The Platform of the Temple of Venus and Rome

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ABSTRACT: The Temple of Venus and Rome at the Roman Forum was allegedly designed by the emperor Hadrian himself and was inaugurated in 135 AD. Its construction upon the Velia hill and precedent structures required an exceptional design and execution, including the provision of a massive 167x 100 m artificial platform. Distinct historical developments on the site like the Vestibule of Nero's Golden House and the later construction of the medieval church and monastery of Santa Maria Nova as well as the Mussolinian operations of *Sventramenti* in the first half of the 20th Century have influenced the construction and altered the presentation of the platform. This paper intends to discuss the strategy, design, construction and current condition of this example of a lesser-known field of Roman structural technology. Foundations and platforms of this kind can offer invaluable information on the function of a temple, its history and structural performance, but theirs study is often neglected.

INTRODUCTION

The exceptional complex that includes the Temple of Venus and Rome and the Monastery of Santa Francesca Romana has not been studied previously as a single site and the various stages and interventions in its history have always been viewed with partial reference to specific areas. The authors have tried in the recent years to link such stages to a more global architectural understanding and conservation approach to the entire site. One area that has been identified to contain potentially invaluable information on the development of the site is the substructure, which materialised around the construction of the massive Roman concrete platform, and the interaction with the existing structures. Archaeological and historical evidence will be discussed in terms of architectural analysis that aims to under-stand the development of the platform in classic Roman times and its uses during later occupations. Interpreting the evolution through key drawings and establishing the construction levels at critical sections have been valuable tools that allow for the first time the architecture of this crucial substructure to be discussed.

Figure 1: The platform of the temple of Venus and Rome from the Colosseum

THE SITE

The Velia Hill

Looking at the platform of the temple of Venus and Rome as it stands (Fig. 1), it is difficult to understand the original configuration of the area. The Velia is a saddle hill between the Palatine and Esquiline hills. Part of it was removed when Mussolinian opened the Via dell' Impero (*Via dei Fori Imperiali)* in 1932. This enormous operation, although destroyed very important archaeological remains, allowed De Angelis D'Ossat to investigate the geology of the area (Fig. 2) in which the platform of the temple sits, composed by a thick layer of debris and made-soil above a rock of lithoid tuff on a marsh fluvial formation.
The Velia has been occupied since ancient times. Its first occupation was most probably a small fortified settlement in the top of the hill (*oppidium*), one of the communities that celebrated the *Septimontium*, join other communities to form later the *urbis*. The hill is also mentioned as the location of the temple of Penatis, the temple of Lares and the house of the Valeriis (Platner; Ashby 1929). The older remains identified so far are a series of structures, mainly to the North of the platform. They include a fine vaulted *criptoportico* studied during the Mussolinian works (Barosso 1940), perhaps part of Nero's *Domus Transitoria* (Fig. 3, coordinates b-c, vi-viii).

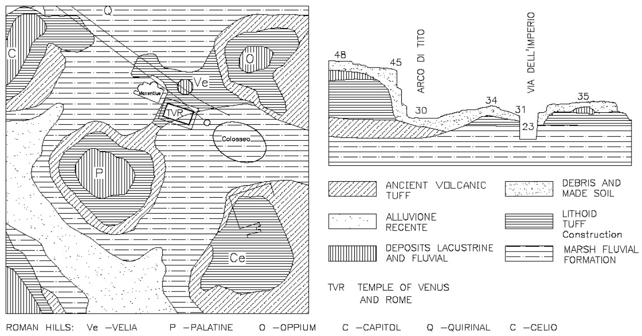

Figure 2: Geology of the area (after De Angelis D'Ossat 1935) showing the location of the platform

