Liquid footprints : water, urbanism, and sustainability in Roman Ostia

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CH 4: CASE STUDY OF INSULA IV, ii

4.0: Introduction to insula IV, ii

Insula IV, ii was excavated during the Fascist period (1938-1942), and attracted previous scholarly attention for the lighthouse-mosaic in the Terme del Faro (IV, ii, 1) (Figure 4.108).[373] A recent socio-spatial study of the insula by Stöger (2011) offered a detailed look at the structural phasing and integration of the *insula* into the larger city in terms of movement. This novel combination of contemporary architectural methods (space syntax) with Roman urban evidence provided a wealth of data for this study. Several of the inscribed lead *fistulae* from the Terme del Faro have attracted interest for their mention of Matidia, the niece of emperor Trajan, as well as suggesting a partial identification of the ownership record of this bath building.[374]

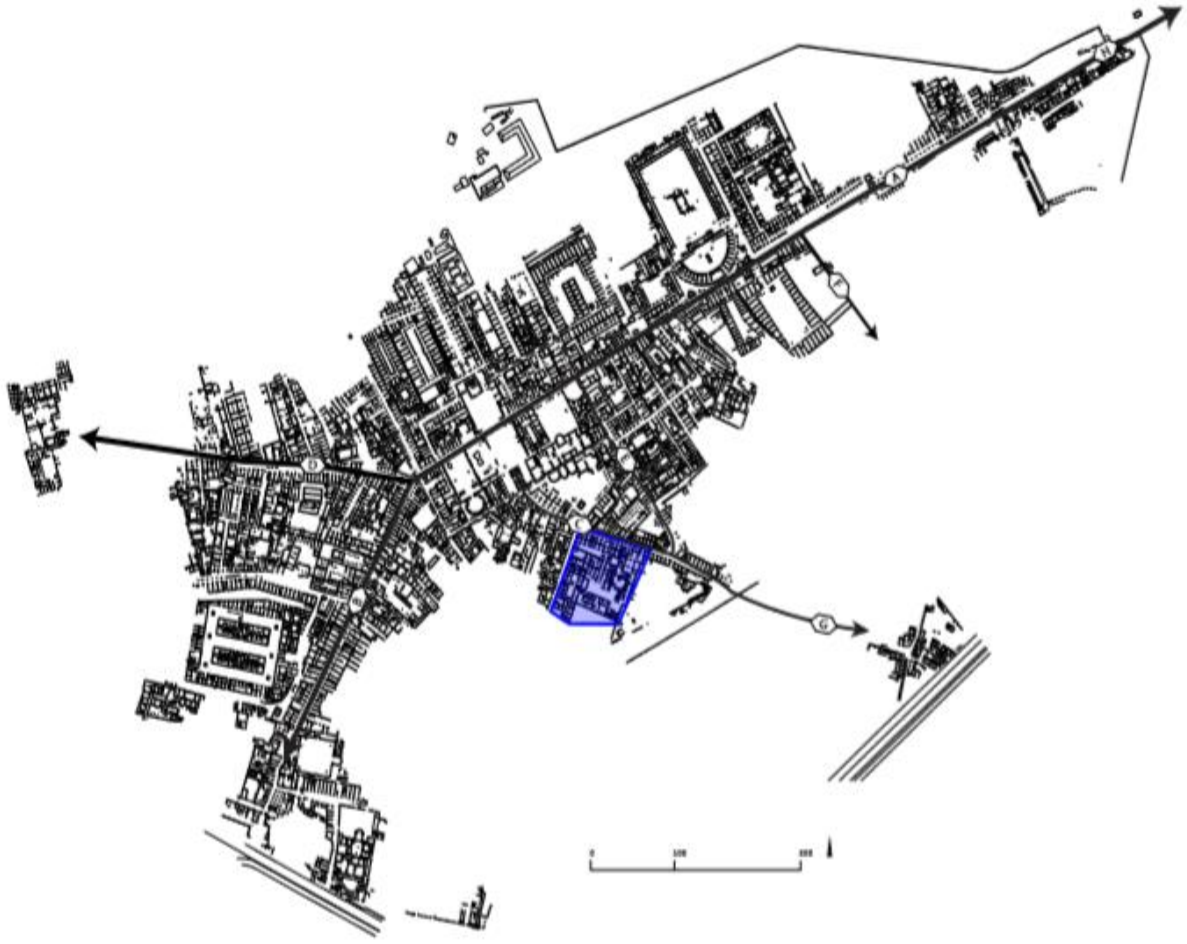

Figure 4.108: Location of insula IV, ii within Ostia.

[373] While the insula is oriented NE-SW, for ease of description, all descriptions for this insula take the *cardo maximus* as north.

[374] Geremia-Nucci 2000; see below section on Terme del Faro (IV, ii, 1).

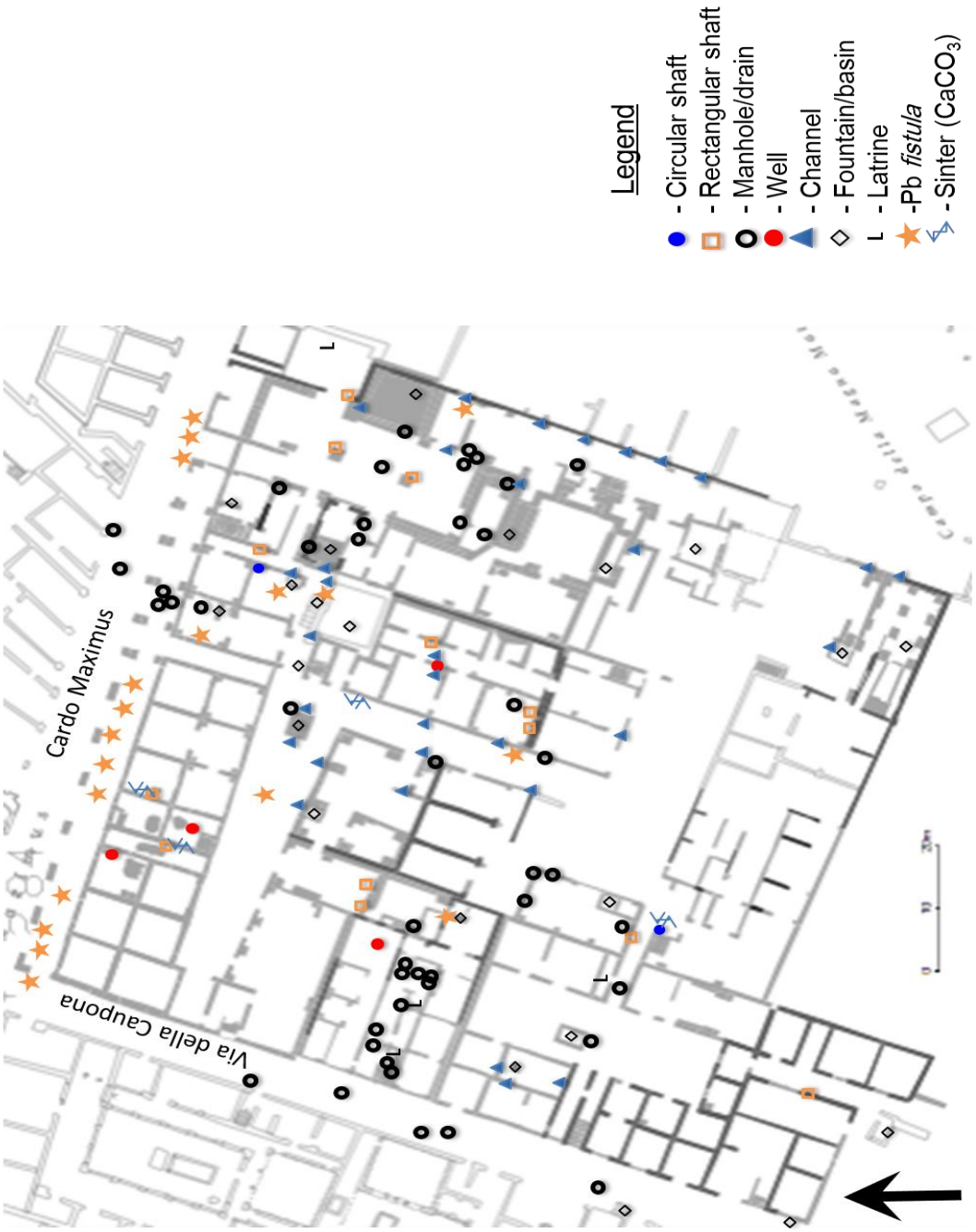

Figure 4.109: All identified hydraulic features in insula IV, ii (after Stöger 2011, 158, Fig. 5.112)

This *insula* has fourteen buildings of diverse usage, such as economic, religious, hygienic, social, industrial, and domestic functions (Figure 4.109). The insula is situated in the southern part of the intra-mural section of the city, where the southern stretch of the *cardo maximus* exits Ostia through the Republican city walls at the Porta Laurentina.[375] Like the Via Ostiensis that heads east to Rome, the southern Via Laurentina was also bounded on both sides by funerary monuments, and acted as a conduit for traffic arriving into Ostia from the city's nearby agricultural Pianabella area. Insula IV, ii lies directly west of a major fork in the *cardo maximus*, where the road splits into the Semita dei Cippi, one of the few roads for which we have the ancient name.[376] The insula rests on the edge of the unexcavated section of the city, which makes it difficult to integrate the preserved buildings to its neighborhood. The

[375] Meiggs 1973, 64; Zevi 1996, 69 for the creation of these walls.
[376] Giornale di Scavi (GdSc) 26, 88 (19-3-1940) for the discovery of the inscription.

city block lies directly west of the Campo della Magna Mater (IV, i), which retained its Republican ground level, surviving the numerous large-scale raising of the wider city level. Directly across the *cardo maximus* from insula IV, ii was one of the largest mills-bakeries in Ostia (I, xiii, 4), with eleven *in situ* grain mills.[377] Directly north-west of the insula's portico (IV, ii, 2-3) was one of the largest thermal structures in the city, the Forum baths (Terme del Foro, I, xii, 6).[378] To the west of the insula was a city block occupied by several elaborate Late Antique domus structures (Domus delle Colonne, IV, iii, 1; Domus dei Pesci, IV, iii, 3; Domus IV, iii, 5). This urban situation places insula IV, ii in a heavily trafficked area that witnessed dynamic architectural changes throughout the history of the city. From the documentary and photographic archives at Ostia from this initial period, excavation around insula IV, ii proceeded inwards from the *cardo maximus* to the south, with the soil originally resting ca. 4 m above the current height of the walls (Figure 4.110).

Figure 4.110: The original height of the soil during excavations in 1940 (SBAO B.2912) at left, compared with the current state of the insula at right. Looking south down hallway 20 of the Caseggiato dell'Ercole (IV, ii, 2-3).

4.1: Methodology

Following the examination of previously published material, as well as archival photographs, primary investigation of the extant remains was carried out by the author. This entailed the systematic search for and documentation of all preserved hydraulic features within the insula. While many of the large features (e.g. bath basins) were described by previous studies, numerous undocumented water features were identified in the course of the current study. These vary from patches of calcium carbonate ($CaCO_3$) on walls, to a large (98, 000 liter) cistern, to single drains, and fragments of lead pipes (*fistulae*). As with

[377] Bakker 1999 for a comprehensive look at this structure and wider subject in Ostia.
[378] Cicerchia & Marinucci 1992 for a study of the Forum baths.

the other *insulae* described in this thesis, arbitrary numbers have been given to each water feature that pertain only to this block.[379] For clarity and ease of identification, a chart and accompanying map are provided for each building to aid the reader in locating individual water features. Water features are described following the pre-established numerical order of the rooms in each building. After the spatial description of all the water features of a given building, the features are organized into temporal phases to present the hydraulic biography of each building in this city block. In the conclusion section of each building, the known water features are arranged into four temporal phases. This section is to be read together with section 4.2, in which the hydraulic infrastructure is integrated into the Roman Water Footprint methodology. This results in a contextualized picture of water in the *insula* in a single time period and how this changed over time. As the insula lies at a roughly NE-SW orientation, for clarity of description in this study, the *cardo maximus* is taken as north, and the Via della Caupona del Pavone lies to the west.

4.1.1: Water Features of insula IV, ii

The discussion of each of the 14 buildings of *insula* IV, ii follows the structure:

History of Excavation and Restoration

Location in insula

Phasing and Comments

Water Features Chart

Description of Water Features

Infrastructure Chronology

Conclusion

[379] See Appendix 3 for a master list of water features.

IV, ii, 1: Terme del Faro

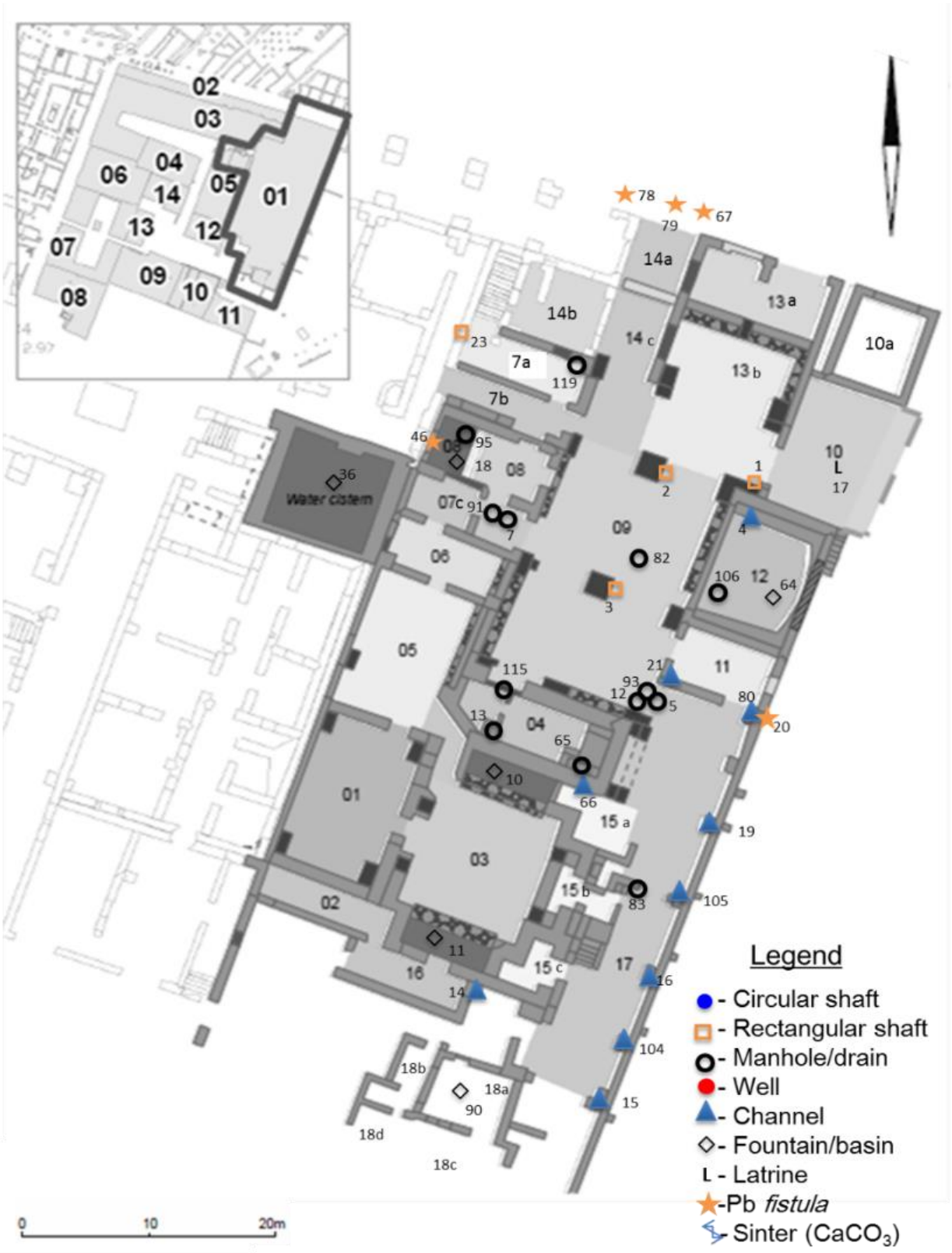

Figure 4.111: Identified water features in the Terme del Faro (after Stöger 2011, 79, Fig. 5.16).

Location in insula

The bath building is entered directly from the *cardo maximus* and lies directly west of the Campo della Magna Mater, to which it was connected in a later period by a staircase (Figure 4.111).[380] The southern section of the building is connected to the southern courtyard of the entire *insula*. The baths are bounded to the west by the Caseggiato dell'Ercole (IV, ii, 2-3) and building IV, ii, 5.

History of Excavation and Restoration

The initial excavation of this building dates to 1940, when excavation moved past the brick pilasters of the Portico dell'Ercole. Calza describes the statues uncovered here, and is surprised that this area wasn't excavated by Visconti, commenting on the large sections of fallen vaulting.[381] The mosaics were restored between 1956-1961, which revealed metal screws to close water taps, as well as 23 bronze coins cemented into the floor of the service corridors.[382] A targeted trench of the hypocaust system in rooms 1 and 5 was carried out by Fausto Zevi in 1964.[383] Onomastic research conducted by Roberta Geremia-Nucci in 2000 produced a sequence of ownership of the bath building based on inscribed lead pipes found in and around the baths.[384]

Phasing and Comments

Before the creation of the mid-sized bath building in AD 138-192, there are fragmentary traces of earlier structures, notably *tabernae* in rooms 14b and 13b, the latter of which housed the later eponymous bath mosaic.[385] The foundations of these early walls (ca. 1.0 m below the current floor level),[386] indicate a date contemporary with the construction of the Campo della Magna Mater, although this does not imply any connection to the cult's activities. The average current floor level in the bath building is ca. 1.50-1.80 m higher than the Campo ground level.[387] In general, the underlying terrain of the building slopes down to the south from the *cardo maximus*.[388] The south wall of taberna 14b has an *opus reticulatum* wall that also included some tufo quoining; the *opus reticulatum* and brick wall of taberna 13a presented a street front that was later incorporated into the Portico dell'Ercole (IV, ii, 2). In the Trajanic period, the west wall of room 13a was modified, which decreased the size of a religious niche present there.[389] The first clear use of the structure as a bath building in the mid-2nd century AD comes from *fistulae* evidence as well as brick stamps.[390] The extent of the bath building at this period is unclear, but may have constituted only the southern rooms 1, 3, 4, and 5. The service areas on the eastern and southern side of the bath also date to this period, as does the *opus reticulatum* retaining wall separating the bath from the Campo to the east.[391] The Severan period (AD 193-235) witnessed the largest structural change to this building, with a new hypocaust system built ca. 85 cm higher than the previous

[380] Calza & Nash 1959, Pl. 133 with an enlivened version of Piranesi's Campo Vaccino.
[381] GdSc 26, 84 (8-3-1940); GdSc 28, 143 (5-7-1940) for the initial excavation.
[382] GdSc 32 (covering 1956-61), (17-10- 1958); GdSc 33, 105 (13-7-1964).
[383] GdSc 33, 107 (15-7-1964).
[384] Geremia-Nucci 2000.
[385] SBAO R4260 (inv.14903 no.9) for the taberna; in SO 1, 127 these structures are dated by Becatti to Trajan, but by Bloch to the second half of the 2nd century (p.226).
[386] Stöger 2011, 76, note 31.
[387] Stöger 2011, 72.
[388] Although this might be the result of overzealous excavation methods during the 1938-1942 period.
[389] Bakker 1994, 229, Pl. 40.
[390] Geremia-Nucci 2000, 386 mentions Cornificia, either the daughter or sister of Marcus Aurelius; Barbieri 1953, 158, no. 5 (CORNIFICIAE IIX= *Cornificia*); GdSc 33, 105 (13-7-1964).
[391] Rieger 2004, 125 for a Trajanic date of this wall contemporary with the wider ground level raising of Ostia in the early 2nd century AD; Stöger 2011, 76-78 prefers a date closer to the bath's first phase (AD 150-160).

one (Figure 4.112), the creation of the eponymous lighthouse mosaic in the *apodyterium* (room 13b), and a Europa and Zeus-bull fresco in *frigidarium* 8.[392]

The baths were further embellished at this point with sculptures of a Capitoline Venus and a Farnese style "weary" Hercules, as well as other aquatically themed mosaics, which today unfortunately lean stacked against each other in room 3, spilling tesserae into the tall grass. Zevi's attribution of this period more precisely to Caracalla aligns well with the epigraphic evidence: an inscribed lead pipe from the early 3rd century.[393]

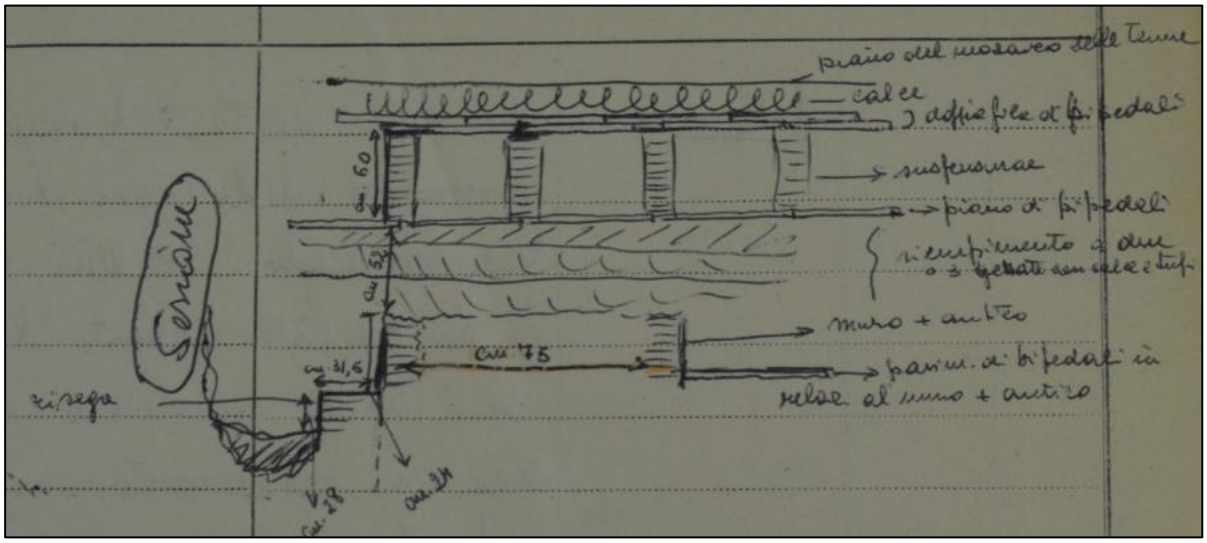

Figure 4.112: Zevi's original sketch showing the original level of the hypocaust, followed by a fill layer, with the 3rd century *suspensurae* on top (GdSc 33, 107 (13-7-1964)).

A multi-seater latrine (room 10) also dates from this Severan period.[394] The last quarter of the 3rd century CE saw a re-construction of taberna 13a, perhaps connected with a change of ownership, as recorded by another inscribed lead fistula.[395] The bath continued to function at least until the 5th century AD, based on the final piece of inscribed water pipe, dating to ca. 450 AD. Coins dating to the 5th century AD were uncovered in the service hallway of the baths, indicating the long usage of this bath building. Evidence for later continuity of the structure comes from the blockage of the wall between room 5 and 6 with rough tufa and stone cobbles; these walls were removed in the modern period.

Water Features Chart

The following hydraulic features are located in the Terme del Faro (IV, ii, 1) (Table 4.25).

[392] Clarke 1979, 93, 97 sees room 01 as "late draftsmanly" and later in date than the Pharos mosaic; Meiggs 1973, 433 compares the fresco to the Venus in the Baths of the Seven Sages (III, x, 2); SO IV, 172-176, 342-44, Pl. CXLVIII, no. 323.

[393] Geremia Nucci 2000, 395 for a discussion on L. Didius Marinus, expanding Barbieri 1953, 155, no. 6β: (DIDI MARINI.E.VE=*Didi Marini e(gregii) v(iri) e[t…]*); Zevi's 1964 sounding dated this closer to Caracalla in comparison with the themes and style of the frescoes.

[394] Jansen 2002, 178, note 240 identifies this latrine.

[395] Geremia Nucci 2000; Stöger 2011, 78.

