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# The Pompeii *Quadriporticus* Project. The eastern side and colonnade

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*This article provides a preliminary report on the 2012 field season for the Pompeii Quadriporticus Project (Universities of Massachusetts Amherst and Cincinnati). This was the third field season for the Project, in which our efforts were focused on an architectural survey of the eastern side of the building and the entire inner colonnade. The report outlines the relative stratified sequences in the construction of the eastern side of the building, connecting the phases to those already outlined for the remainder of the building in earlier seasons, as well as to excavated data uncovered in the adjacent insula (VIII.7.1-15) by the Pompeii Archaeological Research Project: Porta Stabia. From these technologically sophisticated studies, as well as from two seasons of geoprospection and a novel approach to reading the complex but valuable chronological information in each of the columns of the colonnade, it is now possible to reconstruct the original form of the Quadriporticus and to chart its development over time – in relative and absolute terms – as well as to know something of its place in the infrastructural history of Pompeii.*

## *Introduction*

The Pompeii *Quadriporticus* Project (PQP) conducted its third campaign of field-work in July, 2012 on the fifth largest monumental structure in Pompeii[1]. Our work focused primarily on the masonry analysis and documentation of the eastern side of the building, but also saw completion of the study of the northern and southern sides, which began in 2011[2]. Additionally, the PQP devised and implemented a novel methodology to record the stratigraphic information preserved on the 77 columns within the *Quadriporticus*. We continued to explore and expand the use of digital technologies in the field in the 2012 season, including further investment in the use of iPads for recording and analysis, geophysical prospection, and exploring imaging techniques[3]. Finally, funding from a Mellon Digital Humanities grant through the Five Colleges, Inc. allowed the PQP to indulge in valuable interdisciplinary introspection, bringing three scholars to Pompeii whose related research interests gave a critical mirror to our methods and interpretive regimes.

## *Modern Phases and Archival Work*

For longer than any other monumental building in Pompeii, the *Quadriporticus* has served the tourist's image of the ancient city's imagined past (fig. 1). In the 2012 field season, the PQP made a number of important advances in archaeological and archival research concerning the *Quadriporticus*' 250 year modern history, conducting masonry analysis in wholly reconstructed areas of the building and extending archival research to the documentation created and maintained by the Soprintendenza archeologica di Napoli e Pompei, as well as to the paintings and finds now housed in the Museo archeologico nazionale di Napoli. The stratigraphic sequencing of modern masonry work is beginning to reveal a series of reconstruction events, especially in the southeastern section of the building,

[1] At c. 4000m$^2$, the *Quadriporticus* is smaller in size only to the Grande Palaestra (c. 16,600m$^2$), the Amphitheatre (c. 13,300m$^2$), the Triangular Forum (c. 5,200 m$^2$) and the sanctuary of Venus (c. 4,600 m$^2$).
[2] POEHLER and ELLIS 2011.
[3] Imaging work included experimental video recording with the AR Drone 2.0, which was found to have mixed results. Examples of our flight videos can be found on the PQP's YouTube channel:
http://www.youtube.com/user/*QuadriporticusQuadriporticus*/videos?flow=grid&view=1.


*Fig. 1. Former entrance to the* Quadriporticus. *(Soprintendenza Antichita Napoli, #7950). Undated, but likely 1941.*

which had its roof restored as early as 1794[4]. Evidence for this massive restoration effort is found in a 4.95m long by 1.05m wide lime smear on the Phase Four (see below) eastern exterior wall. This smear is all that remains of one side of a large lime vat that had been built against this wall prior to the complete exposure of this part of VIII.7 in the early 20th century. The reason we only have one internal side of the vat is because it had been cut into the modern ground level here, which coincided with the ground level of the *Quadriporticus* but not (yet) the lower buildings at VIII.7. The lime vat thus very likely dates to this period (*i.e.*, the late 1700s), and may in fact be represented in Hackert's painting of the area (fig. 2). The 1906 excavations down to the lower ancient ground level in VIII.7 thus destroyed the vat, leaving only its remnants high against the wall. The height of the vat in relation to the ancient ground level, therefore, demonstrates something of the variable topography and history of excavations[5]. The lime was therefore certainly used in mortars to reconstruct the *Quadriporticus* based on its location and its size: assuming that the vat was at least 1m wide, it would have held over five cubic meters of lime, a volume sufficient to build a wall 6.5m long, 2m high and 0.40m wide entirely out of lime[6].

The intensification of archival work (under the direction of Prof. Bettina Bergmann) has yielded much success, revealing important stratigraphic sequences behind the western terrace wall (fig. 3); documentation of how columns were conserved in the 1980's; and an understanding of the condition of the wall paintings showing gladiatorial arms that have given the building its common name: La *Caserma dei Gladiatori*. The *Quadriporticus*' epigraphic landscape is also being reconstructed by Heather Pastushok, who has repositioned more than 100 inscriptions from the *Corpus Inscriptionum Latinarum* in the *Quadriporticus* and adjacent monumental structures.

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[4] Hackert 1794.
[5] For a similar but smaller vat recovered in VIII.7.12, see Ellis and Devore 2006: 12; the lime found within this vat is also from early 20th century reconstruction efforts. On the lime vats discovered in the so-called Eumachia Building, see Bechi 1820: 66, Maiuri 1973: 94, 99 and Dobbins 1994: 660-661.
[6] For a brief introduction to the production of lime for mortars, see Lancaster 2005: 53-54.

*Fig. 2. Detail from J.-P. Hackert's The Excavations at Pompeii (Attingham Park, The Berwick Collection, National Trust; inventory no. 608992). Shelter built over lime vat at upper left.*

*Fig. 3. Collapse at northwest corner. May 11, 1990.*

Finally, to manage such an enormous volume of archival information and to compare each item with the current state of the building (as well as other archival materials), the PQP has begun a partnership with the NEH funded *DM* project to digitally map, annotate, and collate these data[7]. By directly comparing imagery from 2012 with all available archival materials we hope to reconstruct the modern phases of reconstruction so as to equally recognize the unique history of the *Quadriporticus* during the 18th, 19th, and 20th centuries.