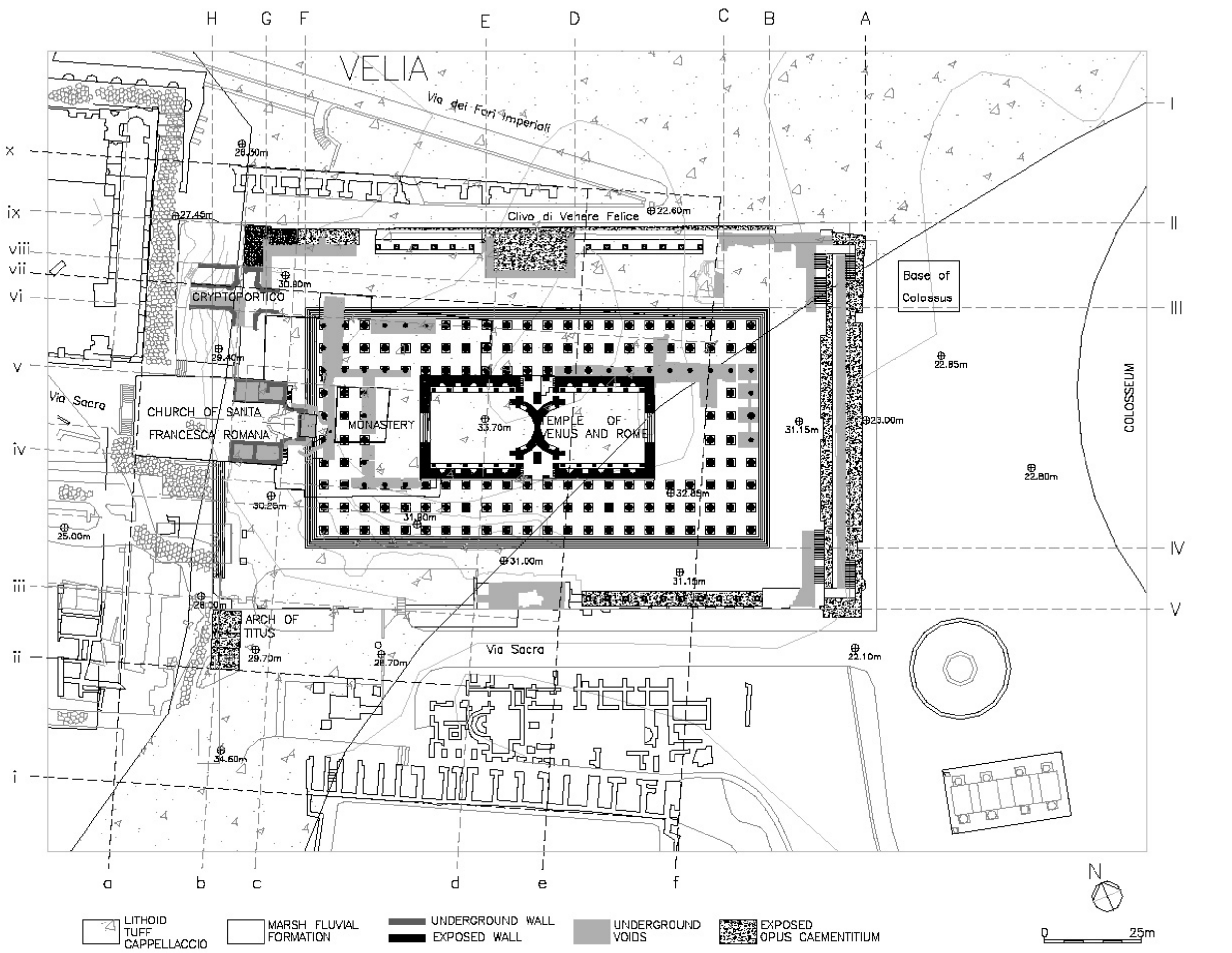

Figure 3: Plan of the existing platform and the temple of Venus and Rome on the Velia Hill with indication of the topography, based on (Panella 1985, 1990) and (González-Longo 2004).