IV, ii, 1 Room #	Feature	Description/Position	Feature #	Roman Water Footprint Phase
3	basin	caldarium, N side of room	10	3
3	basin	caldarium, S side of room	11	3
4	ceramic pipe	S wall of room, E part	65	4
4	drain	half cappucina shape, S wall of room, W part	13	3
4	sewer	N wall of room, N part	115	3
7a	sewer	NE corner	119	2
7c	manhole cover	within E part of floor	7	2
7c	sewer	within E part of floor	91	2
8	basin	frigidarium, W side of room	18	2
8	drain	within N part of floor	95	2
9	rectangular downshaft	E face of central pier	3	2
9	manhole cover	within floor of SE corner	5	2
9	sewer	NW drain	93	2
9	sewer	W drain	12	3
9	sewer	runs in NW-SE direction	82	2
10	latrine	entire room	17	3
11	channel	SW corner of room	21	3
12	fistula outlet(?)	N wall of room, W part	4	3
12	basin	frigidarium, entire room	64	3
12	drain	W wall of room, S part, at floor level	106	3
13b	rectangular downshaft	SE corner of room	1	3
13b	rectangular downshaft	E face of S pier	2	2
15a	channel(?)	N wall of room	66	4
15b	drain	N wall of room, E part	83	3
16	channel	half cappuccina shape, within pier on N wall of room	14	3
17	2 fistulae	pier 1	20	3
17	channel	pier 1	80	3
17	channel	pier 3	19	3
17	channel	pier 4	105	3
17	channel	pier 5	16	3
17	channel	pier 6	104	3
17	channel	pier 7	15	3
18	fountain/castellum?	entire room	90	3
Cardo Maximus	fistula	CORNIFICIAE IIX	67	2
Cardo Maximus	fistula	SCIPIONIS ORFITIS	78	3
Cardo Maximus	fistula	VALERI. FALTONI.ADELFI.VC. ET IN…ET ANICIAE ITALICAE	79	4

Table 4.25: Identified water features in building IV, ii, 1.

Description of Water Features

The excavation of numerous lead *fistulae* (features 67, 78, 79) in the *cardo maximus* around the entrance to the bath building have provided invaluable epigraphic data concerning the ownership

history of this bath building.[396] Although individual pipes cannot be associated directly with specific bath basins, they prove a continuity of aqueduct-fed water. In the caldarium of the baths (room 3), there are two rectangular pools on the north and south wall of the room (features 10 and 11 respectively). Although the water supply and drainage of feature 11 is unclear, a half-cappuccina channel (feature 14) in the service room 16, appears to be connected to the basin's water supply. This type of feature is usually part of drainage systems, but its height of more than 1.5 m above the current ground level makes this unlikely. The channel passes through the center of a pier that lies next to numerous openings through the west wall of *praefurnium* 15c. Given the concentration of water supply features in the eastern section of the building, feature 14 likely held a pressurized water pipe that entered through the upper back wall of basin 11.[397] The water supply to the northern caldarium basin (feature 10) is also unknown, however the drainage system is visible on the north side of the basin itself.[398]

Directly north of the caldarium basin (feature 10), is an L shaped drain (feature 13) that runs along the south wall of room 4 before turning 90° to the north. The L-shaped section has a half-cappucina shape, and its drainage function is proved by feature 115, a rectangular channel on the north wall of room 4 that extends slightly under the floor of room 9 of the bath building. The roof of drainage channel 115 is made by two roughly cut blocks of travertine.[399] In the southeastern corner of room 4 is a partially preserved *in situ* ceramic channel (feature 65) that descends from west to east on a roughly 45° angle. This is made from two *imbrices* placed together, and acted as a drain from an upper floor. Its drainage function is corroborated by a heavily damaged channel (feature 66), which is dug ca. 1.72 m into the other side of the same wall, in service area 15a. The presence of an upper floor here is substantiated in this part of the building by the staircase in the service room 15c.

In the northeastern corner of room 7a is a cappucina sewer (feature 119) section. The sewer could be identified continuing to the south for ca. 1.30 m before turning to the east, under the floor of room 14c. Built into the floor of room 7c is a square manhole cover (feature 7), which has 3 almond shaped openings. This covers a rectangular drain (feature 91), which runs in an E-W orientation parallel to the walls of room 7c. This drain likely was responsible for removing water from the floor, as the *frigidarium* directly to the north has its own drain. The marble clad *frigidarium* (feature 18) in room 8 contains a colorful fresco of Europa sitting astride a Zeus-bull and is entered by walking down several reconsolidated marble steps.[400] A short piece of lead *fistula* (feature 46) is present in the west wall of this cold pool and connects with an aedicula-style niche,[401] pointing to a possible supply source from the large cistern discussed below in building V, ii, 5. A small circular drain (feature 95) is visible at the north end of the frigidarium's floor. As the initial excavation photos show very few walls preserved above ca. 2.0 m, a modern creation date may apply to the water features in this *frigidarium*. In the bath's main room (room 9), rectangular downshafts (features 2, 3) were built into the east side of the two central brick piers. These are central pillars of the bath, immediately visible upon entering, and would have accentuated the highly decorated large *frigidarium* (feature 64).[402] A third rectangular vertical channel (feature 1) is present on the north side of this *frigidarium*, but instead of running the entire vertical length of the surviving wall, the vertical shaft turn 90° ca. 1.20 m from the ground. Instead of conducting water downwards, this channel likely held the pool's supply pipe; this interpretation is supported by the impression of a *fistulae* pipe (feature 4) on the internal north wall of the pool. The

[396] Geremia Nucci 2000, 400 for a discussion on Valerius Faltonius Adelfius and his wife Anicia Italica, expanding Barbieri 1953, 170, no. 32α (VALERI. FALTONI.ADELFI.VC. ET IN= *Valeri Faltoni Adelfi v(iri) c(larissimi) et in(lustris)*); See section IV, ii, 2-3 below for additional *fistulae* evidence.

[397] SBAO A1848 (inv.1848) for feature 14; SBAO B3645 (inv.6134) for a view on the number of holes in the west wall of room 15c.

[398] SBAO B3652, D1310 for a trial sondage in room 3.

[399] SBAO B3651 (inv.6140), B3653 (inv.6142) for the two travertine support stones of feature 115.

[400] Calza & Nash 1959, Pl. 89 for this room.

[401] See below, section IV, ii, 2-3, feature 47.

[402] Stöger 2011, 82 for a visibility analysis of this frigidarium.

southwest corner of the pool has a drain (feature 106) below the lowest step that proceeds ca. 4.00 m into room 9 at a NE-SW angle. During the excavation of the marine-lighthouse mosaic in room 13b, a sewer was identified running at a roughly NW-SE angle across room 9 (feature 82).[403] Directly where the public and functional sections of the bath meet (between rooms 9 and 17), there is a circular travertine cover stone (feature 5). This lies directly above the intersection of two drainage channels (feature 93 and 95). Interestingly, a glimpse inside this channel revealed that the two channels are not linear or perpendicular, but rather, they radiate from under the drain at a roughly 45^0 angle (Figure 4.113).

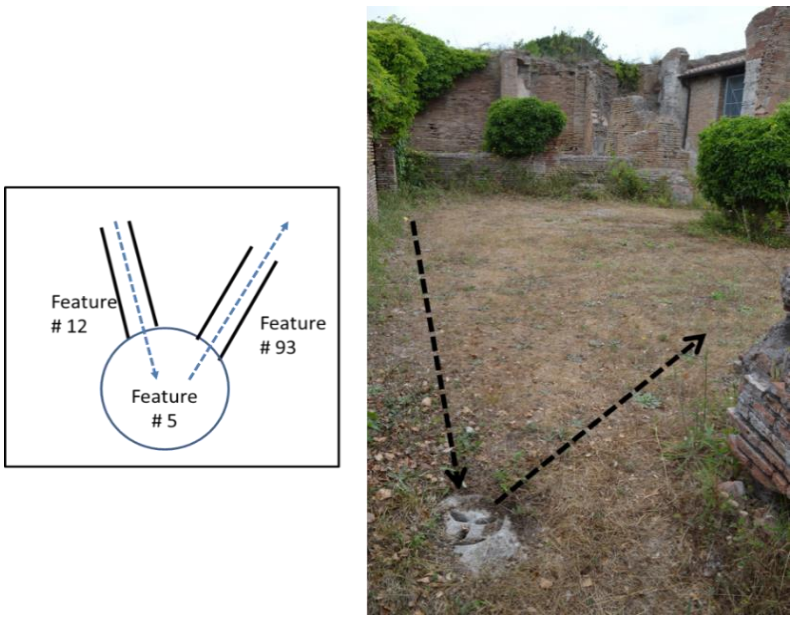

Figure 4.113: Plan of the orientation of the drains 12 and 93 in relation to the manhole cover (feature 5). The dashed lines indicate the direction of flow through drains 12 and 93.

A multi-seater latrine was installed in room 10 in the Severan period, contemporary with the larger development of the northern area of the bath. Multi-seater latrines are known in conjunction with several other bath buildings at Ostia, and a nearby parallel comes from the southwest corner of the Terme del Foro (I, xii, 6). The latrine in the present case likely drained into the sewer running under the *cardo maximus* (feature 114). Although described as a latrine by previous research, the present study could not find any trace of the architectural or hydraulic features associated with multi-seater latrines.[404] On the east side of the building is the long rectangular service corridor (room 17), punctuated by three *praefurnia* (rooms 15a, 15b, 15c), which warmed the *caldaria* and hypocaust floors of room 3. On the east side of room 15b, there is an east-west projecting wall of *opus latericium*; at ground level is a half cappucina drain (feature 83) piercing the bottom of this wall. The eastern wall of room 17 divides the baths and the Campo della Magna Mater. The six preserved brick piers running along the internal face of this wall all contain a horizontal rectangular channel (features 15, 104, 16, 105, 19, 80) that runs at ground level. The internal dimensions of these channels differ, yet they all have a similar large *bipedalis* as their roof. Based on the two contiguous *fistulae* preserved in the north-most pier (feature 20), these pipes must have extended the entire length of the service corridor. It is interesting to note here that the southern wall of room 11 contains many irregularly placed rectangular openings, including one in the southwest corner (feature 21). Together with the supply pipes immediately south of this wall, it is possible that this room acted as a kind of distribution space for various water features.[405] The

[403] GdSc 29, 14 (18-12-1941): *"Nel ripulire una fogna che* ***traversa obliquemente la sala centrale*** *adiacente a quella con mosaic marino nelle Terme del Faro, si trovano mescolati con la terra di riempiemento alcuni frammenti di iscrizioni..."*, emphasis added.

[404] Jansen 2002, 178, note 240 includes this latrine in a list of other multi-seater latrines in baths.

[405] Gorgato 1998, 109-112 suggests this, although this room appears heavily rebuilt.

structure designated by the author as room 18 (feature 90) is puzzling given its present isolation and poor state of preservation. It is here proposed that this structure in fact was a small *castellum*-fountain structure, given the similarity of its ground plan to the nymphaeum III, vi, 4 near the Case a Giardino.[406] The structure is heavily overgrown, yet possesses an interesting combination of building techniques, including *opus latericium* and *opus quasi-incertum*, as well as an *opus spicatum* paved space to the south east (room 18c; Figure 4.114, see also Figure 4.111 above).

Figure 4.114: Feature 90 directly south of the Terme del Faro (IV, ii, 1) (SBAO B3714).

Infrastructure Chronology

Roman Water Footprint #1 (4th century B.C.- AD 50)

No known water features.

Roman Water Footprint #2 (AD 50-200)

The archaeological traces of the building's first water system can be securely dated from epigraphic evidence to the mid-2nd century AD.[407] This *fistula* pipe (feature 67) supplied the early bathing complex, focusing on the hot room 3 (features 10, 11) and the service room 4 (features 13, 115).[408] The cold room 8 (features 18, 95) also was likely fed at this time; this arrangement changed in the Severan period with the addition of the Europa fresco and supply by means of a lead pipe (feature 46). Given the *opus reticulatum* within the lowest level of several walls in feature 90 (especially in room 18a), this feature also dates to this period, perhaps as a storage room for the bath building. Room 9 is where the majority of the drainage features converge. The central drain line is likely feature 82, which begins at the cappucina drain (feature 95). The downshaft in the southern pier (feature 3) emptied into this drain as it heads at a roughly NW angle through room 9. It is also possible that the drain 91 from room 7c drains into sewer 82 as it heads toward the street. Upon entering the bath's corridor toward the *cardo maximus*, downshaft 2 and drain 119 are placed so as to empty into the main sewer. From this point, the sewer would continue into the main *cardo* sewer (feature 114).

Roman Water Footprint #3 (AD 200-300)

In the Terme del Faro, the epigraphic evidence from this period points to a complete re-building of the hypocaust system (in rooms 1, 3, 5 and 6), as well as the insertion of a multi-seater latrine (feature 17),

[406] RS II, 218 for the nymphaeum at III, vi, 4.
[407] Geremia-Nucci 2000, 389.
[408] SBAO B3654 (inv. 6143), C 2149 (inv.8693), C2153 (inv.8699) for this room.

the two *caldaria* (features 10, 11), and the *frigidarium* (feature 64).[409] In connection with *fridarium* 64, drain 106 was installed and connected to the existing drainage system from the previous period. Additionally, the drains leading out of room 4 (features 13 and 115) were created to connect with the previously created sewer line (feature 82), where it begins at feature 5. This accounts for the otherwise strange combination of sewer directions here (

Figure 4.115).[410] A supply line (features 1, 4) fed *frigidarium* 64, perhaps connected to the lead pipe naming a Servius Scipio Orfitus (feature 78).[411] In connection with the insertion of the large cistern in IV, ii, 5, a door that previously connected the bath to the central *insula* courtyard was blocked up.[412] In this period the Europa *frigidarium* (feature 18) was redecorated, with the drain (feature 95) and supply (features 46, 47) rebuilt.[413] The brick piers added on the inner face of the wall dividing the *insula* from the Campo della Magna Mater date to this period as well, as the piers are not integrated into the wall but built against it. The rectangular channels(features 15, 16, 19, 80, 104, 105) that pierce these piers and the contiguous lead pipes (feature 20) date to the period of the large Severan overhaul of the bath building. Their length is the interesting factor, as it expands the reach of the pressurized water system to the south of the insula, where there are very few water features. This could imply that piped water came not (only) from the *cardo maximus*, but also from the supra-mural water line already in existence since the Hadrianic period.[414]

It is here postulated that feature 90 was at this moment transformed into a localized *castellum divisorium*/nymphaeum with a connection to the larger urban network. Given the vicinity of the Republican wall and the similarities to the nymphaeum in III, vi, 4 mentioned above, this feature acted both as a small cistern for the baths and for the southern part of the insula. The *opus spicatum* floor (18c) would indicate a high degree of foot traffic, which would be difficult to account for given the liminal placement of this structure.[415] A localized pressure system could also account for the variable heights of some of the supply channels in the bath building.

[409] GdSc 33, 107 (13-7-1964).
[410] Stöger 2011, 167 also identifies this space as significant to movement patterns in the baths.
[411] Barbieri 1953, #28α; GdSc 26, 78 (20-2-1940); Geremia Nucci 2000, 386.
[412] SBAO D1318 (inv. 10243) for a window at the top of the west wall of room 7c; see section IV, ii, 5 below.
[413] Clarke 1979, 51-52, describes the lighthouse mosaic as having an asymmetrical juxtaposition of figural elements that contrasts strongly with 2nd and early 3rd century mosaics given their lack of directional cues.
[414] Bruun 2002, 170 records *fistulae* (# A2a) discovered in front of the temple of Magna Mater dating to the Hadrianic period: (…*sub. cur. proc. patri(moni)*), C.I.L. XV, 7739α; Bukowiecki *et al.* 2008, 158 for the Hadrianic date of this supra-mural line.
[415] Stöger 2011, 184, fig. 6.17 shows that this is the least spatially connected part of the entire insula.

Figure 4.115: Dashed lines indicate reconstructed drainage lines in the 3rd century (after Stöger 2011, 79, Fig. 5.16).

Roman Water Footprint # 4 (AD 300-600)

In the final period of the bath's life, epigraphic evidence dating to ca. 420 AD testifies to the continued vitality of this bath building.[416] In terms of drainage, we have the insertion of a drainage pipe composed of two clam-shelled *imbrices* (feature 65) roughly hewn into the south wall of room 4, as well as a rectangular hole (feature 66) cut into the other side of the same wall (15a).[417] Together with the half-cappuccina drain (feature 83) these three drainage features may point to a higher ground level in this part of the bath building in this time period. As mentioned above, the bath underwent several

[416] The lead pipe (feature 79); Barbieri 1953,# 32α; Bruun 1991, 288; Geremia Nucci 2000, 400 for Valerius Faltonius Adelfius and his wife Anicia Italica; AE 1954.180; GdSc 26, 78 (20-2-1940).
[417] See SBAO D1296 (inv.10220) for restoration of this wall.

architectural transformations in this period, with walls closing off rooms (rooms 1, 4, 6, 7c) (Figure 4.116), and stairways connecting the bath to the Campo della Magna Mater (rooms 10, 11).[418]

Figure 4.116: Late Antique doorway blocking *in situ* in 1964 at left (GdSc 33), and wall removed for accessibility seen in 2015 (by author).

Conclusion

Although many of the bath building's water systems appear isolated from the rest of the insula, a systemic view reveals its connection to the wider insula, and to the larger urban networks of supply and drainage. The bath's total renovation in the Severan period follows a wider contemporary trend in Ostia, in which many bath buildings were renovated or built *ex novo*. Its modifications in the Late Antique period also match the broader trend in Ostia of subdividing internal spaces.[419] Especially the blocking up of walls to the heated rooms suggests an end, or at least a reduction, of the thermal capabilities of the building in its final phase.

[418] SBAO D1310 (inv.10226) shows no wall originally between feature 10 and room 15a.
[419] See section 4.2 for a discussion of wider trends in construction in Late Antique Ostia.

IV, ii, 2 and 3: Portico e Caseggiato dell'Ercole

Figure 4.117: Identified water features in IV, ii, 2-3 (after Stöger 2011, 93, Fig. 5.35).

Location in insula

The Portico and Caseggiato dell'Ercole are located on the north side of insula IV, ii and present a ca. 65.00 m face onto the *cardo maximus* (Figure 4.117). A row of square rooms are accessible from the street through the brick-piered portico, and only the rooms in the eastern section (rooms 5, 6, 8-19) are connected to back rooms of equal dimension. However, all of the southern facing rooms open onto a broad trapezoidal courtyard. Evidence for the use of several of these rooms as *tabernae* is known for rooms 3, 5, 8, and 21. The northwest corner of the portico lies ca. 10.00 m across the street from the southern entrance to the Terme del Foro (I, xii, 6) courtyard, and at the place where the *cardo* changes direction; this suggests a prime location for the shops. The caseggiato also includes three rooms to the south that likely had an industrial function (28, 29, 30), and a courtyard entrance with an *opus latericium*

wall niche.[420] These three southern rooms are to the north of building IV, ii, 6, and to the west of building IV, ii, 4. A stretch of sidewalk frames the western face of the Caseggiato along the Via del Caupona, extending only the length of the Caseggiato and not including the portico on the *cardo maximus*, or the subsequent buildings to the south. The originality of this and other sidewalks has been seriously called into question by recent research.[421]

History of Excavation and Restoration

The building was excavated between December 1939 and July 1940 and immediately underwent consolidation and restoration. This applies especially to the piers along the *cardo maximus*, some of which are precariously unstable at the time of writing, necessitating the closure of the entire insula to the public. At the same time as the initial excavation-restoration, several walls from the last period of the insula's life were torn down to create a more harmonious *mise-en-scène*.[422] A relief of Heracles holding a club and wearing a lion skin was found among the rubble of the portico and was used to name the entire caseggiato-portico complex. The portico and caseggiato are studied together given their interconnectivity and contemporary building phases.

Phasing and Comments

Offering a frontal view onto the *cardo maximus* and close to the Porta Laurentina, evidence of an earlier domus from the Republican period is attested in the western half of the caseggiato, around rooms 17/18 and 21.[423] Evidence of this earlier domus also comes from two wells, which survived the raising of the ground level in this part of the city in the early 2nd century, and were incorporated into the later Caseggiato and Portico dell'Ercole. Based on brick stamps the major building phase of this structure dates to AD 160-170, when the *opus latericium* structure was built against both the *opus reticulatum* of the Caupona del Pavone, and the *taberna* of the earliest phase of the Terme del Faro (IV, ii, 1, room 13).[424] The portico was built in alignment with the existing *taberna*, forming a cohesive visual face of the insula; this was contemporary with the creation of the portico along the western side of the Terme del Foro, monumentalizing the street into a unified view of multi-story porticoes. Supporting brick piers were placed in the corners of several rooms of the caseggiato. The western rooms of the caseggiato (rooms 21-26), lacking these piers, seem to have been added slightly after AD 170; the brick piers in front of these rooms are off-center in comparison with those to the east and are likely also from the same later phase.[425] Additionally, the eastern wall of hallway 20 has a massive relieving arch of red-painted *bipedales* with white-painted mortar to support the dual staircases at the end of the original group of structures.[426] The caseggiato has evidence for at least one upper floor, indicated by staircases spread throughout the caseggiato (rooms 2, 17/18, 19, 21, and 28). The large room 30 originally was divided by more walls, as indicated on Calza's plan,[427] yet these are not preserved. The once vibrant wall paintings in taberna 8 date from the mid-3rd century.[428] Two late walls of *opus vittatum* were recorded in the courtyard by archival photographs, and plans from the initial excavation. One of these walls continues the eastern wall of IV, ii, 04 at least as far as incorporating the courtyard fountain (feature 68).[429] The second of these walls continues the line of the Caseggiato dell'Ercole's hallway 1 to the south to the stairs of the cistern (IV, ii, 05, room 14 below). These walls indicate a later division of the open space of this courtyard, and of the entire insula.

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[420] Bakker 1994, 230, dates this niche to the period of Marcus Aurelius.
[421] Stöger 2011, 96 for the sidewalk; Claire Weiss, pers. comm. doubts the originality of these sidewalks.
[422] Bakker 1994, 90.
[423] Stöger 2011, 96.
[424] SO 1, 226 for Bloch's reading of the brick stamps.
[425] Stöger 2011, 100 for these piers.
[426] Meiggs 1973, 240.
[427] SO I, plan sec. 13.
[428] SBAO B2949, R4260 (no.9) for the taberna in a 1986 snowfall.
[429] Rinaldi 2012, 76; SBAO B3036; See below IV, ii, 5 for these archival photographs.

Water Features Chart

The following hydraulic features are located in buildings IV, ii, 2-3, (Table 4.26).

IV, ii, 2-3 Room #	Feature	Description/Position	Feature #	Roman Water Footprint Phase
3	basin	within bar counter	88	2
6	fountain basin	SE corner of room	24	3
6	Pb fistula	NE corner of basin #24	75	3
6	channel	E wall	130	3
7	rectangular downshaft	E wall of hallway	23	2
7	circular downshaft	W wall-continues upwards	22	2
8	bar basin	within bar counter	94	2
8	Pb fistula	leads to the W	142	3
8	sewer	N of bar counter	117	2
8	manhole	floor drain directly N of rm 08	25	2
8	sewer	E-W sewer branch	92	2
8	sewer	N-S sewer branch	127	2
14	rectangular downshaft	W wall-N face of pier	26	4
17/18	well	center of room	27	1
20	rectangular downshaft	E side hallway	28	2
21	well	between rm 20 and 21	29	1
Cardo Maximus at portico	Pb fistula	OFI(cina).IVLI.MARCIHNI	83	3
Cardo Maximus at portico	Pb fistula	M AVRELIVS PRIMVS FEC	133	2?
Cardo Maximus at portico	Pb fistula	EX OFF A METILI T(hreptionis)	134	2?
Cardo Maximus at portico	Pb fistula	M AVRELIVS PRIMVS FEC	135	2?
Cardo Maximus at portico	Pb fistula	SCIPIONIS ORFITI	136	3
Cardo Maximus at portico	Pb fistula	EX OFF A METILI THPEPTIONIS	137	2?
Cardo Maximus at portico	Pb fistula	VQ. FAV	138	2
Cardo Maximus at portico	Pb fistula	M.AVRELIS PRIMUS FEC	139	2?
Cardo Maximus at portico	Pb fistula	SCIPIONIS ORFITI	140	3
Cardo Maximus at portico	Pb fistula	EX OFF AMETILI THPEPTIONIS with 10 pointed star	141	2?

Table 4.26: Identified water features in the Portico e Caseggiato dell'Ercole (IV, ii, 2-3).

Description of Water Features

In the easternmost taberna of the caseggiato (room 3), is a bar counter with its ground level basin (feature 88) that projects out into the room (Figure 4.118).[430] Continuing into the southeast part of the

[430] Hermansen 1982, 162 (no. 26) for the bar counter.

building, in the southeast corner of room 6 there is a fountain basin (feature 24) with a lead *fistula* fragment in situ (feature 75).[431]

Figure 4.118: Bar counter with its projecting floor level basin, feature 88, (Stöger 2011, 88, Fig. 5.29).

