OKAN UNIVERSITY INSTITUTE OF

SCIENCES AND ENGINEERING

UNIVERSITÀ DEGLI STUDI DELLA

CAMPANIA LUIGI VANVITELLI

IMPROVING THE SOCIO-CULTURAL AND ENVIRONMENTAL GAIN OF DEAD AND STRICKEN AREA:

"Piazza Marconi Environmental Restoration Project"

by

DIDEM DEMIRCI

THESIS FOR THE DEGREE OF

DOUBLE MASTER OF ARCHITECTURE

ADVISORS

Prof. Dr. Andrea BUONDONNO

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ISTANBUL, January 2018
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DIDEM DEMIRCI

submitted to the Department of Architecture of

UNIVERSİTÀ DEGLI STUDI DELLA

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ÖZET

Bu çalışmada Caserta iline bağlı Aversa ilçesinde bulunan Piazza Marconi ele alınmıştır. Normanların İtalya'ya gelmeleriyle hakimiyet kurmak için 1030 da Aversa kontluğu olarak ilan ettikleri çok önemli bir kimliğinin olduğu zamanlardan, bugün sadece bu bölgede yaşayan insanlar tarafından bile adı unutulan ve zaman içinde bir pazar meydanı haline getirilen bir alandır. Bu çalışma, Piazza Marconi'nin mevcut durumunun belgelenmesi, alandaki bozulmaların ve çevresel eksikliklerini belirleyerek saptanmasıyla çevreye tekrardan geri kazandırılması ve geliştirilmesini amaçlamıştır. Yanlış kullanım ve kullanıcı tahribatından ötürü yıllar içinde değerini kaybetmiş olan Piazza Marconi özgün işlevini koruyamamıştır. Bu yüzden bir çevresel yenileme proje önerisi hazırlanmıştır. Tezin ilk bölümünde, çalışmanın amacı ve kullanılan yöntemler açıklanmıştır. İkinci bölümde alanın bulunduğu Aversa'nın sosyal karakteristikleri, ekolojik karakteristikleri ve mekansal karakteristikleri ele alınmıştır. Üçüncü bölümde önceki bölümden elde edilen verilerle öncelikler belirlenmiş ve tasarlanan restorasyon önerisi detaylandırılmış ve ele alınmıştır. Dördüncü bölümde projede kullanılacak olan materyaller koşullu planlama yaklaşımı ile ele alınmış ve sonuçlanmıştır**.**

Anahtar kelimeler: Piazza Marconi, Pedoteknoloji, Çevresel Restorasyon

ABSTRACT

In this study, Piazza Marconi in the Aversa Town in the Caserta Province is addressed. Piazza Marconi, an area that had an important urban identity in 1030 when the Normans had declared as the County of Aversa to establish dominance in Italy, is now forgotten even by the ones living in the area and that has become an ordinary marketplace. This study, the documentation of the present status of Piazza Marconi aims at identifying the deteriorations and environmental deficiencies in the area, and improving and bringing the area to the environment. Piazza Marconi could not preserve its original function due to misuse and loss of value for the users. Thus, an environmental restoration project proposal is prepared. In the first chapter the thesis the objectives of the thesis and the methods used to obtain these outcomes are explained. The second chapter addresses the social, ecological and spatial characteristics of Aversa that contained the area. In the third chapter, the priorities determined using the data obtained in the previous chapter, the anticipated restoration proposal is elaborated, and addressed. In the fourth chapter, the materials to be used in the project are discussed with conditional planning approach and they are concluded.

Keywords: Piazza Marconi, Pedotechnology, Environmental Restoration

To my FAMILY;

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SYMBOLS

q_u : Unconfined Compressive Strength

MPa: Megapascal

PI : Breaking load

Q:Rock Tunelling Quality

Jn: Joint set number

Jr: Joint roughness number

Ja: Joint alteration number

Jw: Joint water reduction coefficient

ACRONYMS

F.A.O: Food and Agricultural Organization

R.R.S.S.U.U : Court of Cassation

TCR: Total Core Recovery

RQD: Rock quality Designation

SPT: Standart Penestration Test

RMR: Rock Mass Rating

SFR: STRESS Reduction Factor

CSIR: South African Council For Scientific and Industrial Research

NGI: Norwegian Geotechnical Institute

SWOT: Strengths, Weaknesses, Opportunities, Threats

D.O.S: Strategic Orientation Certificate (Documento di Orientomento Strategico)

PIU: Integrated Urban Program (Programma Integrato Urbano)

POR: Regional Operational Program (Programma Operativo Regionale)

FESR: European Fund for Regional Development (Fondo Europeo Per Lo Sviluppo Regionale)

i.e:namely

CHAPTER I- INTRODUCTION

Environmental restoration starts or speeds up the improvement of an ecosystem that is detoriated, damaged or polluted due to human activities or natural material. The present surface layer that we see around is shaped as a result of the transformation of the rock layer (lithosphere) that forms the crust of the earh, due to climatic and geological events. The soils does not only comprise of minerals, organic material, water and air. Soil is the product of the interaction of these elements.

Environmental restoration characterizes the phyical and chemical features of the basic material of soil such as surface fill, soil texture (or sand, silt and clay mixture), reaction and salinity. In time, this basic material are transformed to obtained unique soil and landscapes. At this point, the science of Pedology steps in.

Pedology is the soil science that examines and digitises the apperanace, formation, physical, chemical and biological compositon, classification, and distribution of the soil. It investigates the connections and interactions due to human factor, between global environmental change, the atmosphere, hydrosphere, bioshphere, cryosphere, pedosphere, lithosphere, and near space. (Ugolini, F. C. ; Spaltenstein, H.,1992) The soils forming the pedoshphere are formed with the disintegration of rocks with physical, chemical and biological means. This layer is the one in which the plants hold on and grow. Pedosphere (soil) only develops when it interacts with the atmosphere, hydrosphere, lithosphere and biosphere (Ugolini, F. C. ; Spaltenstein, H.,1992) Thus, plants renew the soil by enabling the interaction of the layers with air and water. The plants mainly give the reduced carbon to the soil, in sugar and carbonhidrate form,

and support the heterotrophic biomass in the soil. This exchange results in the disintegration and transformation of subtrates and energy production.

The natural factors influencing the formation and development of soil are the type of the basic material, topography (surface forms), climate, vegetation, population increasing in time, and the human activities during the day and night. Soil degredation results from natural and unnatural anthropologic factors. Soil degradation is the compression of the soil and change in the physical features of the soil due to the anthropological factors. The compression of the soil causes the degradation of its structure and thus significant changes in its volume features such as bulk density, porosity and penetration. The misuse of the land, logistics services, unability to recycle waste material are among main anthropological factors. The present surface continues to change and degrage in time as these factors increase (Dudal, R, 1928). The main reason for this situation is the planning of the anthropological factors against the environment due to socio-economic pressure of the increasing population.

In an environmental restoration project, one should pay attention to the data obtained when an exercise is done aiming to protect the environment. It is imperative that an investigation, assessment and monitoring is conducted for the protection, improvement and productive usage of the soil; the problems are identifies; and a consensus is arrived to take, develop and implement the precautions for soil protection and for troubleshooting the problems. The project to be realized focuses on the analysis of the connections between the local, regional and global economy, and the environmental change; it addresses the role the economic analysis plays in the design and practice of the environmental policies. Within the context of nonrenewable

resources (oil, natural gas, natural forests), the sustainable use of renewable natural resources (soil, air, water, bacteria, plants and animals) is an important environmental problem that the human population encounter in local, regional and global scale. (Ugolini, F. C. ; Spaltenstein, H.,1992) Environmental restoration and reversing the destroying or damaging of the natural resources increase the sustainability of the suffering natural resources. Regaining areas, which have lost their functionality for some reason, means the regaining and improvement of the socio-economic conditions and living standards in that region. Therefore, environmental restoration and pedology are the sole option to increase life quality.

In this thesis study, Piazza Marconi, situated in the Aversa town of Caserta province in the Campania region in Souther Italia is selected as the case study in accordance with the data. (Figure1) When Piazza Marconi is viewed from a wider perspective, it is seen that the area is destroyed physically and environmentally by natural and unnatural (misuse, human factor, settlement, overpopulation, climate, etc.) sources. In line with the aforementioned research steps, the pedologic characteristics of Piazza Marconi is investigated and the environmental restoration project is prepared.

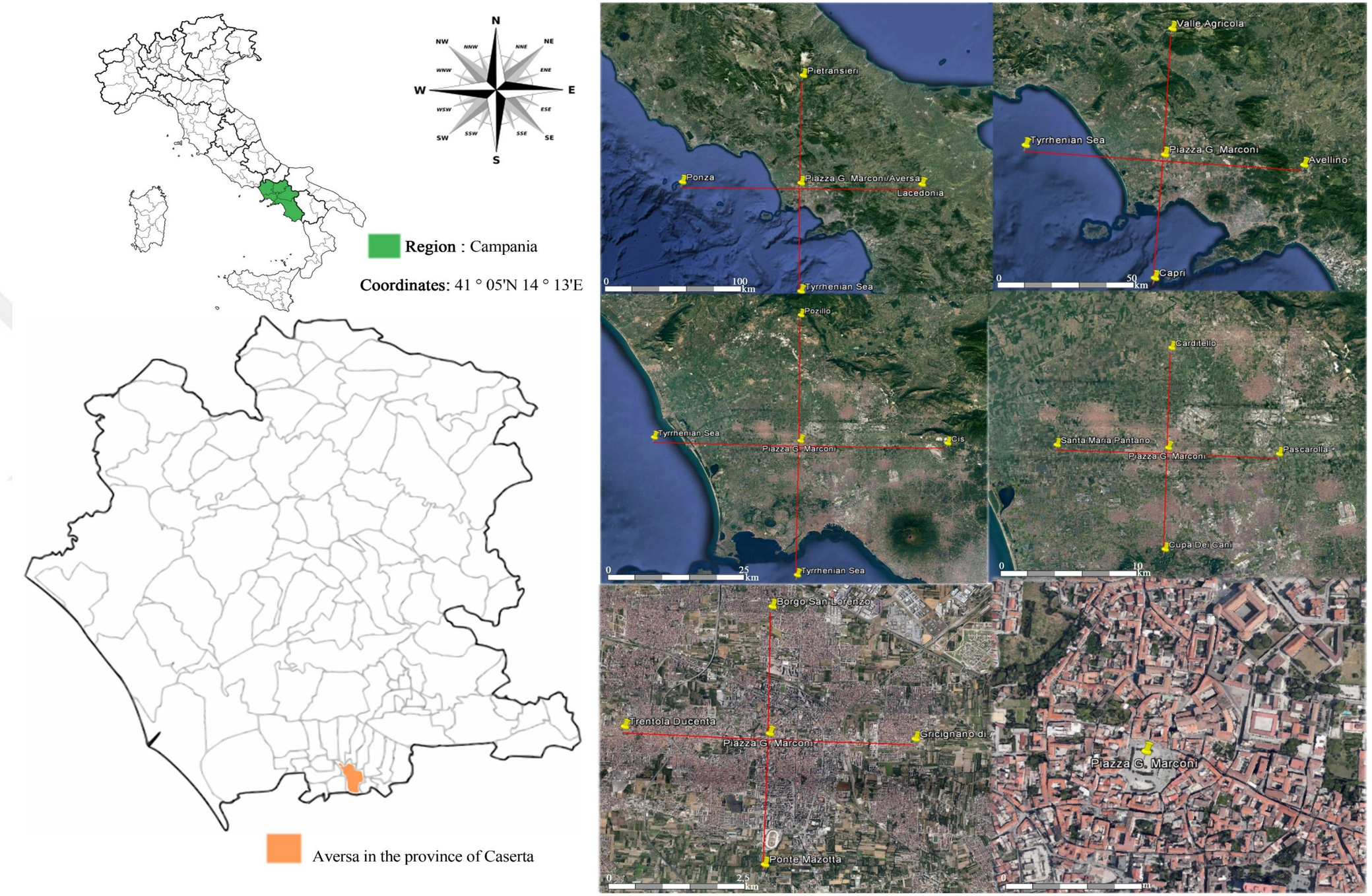


Figure 1. Position the town of Aversa in the province of Caserta, Location of Piazza Marconi

1.1. Goal

Renewing the soil means bringing a new and functional objective to it, and regaining both the pedological and the environmental integrity. It is essential that the design stages of the environmental restoration projects conducted in urban areas are implemented completely. In this study, a design-restoration project was prepared for the reorganization of a present area to prioritize the Marconi square which have a historical significance. The project study was conducted considering the restoration process of the design. To determine the objectives and problems, research, the project and implementation project, data collection for the present situation (questionnaires and literature review) and environmental analysis were conducted.

Aversa is situated in the Campania Region in Caserta province. Aversa has a long history and an established tradition of architecture, cultural environment and the people living there. Normans, 10th century the protectors of the city has transformed this city a very significant center until 15th century. However, the area has lost its significance exhibiting a good example to aesthetic, social, environmental and financial degradation. This area is ignored by the people; people cannot walk in the streets due to parking violations and insecurity. The people of the city are not able to use and enjoy this park, because it is not secure and the surroundings are polluted. Also, some people take advantage of the area's decrepitude and use and sell drugs.

Streets, squares and parks shape the translocation of people. These dynamic areas are important complements of business and domestic life in providing range of motion,

forming communication nodes, and establishing common spaces for recreation. (Carr, S. ;Francis, M.; Rivilin; L.G. & Stone, A.M., 1992)

This study aims at benefiting the environment by renewing the soil and bringing a new function to it. Protection means the interpretation, management, understanding and transfer of cultural heritage, and bringing new interpretations and revaluate its profile. In accordance with these etudes, this study aims at constituting a resource for further studies for transferring the historic fabric at Piazza Marconi in Aversa and the related high culture to the next generations, and steering these studies so as to protect the historic fabric of the area ideally.

Sustainable development is a central issue for outdoor museums and it means increasing the value of some place rather than decreasing it. The evidence obtained from the best practices identifies two main elements of this process: place-based development and improvement of local networks in which the outdoor museums play a key role as catalysts in the development of social capital.

This is related with designing real actions and changing the society, and improving the soil and landscape.

1.2.Material and Method

The materials of the study consists of the area in which the study was conducted and the research tools and equipments. The thesis comprise of four chapters; an Introduction, Chapter Two Initiation, Chapter Three Evaluation and Planning, and Chapter Four Shaping the Plan. This study is conducted in a square of 11,296 m2 encompassing a park, located in the Campania Region, Caserta Province and Aversa

village. In this area which had been organized in the 15th century, there is a 3492 m2 center area encircled by disordered settlement. The present firm soil is extremely eroded due to the material and excessive use. The layout plan of the area, the topographic map, the 1/1000 scaled application map, project, reports, photographs, documents, and the interviews with the local authorities were acknowledged as materials of the study. In shaping the projects sketch drawings, Matlab, Autocad and Sketchup Pro software were used.

Previous studies and resources was used for historical research. There has not been any previous restoration project or construction project for this area. For the theoretical and historical information, the research "Norman Tradition and Transcultural Heritage" by Burghart, S. and Foerster, T. in 2013 and the biography titled "The History of the Normans" by the historian Amatus of Montecassino, one of the earliest historians who had lived in the Norman era.

The ecological (morphology, soil, plants), visual and functional area analysis were prepared considering the aforementioned data and presented in the study. In the selected area, Piazza Marconi, photos were taken in-situ analyses and field observations. In accordance with the in-situ survey and the photographed visual analyses, the current situation photos and recommendations were presented with sketches in the planning section of the thesis.

In accordance with the interviews and surveys conducted with the people living and the area and the users of the area, an environmental restoration proposal was made regarding the requests by the users and the historical texture of the area.

Field research was conducted using an in-depth interview technique within the qualitative research tradition. The restoration design project is approached in three stages using the opinions of the local people and the documents in the preparation of the landscape restoration design project.

F1-Inıtıatıon

F2-Definıtıon Phase

F3-Planning

A project proposal was initiated in line with the needs of Piazza Marconi. With regard to the aforementioned data and research, the deficiencies and deteriorations of the area were defined and the historical, ecological and spatial characteristics of Piazza Marconi were analysed and identified respectively. The environmental restoration project proposal was prepared and presented with regard to the deficiencies, which had been identified in line with these definitions and analyses, and with regard to the user requests.

CHAPTERII- SOCIAL,ECOLOGICAL & SPATIAL CHARACTERISTICS OF THE SITE

2.1. Social Characterıstics

2.1.1.History

There is many farming area and villages during the antiquity of the Romansin Aversa, and has witnessed many things since the time of the Norman times from medieval times. The city of Aversa, which had been used as an agricultural and settlement site in Ancient Rome, witnessed multifarious events and numerous battles during the Norman era. The importance of Piazza Marconi had declined as time passed by, although it had been a significant civic centre, and it had witnessed an economic downfall. It had also lost its historical importance since then and it was completely perished and started to be used as a marketplace only.

In this section, the prehistorical and the medieval period of Normans and Piazza Marconi, the arrival of Normans to Italy and their architectural history are addressed.

2.1.1.1. Prehistory

According to ancient resources and the archaeological excavations near Aversa, it has been shown that people have lived there since the Neolithic period until now. Although it was the Etruscans, who had carried out the urbanization, the first colonies in Aversa were the Libyans, people of Illyrian origins, according to the aforementioned resources. (Cecere, A., 2000)

2.1.1.2 Lower middle ages

The geological and historical importance of Aversa is that it had functioned as the first military base in the Mediterranean region from where many Gothic battles had been won and many victories had been commanded.

Burghart,S.; Foerster, T., (2013) makes mention of this topic as; "*In the first half of the eleventh century, Norman Pilgrims and mercenaries begun to conquer and to settle in the Mezzogiorno where they subsequently seized large regions and established their own dominions which in 1130 were united to form a Norman Kingdom of Sicily. By this cultural syncretism peripheral nature of the Norman territories gained a new quality. However in all of this territories, particular Norman traditions at also been continued, and local heritages had been adopted. In political terms this mingling of different heritages and traditions bound these societies together and brought forth political units that were unlike anything medieval Europe had known before*.". (Burghart,S.; Foerster, T., (2013),p.2)

2.1.1.3 Norman's history

The Normans were the people who, in the 10th and 11th centuries, gave their name to Normandy, a region in France. (Chibnall, M. 1999, p.2) According to Mendola, L. and Salerno, V. (2015), the traditions, legends and cultural identities of Normans has survived since the beginning of the 10th century until today. (Mendola, Salerno, 2015)

Between the 8th and 11th centuries in history, a Viking invasion occurred in across Europe. Thus, this period is called as the "Viking Age". The first of these invasions

were told to be in 999. The Vikings, who followed up the River Seine attacked Paris two times in 845 and 885, also organised numerous attacks to Lisbon, Bordeaux and the Italian shores. In the course of two centuries the Normans launched a series of extraordinary conquests, transforming Anglo-Saxon England into Great Britain, setting up a powerful Crusader state in Antioch, and turning Palermo into the dazzling cultural and economic capital of the western Mediterranean. (Brownworth, L., 2009)

The Romanesque architecture, ethnic music and traditions of Normans has continued from the 11th and 12th centuries to this day. Likewise, the Norman impact can still be seen in architecture in the Southern Italy. The Normans established the Kingdom of Sicilly, after conquering Southern Italy and Malta under the reign of Roger II. After this, the campaign in the name of William the Conqueror ended in the conquest of England in 1066 after the Battle of Hastings (Chibnall, M. 1999,p17)

2.1.1.4 Arrival of the Normans in Italy

There are many rumours on how the Norman Knights arrived in Italy. The 11th and 12th centuries in Southern Italy was the period of many battles in the southern regions of Italy and the conquest period by the Normal political actors. The subjects which united as Kingdom of Sicily in the following periods, reigned on their own dispersedly in the region at first. The Kingdom ruled, in addition to the Isle of Sicily and Southern Italy, Malta and lands in North Africa. (Amatus, 2004, pp.31-36)

Amatus Montecassiono, the oldest historian of the period on the conquest of Southern Italy stated that; "*The Norman conquest of southern Italy and Sicily was one of the most dramatic evens of the eleventh century. To understand the magnitude of the*

Normans'archievement, and especially those of Robert Guiscard and Richard of Aversa,it is essential to know something of the world in which they lived and the manner in which they were able to create a Norman state in territories whit a very different cultural tradition." . (Amatus, 2004, p.63)

2.1.1.5.Normans and Aversa Relation

The Duke of Naples Sergius IV entitled the Norman Commander Rainulf Drengot of Alencon, Normandy as Count of Aversa with the approval of the Conrad II. The Holy Roman Emperor, as an award to the Norman mercenaries who were used as armament against the Arabs threatening Southern Italy in 1030 (Figure 4). Thus Aversa had become the center of the county. Aversa, then a small village had grown rapidly as Count Rainulf was propitious to those who escaped the justice of other Italian governors and providing them asylum (Amatus, 2004, p.37).

Also, Normans started to use this County as a base for their raids to Southern Italy and Sicily, thus the city become a center for liquidation of the Norman pillages.

2.1.2.Architectural History

2.1.2.1.Military Architecture

The original urban center was surrounded by just ditches and embankments. (Amirante, 1998,p.38) In the new urban reality, the church takes on a role and a central location, not only as a religious symbol but also a place for the community meeting. The radial-model adopted has no contemporary evidence in the Italian territory, strongly influenced by tradition Roman colonial. In France it is noted, in many urban

areas, centered on the cathedral: examples are Bram and Brive. (Figure 2.1-2.2) . We can see these Norman military style center design in Piazza Marconi. (Figure 3)

BRAM, FRANCE

BRIVE FRANCE

Figure 2.1. Urban design system of Bram and Brive

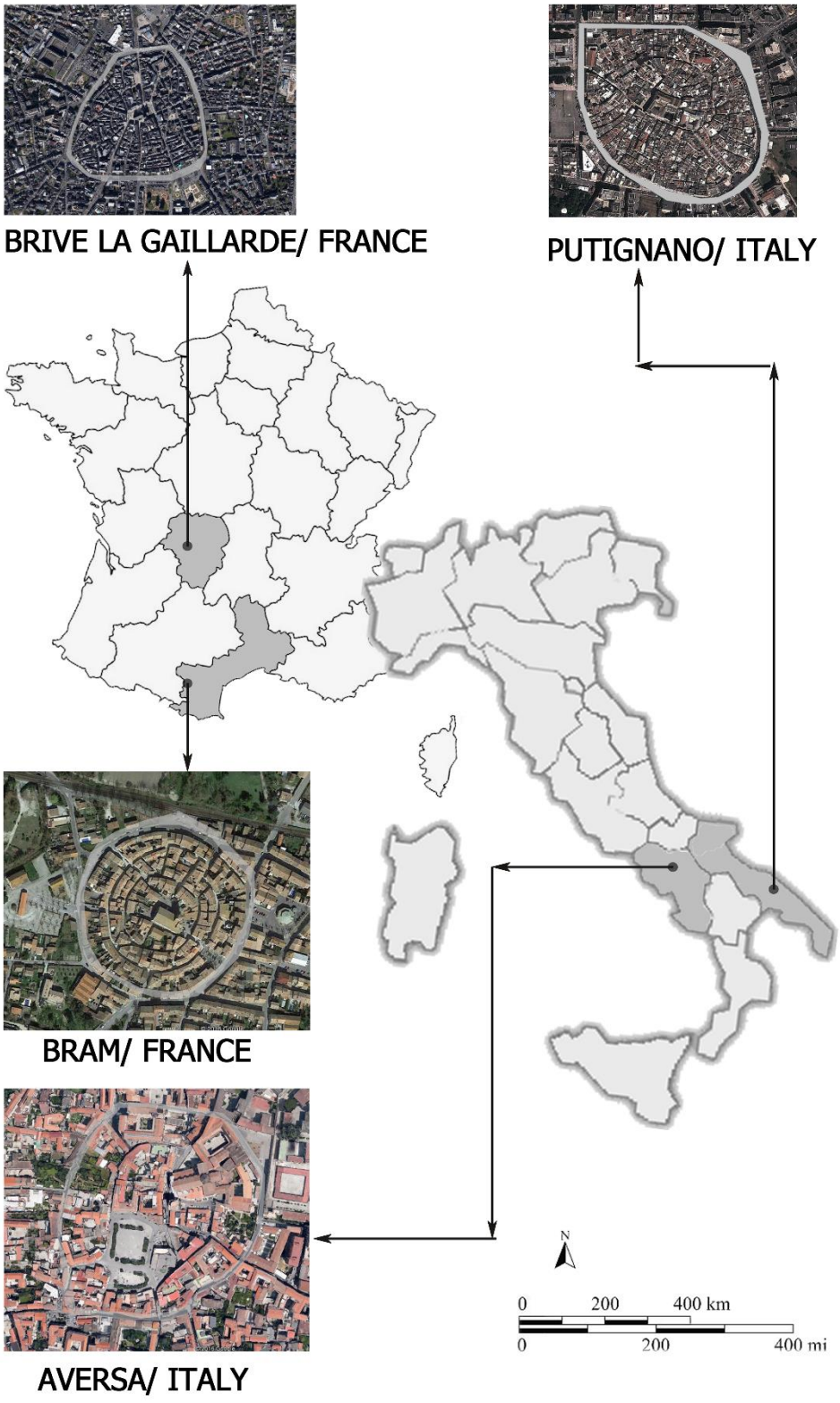


Figure 2.2. The radiocentric model of France and Italy (Demirci, Didem,28.05.2017)

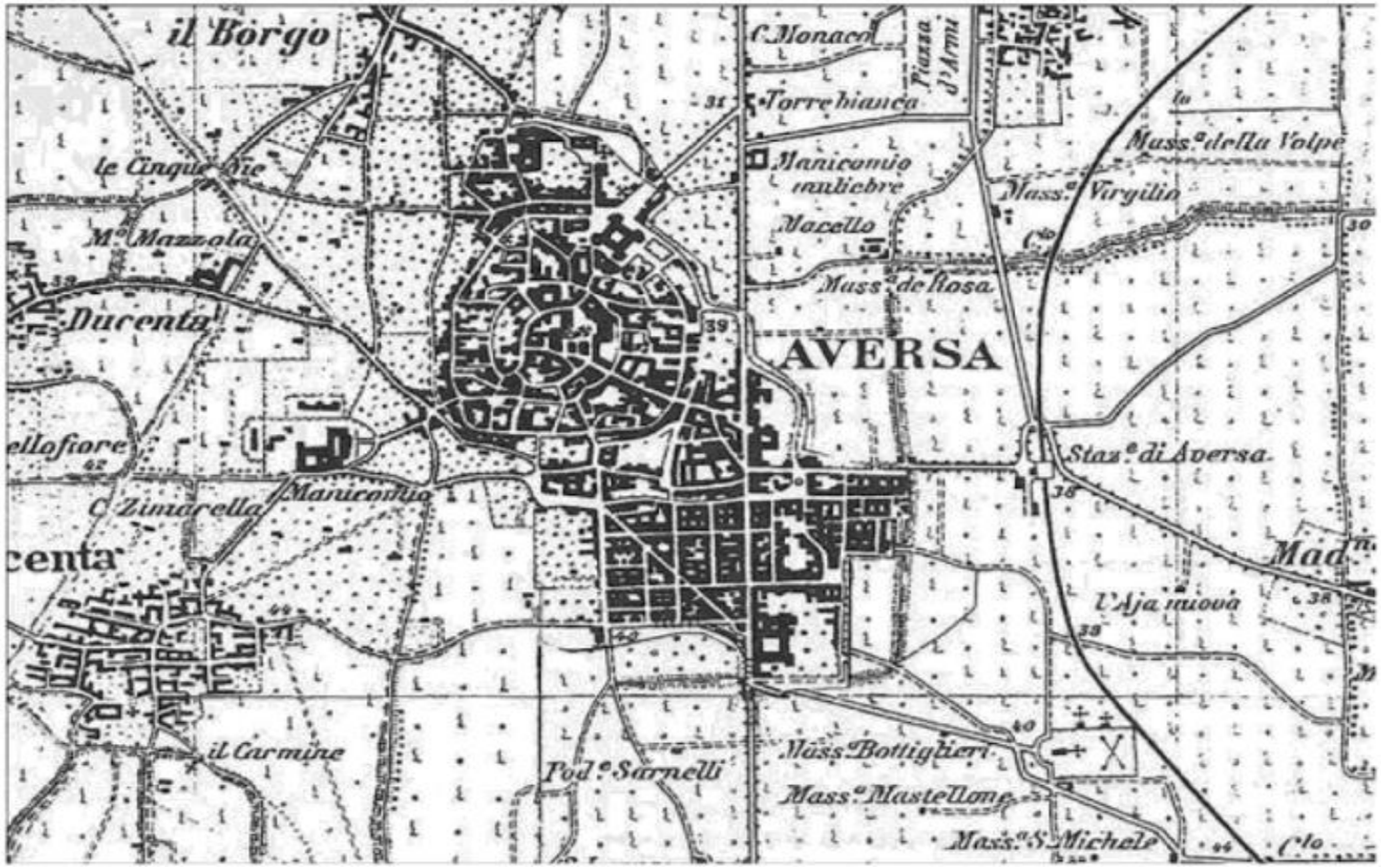


Figure 3. Norman Military Style center design of Piazza Marconi / Aversa (Istituto Geografico Militare,1905*)*

The original center of Aversa was characterized by the polarity of the cathedral and palace, both centrally located because the two buildings were placed side by side. Originally there was no fortified structure. The subsequent growth of the city is summarized in the commitment to redefine the two poles of interest, the cathedral and the castle. For Aversa, only after the unification at the hands of Roger II of Sicily in 1135, it was planned to build the most suitable defense structures (Amirante, 1998, p.80).