Figure 4: a) View of the SW corner of the platform b) The foundations of the Arch of Titus to the right

The Golden House of Nero

After the great fire of 64 A.D. , Nero (reigned 54–68) built his Golden House around an artificial lake located where the Colosseum now sits. The Vestibule was placed on the Velia Hill, under the area in examination. According to Suetonius, the Vestibule had a triple, mile long colonnade and contained the colossal statue of Nero impersonated as god Helios in the centre. The statue was 30 meters high, approximately the same height of the existing medieval campanile of the church of Santa Francesca Romana.
Van Deman (1923) identified for the first time and established the level of the Via Sacra (the main street of the Roman Forum) at the time of Nero, part of the large urban transformation of this area after the fire. She demonstrated (Van Deman 1925) that the street had *Porticus* (solid arcades added as protection against fire), and that it led to the columnated square of the Vestibule on the Velia. The arcade ran through a mainly residential district originally, which at the time of Vespasian become a truly commercial area around the *Horrea Piperataria*, located in the area that the Basilica of Maxentius occupies today.

The Arch of Titus

After Nero's death, the Flavii restructured the area. Titus (reigned 79-81 A.D.) completed the Colosseum, started by his father, Vespasian. After the death of Titus, his brother Domitian built the Arch of Titus on the Via Sacra to commemorate the capture and sack of Jerusalem. The Arch is located next to the platform of the temple (Fig. 4a) and sits on what appears as Neronian concrete foundations, although there is a slight change of orientation, probably due to the intention to make a visual relationship with the newly built Colosseum. The foundations of the arch have now been excavated down to the pre-Neronian level and exposed (Fig. 4b).

The Temple of Venus and Rome

The Temple of *Venere Felix* and *Roma Aeterna* was the biggest temple of Rome and one of the biggest of the Antiquity. It was allegedly designed by the emperor Hadrian (reigned 117-138 A.D.), starting its construction in 121 A.D. (there was already a project since 117 A.D.). He consecrated the still unfinished building on his return from Judea (136-137 A.D.) and it would be completed by his successor Antoninus Pius in 140 A.D. The site on the Velia had important symbolic and urban values for Hadrian, connecting the new and the old part of the city, and establishing an axial relationship with the Capitoline Hill, similar to the one between the temple of the Olympian Zeus (restored by Hadrian) and the Acropolis of Athens. However, the setting and ground conditions between the two temples were quite different. The temple in Athens was located in a large flat area, where the Roman temple was located in a hill with a number of precedent buildings and structures.
The temple was a very large building, 113 x 56 m in plan and around 30 m high. It has an extremely interesting design, displaying the unique pattern of two back-to-back *cellae*, an example of Hadrian's eclectic architecture, which combines Hellenistic proportions and urban presence with Roman spaces and construction techniques. In accordance with archaeological excavations (Panella 1985, 1990) and our own survey and study (González Longo; Theodossopoulos 2004), the temple was decastyle (with twenty-two columns at the sides), of Corinthian style, dipteral (two rows of columns in all facades), *systyle* (columns two diameters apart), and *amphiprostyle* (free standing columns in the pronaos). The diameter of the columns is, according with our calculations, 1.74 m (about 6 Roman feet), similar to temple of the Hadrianic Olympeion in Athens. The cella was raised by five steps from the surrounding stylobate. The temple had no podium, unlike the rest of Roman sacred architecture, but stands above a crepidoma of seven steps to the stereobate and seven steps from this to the *stylobate* (Figs. 3, 9).
After some damage by fire in 283 A.D., the building was restored by Maxentius (reigned 306-312 A.D.), but it does not appear in use at the time. The decay of the temple started following Gratian's Decree in 382 A.D. confiscating all properties of pagan cult, and is more severe after the bronze tiles were removed (between 626-629 A.D.) by Pope Honorius I in order to roof the old S. Peter's. The great earthquake of 847 A.D. probably caused the collapse of the already decaying vaults of the roofless temple and the building slowly became an authentic materials quarry, providing not only stone, but also lime to other sites in Rome (Lorenzatti 1990). The columns were extensively reused in building the new St. Peter and St. John in Lateran. Between 1464-1471, Paul II ordered the removal of the massive peperino and travertine blocks of the foundations in order to be used in the building of Palazzo Venezia.