The pipe fragment is likely the product of modern restoration to the basin, but the supply channel for the fountain is original (feature 130). This channel passes from hallway 7 through the east wall of room 6 into the basin, and was likely supplied by the large cistern (feature 36). Hallway 7 also has vertical channels recessed into its western and eastern walls that are roughly across from each other. The semi-circular downshaft (feature 22) on the western face of this wall (feature 22) continues the entire height of the wall. This vertical downshaft continued into the upper floor of the building, and is visible on the landing at the top of the staircase of room 2. Compared with other combinations of downshafts and staircases in Ostia, this is evidence for a drop-toilet on an upper floor.[432] On the eastern wall of hallway 7 is a rectangular channel (feature 23) built as part of the wall. Unlike a typical downshaft, it does not continue up the entire height of the wall, but at a height of ca. 1.50 m from the floor turns 90^0 horizontally into the neighboring room 7a of IV, ii, 1.[433] This elbow joint makes it unlikely that feature 23 was part of a drainage system, and should instead be interpreted as part of a pressurized supply system using an inverted siphon.

The bar counter in room 8 was built directly against the east wall of this room, facing the *cardo maximus*. Underneath the marble covered barrel vault of the bar is a water basin (feature 94). It was supplied by a lead pipe (feature 142) that entered from the doorway between rooms 1 and 8 (Figure 4.119).[434]

[431] For this fountain see: RS II, 132 (sch.123); SBAO D1188 (inv. 10113), filed in the Ostia archives under IV, ii, 04.
[432] Hobson 2009, 71 for drop-toilets.
[433] The same orientation as the downshaft (feature 1) in IV, ii, 1.
[434] Hermansen 1982, 163.

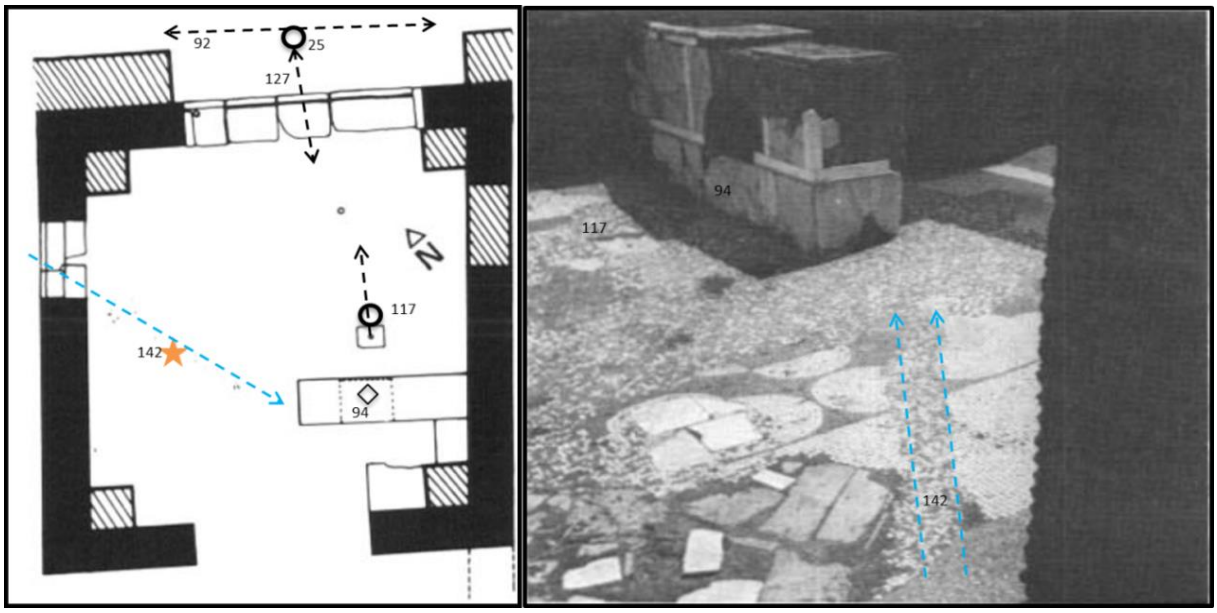

Figure 4.119: Hydraulic features in connection with the bar counter in room 8, with the line of the lead supply pipe indicated on the right picture by dashed lines (Hermansen 1982, 164, Fig. 101; 165, Fig. 100).

The disrupted tesserae of the mosaic in room 8 indicate that the pipe was inserted after its creation, and that the pipe entered from room 1. The water from the bar basin drained out through a sewer line directly in front of the bar counter (feature 117), which sloped downwards towards the north. Directly in front of the threshold of taberna 8 and within the floor of the portico is a square marble manhole cover (feature 25) with 3 almond shaped holes. The position of the manhole cover only two meters from the street would suggest a direct exit into the city's main *cardo* sewer (feature 114). However, internal inspection of the drain revealed that it was built in a T shape, with one branch (feature 92) running parallel to the portico (in an E-W direction), and the perpendicular line (feature 127) leading south into the taberna in room 8. From the trajectory and type of sewer (cappucina) we can infer that drain 92 is a major line that continues under the portico in both directions before emptying into the central sewer. In contrast, the flat-roofed *opus latericium* section that connects to the taberna (feature 127) is similar to other smaller secondary drains observed in other buildings of the insula.

A rectangular downshaft (feature 26) is present in room 14, which faces onto the *cardo* (Figure 4.120, Figure 4.121, Figure 4.122). However, in this case, the vertical rectangular channel is not built into a wall, but rather is situated in the north face of an oddly placed pier on the western side of the room. Unlike other later piers identified in this insula, which are placed against corners or load-bearing piers, this pier is keyed into the middle of the length of the wall, and the channel is roughly cut into the western wall of room 14.[435] This poses a puzzling sequence of construction, whereby an existing rectangular downshaft within the west wall of room 14 acted as a grafting site for the later brick pier 26. Given the consistently thick coating of calcium carbonate ($CaCO_3$), and the shape of the brick pier, this structure is here interpreted as a water distribution tower of the type known from Pompeii and Herculaneum.[436] The rectangular shaft would then have held vertically placed lead pipes bringing water to a (now-lost) basin on top of the tower. This system of using pressurized water (inverted siphons) was not previously known at Ostia, and based on the bricks used, must date to the late 3rd or early 4th century AD.[437]

[435] For an expanded discussion on inverted siphons and urban water towers, as well as the dating of this feature, see Locicero 2017.

[436] Camardo *et al.* 2006 for the two water towers known in Herculaneum; Olsson 2015 for the water towers in Pompeii;.

[437] Heres 1982, 123, Fig. 32.4 for similar masonry style in the piers along the *decumanus* dated to AD 350.

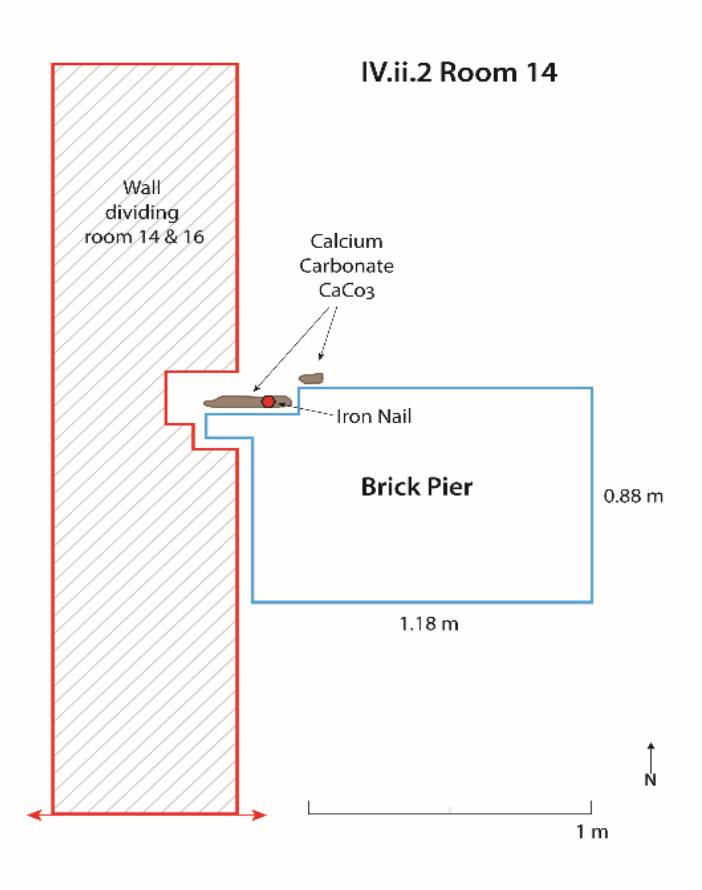

Figure 4.120: Schematic ground plan of feature 26.

Figure 4.121: Archival photograph of feature 26 viewed from the north when it was excavated in December 1940 (SBAO B2916).

Figure 4.122: The water tower (feature 26) viewed from the north in 2016, with the white coating of calcium carbonate visible on its inner lip.

There are two wells in the caseggiato (room 17/18 and 21), which are surviving elements from the earlier Republican *domus* here. The well in room 17/18 (feature 27) has a fluted marble well-head and its stubborn persistence through the early 2nd century ground raising of the area is the reason for its location in the center of a small stair room.[438] The second well (feature 29), is also in a strange position in the eastern part of the caseggiato, namely in the middle of a wall separating a taberna from a hallway (room 20). Given the unusual internal dimensions of the well, it appears that the original position of the well would place it directly within hallway 20, and that its shaft was built up at a roughly 45° angle towards the west (Figure 4.123).[439] This would have allowed access to the well water both from within the taberna and from the hallway of the caseggiato.

[438] RS I, 45 (sch. 32) for the well.

[439] Hermansen 1982, 165-166 (no. 28); RS I, 45 (sch. 31); The opening of the well extends 30 cm into hallway 20.

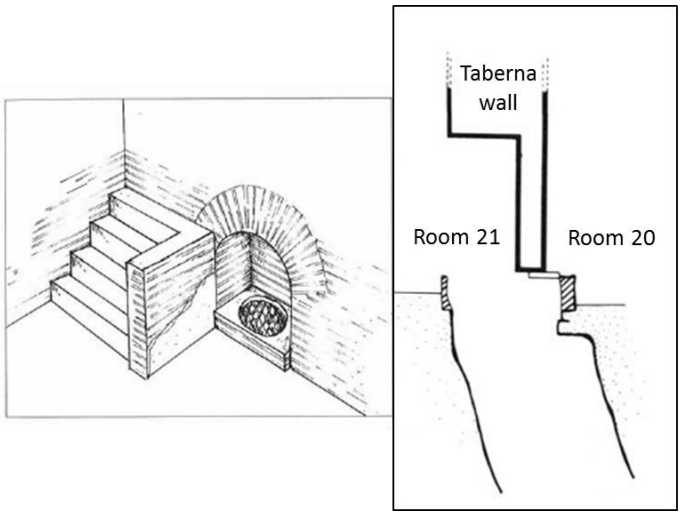

Figure 4.123: Reconstruction of feature 29 viewed within room 21 (RS I, 45, Fig. 52). Cross section of feature 29, with room 21 on the left and room 20 on the right (Hermansen 1982, 166, Fig. 105).

The eastern face of hallway 20 contains a rectangular downshaft (feature 28) that exists for the entire preserved height of the wall and is coated with sinter to a varying thickness.[440] The placement of a downshaft within a hallway seems uncharacteristic for this architectural feature, however, its corroborates the structural sequence of the caseggiato: this wall was originally built as the external wall of the building unit (rooms 1-20). Slightly later, rooms 21-26 were added onto the western side of the caseggiato. More than a dozen sections of lead pipes were found in the vicinity of the portico and the *cardo maximus* in 1940 (features 83, 133-141) with little precise indication of their original location.[441] Several prominent *plumbarii* (lead pipe manufacturers) from Ostia are represented in this group, namely the Aurelii and the Iulii, who predominantly date to the 2nd and 3rd centuries AD.[442]

Infrastructure Chronology

Roman Water Footprint # 1 (4th century B.C.- AD 50)

From the earliest period of the insula's history are two wells (features 27, 29). The stubborn survival of these through multiple ground level changes attests to their continued importance for the insula's inhabitants.

Roman Water Footprint #2 (AD 50-200)

With the creation of the Portico and Caseggiato dell'Ercole comes the creation of several water features, as well as the main architectural structure of the wider *insula*. The two bar counters were added slightly later (features 88, 94), taking advantage of thirsty travelers arriving through the Porta Laurentina. In the latter, a sewer line (feature 117) was also created to drain water out of the bar and into the sewer line (features 127 and 92) running under the portico. Downshaft 22 certainly continued into the ground, and likely proceeded toward the *cardo maximus*, where it either emptied into the main sewer, or into the branch of drain 92. The sharp right angle turn taken through a wall by feature 23 suggests a supply function (with pressurized pipes), and may be related to the Terme del Faro or the original changing room (*apodyterium*) of the baths (IV, ii, 1, room 7a).

Feature 28 acted as a drain from the upper floors of the caseggiato, however, the uniform coating of sinter ($CaCO_3$) makes this interpretation more problematic, as this formation is associated with the karstic (limestone) source of the long-distance aqueduct lines, and not from the sand-percolated ground

[440] SBAO B2912.
[441] The three lead pipes discussed above in IV, ii, 1 (features 67, 78, 79) were also found in this context.
[442] Bruun 1991, 309 for a list of several prominent *plumbarii* families in Ostia.

water of the city.[443] Should we imagine that the aqueduct-fed water from the courtyard fountain (feature 68) was physically transported upstairs and drained through upper floor kitchen-toilet structures? The majority of the lead pipes found around the portico date to this period (features 133,[444] 134,[445] 135,[446] 137,[447] 138,[448] and 139[449]). Although some of the pipes were connected to each other, this does not imply a unified system, or that they were even connected to water features within insula IV, ii.

Roman Water Footprint # 3 (AD 200-300)

As described below in section IV, ii, 5, this period witnessed the insertion of the large cistern less than 3.00 m to the south of the rooms of the caseggiato. While its technical details will be explained more thoroughly below, it suffices here to say that several *in situ* lead pipes and channels are preserved in the northern wall of this cistern. As the fountain (feature 24) is fed by a channel (feature 130) in the south part of hallway 1, it can be deduced that the creation of this fountain is directly linked to the cistern.[450] Also in this time period, the water supply to the taberna in room 8 changed: a lead pipe line (feature 142) was installed that entered from hallway 1.

Roman Water Footprint # 4 (AD 300-600)

The water tower dates to the late 3rd or early 4th century based on the quality and style of its *opus latericium*. The vertical channel of the tower (feature 26) was built against an existing downshaft within the west wall of room 16. However, the calcium carbonate that coats the channel of the tower is completely absent from the downshaft. This means that the downshaft continued to function after the tower was built, and the calcium carbonate was blocked from forming on the inner face of the downshaft because it was protected by a section of wood.[451]

Conclusion

The water features in the Portico e Caseggiato dell'Ercole present a very stable hydraulic history over time, where new elements were added to earlier systems. Buildings IV, ii, 2-3 manage to look both outward, with their bars, and inward, by means of the later water tower. This water tower offers strong support for the continuity of hydraulic investment in the later period of the city's life, and implies the connectivity of the Portico with other buildings in *insula* IV, ii, or perhaps to a neighboring *insula*.

[443] Meiggs 1973, 249, "No rooms yet found in *insulae* are heated, and upper floors could have no running water…"; Dig. I, 15, 3.4 states that tenants in the upper floors of apartment buildings were required to keep water in case of fire: *"praeterea ut aquam unusquisque inquilinus in cenaculo habeat, iubetur admonere (praefectus vigilium)"*.

[444] Barbieri 1953, #28β; GdSc 26, 78 (20-2-1940).
[445] Barbieri 1953, 182; C.I.L. XV, 7739β (=XIV, 1997); GdSc 26, 84 (8-3-1940).
[446] Barbieri 1953, #28β; GdSc 26, 90 (27-3-1940).
[447] GdSc 26, 98 (8-4-1940).
[448] Barbieri 1953, #48; GdSc 26, 98 (8-4-1940).
[449] Barbieri 1953, #28β; GdSc 26, 98 (8-4-1940).
[450] RS II, 132 (sch. 123) dates this to the late 2nd century AD.
[451] Such coverings are inferred from the frequent pairs of nails preserved around other downshafts in insula IV, ii and in other parts of Ostia (e.g. Chapter 3.1: III, i, 1, feature 4).

IV, ii, 4

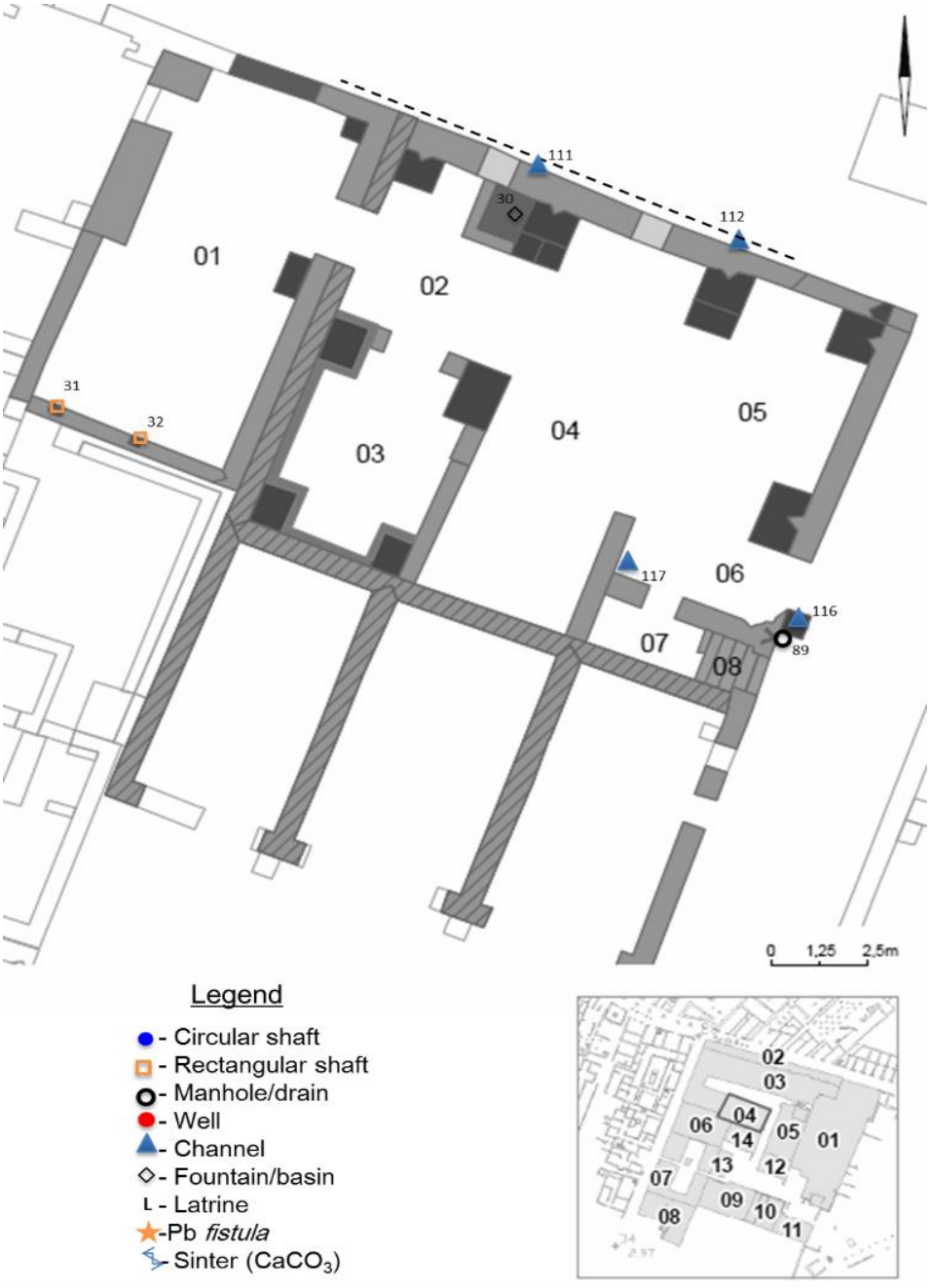

Figure 4.124: Identified water features in IV, ii, 4 (after Stöger 2011, 107, fig. 5.52).

Location in insula

Building IV, ii, 04 is located within the northern courtyard of the *insula* (Figure 4.124). Its current entrance is on the eastern side, and opens onto the corridor connecting the northern and southern courtyards of the *insula*. Three windows open onto the originally basalt-paved northern courtyard. The building is buttressed by numerous large piers in the corners of almost every room; these are much larger and thicker than in other parts of the *insula*. The internal space is divided into four roughly rectangular areas, with a small stairway room (room 7) squeezed underneath a later stairway (room 8). Room 1 originally was open to the industrial space 30 of IV, ii, 2-3, as well as onto the northern courtyard

of the *insula* but this was later sealed up. A doorway was also later sealed between room 4 and IV, ii, 14, room 2.[452]

History of Excavation and Restoration

This building is located in the heart of the *insula*, and is interpreted as being for industrial purposes, based on the layout of its rooms.[453] Although not explicitly mentioned in the initial excavation reports, it is likely that this structure was also excavated in 1940 together with the other buildings of this *insula*. Also, like other structures in the *insula*, this building underwent consolidation work in the 1960s.[454]

Phasing and Comments

Based on brick stamps, the building IV, ii, 4 dates to the late Hadrianic or early Antonine period and shares a wall with the *tabernae* of IV, ii, 14.[455] The building initially had a wide doorway on the north side of room 1, which opened onto the northern courtyard of the insula. The construction of industrial space in this part of the *insula* has parallels with IV, ii, 5, 6, and 14. Large brick support piers were later installed in many other buildings in the block in the late 2nd century AD, yet in this structure several of the brick piers had *additional* piers added onto them.

Just as the northern courtyard of the insula, this building also originally sported a robust basalt floor. As mentioned in the previous section, walls visible only in the initial excavation photographs show later walls of *opus vittatum* present in the courtyard. These extended the eastern wall of IV, ii, 04 in a northern direction as far as, and including the courtyard fountain (feature 68). Together with the parallel wall of the same date, it appears that this connecting corridor acted to partially restrict the interconnectivity of the insula. Similar divisions of the internal layout of *insulae* from the 3rd and 4th centuries are known from other *insulae* at Ostia.[456]

Water Features Chart

The following hydraulic features are located in building IV, ii, 4 (Table 4.27).

IV, ii, 4 Room #	Feature	Description/Position	Feature #	Roman Water Footprint Phase
1	rectangular downshaft	S wall- W shaft	31	2
1	rectangular downshaft	S wall- E shaft	32	2
2	fountain basin	basin in NE corner of room 2	30	3
2	channel	external N wall of room 2	111	3
1-2-4-5	fistula channel(?)	runs along almost entire N external face of IV, ii, 4	112	2
6	channel	runs parallel to E side of IV, ii, 4; through later pier at doorway	116	3
6	drain	S of entrance to IV, ii, 4; on external SE corner at ground level	89	3

Table 4.27: Identified water features in building IV, ii, 4.

[452] See section on IV, ii, 14 below.
[453] Stöger 2011, 108, although she admits the limited evidence for this attribution.
[454] GdSc 32, 127 (6-7-1960).
[455] Stöger 2011, 106.
[456] Gering 2004 gives an overview of this subject.

Description of Water Features

Along the internal side of the northern wall of the building is a large fountain basin (feature 30), built against the corner formed by the double piers that subdivide this space (Figure 4.125).

Figure 4.125: North facing view showing basin 30 against the north wall of room 2 before consolidation (RS II, 136, sch. 125).

This basin was fed by a channel in the north wall of room 2 (feature 111). This channel is formed by a *bipedalis* brick extending over a rectangular space through the north wall of room 2. While the lead pipe itself is now lost, there is a narrow channel (feature 112) cut into the *opus latericium* wall where it meets the northern courtyard floor. While at first view this may seem like the effect of vegetation eroding the bricks, this is an intentional channel that has been covered in three places by angular brick fragments (Figure 4.126). At ground level the brick course has been replaced by an L shaped section tile, perhaps a reused section of hypocaust *tubulus*, or a section of roof tile *imbrex*. This channel runs for a length of ca. 17.50 m, from the northeast corner of the building until the blocked doorway in room 1. Although not technically a covered channel, the pipe would have been protected from the activities in the courtyard by the overhanging lip of the inserted L-shaped fragments.

Figure 4.126: View looking east at feature 112, from the northern courtyard of insula IV, ii.

Along the southern wall of room 1 are two parallel rectangular downshafts (features 31, 32). The eastern one of these shafts (feature 32) is less structurally coherent than its neighbor, and the bottom 0.50 m of its shaft was filled with rubble. These downshafts were not built as part of the *opus latericium* wall, but are of the tile-backed variety, and are composed of vertically placed *bipedales* set against the external wall of room 7 of the Caupona del Pavone (IV, ii, 6).