The Swabians were engaged in works of considerable scope for adapting the castle to new defensive. The Anjou gave a decisive contribution to the growth of Aversa with the expansion of the wall track decided in 1382. (Amirante, 1998, p.139) At the beginning of 800 began the demolition of the walls and the doors, which were seen as an impediment, a constraint to remove a contentious presence with the ideals of modernity and hygiene. (Cecere, A., 1997,p.17). Of the ancient walls remain:

- The castle
- Fragments of walls near Porta San Giovanni
- Porta San Giovanni in the street

2.1.2.2. Arhitecture

Normans had carried their culture to the placed they had invaded. They also reflected these cultural characteristics into the architectural works. Particularly, they had forced their own architectural order to the placed they had captured. Especially, the militaristic urban layout in the northern cities had been present in the cities they had

captured. Thus, this urban layout had survived until today and formed a Norman city profile and identity. Normans had introduced the Romanesque architectural movement with round arched gates and windows, and cubic stone forms. These architectural characteristics can also be seen in the United Kingdom, Italy and Ireland. Likewise, this architectural movement had ensured that the regions in the Norman invaded countries to take this particular form.

Normans had combined their architectural techniques with the present culture (Islamic, Byzantine and Lombard) and had started an unparalleled architectural movement, which is called Norman-Arab architecture (Mendola, Salerno, 2015)

2.1.3. Geography Anthropogenic

The town of Aversa revealed in its urban structure of two different stages of development:

- Norman foundation nucleus (eleventh century) to radiocentric plan formed by annular and radial roads in the center the Cathedral of St. Paul .
- The orthogonal structure of Lemitone district (XVII century) located south-east of the original nucleus. (url1)

The first pattern is still recognizable in the ring road composed of via S. Domenico, via Sellitto, Via Domenico Cirillo, Via S. Nicola Via S. Marta, subsequently expanded to also include the formation of new villages. This second circle of walls, which ran along Via S. Maria La Neve, Via S. Francesco di Paola, Via S. Andrea, Via Domenico Cimarosa, Via Golia and Via Rainulfo Drengot, continued to respect the radiocentric

structure of the original urban scheme , joining the political and religious center of the city, with radial road layouts. During the period Angevin the city walls were enlarged (1382) and the opening (1303) of a new and important artery, the Via Nuova (the present Via Saporito and Via Roma), which, by encouraging the development towards the south, will give a new look the city, starting the dissolution of the medieval radial pattern. Between the sixteenth century and seventeenth century the realization of Lemitone district, according to a wishbone scheme with roads that intersect at right angles, cut by a diagonal (via Orabona), settled the final blow to the old urban plan. The Lemitone, the perimeter of which is represented by Via Magenta, Via Roma, Via Belvedere and via Constantinople, repeats the pattern of the Spanish Quarter of Naples , made build more than half a century earlier by the Spanish viceroy Don Pedro de Toledo . (url1)

Between the end of ' the nineteenth century and the first half of the twentieth century other major changes were made to the structure of the city, the opening of new roads and the clearing of many convents and civil buildings abandoned. Among the most significant, the realization of Piazza Marconi (1928) and Piazza Municipio (1937), which will rise respectively in the former convent of S. Girolamo and St. Francis of Assisi, and the way system (Mazzini-Diaz -Garibaldi) and squares (Mazzini Vittorio Emanuele-Hall) that connects the train station to Piazza Municipio.(url1)

2.1.3.Socio-economic Position

The socioeconomic investigation took the interviews with the citizens of Aversa and the previous studies into consideration. Accordingly, it was seen that the employment

participation rate of the Aversa population and the variability of regular employment possibilities were considerably lower than the national average.

The socio-economic factors, which affect the life quality and health of the individuals, are difficult to measure and assess. Unemployment, inadequate environmental health, inadequate medical care, and difficult social conditions such as inadequate social housing and high crime rates directly influences the social structure. In this respect, urbanization is a significant social intervention tool. The current situation of Aversa weakens the structural articulation of the production system due to its destroyed elements. In the meantime, the inadequate social adaptation conditions have been increasing. The number of dropout children and youngsters have been increasing compared to the past. Thus, there are common cross weaknesses such as inadequate security conditions and permanent inadequacy of the greater portions of public administration.

The cultural system comprising of artistic heritage should be promoted and protected by the municipality and be open to enterprises. In addition, their current value should be protected and their prior value should be regained. It is significant that this region, which had been very substantial in the past, regained its old importance. By this means, both the cultural heritage is protected and the socioeconomic culture develops. As it can be seen, the area which is under investigation in Piazza Marconi is very significant in this respect. The buildings with high historical value should be recovered and they should be ensured to contribute to the cultural tourism. Thusly, both employment opportunities would be provided and the cultural resources would regain their values.

The protection of the cultural and natural heritage has been one of the issues that attracted attention of the states, and it is one of the areas to which the European Council, the European Union and some other organizations have focused. In addition to many international regulations on protection, the protection of natural and cultural environment (heritage) is being considered together with human rights (3rd generation rights, solidarity rigts, environmental rights, etc). (Ozdemir, 2005)

2.1.4.Cultural Status

Along with the natural and cultural heritages, the historical monuments are products of all humanity as well as of a country. These structures which survived from past to present and which should survive from present to the future, are treasures of civilisation in reflecting the common values of humanity and the identity of a nation. The city of Aversa contains many different cultures. Especially, the works and cultural heritage remained from the Norman period in Southern Italy are the most important examples of this. Numerous churches had been built in the conquest period by the Normans in the 11th and 12th centuries.

2.2. Ecological Characteristics

2.2.1.Geolocical Position

The lateral and vertical changes of the outcropping geologic elements in the residential area of Piazza Marconi, their morphotectonic characteristics, structural characteristics, engineering and geotechnical parameters and dynamic-elatic parameters were obtained, and geomorphological, geological, geophysical and geotechnical surveys were conducted. In these surveys, the previously formed survey maps were used. The

geological, geophysical and geotechnical parameters were compared, and the survey area was evaluated with regard to residence and settlement by revealing all the characteristics of the outcropping elements. The soil structure and the tectonic risks were evaluated together with the findings obtained from the survey, the environmental restoration suitability assessment was conducted, and the geological-geotectonic survey was prepared as a basis to the city development plan revision.

At the survey area (Piazza Marconi), situated 14.82 km to the north of Naples, various elements comprising of magmatic, metamorphic and sedimentary rocks formed between the Mesozoic eras until today.

As part of this study, the 1/1000 scaled slope index geological map of the survey area was prepared. In this report, the data gathered in the project area are presented and process and the geotechnical assessment is presented.

The data used in general evaluations are presented in the appendices as the geological map, slope index map, lithological map, and tectonic map. The plans and profiles in the analysis are presented in the 1/1000 scale.

2.2.1.1.Regional Geology

Italy is one of the regions on the world where the formation and activation islandic arc volcanism can be observed in their finest detail. Especially the environment covered by the Vesuvius volcano, situated to 25 km north to the project area is formed of volcanic rocks. Also, the Stromboli volcano on the Aoelian islands is called the “the

lighthouse of the Mediterranean". The volcanic activity has been continuing for 1.3 about million years on these islands which is completely comprised of volcanic rocks.

2.2.1.2.Geology of The Project Area (Piazza Marconi)

Various volcanic elements and volcanites such as lava, rhyolites, rhyodacites, trachyte, latite and pyroclastics are accumulated in the project area. (Figure 4)

2.2.1.3.Tectonics of the project area

This analysis were conducted using the present tectonic map at hand. The islandic arc volcanism occurs when a moving part of the solid lithosphere, which forms the outer crust of the earth, gets close to another part and plunges underneath it. In this event, which takes millions of years to occur, if there is sea over the tectonic plate on the top, the ourcropping magma forms volcanic islands through the dissipation in the sea, and these islands are lined up in the form of an arc. The earthquakes are either tectonic or volcanic. Aversa is situated 25 km to the southeast of Vesuvius. Therefore the tectonic movements are volcanix in nature. Vesuivus is a stratovolcano. Stratovolcanoes are volcanoes with a high conic shape formed of lava, tuff and ash layers (Zernack, A.,V.,2008). These volcanoes are characterized with steep slopes and periodic eruptions. The viscosity of the lava erupting from the stratovolcanoes is low and the lava cools and hardens before it gets far. The magma contains acidid or high-moderate silica (rhyolite, andesite, and dacite). (Figure 5)

2.2.1.4 Soil Mechanics

The present data is summarized and it is seen that there are not any weak soil according to these data.

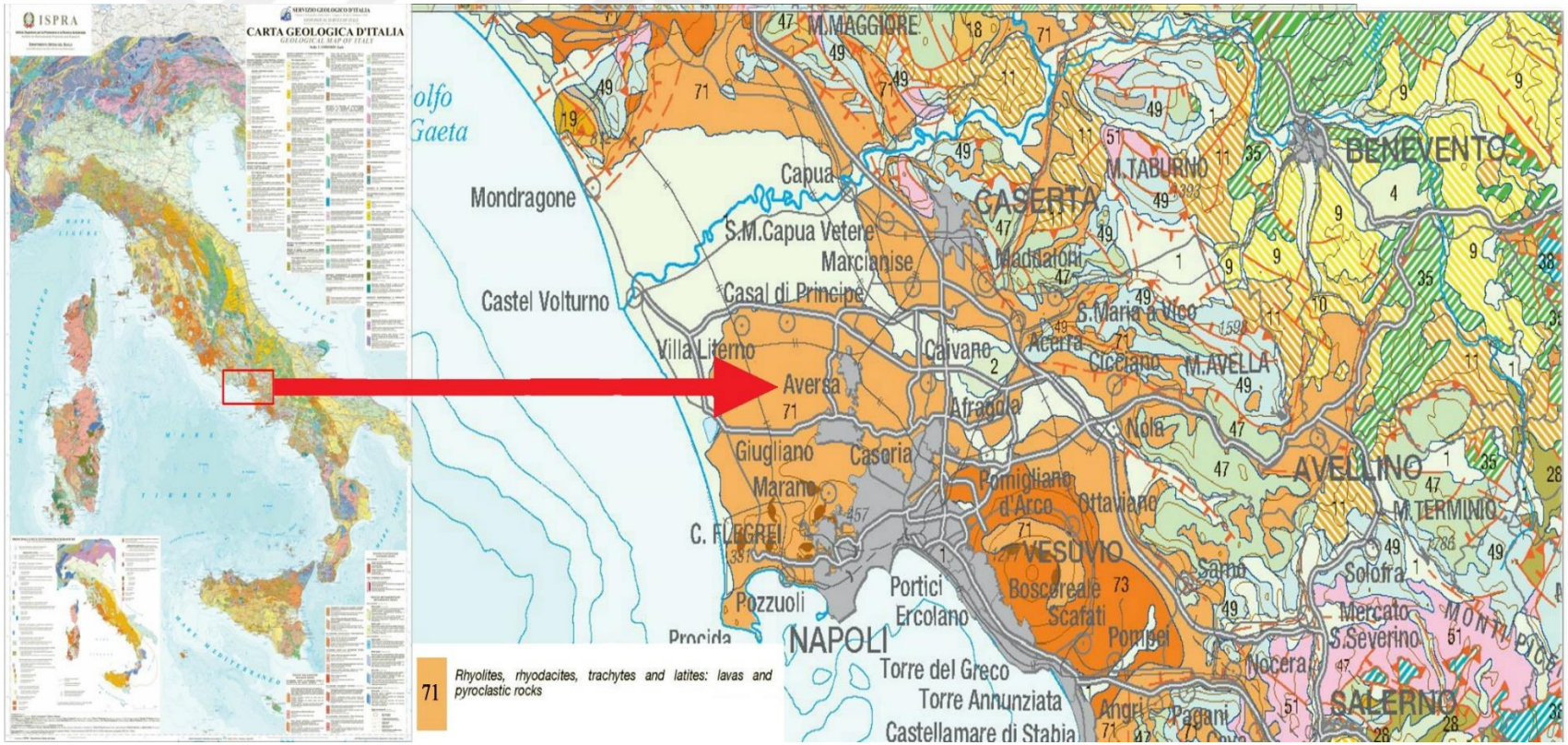


Figure 4. Geological Map of Piazza Marconi /Aversa (url2)

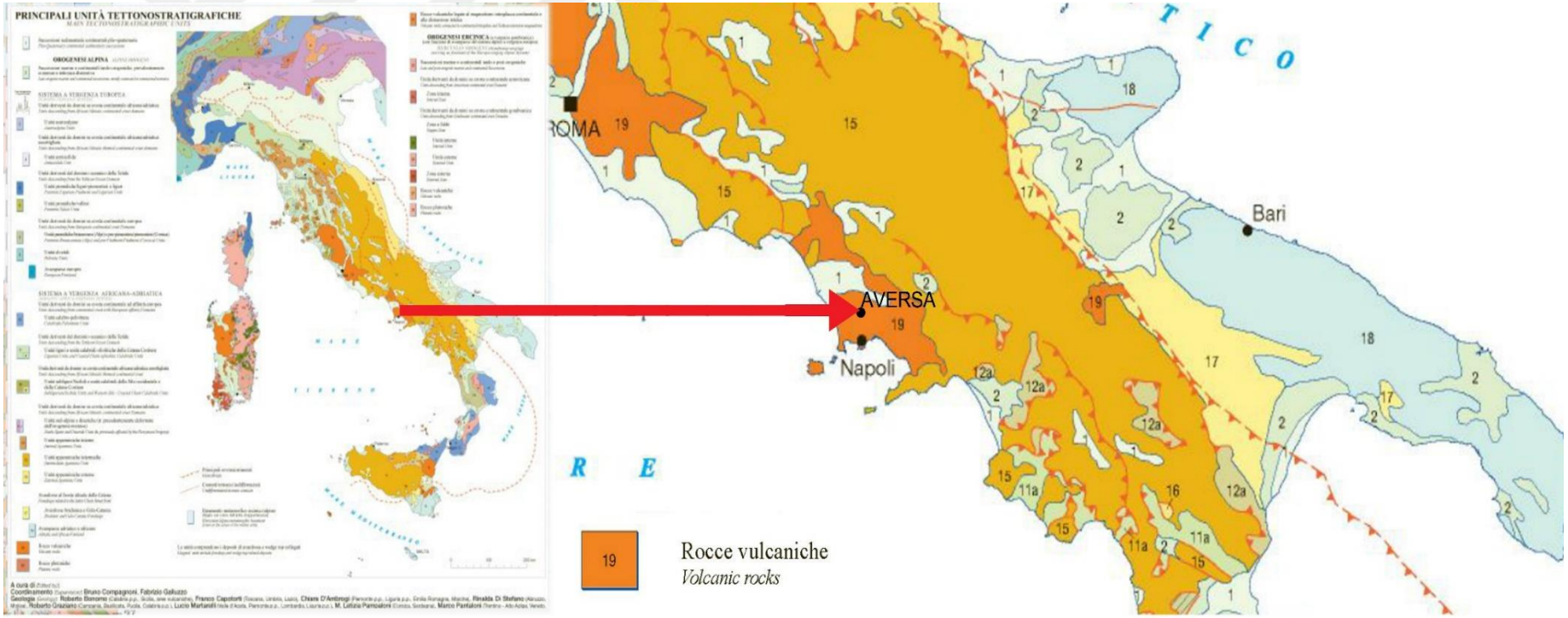


Figure 5. Tectonical Map of Piazza Marconi /Aversa (url3)

2.2.1.5.Soil Use and Lithological Units

The physical characteristics of the volcanic rock elements in the survey area are defined with reference to the available soil map and lithological map.

Worn out volcanic glass are found on the surface and andic soil with high organic matter concentration is found in the survey area. In addition, euric leptosols, thaptoandic cambiosol, vitric andisol and euric rogosol (humic soil) are found. (Figure 6)

If the overlying material and buried soil exhibit the characteristics of Histosol, Technosol, Cryosol, Leptosol, Vertisol, Fluvisol, Gleysol, Andosol, Planosol, Stagnosol ya da Arenosol, they are classified as one soil (Url:3)

The lithological element found in the project area is the volcanic product and have the characteristics of “ROCK”. (Figure 7)

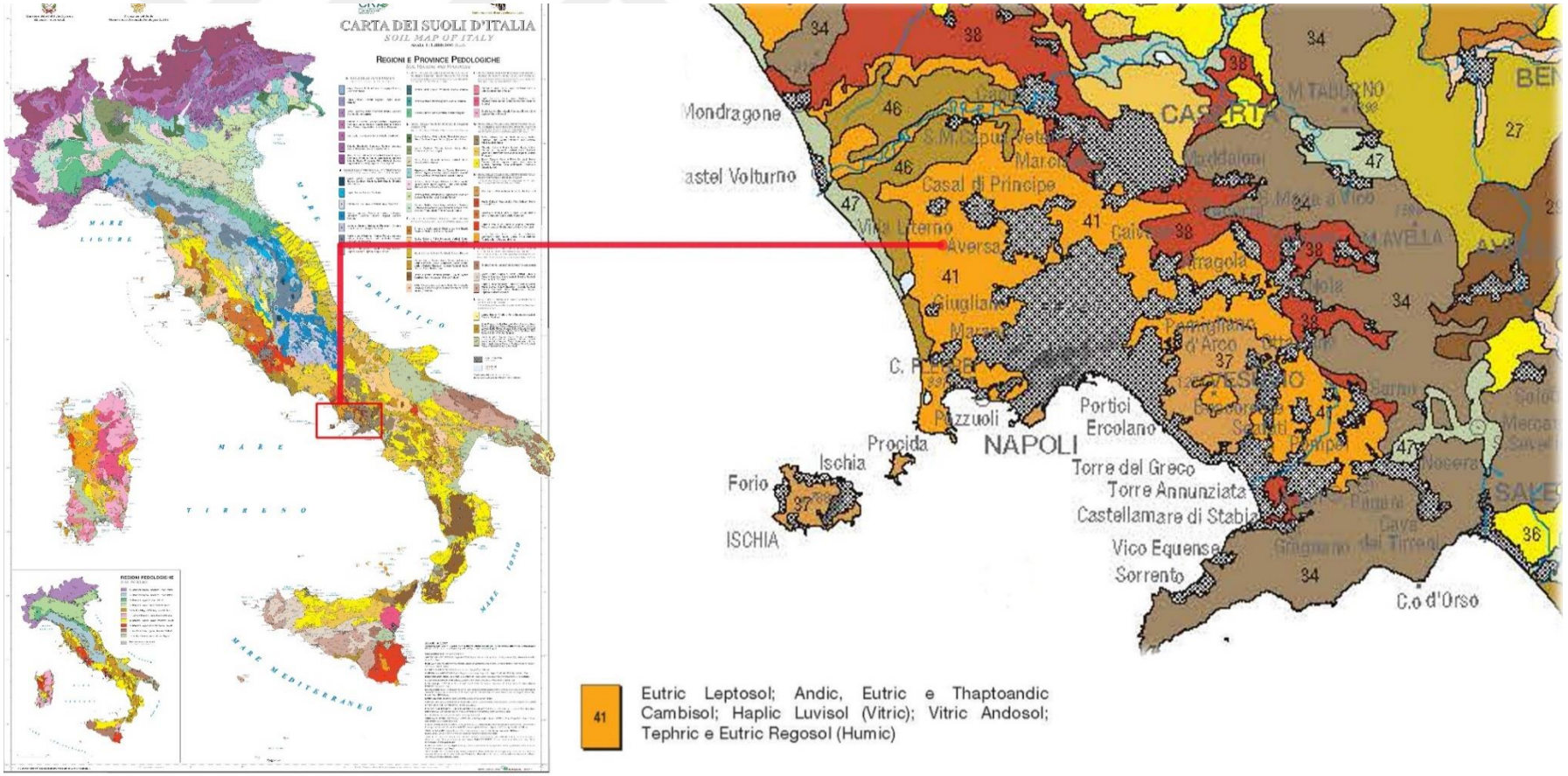


Figure 6. Soil Map of Piazza Marconi /Aversa (url4)

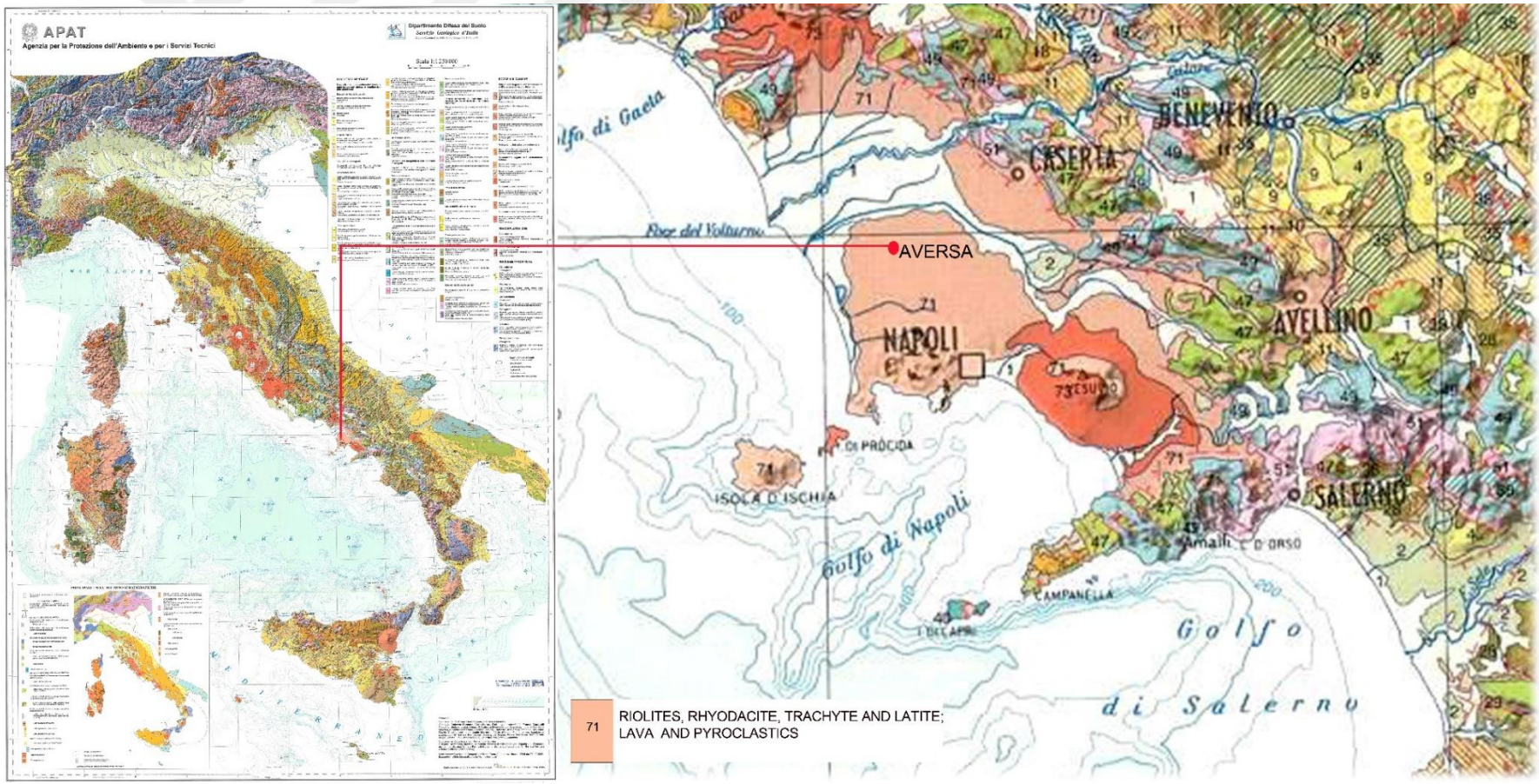


Figure 7. Lithological Map of Piazza Marconi /Aversa (url5)

2.2.2.Climatic

Aversa is located in the southern part of Italy. Southern Italy is largely characterized by a typical mediterranean climate made by mild, rainy winters and hot, dry weather. Aversa climate is conservative and warm. The summers are hot and the average temperature is 26 ° C (maximum temperature 40 ° C). There is almost not rain in Aversa this season.

When the data obtained from the Italian Air Forces Meteorology Division is examined, it is seen that, between 1971 and 2016, the coldest month was January with an average temperature of +8.2 °C, while the hottest month was August with an average temperature of +24.1°C. There is frost in 18 days per year, averagely. An average of 39 days have temperatures equal or greater than +30°C. The lowest value between these years was measured as -6.4°C in February 1993, and the highest value was +39.5°C in August 1981.