Figure 5: Exposed concrete a) towards South b)with clay towards East c) drains towards Southeast

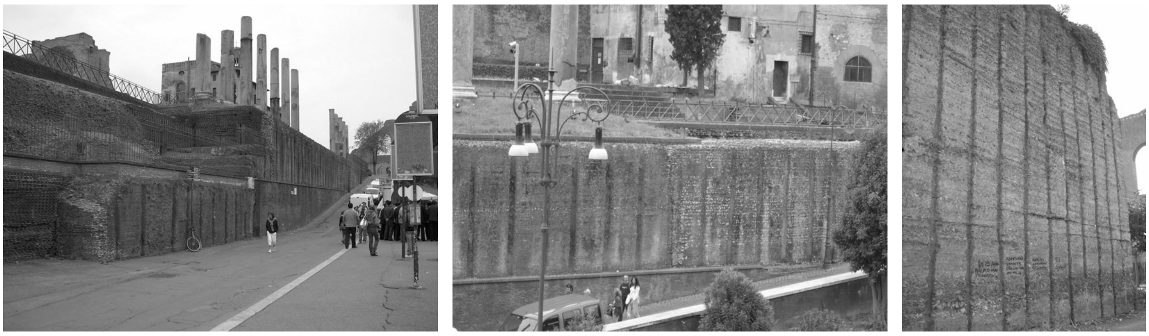

Figure 6: a) Platform to NE b) Platform to North c) Neronian wall to the Via dei Fori Imperiali

The Church and Monastery of Santa Maria Nova (Santa Francesca Romana)

The first Christian presence in the site could have been between 314-335 A.D., when St. Sylvester founded a church dedicated to Sts. Peter and Paul (Prandi 1937). Following the abolition of the Pagan faith and closure of the temple, a church was built in the area by the Pope Paul I (757-767). After the great earthquake of 847, pope Leo IV built the church and monastery of Santa Maria Nova (now named Santa Francesca Romana), at the front of the west cella of the ruins of the Temple, but without occupying the cella, and partially built using materials from the ruins. Prandi identified two different sections of the ancient church that are separated by the steps of the stereobate (Fig. 4b) and this had a crucial effect on the structure of this area of the church and the adjacent cloister. A detailed account of the history of the church and monastery can be found at (González-Longo; Theodossopoulos 2008).

The church and the monastery went through a radical restoration by Alexander III re-consecration of the church in 1161, building also a cloister, apse and the bell tower. Extensive restoration works were carried out under Honorius III (1216-1227) and later (1278 and 1294). In 1352 the church was given to the Olivetan monks (*Benedettini della Congregazione di Monte Oliveto*), who carried out further works, particularly at the cloister (1371), built above the foundations of the temple. They are still occupying part of the building today.

During the 15th century a large amount of peperino and travertine blocks of the foundations of the temple were removed from the area not occupied by the church and monastic buildings, in order to re-used them elsewhere. From early 15th century S. Maria Nova became also centre of pilgrimage around the tomb of Santa Francesca Romana (1384-1440). Between 1612 and 1615, the original pedimented façade with six ionic columns and a mosaic became a baroque travertine composition. In the 18th century the building presented a very precarious situation and the monastery was enlarged between 1744 and 1750 under pope Benedict XIV. In 1811, the part of the monastery adjacent to the Arch of Titus was demolished, as part of a wider restoration of the Roman Forum by the French administration, exposing part of the stairs to the stereobate (Fig. 4).

Giacomo Boni converted in early 20th century the monastery to a Museum for the Roman Forum and made accessible for study part of the foundations of the temple (González-Longo 2006).

Recent interventions

Antonio Muñoz restored the temple in 1935 (Muñoz 1935). The works, including "archaeological" excavation, were carried out for political reasons (the works had to be completed by the 21st April 1935) at an astonishing speed of just four months (December 1934- April 1935), which unfortunately prevented a complete investigation. Some of the consolidation of the decayed masonry and the re-erection of some of the columns have actually impaired the interpretation of the main phases through the study of the masonry and concrete. No comprehensive study on the original water management of the platform was carried out prior to the works. An intrusive intervention was carried out and as a consequence original drains and water routs were blocked, resulting in visible retention of water within the fabric today. Although the building is currently well maintained by the Archaeological Superintendence of Rome and the remains of the temple in elevation are in good condition, there are signs of flooding at basement levels to the North and there is evidence of dampness in some areas towards SE (Figs. 5a,b). The archaeological excavation of Panella in 1985 had as initial purpose the drainage of the masonry and subsequent interventions have prioritised this important issue.