*Methods and Technology*

The PQP furthered its architectural study of the *Quadriporticus* through our particular adaptation of the masonry analysis methodology[8]. Briefly, in this method individual events of construction on the face of a wall – from the building's foundation to modern consolidation work – are identified and distinguished from one another. These events (stratigraphic units) are then recorded into a database, organized stratigraphically in a Harris matrix and drawn onto a digital image of that wall's face. All of this work to record, organize, and

[7] http://ada.drew.edu/dmproject.
[8] See POEHLER and ELLIS 2011, and ELLIS *et al*. 2008.

share our observations is accomplished using the iPad, a device that brings astonishing efficiency and clarity to fieldwork[9]. Of course, observation is not archaeology, records are not history, and efficiency is not scholarship. What this efficiency provides, instead, is the time needed to expand the range of questions that can be asked and to intensify the interpretative work (in addition to observational work) that can be carried out while still in the field. To this end, we initiated a new interpretive procedure, giving our student staff a digital database tool to add together stratigraphically and typologically similar stratigraphic units from the opposite faces of a single wall as well as the faces of other physically adjoining walls[10]. This tool allowed the PQP staff to break from the abstract frame of the wall face and extend their interpretations to more realistic architectures, from an individual segment of masonry to an entire suite of rooms. The value of this procedure is (at least) fivefold:

1. it moves the primary interpretive work back into the field where it can be done in the presence of the object being interpreted;
2. it leverages the staff's expertise about these walls;
3. it reduces the overall interpretive complexity of the site from thousands of individual observations to hundreds of 3D segments of architecture;
4. it documents the interpretive process, recording the intermediate steps between observation and phased plan.
5. it serves as a check upon the earlier observations and interpretations.

Though only begun near the end of the 2012 season, the results of this procedure are encouraging and will be expanded in the 2013 campaign. Our purpose in stressing the importance of this technical procedure is twofold. First, we hope to broaden the awareness of such technologically informed methodologies in order to encourage their adoption and further refinement in other archaeological contexts. Second, we believe it is important to demonstrate the real impact of digital humanities in general and the iPad in particular on archaeological research, interpretation, and publishing. These devices and methods are not gimmicks, but genuinely help one to work faster, better, and in new and interesting ways. As already mentioned, efficiency is not a goal in itself, but rather a way to buy time for the kinds of synthesis of data not normally possible in the field. Paralleling efficiency is data quality. Observations are recorded into databases without a concern for copying errors and then re-checked while in the field as part of the interpretative process to combine stratigraphic units together. Finally, employing digital methods that replicate traditional methods often leads to an interrogation of the method itself. This allows, and sometimes forces, researchers to consider improvements to the method and even to invent wholly new procedures that produce unique evidence of the ancient world.

An example of the latter was the invention of a process to study the 74 columns surrounding the *Quadriporticus*' courtyard and the three columns of the Ionic Proplyon[11]. It had been observed that most of the columns bore 'scarring' marks caused by their (re)use in antiquity, and that these could potentially yield important spatial and functional information about the colonnade. Each column and drum was numbered sequentially and the interventions on each – holes cut (and filled), plastering events, breaks and cracks, etc. – were recorded drum by drum. The shape of each intervention, its height on the column from the stylobate, and its width were recorded in a spreadsheet on the iPad. To reflect the position of each intervention, the circumference of the columns was divided into the twelve positions of a clock face, with the north side of the building set as "twelve o'clock". We are only just beginning to process the results of this careful observation and recording of columns, but the data lend themselves to interpretation though both quantitative and qualitative approaches. In an initial expression of the quantitative approach, the raw numbers have been grouped to reflect the number of holes on a column that 1. face another column (blue), 2. face across the portico toward the façade of the building (red), or 3. face into the open courtyard (green). When visualized as a column graph, superimposed on an image of the eastern colonnade's columns, these most basic results are revealing (fig. 4). The corner columns show a high number of interventions, a trend that decreases generally until the nearing of the middle of the colonnade, where the number of interventions increase again. At the very center of the colonnade there is a significant reduction in interventions, an absence that interestingly elides with the presence of cuttings in the central intercolumniation for a doorway (fig. 5). These rough numbers appear to suggest a surprising impermeability of the colonnade, with movement through it limited to a single, central location[12].

[9] For details of our iPad use, see Poehler and Ellis 2011; Poehler and Ellis 2012.
[10] The database tool was built by John Wallrodt, University of Cincinnati.
[11] Significant credit belongs to Dr. Nick Ray (University of Leicester) and the PQP team for helping to invent and field test this method. Tess Brickley (UMass Amherst) assisted in the post-season analysis of the column data. To provide background comparanda for our column data, we also analyzed and recorded 29 columns in the Triangular Forum and examined more informally the columns from public and private spaces in the Forum, Samnite Palaestra, and the House of the Faun.
[12] These columns are painted blue, as distinct from the others in the colonnade, in the 1879 cork model now housed in the Museo archeologico nazionale di Napoli; this distinction of colour may thus equally indicate some kind of functional or symbolic particularity. On the positive value of cork models for visualizing parts of buildings now lost or damaged, see Kockel 2004. It

*Fig. 4. Column graph of interventions on columns of eastern portico.*

*Fig. 5. Cuttings at the center intercolumniation of east portico.*

*Results of the architectural survey*

The 2012 architectural survey closely examined the *Quadriporticus*' east side, which is composed of five parts (fig. 6): 1. a monumentalized Ionic Propylon, 2. and enfilade of rooms, interrupted by 3. the eastern grand staircase, 4. a large exedra, and 5. several rooms of exceptional size surroundding the exedra. Unfortunately, due to the creation of modern office and storage space in rooms 8 and 9 and the installation of toilet facilities in rooms 10, 12, and 14-16, none of the ancient masonry is visible for study. On the other hand, the evidence in adjacent areas indicates that much if not all of the extant ancient architecture belongs to a single, latest phase of the *Quadriporticus*. The similarity in construction style and bonded relationship to both the final eastern *opus vittatum mixtum* façade walls[13] and the rebuilt central section of the eastern exterior wall (B), clearly demonstrate this late date[14]. The remainder of the eastern exterior wall is built in two parts. The northern section (A) is a lava stone *opus incertum* wall quoined in brick and preserving a trace of a thick, yellow painted plaster behind an abutting wall (*i.e.*, the northern perimeter wall of *insula* VIII.7). To the south (C) is an undulating wall composed of a lower foundation section in *opus incertum* (using mostly lava stone) and an upper *opus incertum* build (using a mix of Sarno and cruma stones, with other materials), quoined with tuff blocks in *opus vittatum*.

