

The Railway Station as a Contributing Element in the Colonial City Design and Landscape: Investigating the Algiers Railway Station Project

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Abstract

Since their appearance in the nineteenth century, railway stations have rapidly acquired a major role in cities, designed mainly to receive trains and welcome passengers, and consequently became the new gateway to the city. In Algeria, these emblematic figures of the industrial revolution were introduced later in the middle of the nineteenth century following those of France; strongly influenced by its colonial policy, which was not only reflected in the Neo-classical (victorious) style characterizing public buildings during this period but also in the design, character, urban layout and construction methods.

In the interests of knowledge and identification of architectural railway heritage in Algeria, this research aims to highlight the defensive character of the Algiers central railway station, particularly the military and security influence in the design at that time. Indeed, this railway station illustrates this observation and provides a wide field of study for scientific research. To achieve this objective, the qualitative method was adopted as well as a literature review, collection of archive data, and analysis of old maps and plans. This research provides new knowledge on railway architecture and the elements that determine it apart from the architectural style and the building function. The new facts established by this study highlight the political and military influence on architecture during the colonial period in Algeria and particularly on the railway stations, which in this case the objective of its realization is not only defined by the need for displacement but also by a need for colonization and domination. The second fact is to fill the gap in the state of knowledge about this type of building and architecture.

Key words: Railway stations, colonial policy, railway heritage, security influence, railway architecture.

INTRODUCTION

Considered as a symbol of the industrial revolution, railway stations are today part of the railway heritage, which represents and testifies to a key period in the history of humanity. In Algeria, contrary to this, protection measures in the industrial field remain very rare, except for a few monuments, including the only railway station in Skikda classified in 2017 (MINISTRY OF CULTURE, 2017).

In Algeria, the railway was introduced by the French colonization during the middle of the 19th century, its appearance is represented by the imperial decree of Napoleon III of 1857 (BEJUI & al, 1992), with the aim of facilitating transport and displacement given the difficulty of the existing geographical and topographical conditions, but also to evacuate the country's wealth towards the North thanks to a railway layout (South-North) inspired by the existing Roman road layout (MEYNIER, 1981), but beyond the economic aspects, at the time the colonizers were exploiting with a logic of domination and land ownership, and consequently, like any new country, Algeria was compared to the United States and its railway (DELAVIGNE & al, 1854).

It is therefore impossible to study the Algerian railway station without approaching the study of the railway network, since its creation, implantation, and layout depend firstly on the logic of the railway network and secondly on the site and the city of its creation. In these conditions, the historical-architectural approach is necessary to demonstrate this logic. The characterization and the identification of the railway station allow grasping the intrinsic elements and the necessary arguments for future operations of a patrimonial nature or protection measures.

The central railway station of Algiers, which is a building that is still well preserved in comparison with certain railway stations in Algeria, represents the ideal object of study, taking into account several criteria: its importance (station of the capital) and one of the imperial line, station of the first railway program in Algeria, its simultaneous construction

with its Non aedificandi site, adding to this the influence of the French military policy on its architecture, design, and integration to the site. This leads us to the following question: how and in what context did the military engineers build the Algiers railway station? What aspects define it?

Studies in the field of French railways and specifically the railway station as an object of study were first approached in 1940 by the geographer René Clozier with his doctoral thesis, thus evoking the implantation of the Gare du Nord in Paris (CLOZIER, 1940). Subsequently, studies were oriented towards the historical and architectural aspect of the stations in the city by the precursors Dethier, thanks to his exhibition at the George Pompidou National Centre for Art and Culture (DETHIER, 1978) and Bowie in his book on the major stations of Paris and the role of the actors in the planning (BOWIE, 1987). A great effort was made by Poupartdin in his thesis (POUPARDIN, 2005) by orienting his studies towards the typological aspect and by classifying the railway stations according to their architectural style, programme and functioning. The railways of the Maghreb (Algeria, Tunisia, Morocco) were initially approached by Henri Latrilleux, tracing their history through photographs taken during his travels and through maps of different scales (LATRILLEUX, 1949), later Pascal Bejui, Luc Raynaud and Jean-Pierre Vergez-Larrouy developed the study of the railway in North Africa by evoking the economic aspect, material, works of art and the impact of the French railway on the overseas countries of North Africa (BEJUI & al, 1992). The Algerian railway was taken as a unique object of study with its railway stations and works of art by Safir Mohand Ousaid, in his master's thesis entitled "le patrimoine ferroviaire du XIX et XX siecles en Algérie, identification et valorisation" (SAFIR, 2011). In 2015, in the book entitled "Le patrimoine ferroviaire Algérien, Connaissance morphiques des gares, 1857-1879", Hedya Boulkroune and Amina Bouslama addressed for the first time the morphological aspect of railway stations (BOULKROUNE & BOUSLAMA, 2015).

METHODS AND DATA COLLECTION

This research is based on the analysis of historical-architectural documents of the railway in Algeria and of the central station of Algiers, through plans, maps, images and written documents, but also through the investigation in situ by the architectural survey and the photographs, with the aim of demonstrating its urbanistic and architectural role, its security and military character. The study is in line with the perspective of the enhancement of the railway heritage in Algeria, through its scientific, historical and architectural knowledge. It is thus structured into two parts (Figure 1), the first shows by the diachronic analysis the creation and the evolution of the railway of Algeria in time and space, the second aims by a historical-architectural analysis to demonstrate the factors considered in the realization of the railway station of Algiers and to identify and demonstrate its various aspects, urbanistic and landscape role.