An average of 81 days are rainy per year. The average rain fall per year is 862 mm. The lowest rainfall is in summers and the highest is in autumn. Winter is the season with the highest rainfall after autumn. There is fog 39 days per year, averagely. The average relative humidity per year is 74.3%. The lowest relative humidity is in June, July and August with 71%, and the highest rate is in November and January with 78%. According to the values defined by the World Meteorological Organisation, as the climatic normal between 1961 and 1990, the coldest month is January with +8.0°C average temperature and the hottest month is August with ay +23.6°C average

temperature. The minimum average temperature between these dates was -6.0°C in January 1987 and the maximum average temperaturewas in +39.5°C in august 1981.

The average annual cloudiness is 3.7 octa/day. The lowest average is in July with 2.2 octa/day. The average is highest in February, March and April with 4.6 octa/day. The average wind speed per year is 3.9 m/s. The average speed is 3.7 m/s in September and October, and it is maxium 4.2 m/s in February. The western winds dominates between October and March, and the Northeaster is dominant between April and Seprember.(url6-url11) . Table 1.1. and Table 1.2 below shows the average rainfall and temperature between 1971 and 2016, prepared based on the data obtained from the Italian Air Forces Meteorogy Division.

GRAZZANISE AEROPORTO (1971-2016)	MONTHS											
	Gen	Feb	Mar	Apr	May	Jun	July	Agu	Seb	Oct	Nov	Dec
T. max. average (°C)	12,9	13,6	15,7	18,1	22,9	26,5	29,5	30,2	26,8	22,1	17,1	13,8
T. min. average (°C)	3,4	3,5	4,9	7	11	14,7	17,3	17,9	15,3	11,6	7,3	4,5
T. max. absolute (° C)	20,2	22,2	26,8	27	32,8	37,8	39	39,5	37,4	30,8	24,4	21,8
T. min. absolute (° C)	−6,0	−6,4	−5,2	−1,4	1,8	6,6	10	10,6	6	−0,4	−3,6	−4,6
Rainfall (mm)	84,2	79,5	68,6	79,1	43,4	24,4	19,4	37,2	79,2	118,8	132,3	95,7

Table1.1. Climatical and Rainfall Averages Table of Aversa from 1971 to 2016

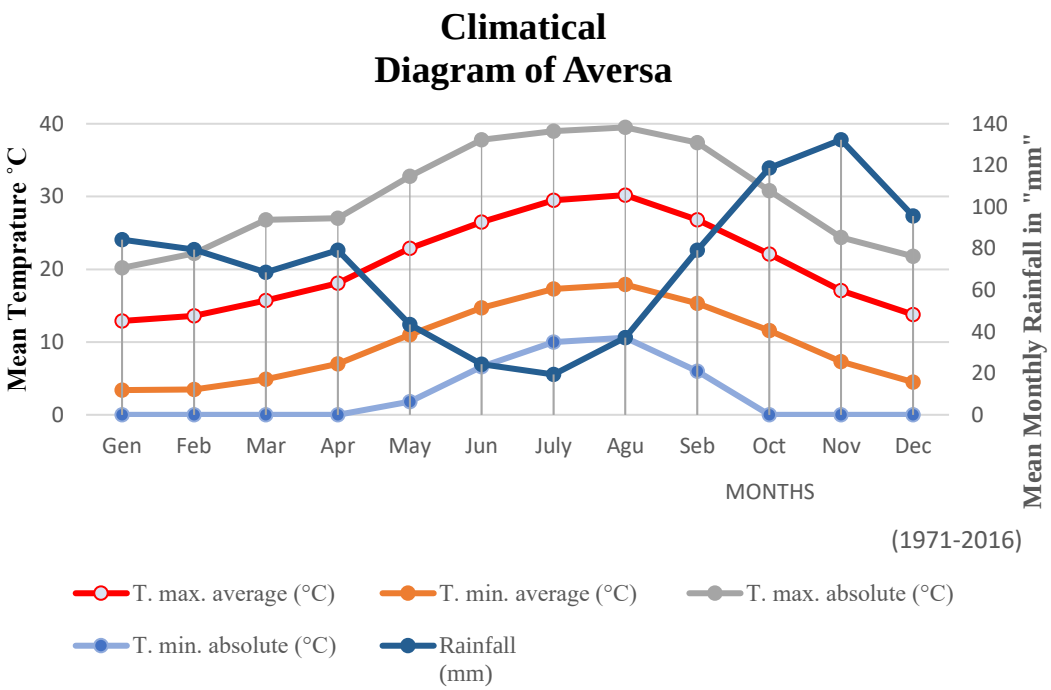
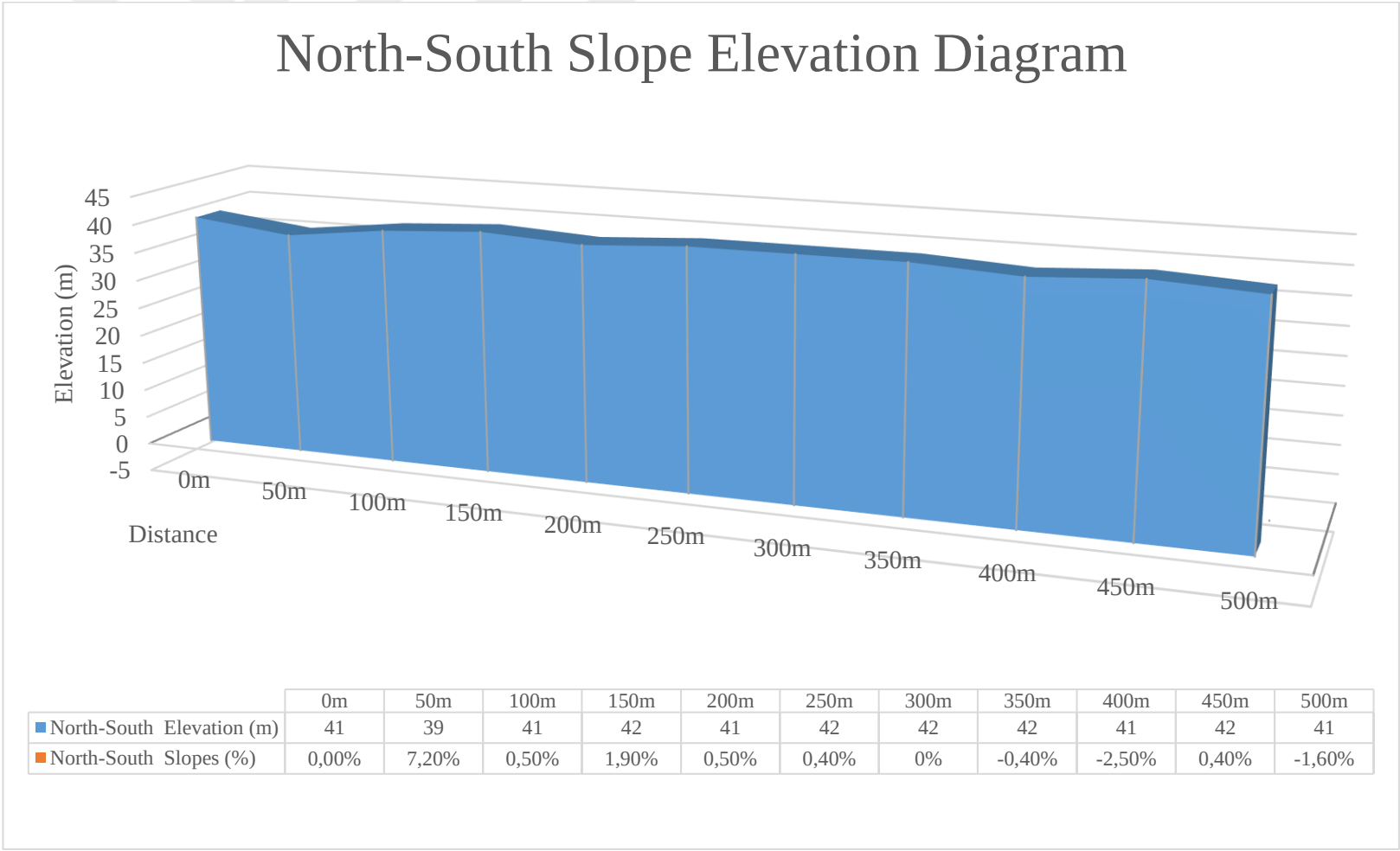


Table1.2. Climatical Diagram of Aversa from 1971 to 2016

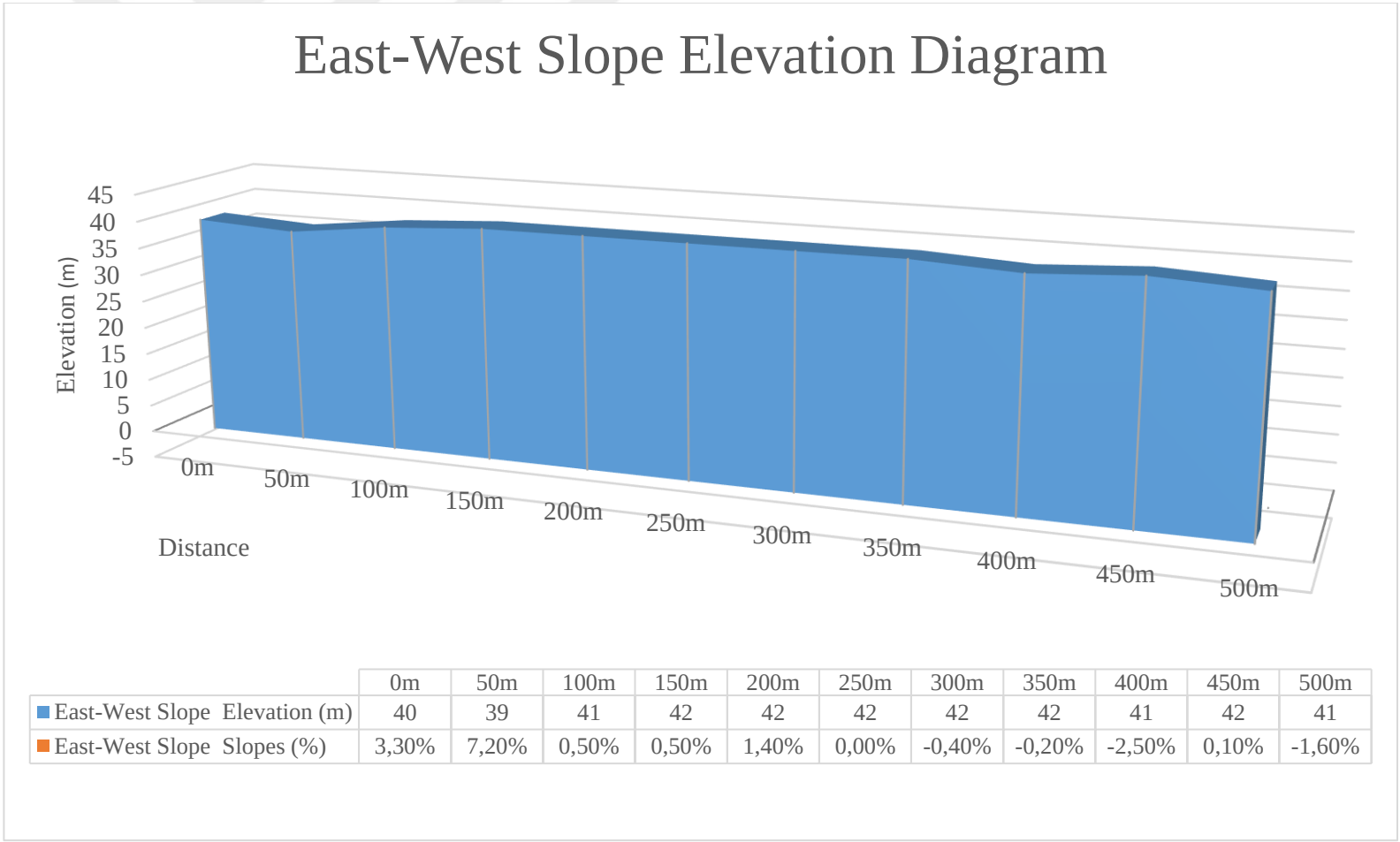
2.2.3. Geomorphology of Piazza Marconi

The slope gradients, in the project area, vary between 39 and 41 meters and the average gradient between 2.1% and 3%. The maximum gradient is 12%. The gradients are investigated separately as North-South gradient and West-East gradient.(Tables 2.1.(a)-2.2(b)). A topological map was created with the data obtained from the project area. (Figure 8.1.(a) – 8.4.(d). The gradient analysis covers a 200.000 m2 area including the project area.



	0m	50m	100m	150m	200m	250m	300m	350m	400m	450m	500m
North-South Elevation (m)	41	39	41	42	41	42	42	42	41	42	41
North-South Slopes (%)	0,00%	7,20%	0,50%	1,90%	0,50%	0,40%	0%	-0,40%	-2,50%	0,40%	-1,60%

Tables 2.1.North-South Slope Elevation Analysis



	0m	50m	100m	150m	200m	250m	300m	350m	400m	450m	500m
East-West Slope Elevation (m)	40	39	41	42	42	42	42	42	41	42	41
East-West Slope Slopes (%)	3,30%	7,20%	0,50%	0,50%	1,40%	0,00%	-0,40%	-0,20%	-2,50%	0,10%	-1,60%

Tables 2.2.East-West Slope Elevation Analysis

Figure 8.1. Elevation Point Map of Piazza Marconi

1.EAST- WEST ELEVATION PROFILE

2. NORTH-SOUTH ELEVATION PROFILE

Figure 8.2. Elevation Profiles of Piazza Marconi

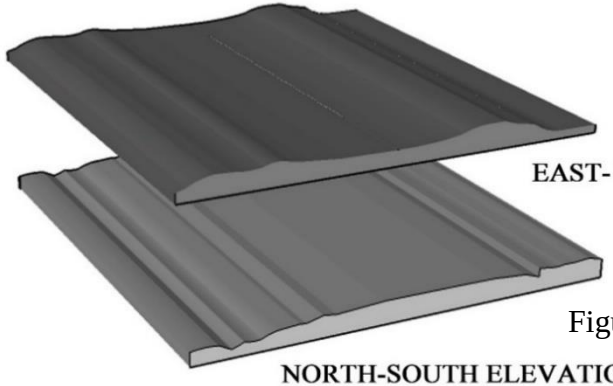


Figure 8.3.a

EAST- WEST ELEVATION MODEL

Figure 8.3.b

NORTH-SOUTH ELEVATION MODEL

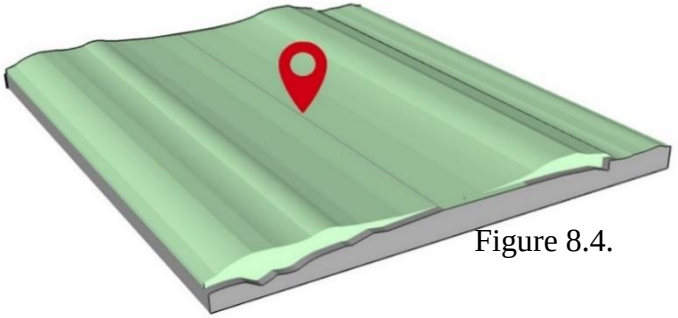


Figure 8.4.

ELEVATION MODEL OF PIAZZA MARCONI

2.2.4. Cadastral Surveying

Piazza Marconi, which is the project area is situated in the borders of Via S. Marta, Via Sellito, Via Cirillo and Via S Nicola, and is at the exact center of the radial city order. (Figure 9)

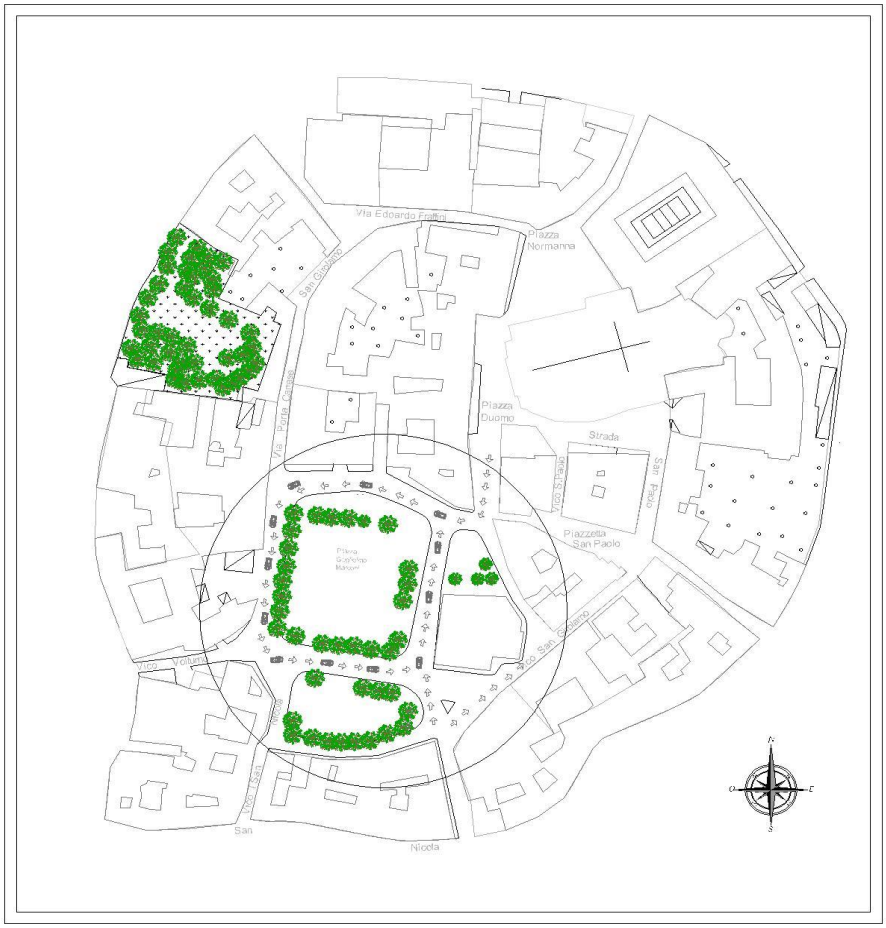


Figure 9. Cadastral Subdivision of Piazza Marconi

As mentioned above, the particular radiocentric urban model realized by the Normans is extremely rare, no other contemporary national comparisons.The city of Aversa, was conceived as a strategic settlement for the territory control.

Carusone makes mention of this topic as "*The urban system was characterized by a central nucleus and by the subordination of all the surrounding elements*". Also, (Carusone, as cited in Amirante, (2015)) "*The cathedral represented the core of the urban planning, assuming towards the setting, the same dominant position that theology practices on the spiritual environment*". (Carusone, M, 2015,p 162).

As the city had lost its strategic and functional significance, the people of Aversa started using these area as a marketplace in certain days of the week. Thus, Piazza Marconi had lost its square function and turned into an ordinary marketplace, in so much that it had lost its name in time. (Carusone, 2015).

Based on the research about deterioration of Piazza Marconi over the years by Carusone; "*To define the actual characteristics of the historical center of Aversa, cannot be avoided to take in reference the urban fabric demolition of 1924. It's since that time that we can consider the beginning of the journey towards the decline of the Aversa historical center*." (Carusone, 2015, p163).

To expand the area plantings not suitable with the techniques were made and as a result of these, bad formed plants had grown. The curbs and plant parterres in the present planning do not allow for gathering.

Aversa has a municipaliy in the city centre, however the municipal services are rendered jointly with the Caserta municipality. Aversa municipality is affiliated with Caserta municipality and needs their approval to continue its services. Thus the

services for the citizens of Aversa are managed from Caserta municipality. Aversa municipality has many service divisions.

Environmental Services

- Preparation and management of environmental revaluation and training projects
- Examination, inspection and monitoring of pollution sources and their impact on health with special reference to atmospheric, acoustic and electromagnetic
- Entegre Integrated wast cycle management and differential waste collection
- Incpection of asbestos, water quality and hygenic problems
- Inspection of unhealthy industries and health recommendations
- The preventive evaluation of effects of the urban transformation choices and urban planning applications on the region and the environment and application of the regional legislation on EIA and DYE.
- Urban solid waste facilities engineering
- Arbour interventions
- Management of cleaning services of closed or open, privately owned or municipaly owned building.
- Correction of polluted sites
- Planning of alternative energy resources: photovoltaic, wind. (url12)

Tunnel and Reinforcement and Aerial Monitoring

- Inspection and management of soil and subsoil mining activities
- Inspection of quarry, peat bed, soil and subsoil exploitation.

- Inspection and monitoring of atmospheric pollution sources. (Url13)

Urban hygene and Differential Collection Unit

- Management and inspection of the integrated waste cycle and differential collection of RR.SS.UU.;
- Inspection of ecological activities (Url14)

Although the municipality has many services there is no certain public transportation service. Therefore, the people of this area have problems with transportation. The presence of railway in the city center facilitates the access to other cities. However, when it comes to accessing certain parts of Aversa, the buses are mostly late and even non-existent. Especially, it is almost impossible to access Piazza Marconi using public transportation.

There are two access roads to Piazza Marconi. One is the “Piaza Trieste e Trento”. It is situated 440m northeast to the project area and connects directly to the main road at 439 m to the northeast. The second road is the “Piazza Municipio”, situated 500 m to the south of the selected area. It connects directly to the Naples-Aversa main road at 100m to the west. (Figures 10,10.1,10.2).

Figure 10. The road links which connected to Piazza Marconi of Piazza Marconi / Aversa (Demirci, Didem, 15.07.2017)

Figure 10.1 Piazza Trieste e Trento (Demirci,Didem,12.06.2017)

Figure 10.2. Piazza Municipio (Demirci,Didem,12.06.2017)

2.2.5. Ecological Characteristics

2.2.5.1.Engineering Properties of Soil and Rock Units

As mentioned above, the project area contains volcanic products and rocky geological elements. The engineering behaviours of these are mostly determined by the dominant discontinuities. These discontinuities can be examined via the crop analyses, drills and test pits in the area.

2.2.5.2.Physical Properties of Soil and Rock Units

The TCR and RQD values of the core samples were measured during drilling. The characteristics of the volcanic rock elements can generally be defined with these measurements. The values measured for the volcanic rock layers in the region are;

TCR= 80% (between 33 and 100) and RQD=0% (between 0 and 38);

and the SPT values in this respect is found N30> 50. (Yüceel,S. 2008,p.38).

2.2.5.3.Soil Structure

The project area has an andic soil structure. The most important factor causing this is the soil being cambiosol and andosol. Accoring to the previous data, the amount of andosol is greater than the amount of cambiosol.(url15-16)

2.2.5.4.Management and use of Andosols

Andosols have a high potential for agricultural production but many are not used to their capacity. Andosols are easy to till and have good rootability and water storage properties.(url17)

2.2.5.5.Management and use of Cambisols

By and large, Cambisols make good agricultural land and are intensively used. The Eutric Cambisols of the Temperate Zone are among the most productive soils on earth. The Dystric Cambisols, though less fertile, are used for (mixed) arable farming and as grazing land. Cambisols on steep slopes are best kept under forest; this is particularly true for Cambisols in highlands.

Vertic and Calcaric Cambisols in (irrigated) alluvial plains in the dry zone are intensively used for production of food and oil crops. Eutric, Calcaric and Chromic Cambisols in undulating or hilly (mainly colluvial) terrain are planted to a variety of annual and perennial crops or are used as grazing land. (url18)

2.2.5.6.Rock Mechanics

The nonconfined pressure tests on the core specimens taken from the volcanic rocks in the project area yielded

qu = 19.5 MPa,

and the Point Loaded Strength Experiments yielded

PI= between 1.67 and 6.66 MPa.

2.2.5.7.Rock Quality

Rock Qualiy and Rock Mass Quality assesment can be performed using these data, according to the RMR-CSIR (South African Council for Scientific and Industrial Research) and Q-NGI (Norwegian Geotechnical Institute) classifications (Bieniawski, Z.T., 1984). The first one makes a classification based on the scores given to Unconfined Compressive Strength, RQD, discontinuity range, discontinuity charactersitcs, groundwater conditions, and the orientation for discontinuities.

The latter calculates the Rock Quality Rate Q using the

Q = (RQD/Jn) x (Jr/Ja) equation. (Jn: Joint set number; Jr: Joint roughness number; Ja: Joint alteration number; Jw: Joint water reduction coefficient; SRF: Stress reduction factor); the total number of Rock Mass Factors, Q is calculated. (Barton, N.R.; Lien, R.; Lunde, J. 1974, p193)

The volcanic rock in the project area, evaluation can be made by considering;
RQD=%0 ve qu= 20 MPa values. Poisson Ratio,

Rhyolite According to RMR Classification;

1.	RMR	52-74
2.	Laboratory compressive strenght (Mpa)*	175
3.	Rock-mass compressive strenght (Mpa)	12-41
4.	Rock-mass tensile strenght	-0.29 to-1.5

2.2.5.8. Ground Mechanics and Underground Water

The underground water level is generally found approximately 5.00 meters in accordance with the drilling works conducted in volcanic areas such as Piazza Marconi region.

2.2.5.9. Available Plant Analysis

2 plant taxon are detected in the selected region, the Piazza Marconi. There are 46 *Quercus ilex* tree, 28 of which are located in the middle section of the area at four corners; 16 of which are at the southern part of the square, one of which was cut afterwards; and 2 at the parking area. Also there are 4 *Magnolia grandiflora* trees at the parking area.(Figure 11)

Figure 11. Existing Plants Plan

When the environment, in which the Piazza Marconi is situated, is taken into consideration, the existing plants are investigated in the green areas around Piazza marconi, Via between S. Marta and Via Porta Carrese Girolamo which is situated 100 meters northwest to Piazza Marconi. A guide is created for the plants to be selected for this invesion. (Figure11) According to this analysis, there are Sambucus species trees, mainly *Gleditsia triacanthos*. Also, three species of ivy, *Adlumia fungosa*, *Convolvulus arvensis* and *Hedera helix (Hederae helicis folium*), are found.

2.3. Spatial Characteristics

2.3.1. Aesthetics

When the physical and socioeconomic conditions of the Marconi square is considered, it is seen that the district is divided into two sections. The inner sections of the districs have the charactersitics of both residence and recreation. The Marconi square which is situated in the district, has a radial structure, encircles the residential area; and the project area comprises of this area. (Figure 12)

Piazza Marconi is situated in a central point of Aversa on the access roads. It is a square which is situated in between the collective housing areas. Although it is defined as a square, it is seen that it cannot meet the recreation needs of the people of Aversa. (Figure 13). As it can be understood from the figure, we see that the landscape elements are incorrectly. The square is generally deserted and most of the shops are closed. Also, the buildings are weathered due to climatic conditions and lack of maintenance; the square is defaced due to excessive vehicle use. In addition the people cannot walk on the square. In the present condition, people use the square as parking places and

they park their vehicles disorderly. (Figure 14.1,14.2) For this reason the pedestrians have difficulty in using this square as it is supposed to be. In the meantime, the present situation lacks an aesthetic appearance and this renders Piazza Marconi less significant but more dangerous.

The area selected for the study, Piazza Marconi had been inflicted many mark in terms of aesthetics due to the changes in urban fabric and culture, and the physical changes from past to present. Reasons such as the settlement due to population increase, including people from many different cultures, buildings left for weathering due to economic conditions, cause Piazza Marconi to lose its urban fabric. Also, architectural identity is the most important element of a building and it is shaped with the continuity that the buildings form around a certain place. There are important churches from the Norman area in the radial order of the city surrounding the project area. These buildings are significant heritages that brings together history and the modern-day life. Therefore, they are the continuation of the existence of a culture which was lived in the area.