Figure 7: NW corner of the platform a) General view b) Detail

Figure 8: a) Foundations of the Temple of Hadrian b)-c) Voids left by the travertine and peperino foundations to the South of the platform d) Crack to the North side of the platform

THE DESIGN AND CONSTRUCTION OF THE PLATFORM

Design of Hadrian's platform

Hadrian's temple follows the basic 'rule' mentioned by Vitruvius (Book IV): "The length of a temple must be twice its width." However, the location, orientation, dimensions and construction of the platform of the building had not only to respond to primarily theoretical, political and symbolic aspects, but also to be determined by the site conditions and precedent constructions. Fig. 3 is a key drawing that interprets the design and orientation of the temple with respect to precedents and uses a system of coordinates to refer to key stages. Overall, Hadrian's ambitious design required a platform of 167x 100 m (Fig. 3, coordinates A-H, II-V), standing around 7.5 m above the piazza of the Colosseum and 3.5 m above the Summa Sacra Via to the West.

There is evidence that a substantial platform was already in the site (Fig. 3, coordinates b-f, ii-x), most probably the structure that supported the Vestibule of Nero. The now exposed retention wall to North (Fig. 6a,b) is similar to the Neronian wall on the other side of the *Clivo di Venere Felice* (Fig. 6c). There are also signs of different construction phases in this wall, probably belonging to the two major Neronian transformations of the area (*Domus Transitoria* and Vestibule of the Golden House) and the Flavian transformation, including the Arch of Titus to the South. The area suffered further radical transformations as a result of the drying out of Nero's *Stagnum*, with more changes provoked by the construction of the Colosseum, therefore the configuration of this side of the Velia at that time is still unknown.

A complex operation had to take place to allow the temple to be built, including the relocation of the Colossus of Nero. There is an anecdote related by Aelius Spartianus, concerning the removal of the Colossus with the aid of the architect Decrianus and twenty-four elephants, "keeping it in an upright position," moving it away from the place in which the temple is now. Considering the new position of the statue to the NE corner (Fig. 3), and the configuration of the platform in this area (Fig. 6a and Fig. 3, coordinates A-C, II-III), which includes a sloping section (upwards to W) of a concrete wall (a ramp perhaps), could give clues about the access prepared at the time for the relocation of the gigantic statue, which could be used later as access to the temple precinct.

Due to the irregular terrain, a massive artificial concrete platform terrace had to be created to the SE, which can be considered as an extension to Nero's substructure. There is another well-known anecdote narrated by Dio Cassius (IV, 1-5), in which the architect Apollodorus of Damascus criticised the design and suggested that spaces to house the machines of the Colosseum should be created within the platform. This indicates that the original design of the Hadrianic extension of the platform involved a great mass of solid concrete.

The face towards the Colosseum shows today a characteristic arched sloping wall, a sort of buttresses, with cave-like recesses, with a corridor behind (Fig. 5b), which reminds the walls to the terraces of the temple of the *Fortuna Primigenia* at Palestrina. This wall is made of tuff concrete up to a depth of 5.5m, below which the aggregate used is selce.

The Mussolinian intervention had a rather picturesque character and failed to investigate in full the original configuration of the temple's precinct, which perhaps included a series of ceremonial ramps and stairs to its access from the Colosseum area, like the aforementioned concrete mass to the NE that can be interpreted as a ramp.

The degree to which precedent structures were used in this phase is not clear. Although, during the survey of the building, it has not been possible to access to all the underground structures, there is evidence of precedent buildings and structures incorporated in the platform, like the criptoportico to NW.

Materials and Techniques

Due to the bad quality of the soil and the presence of water in the site, the platform on the Velia had to be massive. Considering the volume and structural requirements, concrete was the obvious choice of material. It was used for two main purposes: to fill the core of two-leaf walls and vaults and to provide foundations (either deep or strip and raft). The pozzolana concrete (*opus caementitium*) platform of the temple is composed by fragments of travertine and tuff and lime and pozzolana slurry and laid in layers, which provided a strong base.