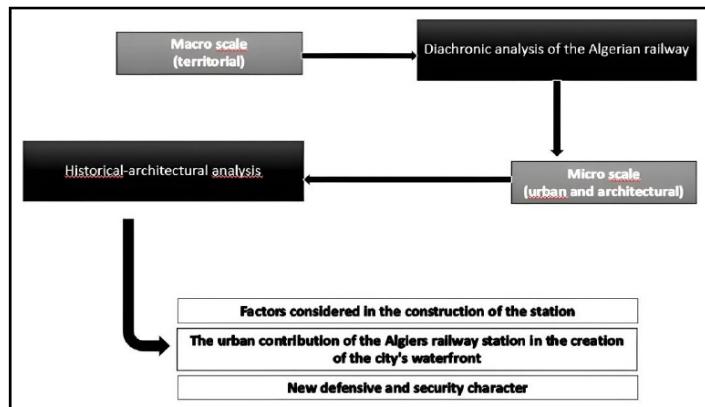


Figure 1. Schematic overview of the research method

HISTORICAL OVERVIEW OF THE RAILWAY IN ALGERIA

The Pre-Railway Period in Algeria

The realisation of the Algerian railway was strongly inspired by the previous communication networks already present, therefore, the knowledge of the forms and types of the pre-railway networks is primordial, as its understanding allows a subsequent clarification of the implantation and types of stations.

Communication Networks During the Roman Period

North Africa was marked by commercial activity during the Roman period, with the aim of reaching the interior of the country which was previously inaccessible by waterways. The Romans therefore gave importance to road networks,

particularly by building main and secondary roads in order to link the large cities such as Cirta with the farms and military camps (SALAMA, 1948), this provision met two objectives (Figure 2):

- First objective: to link the South to the North by connecting the cities to the ports in order to evacuate the wealth, this arrangement was later inspired by the French colonisation and was applied to all types of communication networks.

- The second objective: to link the east and west by inland carriageways parallel to the Mediterranean in order to develop trade and internal exchanges. This lateral layout was later inspired by the French colonisation for commercial and security reasons (belt around the cities).

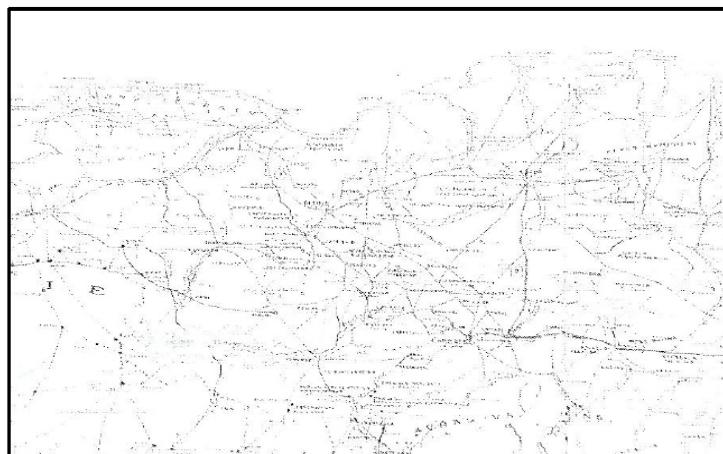


Figure 2. Map of the Roman Africa road network, Eastern Algeria (SALAMA, 1947)

Communication Networks During the Period of the Muslim Dynasties

This period was mainly characterised by trans-Saharan commercial activity with the countries of the Middle East, which favoured East-West transport, contrary to Roman logic, lateral displacement using horses and camels marked this period. The routes were numerous and classified into two categories:

Long-distance routes: characterised by a high density in the south, this is linked to the ease of movement using camels and horses but also linked to commercial activities (gold trade) with the Middle East (COTE, 1993).

Short-distance routes: these routes had acquired a local interest, known for the transverse movements in the North, which were less dense than in the South of the country due to the topographical nature and the mountainous areas which were difficult to cross (GOLVIN, 1957). The map below (Figure 3) illustrates the main routes used in medieval times.

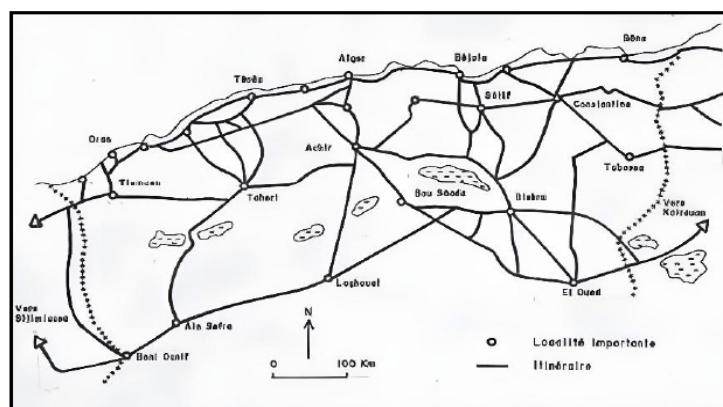


Figure 3. Map of the main routes during the 10th century in Algeria (Raham, 2001)