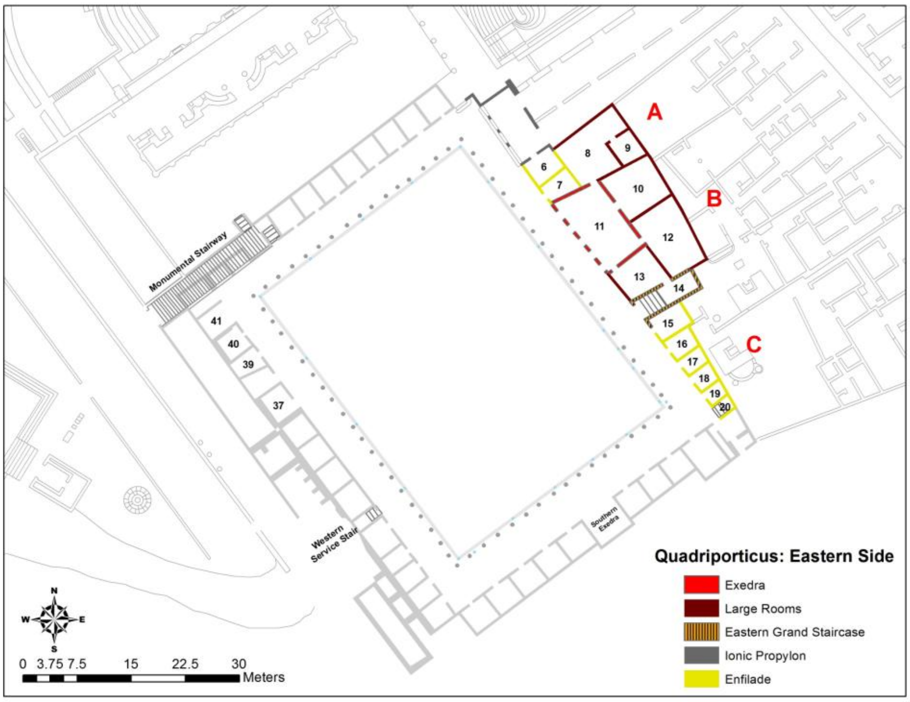


*Fig. 6. East side of* Quadriporticus.

should be noted that although these raw numbers do not account for chronology, this pattern of impermeability is known to have preceded and perhaps been interrupted by the Phase Five reconstruction of the *Quadriporticus*.

[13] The *opus vittatum mixtum* construction is consistent with that found in the northern, southern and southwestern facades.

[14] The wall forming the north side of the eastern grand staircase (WF_089) bonds both to the façade (WF_088) and to the upper rebuilt section of the exterior wall (WF_1003).

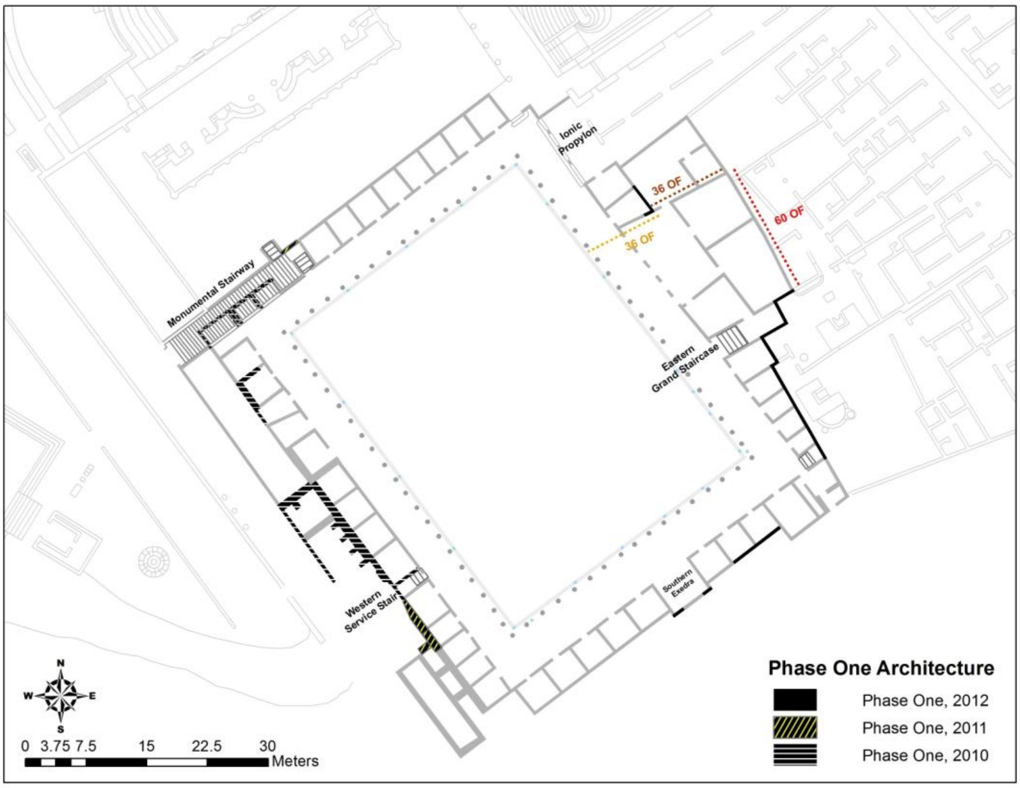


*Fig. 7. Plan of phase one architecture*

*Fig. 8. Phase one Sarno limestone construction in WF 219.*

*Phase One (fig. 7)*

The earliest architecture in the eastern half of the *Quadriporticus* consists of several walls at foundation level and another wall presumably representing the style of construction above these footings. The foundation walls were built in *opus incertum* using large lava stones with a very hard, brown mortar. Six of these walls form an undulating foundation for the building's original southeastern extent, two others created parts of rooms in the northeast, while two additional remnants defined the southern exedra's exterior wall. These walls can be connected by stratigraphy, typology, and metrology: they are earlier than all other structures; they share a common construction style, materials, and mortars as well as orientation and elevation; and those in the east form an extension of the *Quadriporticus* that measures 36 (E-W) by 60 (N-S) Oscan feet (OF)[15]. Interestingly, the distance from the edge of the colonnade's stylobate to the beginning of the eastward extension is also 36 OF, a number doubled to 72 OF in the construction of a great cistern below the southeastern colonnade, also built in Phase One (fig. 18, below). This cistern was undoubtedly intended to capture the substantial volume of water collected by (at least) the eastern colonnade's roof[16].

Above these foundation-level lava walls was a superstructure built in Sarno limestone (fig. 8), matching the Phase One style of construction found in the western terraces[17]. A 7.20m section of wall remains in the southeastern

[15] Metrological measurements of the *Quadriporticus*' eastern exterior are taken from laser theodolite survey data of *insula* VIII.7 collected by Syd Evans for PARP:PS; see POEHLER and EVANS 2007: 126.

[16] The roofed area of the *Quadriporticus*' original east side (Phase One) is at least 660m$^2$, which at a heavy rain fall of 0.075m / hour produces 49.5m$^3$ of rain water; potentially more if other roofed spaces were channeled to this destination. Approximately 3.5 hours of such sustained heavy rain would fill the cistern. A video recording of a rain storm in the *Quadriporticus* was taken on July 23rd, 2012 at 10:00. The video is available on the PQP YouTube channel: http://youtu.be/pIQF0UJwrUc. The measured rainfall of this event was 0.0254m (source: http://www.worldweatheronline.com/torre-annunziata-weather/campania/it.aspx?day=21).