Hadrian is well known for his major projects in *opus caementitium* like the Pantheon and his Villa at Tivoli. The lime-based concrete in Hadrian's time was of the highest quality. This was due to the good preparation of the mix that involved the use of highest quality lime putty, aggregates and additives like *pozzolana*, that would improve the lightness and strength of the mix, and make it hydraulic, setting under water. As it is evident here, Nero's experts had already mastered the technique. After the great fire, new regulations implemented the use of solid arcades, reconstructing buildings without using timber and promoting extensive use of Peperino, a brown-grey tuff from the Alban Hills, near Rome, with fire resistance properties.

This platform contains a variety of foundation techniques in response not only to the variety of soil and existing structures but also to their final position above or below ground. Initially, the natural rock (*Cappellaccio*) would be cut to receive a course of *peperino* blocks to level the surface. In the earlier sections of the platform, the courses of peperino are laid and the void is filled with *opus caementitium* containing fragments of travertine (Fig. 7a). Later construction is in *opus testaceum*. In the areas without natural rock underneath, more substantial foundations had to be created. There is evidence to the South (fig. 8b,c) of what appear to be a concrete raft foundation, in an area lacking of tuff rock underneath (Fig. 3, coordinates d-e, iii).

The North side of the platform was always an underground foundation wall but was left exposed after the creation of the *Via dell'Impero* by Mussolini in 1932. As described by Giuliani (1992), it presents deep foundations made in trenches shored up by a timber shuttering composed of boards fixed to vertical studs. Horizontal struts hold the opposite trench side, and the imprint of the timber studs are still left into the wall (Fig. 6a,b). The aggregates were laid by hand in layers and lime and pozzolana slurry (with high water content) was poured over and tamped down in order to avoid air pockets. In large foundations like this, small walls of around one foot thick were built to confine the different batches (Figs. 6a, 7b) and avoid deformations due to the long but different setting time between them.

The largest amount of artificial platform and the most solid construction had to be to the South, especially to the SE corner, where there is no natural tuff rock as support. The deep foundations are not exposed; only foundation walls above ground are visible. These are brick-faced concrete (*opus testaceum*), a preferred technique for such conditions, and it has been extensively used in the South of the platform. The bricks have a triangular shape (one full tile cut in four across its diagonals), so that they key better within the concrete fill. There are in some instances transverse bonding courses at the end of each lift, in the form of full bricks spanning the full width of the wall. A large part of the facing has now been lost, with the inner concrete left now exposed (fig. 5a).

The deep concrete platform provided a strong base. Voids around 3 m deep were left to receive the *peperino* dry strip foundation underneath the walls. Travertine, a material more resistant to compression, was used where concentrated loads were applied, for example under the columns. Similar construction was used in the temple of Hadrian in Rome, built by Antoninus Pius (Fig. 8a). The foundations of the columns of the temple were just 2 meters deep, consisting of a grid of concrete rings with travertine and peperino strip foundations inserted within it, supporting the columns and walls. Between 1464 and 1471, Pope Paul II ordered the removal of the massive *peperino* and travertine blocks of the foundations for the construction of Palazzo Venezia and the voids left in the platform, with imprints of some of the blocks in the concrete, are still visible (Fig. 8b, c).

The craftsmanship was of the highest quality, in both *opus testaceum* and *opus caementitium* construction. The platform is the result of a unique period in which the emperors followed closely the design and delivery of the projects by architects, engineers, surveyors and other experts. The construction sites were often conducted as military operations, most of the times with the intervention of army professionals. It is clear the importance of site logistics and experience in such projects.

Water collection, features and drainage

Since archaic times, there was a water stream coming from the Velia towards the valley of the Roman Forum, which in time became a drain joined with the Cloaca Massima (Quilici 1979). The lake of Nero was fed by a stream still visible under the church of San Clemente, to the East of the Colosseum, which continued towards the Circus Maximus. Water provision and drainage was a key element in the first settlements in the area, and it is important in the understanding of the construction of the platform. For such a large temple, the water system should have been an integral part of the design (Fig. 5c), even more if, as previously proposed by the authors (González-Longo; Theodossopoulos 2004), the temple was open to the sky, following the same *hypæthros* canon as the Athenian temple of Olympian Zeus.