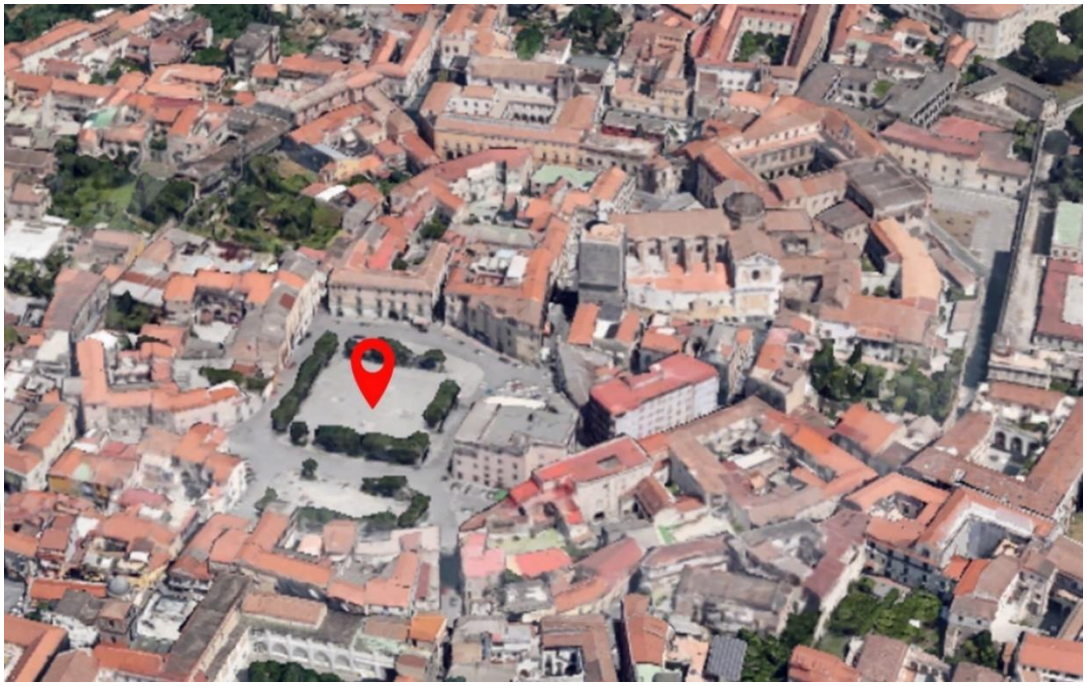


Figure 12. Piazza Marconi from bird's eye view

Figure 13. Current situation of Piazza Marconi (Demirci,Didem,12.06.2017)

Figure 14.1. Marconi Square (Piazza Marconi) Irregular Parking-1

(Demirci, Didem,12.06.2017)

Figure 14.2. Marconi Square (Piazza Marconi) Irregular Parking-2

(Demirci, Didem,12.06.2017)

2.3.2. Architectural Assets

When we look from a broad perspective of The Piazza Marconi, that showing it sitting in a Norman style radial architectural system. When we look systematically, design items are spread out from the center. This circular system starting from the center of Piazza Marconi and it is continue with churches which around the square.Each of church is located at a certain point on the circular layer respectively. (Figure 15).

If we look at the overall appearance map of Piazza Marconi in 1650; it is seen that the walls surrounding the area at that time. (Figure 16). But unfortunately it has not been able to survive until these days and has collapsed.

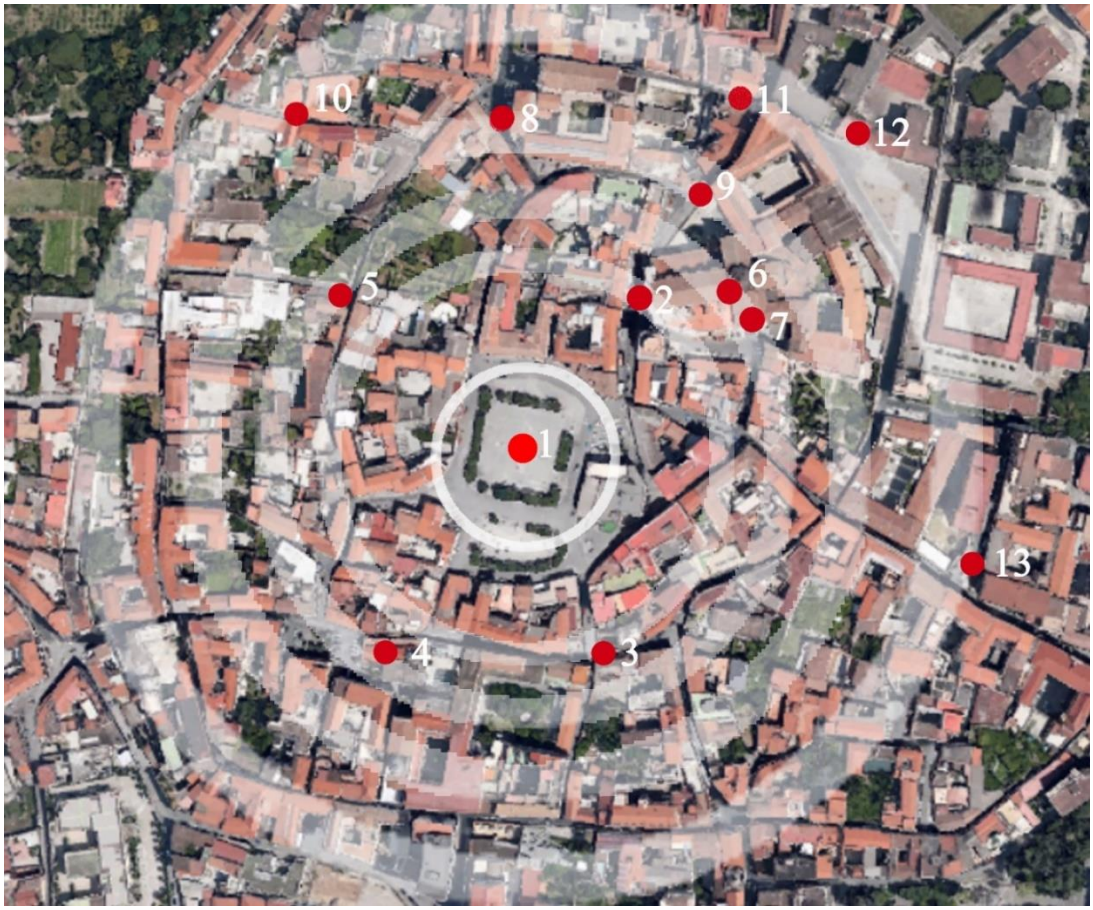


Figure 15. The circular system of Piazza Marconi (Demirci, Didem,15.07.2017)

1.Piazza Marconi

2. Cattedrale Duomo San Paolo

3. Church of S. Maria Succurre Miseris

4. Church of S. Nicola

5. Church of S. Marta Maggiore

6. Dioceses of Aversa

7.Uff.DiocesanoM.C.V.

8. Church of San Domenico

9. Seminario Vescovile Di Aversa

10. Church of S. Marta Minore

11. Church of S. Maria del Popolo

12.Curia Catholic Church

13.Church of Sant'Antonio at Seggio Friars Minor Conventual Aversa

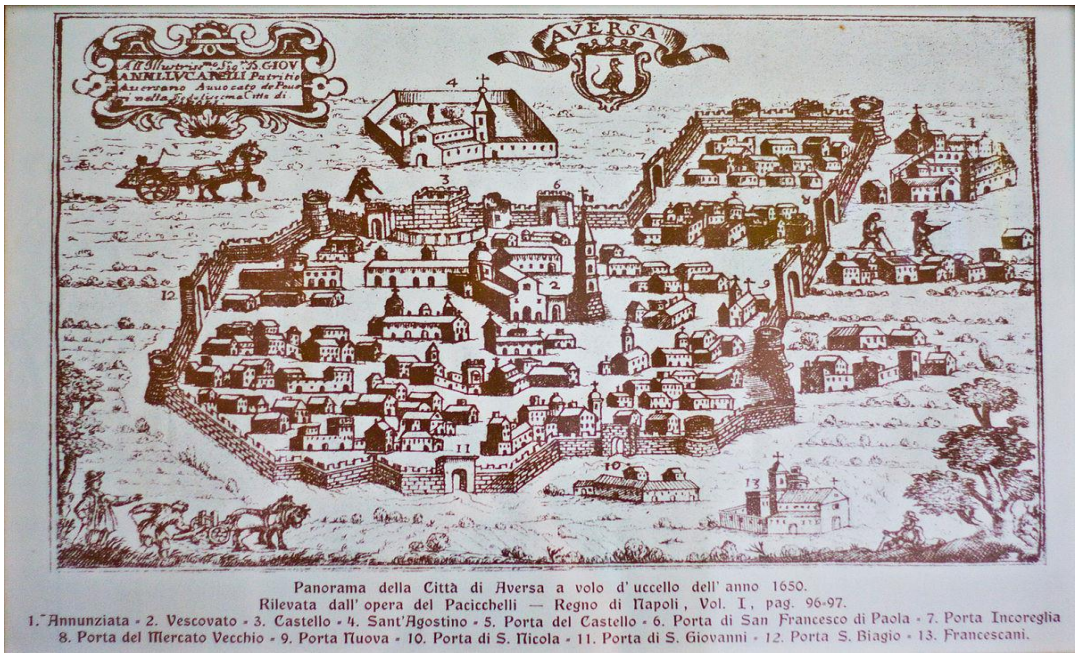


Figure 16. Panorama della Città di Aversa a volo d'uccello dell'anno 1650/ Panorama of the City of Aversa from bird's eye view in 1650 by D. Giovanni Luca

2.3.3.Monumental Constructs in the Circle

2.3.3.a.Cathedral of St. Paul

This cathedral mattering for Aversa. Cathedral of St. Paul is the main cathedral of Aversa region. The facade of the Duomo, in the Baroque style, is due to start operations mainly took the eighteenth century by Bishop Innico Caracciolo, restorations due to various earthquakes that have occurred over the centuries and which brought down much of the building. On the right of the facade, a bridge connecting the tower to the cathedral in 1493 (Figures 17-17.5) . It was right in the corners by groups of four columns at each corner. Terminates at the top Din an octagonal shape, where it is walled a marble bust which perhaps depicts a Norman warrior.

The cathedral is at the heart of the religious life of the city. It is located in the heart of the old town. Its construction is due to Richard I , who began work in 1053 and was completed by his son Jordan in 1090 (Cecere, A., 1997, p.44). The building has undergone various devastation and numerous renovations that have altered the old original appearance. The dome, in Arab-Norman style with two rows of blind arches, was built in 1349 and renovated as recently as 2011. Crucial to the current appearance of the Cathedral were the changes made since 1703 by the will of the bishop and cardinal Innico Caracciolo, who entrusted the work to the Roman architect Carlo Buratti, who conceived the present facade baroque. The interior is divided into three naves with side chapels and is decorated with several paintings such as The Virgin and St. Bonaventure, Francesco Solimena. (Sergi, G.; Nappa E., 2013)

Figure 17.1. Fasade of Cathedral of St. Paul (Demirci, Didem,12.06.2017)

Figure.17.2. Fasade of Cathedral of St. Paul (Demirci, Didem,12.06.2017)

Figure 17.3. Fasade of Cathedral of St. Paul (Demirci, Didem,12.06.2017)

Figure 17.4. Fasade of Cathedral of St. Paul (Demirci, Didem,12.06.2017)

Figure 17.5. Fasade of Cathedral of St. Paul (Demirci, Didem,12.06.2017)

2.3.3.b.Church of Santa Maria in Piazza

Located near the Aragonese Castle, the Church of Santa Maria Square is the oldest church in Aversa (eleventh century). The building was erected in the form Romanesque. But as a result of an earthquake, the original plan underwent in the fourteenth century (D'alesıo,L.,2000,p.28). According to a complete transformation of 'canons Gothic architecture.

It was once the site of encounter and exchange of merchandise from another origin people like Jews, Arabs, Byzantines, and Lombards. The church has an exposed tufa facade with three ogival-shaped portals. On the right, embedded in the structure, is the bell tower, unfinished. Also the bell tower, also of the eleventh century. At the Tibet of the dome on the octagonal cruise, two semi cupolas of the sides of the transept and the lower apse are supported. (Figures 18.1-18.3). (url19)

Figure 18.1.Fasade of Church of Santa Maria in Piazza (Demirci,Didem,12.06.2017)

Figure 18.2.North Side Facade of Church of Santa Maria in Piazza (Demirci, Didem,12.06.2017)

Figure 18.3. North Side Facade of Church of Santa Maria in Piazza Dome Part Corruption-1 (Demirci, Didem,12.06.2017)

Figure 18.4 North Side Facade of Church of Santa Maria in Piazza Dome Part Corruption-2 (Demirci, Didem,12.06.2017)

1. Facade pollution

2. Affusion and facade pollution caused by external factors.

3. Plaster crack

4. Pouring plaster : 0.5-1 cm thickness

The interior has three aisles, the pillars and the round arches of the nave are for tufa view. It houses frescoes and fragments of the first Giotto school .(url19) The building has been degraded due to climate and weather over time. (Figure 19.4). Particularly in the northern part of the gate there is a plaster.

2.3.3.c.Church and Monastery of San Domenico

The church was founded by Charles I of Anjou in 1278 and completed by his son Charles II of Anjou and dedicated to St. Louis IX , King of the French, and then became San Domenico because the Dominicans lived there until 1808 . Originally it had a large rectangular classroom pattern until, in 1742 , the Monastic Order thought of a radical restoration, commissioning Filippo Raguzzini , who used the project for the San Giovanni in Laterano competition in Rome for the facade. The Ragguini inserted on the facade four edicoles with the statues of Benedict XIII and Pius V. In the upper ones, and Benedict XI and Innocent V , in the lower ones and on the top of the facade is the statue of Louis IX.(Cecere, A., 1997, p.72) (Figure 19).

The church preserved interesting works on the sides of the entrance, two beautiful marble medallions with the Saints Peter and Paul of Merlino culture. At the second right altar, the *Annunciation* by Francesco De Mura; To the Third, *Resurrection of Jesus* by Francesco Solimena . The arch of the apse, On which a 17th century transnational organ rests, was rebuilt in brickwork in 1847 . In 1813 the monastery passed to the Minor Observant of Maddalena, who remained there until 1911 . .(Cecere, A., 1997, p.73). The church was closed down by the 1980 earthquake and is currently being restructured.(Montone, S.,2014)

Figure 19. Church of S. Domenico – Aversa (Demirci, Didem,12.06.2017)

2.3.4.Homogenity

Piazza Marconi is the central part of an area along with the direction of the selected area. The architectural constructions with radial axis are took into account according to the regular and homogeneous location commented by considering the circular center. But when we look at the old resources, at the time of Normans started to build and at the same time we can see that the integrity of the structure within a certain harmony has deteriorated.(Figure 20) Selected area taken as a base, we see that the houses around it and the architectural works in the vicinity of the square structure do not

overlap. When we see Piazza Marconi first image come to our mind actually, it's just a reflection of the old identity of city. But unfortunately when we look at the present situation, we can see that there is an irregular urbanization.

In the restoration environment always born from interactions within places and masses. Every massed building defines the place. Landscape as well as object become definition with place. Therefore, when we look at many cities like Piazza Marconi, which has no identity, it is observed that these cities are not satisfied with the urban spaces, the physical conditions and the experience formed in them.

Figure 20. Homogenic view of Piazza Marconi

2.3.5.Heterogenity

At the same time we can see that Norman architecture can not catch a certain balance of current structures. We can see that Baroque architecture of St. Paul's cathedral showing contrast with the current structures. Raises an important issue, for new elements within southern Italy might not necessarily all be 'Norman'. (Figure 21.1,21.2)

Burghart, Foerster, Stefan and Thomas (2013)) makes mention of this topic as; "*Thus even within the quintessentially 'Norman' town of Aversa, we have references, in small group of charters from the 1070's, to the mos Francorum, rather than mos Normannorum. Similarly, while nothern influence is clear in at least some of the surviving architectural evidence from southern Italy this was not necessarily always Norman*." (Burghart,S.; Foerster, T., (2013), p.40).

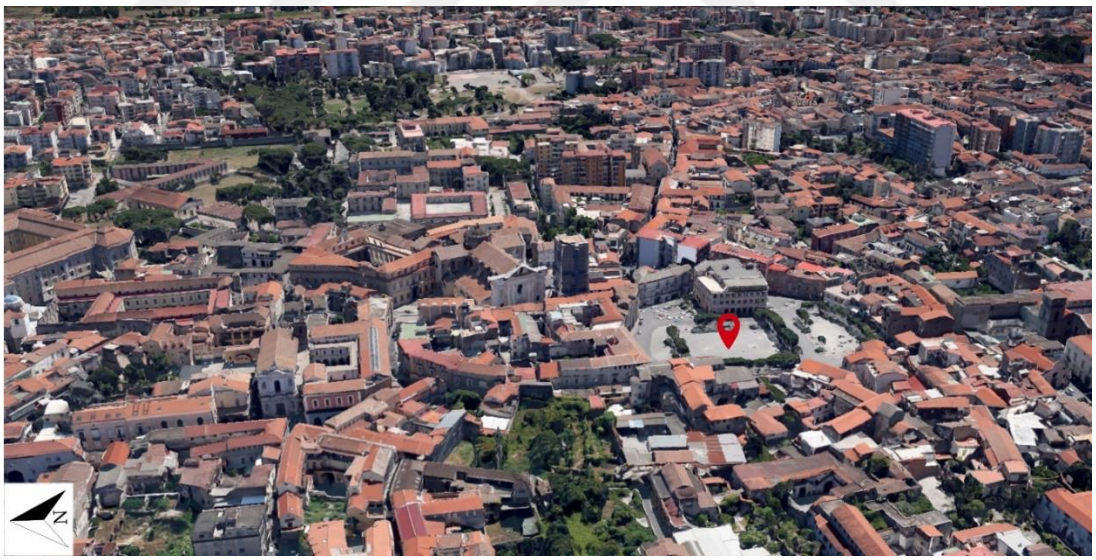


Figure 21.1. Hetorogenic view of Piazza Marconi

Figure 21.2. Heterogenity of buidings and Environment in Piazza Marconi

2.3.6.Foreign Bodies

Except wrongly use of selected area, used materials are not like they should have been. The pink exterior building located at the eastern part of the square and used as a school before it is abandoned and used barring the purpose and presents danger. This structure, which also causes image pollution, was built on the Christian society's church. Because of this, some part of additional building's interior still use by this society independently.(Figures 22.1.-22.3)

Figure 22.1. Christian Society's Church

Figure 22.2. Christian Society's Church

Figure 22.3. Christian Society's Church (Demirci, Didem,12.06.2017)

Although there is lighting at the same time in the building where there is no function on this, it does not work well enough, which makes it extremely dangerous at certain times of the day. There is two spot lighting at the 4 corner of central square and which is located at the south part of island. Unfortunately, these spot lights not working very well. Also, there are 2 benches on the east and west side of the center. In addition to this, there is a fountain on the west side. .(Figure 23) This area is very deserted and lack of security because pubs and economical places which are located innerside of Piazza Marconi's.

Figure 23.Benches on the West and East Side (Demirci, Didem,12.06.2017)

Figure 24. The Fountain on the West Side (Demirci, Didem,12.06.2017)

Deteriorations, which are located in square, are too much attract the attention. At the current situation concrete square parquet covering was used in the middle area and island part.(Figure 25) Because of wrong use of space and wrong car parking deformations and levels occured on the floor. With this levels on the concrete plates which are footing on ground, there is tearings, crashes, affusions.(Figure 26).

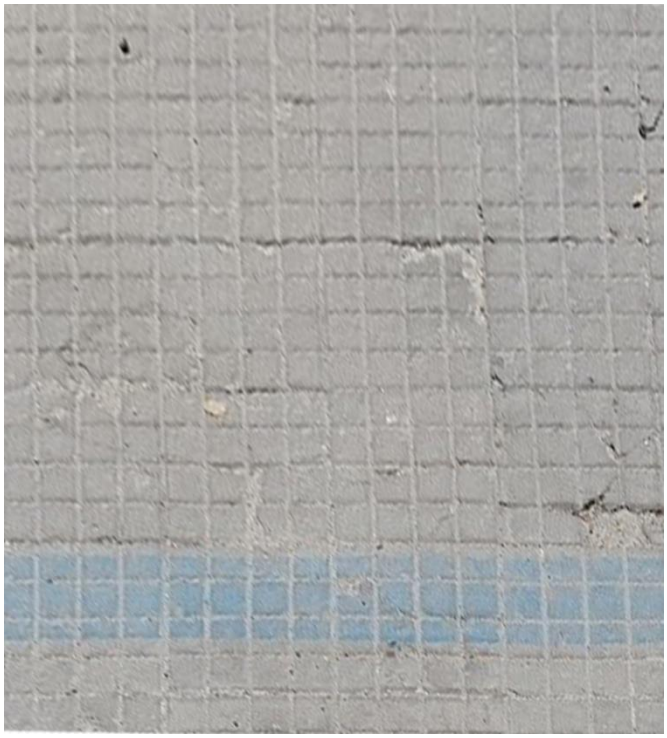


Figure 25. Concrete Square Parquet (Demirci, Didem,12.06.2017)

Figure 26. Floor Deterioration/ Fracture and Breakage.
(Demirci, Didem,12.06.2017)

These and other deformations are continuously discontinuous, and the explanations that may be in one or in combination usually include the kind of sensitivity that is required to make a rigorous reasoning. To define the damage, these are damage types that provides big value. Because this shows us how the area is used. We see that the strength value of the concrete is exceeded in places where breaks and deterioration occur. Also we understand that these deteriorations happen because of more than ones pressure force. This tells us whether there is any possible or continuous tension or pressure in damaged areas and other areas that have not yet been damaged. At the same time, when these damage causes were investigated and broken points were examined, it was concluded that the material used in the field was inadequate due to insufficient workmanship and inadequate drainage. On the other hand, an improvement made by using modified asphalt was tried to be applied in the parts of the ground. (Figure 27.1-27.2) Because of frequent afforestation, some of the plazas were tried to be planted rather than afforested, but later dismantled due to the fact that the vehicles can move easily or due to an unknown reason. So that the part of the separating stones that separates the afforestation from the ground is also damaged. (Figure 28).

Figure 27.1. Floor Deterioration-2 / Modified Asphalt Operation.
(Demirci, Didem,12.06.2017)

Figure 27.2. Floor Deterioration-3 / Modified Asphalt Operation.
(Demirci, Didem,12.06.2017)

Figure 28. Floor Deterioration-4/ Dismantled Afforestation Damage

(Demirci, Didem,12.06.2017)

On the road stone mastic asphalt used. On the asphalt section we can see that there is second type abrasion. When you compared the biggest grain size which is 12.5 mm to the Type 1 wear, it gives us much higher wear ratio. This applied at places like without heavy and non-stop traffics usually light car otoparks, sport areas, walking lanes. The soil structure was further deteriorated by applying modified asphalt on top of it due to deterioration afterwards. (Figure 29.1) If we inspect the current asphalt we can array the levels of deterioration and fatigue in three groups from low to middle and to high. Multiplex deterioration has occurred at the beginning of the lines connected to Piazza Marconi, which is generally the side streets of the asphalt roads. (Figure 29.2) Very important damages happen at the roads because of too much vehicle. Due to the horizontal and vertical stresses that occur as a result of these overloads, the surface of

the asphalt breaks shortly, cracks and seats. Reason of this, ground actually consist of 25x40 black granite stones. Not to mention the fact that this granite parquet stones damaged because of vehicle traffic. Except for these important factors which cause the road cover to deteriorate, faulty patches are degraded due to faulty manufacturing such as inadequate drainage, use of inappropriate -filling materials and insufficient compaction. This situation aesthetically decrease the road quality significantly.

Another important issue that causes short-term deterioration is the highway cracks caused by freezing and thawing especially in the winter months in regions where temperature difference is high at night and day. Specially it has a climate like Aversa. Because of the temperatures of 40 degrees in the summers and the subsequent damage caused by the use of vehicles and people can not be ignored.(Figure 29.3)

Figure 29.1. Asphalt Deterioration-1/ Patch Operation

Figure 29.2. Asphalt Deterioration-2 / Multilevel Asphalt Degradation.

(Demirci, Didem,12.06.2017)

Figure 29.3 Asphalt Deterioration-3 / Asphalt Application on Granite & Multilevel Asphalt Degradation. (Demirci, Didem,12.06.2017)

Figure 30.1. 0.5-1,5 cm Plaster Deformations and affusion. (Demirci, Didem,12.06.2017)

Figure 30.2. Facade Corruption depend on Squalidity and 0.5-1,5 cm Plaster Deformations and affusion. (Demirci, Didem,12.06.2017)

Figure 30.3. Facade Corruption depend on Squalidity & 0 – 1,5 cm Plaster Deformations and affusion. (Demirci, Didem,12.06.2017)

Buildings, which are located around the square, are also very deteriorated. First of all deterioration reasons investigated, boil down to historical environment and its component size like Piazza Marconi. Climatic as well as human use and usage in different functions deteriorations are increasingly increased. Frontage deterioration determines are done for the buildings that in the square and around the square. There is plaster deteriorations because of building obsolescence and the lacking of care. Nearly at everyone of them there is plaster deteriorations and pours between 0,5-1,5 cm. (Figure 30.1-30.3) At the innovation of cutting not remained faithful to the original parts. Ground floors have been enlarged for use in showcases and shops. Because of this frontage integrity has been broken. All of the different structural frontages have been changed. The random placement of tablets has created visual pollution on the field. Aircon and external units are placed in such a way as to cause visual pollution regardless of the frontage.

There are also many neglected socioeconomically chains here. Interviews with those living in the area of environmental protection and supervisors of architectural practices in this area have facilitated the concrete identification of existing problems in the historical environment. It was observed that the people of Aversa were not very pleased with this situation after the speeches of the people who lived there and conducted surveys and interviews. According to what is said, the municipality did not do any activities such as care, ecological or educational activities. They talked about being silent about all the negativities like in addition, the municipalities within the borders of negligence, water, sewage malfunctions, cleaning, negatives in public buses, vehicles parked in the wrong place, mobile sellers etc. The simplest but most important example is the trash problem. The biggest problem of Piazza Marconi, which is used as a market place, is the pollution that mobile sellers have left and the problem of the garbage that comes after. Two years ago, with the problem of the garbage heap living in 2014, it was revealed how the plaza lost its former significance. (Video 1-2) This garbage problem has been solved in the direction of the complaints of the people there because of the lack of interest of the municipality. But there are other problems besides the fact that the garbage is not collected.

Almost all of the participants agree that the renewal of the surrounding buildings is necessary as well as the renewal in a holistic way based on the historical location of the present location. But according to participants, the region has been deprived of basic infrastructure services for many years. It is the bid for the renovation of the buildings by the municipality.