[17] POEHLER and ELLIS 2012: 3-4, fig. 7; POEHLER and ELLIS 2011: 5-6, figs. 8-9.

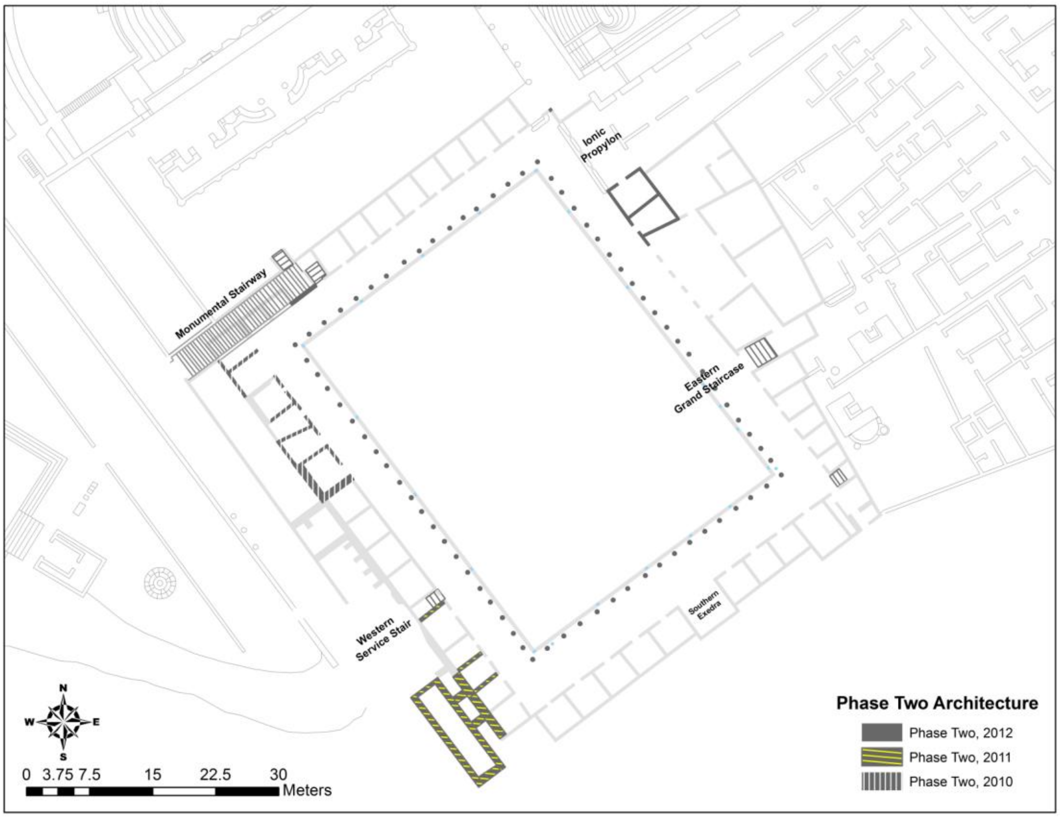


*Fig. 9. Plan of phase two architecture.*

section of the *Quadriporticus*' exterior wall, quoined by two Sarno limestone blocks. A third block was truncated by the brick course in the Phase Four rebuild. It is unclear if the edge created by these stones once formed a doorway or served to key several sections of wall together.

*Phase Two (fig. 9)*

A second phase of construction in lava stone *opus incertum,* bonded with very hard lime mortar and quoined with brick, survives in the two northeastern rooms (fig. 10). A single brick pier also belongs to Phase Two[18]. This particular construction style, as well as the stratigraphic position of these walls , built over Phase One foundations and abutted by Phase Three architecture, combine with their proximity to the *Teatrum Tectum* (Odeon) to associate them with the construction of that new building. Moreover, the unit of measurement in this period appears to switch to Roman feet (RF): the eastern colonnade is narrowed to 15 RF and the Ionic Propy-

*Fig. 10. Phase two lava stone* opus incertum *construction in WF 029.*

[18] According to Adam (2007: 108), brickwork "appears precociously early in Campania", exemplified by several buildings in Pompeii including the Basilica, Forum Baths, and the adjacent *Teatrum Tectum*.