The Railway period in Algeria (Colonial Period)

Faced with the worries of displacement, the lack of infrastructure, and the need to exploit the riches of Algeria, the French found themselves in front of a Roman route that had been erased and replaced by narrow Ottoman paths, so they opted to develop communication networks by integrating them into the existing road network (GODARD, 1996). The

birth and evolution of the Algerian railway are defined by a process divided into several periods and railway programs. The choice of the type of communication network went through several studies, including the comparison of creation and circulation expenses between roads and railways, where it turned out that the railway is the most affordable means considering maintenance, speed flows, and its impact (DELAVIGNE & al, 1854).

The First Railway Program 1857-1879

The imperial decree of Napoleon III constituted the legal framework of the Algerian railway, thus representing its birth on April 8, 1857, the latter cited the following proposals (BEJUI & al, 1992).

- A parallel line to the Mediterranean, linking the three provincial capitals, Constantine, Algiers, and Oran
- Perpendicular lines to the Mediterranean, linking the main ports with the interior of the country (Figure 4).

In order to execute the different railway programs, several railway companies were involved, such as the Algerian Railway Company CFA, which was the initiator of the Algiers - Blida line, the Paris Lyon Méditerranée Company PLM, the Western Company, the Eastern Company, the Bône-Guelma Company, and the Algerian State Railway Company CFAE.

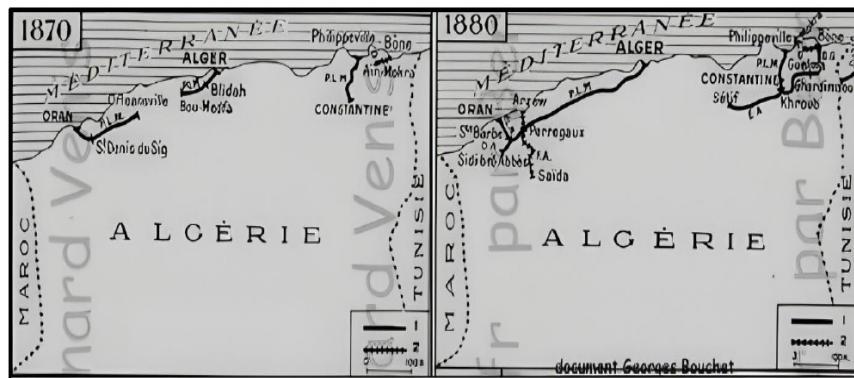


Figure 4. Map of the railway network in Algeria between 1870 and 1880 (FOURNIOL, 2001)

The Second Railway Program: 1879 - 1907

The second railway program was characterized by the classification of the existing lines of local interest towards the general interest, as well as the realisation of the branches in the North, the extension towards the Moroccan borders, and the creation of a network in the South of the departments Constantine, Algiers, and Oran (POGGI, 1931). During these years, the Algerian railway began to take shape, initially with a line parallel to the sea and north-south penetration routes (Figure 5).

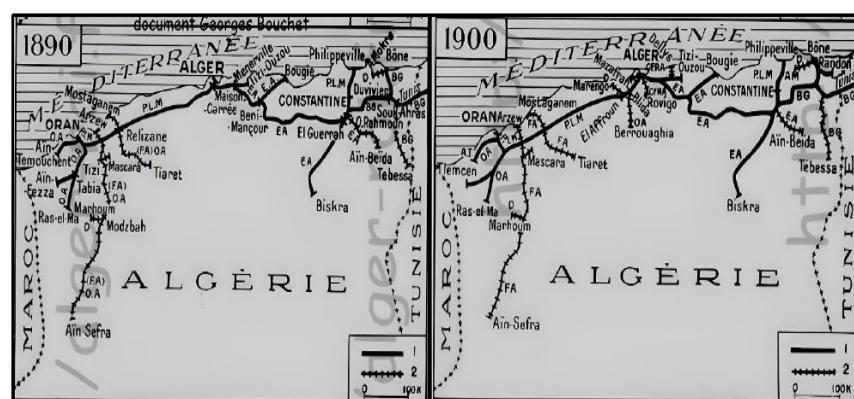


Figure 5. Map of the railway network in Algeria between 1890 and 1900 (FOURNIOL, 2003)

Third Railway Program: 1907 - 1920

Characterised mainly by the consolidation of engineering structures and other repair works, as well as the realisation of new branch lines not executed during the 1879 programme (BEJUI & al, 1992): Tlemcen - Beni-Saf, Sidi-Bel-Abbès -Tizi -Mascara -Uzès-le-Duc, Relizane -Prévost-Paradol via Zemmora, Orléansville -Ténès and finally Bouïra -Aïn-Bessem -Aumale (Figure 6).