Three hydraulic features are clustered around the entrance to IV, ii, 4, hallway 6. Immediately south of the entrance is one of several brick piers in this hallway. Between the pier and the outer wall of this building is a small channel (feature 116), that is within the foundation of the pier placed below its bonding course (Figure 4.127). Where the channel emerges on the south side of the pier, it is covered by two bricks, which appear to protect it. Continuing along the outer face of the building, there is a partially blocked *cappucina* drain connected with room 6 of the building (feature 89).[457] There is evidence of bubbled sinter on the inner face of these *bipedales*, and the channel certainly continues much deeper into the ground that is currently visible.

Figure 4.127: View looking west at the eastern side of room 8 of building IV, ii, 4. The cappucina drain 89 and the southern end of channel 116 are indicated by the dashed circles. The black dashed line indicates the transition between the foundation and the upper courses of the wall.

Infrastructure Chronology

Roman Water Footprint # 1 (4th century B.C.- AD 50)

No preserved water features date from this period.

[457] SBAO B3705 (inv. 6194) shows this cappucina as well.

Roman Water Footprint # 2 (AD 50-200)

The two downshafts (features 31, 32) are from the earliest period of the building's use, when it was built against IV, ii, 6. They imply drainage from an upper floor, perhaps of rainwater. These downshafts likely drained downwards to the north, and were blocked at the same time as the north and west doorways of room 1. The long channel running along the exterior north face of the building (feature 112) dates to this period, as it does not continue across the wall closing off room 01.

Roman Water Footprint #3 (AD 200-300)

The basin (feature 30) is dated to this period based on its insertion against the substantial pillars added in the late 2nd or early 3rd century. This dating is supported also by the discovery of a lead *fistula* pipe, which ran the entire length of the northern courtyard of the insula, and is dated epigraphically to the late 3rd century AD.[458] The channel feeding the basin (feature 111) also dates to this period. During this period comes the first evidence of a supply and drainage system running down the central corridor of the insula, which will be synthetically treated in the subsequent section (4.2) as it involves four contemporary buildings. The drains and channels (features 89, 116, 117) are contemporary with the addition of the supporting piers in the courtyard. These piers in turn coincided with a change in elevation in at least this section of the insula, based on not only the height of the features today, but on their position securely within the foundation course of the piers. Given the calcium carbonate evidence within the *cappucina* drain (feature 89), it must have carried a pressurized pipe into the channel of feature 117.

Roman Water Footprint # 4 (AD 300-600)

No preserved water features date from this period.

Conclusion

Building IV, ii, 4 preserves evidence of its connection to the adjacent buildings of the insula, which increases in the Severan period (Roman Water Footprint #3). The rising ground level across the insula in this period caused the building to become more closed off, with only one opening onto the central corridor of the insula. The two tile-backed downshafts indicate an upper floor, but their destruction also suggests that the spatial arrangement of this upper floor apartment changed dramatically.

[458] See below section IV, ii, 5 (feature 76).

IV, ii, 5: Caseggiato

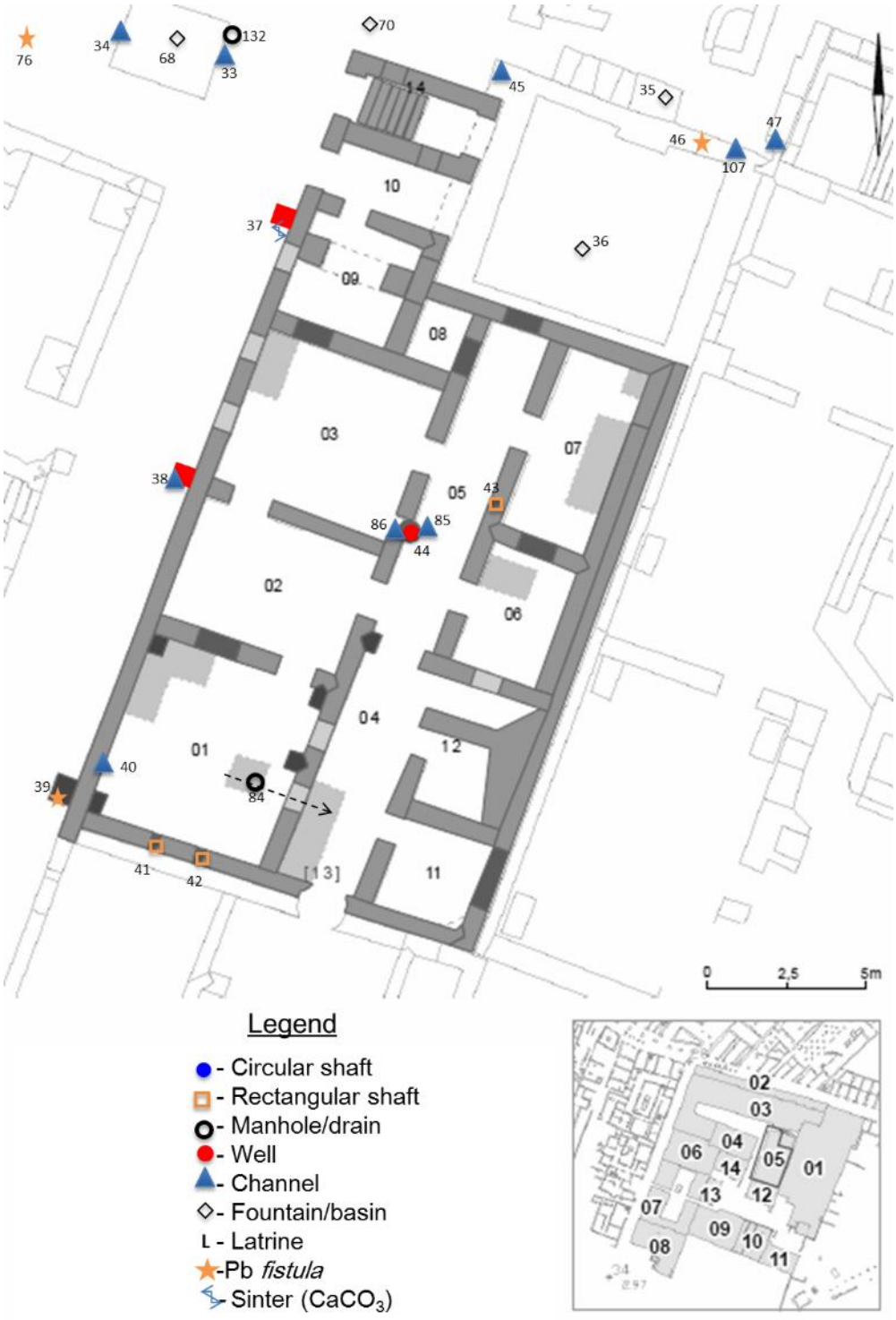

Figure 4.128: Identified water features in IV, ii, 5 (after Stöger 2011, 109, Fig. 5.55).

Location in insula

This building lies in the central core of the insula, and its eastern side is contiguous to the Terme del Faro (Figure 4.128). It is bounded on the south by building IV, ii, 12, and on the west by the central corridor that connects the two internal courtyards of the insula. The northern edge of the building is bounded by the large cistern (feature 36).

History of Excavation and Restoration

Like the other buildings of the *insula*, IV, ii, 05 was excavated in the 1938-42 period by Calza, and also underwent restoration in the 1960s. Several targeted excavation trenches occurred in 1994 and 1995 directed by Pellegrino, Falzone, and Olivanti, with the well-preserved wall paintings subsequently studied.[459]

Phasing and Comments

The main construction phase for this building is dated by an *in situ* brick stamp between AD 123-155, although it incorporates sections of Hadrianic reticulate.[460] The layout of the structure appears residential, with especially rooms 6 and 7 resembling *medianum* apartments, implying light entered only from corridor 5.[461] The building is divided into two parts by a central hallway (room 4, 5). The original entrance to this building was from the north, through hallway 5. At a moment in the later 2nd century, rooms 11 and 12 were inserted into the small courtyard (room 4), respecting the original layout and window in room 6. A strange architectural feature is present against the east wall of room 12, and resembles a broad triangular pier with a small dividing wall extending from its apex. This feature is far too large to act as a lateral support, and may be evidence of a changing arrangement of upper floor apartments.

In the Severan period a large cistern was created that blocked the northern entrance to the building, and a doorway leading into room 7c of the Terme del Faro (IV, ii, 1). A similar obstruction can be observed at the southern extent of the eastern wall (room 11), which would have led into the *caldarium* of the baths. As mentioned above, the Severan period is the most dramatic building phase for the bath building, when all its currently visible technological and artistic accoutrements were added. This would reinforce the interconnectivity of the baths with building IV, ii, 5 in the Severan period, when the orientation and entrance changed outwards, toward the *cardo*. A noticeable architectural feature of this eastern wall of IV, ii, 5 is the doubling of its walls, possibly linked to the late 1st century AD construction laws requiring walls to separate bath buildings from neighboring structures due to the heat.[462] The rooms on the opposite side of this eastern wall were all heated by large *praefurnia*, partially explored in the 1960s.[463] The southern extent of IV, ii, 5 exits into building IV, ii, 12, which will be discussed in greater detail below. However, the nature of the connection between these two structures is unclear, as the opening between them is very roughly preserved (Figure 4.129). Perhaps the staircase in the southeast corner of this building was used to access the upper floors of IV, ii, 5.

Additionally, building IV, ii, 5 seems to have been connected with the final architectural phase of buildings IV, ii, 4 and 14; it seems no coincidence that the corridor dividing these buildings has 3 sets of piers with their counterpart across the corridor. A coin of Gordian III (AD 238-44) was found, which points to the building's continued use into the later 3rd century CE.[464]

[459] GdSc 32, 125 (26-4-1960); GdSc 74 (1994-1995); Liedke 1995, 15 dates the wall paintings in room 6 to the Pre-Severan period.
[460] Stöger 2011, 112 for the brick stamp
[461] DeLaine 2004, 151.
[462] *Dig*. VIII, ii, 13.
[463] See Miliaresis 2013 for a recent study on heat transfer using computational fluid dynamics within the Forum baths of Ostia; baths were likely always kept at a minimum level of heat, since fully igniting a hypocaust system every day uses exponentially more fuel; See also Oetelaar *et al.* 2014, and the above discussion of building IV, ii, 1 for the *praefurnia*.
[464] Stöger 2011, 111, note 133.

Figure 4.129: View looking north at the current passageway between buildings IV, ii, 12 and building IV, ii, 5.

Water Features Chart

The following hydraulic features are located in building IV, ii, 5 (Table 4.28).

IV, ii, 5 Room #	Feature	Description/Position	Feature #	Roman Water Footprint Phase
1	fistula	external W face of W wall; S face of pier 3	39	3
1	drain	cappuccina shape, W wall near SW corner	40	3
1	rectangular downshaft	S wall, W shaft	41	2
1	rectangular downshaft	S wall, E shaft	42	2
1	sewer	E part of room	84	2
2	drain	cappuccina shape, external W face of W wall; S face of pier 2	38	3
3	ceramic pipe	bottom of well 44- E side	85	1
3	ceramic pipe	bottom of well 44- W side	86	1
5	rectangular downshaft	E wall	43	2
5	well	between rooms 3 and 5	44	1
9b	sinter	external W wall of room 9b; S face pier 1	37	3
15	channel	external NW corner	45	3
15	fistula	external N face	46	3
15	fountain niche(?)	semicircular niche where IV, ii, 5 (room 15) meets IV, ii, 1 (room 8)	47	2
15	basin	external N face at top of staircase	35	3
15	channel	external N face of cistern	107	3
15	cistern	cistern inserted into courtyard	36	3
16	channel	E face of courtyard fountain	33	2
16	channel	courtyard fountain- W side exit point of pipe	34	2
16	fountain	E part of N courtyard	68	2
16	drain	drain in internal bottom NE corner	132	2
16	basin	N of staircase 14	70	4
31	fistula	runs E-W length of internal courtyard	76	3

Table 4.28: Identified water features in building IV, ii, 5.

Description of Water Features

This building offers an exciting diversity of water features that may hold the key to understanding the larger distribution of water in the insula and perhaps the larger southern intra-mural area of Ostia. The corridor running along the western side of the building presents several interesting water features. Firstly, at the southernmost extent of the building, there is a brick pier added against the wall with a lead *fistula* pipe (feature 39) at ground level. The pipe is visible on the south side of the pier, yet it turns 90^0 into the southwest corner of room 1. The direction of water flow is unclear, as lead pipes are also known in drainage systems in Ostia.[465] Continuing north along this corridor, one encounters a second brick pier along the eastern wall with a cappucina drain (feature 38) at the bottom, although in this case the channel continues through the entire length of the pier. As mentioned above, these three piers (except the northern one) have an identical pier across the corridor, which are dealt with in their various building sections.[466]

The northernmost pier in this corridor does not have a channel, but it does offer some tantalizing clues regarding the larger provisioning of water in this building. A wide patch of calcium carbonate (feature 37) is present directly south of this brick pier, on the external wall of room 9b. The sinter patch ranges up to ca. 1.10 m away from the pier, stretching to the current ground level, and over a rectangular construction, perhaps where a pipe turned horizontally to the south (Figure 4.130).

Figure 4.130: West wall of IV, ii, 5, room 09 with calcium carbonate concentration (feature 37). Cylinders indicate possible location of now-lost vertical pipes .

[465] Jansen 2002, 171, note 196 for lead pipes in drainage capacities.
[466] IV, ii, 4 and IV, ii,14.

Returning to the southeast part of the building, a cappucina drain was roughly installed into the space under a relieving arch in the west wall of room 1 (feature 40). Also in room 1, we find a parallel set of rectangular tile-backed downshafts (features 41, 42), that run the entire extant height of the wall and are similar to the ones described above in IV, ii, 4 (features 31, 32).[467] Feature 41 is heavily damaged, and it's tile backing is poorly preserved, revealing the northern face of building V, ii, 12. The 1994-1995 excavations uncovered a small section of a sewer line (feature 84) in room 1 that runs into the central hallway of the building. Ceramic material found within this cappucina drain dates its purposeful filling to the 3rd century AD.[468]

Continuing inside the building, we move into its long central hallway to a well (feature 44). The position of this well was respected by the east wall of room 3, which arches over the well.[469] The well wall is made of *opus reticulatum* and the well-head is a roughly pitted piece of travertine. However, the designation of this feature might equally act as a small cistern given its two internal ceramic pipes (feature 85 and 86). These circular pipes are set into the *opus reticulatum* walls of the well at a NNE-SSW orientation and at different heights. They likely channeled rainwater from the roof of an earlier structure into the well.[470] On the eastern side of the hallway is a rectangular downshaft (feature 43), which provides further proof of at least one upper floor. It is unclear whether this downshaft was connected to the nearby well 44, as the bottom of the downshaft is heavily eroded.

On the eastern edge of the northern courtyard is a rectangular fountain (feature 68). The fountain is one of the "bauletto" type known across Ostia, which can be generally described as barrel vaulted, rectangular, (mostly) aqueduct fed, and offering a rectangular opening on one side to allow for bucket access.[471] This action is attested by rope-wear marks on the travertine blocks used in several of these fountains.[472] Alternatively, overflowing water (if present), could exit in one or more streams to be filled in containers, proved both by remaining exit holes in the lateral side of these fountains, as well as convex basins cut into travertine gutters along their long side.[473] This fountain follows the general trend, with a small rectangular shaft (feature 33) on the eastern side with the remains of a circular channel for a lead *fistula* to enter ca. 0.88 m from the ground level. While the *fistula* itself is now lost, it implies a localized pressure system. Within the lower north east corner of the fountain is a small drain (feature 132) that emptied into the courtyard. The western face of the fountain has an overflow spout (feature 34). While the roof of this fountain is largely restored, its internal walls retained the original coating of waterproof mortar, especially in the corners. The barrel-vaulted ceiling was rebuilt at the time of excavation using several anepigraphic bricks (Figure 4.131).[474] Due to similarities to the masonry of the Portico e Caseggiato dell'Ercole (IV, ii, 2-3), the fountain is dated to AD 160-70. Although this fountain (est. capacity ca. 5500 l) was certainly fed by a pipe on its eastern face, a stretch of six lead *fistulae* pipes (feature 76) was found to the west which ran the entire length of the courtyard toward the Via della Caupona.[475]

[467] SBAO B6253 (no. 16, 18), with a west facing view showing both downshafts.
[468] GdSc 74: see section D, locus 30 for the fill composition.
[469] SBAO B3702 (inv. 6191) also shows feature 43.
[470] Similar combinations of pipes and wells are noted in Chapter 5, for insula V, ii (e.g. V, ii, 2; V, ii, 5; V, ii, 13).
[471] RS II, 134, (sch.124) for this particular bauletto fountain
[472] E.g. the fountain in the Via della Fontana (RS II, 65-68, sch. 57).
[473] See especially the fountains of Case a Giardino: Jansen 2002, 172; Paschetto 1912, 252; RS II, 214.
[474] Shapes made by impressed dots: swastika, trident, upside-down T; these were not recoded in greater detail as they were certainly purposely placed there by the restorers as a wink to future archaeologists.
[475] For these pipes see: Barbieri 1953, 173 #38 (EX. OFICI. IVLIES.AQVILINES (=*ex ofici(na) Iulies Aquilines*)); C.I.L. XV, 7758 (=AE 1977, 164); GdSc 26, 78 (20-2-1940); RS II, 134.

Figure 4.131: Original and current state of the bauletto fountain viewed from the west (SBAO B3036).

Thanks to an examination of the archival photographs of the entire northern courtyard from the initial excavation period, two walls of *opus vittatum* were identified in connection to this fountain. The first was mentioned above in the discussion of IV, ii, 4; this wall extended northward from the east wall of IV, ii, 4 and included the east wall of the fountain, restricting access to the central corridor of the *insula*. The second extended southward from the west wall of hallway 1 from IV, ii, 3, and likely closed off this narrow corridor; this obstructed access to the baths from the larger courtyard (Figure 4.132,Figure 4.133). Built against this latter wall was a small semi-circular basin (feature 70) that was removed together with the *opus vittatum* wall.

Figure 4.132: Archival photo showing the two walls of *opus vittatum* outlined in black, the bauletto fountain 68, and the basin 70 outlined in red (SBAO B3036).

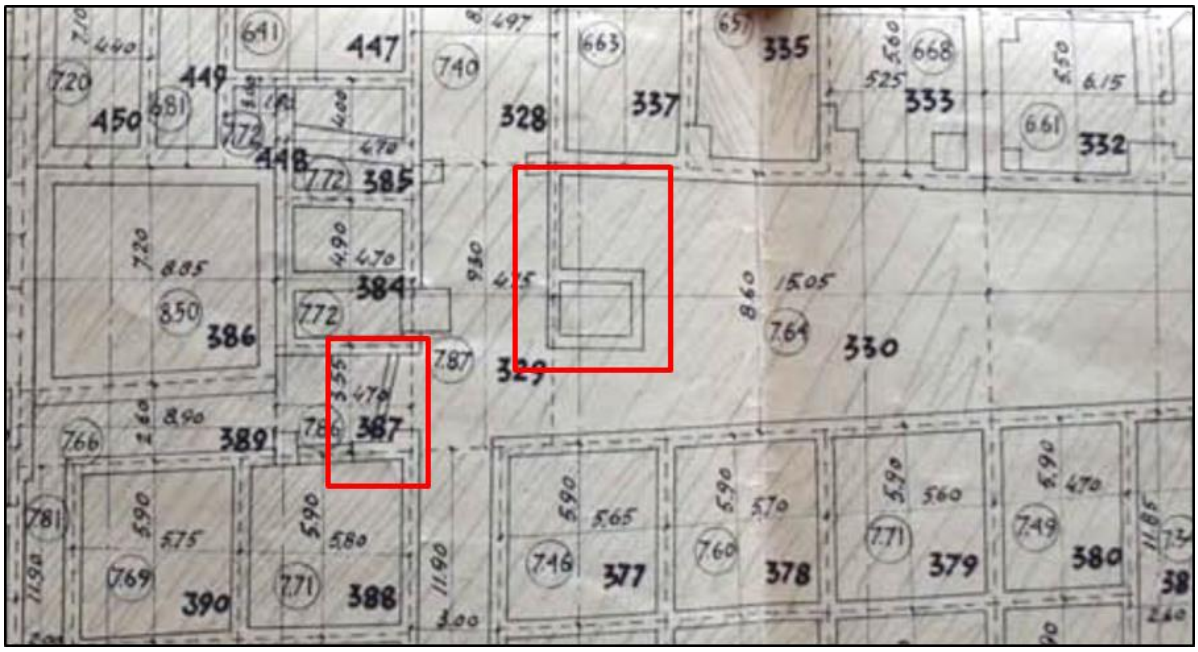

Figure 4.133: Plan drawn of the northern courtyard of insula IV, ii with *opus vittatum* walls outlined in red. North is at the bottom of the image (after Rinaldi 2012, 76, Fig. 7).

The largest concentration of water features for the entire *insula* exists around this next feature. The large cistern (feature 36) was inserted in the Severan period and blocked earlier doorways to both IV, ii, 5 and the Terme del Faro (IV, ii, 1).[476] At ca. 6.00 x 7.00 m the cistern could hold roughly 98, 000 litersof water, and was certainly connected to the water needs of the adjacent Terme del Faro.[477] The cistern is today entered from a modern breakage in its western wall, through room 10 of building 5. This breakage is comparable with the hole broken through the south side of the Porta Romana *castellum*, done to remove large lead pipes. In the case of the cistern in IV, ii, 5 this breakage may indicate that there were large lead pipes previously exiting the western wall of the cistern (Figure 4.134).

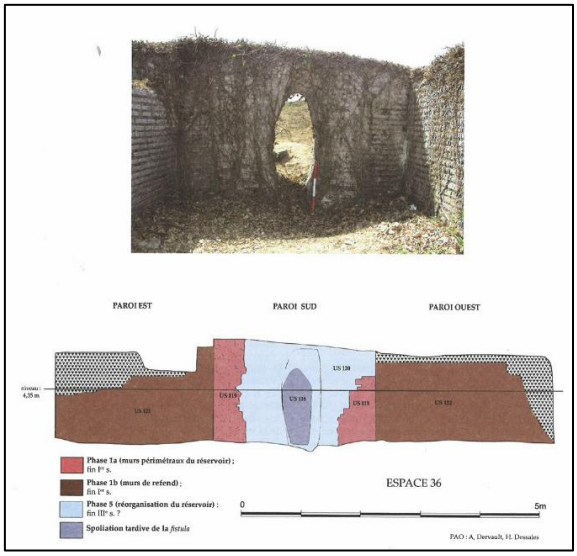

Figure 4.134: Ovoid breakage through the south wall of the Porta Romana *castellum* (Bukowiecki *et al*. 2008, 23, Fig. 5).

[476] RS I, 171 for this cistern.

[477] Volumetric calculation of basins at Ostia are based on the average surviving height (ca. 2.00 m) of waterproof *opus signinum* residue.

Due to the outward pressure of such a volume of water, the walls of the cistern are almost double the thickness of the other walls in the *insula*. The insertion of the cistern wall is clearest at the north end of IV, ii, 5, where the southern face of the cistern is visible through an ovoid breakage of one of the original entrances to the building; the external east wall of the cistern is visible through a rectangular "window" of the baths (IV, ii, 1, room 7c). Interestingly, when viewed from above, these walls are not directly contiguous, but rather are separated by a gap that varies from ca. 0.50- 0.85 m (Figure 4.135).

Figure 4.135: View looking south at doubling of walls between the cistern (right side) and the Terme del Faro (left side). The gap lies between these two walls.

Based on the fill material uncovered during excavation, the cistern was covered by a barrel vault, and could only be accessed via a staircase on the external side of the north wall. At the top of six stairs is a small rectangular basin pierced by circular holes on each of its four sides, evidence of its use as a distribution box (feature 35).[478] Private access staircases are known in connection with other cisterns (e.g. Terme di Nettuno II, iv, 2, room 16), and offered restricted access to the water distribution. While this distribution basin is heavily restored, the presence of the four channels are verified in archival photos. It is unclear from where the water arrived to fill this basin, but this small basin certainly redistributed water to other supply systems.

Progressing into the narrow hallway along the external north face of the cistern, a number of irregularly placed rectangular channels exit the northern face of the cistern. At about 50 cm above the current ground level there is an in situ lead *fistula* (feature 46) that exits the wall at a NW-SE direction. It is set into a rough matrix of mortar and brick fragments. Slightly to the east there is a channel (feature 107) at the same level of the *fistula*, which may indicate a drain. However if this were the case, then it would render the lead pipe (feature 46) at a great risk of clogging from particulate (Figure 4.136).[479] In the corner formed by the northeastern external corner of the cistern and the external western wall of the bath's *frigidarium* (IV, ii, 1, room 8), there is an arched recess at ground level (feature 47).[480] Inside this niche is a fragment of the lead fistula that exits the west wall of the bath's Europa *frigidarium* (feature 46). The insertion of the cistern partially blocked the accessibility of the niche, but it appears that the niche remained accessible.