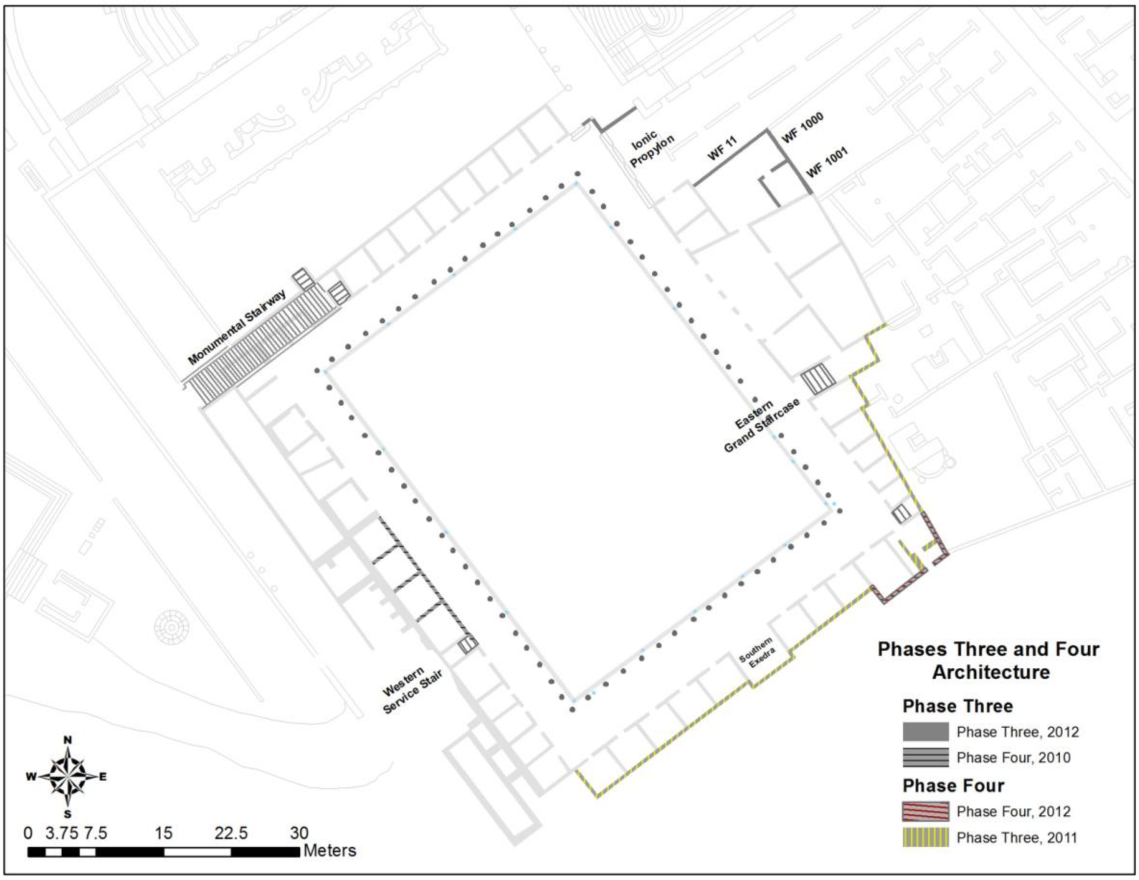


*Fig. 11. Plan of phases three and four architecture.*

lon is defined at 40 RF wide[19]. To this phase we must also add the construction of the large drain originating at the *Teatrum Tectum*, which has been dated to the early first century BC[20]. Unfortunately, there is little architectural or geophysical evidence for its exact course within the building. However, the evidence for the places through which the channel did not run, make the eastern great cistern (see below) its only logical destination.

*Phases Three and Four (fig. 11)*

Two expansions of the *Quadriporticus*, likely unrelated, but close together chronologically, belong to the third and fourth phases of construction. In Phase Three, a new northeast corner for the building was created by enclosing a large area within an “L” shaped wall. This wall was built using mostly lava stone, bonded with a hard, light colored mortar, and quoined at the corner in brick[21]. The stratigraphic position of the northeastern expansion is defined by three factors: 1. the northern wall (WF_011) was differently constructed and abutted the back of the Phase Two architecture[22]; 2. the eastern wall (WF_1000) was cut and built against by the *opus vittatum mixtum* of a Phase Five wall (WF_1001; fig. 12); and 3. the eastern wall (WF_1000) also destroyed the large drain feature running toward the *Quadriporticus* from the *Teatrum Tectum* (fig. 13). The fill of this destroyed drain dates the Phase Three walls to

[19] The Ionic Propylon measures 40.14RF (11.84m) from the NE corner of WF_198 to the face of WF_001. The eastern colonnade is 15.42RF (4.55m) wide as measured from the SW corner of WF_002 to the stylobate. The 15 RF measurement matches the width of the northern colonnade (15.02RF (4.43m), measured from SE corner of WF_366 to NE corner of stylobate) and western colonnade (14.88RF (4.39m), measured from NE corner of WF_292 to NW corner of stylobate). It is important to note that change in width of the western colonnade also belongs to Phase Two.

[20] See Phase 2 of Trench 28000 in ELLIS and DEVORE 2010: 14. The dating comes from associated ceramic assemblages and, in particular, a coin (Quinarius) which dates to 97 BC; the numismatic evidence is courtesy of Giacomo Pardini, head numismatist for PARP:PS (cf. RRC, 332, Nr. 333/1: Plate XLIII, 4.S).

[21] It is noteworthy that there are seven courses of brick in the quoins, unlike at other locations, which all use six brick courses.

[22] The brick quoins in the east side of WF_011 are irregular in placement and use only 6 bricks, perhaps in an attempt to match the Phase Two masonry that it abuts.

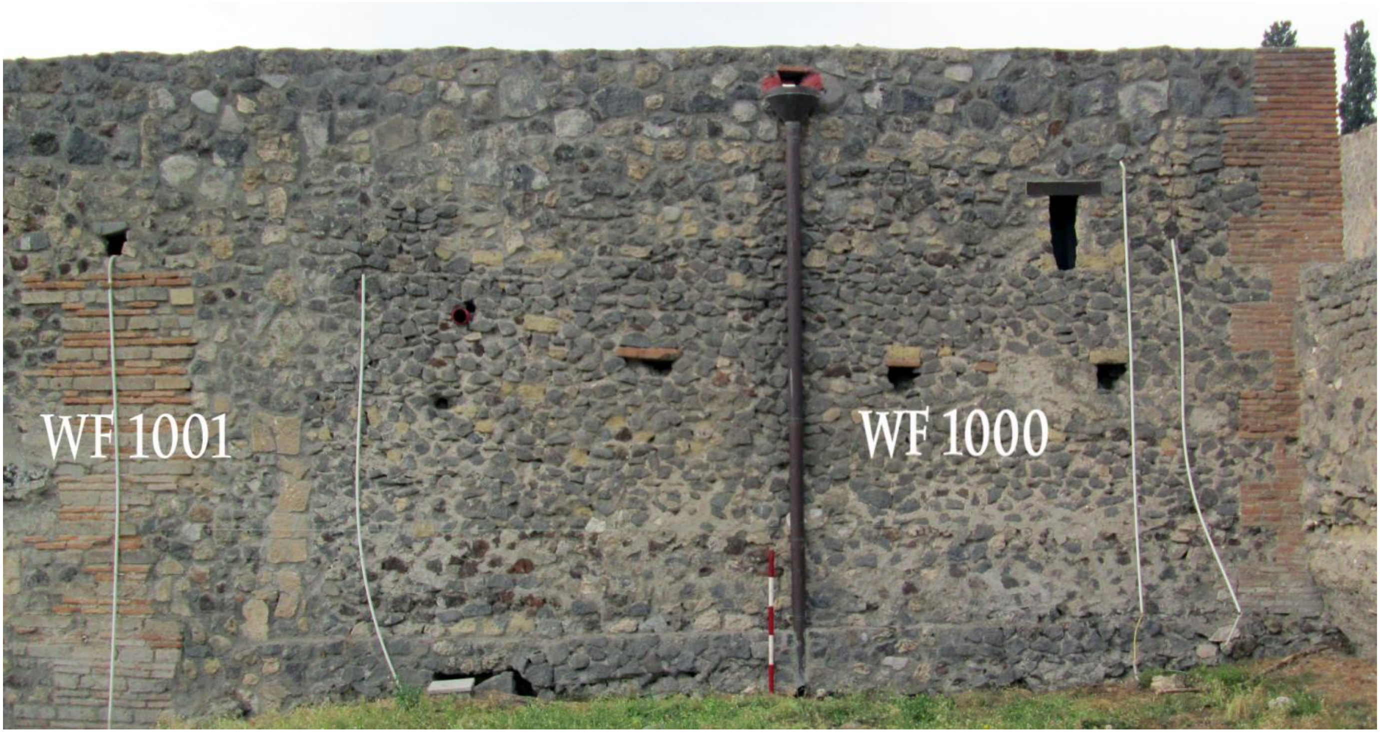


*Fig. 12. Phase three* opus incertum *construction in WF 1000.*

*Fig. 13. Former* Teatrum Tectum *drain, from west and above (under excavation by PARP:PS; Trench 28000).*

the late Augustan period or later[23] and because this wall was abutted by the later Phase Five architecture, it is tempting to identify this change as one of the many that were happening across Pompeii, and not least in this area, during the Augustan era.