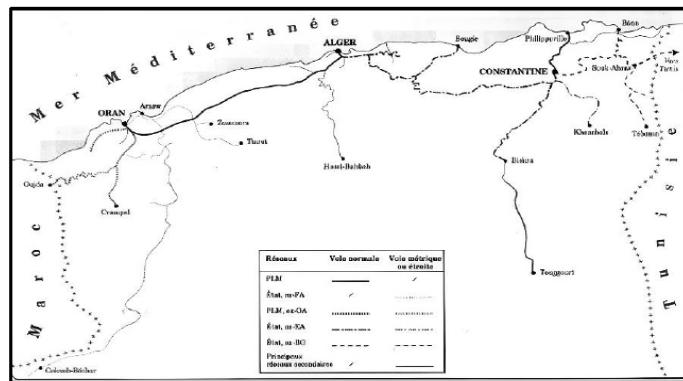


Figure 6. Structure map of the Algerian railway network in 1921 (BEJUI & al, 1992)

Fourth railway program 1920 - 1960

The program was applied late in 1921, characterised by the homogeneity of the companies' lines, PLM in the West and CFAE in the East, as well as the modernisation of the networks (electrification of the Bône - Oued Kébérif mining line).

Finally, the management was put in the hands of the National Society of French Railways in Algeria (SNCFA), with a capital provided by the state and the SNCF métropolitaine (BEJUI & al, 1992)

The railway during the post-colonial period

Apart from the electrification, doubling, and creation of industrial tracks, the Algerian railway has kept the same colonial structure (Figure 7), which explains the will to industrialise the country. The railway is managed until today by the national railway company (SNTF). The twenty first century was marked by the creation of the ANSERIF, a national agency for the study and monitoring of railway investments in 2005, whose main mission is to develop the railway sector by building new stations and railway lines and acquiring new high-speed trains, although the old railway stations remain frozen in time, excluding them from the programs of adaptation, modernisation and preservation.

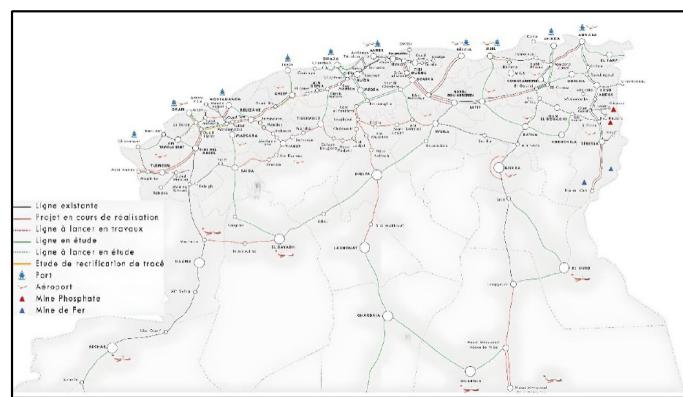


Figure 7. Map of the current rail network (ANESRIF, 2017)

THE ALGIERS CENTRAL RAILWAY STATION: A HISTORICAL AND ARCHITECTURAL SURVEY

The Dilemma of the Intramuros Implementation of the Railway Station

The realisation of the Algiers railway station project proved to be indispensable because of the absence of an inner station in Algiers, but at the same time impossible in view of the law of 1857, which imposed the establishment of stations outside the fortifications (Proceedings of the conference of 31.03.1862). This provision was widespread in Europe during the 19th century, In France, the stations appeared in the 1830s, almost clandestinely, on the edge of the suburbs, on the site of the fortifications (DE ROUX & CARTIER, 2007), with the arrival of the industrial revolution, these fortifications had acquired a double role, a defensive function and at the same time a fiscal frontier, with all goods entering the city passing through the tax formerly known as the octroi (MICHAUD, 2004). Conceived as a mixed station and operated by two railway companies, PLM and Compagnie de l'Est, the Agha station ensured the Algiers-Oran and Algiers-Constantine connection provisionally from 1862 until 1867.

After the conference of March 31st, 1862, held in Algiers, which authorised the realisation of an interior station, six projects were proposed; after the examination of the proposals, the conferees opted for the sixth project proposed by the CFA company which consists in the establishment at the level of the Square Port Said while proposing a correction of the alignment of the waterfront in the objective to recover the grounds on the quays of the port (Figure 8). The accessibility to the station has been studied in such a way that it does not disrupt the activity of the port, breaks for the mechanical traffic and stairs for the pedestrian traffic (Report of the PLM company, dated 12.02.1864, 1864).

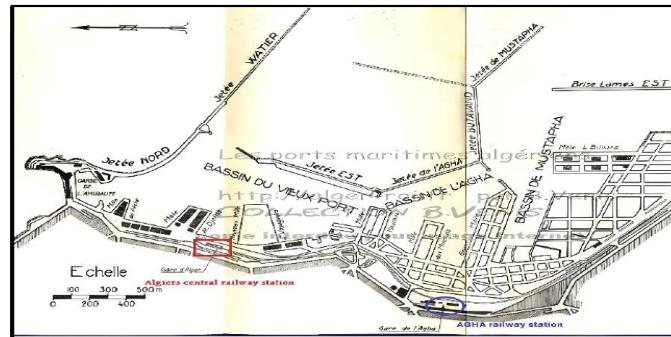


Figure 8. Plan of the port and location of the two stations in 1942(PAUL, 2010)