[478] Cf. RS I, 158 (sch. 30); SBAO B3038 shows the external north face of the cistern and the relationship to the staircase; B3039 (inv. 5528) shows a close-up of the basin with circular holes exiting the eastern and southern side.
[479] Bukowiecki *et al.* 2008, 130 describes pipes at bottom of structure 12 of the Porta Romana castellum, with a similar possible problem.
[480] See above discussion on the Terme del Faro (IV, ii, 1).

Figure 4.136: Looking south at the north wall of the cistern in building IV, ii, 5. The lead *fistula* (feature 46) is visible at right, and the channel (feature 107) at left.

Infrastructure Chronology

Roman Water Footprint #1 (4th century B.C.- AD 50)

The well (feature 44) is a stubborn reminder of the Republican past of building IV, ii, 5. The orientation of the internal ceramic pipes argues for an earlier rain-fed supply system. Several Claudian coins and amphorae fragments attest to the longevity of the building before its transformation.[481]

Roman Water Footprint #2 (AD 50-200)

With the initial construction of the building came the insertion of the three downshafts (features 41, 42, 43). The question of drainage is raised by these three downshafts: where did the water go? For feature 43, it is likely that it acted as a drain for roof water, and in that case was connected to the earlier system of the well (feature 44). However, the story seems different for features 41 and 42. Perhaps these also drained roof water, but instead of into a cistern, they funneled the water out through feature 84. The section of sewer (feature 84) dates from this period given its stratigraphic relationship below the 3rd century mosaic, and above a late 1st century fill layer.[482] The central courtyard fountain (feature 68) also dates to this period. While this fountain basin is the only contemporary pressurized water feature, the line supplying it remains unclear. The fountain was created centuries before the later cistern: based on contemporary dates and vicinity (ca. 3.00 m), it is hypothesized that this fountain was fed by a branch of the lead pipe that ran along the north side of building IV, ii, 4 (feature 112 above).

[481] GdSc 74, locus A.55 for Dressel 2/4; local B.53 for Dressel 6a sherds and two coins of Claudius.
[482] GdSc 74, locus B.19.

Roman Water Footprint # 3 (AD 200-300)

In the Severan period, the large cistern was created, and while it was certainly not as large as the *castella aquae* at Porta Romana, Porta Marina (IV, viii, 2) or under the Terme di Nettuno (II, iv, 2), it is on the larger end when compared to the estimated capacities of other cisterns in the city.[483] While this water reserve helped to supply the Terme del Faro, we also have concrete evidence for another lead pipe line feeding this bath from the *cardo* at this time period (feature 78), so there would be a significant amount of water left over. The two channels and the lead *fistula* on the north face (82, 107, 46) also point to a substantial amount of water exiting the cistern in this direction. One of these likely supplied the contemporary fountain in room 4 of IV, ii, 2-3 (feature 46), while another fed the *frigidarium* of the Terme del Faro (IV, ii, 1, room 8) through the curved niche (feature 47). Building upon this idea of surplus water, comes the evidence from the small rectangular structure at the top of the stairs (feature 35), which acted as a distribution box for water in several different directions. If we accept even the position of this box as original, we can then assume pressurized water could be pushed up to this height (ca. 3.00 m from current ground level), well above any of the other water features in the *insula*.[484] Features 45 and 37 are also likely connected to the wider distribution of water from the large cistern. The *fistula* pipe (feature 76) that runs through the length of the northern courtyard dates from the 3rd century, and instead of supplying the courtyard fountain (feature 68), more likely was connected to another structure. The brick piers in the insula's central hallway date from this period, as do the channels passing through the bottom of the piers (features 38, 39). As mentioned in the discussion of the preceding building, these features, now exposed, belong to a period when the internal level of the courtyard was higher, therefore placing them securely underground. The roughly built drain (feature 40) in the west wall of room 01 of IV, ii, 5 is difficult to date, as it exists at roughly the same depth as the sewer in the same room (feature 84). Additionally, the fill material (2 nearly complete amphorae laid on their side) of feature 84 indicate a conscious destruction of this system in the 3rd century.

Roman Water Footprint # 4 (AD 300-600)

The archival photo described above (SBAO B3036, Figure 4.132) shows that even though the internal arrangement of the insula was split into an eastern and western section, a new smaller basin (feature 70) was created for those passing down the central corridor. This also proves the late continuity of the courtyard fountain well into this period.

Conclusion

Building IV, ii, 5 always had a hydraulic and spatial connection to its neighboring buildings, especially the Terme del Faro. The *medianium*-style rooms survived the insertion of the large cistern to the north, yet the central sewer system of the building did not. This system turned out into the central corridor of the insula and was part of a larger insula-wide sewer project of the 3rd century. However, the water supply system of the well and downshaft in the northern part of the building remained functional throughout these changes.

[483] RS I, 103-140 for all the non-thermal cisterns in Ostia and their estimated volumes.
[484] SBAO B3036 and B3037 for a before and after look at this internal courtyard.

IV, ii, 6: Caupona del Pavone

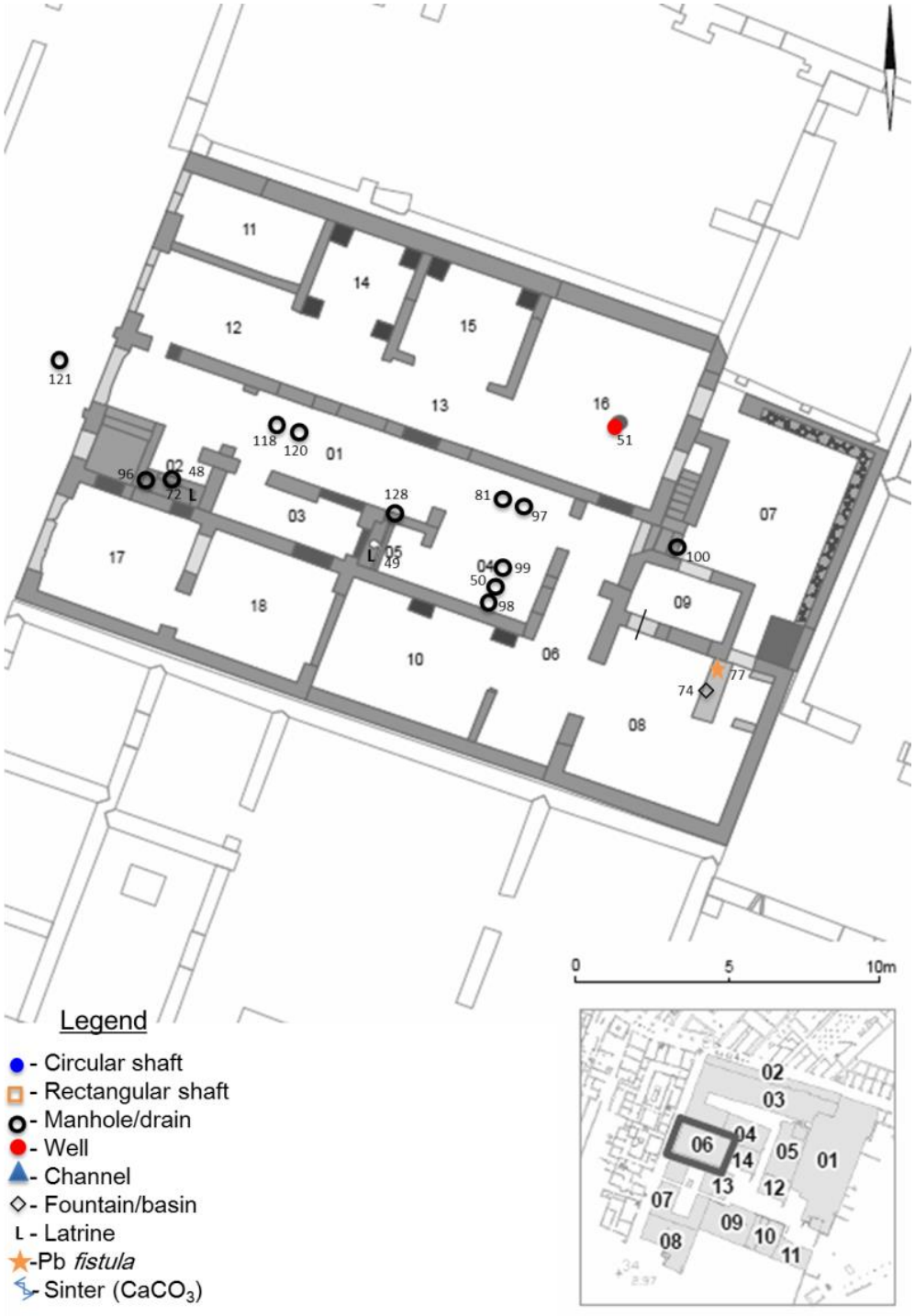

Figure 4.137: Identified water features in IV, ii, 6: the Caupona del Pavone (after Stöger 2011, 116, fig. 5.61).

Location in insula/in relation to other bldgs.

This building is located on the western side of the insula, with four doorways which all open onto the Via della Caupona, a side-street of the *cardo* (Figure 4.137). Building IV, ii, 6 lies between building IV, ii, 03 to the north, and the rooms of IV, ii, 07 to the south. The eastern side of the building is bounded by the rooms and courtyard of IV, ii, 14 and IV, ii, 4. The building has no connection with the inner spaces of the insula, and its four wide doors on the street make it resolutely outward-facing.

History of Excavation and Restoration

This building was excavated in July 1940 and restored shortly thereafter by I. Gismondi. Restoration applied especially to the internal rooms and their high number of preserved wall paintings.[485] The walls and their paintings survive to around 2.20 m, especially in the rooms farthest from the street. Restorations continued sporadically in the 1960s.

Phasing and Comments

The majority of the building's core is Hadrianic in date, and it was likely a luxurious private house. The floor level was also changed in this period, as is visible under the well head in courtyard 16, where an earlier *opus spicatum* floor was covered by the later black mosaic tesserae. In the Severan period (AD 193-235) the southern half of the building was adorned by the luxurious wall paintings that are visible but rapidly fading today. Based on stylistic and technical comparisons with similar motifs, these paintings of semi-nude youths floating on a blood-orange colored background, vegetal motifs, and simple red bands on white backgrounds can be dated closer to AD 200-220 (Figure 4.138).[486]

Figure 4.138: North wall of room 9 in 1970 at left (Gasparri 1970, Tav. X), and in 2015 at right (by author).

To this Severan phase can be attributed the insertion of the geometric mosaics and supporting brick piers in several rooms (10, 14, 15), as well as the closure of several doors on the north half of the building with variations of *opus vittatum*.[487] The only trace of previous structures comes from a well in room 16, with the original depth accessible down a staircase in room 7. Given its depth, it is likely from the earliest period of the insula's history, and can be dated to the late Republican or early Augustan period.[488] Some late examples of *opus reticulatum* are known in the northeastern part of the building in this period, placed between *opus vittatum mixtum* piers and intersected by a band of brick.[489] In a 3rd phase, the

[485] Gasparri 1970, 5-7 for a full description of the excavation.
[486] Gasparri 1970, 12-14, 32, 33.25. This section on phasing draws upon Gasparri's close reading of the masonry and decoration.
[487] Becatti 1961, 176-7, n. 324-6.
[488] RS I, 46 (sch. 33) for this well and access room.
[489] Van Dalen 1991, 263.

richly decorated room 8 had its lower wall band decorated with a design of false *giallo antico* marble with red veins. The final phase of this part of the structure saw its dramatic change from a domestic space to an inn (*caupona*) of some kind. This is when the bar counter with its mounted marble steps was inserted into room 8 (Figure 4.139), and the building assumed the function that now to defines it. To this period can also be dated the decorations from room 11, 14, 17, and 18.[490]

Figure 4.139: View looking south at the bar counter and stepped shelves of room 08 in IV, ii, 6.

As for the final phase of the building's life, we are only informed by a large pile of tesserae that were found in room 3 as unused spolia.[491] In general, it is difficult to precisely define the exact functions and differentiations between *popina, stabulum, caupona,* but the number and size of the rooms, the side street location of the bar, and the high degree of painted decoration, point to a relatively higher class of clientele visiting and staying here.[492] The stairs immediately next to the central entrance point to additional rooms accessible on upper floors.

Water Features Chart

The following hydraulic features are located in building IV, ii, 6 (Table 4.29).

[490] Gasparri 1970, 27 for a revival of Pompeian 1st Style wall painting in the 3rd century.
[491] Becatti 1961 (=SO IV), 156 for this description.
[492] Hermansen 1982, 191-195 for an overview of the terminology.

IV, ii, 6 Room #	Feature	Description/Position	Feature #	Roman Water Footprint Phase
1	manhole	hallway across from doorway into room 3	118	2
1	sewer	hallway across from doorway into room 3	120	2
2	latrine	directly S of main entrance	48	4
2	drain	W side of latrine	96	4
2	drain	N side latrine	72	4
4	drain cover	SE floor drain	50	3
4	sewer	N from cover 50	99	3
4	sewer	S from cover 50	98	3
4	drain cover	NW floor drain	81	2
4	sewer	under features 81-96	97	2
5	latrine	W part of room 4; single seater	49	3
5	drain	NE corner of latrine 49	128	3
7	drain	under lowest courtyard step	100	2
8	basin	within bar counter	74	3
8	fistula	feeds small basin within bar counter	77	3
16	well	in center of room	51	1

Table 4.29: Identified water features in building IV, ii, 6.

Description of Water Features

Entering the third doorway from the north along the Via della Caupona, a shallow rectangular basin is placed on the floor of the first small room on the right hand side. Given the drain (feature 96) sloping down toward the street, this has been generally interpreted as a latrine (feature 48), although the low walls running around its 3 external sides could also make it a simple industrial drain.[493] An additional wide drain pierces the northern side of the latrine (feature 72), implying that it also served to drain excess water from hallway 1.

Proceeding down the *opus spicatum* hallway (room 1) is a marble fragment mostly covered by vegetation. This fragment (feature 118) is directly across from the doorway into room 3 and is likely a modern safety feature to cover the 1.40 m deep shaft above a sewer line.[494] This sewer line is built with latericium walls, although the typical bipedales leaning against each other (cappucina) are absent. West of the shaft the sewer (feature 120) continues under the length of the hallway and into the sewer line under the Via della Caupona (feature 121). To the east, this sewer continues to connect with drains 97 and 100 (

Figure 4.140).

[493] RS II, 136 (sch. 126a) identify this as a 3rd-4th century fountain basin; SBAO Colore 511, 116. The latrine is almost completely restored with modern concrete.

[494] It is labeled as a water feature, since there must have been some kind of drain cover here *in antiquo*.

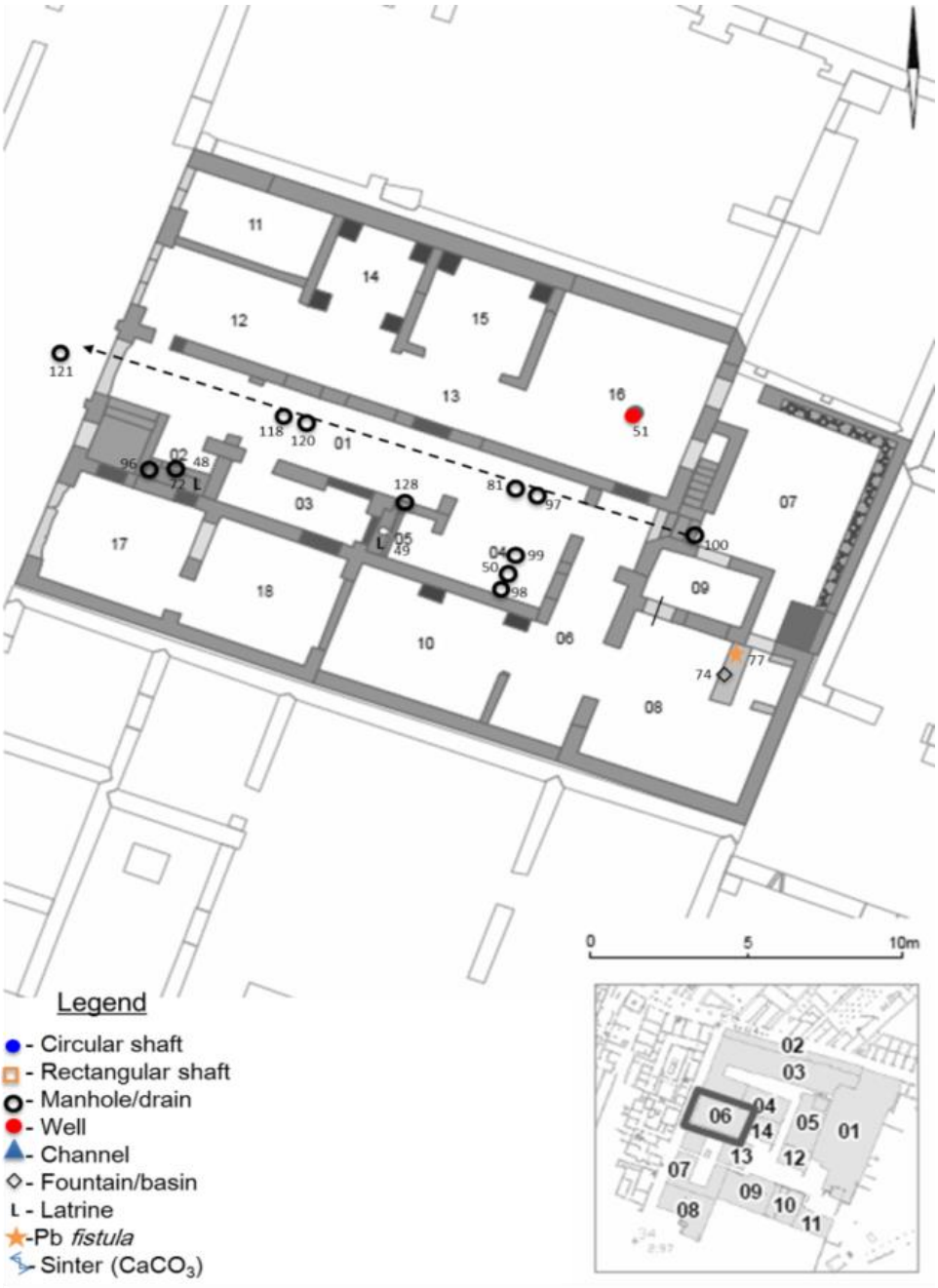

Figure 4.140: Total length of sewer 100 indicated in black dotted line (after Stöger 2011, 116, Fig. 5.61).

At the eastern end of this hallway is room 4, which has two drains in the floor. Given the sloping of the floor here, it is assumed that this room was exposed to the sky. Both of these drains are simple holes in square travertine blocks (features 50, 81), and are only 0.40 m apart.[495] The northern drain (feature 97) connects with and is similar to feature 120 in the same hallway, although east of the manhole the bipedales roofing is preserved. The southern drain (feature 99) is much more modest in its preserved size, but also has a cappucina-style roof like feature 97. This drain runs perpendicular (north) to feature 97, and is connected to a smaller secondary drain, feature 98, which comes from the south and has a single flat *bipedalis* roof. A rough repair of the floor *in antiquo* is indicated by irregularly shaped pieces of marble placed directly into the surrounding white mosaic tesserae (Figure 4.141).

[495] SBAO B1077 (inv. 3566) shows these drains.

Figure 4.141: Looking north at drain cover 50 in IV, ii, 6 with *in antiquo* repair visible on the right side of the image. Channels 99 and 98 are indicated by the dashed line.

Within the small space attached to this internal courtyard is a single-seater latrine (feature 49) with a modern keyhole seat (Figure 4.142). It has a drain (feature 128) that initially slopes down to the north. However, as no trace of this drain is visible within the sewer line running down hallway 1 (feature 120), drain 128 must turn 90° and drain towards the street.

Figure 4.142: View looking west at latrine 49 in room 5 of IV, ii, 6.

Entering into the caupona proper, we see the black and white geometric mosaics and the fading wall paintings. In the east corner of room 08 is a bar counter with a small stepped marble countertop against the back wall of the room, covering the earlier wall paintings.[496] Like many other bar counters in Ostia,

[496] Hermansen 1982, 167-169; Similar to the stepped bar in other such establishments in Ostia (e.g. Caseggiato del Termopolio (I, ii, 5)).

this one has a barrel vaulted opening with a square basin (feature 74) at roughly knee height. This basin would have been filled with running water from a lead *fistula* pipe (feature 77). Unique in Ostia, the underside of this arch was decorated with green and red fish painted on a white background, visible to a customer only when standing immediately in front of the counter. Regardless of what had already been consumed at the taberna, the rippling water in the basin would appear to contain moving fish (Figure 4.143). A short graffito is carved into the back of the bar, perhaps by a bored bar tender.[497]

Figure 4.143: The fish decorating the underside bar counter: view in 1970 at left (Gasparri 1970 Tav. VII), view in 2015 at right (by author).

Continuing into the back courtyard of the *caupona* (room 7), one descends several steps almost a meter down into a rectangular space with a bench on its north and east sides. A narrow rectangular drain (feature 100) is set into the final step of these stairs. This is the final feature in the long sewer (ca. 20 m) that runs down almost the entire length of the caupona. There is a small niche in the south-east corner of this courtyard that was partially blocked by the insertion of room 9. The aedicula niche preserves the building's eponymous fresco of a peacock with several objects surrounding it (Figure 4.144).[498]

[497] See Appendix 2 for this.

[498] Bakker 1994, 91 dates the *aedicula* to the Severan or first half of the 3rd century.

Figure 4.144: Remains of the eponymous peacock fresco in IV, ii, 6 in 2015.

The courtyard holds the last surprise of the building with a subterranean well accessible down seven stairs. The well (feature 51) retained its Republican-Augustan shape, surviving several changes to the ground level, and reaching a height of ca. 2.80 m for its shaft. The well was threby accessible both from this subterranean access point, as well as from room 16 of the *caupona* from a pepperino well-head (Figure 4.145,Figure 4.146).[499]

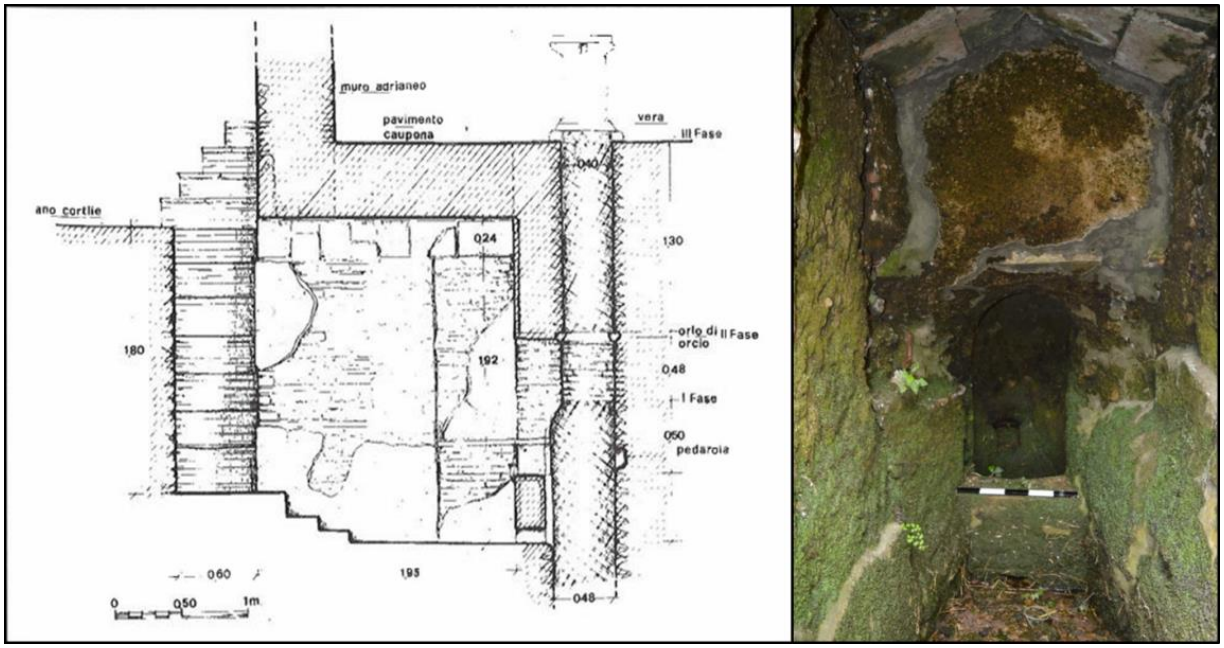

Figure 4.145: Looking west at the small access room for well 51 on the right, cross section of the well and its access room at left (RS I, 47, Fig. 56b).