A deep well is still visible within the area occupied by the platform under the apse of the church of Santa Francesca Romana (Fig. 9), and a cistern is located in the cloister of the monastery. There is also evidence of an extensive system of sewers embedded in the concrete foundations, of around 60cm height and at a level of between 27.4 and 28 m a.s.l. As mentioned by Van Deman (1925) there is a well-built sewer beneath the Sacra Via, attributed to Septimius Severus (reigned 193-211). Water features and display are also evident in the buildings, like the small marble pool within the remains of the Domus Transitoria, to the NW of the platform.
Some of this water infrastructure relates to an overall water system still to be understood in full, and it could be related with the functioning of the Colosseum, in which there are still many unknowns about its water systems.

Levels

Another important tool for the understanding of the sequence of operations and the function of the platform is the establishment of the stratigraphic and construction levels between the various phases. The overall platform is a complex construction, which reaches overall more than 9 m visible depth to the East. It is difficult to establish a permanent datum in this area, as it was altered several times. In an attempt to clarify the different construction levels, we have opted for using as reference the levels above sea (a.s.l.). The section in Fig. 9 incorporates data from site survey as well as from the published results of the archaeological excavations by Panella (1985, 1990).
We have established at a level of 27.4 m a.s.l., the highest point of the natural tuff rock in the area, below the transept of the church. This is the area in which the Colossus could be located. The remains of the Neronian *cryptoportico* to NW are at 25.30 m a.s.l. and at a depth of 3.75 meters from the existing street level above it, being the lowest space within the platform. The level of the transept of the church, identified by Prandi (1937) as the oldest part of the church is at the same level as the stereobate of the temple, i.e. 30.63 m a.s.l. The nave of the church, is at 29.22 m a.s.l, which appears to be the lower level of the Neronian Vestibule. The level was probably raised by around half meter during the Flavian construction of the Arch of Titus. Considering some marble pavements under the monastery, the next Neronian level appears to be to the same height that the temple stereobate. The existence of a further Neronian level at the level of the temple's cella, 33.70 m a.s.l., will explain some rests of marble pavement (Fig. 3, coordinates E-D,III-IV), so far attributed to Hadrian, with the wall above attributed to Maxentius. This is material for further detailed research.

The construction phases

As described before and shown in Fig. 3, there are clearly different phases overlapping the construction. Despite the fact that different materials and techniques could be used within the same building at any one time, there is always a consistency in the use of materials and techniques within each of the phases, which could help to identify the construction sequence.
Before the great fire of 64 A.D. the area covered now by the platform to NW was occupied by residences, some of them very fine, as the one explored by Barosso (1940). After the fire, which destroyed part of these structures, Nero built the Vestibule, covering part of these houses, but incorporating some of the spaces and keeping the orientation of the precedent buildings layout.
The concrete foundations of this period present a characteristic layering of fragments of travertine and selce with a dark grey mortar. The concrete foundations of the Neronian arcade, identified by Van Deman to the South of the Basilica of Maxentius, and the exposed lower foundations of the Arch of Titus (Fig. 4b) are very similar to the concrete foundations exposed to the NW corner of the platform (Fig. 7a,b), which suggest that they belong to the Neronian construction.
Flavian transformations of the area after the construction of the Colosseum are evident in the NW corner of the platform, where a section of selce-only concrete with a reddish mortar (Fig. 5b) was laid. This section aligns with the location of the Arch of Titus and destroyed three quarters of the Neronian Crytoportico.
The discussion of the evidence so far, establishes a hypothesis that Hadrian reused extensively the Neronian and Flavian substructures, adding only a small but substantial section towards the East (Fig. 3 coordinates A-C, II-V).