The Military Influence on the Algiers Railway Station Project

The railway station project was influenced by military and security concerns, given its location on the seafront, the military engineers took into consideration the defensive character of the city (an urban façade protected by ramparts). Among these military and security criteria, we cite :

Determination of the Building Height According to the Positioning of the Cannons on the Bastions

The argument presented to the army was defined in the height of the building which should not exceed 12 metres, so as not to constitute an obstacle to the cannons located at a height of 17 metres (Figure 9,10) in the event of a maritime attack, moreover, this design allows a view and integral surveillance on the sea with a free field of approximately 6 degrees. (Proceedings of the conference of 13.02.1865, on the project presented by the PLM company, for the construction of a passenger station on the quays of the port of Algiers, 1865)

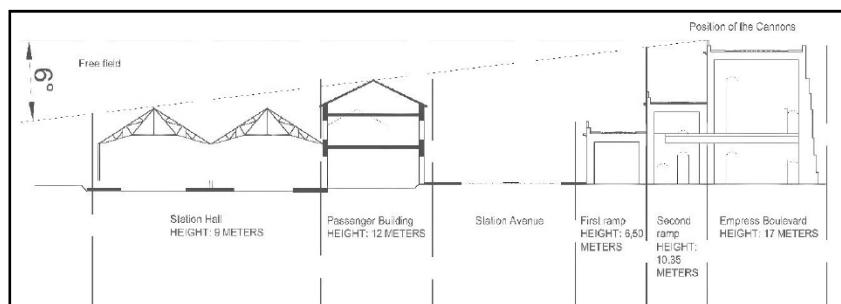


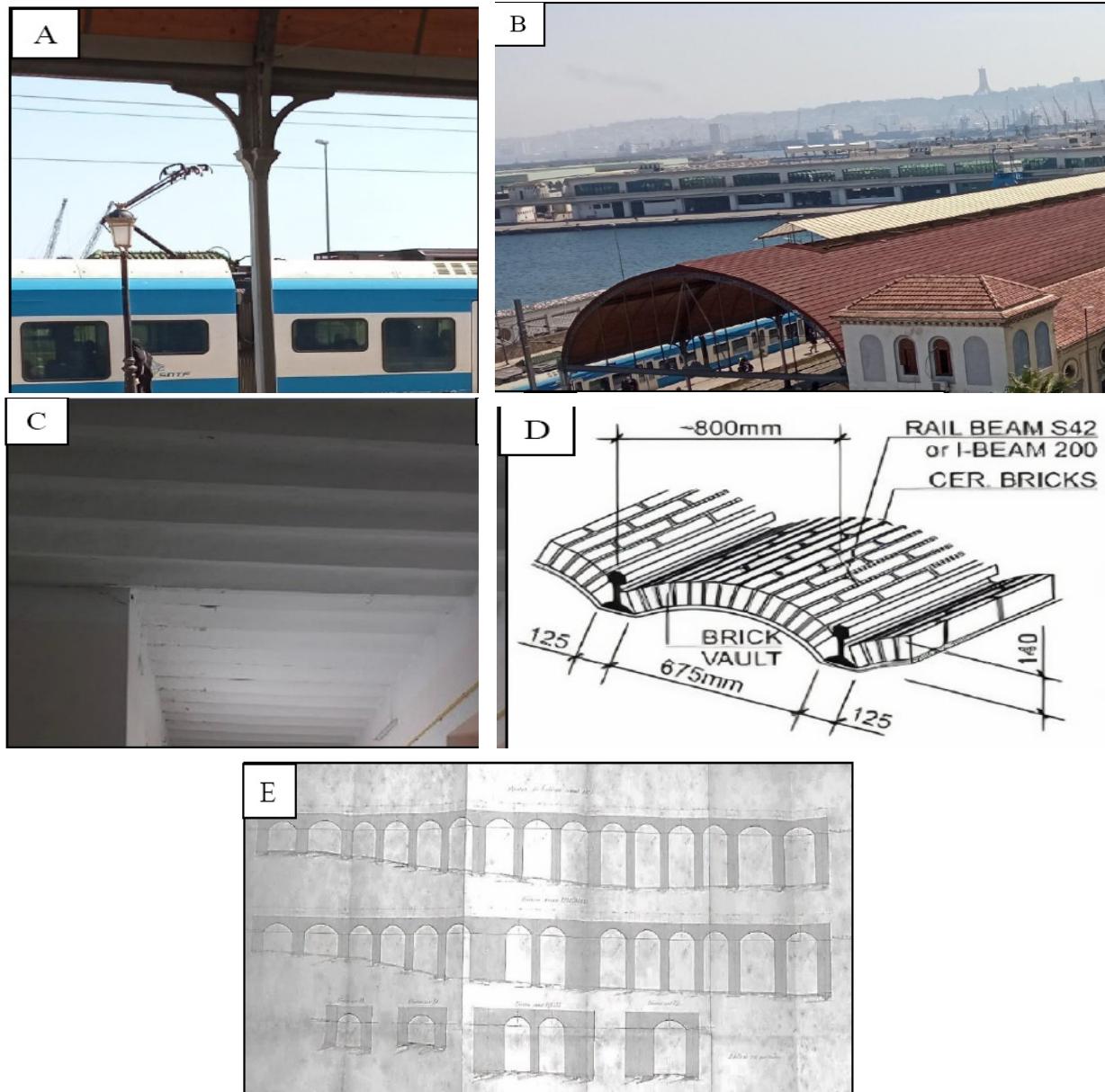
Figure 9. Profile section on the central railway station and its context (drawn by the authors, based on SNTF archive documents, consulted on 08/12/2020)