In addition to negligence of municipality and such causes, there is also a problem in

terms of security here. Since there is not much lighting, there are many problems such as depression, deprivation, insecurity and so on. Participants with different security perceptions even at different levels have expressed that they experienced some security problems. As the reason for the safety problems, this is because the participants say that police and safety do not show sufficient work rather than physical conditions in the neighborhood. In the direction of what Aversa residents say, there are some excesses because of being unreliable, the sale of bad stuff, and bars being close.

It is seen that the approach of the people living in the region is positive if there is a renovation process. Most of the proposals included in this study are intended to be designed according to the wishes of the people living here. Therefore, the views expressed in this study also indicate the limits of the renovation works. It also produced answers about how it should be.

2.3.7.Attractors- Detractors

The charm of the Piazza Marconi can be seen. The most important of these is the fact that in the Norman period there is a certain historical importance and that it has its own story. At the same time, remained walls from the Norman period and architectures make the Piazza Marconi attractive. Geologically, the presence of a volcanic soil group like rhyolite, trassite and so on. Agronomically processable and efficient, and in addition, the potential for tourism is high. Unfortunately, there are detractors besides their attractiveness. If we say the detractors, we can say that the most important is the destruction of the historical identity. Failure to provide transportation

and substructure disturbances are important detractors. At the same time deterioration of the structures of the Piazza Marconi area and surrounding areas. Likewise, climate conditions are quite challenging.

2.3.8.Persuaders – Dissuaders

In the present case, the dissuaders are more than the persuaders. There is almost no persuaders. We can only say that the neighborhood cult still continues.

Dissuaders are;

- Homogeneus
- Non-achievable heterogeneous balance
- Lacking of environmental harmony
- Deterioration of socio-economic structure
- Lacking of security
- Lacking of education and unemployment
- Municipal negligence
- Disproportionate urbanization
- Lacking of green space

CHAPTER III. EVALUATION AND PLANNING

3.1.Evaluatıon Stage- Current State Assessment

3.1.1.Resources

Having a unique story for Piazza Marconi is an important feature that enhances its attractiveness. Because there are a lot of agreements, cultural heritages and many experiences that have happened here in time. At the same time, the cultural richness of the Norman period, both the remains of walls and the historical architectures can be seen increases its attractiveness. The importance of the area in terms of urban identity is in fact an economic and cultural development for all urban residents. Discussing the tourism potential of the area is one of the main discussion topics of the participation process.

One of the most important actors of the urban renewal process is the local people's views on the region, their experiences, their approaches. At the same time, preliminary studies and historical sources on Piazza Marconi have been evaluated. These assessments will shed light on the work to be done within the context of environmental restoration. As it was mentioned in the “Material and method ” field research was conducted using an in-depth interview technique within the qualitative research tradition. The fact that the region has not renewed itself for many years has caused different problems to be experienced over time. In this context, both physical and economic infrastructure brings social and cultural problems. The people of Aversa, that is to say the participants, almost agree on everything that the restoration work will be much better than the old version of the region, regardless of the nature of its work.

By renewing the region according to the participants, the social, economic and cultural structure will be changed by preventing the mentioned problems and the gains of the tradesmen will be increased.

Another important element of this region is its own food sector. Because it's location in a fertile coastal shore in the northern part of Naples, we can call it the central source for agricultural products. This is only known by the people of Aversa and the people who live in the vicinity. At the same time, it can't be ignored that it is very efficient in terms of soil. Because it is a volcanic soil structure, there are rocks composed of rhyodacite, rhyolites and volcanic lava stones. This means that S1O2 is present in large quantities. So the amount of mineral matter in the soil is quite high. Because the minerals in the soil go on the surface, they are in communication with other factors such as air, sun and water, and increase soil productivity. After the physical and chemical erosion of the emerging rocks, a layer with high productivity can be formed in the same way. These lands are also known as highly effective areas to form other activities besides agriculture (Oğuz, H, 2008). Sustainability of agricultural activities provides both socio-economic benefits and employment for this region. Participants are also agree on the development of this issue. Participants think more about the cultural and socio-economic well-being of the place more than its historical significance.

On the other hand, we can see that the element we call the Napletian temperature continues in this region. Because they dont want the neighborhood, fraternity and tolerance climate here to deteriorate.

3.1.2.Shortcomings

Piazza Marconi and its surroundings, which are intended to be improved, are generally deserted and most shops are closed. In addition, the buildings have been deteriorated from the climate and neglation, while the square has been deteriorated from the use of many vehicles. People can't walk here on this square. At present situation people use this square as a parking space and park it in a very irregular way. For this reason, the pedestrians can't use this square as much as they like and it is difficult. At the same time, the current situation is lacking in aesthetic sense, which makes Piazza Marconi even more insignificant and dangerous.

The Social Services Sector has an institutional mission to mobilize social policies in the region. The primary targets of the sector are to support people and families, protect their private lives with respect. It is to provide, encourage and protect the actions aimed at improving the skills of individuals by working with civil, public and private organizations. The social service units of the local service centers in each region are directly concerned with the citizens who are socially disadvantaged and need assistance. The Piazza Marconi theme is brought together between municipalities. However, we see that there is a significant delay in collecting and providing social services for the residents and community. . It has been seen that due to the shortcomings in the public sector, individuals in such a traditional region have difficult intervening. That's why need of public usually cannot be done.

Unfortunately, the transportation service in Aversa is very poor if we come to transport. We can say that the main access to Aversa is a rail system from the center

of Naples. Otherwise it can be difficult to reach from the main roads due to the frequency of private vehicles and wrong parking problems. Likewise, heavy vehicle which used for goods and transports, can not use roads because the streets are narrow in a special case. For example, an event that has taken place this year has been moved to social media by someone living in this region. (Video 3)

32% of interviewees regarded intra-city transportation as the responsibility of public benefit, public service and local government. 8% of the respondents stated that urban transport services are a whole and talked about the people-oriented approach. However, 60% of the interviewees held the municipality responsible for this issue and expressed dissatisfaction with their failure to fulfill their responsibilities. In this context, it has been mentioned that the provision of a town accessible to all segments of the population and the accessibility of public transport, youth and children, and even the disabled can benefit more from the means and means. In addition to public transportation, pedestrian transportation, vehicle transportation and bicycle transportation are included in the concept of transportation.

Also we need to mentioned that security is important. According to the people of Aversa, there are cases of drug sales, seizure, robbery and other similar events due to unemployment, lack of education and poverty, and most of the children and youth of the region are affected and some adults have been avoided to travel around the region late at night. If the brand values of the organizations providing products and services are increasing, the brand values of the cities and countries are increasing. Because the brand is a sum of perceptions, the concrete benefit of the offered product and service alone is not enough. The power of the brand, as well as the experience of the product,

is determined by the values it has and the emotions that it evokes in its customers. The same is true for tourism brands. The beauty of the place, historical texture or amusing environment alone is not enough. The perception of a city determines the inhabitants. It depends on the work of the region to increase the brand value, to appeal to the citizens of the issue, to seek pleasure to depart. Guests need to provide good service and a safe environment. Designed by Norman at the time, Piazza Marconi was considered a strategic solution for timely zone control. It was inevitable not to lose the identity of this area, which had an important value, with its elements such as the use of shan only as a market place.

At the same time, as mentioned above, the potential of agriculture and the unique food sector are only within certain boundaries. Because as mentioned above, people of Aversa and people who lives around Aversa only can know here. That's why, this sector only takes place within small borders. However, it is necessary to expand this pattern which is trapped in these cultural and historical facts. For this reason, related sectors such as tourism, food-beverage, entertainment are defined as another participant group in the city. It is thought that this project will benefit from the problems in implementing the restoration works carried out in the beginning, the reasons for the gradual depletion of this area, and the infrastructure problems.

Also we see that climatic problems arise because of the lack of afforestation. Because there is rarely rain in Aversa and the temperature is not absurd but it causes various structures deterioration. Rare afforestation makes this situation even worse, so there is almost drought.

3.1.3.Survey Questions and Rate

Living in and 25 attender from Aversa and around areas were asked, discussed and identified deficiencies.

Questions **Percent (Yes / No / Null)**

- Are you satisfied with the sake of Piazza Marconi? Why? %8 / %80 / %12
- Are you satisfied with Aversa municipality? Why? %0 / %96 / %4
- Do you think Aversa is clean? Why? %0 / %92 / %8
- Is transportation of Aversa easy? How? %8 / %60 / %32
- Would you like to renew the Piazza Marconi especially in Aversa? %100 / %0/ %0

How can be that renewal?

Questions	Yes	No	Okay
Piazza Marconi	2	20	3
Municipality	0	24	1
Cleaning	0	23	2
Transportation	2	15	8
Renew	25	0	0

Table 3.1. Survey Results Diagram

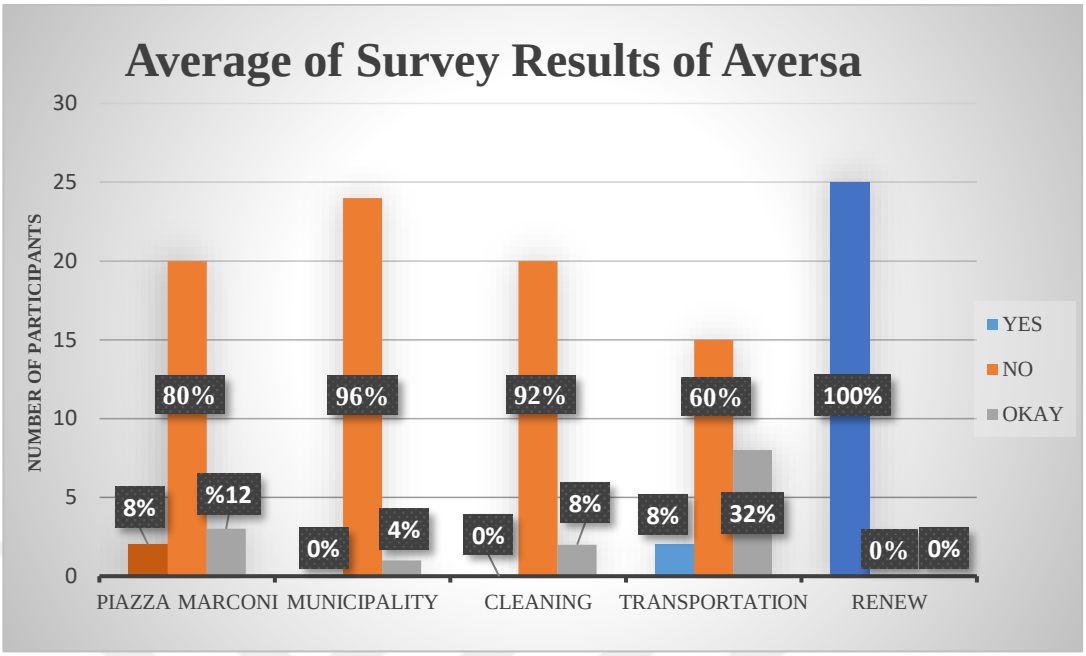


Table 3.2. Average of Survey Results Diagram of Aversa

We can say that when we look at the sources in the Piazza Marconi, we can be quite appreciative. These detractors, dissuaders, and materials that help solve the problems are eliminated. But the fact that the area is in a bad situation is not a spatial source but a people-oriented public responsibility that does not work in a solution-oriented manner and makes it a chain of constant negligence.

The above-described SWOT analysis has been accompanied by quantitative reading, addressing the risks and opportunities associated with the orientation stratification and strategic axes in the context. Therefore, it emphasizes both the regional context and the priority themes to support for qualitative synthesis. The risks identified by SWOT analysis on this basis were determined by taking into consideration the external scenarios for which opportunities are sought. This descriptive SWOT analysis also addresses the deterioration of the cultural heritage of urban and marginal areas. Many

invaluable landscapes from cultural and historical point of view can be disturbed, emphasizing transport infrastructures and the deterioration of existing resources. It also shows inadequate and misused areas as well as existing assets.

The dismissal of the square, its non-functioning use, does not know that it is hosting an important event, or that it is unaware that it pushes the function to nonfunctional if it is the function of the field. In other words, it is almost like leaving the place to misery and burying a history of dusty papers. On the other hand, tourism and similar historical sites must go through environmental restoration in order to increase the development of this region as well as employment.

At the time of the Piazza Marconi / Aversa's presence in the region had a historic prescription. Although it is still so, the importance is not given and it is losing it. Hence, it is already an outdoor museum like Pompei itself, with its buildings around it, its structures and the ruins of the fortified walls. The goal is to integrate old and new from one another. At the same time, considering that it is sustainable, it should be given a function that will benefit much from this function.

Sustainable development is a central issue for the open air museum, and it also means raising a value instead of reducing one's value. Evidence from best practice describes two key elements in this process: the improvement of local networks where, as I have already mentioned, ground-based development and open air museums have to play a key role as catalysts in the development of social capital.

Moreover, this concept is very suitable when we consider the economic decline of Aversa now. Looking at the past, as mentioned above, the city, which has witnessed

many histories of people living in many cultures, is now very far from the old case. It is planned that people will come here from now on again and be redesigned to be a square where different cultures can come together. Thus, people use squares to go from one place to another, to meet someone, or to perform an activity. So the tradesmen here can develop, people can walk safely here and go out.

The environmental restoration to be done here does not only involve physical change of the city. As a result of these physical changes, social, socio-economic relations will reappear. These concrete changes will have different effects on each one, since it will make Piazza Marconi a new perspective and different from what it is. At this time, environmental restoration work involving physical and socio-economic changes will also be modernizing effects.

When we look at the environmental restorations that have been made up to now, we can see how much you consider the area you are in, how important it is and how much you earn. One of the examples found today is Bergues / France. As we have seen here, the environment and history are in a certain harmony. (Figure 31)

Figure 31.Bergues/Fransa Norman city

3.2.Definıtıon Phase

As mentioned above, it was mentioned that the environmental restoration to be done here would be different from that of concrete changes, with a new point of view. Each change is said to have different effects. If we were to break them down:

3.2.1.Preliminary Projection

A specific protocol has been followed in terms of a feasibility survey which has been built to sustain the development of Aversa.

Aversa city is detailing the DOS (Strategic Orientation Certificate) which is appropriate to Integrated Urban Programs Act and the operational objectives of POR FESR Axis 6 of the Integrated Protocol Programme. (“Documento di Sintesi”, 2010)

The strategy that is necessary for D.O.S application will be configured in financial basis.

For this reason, D.O.S includes PIU EUROPA which would contribute Aversa to regain its highly competitive role in regional and national scenario that would result in actualisation for important economical and social changes of the national growth process.

The extent of of PIU is defined in details in in the following figure Appendix a

Scale 1: 5000. (Figure 32). Hence, this project will provide finance to the municipality of Aversa and related institutions. It has provided a renovation in 2051.278 km diameter.

Figure 32. The area where the relevant institutions of Aversa will provide financing. ("Documento di Sintesi", 2010)

3.2.2.Analytical-projective stage

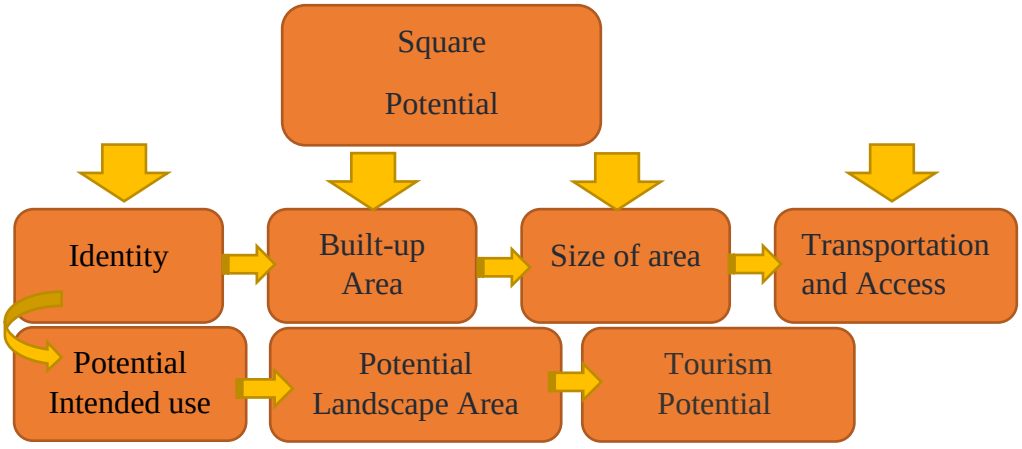


Table 4. Analytical-Projective Stage Conceptual Model

3.2.3.Impact Assessment

The analysis of the current area (Piazza Marconi) has been carried out through the schema as we previously stated. The visions and the effects of the post transformation of the current materials situated in the square, have been shown.

The result we gained through going around the current plan is; the area is perceived as functionless and a place for the cars that are parked arbitrarily, and a deserted, temporary market place. Moreover even the inhabitants ignore the area and consider it as a waste. Therefore the shops have been closed due to this idle situation. Current landscape policy has been triggering environmental discrepancies and worsening the region which is currently hot and arid. The sense of emptiness which is related to its dramatic size, makes the area more functionless and easy to be classified as idle. Also the feeling of insecurity which is felt with the sense of emptiness has been growing more and more each day. Therefore; the priorities such as security, economical situation, life quality are changing day by day for the inhabitants.

Considering not only the potential aims and objectives, but also the quantitative parameters, it is clearly visible that the soil structure is suitable and the inhabitants all agree on the necessity of an environmental transformation of the area.

3.2.4. Identifying Priorities

Through the analysis of the attendants' views the priorities and the necessities in the process have been pointed out as:

- The regeneration of the square for the environment. (The reestablishment of the spatial identity)

- Forestations.
- Functionialisation of the square
- Renovation within the protection of the historical structure.
- Re-securisation of the square
- Creating a sustained parking lane
- Facilitating the transportation.
- Increasing the touristic attraction and introducing it to public.

3.2.5. Planning

The dwellers of the Piazza Marconi and the neighbourhood, in other words the constant users of the square comprise the most important participant group. The importance of the square in terms of the urban identity offers an advancement for all the citizens both economically and culturally. Talking over the tourism potential of the area is one of the basic matters of debate. Therefore, the sectors in the town such as tourism, food and beverages, and entertainment are defined as another participant group. It is believed that this project would provide benefit among the debate on the problems in the implementation of previously conducted restoration oriented works, the reasons for the area to become run-down, and infrastructure problems.

The studies (Carusone-Marco, Italy, 2015) indicate that the district is divided into two spatially, considering the physical and socioeconomic conditions of the Piazza Marconi. The inner section of the district have both residential and environmental features. The section situated in the radial formed district regions, and which limits

the inner section covers the study area, which is called Piazza Marconi and surroundings. The square fabric seems sustainable with simple interventions and supports. There are several important outcomes of the participation experience in the decision making process for Piazza Marconi and surroundings. First, how a public open space should be used, and what functions a square in a historical surrounding should have, were discussed with the citizens. The participation enabled directly detecting the extent of the problems about the area. The interviews with the dwellers of the environmental conservation area, and the experts who audit the architectural practices in this area facilitated the corporeal detection of the problems in this historical environment. In addition to all these benefits, an extensive platform was created in the town on historical environment conservation, urban identity and urban culture.

Piazza Marconi and surroundings, which is planned to be developed, has a radial form and is situated within the limits of Via S. Marta, Via Sellito, Via Cirillo and Via S. Nicola. The square is generally desolate and most of the shops are closed since they could not earn income. Also, the buildings are deformed due to climate and disrepair and the square is deformed due to heavy traffic. In addition, the people cannot walk through this square. In the present condition, the people use the square as parking area and they park irregularly. Therefore, the pedestrians cannot use the square as it should be and they have difficulties in accessing the square. Also, the present conditions is devoid of aesthetics and this renders Piazza Marconi less important and more dangerous.

Today, cities, buildings and squares resemble each other very rapidly and lose their authenticity. The cities and squares having distinctive spaces requires both conserving their historical and cultural values, and creating new and original values. In addition, the influence of the square to the surroundings and its harmony with the streets are significant. It has widely accepted that the historical and urban fabric to be improved with tourism oriented development strategies. On the other hand, the idea that historical environments could be conserved and sustained as long as they become a part of the daily life has gained a broad acceptance.

The re-improvement of the square involves the rest of the city along with the removal of the architectural barriers and recovery of the assembly areas. The renovation theme of Marconi Square has a massive effect among the inhabitants as it has a special importance in the Norman settlement in the beginning of the Middle Age Therefore, transforming this area into a open-air museum would gain this significance and it would enable the junction of the economic structure. It means to go beyond an offical school course that is based on a written text. It is more related to designing real activities, transforming a society and improving the landscape. The improvement and presence of social environment is directly proportional with the green fields. They become venues for cultural and artistic activities which are educative as well.

The use of the vegetation, soil structure, and the structural and architectural material is significant for the area, which is planned to be designed. Thus, in all planning stages, the environmental conditions are taken into consideration. A project, which is planned without considering the environmental conditions, would become discordant to the environment, it is regarded odd and it incommodes people (Korkut, Şişman, Özyavuz,

2010). Therefore, this aspect should specially be addressed, because the most important demand of the people living in this area is to live a better life without disrupting the environmental integrity.

The design process follows from the general to the specific. First, the area was examined with a general point of view, and later the important structures in the square and its surroundings were determined. The analyses of the area were conducted with the survey studies and then the planning stage started. Later, the damage in the area were identified, and element addition and removal was done accordingly. With the purpose of reveal the present situation of the area in every aspect, a survey diagram was formed based on the observations done in the area and in the surroundings.

(Figure 33)

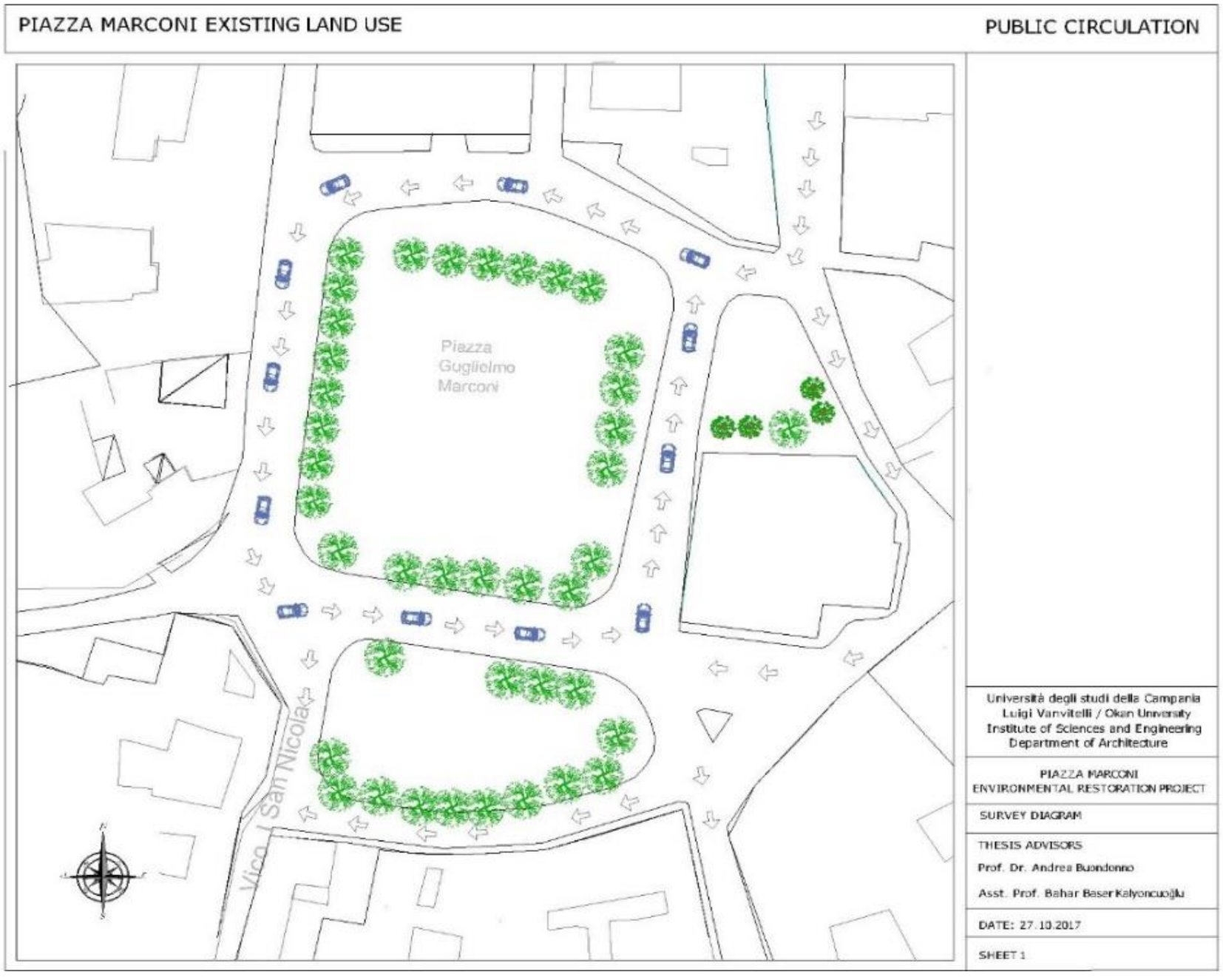


Figure 33.Piazza Marconi Survey Diagram

There are concrete elevation structures in the project area which sustains the planimetric durability of the instalments. Currently, there's a plantation area in the middle of the square with *"Quercus ilex" Holm oak ve "Magnolia grandiflora"* trees.

(Figure 34)

Figure 34. Existing afforestation in current area

When the design was being made, where and how the Normans had lived was investigated in addition to taking the Norman architecture and Norman battles into consideration. The Normans had satisfied their need for food and heating from the forests surrounding the city. When the project area is examined, a forest garden is designed considering that a Norman City would utilize a green space as such. Thusly, the quality of a forest in which once the Normans had celebrated their victories and they obtained their needs is transferred in the project area. In other words, the users of the area can maintain their activities and they fulfil their need for a square since it would gain a recreational function. Therefore, we see that a recreation area required by an open-air museum is designed based on the history and thusly integrate the old and the new.