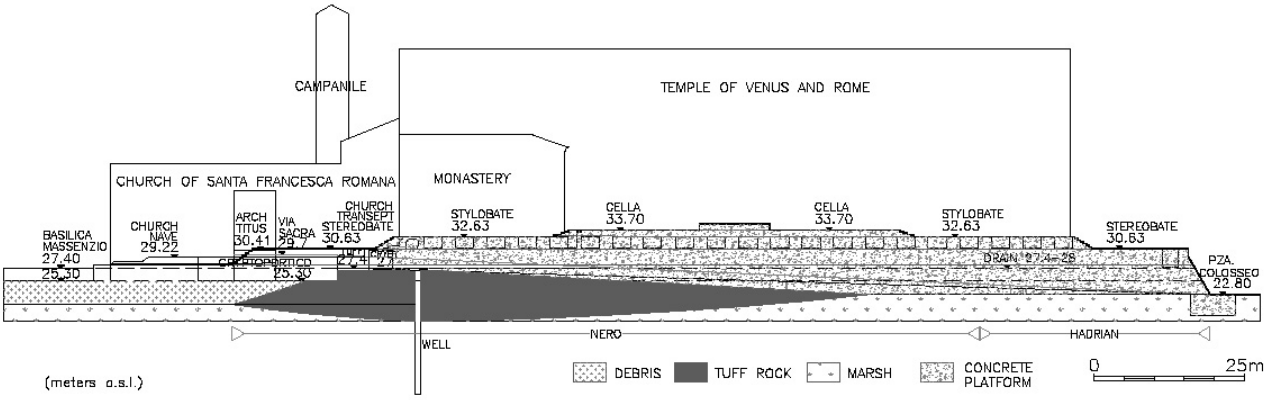

Figure 9: Long section of the Platform showing levels and composition

CONCLUSIONS

This study is an initial attempt to analyse the construction and architecture of the platform of the temple, and has established the dimensions, levels, orientation and construction characteristics of the different structures within the platform. A first conclusion is that the Neronian platform appears to be larger that originally thought. The existence of underground spaces that are still accessible and legible makes evident that sections of previous buildings in the area were not cleared up, but incorporated in the new structures. Also, as a lesson from the great fire of 64 A.D., Nero promoted a more robust and durable construction techniques, which would be extensively used and developed over the next century. The architects of the Domus Aurea (probably Severus and Celer) followed the same orientation as the previous buildings in the area (perhaps built also by them). In comparison, the Hadrianic temple shows an anti-clockwise rotation of around four degrees, probably inherited from the earlier Flavian rearrangement of the area that focused around the Colosseum.
The study attempted to piece together information that was produced for separate areas or phases of the site and a clearer relationship emerges between architectural developments of the superstructure and the integrity of the substructure, as they are summarised in the key drawing in Fig. 3. Distinct later events like the construction of the church and monastery, the ruthless removal of any valuable material during the Renaissance, the restorations of the building and the Mussolinian *Sventramenti*, have altered and exposed the platform or changed the applied load. Lumps of concrete once contained behind brickwork or between travertine and peperino blocks have been exposed to the elements. The North side was an underground deep foundation that has been left exposed. There are some visible cracks in this area (Fig. 8d), which continue through the 1930s masonry reinforcement to its lower section, confirming that the movement occurred after the removal of the abutting soil. However, it is important to underline that the monolithic character of the concrete platform, seems to be still effective. The actual apparently good structural condition and strength of the platform is a testament to the exceptional quality of Roman materials and construction precision. Another level of design complexity the study displayed is due to the continuous presence of water installations in the Roman buildings and landscape, and even later in the monastery.
These two issues (structural stability and dampness) need to be investigated in detail to secure an effective conservation of the platform. The continuous occupation of the church and monastery of Santa Francesca Romana and most recently, the adjacent offices of the Archaeological Superintendence, has immensely helped to the effective conservation, care and safeguard of the area. By building the church and monastery immediately above the ruins and foundations of the temple, part of this important building has been preserved. The aim of this study was to examine the platform in its entire complexity and to present in detail all the stages of its design and construction. Structures of this kind can offer invaluable information, but they are often neglected in the analysis. The substructure of the Temple of Venus and Rome offers a unique source of material evidence for the understanding of the complex, which could inform its conservation and presentation.

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