Figure 10. View of Algiers station avenue (GEISER, 1880)

Determination of Building Material

The maritime services prohibited the use of flammable materials because of the proximity to ships and proposed the use of resistant materials capable of containing a possible fire (Figures 11,12). The army also imposed the use of light materials, easy to destroy in the event of a siege of the building by the enemy. The frame and floors were made of non-combustible materials such as iron, zinc, cast iron and brick. (Proceedings of the conference of 13.02.1865, on the project presented by the PLM company, for the construction of a passenger station on the quays of the port of Algiers, 1865). The used construction system consists of a 60 cm thick rubble wall structure and a vaulted floor made of iron ribs and brick (Figures 13,14), while the foundations are made of massive stone vaults at a depth of 7.50 m below sea level (Figure15).



A) Figure 11. View of a column made of cast iron (taken by authors on 25/03/2021)

B) Figure 12. View of the roof made of moulded zinc sheet (taken by authors on 25/03/2021)

C) Figure 13. View of the vaulted floor inside the station (taken by authors on 25/03/2021)

D) Figure 14. Drawing of the brick vault floor (KRENTOWSKI & al, 2019)

E) Figure 15. Elevation of the station's foundations(SNTF archive center, consulted on 8/12/2020)

Determining the Layout of the Station

The classification of railway stations depends on several criteria of different kinds depending on the operation, nature of use, location on the line, class of station, and layout (BOULKROUNE & BOUSLAMA, 2015).

According to (KANAI, 2005), the layout of railway stations can be established in five types (Figure 16):¹

Lateral Layout: The Main Building is located on a lateral side, parallel to the rails.¹

Bilateral layout: Two main buildings located on the two lateral sides and parallel to the rails.¹

Frontal Layout: The main building is located on an axis perpendicular to the rails.¹

L-shaped layout: A combination of the Lateral and Frontal layout, it consists of two separate or joined buildings, one located at the head of the rails and the other on the lateral side.

U-shaped layout: A combination of bilateral and frontal layout, in this case, the rails are surrounded by main buildings on three sides.

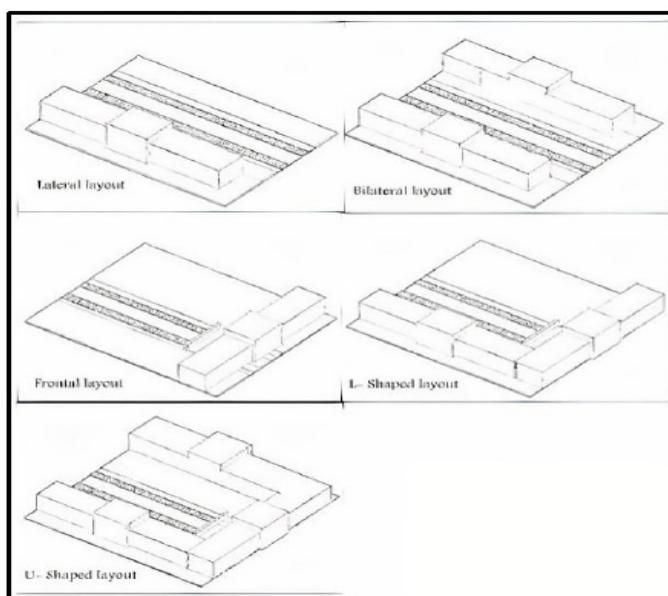


Figure 16. Types of railway stations according to the layout of the passenger building (Drawn by authors)

The Algiers station is considered as a terminal station, which unlike the stations of the same type at the time, adopts the lateral layout that characterised the transit stations since indeed the stations of the terminal type are globally recognised by the (L)- or (U)-shaped layout. The initial plan of the Algiers station initially proposed an L-shaped layout (Figure 17), with one yard for the departure and the other for the arrival, which is located opposite Bastion 18. This layout was abandoned in favour of the lateral layout (Figure 18) for security and land reasons, because the presence of the passenger building opposite the Bastion presented visibility problems, while the off-centre layout to the Empress Boulevard and parallel to the Bastion occupied a considerable area.