[499] Becatti 1961, 9; Kieburg 2014, 176; RS I, 46 (sch. 33).

Figure 4.146: View looking up the shaft of well 51 in the Caupona del Pavone.

Infrastructure Chronology

Roman Water Footprint # 1 (4th century B.C.- AD 50)

The well (feature 51) clearly played an important role throughout the entire history of the building. As the building is closed off from the rest of *insula* IV, ii, this well would have acted as the main water source for close to 200 years.

Roman Water Footprint # 2 (AD 50-200)

As mentioned above, the majority of the structure dates from the Hadrianic period, when we can identify a raise in the ground level in this area. Taking advantage of this raising, the sewer line was installed running the length of the ca. 20 m long hallway 1 (features 100, 97, 120). This ca. 0.50 x 1.00 m sewer is the most substantial in the entire insula and has a clear connection to the larger urban sewer network running under the Via della Caupona, which was unknown previous to this research. The walls of this sewer are of a similar *latericium* as the wall dividing room 1 from rooms 12 and 13. Its size is comparable to the sewer branch running underneath the *cardo maximus* (feature 114), which points to its high quality and the expense of its construction.[500]

Roman Water Footprint # 3 (AD 200-300)

The drain in the southeast part of room 4 (feature 99) can be dated to this period. This is based on the adjacent large tesserae placed to direct water towards the drain. Perhaps the northern drain cover (feature 81) was often blocked by courtyard detritus and required an extra adduction point. Little more can be said about the direction of drain 98, which extends southward from feature 50 into the covered rooms of the building. In the later part of this period (late 3rd century CE) the building assumed its role as a *caupona*, and it subsequently gained architectural features typical to the increased movement of people. The bar counter was installed in the room furthest from the road together with its rippling fish basin (feature 74) fed by a lead *fistula* pipe (feature 77). Returning to the courtyard (room 4), a small *opus vittatum* wall was installed that reduced the size of this space, but offered the perfect nook for a single-seater latrine (feature 49) which drained not into the hallway sewer, but made its own linear way

[500] Meiggs 1973, 374, note 3, dates this building as Hadrianic around a Trajanic core.

under the street to the west (feature 128). A single seat latrine meant a touch of luxury as is known from other contemporary wealthy homes around Ostia.[501]

Roman Water Footprint #4 (AD 300-600)

The final evidence for water flow in this building comes from the latrine/basin next to the main entrance (feature 48), which simply was affixed to the existing drainage system created by the earlier latrine (feature 49).

Conclusion

Building IV, ii, 6 was always outward facing, both spatially and hydraulically. It relied only on ground water when it was a private domus, and added an aqueduct-fed feature only when it became a public caupona, requiring more water. The large sewer line within the building also attests to this inward facing attitude, as the building never connected to the sewer network created between nearly all other buildings of the insula in the 3rd century.

[501] See Chapter 5 for examples from the Domus del Protiro (V, ii, 4-5), and the Domus della Fortuna Annonaria (V, ii, 8).

IV, ii, 7

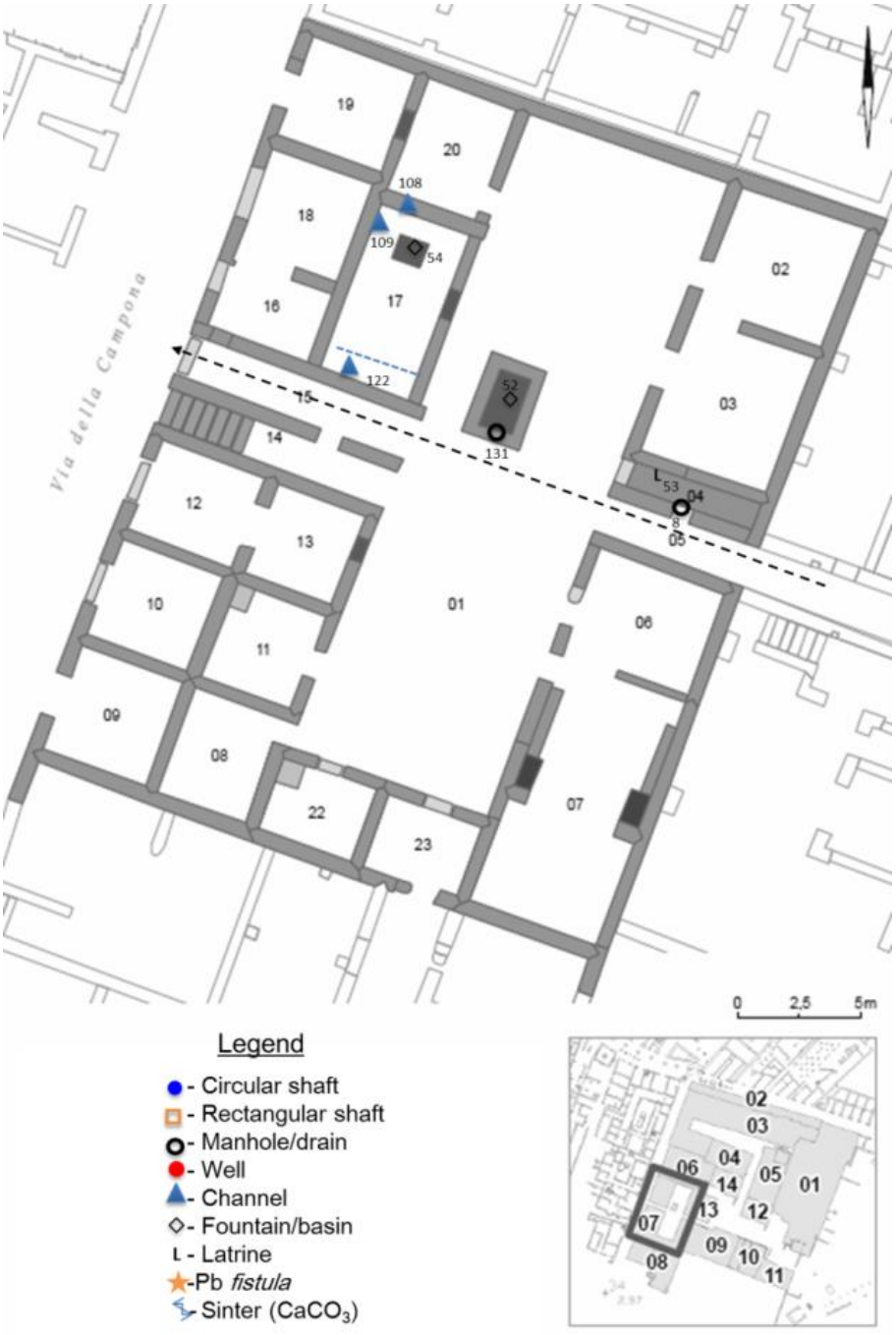

Figure 4.147: Identified water features in IV, ii, 7 (after Stöger 2011, 124, Fig. 5.68).

Location in insula

The building is located in the southwest section of the insula and is accessible both from the Via della Caupona and from the internal southern courtyard of the insula (Figure 4.147). It lies directly south from the Caupona (IV, ii, 6), and presents six open *tabernae*-like rooms onto the Via della Caupona. Building IV, ii, 7 lies directly north of building IV, ii, 8.

History of Excavation and Restoration

Calza likely excavated this building also in 1940, although exact descriptions of it are lacking. The building was restored in the 1960s, when coins ranging from Nerva to Gallienus were found.[502]

Phasing and Comments

The current layout of the building has a ring of rooms opening onto a central courtyard and a rectangular fountain in the center. A central hallway allowed movement from the Via della Caupona into the center of *insula* IV, ii and divided the building into a northern and southern half. A single staircase south of the building's main entrance hallway (room 14) provides evidence for at least one upper floor. The south and southwest sections of the building date from the Hadrianic period; the north and northeast sections were built in a slightly later phase against the existing walls of IV, ii, 6.[503] In this late Hadrianic-early Antonine phase, partition walls were added between rooms 19-20, 1-17, and 1-13. These are thought to be the latest walls in Ostia to have reticulate facings of high quality.[504] In the mid-3rd century CE there was more building activity here.[505] It is interesting here to mention that the building lacks brick piers supporting its walls like nearly every other building in the *insula*. In room 2 and 3 a large amount of marble revetment was found at the moment of excavation, evidence of later spoliation processes.[506]

Water Features Chart

The following hydraulic features are located in building IV, ii, 7 (Table 4.30).

IV, ii, 7 Room #	Feature	Description/Position	Feature #	Roman Water Footprint Phase
1	fountain	in building courtyard	52	3
1	drain	S wall of fountain 52	131	3
4	latrine	N side of corridor 4	53	2
5	sewer	runs E-W through room 5	8	2
17	basin?	along entire S length of room	122	4
17	fountain (?)	N half of room; L shape	54	3
17	channel	W wall; NW corner	108	3
17	channel	W wall; NW corner	109	3

Table 4.30: Identified water features in building IV, ii, 7.

Description of Water Features

All of the water features are located in its northern half of the building. Starting in the main courtyard, there is a rectangular fountain (feature 52).[507] The fountain basin is quite thick and large, and it is unclear whether it was roofed. Its location north of the main hallway acknowledges a high degree of movement in this area (Figure 4.148).[508] A circular ceramic drain (feature 131) is present at ground level on its

[502] GdSc 32, 119-120 (22-2-1960); Stöger 2011, 125.
[503] Stöger 2011, 129; Van Dalen 1991, 265-269.
[504] Van Dalen 1991, 276 for the study of late usage of *opus reticulatum*.
[505] A coin of Gallienus (AD 253-268) was found here.
[506] Stöger 2011, 128; Spolia material was also found nearby in room 3 of IV, ii, 06.
[507] RS II, 137 (sch. 127) for this basin.
[508] Stöger 2011, 193, Fig. 6.22 for fountains respecting central corridors of movement and lines of sight in the insula.

southern face, although this is only visible in the original excavation records. A rectangular latrine (feature 53) was placed on the eastern side of the building, within room 4 (Figure 4.149). This latrine opened onto the corridor connecting the internal courtyard of the insula to the Via della Caupona. From archival photographs, the latrine drains can be identified as emptying into the larger sewer line (feature 8), which runs in an east-west direction under hallway 5. This sewer continues westward toward the Via della Caupona.[509]

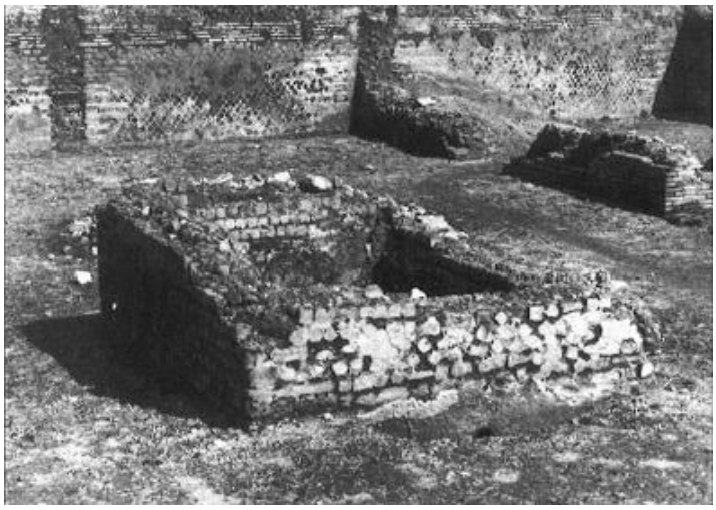

Figure 4.148: View looking north at feature 52 and its drain 131 in the foreground (SBAO D1168).

Figure 4.149: Looking east at the latrine 53, with its drain indicated by the dashed white line (SBAO B3707).

The final cluster of water features visible in the building is in room 17 (Figure 4.150). The strangest is a feature (feature 54) that is shaped like a single-seater reclining sofa, or an upright L shape (Figure

[509] GdSc 32, 124 (10-4-1960); Merletto 2000, 301 for a typology of Roman latrines. According to Merletto, this narrow rectangular format is the most common shape for latrines across the Roman world.

4.151,Figure 4.152). It is composed of an odd agglomeration of different types of bricks and tufa stones, and sits on a low foundation of bricks. The north wall is completely flat, except for an apparent entry point for water that is covered by a very thick *bessalis* brick (Figure 4.153). This feature is identified tentatively as a fountain due to the presence of several holes for water supply on its northern and western faces. Water flowed downward and out through its southern face, although there is evidence that an additional water exit hole was blocked by roughly filling in the space under two leaning *bipedales*.

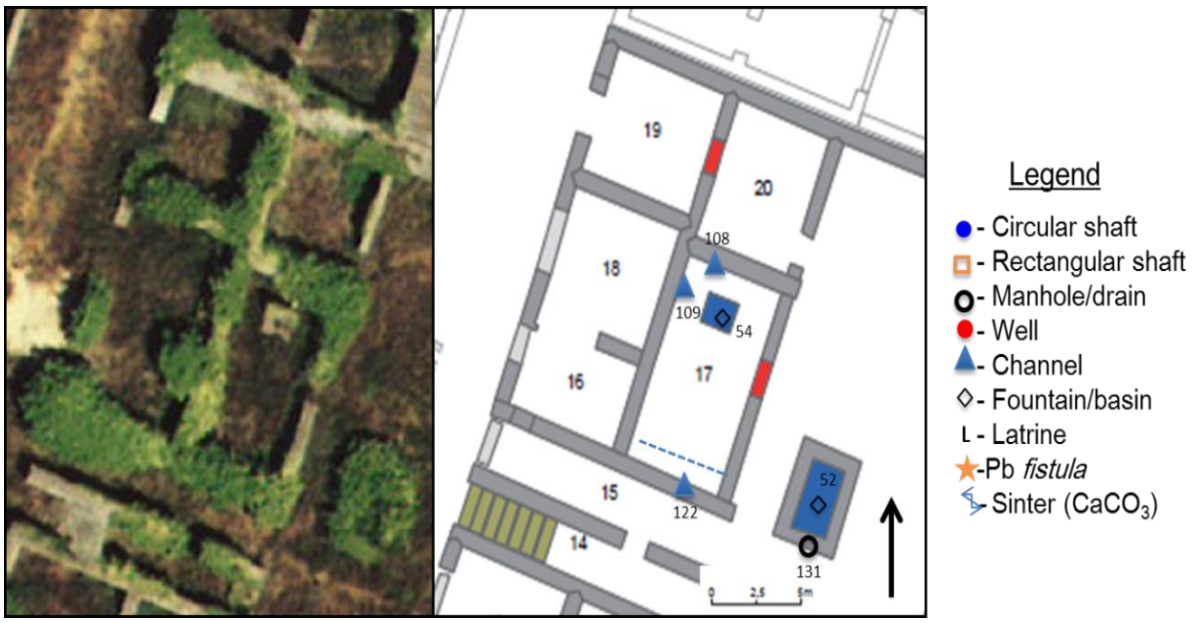

Figure 4.150: View of the northwest corner of IV, ii, 7 from above at left (Mannucci 1995, Pl. 44), and with identified water features on right (Stöger 2011, 124, Fig. 5.68).

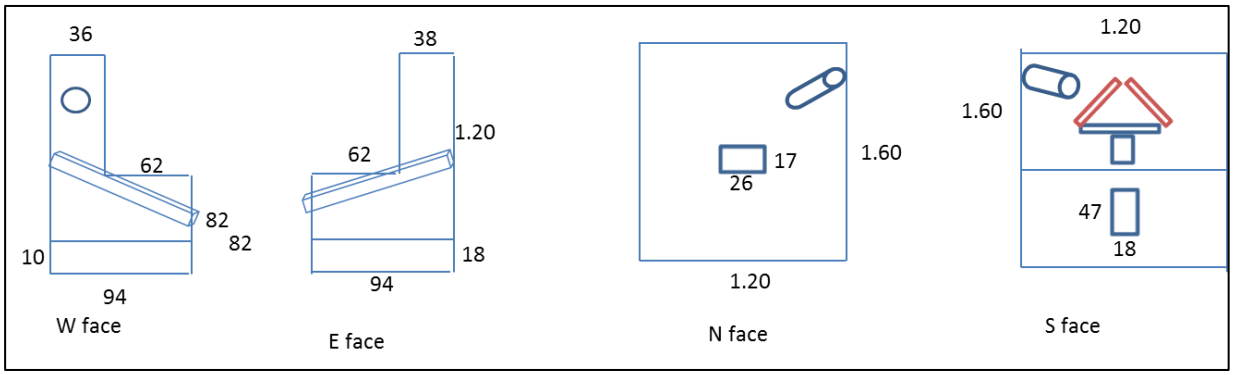

Figure 4.151: Schematic measurements of feature 54 in building IV, ii, 7.

Figure 4.152: West face of the feature 54, showing its L shape, and possible supply line made of two *imbrices*.

Figure 4.153: View of the north face of the feature 52, with the thick *bessalis* brick covering a possible supply feature.

Evidence for the blocking up of water channels is also present in the northwest corner of this room, where two channels (features 108, 109) were closed by a rough mixture of brick and mortar pieces, fragments of ceramics, and burned glass (Figure 4.154). These channels are at the same height as the supply channel on the west face of the fountain, although the relationship between these features is unclear. Also in room 17 is a curious feature located on the southern wall. This has been interpreted as a bench, however it appears more like a basin with an internal partition, similar to feature 58 in the neighboring building IV, ii, 13. The basin (feature 122) is very roughly built and contains some stamped 1960s reconsolidation bricks in its northern wall. It may have had a drain in the south into hallway 15, although this is where the doorway into the room was closed at a later point with a very rough reticulate wall.

Figure 4.154: View of feature 109, a possible closed channel in the northwest corner of room 17.

Infrastructure Chronology

Roman Water Footprint #1 (4th century B.C.- AD 50)

No preserved water features date from this period.

Roman Water Footprint # 2 (AD 50-200)

The latrine (feature 53) and its sewer (feature 8) are the only water features that date from this period. The sewer drained to the south for a short distance before turning 90° to the west and leading out to the Via della Caupona.

Roman Water Footprint #3 (AD 200-300)

The rectangular courtyard fountain (feature 52) was built in this period out of tufo cobbles, and attached itself to the existing drainage line via a drain(feature 131). The relatively late date for the central courtyard fountain could be explained by the blocking up of room 23 and the access into IV, ii, 8. If the irregular structure (feature 56) to the south of IV, ii, 8 is interpreted as an earlier fountain (see next section, IV, ii, 8), then the insertion of room 23 would represent an obstruction or reduction in access to this water source in the 3rd century. Also in this period we see the creation of the fountain like structure (feature 54) and its associated channels (features 108, 109). How the pipe on its western face (made by 2 imbrices) was fed, or where the water eventually flowed remains unclear given the extreme density of vegetation in this room. Perhaps the wall closing the east side of room 17 also dates to this period, restricting access to this water feature. A threshold ca. 0.30 m above the current ground level indicates a difference in the 3rd century ground level here. It is unclear how far into this period the sewer

(feature 8) of latrine 53 functioned; a coin of Maximius Thrax (AD 235-238) was discovered in the fill of the sewer in 1960, offering a *terminus ante quem* of its disuse.[510]

Roman Water Footprint # 4 (AD 300-600)

From this final period of the building's life, we have the evidence from room 17, which lost one of its entrances with the creation of basin 122. The lack of waterproof *opus signinum* and the normal thickness of the walls make it unlikely that the entire room was flooded.[511] Given the height of the threshold (ca. +0.30 m above ground level) on the eastern side of room 17, perhaps basin 122 was sunk into the ground.

Conclusion

Although little is known of the water systems of this building, its multi-seater latrine and large courtyard basin indicate that the many different activities were occurring within its rooms. The position of these two water features also indicate that building 8 was deeply connected with other buildings of the insula, and that they were intentionally placed to take advantage of the flow of people from the street into the southern part of the insula. The unusual water features in room 17 may indicate some kind of specialized industrial or economic activity.

IV, ii, 08

Figure 4.155: Identified water features in IV, ii, 08 (after Stöger 2011, 131, Fig. 5.76).

[510] GdSc 32, 124 (10-4-1960) for the coin.

[511] The room's dimensions are ca. 4.00 x 7.50 m. Given the average *opus signinum* height in Ostia of ca. 2.00m that equals 60m^3 (=60,000 l). The large Severan cistern (IV, ii, 5, feature 36) has a capacity of 98,000 l, however it has substantially thicker walls and *opus signinum* coating.

Location in insula

The building is located on the limit of the site's excavated area, in the southwest corner of the insula, where the Via della Caupona runs into the area now used for modern agricultural activities (Figure 4.155). Building IV, ii, 8 delimits the western side of a large open space directly south of insula IV, ii that is currently more than 1.00 m lower than the ground levels of the buildings in this part of the insula (Figure 4.156). Building IV, ii, 8 was originally connected to IV, ii, 7 to the north through hallway 12. Structurally, the building is very outward facing and has very few internally connected rooms. It is divided into an eastern and western section by hallway 12; the western section has doorways opening onto the Via della Caupona and a small square to the south, while the eastern section is made up of four small rectangular rooms. Unlike the western half, these four rooms continue the architectural line of the southeastern corner of IV, ii, 8. The two doors fronting the Via della Caupona are separated by a small staircase, offering access to upper floors.

Figure 4.156: View of the external east face of building IV, ii, 8 where it intersects with the south wall of building IV, ii, 9.

History of Excavation and Restoration

As with IV, ii, 7, little is known of the initial excavation of this structure, although it is safe to assume Calza also excavated this building in 1940. The 1960 restoration unearthed a small *giallo antico* marble head from this building.[512]

Phasing and Comments

Based on the identified brick stamps and the quality of the *opus reticulatum*, the building dates to the Hadrianic period.[513] At a somewhat later stage, supporting pillars were added along the four sides of room 07 in *opus vittatum*, while two projecting masonry arms were added to the south of room 11.

[512] GdSc 32, 125 (29-4-1960) for this discovery
[513] Stöger 2011, 131.

Water Features Chart

The following hydraulic features are located in building IV, ii, 8 (Table 4.31).

IV, ii, 8 Room #	Feature	Description/Position	Feature #	Roman Water Footprint Phase
4	basin	external SW wall of room 4	73	3
12	rectangular downshaft	W side central corridor	55	2
13	basin?	Rectangular structure S of room 6	56	3

Table 4.31: Identified water features in building IV, ii, 8.

Description of Water Features

This building has three water features. Built against the street side of room 4 is a now-lost rectangular basin (feature 73), which was recorded by Calza during the initial excavation. The second feature (feature 55) is a rectangular downshaft on the west side of hallway 12, and although it exists for the entire length of the preserved wall, appears to have been heavily restored during the 1960s. More interestingly for local water usage is feature 56, an irregular rectangular basin that seems added onto an existing support structure. Together with the suppFigure 4.157ort walls added onto the south side of room 11, this continues the hallway of room 12 (Figure 4.157).

Figure 4.157: Aerial view of IV, ii, 8, with feature 56 indicated by the dashed lines (after Mannucci 1995, Pl. 43, 44).

Infrastructure Chronology

Roman Water Footprint # 1 (4th century B.C.- AD 50)

No preserved water features date from this period.

Roman Water Footprint #2 (AD 50-200)

The rectangular downshaft (feature 55) dates to this period of Hadrianic construction, and its position on the external wall of a complex of buildings suggests its function was to drain rain water. No sinter was discovered inside the recess.

Roman Water Footprint #3 (AD 200-300)

The irregular rectangular basin (feature 56) in the south of the building can be dated contemporary with the *opus latericium* support arms added on the south of room 11. The creation of this freestanding basin coincides with the blocking of the hallway between this building and IV, ii, 8, and may represent an independent source for water supply. As there are no additional structures to the west, this may substantiate its identification as a small courtyard fountain, since it would be directly accessible from the Via della Caupona. Feature 73 is tentatively dated to this period, since it is the period when structures of all kinds began to encroach upon the street space.[514] A targeted geophysics project carried out in 2015 highlighted the potential for future non-invasive research in this areaFigure 4.158 of Ostia, and for further integrating insula IV, ii into the wider urban fabric of the city (Figure 4.158).[515]

Figure 4.158: Preliminary geophysics results, with building IV.ii.8 in the black box (after Sonnemann *et al.* 2015, 11, Fig. 3).

[514] Gering 2013, 262 for examples of this process.
[515] Sonnemann *et al.* 2015.

Roman Water Footprint # 4 (AD 300-600)

No preserved water features date from this period.

Conclusion

Building V, ii, 8 appears to have been mostly disconnected from the other buildings of the insula, although it shared a hallway with building IV, ii, 7. Although its basins (features 56, 73) suggest that it was responsible for its own water supply, the preliminary results of the geophysics indicate that there are many more unexcavated structures near this building: its modern liminal situation cannot be extrapolated for antiquity.