The *Quadriporticus*' extreme southeast limit was similarly expanded in Phase Four by extending the eastern foundation wall to form a room in the newly created corner. The new wall also bonded with the southern boundary wall of *insula* VIII.7, simultaneously giving the *insula* its final shape[24]. The southern section of the eastern exterior wall (fig. 6, C) was also substantially rebuilt at this time. That this expansion coincided with a full-scale reconstruction of the southern exterior wall is evidenced by the southern exterior wall's distinctive style of construction (*opus vitatum* quoining with a brick work band above it) that meets and rounds the new room's southwest corner. Like the northeastern expansion of Phase Three, the Phase Four walls were sandwiched between earlier (Phase One and Phase Two) and later (Phase Five) constructions, but the relatively late and distinctive construction style[25] suggests its later chronology.

*Phase Five (fig. 14)*

The east side of the *Quadriporticus*, along with the rest of the building, underwent significant renovation and reinvention in the final phase of construction. The entire eastern façade was rebuilt in *opus vittatum mixtum*, *opus*

[23] See Phase Three of Trench 28000 in ELLIS and DEVORE 2010: 14-15.
[24] It should also be noted that the style of construction and materials of the *insula* wall is identical as well.
[25] The use of the extended brick course, more commonly associated with *opus reticulatum*, is a development of the first century CE, ending in Italy in the mid-second century CE. See ADAM 1994: 132-33, figs. 311-14.

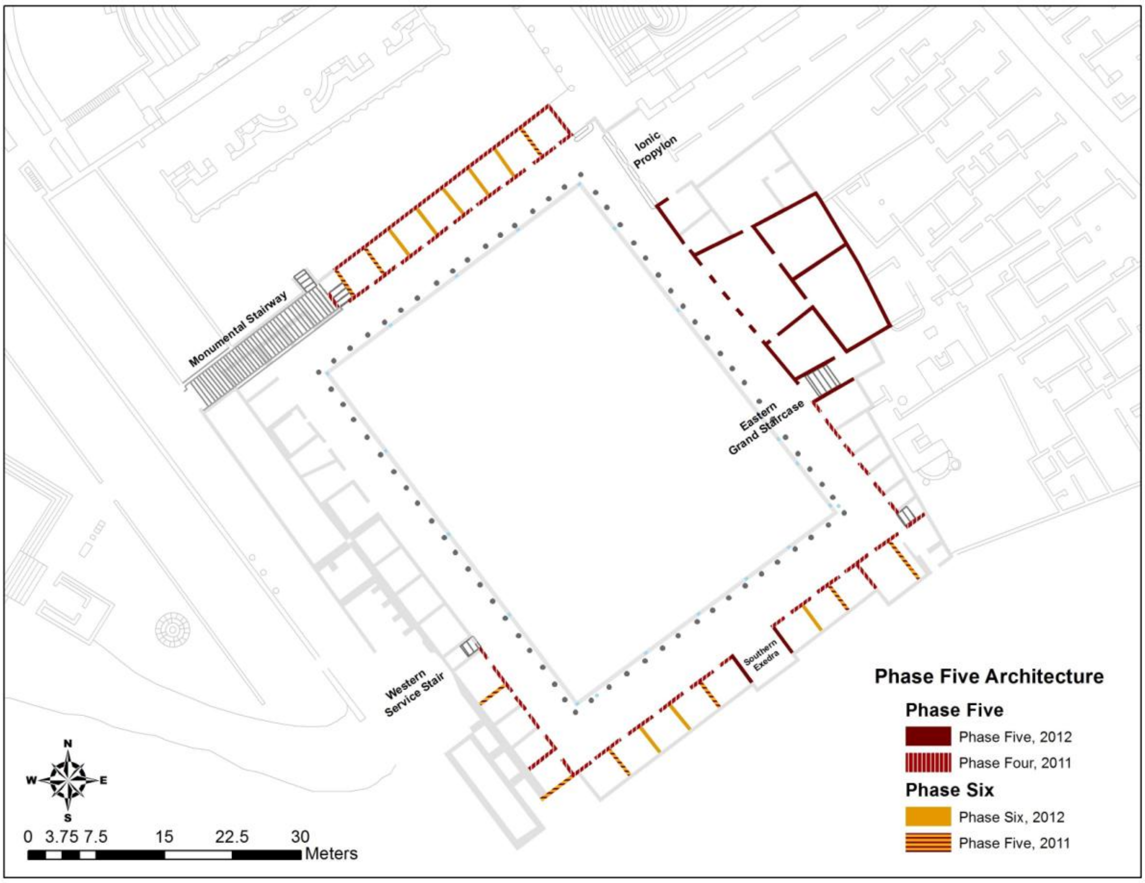


*Fig. 14. Plan of phase five architecture.*

*Fig. 15. Excavation of former tannery by PARP:PS; Trench 13000 (looking west toward outside eastern limit of the* Quadriporticus*).*

*testaceum*[26], and *opus incertum*, the later characterized by an abundance of cruma stone[27]. Additionally, the eastern exedra, eastern grand staircase and two more rooms (13-14) were reconstructed or built for the first time in Phase Five. A new staircase to access the second story balcony was also added in the southeast (room 20), matching those built in the north and west in the final phase. In all cases, the Phase Five architecture is later than any other, abutting, building over or cutting into previous structures. These relationships are exemplified in the eastern exterior wall's middle section (fig. 6, B), which was built against both Phase One and Phase Three architectures. Excavation conducted at the southern end of this wall segment shows its foundations cutting through the vats and work surface of a former tannery (fig. 15). The fill that destroyed the tannery also abutted the *Quadriporticus* wall, and its datable materials – which offer a *terminus post quem* for this wall as well as a *terminus ante quem* for the

[26] Note that *opus testaceum* is often built with *opus vittatum mixtum* in the *Quadriportucus*' final phase, bonded into it (*e.g.,* WF_086 and WF_258.) as well as standing alone (piers WS_014-017). See POEHLER and ELLIS 2011: 3, n. 6.
[27] The prevalence of cruma di lava stone is due to its extraction from below the western portico to create the new line of the Altstadt sewer.