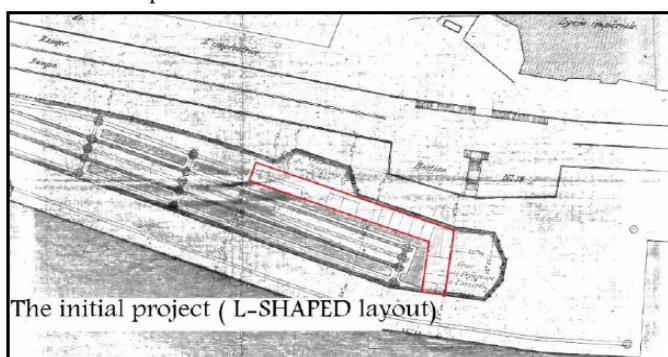


Figure 17. The initial project of the Algiers railway station (1864) (SNTF archive center, treated by the authors, consulted on 8/12/2020)

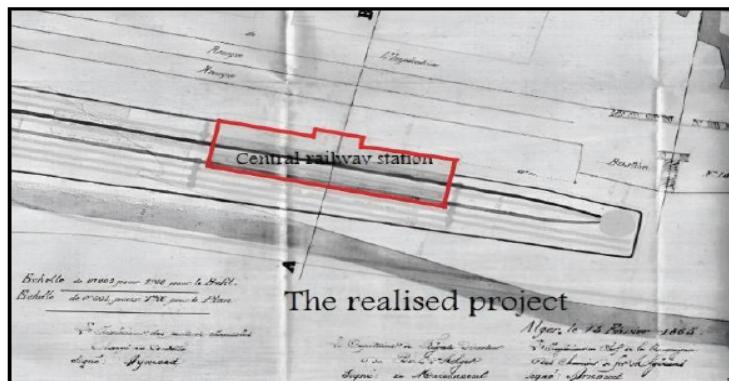


Figure 18. The realised project of the Algiers railway station (1865) (SNTF archive center, treated by the authors, consulted on 8/12/2020)

Determining The Railway Station Design

A- The passenger building

Despite the military and security influences in the design of the project, the Algiers railway station has adopted the character of 19th-century public buildings and railway stations in the neoclassical style. The building is composed of two entities, the first consisting of a central pavilion (main body), which stands out to mark the entrance of passengers and the central space housing a ticket office inside; the second consists of two perfectly symmetrical parts housing waiting areas and administration offices (Figure 19). This play of volumes helps to mitigate the linear effect marked by the considerable languor of the building (100m) (Figure 20). Aesthetically, the station has very few architectural elements (Figure 21), apart from the central clock and the treatment of the horizontal bands, which logically refers to the required defensive character and the clauses taken by the military authority, which ordered the destruction of the station in case of force majeure. This criterion influenced the choice of building materials, prohibiting the use of wood and the use of non-combustible materials capable of containing a possible fire, and at the same time, easy to destroy by cannons (rubble masonry, cast iron, cut stone).

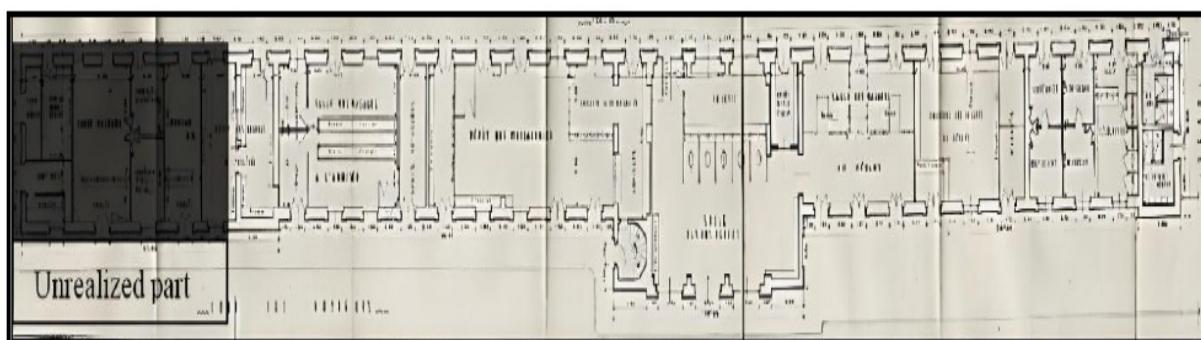


Figure 19. Ground floor plan of the central station of Algiers (SNTF archive center, treated by the authors, consulted on 8/12/2020)

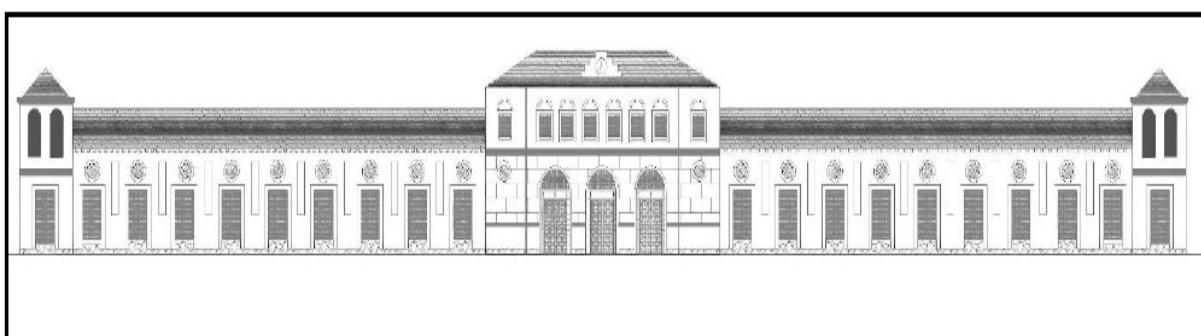


Figure 20. Algiers central railway station main façade (Drawn by authors)

