all stations and depots</td>
</tr>
<tr>
<td>- Twin Handrails at Bi-directional Stairs</td>
<td></td>
</tr>
<tr>
<td>- CCTV Cameras</td>
<td></td>
</tr>
<tr>
<td>- Large Electrical Switches</td>
<td></td>
</tr>
<tr>
<td>- Dense grilles in accessible manholes</td>
<td></td>
</tr>
<tr>
<td>- Curb cuts (Ramps)</td>
<td></td>
</tr>
<tr>
<td>- “Guide for sight impaired persons”</td>
<td></td>
</tr>
</tbody>
</table>

One of the most impressive artistic interventions was the CALATRAVA pedestrian bridge and the walkway constructed over DOUK. PLAKENTIAS Station in Halandri area.

Such bold planning and construction interventions aim at uniting in a harmonious manner the underground areas of the facilities with the street level and, thus, ensuring an agreeable and harmonious integration thereof in the urban web of the city.

2.7 Improvement of the 25 “Living Rooms” of Athens Metro System in terms of Aesthetics

One of ATTIKO METRO S.A. targets is to reveal the “hidden” city. In order to meet this purpose, the Metro Stations turned into an endless original open Museum where the most significant archaeological finds coexist with works of art of the most contemporary Greek artists, such as Yiannis Gaitis (LARISSA Station), Alekos Fassianos (METAXOURGHI Station), Yiannis Moralis (PANEPISTIMIO Station), George Zongolopoulos (SYNTAGMA Station), Yiannis Mytaras (DAFNI Station), Chryssa (EVANGELISMOS Station), Costas Tsoklis (ETHNIKI AMYNA Station), Christos Karras (HALANDRI Station) and many others. By studying their works of art, it is noted that almost all artists expressed themselves through themes inspired from the local characteristics of the stations, which emanate from the rich history, the mythology and the traditions of this city. For example, in METAXOURGHI, AKROPOLI, ETHNIKI AMYNA, MEGARO MOUSSIKIS, etc. Stations, the artistic creations identify themselves with the specific area, strengthening, thus, the identity of each individual station.

This effort was spontaneous and, certainly, it did not originate from a contractual or legal obligation of ATTIKO METRO S.A. On the contrary, this effort was the outcome of the significant importance given on improving the quality of life in the historic city of Athens, through the addition of 25 luxurious and functional “Living Rooms” at the service of all citizens.

SYNTAGMA Station is a typical example with its well-known multi-event room, suitable for the organization of multiple events. The social dimension of the Stations is expressed in Syntagma Station where human activities, architectural form and a means of transport interact.
As already stated in the Introduction, “this link uniting several activities constitutes a distinct unit of special architectural form, which is enriched by alternating images influencing the visitors-users and those working in the Metro system and having a positive impact on them”. Finally, another significant factor which acts as a catalyst in revealing and maintaining the “most positive image” of the architectural and, in general, the artistic project of the stations should also be highlighted. More specifically, perfectly organized crews of AMEL provide supervision, maintenance and cleaning services on a constant basis. It is worth pointing out that citizens are particularly mindful and contribute in keeping the stations clean by not littering the floors and walls (no graffiti on the wall) and by abiding willingly by the suggestions announced from the station loudspeakers on the prohibition to smoke, eat and drink in the Metro areas.

REFERENCES