IV, ii, 09 and IV, ii, 13

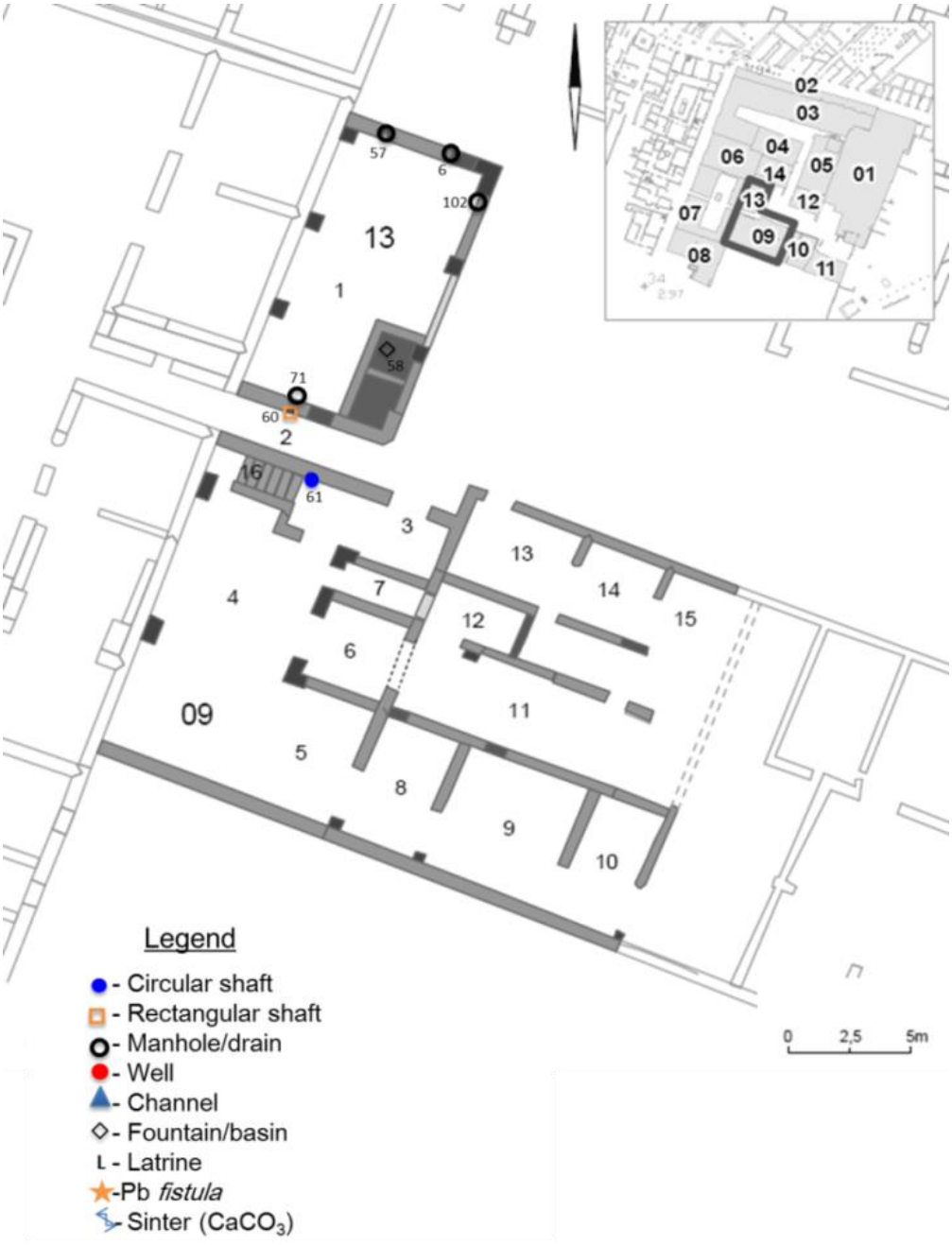

Figure 4.159: Identified water features in IV, ii, 9 and 13 (after Stöger 2011, 134, Fig. 5.80).

Location in insula

These two buildings form an L shape on the internal side of the large southern courtyard of *insula* IV, ii (Figure 4.159). The buildings are directly to the east of the IV, ii, 7. They also lie along the southern border of the insula, with their backs bordered by the large dividing wall of Antonine *latericium*. The ground level within IV, ii, 9 is ca. 1.00 m higher than the current ground level south of this wall.

History of Excavation and Restoration

These two buildings are studied together because of their intertwined building history. The buildings underwent restoration in the 1960s, as indicated by modern brickstamps.

Phasing and Comments

The eastern section of IV, ii, 9 dates from the Trajanic period with its *opus reticulatum* and tufo quoining.[516] In the mid-2nd century CE the western section was completely rebuilt against IV, ii, 7. The rooms 8-9-10 possibly acted as a *medianum* style apartment, similar to the eastern rooms (rooms 6, 7) in IV, ii, 5.[517] At a later point in the 3rd century supporting piers were added in the western section (rooms 1, 4), as well as along the southern wall (rooms 8, 9, 10). In this period doorways were closed up in rooms 1, 8, 9, and 12. However, the doorway closed in the south wall of room 1 appears modern, given the presence of modern bricks *below* the travertine threshold. In room 1 the threshold on the eastern side of the room is ca. 0.40 m above the current ground level, and the piers placed around the room have ca. 0.40 m of rough block and brick foundation visible before a bonding course and subsequent levels of brick courses. Together, this implies a higher ground level, otherwise there would need to be two small steps on either side of the travertine threshold to access the room. Room 1 is divided from the rest of the rooms by a hallway (room 2), which continues the eastern hallway of IV, ii, 7. Building IV, ii, 9 has a central internal courtyard (room 4), which is accessed in the south by a hallway that runs parallel to the south wall of the building. The northern rooms of the building are accessed from the southern courtyard of the insula through room 13. The building is heavily overgrown and mostly inaccessible.

Water Features Chart

The following hydraulic features are located in buildings IV, ii, 9 and 13 (Table 4.32).

IV, ii, 9, 13 Room #	Feature	Description/Position	Feature #	Roman Water Footprint Phase
1	drain	N wall; E corner	6	3
1	drain	cappucinna shape through N wall	57	3
1	drain	half cappuccina shape, E wall NE corner	102	3
1	fountain basin	double basin in SE corner	58	4
2	drain	N side corridor 2; open to room 1	71	4
2	rectangular downshaft	N side corridor 2	60	2
3	circular downshaft	NW corner; E of stairs 16	61	2

Table 4.32: Identified water features in building IV, ii, 9, 13.

[516] Stöger 2011, 133-136, Figs. 5.81, 5.82 dates this section of the southern wall to the Antonine period; *Contra* Van Dalen 1991, 264, who dates the *latericium* in the east wall of room 13 between 200-235 AD.
[517] DeLaine 2004, 151; see above for building IV, ii, 5.

Description of Water Features

The majority of the water features are in room 1. The first (feature 57) is on the northern wall of room 1 and is a cappucina-style drain. This channel is at the current ground level and passes through the entire thickness of the wall into the small open space between this building and IV, ii, 14 (Figure 4.160). While the *bipedales* are securely in the foundation level, it is unclear how deep into the ground the channel continues. Continuing to the east along the same wall, a rectangular drain was installed together with the blockage of a doorway here (feature 6).

Figure 4.160: External north wall of room 1, with feature 6 on the left, and feature 57 on the right.

On the east wall of the same room is another drain (feature 102), although this one is the half-cappucina shape and has much less of its opening visible above ground (Figure 4.161).[518] This drain also lies within the foundation course and goes through the entire thickness of the wall, and the single angled *bipedalis* continues into the ground for an unknown depth. The feature is located directly south of the join between two walls; on the internal face of this joint is a low rectangular construction similar to the one encountered in connection with the sinter spread in IV, ii, 5 (feature 37). Perhaps as in the case of feature 37, this low construction indicates where a vertical pipe was bound to the corner and turned at a sharp angle into a lower drain.

In the southeast corner of room 1 is a large double basin made of irregular brick masonry (Figure 4.162). This fountain basin (feature 58) was built against the existing southern and eastern wall of the room, and is also partially attached to the southern extent of the room's travertine threshold.[519] The basin/fountain was originally a single internal basin but was divided at a later point by a narrow wall of similar masonry to the basin.

[518] Behind the shed created for a planned archaeo-park for children to excavate a spoil heap in the same courtyard.
[519] RS II, 138 (sch. 128); SBAO B3697 (inv. 6186) for a pre-restoration view, C1775 (inv.8297). The latter is to be found in the SBAO archives filed under building IV, ii, 6.

Figure 4.161: Visible features of drain 102 in the northwest corner of room 1 at left. At right, a similar half-cappucina in the Terme del Faro (IV, ii, 1).

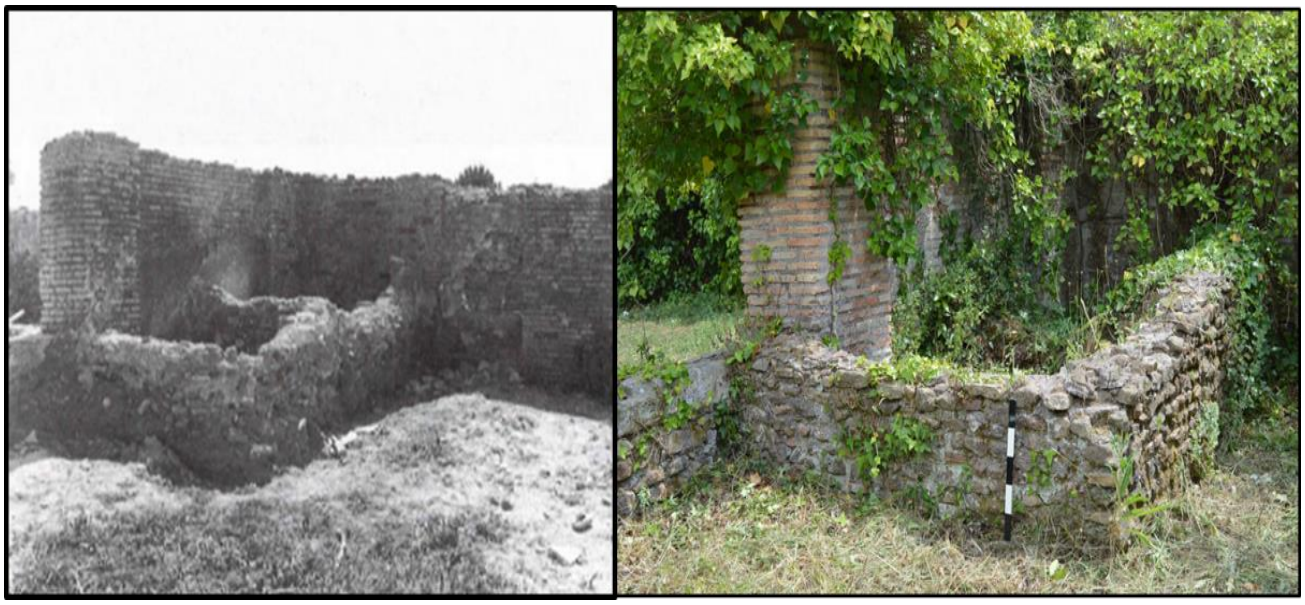

Figure 4.162: Southeast view of basin during initial excavation (SBAO C1775-1776), and in 2016 (by author).

On the external face of the south wall of room 1 is a rectangular downshaft preserved for the entire height of the wall, although the upper section is restored. This downshaft (feature 60) has a rectangular opening through the wall into room 1. This rectangular opening is feature 71, which is a small drain created to take advantage of the drainage connection established by feature 60 (Figure 4.163).

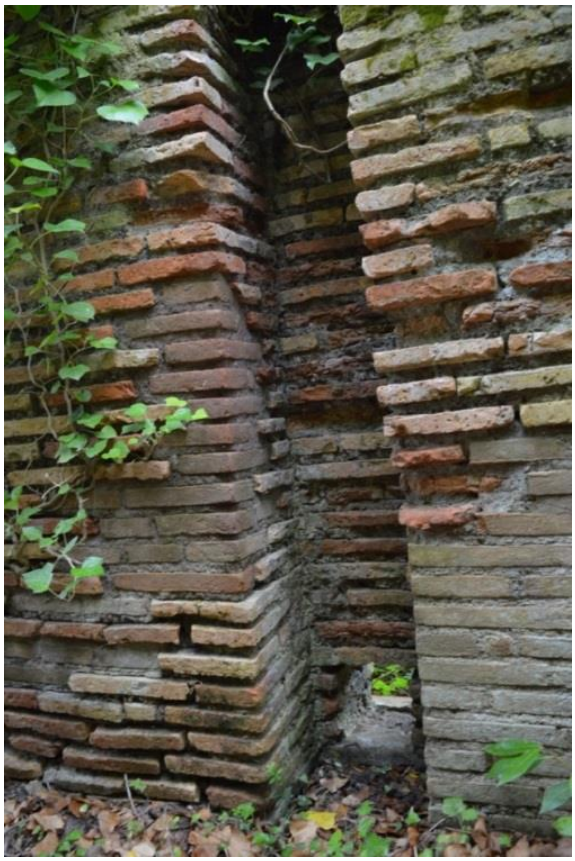

Figure 4.163: Downshaft feature 60 with drain 71 at bottom.

The final water feature is a semi-circular downshaft (feature 61), located on the inner face of the north wall of room 3 in IV, ii, 13. It is heavily damaged at its lower extent, and the eroding bricks make its dimensions unclear, yet there are significantly thick layers of sinter (calcium carbonate) covering the entire inner surface (Figure 4.164).

Figure 4.164: View looking down the inner face of feature 61 with the thick and irregular coating of sinter.

Infrastructure Chronology

Roman Water Footprint # 1(4th century B.C.- AD 50)

No preserved water features date from this period.

Roman Water Footprint # 2 (AD 50-200)

The two downshafts (features 60, 61) date to the Antonine period, when the entire western section of the building was heavily rebuilt. It is at this point that the downshafts could easily have been connected to the drainage system installed in the latrine of IV, ii, 7 (feature 53).

Roman Water Footprint # 3 (AD 200-300)

The drainage channels in the room 1 (features 6, 57, 102) point to a later date in the 3rd century. Together with the raised threshold on the eastern side of the room and the clear difference between the foundation and brick wall courses visible in the room, these water features demonstrate the later substructures of this building.[520] Given the levels of the bonding course in the central hallway of the insula and similar drainage discussed above (e.g. features 39, 40, 89, 101), we can hypothesize the modern under-excavating of the later floor level in this building as well.

Roman Water Footprint # 4 (AD 300-600)

The double basin (feature 58) dates to this period, as it covers the blocking layer on the south and east side of room 1. Given the height of the travertine threshold in this room and the extreme roughness of the external walls of this basin, it is likely that it was a basin sunk into the floor of this room. The basin drained out through feature 71, which was roughly broken through the bottom section of downshaft 60.

Conclusion

The hydraulic evidence from buildings IV, ii, 9 and 13 matches the contemporary events of the insula, which may be another factor in helping to identify which buildings worked together, or were owned by the same person. Upper floors were present above both buildings, and the difference in shape of the two downshafts indicates a division of upper floor drainage systems, with the rectangular downshaft removing rain water and the circular one removing waste from an upper-floor toilet. These buildings were intimately connected to all the activities of the insula, with the same evidence for higher ground levels and shared sewer networks as its neighboring buildings.

[520] Van Dalen 1991, 264 gives a date of AD 200-235 for this eastern wall.

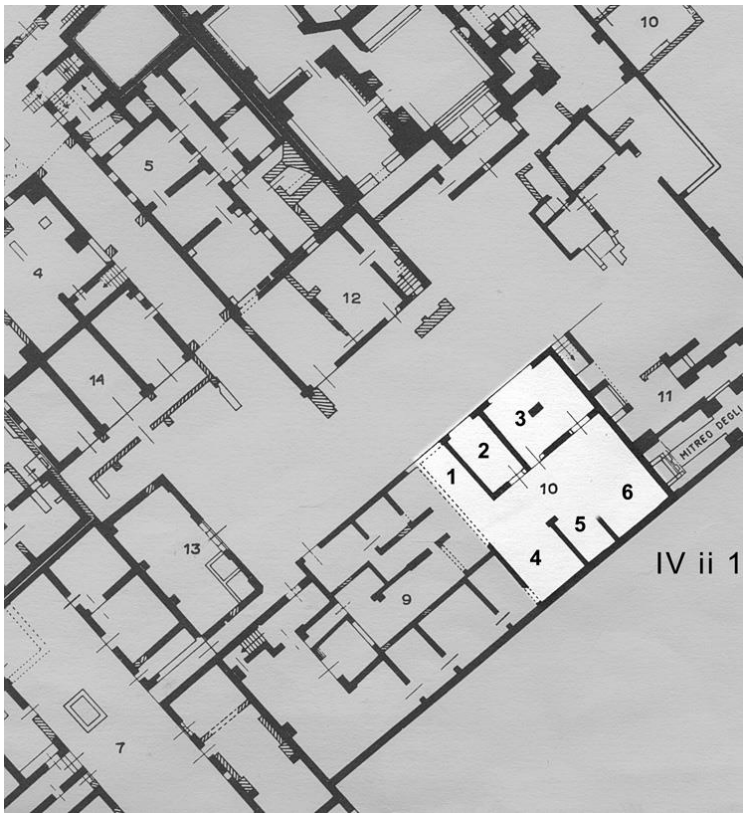

Figure 4.165: Plan of building IV, ii, 10 (SO 1, Pl. 13)

Location in insula

The building is made up of a northern and southern group of rooms divided in half by a small courtyard, although its internal wall divisions and connection to IV, ii, 9 are unclear (Figure 4.165). This building also has as its back the Trajanic wall, which divides the insula from the open area to the south. A large (+ 3.00 m) breakage is present in this retaining wall.[521] On the external northeast corner of the building is a later staircase, proving the existence of upper floors.

History of Excavation and Restoration

This building was initially excavated together with the neighboring Mitreo degli Animali (IV, ii, 11) and was one of the earliest buildings excavated in this area of the city.[522] This was based on the earlier interpretation that this structure must be connected with the temple of the Magna Mater and the *mithraeum*. However, following the floor level of the mithraeum caused the excavators to undercut the floor of IV, ii, 10 by ca. 0.60 m.

Phasing and Comments

The floor level in this building is also ca. 1.00 m above the open area to the south. The northern rooms (rooms 1, 2, 3) open onto a small inner courtyard, and perhaps also onto the southern courtyard of the

[521] Stöger 2011, 132, fig. 5.77 (=SBAO inv. 1171) shows the substantial breakage in the south wall of room 4.
[522] Stöger 2011, 139; it was excavated between 1864-1869 by P.E. Visconti during the period of papal excavation but disrupted by the Risorgimento.

insula. In the center of room 3 is a freestanding brick pillar that is likely connected to the staircase that was added onto the external northeast corner of the building.[523]

Water Features Chart

The following hydraulic features are located in building IV, ii, 10 (Table 4.33).

IV, ii, 10 Room #	Feature	Description/Position	Feature #	Roman Water Footprint Phase
No known water features	x	x	x	x

Table 4.33: Identified water features in building IV, ii, 10.

Description of Water Features

No water features have been discovered in this building.

Infrastructure Chronology

No water features have been discovered in this building.

Conclusion

With a complete lack of identified water features, the inhabitants of IV, ii, 10 must have completely relied upon the neighboring buildings for their water needs. The contemporary addition of a staircase and brick pier indicates that a new apartment was added above the rooms of building IV, ii, 10 in a later period.

[523] Stöger 2011, 137 (=SBAO inv. 1782) is incorrectly labeled in Ostia's photo archives, given the inconsistency between the view and a structural plan.

IV, ii, 11: Mitreo degli Animali

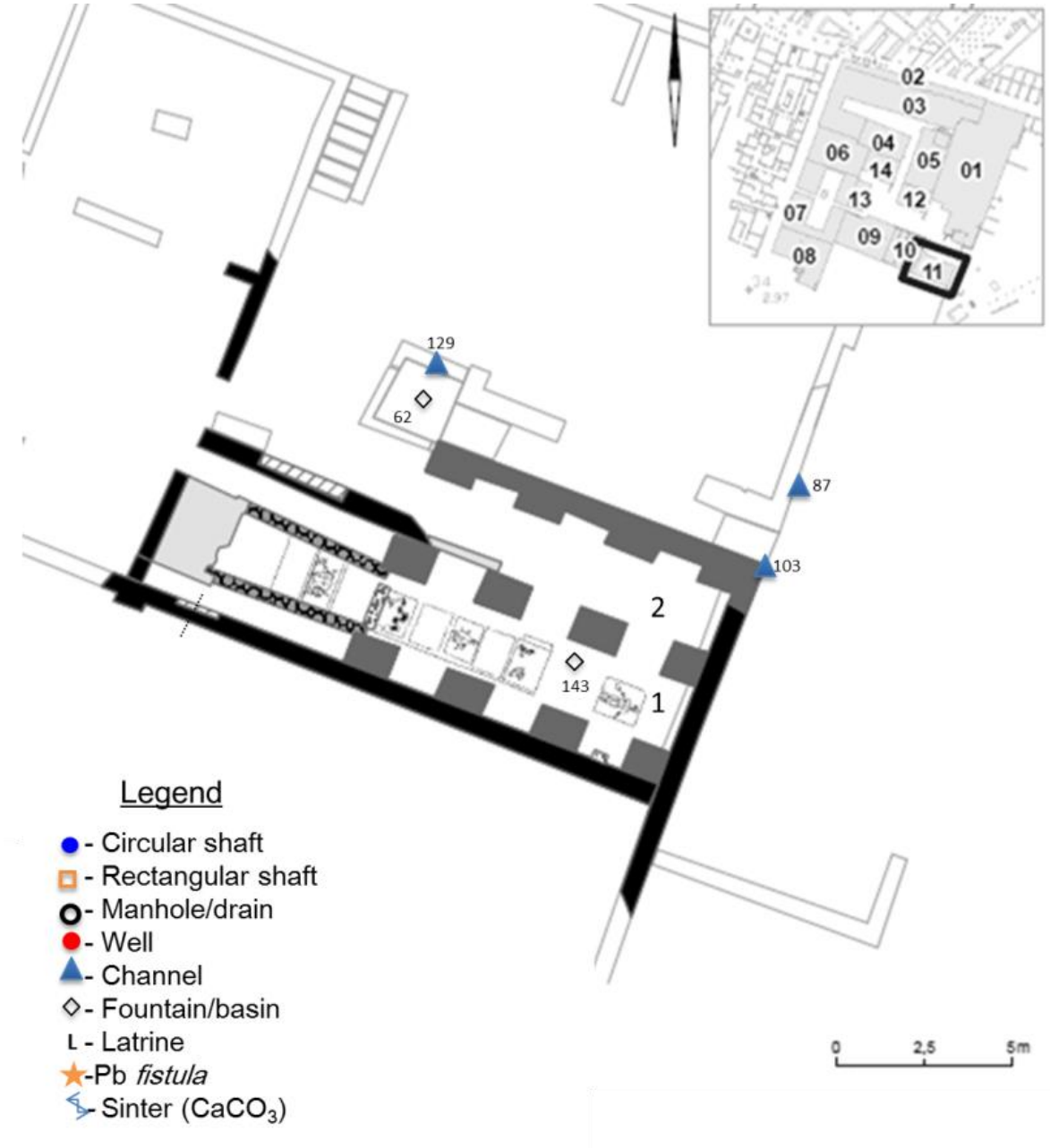

Figure 4.166: Identified water features in IV, ii, 11 (after Stöger 2011, 140, Fig. 5.90).

Location in insula

The mithraeum is located in the southeast corner of the insula (Figure 4.166). The north side of the building is accessed via a small hallway that opens onto the southernmost section of the insula's courtyard, and places the mithraeum at a considerable distance from all known streets.[524] It is bordered to the west by IV, ii, 10, and to the north by the small southeast courtyard of the *insula*, only a short distance (ca. 9.00 m) south of the hypothesized water feature 90 of the Terme del Faro (IV, ii, 1).

[524] Stöger 2011, 159 for the mithraeum as one of the most segregated rooms compared to the streets surrounding insula IV, ii.