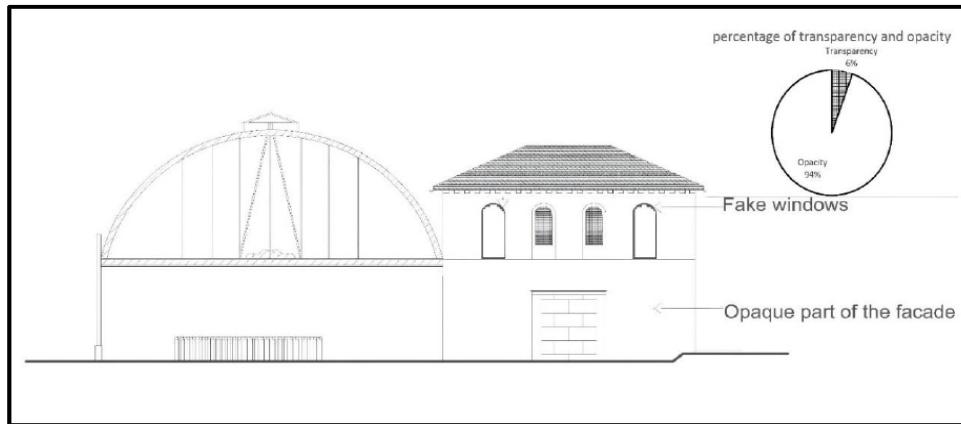


Figure 21. Side elevation of the central railway station of Algiers, sector representing the percentage of opacity and transparency (Drawn by authors)

B- The station hall.

Contrary to the initial plan which provided for a two-bay gabled hall roof, and given its width of 26m, the Polonceau truss with a lattice arch replaced it reducing the width to 19m, indeed and according to National Rail Transport Company (SNTF) archives, this arrangement was made with the dual purpose of avoiding construction on the harbour quays, and using the truss thanks to its arched shape and considerable height as a possible shield in case of a maritime attack. The hall is arranged parallel to the passenger building (Figure 23), occupying the entire length of 100m, and is defined as a transitional space between the passenger building and the train, raised 50cm from the rails to allow passenger access. This space is covered by a metal framework which was considered a new building system at that time, its roofing is made of zinc sheets moulded in the shape of tiles where there are openings called skylights (Figure 22), designed mainly for smoke evacuation, ventilation and lighting, the cast iron columns serve as supporting elements of the framework.

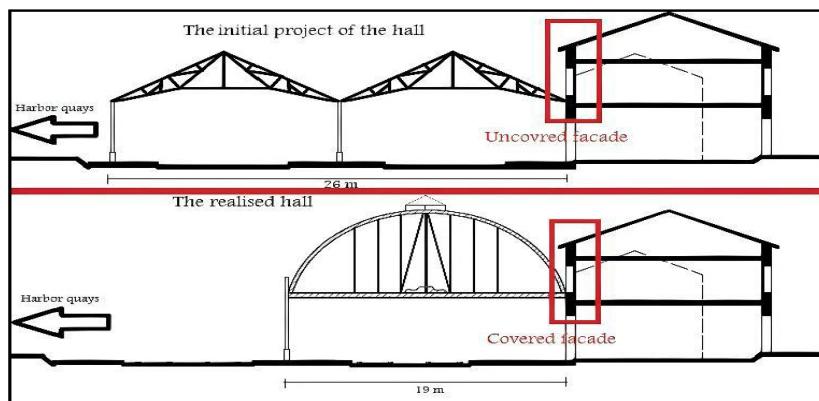


Figure 22. Section of the initial and actual station hall (Drawn by authors based on SNTF archive documents)



Figure 23. General view on the central railway station of Algiers (taken by authors on 25/03/2021)

RESULT AND DISCUSSION

The Algerian railway bears witness to a key period in its history, initially built for commercial, military and security reasons, it now represents the image of the city through its railway stations. Indeed, this research has attempted to explore the field of railways through a hierarchical reading of the territorial scale (macro) to the urban and architectural scale (micro). The example of the Algiers railway station illustrates the logic of the creation of railway stations in the 19th century, taking into account security imperatives, its location, integration into the site, orientation, design and construction materials have been fully studied, affirmed today by its neoclassical architectural style characterised by the defensive and security aspect.

This study also demonstrated through the different archive documents the factors considered during the realization of the project of the station of Algiers such as the factor of the height of the building, the materials used, the selected layout, and the design of the station and its hall. consequently, all that influenced the development of the image of the city and its urbanism by the realization of the ramps facilitating the access from the Empress boulevard towards the station, until the creation of the station boulevards and thus taking part in the process of the creation of the capital urban facade.

CONCLUSION

This research aimed to identify the railway architecture in Algeria during the 19th century through scientific and historical knowledge, in order to popularize and enhance the Algerian railway heritage which until today remains neglected and poorly documented, while it testifies to a landmark period in the history of humanity and the country that deserves to be studied in depth. The new knowledge in this research was discovered through archival documentary research, and in situ investigation. the two preceding studies have shown that Algerian railway architecture of the 19th century was imported from the european model in its globality but soon influenced by security factors, this has made the Algerian railway model atypical, rich, and a source of knowledge, hence its rarity value. Finally, this study can serve as a support element for any heritage operation concerning the railway in Algeria.

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