At this stage, the influence of environmental factors on the present uses of the area, with regard to the results of the analyses conducted before. The area is divided into six sides. These sides are named as A, B, C, D, E and F. All sides are combined after detailed blueprinting. (Figure 35)

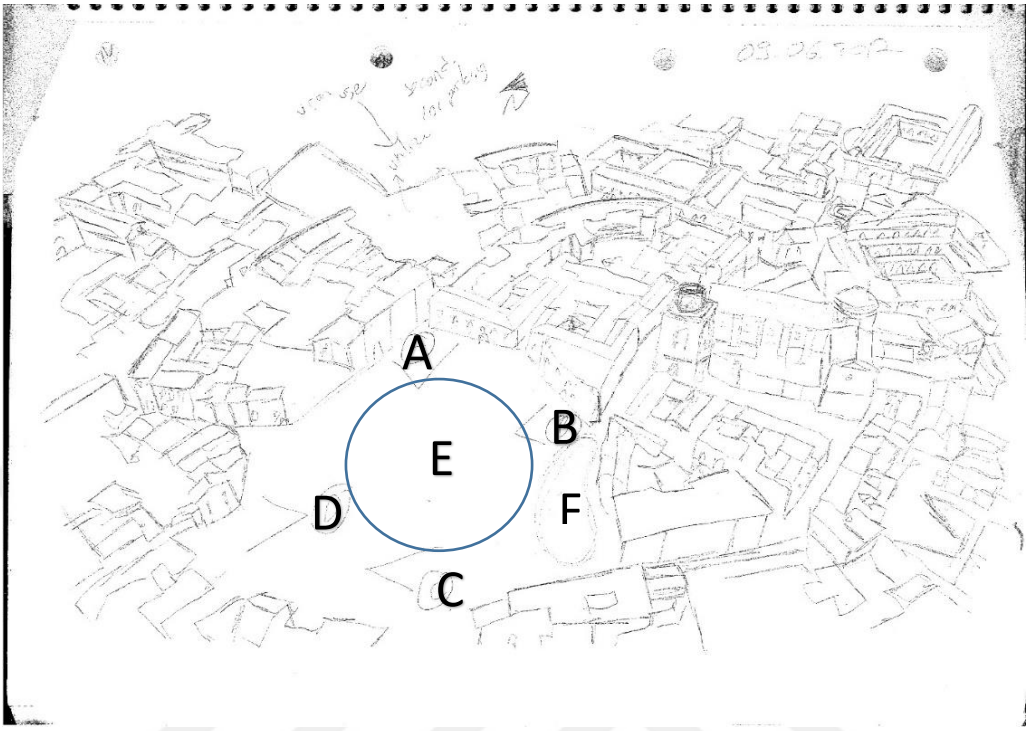


Figure 35. Project side of Piazza Marconi

3.2.5.1. Survey Result of A Side

When the present status of Piazza Marconi is observed from the A side, we encounter the view of deformed buildings, and we see two rows of *Quercus ilex* trees.(Figure 36) The thermal ratio of this side is lower than other sides and it is situated to the north. Thus, the main sitting area is relocated here. The external floor of the sitting area is natural travertine pavement and natural stones are used for the inner floor. In the anticipated design, *Laurus nobilis* trees with shading features are used to conceal this area. Also, semi-shading and aromatic trees such as *Acacia dealbata, Corylus colurna, Hibiscus syriacus, Prunus serrulata 'Kanzan',* are used around this area to let the certain amount of sunlight to access the area.(Figure 37)

Figure 36. Piazza Marconi-Current situation of A side

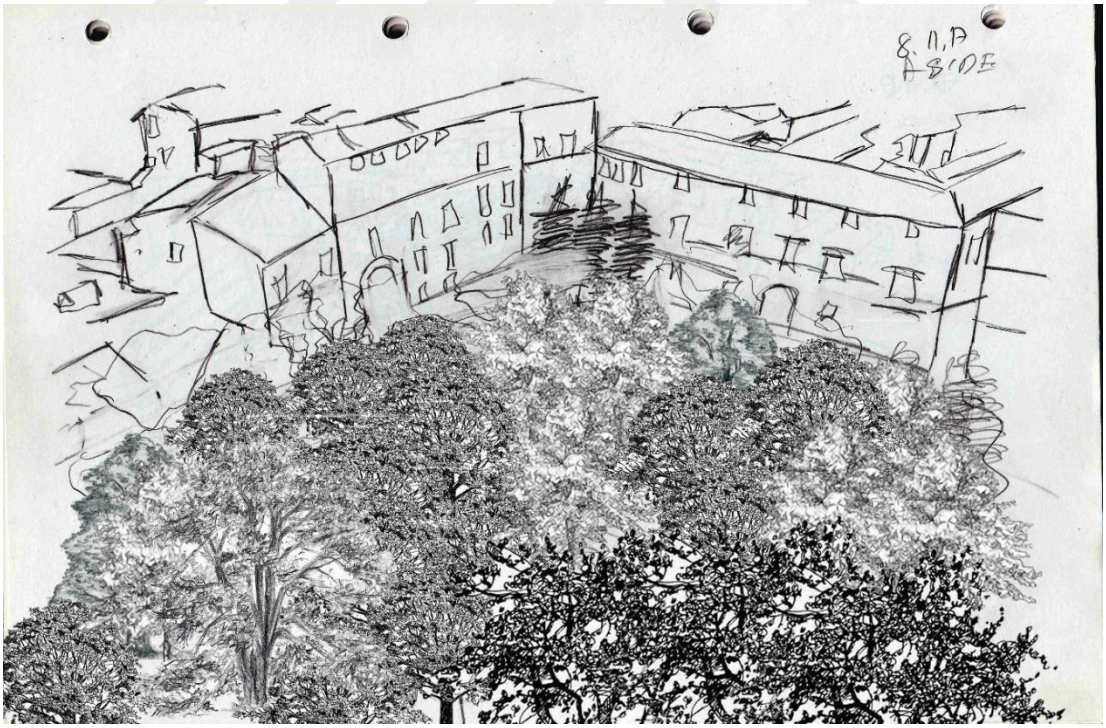


Figure 37. Piazza Marconi-Proposed view sketch of A side (Demirci,Didem, 8.11.2017)

3.2.5.2. Survey Result of B Side

When we look at the present status of the Piazza Marconi from B side, we see the building with incomplete restoration and the Cattedrale Duomo San Paolo. The *Quercus ilex* species seen at the A side continues at this site too. B Side receives more sunlight than A Side. (Figure 38) Therefore, thich tissued and shading trees such as *Acacia dealbata, Cercis siliquastrum, Erythrina crista-galli, Olea europaea* are placed closely in the anticipated design. Also some shrubs are placed as in the A side. The mix lawn areas is placed by thick fixture sodding and is supported with Monadic Flagstone Path in B Side. The Monadic Flagstone Path enabled the circulation in the space by connecting to the main pedestrian walk inside and outside the Piazza Marconi and to the C Side. By this means, the users can continue their walk and activities without being separated from the natural environment. (Figure 39)

Figure 38.Piazza Marconi- Piazza Marconi-Current situation of B side (Demirci,Didem,12.06.2017)

Figure 39. Piazza Marconi-Proposed view sketch of B side (Demirci,Didem, 8.11.2017)

3.2.5.3. Survey Result of C Side

When we consider the present status of Piazza Marconi from the C Side, we see the lot section to the south of the project area, the deserted building once used as a school and the access road. Also we see that this Side is protected from sunlight, in the least, due to the building density. (Figure 40) In the anticipated design, pergolas are placed and they are supported with aromatic and semi-shading trees and shrubs such as *Acacia dealbata, Celtis australis, Fraxinus ornus* and *Jackaranda mimosifolia* placed around the pergolas. The shrubs accompany the trees in the side too. The same sodding is done in this side, and the monadic flagstone path is used to provide easy access to the

pergolas as well as to the pedestrian walks inside and outside of Piazza Marconi. In a similar fashion, two access paths are placed in the lot section and the circulation is continued. Armoatic and shading tree species such as *Celtis australis, Erythrina crista-galli, Fraxinus ornus, Phytolacca dioica,* and *Syringa vulgaris* are used and supported with ornate shrubs. (Figure 41)

Figure 40.Piazza Marconi- Piazza Marconi-Current situation of C side

Figure 41. Piazza Marconi-Proposed view sketch of C side

(Demirci,Didem, 9.11.2017)

3.2.5.4. Survey Result of D Side

When we observe from this side, we see that it receives the most sunlight. When we look at the present status of Piazza Marconi from D Side perspective, we are confronted again with the deformed façades of the buildings. The lined up *Quercus ilex* arbour is seen here too. (Figure 42) In the anticipated design, it is planned to cut the piercing sunlight by placing tight-leaved and shading species such as *Acacia dealbata,* and *Celtis australis.* (Figure 43)

Figure 42. Piazza Marconi- Piazza Marconi-Current situation of D side (Demirci,Didem,12.06.2017)

Figure 43. Piazza Marconi-Proposed view sketch of D side

(Demirci,Didem, 11.11.2017)

3.2.5.5. Survey Result of E Side

The E side comprises the central area of Piazza Marconi. It is the place where the sun is felt the most in the area. We see that the area is divided into lots in its present status. This area is shaped due to the mergence of the lots in B side and C side. On this basis, the present firm soil is shown in ‘Figure 44’ below. Each one of these lots are used, not as the square, but as irregular parking lots as mentioned before. In the anticipated design, these discrete lots are merged into one and the project area is expended and an area covering 5803 m2 is obtained.(Figure 45)

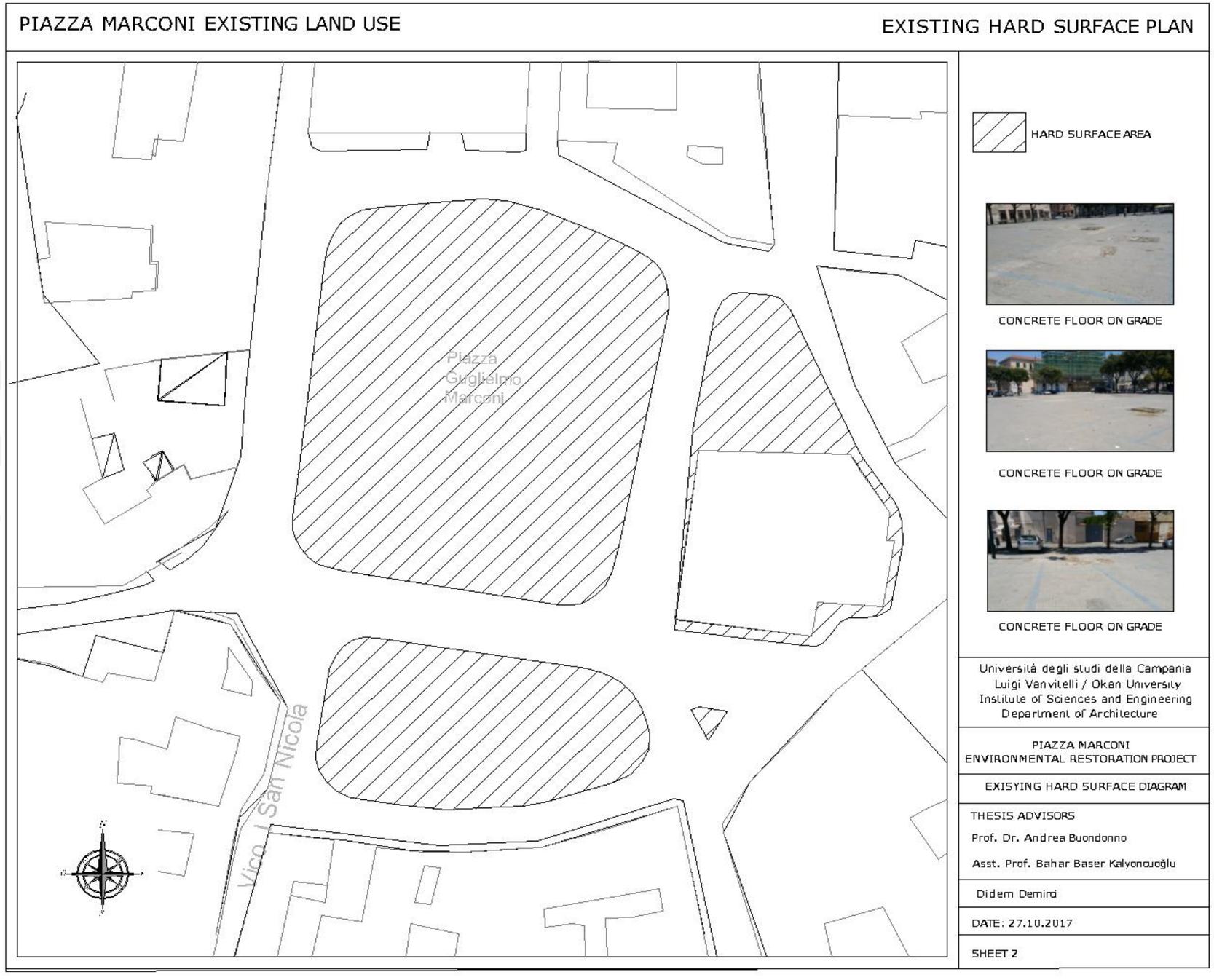


Figure 44.Existing hard surface plan of Piazza Marconi

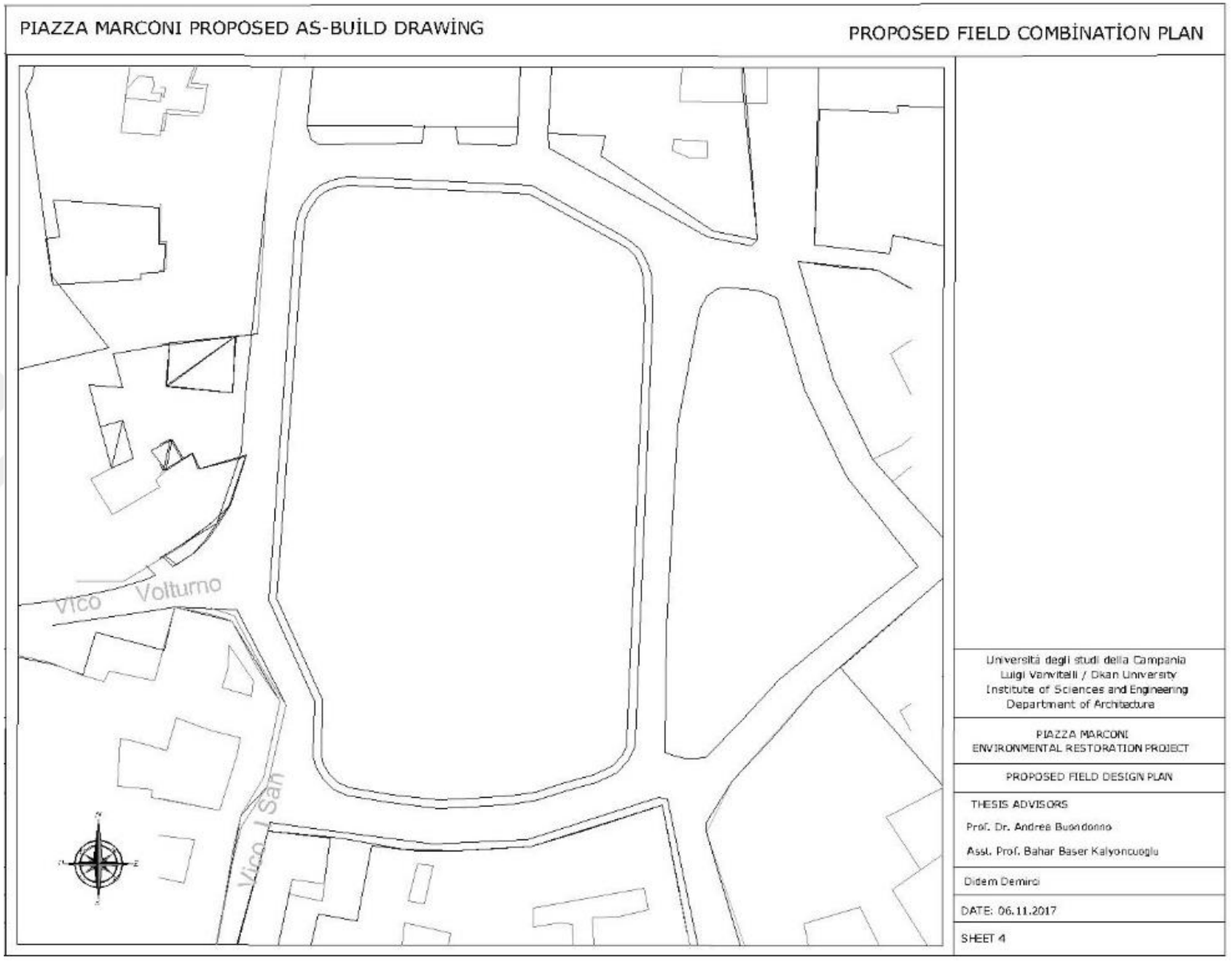


Figure 45. Proposed field combination plan of Piazza Marconi

In the present status of the area, there was a previous arbour. However, as it was mentioned in the “Foreign Bodies” section, these were cut down or stubbed since the roots of the trees had been harmed due to excessive vehicle use and general use. Thus, there is not any element to protect the area from the sunlight. In addition, although the *Quercus ilex* species arbour is planned to be conserved in A,B,C, and D region, they are damaged both in their roots and in their trunks. . Therefore, the arbour that has been damaged, which has lost their visual value or which has been planted as a wrong species, was removed from the area in the structural design analysis. According to the anticipated design, the multiple Flagstone Path was used in the area which enables the people to use the green spaces and to take a walk, and which can integrate with the nature. Thusly, the connections are provided to the main pedestrian walks in the Piazza Marconi. In a similar fashion, the trees in the E side are selected considering the seasons. The arbour is made with regard to the angle of the sunlight from the north of the central section to the south section and the areas are defined accordingly. The sunlight falls to this region perpendicularly at all hours of the day. When the spacing in the area is assessed, it is seen that the thermal influence increases as the sun changes position. It is also seen that the area is exposed to direct sunlight from the small hours to the sunset when the climatic impact is considered. The climatic status analysis of Piazza Marconi is conducted and it is presented in Figure 46. Considering this analysis, dense broad leaved trees with aromatic and shading features such as *Brachychiton acerifolius, Cedrus libani, Phytolacca dioica,* and *Pistacia atlantica* to the areas, which are exposed to perpendicular sunlight (Figure 47)

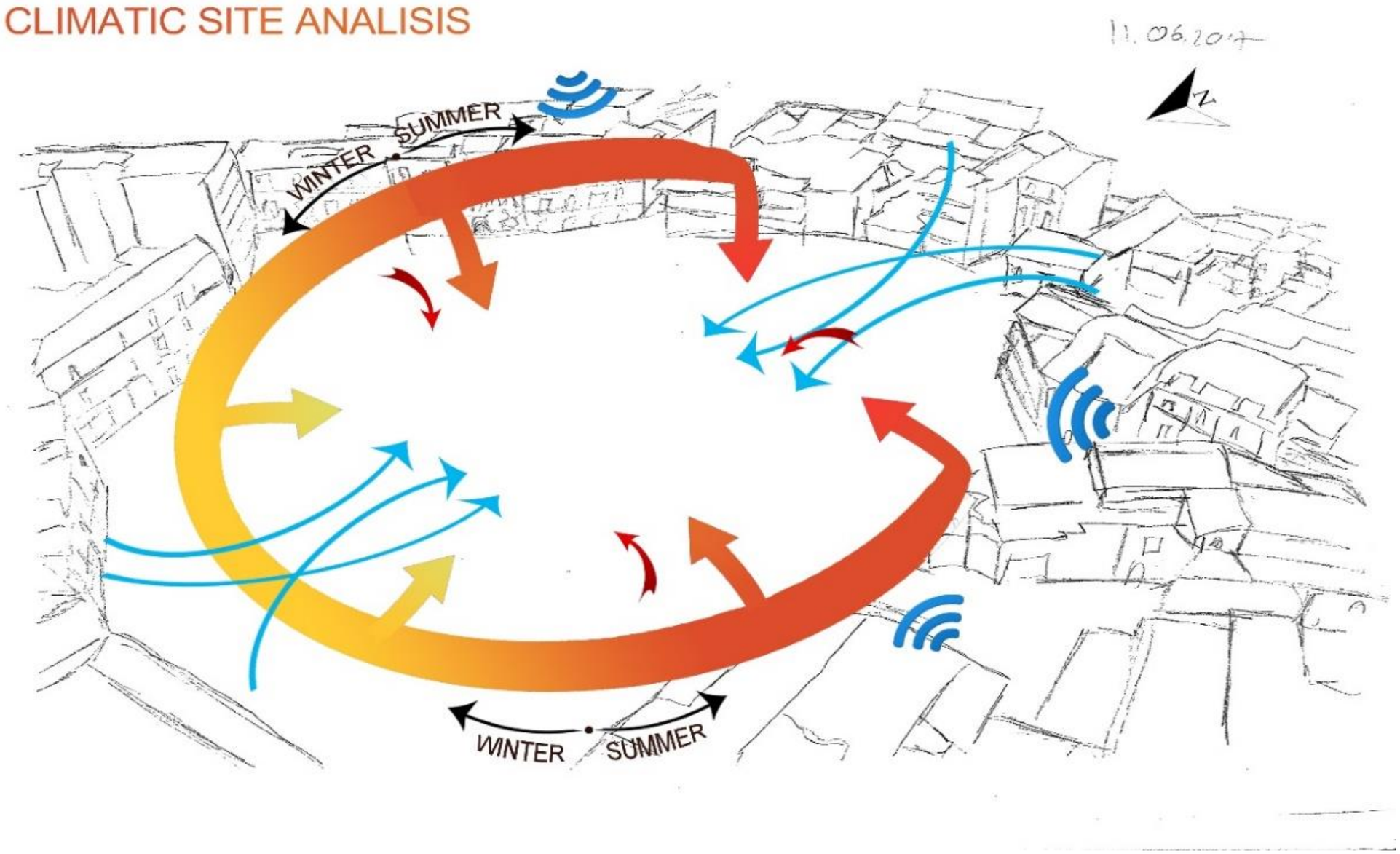


Figure 46. Piazza Marconi existing climatic site analisis

Figure.47. Proposed Planting Plan[1]

[1] For more detail explanations for plant species see APPENDIX 1.1. Plant Species

Figure 48. Proposed Planting Plan Section [2]

[2] For more detail explanations for plant species see APPENDIX 1.1. Plant Species

In addition plants that would balance the climatic impacts, provide the ecological equilibrium of the soil and at the same time that would need low maintanence. On the other hand, considering the extra drought in and the extra coldness in Piazza Marconi in the summer and winter due to the buildings, plants that are resistant to these conditions with high tolerance and that could grow rapidly are selected. (Figure 49) Also, the seasonal cycle is taken into account and the timings of the leaf cast of the trees are designed in a way that the leaf cast of one tree would give its turn to another, and the evergreen trees are used to support these plants. (Figure 50) Especially the current silence, soullessness and colourlessness of Piazza Marconi is taken into consideration and colored trees and shrubs such as *Acacia dealbata, Cercis siliquastrum, Erythrina crista-galli, Jackaranda mimosifolia,* and *Syringa vulgaris* are planted aiming at providing a colourful environment every season. (Figure 51,52.1-52,3)

It is anticipated that the Flagstone Paths accessing the green space, that provide circulation together with the main pedestrian walks, should be supported with dolomite stones. Thus, it would be ensured that the visitors feel the Norman influence more and at the same time they are not separated from the nature. This aspect would also ecologically benefit the soil.

In addition, an ecosystem pond is added to the central section of the E side to render the ecological balance sustainable and this pond was enriched with hydrophytic plants.

Figure 49. Piazza Marconi- Piazza Marconi-Current situation of E side

(Demirci,Didem,12.06.2017)

Figure 50. Piazza Marconi-Proposed view sketch of E side

(Demirci,Didem, 09.11.2017)

Figure 51. Piazza Marconi- Piazza Marconi-Current situation of corner of E side (Demirci,Didem,12.06.2017)

Figure 52.1.Piazza Marconi-Proposed view Monadic Flagstone Path in B Side to C side in E side, East part sketch (Demirci,Didem, 09.11.2017)

Figure 52.2. Piazza Marconi-Proposed Mystical view East and West part sketch of E side

(Demirci,Didem, 09.11.2017)

Figure 52.3. Piazza Marconi-Proposed Flagstone path view East and West part sketch of E side (Demirci,Didem, 10.11.2017)

3.2.5.6. Survey Result of F Side

It is the side where the deserted building which had been used as a school previously. The triangular traffic island contained in the F side is not used as an intersection and it hinders the flow of the traffic. Because this triangular traffic island, along with the deserted school building is used as a parking place. By combining the triangular traffic island, causing faulty flow of traffic, and the area to the north of the deserted school building is combined and an area covering 1971 m2 is obtained, as it is indicated in red. (Figure 53) It is also anticipated that the old school building situated to the eastern part of the area, and that does not have any function at present to be removed and a parking area to be built where people could park regularly.At the same time, some

portion of the southern section of the C side is taken and combined with the central area and the F side is rendered parallel to the E side. In this way, the main road has taken a regular form and regained its standard dimensions.

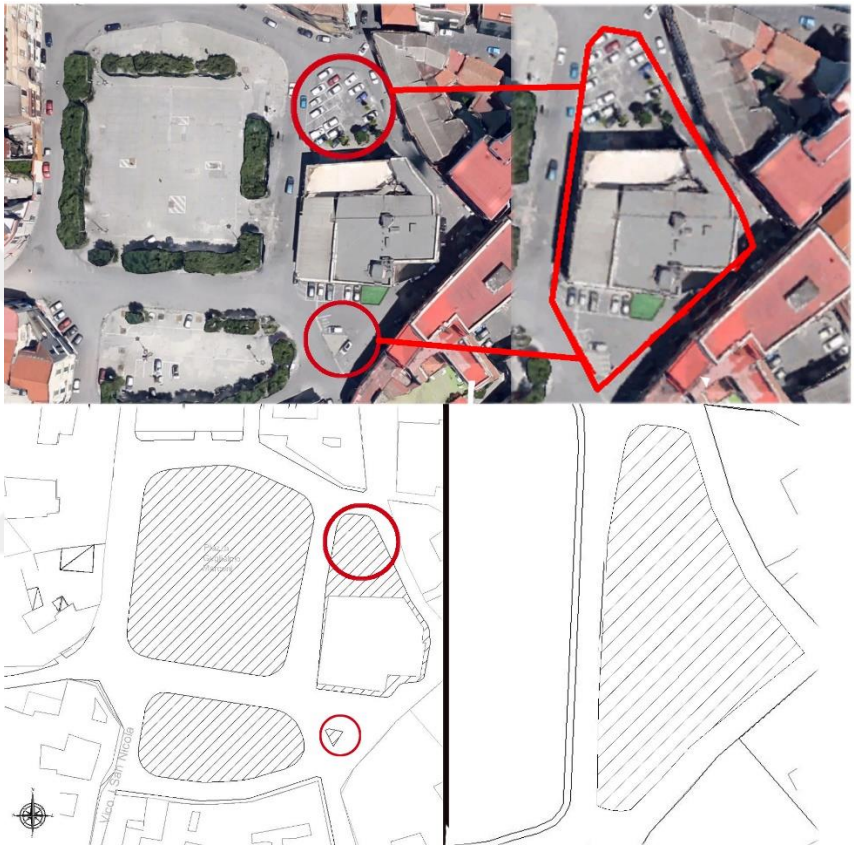


Figure 53.Piazza Marconi proposed parking area

The anticipated parking area is designed in accordance with the contraflow course of the vehicles. Thus the vehicle circulation is regulated too. The parking area plan is presented in Figure 53. In addition, the section is planted with trees and shrubs, resistant to parking area conditions and vandalism, such as *Corylus colurna and Lavandula angustifolia*.(Figure 54).

Figure 54. Afforestation of car park

The circulation plan, hard surface plan and green surface plan inclusive of the whole project are presented in Figure 55.