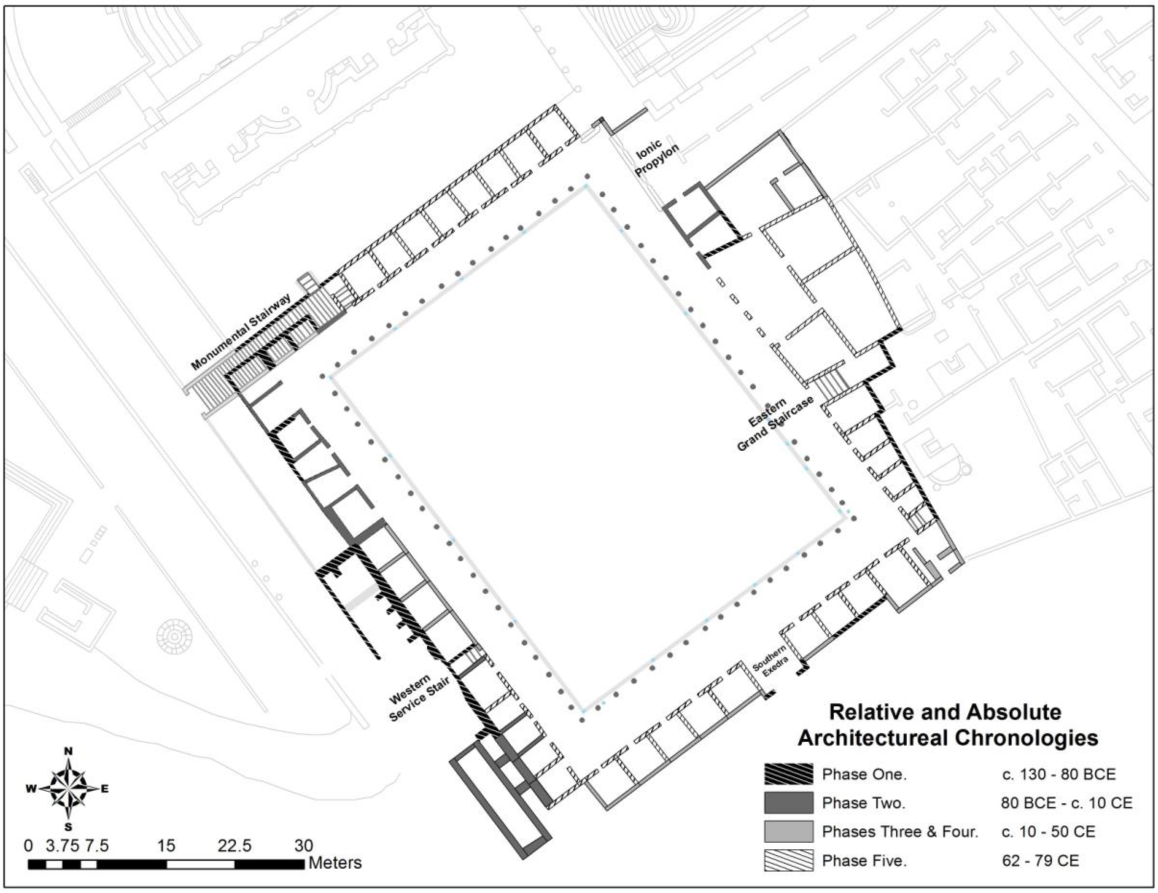


*Fig. 16.. Preliminary plan of phase chronologies.*

tannery – point toward this change occurring not earlier than the late Augustan era[28].

With study of the eastern side of the *Quadriporticus* finished in 2012, the PQP has very nearly completed the architectural analysis of the entire building. Moreover, the work in the east has connected our masonry analysis to the absolute chronologies developed by the Pompeii Archaeological Research Project: Porta Stabia's excavations, allowing that dating evidence to extend across the building (fig. 16). Thus, not only can the date of the *Quadriporticus*' original construction (Phase One) be tied architecturally to that of the Large Theater, assigned by Mau to around the middle of the 2nd century BC, but also to the creation of a terrace and cesspit at the rear of VIII 7, 10-12[29]. Similarly, the physical connections to the *Teatrum Tectum*, the reconstructions within the *Quadriporticus* using nearly identical mortars, materials and construction styles, as well as the switch the Roman foot measure all place Phase Two in the 80s to 70s BC. Again, it is both the destruction of the *Teatrum Tectum*'s sewer by an extension of the *Quadriporticus*' northeast corner, dated by excavation to no earlier than late Augustan era and by masonry stratigraphy to no later than c. AD 62, that situates Phase Three within the 1st half of the 1st century AD. Phase Four's traditionally late masonry style and its consistent abutting relationship with the Phase Five architecture suggest a still later date, likely in the 3rd quarter of the 1st century AD. Finally, the reconstruction – indeed redesign – of the *Quadriporticus* in Phase Five must be dated to the last 17 years of the building's existence. In fact, the *Quadriporticus* was likely in reconstruction for most of this time. On the one hand, the reorientation of the sewer was an immediate reaction to large-scale collapses in the west following, we believe, the earthquake(s) of AD 62. On the hand, while the northern suite of rooms were plastered in AD 79, the beam holes for the second story were scored but not yet cut through at the time of the eruption[30].

[28] See Phase 3 of Trench 13000 in DEVORE and ELLIS 2008: 10-11.
[29] See MAU 1906; 1907, 142; and Trench 9000 in ELLIS and DEVORE 2006: 10-12.
[30] The stratigraphic distinction of the Phase Six cross walls is not meaningful chronologically and should be considered part of Phase Five. These stratigraphic distinctions are a byproduct of the final, large-scale construction process rather than an intentional change in plans for the building's use.