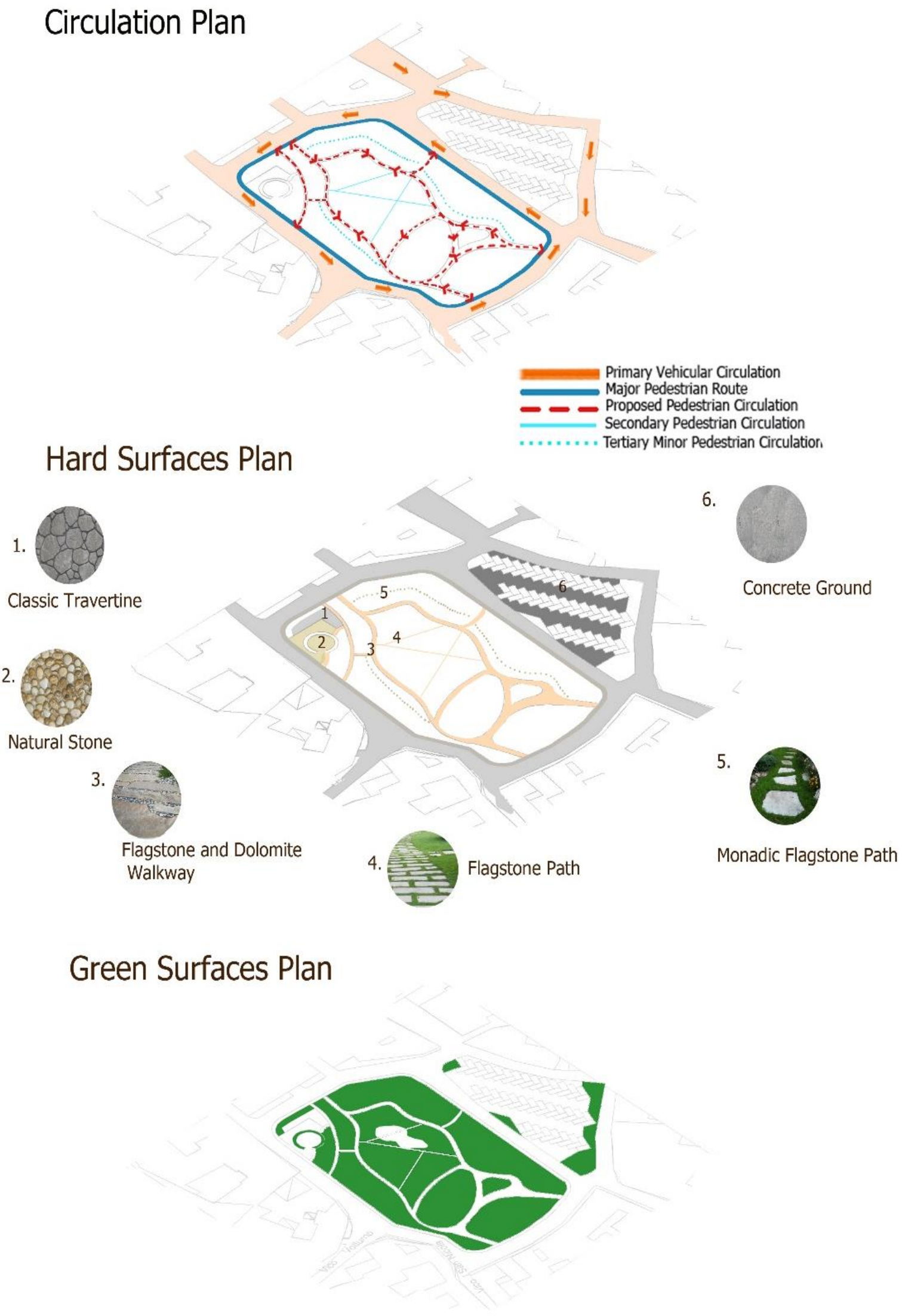


Figure 55. Piazza Marconi Proposed Site Analysis Plans

The plants selected in the project design are anticipated in accordance with the Norman culture. As we have mentioned at the beginning of the design, Normans were supplying their needs for heating, accommodation and especially nourishment and medication from the forests thus the trees and plants. Therefore, the nature was very important for Normans. The common feature of the shrubs selected for emphasizing the integrity of the trees is that almost all of them produce edible fruits. Thus, their wildlife attraction is high; this enables a productive pollination, and creates a sustainable cycle. On the other hand, there are herbs that can be used as medications, such *as Fraxinus ornus, Hedera helix, Laurus nobilis, Pistacia atlantica,* and *Olea europaea* in the project. The plants and the trees are selected taking the grown plants around Piazza Marconi as a basis and thus the natural selection of Aversa is preserved.

The first point to be considered while conducting planting works is ensuring a good drainage. In the anticipated project, the present hard surface can be excavated and the subdurface drainage systems could be comprised of open trenches or tubings and small wells. In order to drain the andosol beneath the hard surface to be excavated, a parallel drainage system is favoured which is suitable for the regular topography of the land and the anticipated structural plan of Piazza Marconi. The drainage systems comprising of tubing and trenches are also called the horizontal drainage systems. With regard to feed of the excess water, the layering of the soil or the characteristics of the aquifer in the region, the subsurface drainage systems can be built as vertical well systems. By this means, the ideal drainage of the soil would be ensured. Therefore, in order to prevent future the problems that a soil type like andosol, which is sticky and extremely water catching, the parallel dreainage system is very suitable.

A good drainage should be provided on the soil surface and at the plant root section, to remove the water that exceeds the needs of the plants from the surface area and the root section. A good drainage system provides an aired root section, a dry topsoil for cultivation and the best soil conditions for the development of a plant. Thus, we increase plant production, we sustain the productivity and we save salty and arid land from drought, such as Piazza Marconi.

A lot in the city center is more valuable than a lot in the country. Therefore, the lot dimensions are low. All the elements and buildings belong to this lot. Every area should be evaluated duly. An intensive plan is made in the area where Piazza Marconi is situated. The citizens would walk freely in the green space situated in Piazza Marconi and they would experience the integration of water and greenery. At the same time, they would feel themselves distant from the urban life, virtually in another world. As it could be understood from the hard surface plan, the pedestrian walk routes run through the natural elements, and intriguing circulations are created for the people who would spend their time here. Apart from arbour and vegetation, especially large lawns areas (with recreational purposes) are allocated in the project. Spaces with extra structural elements are not created in the project area, except for the pergolas. The anticipated design aimed at bringing in the historical fabric and objects that are present at the square, thus attempting to create the urban and environmental harmony. In this way, it is believed that Piazza Marconi would regain its identity. What is pursued here is to bringing in the long forgotten historical spirit to the area one more time by renovating the soil. Briefly, Piazza Marconi would become the centre of a historical place and regain its significance. Even, it would become a place that plays host to

people from different cultures and thus become an attraction point that people would wish to visit. With the increasing cultural tourism and the consolidated area identity, the socio-economic structure would be shaped again and most probably it would offer better living conditions to the people living around. Therefore, we can argue that the designs within the scope of the project are made considering the needs of the people/users, the historical fabric surrounding the area, and the soil conditions. These aspects are paid the utmost attention in the design process.

Normally, people living in the city centres are under negative influence psychologically. Similarly, the situation becomes more significant when the psychological status of the people leiving at Piazza Marconi is considered. Due to reasons mentioned above (insecurity of the area, misuse, becoming outdated), a design that would pacify the people is made. In the present situation the buildings and the formal colors are dull. Therefore, more rounded, curved and softer forms are used in the design.

The lot in which the project area is located is under the influence of certain negative factors (temperature, climatic change, etc.) as well as the psychological factors. In order to save the lot from these negative influences plants with stalactite and shading features are used. To decrease the above normal temperature in summer, objects such as shading trees, plants, water and pergolas are placed.

The anticipated green space forms a physical balance with the residential areas. Since the area that Piazza Marconi is in is an urban area, the anticipated design renders this place as a recreation area, a pedestrian area and a square that can be used by people,

serving a better function Also, it becomes integrated with the residential and commercial areas. As it is seen in the sketches the anticipated green space, alogn with its landscape, functions as separating the different urban fabric present in the square. Therefore, it brings a balance to the buildings and people surrounding Piazza Marconi. . Some spaces with recreational purposes, i.e. resting, entertaining, etc., are created. Each space is created in accordance with the needs of the people. The design also aimed at creating an organic balance, since in the present status, the untended buildings and the settlement around the square forms a chaotic appereance. The dullness and unorderliness of the buildings surrounding the square and their not being uniform have negative influence on the people living in the area. Because the people living under the pressure of the empty square and the settlement surrounding it, lose their standards. Thus, the anticipated green space removes this unfavorable situation, and it would bring a psychological relaxation. The people would regain their standards through the anticipated green space Also, this space creates an appropriate allocation among the historical architectural buildings around and it supports the open air museum concept. Because, the appearance of architectural structures, especially the historical ones, is more striking in a green space.

When the present condition of Piazza Marconi is considered, we only see deteriorating roads, and the hight quality historical architectural structures carryfing the traces of the Vikings being scattered among unorderly settlement. However, the anticipated green space creates an aesthetic value by yielding positive results, and functionality. In this way, the anticipated green space would render Piazza Marconi a more valuable place. Because the number of green spaces in Aversa, which is an urban settlement

with a very high settlement density, is very low in number. Thus, in an urban settlement like Piazza Marconi, the significance of the green space emerges from the passion of human for the nature. The people, who got stuck in the settlement surrounding them (dwellers of Aversa and especially Piazza Marconi), agree that this square should become a green space that would serve them more.

As it was mentioned in the "Climatic" section, There's hardly ever rainy weather in Piazza Marconi/Aversa. Weak plantation has been worsening the situation and making the area drought. Solution method of absorbing the warmth is forestation. Because of the low wind speed at the lower atmospheric layers, the heated air is conveyed far slowlier in urban parts in comparison with the country. This causes the cities to have 8-12 ˚C higher than as of suburban lands. Open and green lands are produce warmer effects in winter and cooler in summer. The air becomes cooler when the sun sets and causes the plants to transpire and evaporate the humidity in the ground. (Polat,A.T.,Önder,S., 2012) Trees have a bigger effect of cooling because of transpiration in the daytime. The necessary temperature for the plants to transpire their juice is extremely high. The absence of warm air and deforestation lowers the oxygen level of the settlement. The anticipated green space would provide microclimatic gains also. Because, this area has an artificial climate due to the concrete and stone structural elements in Piazza Marconi. Accordinly, the temperature in the area is higher than normal in summer and lower than normal in winter. Polat,A.T.,Önder,S., as cited in Deloya, 2012 "*United Nations and World Health Organization recommends that in order to weaken the unwanted environmental effects and make us of the benefits, the minimum green plantation should be 9 m^2 per capita*."

CHAPTER IV. CONDITIONING PLANNING APPROACH (LIMITING FACTOR)

4.1.Land Capability Geo-Pedo-morphological

Laying aside the soil structure of the area containing Piazza Marconi, the area has a structured top layer. The same is valid for other structured areas. The tired soil structure, due to infrastructure works, installments, road works, etc., has necessarily transformed. Thus, the soil loses its authenticity after a certain time. This means that, the clearance volume of the soil decreases, which was once fertile for plants. Because the soil is in a compressed state due to structural practices such as concrete, asphalt, etc. Thus the pore per volume rate is low. The trees and shrubs selected for greening the area are chosen according to their abilities to live in the area, to their seasonal cycles and their resistance. Because the area in its present condition should fulfil the needs of the plant roots to feed from the soil. Also, when it is considered as a compressed urban soil, it is seen that the water holding capacity of Piazza Marconi has decreased; such that the asphalt and the central section of the square are detoriated. Consequently, the existing trees in the area have form disorder water infiltration problems. They cannot benefit from rainwater since the soil surfaces are covered by the concrete materials. The design is based on sustainability, thus the species of the plants, their behavior during the seasons, maintanence, ages, colours and even their odours are important factors. Thereby the project is designed taking into account the color and the fabric of the plants, which could change in time.

4.1.1.Cambisols

1. A cambic horizon starting within 50 cm of the soil surface and having its base 25 cm or more below the soil surface or 15 cm or more below any plough layer; or

2. An anthraquic, hortic, hydragric, irragric, plaggic or terric horizon; or

3. A fragic, petroplinthic, pisoplinthic, plinthic, salic or vertic horizon starting within 100 cm of the soil surface; or

4. One or more layers with andic or vitric properties with a combined thickness of 15 cm or more within 100 cm of the soil surface. (FAO, 2006)

Morphological characteristics of the `typical' Cambisol profile has an ABC horizon sequence with an ochric, mollic or umbric A-horizon over a cambic B-horizon that has normally a yellowish-brown colour but that may also be an intense red. Cambisols in poorly drained terrain positions may show `redoximorphic' features. (Figure 56)The soil texture is loamy to clayey. Signs of beginning clay illuviation may be detectable in the cambic horizon but the clay content is normally (still) highest in the A-horizon.(FAO, 2006)

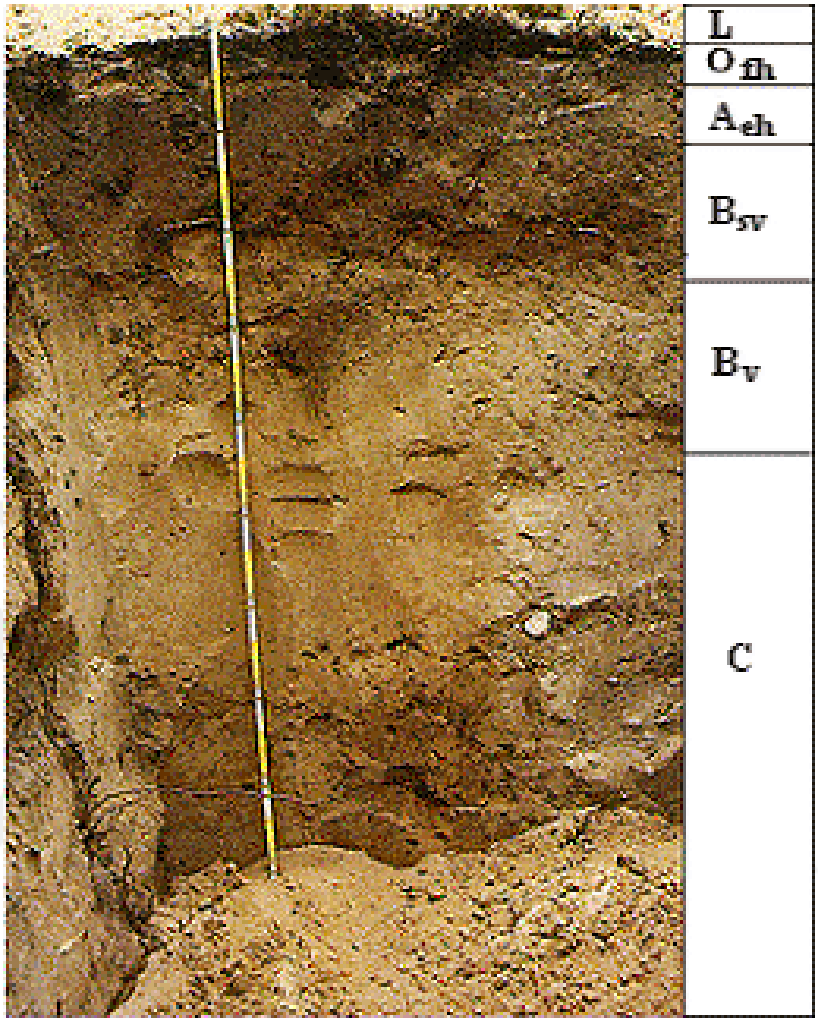


Figure 56. Cambisol profile (url20)

Connotation: soils with beginning horizon differentiation evident from changes in colour, structure or carbonate content; from L. cambiare, to change.

Parent material: medium and fine-textured materials derived from a wide range of rocks, mostly in colluvial, alluvial or aeolian deposits.

Profile development: ABC profiles. Cambisols arecharacterized by slight or moderate weathering of parent material and by absence of appreciable quantities of illuviated clay, organic matter, aluminium and/or iron compounds.

Environment: level to mountainous terrain in all climates and under a wide range of vegetation types.

4.1.2.Andosols

1. One or more layer with andic or vitric properties with a combined thickness of either

a.30 cm or more within 100 cm of the soil surface and starting within 25 cm of the soil surface; *or*

b.60% or more of the entire thickness of the soil when *continuous rock* or a cemented or indurated layer is starting between 25 and 50 cm from the soil surface; *and*

2. No *argic*, *ferralic*, *petroplinthic*, *pisoplinthic*, *plinthic* or *spodic* horizon (unless buried deeper than 50 cm) (url21)

Morphological characteristics of the `typical' Andosol has an AC or ABC profile with a dark Ah-horizon, 20 to 50 cm thick (thinner or thicker occurs) on top of a brown B- or C-horizon. Topsoil and subsoil colours are distinctly different; colours are generally darker in humid, cool regions than in tropical climates. The average organic matter content of the surface horizon is about 8 percent but the darkest profiles may contain as much as 30 percent organic matter. The surface horizon is very porous, very friable, and has a crumb or granular structure. In some Andosols, the surface soil material is smeary and feels greasy or unctuous; it may become almost liquid when rubbed,

presumably because of sol-gel transformations under pressure (`thixotropy'). Andosol soil profile is showing on Figure 57.

Figure 57. Andosol profile (url 21)

Connotation: black soils of volcanic landscapes; from Jap. an, black, and do, soil.

Parent material: mainly volcanic ash, but also tuff, pumice, cinders and other volcanic ejecta.

Environment: undulating to mountainous, humid, arctic to tropical regions with a wide range of vegetation types.

Profile development: AC- or ABC-profile. Rapid weathering of porous volcanic material resulted in accumulation of stable organo-mineral complexes and short-range-order minerals such as allophane, imogolite and ferrihydrite.

Use: many Andosols are intensively cultivated and planted to a variety of crops, their major limitation being their considerable capacity to render phosphorus unavailable to plants. In places, steep topography is a serious constraint. (url22)

4.1.3.Rocks Capability

The volcanic rock elements present in the project area generally forms compact masses. These cannot be separated throughout cracks and discontinuities. Their joints are short (between 5 and 80 cm), frequent (more than 10 per meter), wavy, moderately textured, gerenally linerless and tightly sealed. After a thin weathering close to the surface, the joints are spread up to 1 mm and argillisation is observed. (Figure 58)

Figure 58. Spetacular turbidite outcrop. (Gorgoglione Flysch, Miocene, South Italy,2004) (url23)

The weathered close to surface cross-sections of the rock layers in Piazza Marconi may exhibit “Surface” -like engineering behavior.

4.2.Drainage Materials

As it is mentioned in the plan section above, drainage is of utmost importance for the soil and the ecosystem. Since the present andosol soil is extremely water holding, it may harm the plants and the trees. Therefore, it needs a good drainage. The subsoil parallel drainage is found suitable for the job. As the removal of the present concrete is anticipated, it is possible to encounter with a soil structure that has been unventilated for a very long time. To render this soil fertile again, it requires mineralization using

compost material. To raise crops in a damaged and unused area due to misuse, one should be careful to regain the balanced soil quality.

To ensure this, the soil is dug, plastic pipes are installed, and they are fixed by covering with gravel. It is anticipated that the compost and vegetal soil mixture instead of the excavated soil is filled into to each 100cm by 100 cm by 100 cm planting pit for the trees. In this way, the drainage is increased and the soil is renewed and supported with compost (Bahçeci, İ.?).

The compost would increase the functionality of the detoriated soil and it would become self productive. Compost contains elements with high enrichment factors such as carbon (C), Nitrogen (N), Sulphur (S) and low enrichment factors such as Sodium (Na), Magnesium (Mg), Aluminium (Al), Potassium (K), Chlorine (Cl), Calcium (Ca), Manganese (Mn) and Iron (Fe). These latter elements are minerals important for plant growth (Figure 60). In addition to the Nitrogen (N) that has enrichment factor 80, the highest in the compost, the next benefical element is Carbon (C) with 52 factors.(Figure59)

In most restoration projects, Carbon is rarely used; however, the studies agree that the biological activity is effective, which is enabled through increased carbon rate. Compost is a good way to ameliorate the degraded soil (Ashwanden, C, 2017).

Figure 59. Composting (url24)

4.3.Sodding

Sodding is deemed fit for covering the surface. The thick fixture sodding species *lawns* is selected for areas with possibly intense usage and it is supported with *Hedera helix*.

For sodding, a drained, water holding is required first. If the soil drainage is low, drainage pipes should absolutely be replaced under the soil. The second important requirement is that the physical structure of the soil should be loose, because in 1 m2 of sodding, there is approximately 10.000 sod seeds. (Video 4) In order for these sod roots to develop healthfully, a loose structure is needed for the roots to absorb the nutriments and water in the soil.

4.4.Ecosystem Pond

An ecosystem pond provides the soil, trees and wildlife surrounding it with nourishment, protection and safety. In addition to this, the rocks and gravel to be used for the pond, would render the pond to appear more natural, agreeable to the Norman concept, and also they protect the pond coating from detoriation caused by the UV light, and create large surfaces for the bacteria to clean the waste food and the organic residues in the pond. Thus, the pond would require less maintanence. (Figure 60)

At the same time, placing fish in the pond is anticipated to render the ecosystem sustainable. Fish are integral elements of all ecosystems. Thus, the fish would reduce the maintenance need of the pond since they feed on the organic residues and weeds at the bottom of the pont.

Carex sp., Typha minima, and Iris sp. are chosen as hydrophytic plants since they would provide colour and texture, in addition to their natural filtering features. They are of great importance with regard to the health of the whole ecosystem.

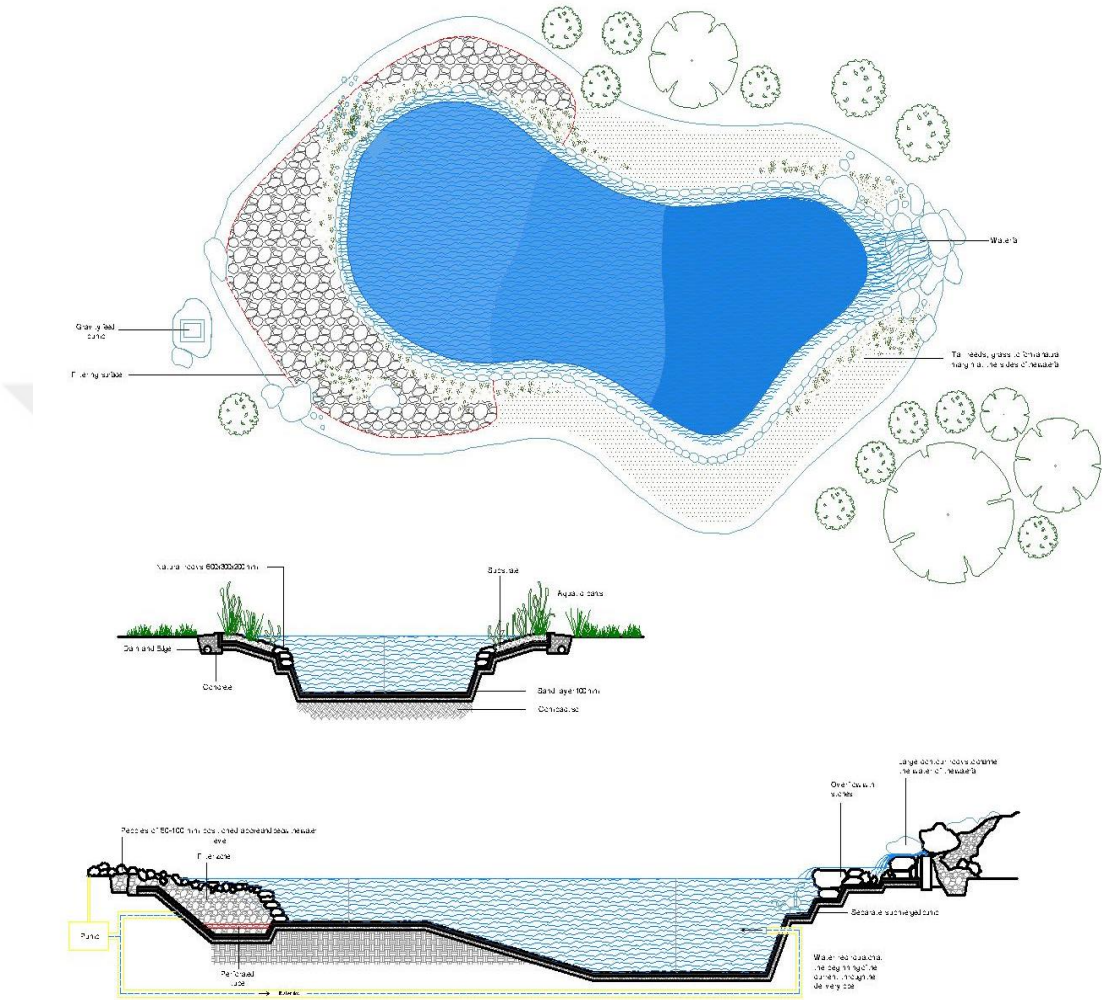


Figure 60. Ecosystem Pond Detail Sheet

CHAPTER V. CONCULUSION

Piazza Marconi has lost its space identiy due to all misuse it has been exposed, and being left to disrepair recently. As it is indicated, led in the studies mentioned above, the factors damaging the area the most are the irregular parking by the dwellers, pollution and the negligence of the Aversa Municipality. Thus, Piazza Marconi suffers from bein outdated due to insecurity of the area. In addition, leaving Piazza Marconi to its fate and losing its importance devastates the area day by day. The detailed status of Piazza Marconi and its surroundings are documented in this thesis. By this way, an environmental restoration project is prepared for Piazza Marconi to be conserved and regain its previous importance. We believe that this thesis would provide a reference for future projects for destroyed spaces similar to Piazza Marconi, for which we have prepared an environment restoration project. The steps to be followed when conducting an environmental restoration project are defined in detail. Time runs against Piazza Marconi in its present condition. The assessment and improvement of this thesis for implementation might be an encouraging start for Piazza Marconi.

With respect to the environmental restoration project of Piazza Marconi, the opinions of the people living in the area and the users of the square were assessed via surveys conducted and the needs of the area were identified. Therefore, the project was evaluated with reference to its sociocultural contributions to both the area and the people living in the area, and also its contributions to the environment. Goal of the thesis, benefiting the environment by renewing the soil and bringing a new function

to it,to determine and protect the original status of the square,constituting a resource for further studies for transferring the historic fabric at Piazza Marconi in Aversa.

Using the historical, sociocultural, socioeconomic, ecological, climatic and spatial research, analyses and surveys, the needs of the area were identified, considering the requests of the users, and the steps to be taken were determined to realise the design. A design, which considers the psychological insecurity of the people living in the area due to the architectural characteristics, was aimed. In relation with this, an environmental restoration project was proposed, which encompassed both the requests by the users and the environmental factors, and aimed at protecting the historical fabric and regain the spatial identity. When all these factors are considered a concept that could help Piazza Marconi to develop was determined.

Considering the church and historical structures from the Norman era, which are present at Piazza Marconi in the radial urban layout, it was decided that the area would be transformed into an Open Air Museum and a soil restoration was envisaged accordingly. By this means, it was envisaged that the architectural harmony would be protected, the present soil structure would be renewed, rendering the area sustainable, and the city would regain its historical ambiance. When viewed from this aspect, it was foreseen that the project would provide a source of income for the people living in the area and thus provide an economic benefit.

The thesis tried to prove that the Open Air Museum concept in the framework of the proposed environmental project is the most optimal idea for the area. Therefore, what

is needed in this area is the sustainable development. Sustainable development forms the common point of the Open Air Museums. The surveys conducted with the people living in the area also showed that the dwellers had the opinion that the historical and environmental value of the project area would increase.

The morphological structure, soil structure, soil mechanics and the tectonics of the project area were investigated referring to the previous ecological surveys, and it was found that there was not lean soil in the area. The inclination was found 2.1% and 3% and mostly andosols were present in the soil structure. Thus, it was found that the soil is very fertile and cultivable. It was deemed suitable to remove the present cement ground. The present plantings were removed since their roots have been damaged, and plants, which lived around Piazza Marconi and which were suitable to the soil structure of the area, were proposed. For soil renovation, it was not deemed fit to apply the afforestation solely on the andosol soils, considering the water retaining characteristics of andosols. Thus, the mineral levels of the soil was increased by supporting with compost. In addition, to balance the water retaining effect, a parallel drainage system was projected. In order to provide the natural circulation of the minerals in the soil, an ecosystem pond was envisaged.

Environmental restoration is a difficult task. It needs examining the project areas, determining the deficiencies considering the social, ecological and historical elements and combining these elements with design. Most importantly, this design should not disrupt the environmental harmony and should be sustainable. It is important for environmental and spatial identity of the area that the structures and spaces in this area,

which had lost their functions in time, to regain their function and to be renewed. By this means, the present historical ambiance is protected and homogeneity are protected.

For the design within the environmental restoration project to be sustainable and not to suffer damage again, it should be utilised and sustained in an actual function. Therefore, the soil structure should be scrutinized and precautions should be taken to render it sustainable in the context of the environmental restoration. In addition, the soil typology should be taken into consideration in environmental restoration works, apart from the precautions. Transforming the soil into actively cultivable state and renovating it with a function make the soil more sustainable.

APPENDİX

1.1.PLANTS SPECIES

 [3]

Acacia dealbata[4]

Common Names: Silver Wattle, Blue Wattle, Mimosa
Family: Fabaceae
Order: Fabales
Genus: Acacia
Wildlife Attractant:Bees
Plant Habit: Tree
Sun Requirements: Full Sun
Minimum cold hardiness: Will tolerate frosts to -7 C
Plant Height: Tree to 30 m; leaves mostly 5–12 cm long.
Leaves Color: Evergreen Tree
Fruit: Seeds
Flower Color: Bright yellow
Flowers: Showy
Flower Time: January to April
Soil: Well-drained, Loamy, Sandy, Clay
Suitable Locations: Street Tree
Uses: Ornamental Plant
Resistances:Drought tolerant

[3] **Figure 62. Acacia dealbata: url24**
[4] **url:25**

5

Brachychiton acerifolius[6]

Family: Malvaceae
Order: Malvales
Genus: Brachychiton
Underground Structures: Taproot
Life cycle: Perennial
Plant Habit: Tree
Sun Requirements: Full Sun
Minimum cold hardiness: -1.1 °C (30 °F) to +1.7 °C (35 °F)
Plant Height: 65 feet (up to 130 feet in its natural range)
Leaves: Deciduous
Fruit: Showy
Flower Color: Red
Soil: Well-drained, Loamy, Sandy, Clay
Flowers: Showy
Flower Time: Late spring or early summer
Suitable Locations: Street Tree
Uses: Flowering Tree
Edible Parts: Seeds or Nuts
Wildlife Attractant: Bees, Birds, Butterflies
Resistances: Humidity tolerant

[5] **Figure 63. Brachychiton acerifolius: url26**
[6] **url27**

 [7]

Cedrus libani[8]
Common Names: Cedar Of Lebanon
Family: Pinaceae
Order: Pinales
Genus: Cedrus
Plant Habit: Tree
Life cycle: Perennial
Sun Requirements: Full Sun
Minimum cold hardiness:-5°C to -1°C (23°F to 30.2°F)
Plant Height: Tree to 30 m (98ft) by 15 m (49ft)
Leaves: Evergreen Tree
Fruit: Cone
Soil: Dry Soil
Leaf type: Needle-like
Color: Green-Blue
Fruit Time: September to November
Suitable Locations: Parks and Gardens
Uses: Ornamental Plant
Resistances: Drought tolerant

[7] **Figure 64. Cedrus libani: url28**
[8] **url:29**

 [9]

Celtis australis[10]
Common Names: Nettle Tree, European hackberry
Family: Cannabaceae
Order: Rosales
Genus: Celtis
Plant Habit: Tree
Life cycle: Perennial
Sun Requirements: Full Sun
Minimum cold hardiness: -12.2 °C (10 °F) to -9.4 °C (15 °F)
Plant Height: Tree to 10–25 m (35–80 ft), rarely up to 40 m (130 ft)
Leaves: Deciduous
Fruit: Drupe
Soil: Well-drained
Flowers: Inconspicuous
Flower Color: Green
Flower Time: Spring
Suitable Locations: Parks and Gardens
Uses: Ornamental Plant, Fodder/animal feed
Suitable Locations: Street and Garden Tree
Wildlife Attractant: Bees
Resistances: Drought tolerant

[9] **Figure 65. Celtis australis: url30**
[10] **Magni, D.,Caudullo,G.,(2016)**

 [11]

Cercis siliquastrum[12]

Common Names: Judas tree
Family: Fabaceae
Order: Fabales
Genus: Cercis
Plant Habit: Tree
Life cycle: Perennial
Sun Requirements: Full Sun - Partial Shade
Minimum cold hardiness: -23.3 °C (-10 °F) to -20.6 °C (-5 °F)
Plant Height: to 12 m (39 ft) in height and 10 m (32 ft)
Leaves: Good fall color, Unusual foliage color
Fruit: Pod
Soil: Well-drained
Flowers: Showy
Flower Color: Pink
Flower Time: Spring, Late spring or early summer
Suitable Locations: Parks and Gardens
Uses: Shade Tree, Flowering Tree
Suitable Locations: Street and Garden Tree
Wildlife Attractant: Bees
Resistances: Drought tolerant

[11] **Figure 66. Cercis siliquastrum: url31**
[12] **url32**

13

Corylus colurna[14]

Common Names: Turkish Tree Hazel, Turkish Hazel
Family: Betulaceae
Order: Fagales
Genus: Corylus
Life cycle: Perennial
Plant Habit: Tree
Sun Requirements: Full Sun to Half-shade
Minimum cold hardiness: 6.9 − 11 °C
Plant Height: 25 m (82 ft) tall
Leaves: Deciduous
Fruit: Nut
Soil: Well-drained
Flowers: Catkin
Flower Color: Yellow / Red
Flower Time: February - March
Suitable Locations: Street and Garden Tree
Uses: Ornamental tree
Wildlife Attractant: -
Resistances: Drought tolerant

[13] **Figure 67. Corylus colurna: url33**
[14] **url 34,35**

15_16

Erythrina crista-galli[17]

Common Names: Cockspur coral tree, Coral tree

Family: Fabaceae

Order: Fabales

Genus: Erythrina

Life cycle: Perennial

Plant Habit: Tree

Sun Requirements: Full sun

Minimum cold hardiness: 30 F° (-1.1 C°) → 40 F° (4.4 C°)

Plant Height: 5–8 m (16–26 ft)

Leaves: Deciduous

Fruit: Beans

Soil: Light (sandy), Medium (loamy) and Heavy (clay) soils and prefers well soil

Flowers: Showy

Flower Color: Red

Flower Time: April to October

Suitable Locations: Street Tree

Uses: Ornamental tree

Resistances: Drought tolerant

[15] **Figure 68. Erythrina crista-galli: url36**
[16] **Figure 69. Erythrina crista-galli: url37**
[17] **url 38-40**

18

Fraxinus ornus [19] [20]

Common Names: Flowering Ash
Family: Oleaceae
Order: Lamiales
Genus: Fraxinus
Life cycle: Perennial
Plant Habit: Tree
Sun Requirements: Full sun
Minimum cold hardiness: -2 to -3°C
Plant Height: to 15–25 m (49–82 ft)
Leaves: Dedicious
Fruit: Samara
Soil: Best grown in moist, organically rich, well-drained loams in full sun
Flowers: Showy
Flower Color: Creamy white
Flower Time: April to May
Suitable Locations: Shade Tree, Street Tree, Flowering Tree
Uses: Ornamental tree
Resistances: Drought tolerant

[18] **Fugure 70. Fraxinus ornus: url41**
[19] **url42**
[20] **Capinera, John L.,(2008).**

21_22

Hibiscus syriacus[23]

Common Names: Rose of Sharon, Syrian Ketmia, Rose Mallow, St Joseph's Rod
Family: Malvaceae
Subfamily: Hibisceae
Order: Malvales
Genus: Hibiscus
Life cycle: Perennial
Plant Habit: Shrub
Sun Requirements: Full Sun to Partial Shade
Minimum cold hardiness: -20 to -10 F˚/ -28.9 to -23.3 C˚
Plant Height:2–4 m (7–13 ft) in height
Leaves: Deciduous
Fruit: Fruitless
Soil: Well-drained- Moist but well-drained.- Sand, Clay, Chalk, Loam
Flowers: Showy
Flower Color: White, Red, Purple, Mauve, Violet, or Blue, or Bicolors with a Different Colored Throat.
Flower Time: Summer, Late summer or early fall
Suitable Locations: Street and Garden tree
Uses: Ornamental tree
Resistances: Drought tolerant

[21] **Figure 71. Hibiscus syriacus: url43**
[22] **Figure 72. Hibiscus syriacus: url44**
[23] **url45**

 [24]

Jacaranda mimosifolia[25]
Common Names: Jacaranda, Brazilian rosewood, blue jacaranda, blue trumpet tree
Family: Bignoniaceae
Tribus: Tecomeae
Order: Lamiales
Genus: Jacaranda
Life cycle: Perennial
Plant Habit: Tree
Sun Requirements: Full sun
Minimum cold hardiness: −12 °C (10 °F) to −7 °C (19 °F).
Plant Height: to 20 m (66 ft)
Leaves: Deciduous
Fruit: Capsules
Soil: It grows in a wide range of soils.
Flowers: Showy
Flower Color: Blue, lavender
Flower Time: Anytime from April to June
Suitable Locations: Street and Garden tree
Uses: Flowering street, Landscape, or Garden tree
Resistances: Drought tolerant

[24] **Figure 73. Jacaranda mimosifolia: url46**
[25] **url47**

26

Olea europaea[27]-
Common Names: Common olive
Family: Oleaceae
Subfamily:
Order: Scrophulariales
Genus: Olea
Life cycle: Perennial
Plant Habit: Tree or Shrub
Sun Requirements: Full sun
Minimum cold hardiness: −10 °C (14 °F)
Plant Height: 8–15 m (26–49 ft)
Leaves: Evergreen
Fruit: Drupe
Soil: They grow in any light soil, even on clay if well drained
Flowers: Showy, Fragrant
Flower Color: White
Flower Time: Early spring, Late spring
Suitable Locations: Street and Garden
Uses: Olive oil, Fine wood, Olive leaf, and The Olive Fruit
Resistances: Drought tolerant

[26] **Figure 74. Olea europaea url:48**
[27] **url 49,50**

 [28]

Phytolacca dioica[29-30]

Common Names: Ombú, Bella Sombre, Pokeweed,
Family: Phytolaccaceae
Order: Caryophyllales
Genus: Phytolacca
Life cycle: Perennial
Plant Habit: Tree
Sun Requirements: Full sun or Partial shade
Minimum cold hardiness: 14 °F (-10°C) and 23°F (-5)
Plant Height: to 4 m (13 ft 1 inç)
Leaves: Evergreen
Fruit: Seed
Soil: Light (Sandy), Medium (Loamy) and Heavy (Clay) soils.
Flowers: Pod,Hermaphrodite
Flower Color: Cream or Whitish-green
Flower Time: April-May
Suitable Locations: Street and Garden
Uses: Landscape, or Garden tree
Resistances: Drought tolerant

[28] **Figure 75. Phytolacca dioica: url51**
[29] **url 52,53**
[30] **Christenhusz, Maarten J. M., Fay, Michael F., Chase W. Mark (2017)**

 [31]

Pistacia atlantica[32]
Common Names: Mt. Atlas mastic tree, Persian turpentine tree
Family: Anacardiaceae
Order: Sapindales
Genus: Pistacia
Life cycle: Perennial
Plant Habit: Tree
Sun Requirements: Full sun
Minimum cold hardiness: 20° to 30°F (-6.5° to -1°C)
Plant Height: to 7 m (23 ft) tall
Leaves: Deciduous
Fruit: Seed
Soil: Light (Sandy) and Medium (Loamy) Soils and Prefers Well-Drained Soil
Flowers: Non-flowering
Fruit Color: Red then Blue
Fruit Time: July to October
Suitable Locations: Parks and Gardens
Uses: Urban street tree, Ornamental tree
Resistances: Drought tolerant

[31] **Figure 76. Pistacia atlantica: url54**
[32] **url 55,56**

33

Prunus serrulata 'Kanzan'[34]

Common Names: Japanese cherry, Hill cherry, Oriental Cherry or East Asian Cherry
Family: Rosaceae
Order: Rosales
Genus: Prunus
Life cycle: Perennial
Plant Habit: Small Tree
Sun Requirements: Full sun
Minimum cold hardiness: (-15 °F) to -23.3 °C (-10 °F)
Plant Height: 26–39 feet (7.9–11.9 m)
Leaves: Deciduous
Fruit: Drupe
Soil: Well-drained, Loam, Sand, Clay, Chalk.
Flowers: Showy
Flower Color: Bronze, Pink, Green
Flower Time: April - May
Suitable Locations: Street and Garden
Uses: Landscape, or Garden tree
Resistances: Drought tolerant

[33] **Figure 77. Prunus serrulata 'Kanzan': url57**
[34] **url 58-60**

35

Syringa vulgaris[36]

Common Names: Lilac or Common Lilac
Family: Oleaceae
Order: Lamiales
Genus: Syringa
Life cycle: Perennial
Plant Habit: Small Tree or Shrub
Sun Requirements: Full sun or Partial shade
Minimum cold hardiness: -34.4 °C (-30 °F) to -31.7 °C (-25 °F)
Plant Height: 6–7 m (20–23 ft)
Leaves: Deciduous
Fruit: Capsule
Soil: Well-drained, Loam, Sand, Clay, Chalk
Flowers: Showy, Fragrant
Flower Color: Lilac to Mauve, White Edged Petals
Flower Time: April to May
Suitable Locations: Street and Garden
Uses: Ornamental tree, Street Tree
Resistances: Drought tolerant

[35] **Figure 78. Syringa vulgaris: url61**
[36] **url 62-64**

1.2.SHRUBS

 [37–38]

Berberis thunbergii 'Atropurpurea'[39]

Common Names: Berberis thunbergii, The Japanese barberry, Thunberg's Barberry or Red Barberry,
Family: Berberidaceae
Order: Ranunculales
Genus: Berberis
Life cycle: Perennial
Plant Habit: Shrub
Sun Requirements: Full sun or Partial shade
Minimum cold hardiness: -34.4 °C (-30 °F) to -31.7 °C (-25 °F)
Plant Height: 0.6 to 2.5 m (2 to 8 ft)
Leaves: Deciduous
Fruit: Berry
Soil: Well-drained, Sand, Chalk, Clay, Loam
Flowers: Showy
Flower Color: Bright Red to Orange-Red
Flower Time: April
Suitable Locations: Street and Garden
Uses: Specimen
Resistances: Drought tolerant

[37] **Figure79.Berberis thunbergii 'Atropurpurea': url65**
[38] **Figure 80. Berberis thunbergii 'Atropurpurea': url66**
[39] **url 67-70**

40

Bougainvillea japonica[41]

Common Names: Bougainvillea
Family: Nyctaginaceae
Order: Caryophyllales
Genus: Bougainvillea
Life cycle: Perennial
Plant Habit: Shrub
Sun Requirements: Full sun
Minimum cold hardiness: 18-21°C (65-70°F)
Plant Height: 1 to 12 m (3 to 40 ft.)
Leaves: Evergreen
Leaves Color: Glossy Green
Fruit: Achene
Soil: Well-drained, Fertile soil
Flowers: Showy
Flower Color: Bright Red Purple
Flower Time: Summer to Autumn
Suitable Locations: Landscape and Garden
Uses: Ornamental
Resistances: Drought tolerant

[40] **Figure 81. Bougainvillea japonica: url71**

[41] **url72-74**

 [42]

Lantana camara[43]
Common Names: Yellow sage, Jamaica mountain sage
Family: Verbenaceae
Order: Lamiales
Genus: Lantana
Life cycle: Perennial
Plant Habit: Shrub
Sun Requirements: Full sun to Partial Shade
Minimum cold hardiness: -1° to +4.5°C (30° to 40°F)
Plant Height: 2 m (6 ft)
Leaves: Evergreen
Leaves Color: Glossy Green
Fruit: Showy
Soil: Well-drained, Chalk, Clay, Sand, Loam
Flowers: Showy
Flower Color: Lavender, Mauve, Orange, Pink, Yellow, Red
Flower Time: Late spring or early summer, Summer, Late summer or early fall
Suitable Locations: Landscape and Garden
Uses: Ornamental
Resistances: Drought tolerant

[42] **Figure 82. Lantana camara: url75**
[43] **url 75,77**

44

Lavandula angustifolia [45]

Common Names: Common Lavender, True Lavender or English Lavender
Family: Lamiaceae
Order: Lamiales
Genus: Lavandula
Life cycle: Perennial
Plant Habit: Shrub
Sun Requirements: Full sun
Minimum cold hardiness: -23 to -29 ˚C (-10 to -20 ˚F)
Plant Height: 1 to 2 metres (3.3 to 6.6 ft)
Leaves: Evergreen
Leaves Color: Glossy Green
Fruit: Showy
Soil: Well-drained, Chalk, Clay, Sand, Loam
Flowers: Showy
Flower Color: Pinkish-Purple
Flower Time: June to August
Suitable Locations: Landscape and Garden
Uses: Ornamental
Resistances: Drought tolerant

[44] **Figure 83. Lavandula angustifolia: url78**
[45] **url 79-81**

46

Leptospermum scoparium[47]
Common Names: Tea tree 'Kiwi', Mānuka, Manuka Myrtle
Family: Myrtaceae
Order: Myrtales
Genus: Leptospermum
Life cycle: Perennial
Plant Habit: Shrub
Sun Requirements: Full sun, Full sun to Partial Shade
Minimum cold hardiness: 20° to 30°F (-6.5° to -1°C)
Plant Height: 2–5 m (7–16 ft)
Leaves: Evergreen
Leaves Color: Green, Bronze
Fruit: Showy
Soil: Well-drained, Chalk, Clay, Sand, Loam
Flowers: Showy
Flower Color: White, Pink (Occasionally)
Flower Time: Late spring, June to July
Suitable Locations: Landscape and Garden
Uses: Ornamental
Resistances: Drought tolerant

[46] **Figure 84. Leptospermum scoparium: url82**
[47] **url 83-85**

48

Pittosporum tobira 'Nana'[49]

Common Names: Australian laurel, Japanese pittosporum
Family: Pittosporaceae
Order: Apiales
Genus: Pittosporum
Life cycle: Perennial
Plant Habit: Shrub
Sun Requirements: Full sun to part shade
Minimum cold hardiness: -10 to -5 ˚C (14 to 23 ˚F)
Plant Height: 10 m (33 ft)
Leaves: Evergreen
Leaves Color: Green
Fruit: Showy
Soil: Well-drained, Chalk, Clay, Sand, Loam
Flowers: Showy
Flower Color: White
Flower Time: April to May
Suitable Locations: Landscape and Garden
Uses: Ornamental
Resistances: Drought tolerant

[48] **Figure 85. Pittosporum tobira 'Nana' : url 86**
[49] **url 87-89**

50

Pyracantha coccinea[51]

Common Names: Scarlet Firethorn, Red Firethorn
Family: Rosaceae
Order: Rosales
Genus: Pyracantha
Life cycle: Perennial
Plant Habit: Shrub
Sun Requirements: Full sun to Part Shade
Minimum cold hardiness: 6 -10° to 0°F (-23.5° to -18°C)
Plant Height: 5 m (16 ft)
Leaves: Deciduous
Leaves Color: Green
Fruit: Berries
Soil: Well-drained, Chalk, Clay, Sand, Loam
Flowers: Showy
Flower Color: White
Flower Time: May
Suitable Locations: Landscape and Garden
Uses: Ornamental
Resistances: Drought tolerant

[50] **Figure 86. Pyracantha coccinea: url90**
[51] **url 91-93**

52

Spartium junceum[53]

Common Names: Spanish Broom
Family: Fabaceae
Order: Fabales
Genus: Spartium
Life cycle: Perennial
Plant Habit: Shrub
Sun Requirements: Full sun
Minimum cold hardiness: -17.8 to -12.3 C (0 to 10 F)
Plant Height: 2–4 m (7–13 ft)
Leaves: Deciduous
Leaves Color: Green
Fruit: Legumes (Seed pods)
Soil: Well-drained, Chalk, Clay, Sand, Loam
Flowers: Showy
Flower Color: Yellow
Flower Time: July to September
Suitable Locations: Landscape and Garden
Uses: Ornamental
Resistances: Drought tolerant

[52] **Figure 87. Spartium junceum: url 94**
[53] **url 95,98**

 [54]

Spiraea vanhouttei[55]

Common Names: Spirea
Family: Rosaceae
Order: Rosales
Genus: Spiraea
Life cycle: Perennial
Plant Habit: Shrub
Sun Requirements: Full sun
Minimum cold hardiness: -30 to -20 F -34.5 to -28.9 C.
Plant Height: 1 to 4 inches (2.5 to 10.2 cm)
Leaves: Deciduous
Leaves Color: Green
Fruit: Fruitless
Soil: Well-drained, Chalk, Clay, Sand, Loam
Flowers: Showy
Flower Color: White
Flower Time: April to May
Suitable Locations: Landscape and Garden
Uses: Ornamental
Resistances: Drought tolerant

[54] **Figure 88. Spiraea vanhouttei: url 97**
[55] **url 98**

1.3 AQUATİC PLANTS

56

Carex sp.[57]

Common Names: White-Tinged Sedge

Family: Cyperaceae

Order: Poales

Genus: Carex

Life cycle: Perennial

Plant Habit: Grass/Grass-like

Sun Requirements: Full sun, Part shade to full shade

Minimum cold hardiness: -34.4 °C (-30 °F) to -31.7 °C (-25 °F)

Plant Height: 60- 91cm (2-3 ft)

Leaves Color: Green

Fruit: Achene or Nut

Fruit Color: Grey

Soil: Water or Wet, Boggy Soils.

Flowers: Showy

Flower Color: White

Flower Time: May

Suitable Locations: Water Garden

Uses: Water plant

Resistances: Drought tolerant

[56] **Figure 89. Carex sp.: url99**

[57] **url 100, 101**

 [58]

Typha minima[59]

Common Names: Bullrush

Family: Typhaceae

Order: Poales

Genus: Typha

Life cycle: Perennial

Plant Habit: Grass/Grass-like

Sun Requirements: Full sun, Full Sun to Partial Shade

Minimum cold hardiness: -34.4 °C (-30 °F) to -31.7 °C (-25 °F)

Plant Height: 30–80 cm (12–31 in)

Leaves Color: Yellow-Brown

Fruit: Seed

Fruit Color: Brown

Soil: Water or Wet, Boggy Soils.

Flowers: Showy

Flower Time: July to November

Suitable Locations: Water Garden

Uses: Water plant

Resistances: Drought tolerant

[58] **Figure 90. Typha minima : url 102**

[59] **url 103, 104**

[60]

Iris sp.[61]

Common Names: Spuria Iris
Family: Iridaceae
Order: Asparagales
Genus: Iris
Life cycle: Perennial
Plant Habit: Grass/Grass-like
Sun Requirements: Full sun
Minimum cold hardiness:
Plant Height: 42 inches (107 cm)
Leaves Color: Green
Fruit: Fruitless
Flower Color: Blue, Gold
Soil: Well-drained.
Flowers: Showy
Flower Time: May to July
Suitable Locations: Water Garden
Uses: Water plant, Flowering plants
Resistances: Drought tolerant

[60] **Figure 91. Iris sp.: url 105**
[61] **url 106, 107**

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Url82<http://luirig.altervista.org/naturaitaliana/viewpics.php?title=Leptospermum+scoparium&B1=Go+%2F+Vai> Leptospermum scoparium

Url83<http://www.agaclar.org/agac.asp?id=1158> Leptospermum scoparium Plant Detail

Url84<http://www.dogapeyzaj.com/urun-leptospermum-scoparium-coral-candy,okyanus-mersini,manuka-329.html> Leptospermum scoparium Plant Detail

Url85<https://www.gardenia.net/plant/Leptospermum-scoparium>Leptospermum scoparium Plant Detail

Url86<http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=285126&isprofile=0&> Pittosporum tobira 'Nana'

Url87<http://www.bitkipark.com/agac/calilar/26/pittosporum-tobira-nana-bodur-yildiz-calisi.html> Pittosporum tobira 'Nana' Plant Detail

Url88<http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=285126&isprofile=0&> Pittosporum tobira 'Nana' Plant Detail

Url89<https://www.gardenia.net/plant/Pittosporum-Tobira-Nanum-Mock-Orange> Pittosporum tobira 'Nana' Plant Detail

Url90<http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=286399&isprofile=0&> Pyracantha coccinea

Url91<http://www.bitkipark.com/agac/cit-bitkileri/118/pyracantha-coccinea-ates-dikeni.html> Pyracantha coccinea Plant Detail

Url92<https://www.rhs.org.uk/advice/profile?pid=842> Pyracantha coccinea Plant Detail

Url93<http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=286399&isprofile=0&> Pyracantha coccinea Plant Detail

Url94<http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=280486&isprofile=0&> Spartium junceum

Url95< http://www.agaclar.org/agac.asp?id=98> Spartium junceum Plant Detail

Url96<http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=280486&isprofile=0&> Spartium junceum Plant Detail

Url97<http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?kempercode=c293> Spiraea vanhouttei

Url98<http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?kempercode=c293> Spiraea vanhouttei Plant Detail

Url99<http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?kempercode=e116> Carex sp.

Url100<http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?kempercode=e116> Carex sp. Plant Detail

Url101<https://garden.org/plants/view/75751/Morning-Star-Sedge-Carex-grayi/> Carex sp. Plant Detail

Url102<https://www.henriettes-herb.com/galleries/photos/t/ty/typha-minima.html> Typha minima

Url103<http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=287389&isprofile=0&> Typha minima Plant Detail

Url104<https://garden.org/plants/view/79357/Dwarf-Cattail-Typha-minima/> Typha minima Plant Detail

Url105<http://www.plantae.ca/Iridaceae/Iris/sp./1520.html> Iris sp.

Url106<http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=256921&isprofile=1&gen=Iris> Iris sp. Plant Detail

Url107<https://garden.org/plants/view/72006/Spuria-Iris-Iris-Adriatic-Blue/> Iris sp. Plant Detail