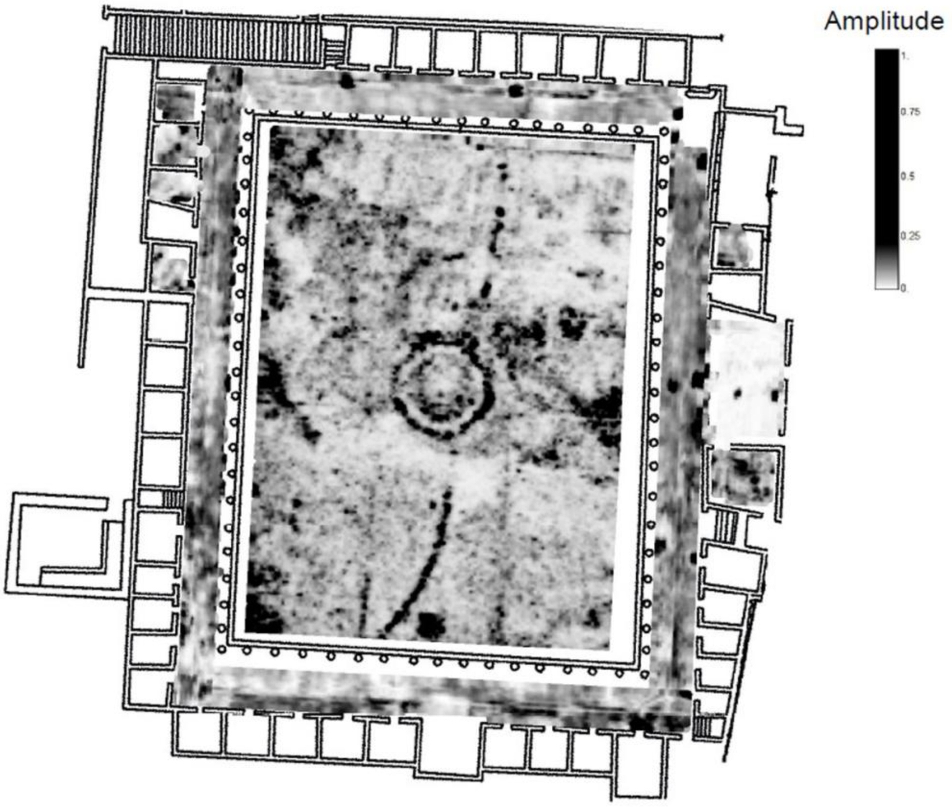


*Fig. 17. GeoRADAR image, slice 4. Approximate depth 0.66m – 0.92m.*


*Fig. 18. Infrastructure phases within* Quadriporticus *and related areas.*

*Infrastructure*

The largest sewer in Pompeii (the Altstadt sewer) runs along the western edge of the *Quadriporticus*, the course of which was altered in the building's final phase to run below the western colonnade[31]. Because the complete path of the sewer was unknown, the PQP conducted a second geophysical survey to investigate this and other subsurface features in the four colonnades and in the western rooms 37, 39-41 and the eastern rooms 6, 11 and 13 (fig. 6)[32]. The results of this survey combine with the evidence from masonry analysis and excavation to define the complex infrastructural history of the *Quadriporticus* (figs. 17-18). While the existence of a large cistern below the eastern colonnade has long been known[33], the 2012 GeoRADAR results now show that this eastern cistern was connec-

[31] See POEHLER 2012: 110-111, fig. 10, which builds upon and supersedes POEHLER and ELLIS 2012: 9-10, figs. 17-18 and POEHLER and ELLIS 2011: 6-8, figs. 13-14, 16-17.
[32] This geophysical survey was conducted in collaboration with our colleagues at the British School of Rome and the Archaeological Prospection Services of Southampton University. Our thanks goes to Sophie Hay, Stephen Kay, Elizabeth Richley, and Alice James for undertaking the survey.
[33] The cistern has long been known (*i.e.*, RICHARDSON 1988: 84) and was most recently documented for the Soprintendenza archeologica di Napoli e Pompei by Giovanni di Maio; we are grateful to Dott. Di Maio for his sharing of these results with us.

ted to a matching cistern in the southwest corner by an overflow drain below the southern portico[34]. The existence of the western cistern also confirms the hypothesis that the redirection of the Altstadt sewer below the western portico[35] co-opted the cistern's 20m length into a ready-made section of sewer as part of an emergency infrastructural procedure following the collapse of the western terrace wall[36].

Unfortunately, the numerous modern interventions in the eastern colonnade have interfered with the GeoRADAR results, obscuring much of what we know from excavations to have been an evolving infrastructural connection between the *Quadriporticus* and *Teatrum Tectum*. As described above, the construction of the *Quadriporticus*' Phase Three eastern exterior wall destroyed a very large drain that turned into the *Quadriporticus* from the *Teatrum Tectum*, dating the life of this drain to between the 70s BC and the late Augustan era. Again, although the GeoRADAR results here are ambiguous, there is only one possible destination for this drain: the southeastern cistern. The destruction of this drain, of course, meant that another drainage scheme needed to be enacted. A combination of excavation and geophysics conducted between the *Teatrum Tectum* and the northern perimeter wall of *insula* VIII.7 revealed an open, eastward flowing drain dated to and associated with the new northeastern corner of the *Quadriporticus*[37]. This later drain may have served to carry away the runoff from the roof of this Phase Three construction, but may also have acted as a gutter below an overhanging roof from the *Teatrum Tectum*, covering the passage between the via Stabiana and the *Quadriporitcus*[38]. The size of this drain, however, is insufficient to replace the drain it replaced. Rainwater from the greater area of the *Teatrum Tectum*, north of the passage, must have instead been funneled elsewhere. The deeper GeoRadar results from the *Quadriporticus*' eastern colonnade show another feature running the length of the colonnade, disappearing just before reaching the southeastern cistern. These observations suggest that the later drainage from the *Teatrum Tectum*'s cisterns overflowed westward into a deep channel that, like the Altstadt Sewer running below the western colonnade, intersected the eastern colonnade's cistern, and overflowed through the drain under the southern portico, effectively connecting the *Teatrum Tectum* to the Altstadt Sewer.

## *Conclusion*

From its inception, the PQP's research design has emphasized the power of non-destructive methods and technologies as a low-impact, high-reward companion to excavation. Bringing together three years of masonry analysis and digital documentation, two campaigns of geoprospection and the results of four previously excavated trenches, the conclusions of the 2012 season, though preliminary, exemplify the value of this approach. It is now possible to reconstruct the original form (Phase One, figs. 7-8) of the *Quadriporticus* and describe the modifications to the building (Phases Two – Four, figs. 9-13), especially those that radically transformed the area of the porticos in the final decades (Phase Five, figs. 14-15). The chronology of (?)relatively sequenced events can now be defined also in absolute terms through the evidence from the PARP:PS excavations along the eastern perimeter wall[39], a process which is itself an example of the value of sharing data across archaeological projects. The geophysical surveys have also revealed a remarkable infrastructural history below ground within the building, which served the *Quadriporticus* and *Teatrum Tectum* and connected to Pompeii's urban drainage scheme. Our investment in technology has provided valuable efficiency, the time gained from which we have reinvested in new methods, such as the detailed examination of columns and the interpretation and synthesis of evidence while still in the field. Through the work of the PQP, the *Quadriporticus* is being reconnected to Pompeii, both ancient and modern, in both space and time.

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[34] Note that figure 17 shows the upper GPR slices, which highlights the overflow drain, but makes deeper structures such as the lateral cisterns and sewers less appearant. For a discussion of the linear and circular features within the colonnades, see POEHLER and ELLIS 2012, 3-4.
[35] The GPR results show the spine between chambers (PB 31) as a high intensity anomaly.
[36] POEHLER and ELLIS 2012: 10.
[37] ELLIS and DEVORE 2009: 15-17.
[38] The passage on the north side of the *teatrum tectum* (VIII.7.20) shows an example of such a drip line channel against the north wall, though different in form.
[39] In particular from three trenches: Trench 9000 in ELLIS and DEVORE 2006: 10-12; Trench 13000 in DEVORE and ELLIS 2008: 8-11; and Trench 28000 in ELLIS and DEVORE 2010: 12-15.

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