History of Excavation Restoration

The Mitreo degli Animal (IV, ii, 11) was excavated in the 1890's by Vaglieri, as it was believed to be the *metroon* of the nearby Magna Mater temple. P.E. Visconti excavated this mithraeum together with the Campo della Magna Mater, Porta Laurentina, and a small stretch of the Via Laurentina. Some brief further work, especially on the mosaics and altar were carried out by Finelli in 1908.[525] Excavation and restoration continued under Calza, who followed Visconti's idea that the building was connected to the temple of Magna Mater since they were both "Eastern" cults, although this connection has now been disproven.[526] The majority of the mithraeum was part of the excavation carried out between 1938-42.[527]

Phasing and Comments

A fragmentary basin was identified underneath the mosaic floor when it was investigated by Finelli, and little additional detail about this phase was recorded. The mithraeum dates to AD 160, and was thought to be the earliest mithraeum in Ostia.[528] However, this view has been challenged most recently by White, who shifts its first phase as a mithraeum into the Severan period (AD 198), and sees the creation of the Mitreo degli Animali as part of a the second wave of Mithraism in Ostia.[529]

Like other mithraea in Ostia, it has a linear series of rectangular images, which refer to the mithraic grades. The modern and ancient literature on the cult of Mithras is enormous, with diverse architectural and artistic trends across the Roman world.[530] In terms of this mystery cult in Ostia, 17 mithraea have been found inserted into a wide variety of contexts, including bath and guild buildings, and grain storage structures.[531] The integration of well-preserved mithraea within the city is unparalleled in the Roman world and thus makes Ostia ideal for the study of this important mystery cult. Actual and ceremonial wells and water sources are often located in mithraea, recalling the hypogean birth of Mithras and his related miracles.[532]

The mithraeum was installed against existing Trajanic *opus reticulatum* walls, with rectangular brick piers added along the north and south side of the figural mosaics. The building has a narrow hallway (room 2) directly parallel to the line of mosaics, but a blocked door in the southwest corner of room 1 (directly south of the altar) points to an earlier entrance to the building from the south.[533] This door is also evidence of the +1.00 m ground level raise associated with the installation of the mithraeum. In the 3rd century a rectangular altar was added against the western wall. As in other mithraea in Ostia, the building would have been covered, likely with few windows and longitudinal benches along either side of the mosaics. Perhaps the staircase on the eastern face of IV, ii, 10 gave access also to an upper floor above room 1.

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[525] GdSc 1, 52 (16-4-1908); GdSc 1, 55 (12-5-1908), where it is called *"il metroon"*, with the mosaics already in a poor state: *"…musaico rinvenuto in una stato orribile di conservazione di piu di quanto fu descritto nell'ultimo giornale…"*; Paschetto 1912, 374 calls it *"il Sacrario sotteraneo"* and includes it in his itinerary (pp. 261).

[526] Rieger 2004, 252-257; Rinaldi 2012, 124 for Magna Mater restorations.

[527] GdSc 26, 66 (21-1-1940).

[528] Paschetto 1912, 375: *"Se è un mitreo, esso è il più antico fra quelli ostiensi".*

[529] Clarke 1979, 90 had already proposed this shift in chronology based on stylistic grounds; White 2012, 446-451, whose dating revolves around epigraphic dedications of M. C(a)erellius Hieronymus (C.I.L. XIV, 70, 4313). He proposed (pp. 462) instead the Mitreo degli Pareti Dipinti (III, i, 6) to be the oldest mithraeum in Ostia.

[530] See the selection made by Meyer 1987, but especially Porph. *De antr. Nymph.* 6-7 and the role of water in the "Mithras liturgy" (P.G.M. IV, 475-834). For secondary sources see Beck 2006, Becatti 1954, and Vermaseren 1956.

[531] Mitreo delle Terme del Mitra (I, xvii, 2), Mitreo di Fructosus (I, x, 4), and Mitre delle Sette Porte (IV, v, 13) respectively.

[532] Part of the Mithras mythology is a Moses-like myth where Mithras shoots an arrow at a rock and a spring gushes forth.

[533] Stöger 2011, 142.

Water Features Chart

The following hydraulic features are located in building IV, ii, 5 (Table 4.34).

IV, ii, 11 Room #	Feature	Description/Position	Feature #	Roman Water Footprint Phase
1	basin	entire area covered by mithraic mosaic	143	1
2	rectangular niche	external E wall of courtyard pier	103	2
	fountain basin	N of mithraeum	62	3
	ceramic pipe	internal N wall of basin 62	129	3
	fistula channel (?)	external E wall, N of courtyard pier	87	2

Table 4.34: Identified water features in building IV, ii, 11.

Description of Water Features

A rectangular basin (feature 143) was created in the area now covered by the eponymous mosaics (Figure 4.167).[534]

Figure 4.167: View looking west at the mithraeum in 2016.

[534] GdSc 1, 52 (16th-30th April, 1908): *"… forse stato notata* ***una vaschetta*** *con cordone in cocciopesto, la quale se estente per tutta la lunghezza del metroon, ma non conserva sempre la medesima altezza, della quale resta il pavimento, il cordone, e pochi resti della stabilitura delle pareti, stabilitura sempre in cocciopesto. Questa vasca piu tardi fu distrutta e cacciata* ***sotto il pavimento in musaica*** *con le figure indicate. Non ho ancora capito se detta vasca era un bagno sacro del tempio di Cibele che gli sta vicinio o un deposito di acqua di una cosa privata prima che vi fosse stati costruito il metroon piu su nominato."*; emphasis added by author.

Attached to the northern wall of hallway 2 is a low rectangular basin (feature 62). It was roughly added against the existing wall of brick piers, although various plans omit this basin altogether.[535] It is now preserved as a shallow sunken basin of brick walls within the current ground level, and was fed by a ceramic pipe in the north wall of the basin (feature 129).

On the external face of the wall dividing the mithraeum (and *insula*) from the Campo della Magna Mater are two hydraulic features (features 87, 103). These are not architecturally connected to the mithraeum but will be treated here given their spatial vicinity. The reticulate wall on the eastern side of the building is connected in its northeast corner to a line of brick piers that form hallway 2. Directly north of this brick pier is a small section of wall that acts as a barrier between the mithraeum and the wall that extends along the same orientation as the east wall of the mithraeum. This wall forms part of the original eastern limit of the insula, and over which the Terme del Faro (see IV, ii, 1 above) expanded to form its service corridor in the Trajanic period. Directly where this wall meets the small section of masonry dividing it from the mithraeum, is a channel with hydraulic mortar inside (Figure 4.168). This channel (feature 87) contains the semi-circular impression of a small (6 cm) lead pipe that is only visible from the external face of the wall. Feature 87 does not pass through into the internal side of the wall, but there is a half-dome shaped cutout in this internal face.

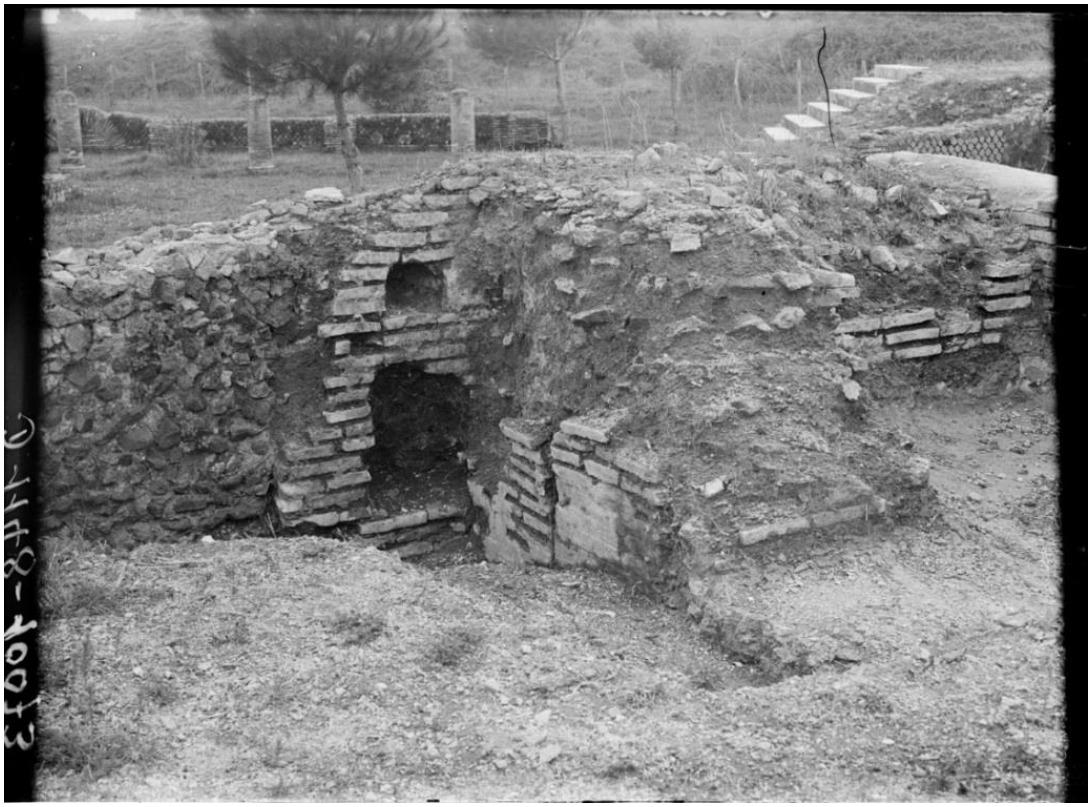

Figure 4.168: View looking east at the internal face of feature 87, with the portico and temple of Magna Mater in the background (SBAO D1148).

Directly north of the brick piers forming hallway 2 is a rectangular recess (feature 103) cut into a small wall section built to connect the mithraeum with the original dividing wall of the insula. The identification of this feature as hydraulic remains tentative, however, its clearly defined shape and vicinity to the two previous features make its hydraulic definition likely.

[535] SO I, map 13 shows only the northern wall of the basin; SBAO B3706 shows this basin.

Infrastructure Chronology

Roman Water Footprint # 1 (4th century B.C.- AD 50)

No preserved water features date from this period.

Roman Water Footprint #2 (AD 50-200)

While the *fistula* pipe impression (feature 87) post-dates the creation of the eastern retaining wall of the insula, little additional archaeological information is preserved. The basin 143 dates to this period, and was completely destroyed by the ground raising connected with the creation of the mithraeum in AD 198.

Roman Water Footprint #3 (AD 200-300)

The courtyard basin (feature 62) and its ceramic adduction pipe (feature 129) date to this period, given their addition against the brick piers of the late 2nd century AD. However, it is unclear whether the basin was connected to the mithraeum, the southeast courtyard of the *insula*, or both. What is clear is that there is a water supply feature in this section of the insula, which perhaps is evidence for a connection to the wider urban supply system. Features 87 and 88 could then form a direct link between the water system circulating along the Republican walls and the water feature (feature 90) directly south of IV, ii, 1, (ca. 9.00 m from here).[536]

Roman Water Footprint #4 (AD 300-600)

No preserved water features date from this period.

Conclusion

In a manner similar to the other early mithraeum known at Ostia, (e.g. the Mitreo delle Pareti Dipinti (III, i, 6), and the Mitreo degli Caseggiato di Diana (I, iii, 3-4), this mithraeum was installed in a previously domestic structure. The basin discovered underneath the mosaic (feature 143) perhaps was originally the shallow *impluvium* of a domestic nature. The installation of the mithraeum is the decisive moment of this structure's life, with the subsequent water features likely connected to the worship of Mithras.

[536] See IV, ii, 1 above for description of this feature.

IV, ii, 12

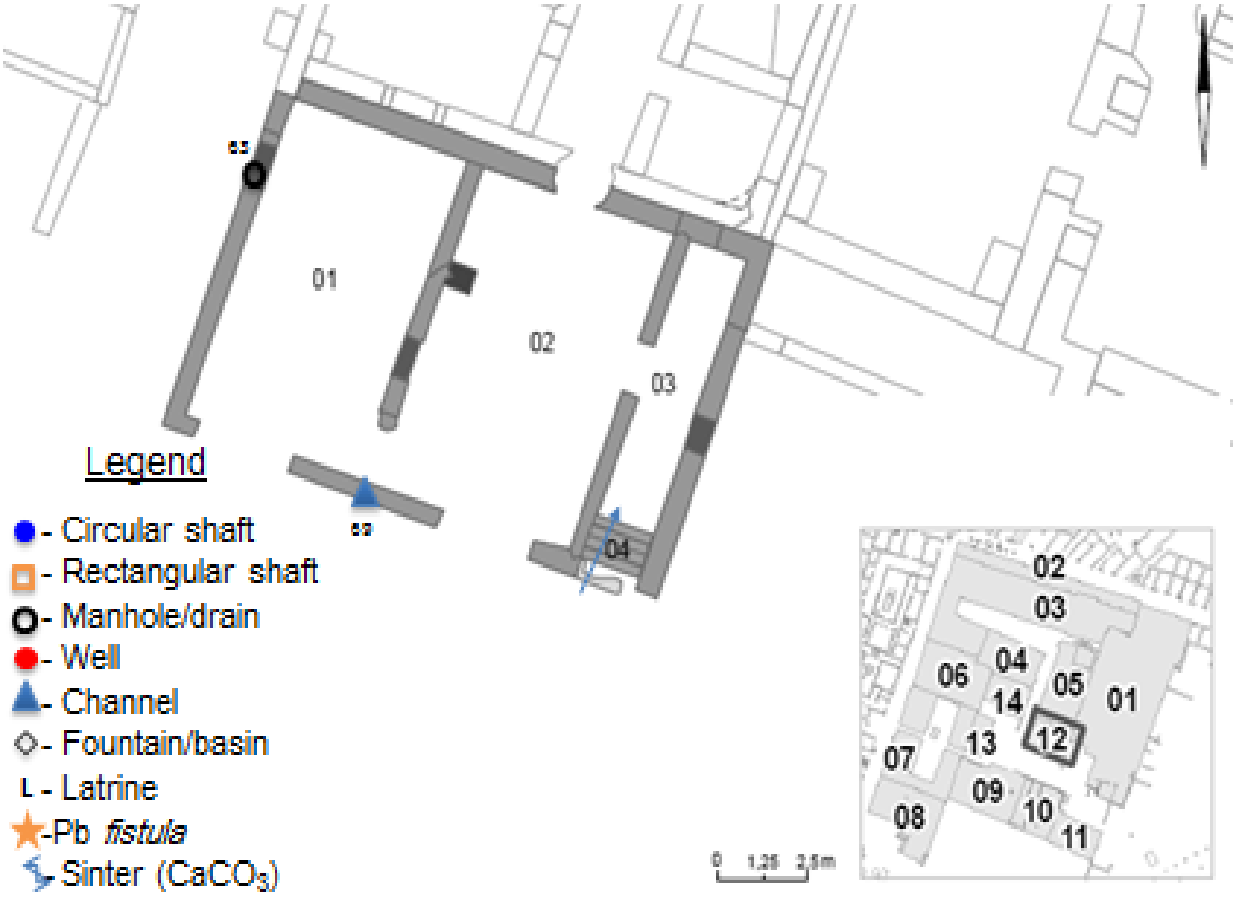

Figure 4.169: Identified water features in V, ii, 12 (after Stöger 2011, 147, Fig. 5.100).

Location in insula

The building is located in the southern part of the insula, and is placed directly to the south of IV, ii, 5 (Figure 4.169). Its western side has a door that originally opened onto the insula's central corridor, but was later blocked. On its eastern side the building shares a wall with the service area of the Terme del Faro (IV, ii, 1).

History of Excavation and Restoration

As with the other buildings of the *insula*, IV, ii, 12 was excavated in 1940, although it received no direct mention by the excavators.

Phasing and Comments

The earliest structural evidence comes from the Hadrianic reticulate of the north wall. The building's current form dates from the Severan period, and is contemporary with large structural changes made to IV, ii, 1 and IV, ii, 5.[537] The wall dividing room 1 and 2 is of *latericium* and rough tufa blocks, and was built against the early reticulate wall. Slightly later, the brick pier in room 2 was added, and doorways were closed in rooms 1, 2, and 3 with a neat *opus vittatum*. The building seems to respect the structural layout of IV, ii, 5, yet it is unclear how and when these two buildings were connected: the passageway

[537] Stöger 2011, 148.

connecting these two buildings may be ancient or modern.[538] The staircase on the southeast corner of the building (room 4) indicates an upper floor; together with the staircase in IV, ii, 5, room 14, these likely both gave access to the upper floor apartments of IV, ii, 5. One is drawn to the connection of the three buildings IV, ii, 1, 5, and 12, all of which meet in the northeast corner of the IV, ii, 12. These buildings are discussed in greater detail above (IV, ii, 1 and 5). Stöger saw this relationship as indicative of a shared ownership of these three properties.[539] Additionally, the large rectangular rooms are separated from the southern courtyard by an east-west section of wall that frames the southern edge of the building. This wall seems to respect the corridor connecting IV, ii, 5 and 12 and may support the antiquity of this connection.

Water Features Chart

The following hydraulic features are located in building IV, ii, 12 (Table 4.35).

IV, ii, 12 Room #	Feature	Description/Position	Feature #	Roman Water Footprint Phase
1	drain	cappuccina shape, under blocked up door	63	3
1	drain?	external S face of E-W wall	69	3

Table 4.35: Identified water features in building IV, ii, 12.

Description of Water Features

On the western side of the building is a cappucina drain with only one *bipedalis* brick remaining (feature 63). This forms a quite large opening (0.37 x 0.33 m) between IV, ii, 12 and the connecting corridor of the *insula* (Figure 4.170). It is securely built into a very roughly composed foundation level, and the wall above it is in the *latericium* of the Severan period. Immediately south of this feature in the same wall, a doorway connecting room 1 to the insula's central hallway was closed by an *opus vittatum* wall. The second water feature in this building is on the external face of the wall blocking access to rooms 1 and 2. Feature 69 is an irregular channel broken through this wall, although it was later blocked on its internal (northern) face. Its function is unclear, as are its dimensions; any supporting *bipedales* or stones are absent. It is preserved only as a large circular hole at the current ground level.

[538] See IV, ii, 5 above for a discussion of the *medianum* layout. The relationship between building 5 and 12 is not dealt with in the GdSc 74 excavation and report on IV, ii, 5.
[539] Stöger 2011, 149.

Figure 4.170: View looking east at the cappucina drain (feature 63) going through the west wall of room 1 in IV, ii, 12. The dotted line indicates the line between the foundation and superstructure.

Infrastructure Chronology

Roman Water Footprint #1 (4th century B.C.- AD 50)

No preserved water features date from this period.

Roman Water Footprint #2 (AD 50-200)

No preserved water features date from this period.

Roman Water Footprint #3 (AD 200-300)

Feature 63 can be dated to the Severan period, when dividing walls of *opus latericium* were added against the earlier (Hadrianic) reticulate wall. Based on the height of the *opus vittatum* masonry closing the door directly south of this channel, it can be inferred that the apex of this channel was under the contemporary floor level. Based on the *opus latericium* similarity to the wall of feature 63, feature 69 also is dated to this Severan period and possibly acted as a drain.

Roman Water Footprint #4 (AD 300-600)

No preserved water features date from this period.

Conclusion

While little remains of the exact personality of building IV, ii , 12, much can be observed from its connection to building IV, ii, 5. Once the large cistern was added in the Severan period, the main entrance into building IV, ii, 5 would have had to been through building IV, ii 12. This also applies to it

supper floor apartments. The water features in this building are related in space and time to the other hydraulic activities undertaken in the 3rd century within the central hallway.

IV, ii, 14:"*tabernae*"

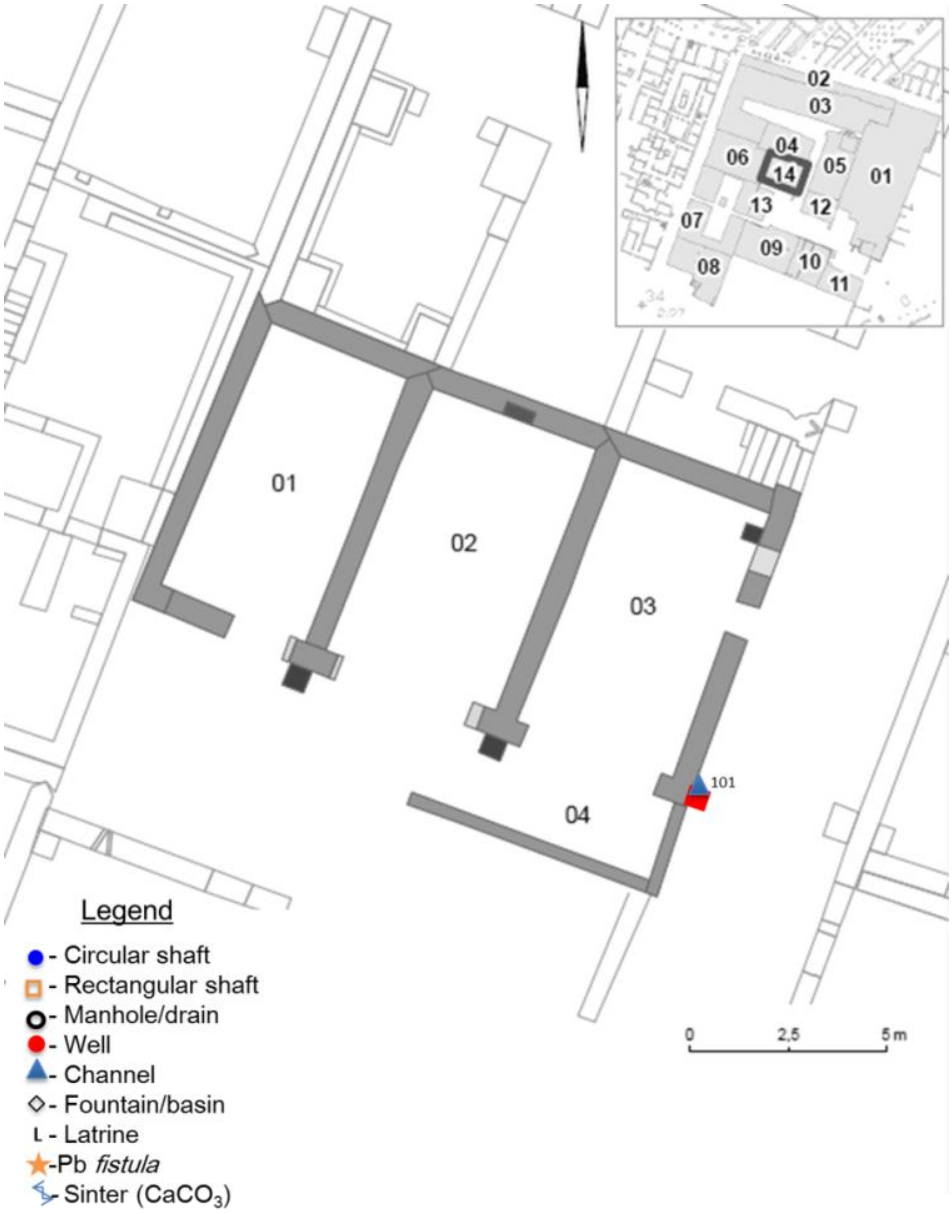

Figure 4.171: Identified water features in IV, ii, 14 (after Stöger 2011, 152, Fig. 5.108).

Location in insula

This building is composed of 3 rectangular rooms in the center of the insula (Figure 4.171). The building lies directly south of and shares a wall with IV, ii, 4. The western wall is against the eastern wall of the Caupona del Pavone (IV, ii, 6); three splayed windows pierce this wall. The building had a small enclosure in its southeastern corner, although a mirroring western section is known from Calza's 1953 plan. The building opens onto the central corridor of the insula, and onto a small courtyard facing the north wall of IV, ii, 13.

History of Excavation and Restoration

This building likely also was excavated in the 1940 period of excavation although no separate mention of it is made in the excavation reports. Brick stamps give evidence for isolated conservation work in the 1960s.

Phasing and Comments

The building was first constructed in the Hadrianic period based on the north wall's reticulate facing and its *opus latericium* quoining. The eastern wall (room 3) was reconstructed in the Antonine period in *opus latericium*, including a window and doorway connecting the building directly to the insula's central corridor. This is likely connected with the creation of this corridor and coeval structural phase of IV, ii, 5.[540] Based on the height of the putlog holes in the wall, the original depth of the floor can be estimated at ca. 1.00 m lower than its current level. Even with this raising, the rooms today lie ca. 0.50 m below the level of the central hallway. Wall paintings in several rooms, now mounted on plaster boards, are dated to the Severan period (Figure 4.172).[541] At a later point, a crude passageway was smashed through the reticulate walls dividing the three rooms, perhaps focusing attention on the central corridor of the insula.

Figure 4.172: Severan wall painting on the eastern wall of room 1 in 2017.

Water Features Chart

The following hydraulic features are located in building IV, ii, 14 (Table 4.36).

IV, ii, 14 Room #	Feature	Description/Position	Feature #	Roman Water Footprint Phase
3	fistula channel	external E face; through brick pier	101	3

Table 4.36: Identified water features in building IV, ii, 14.

[540] Stöger 2011, 154.
[541] Liedke 2003, 105 for the paintings.

Description of Water Features

This building possesses one water feature on the external side of its eastern wall (room 3). Feature 101 is the preserved imprint of a lead *fistula* pipe that ran vertically along the corner formed by the eastern wall of the building and the brick pier. The hydraulic mortar imprint runs ca. 0.84 m vertically from the current ground level up the wall before stopping suddenly. At ground level, the semi-circular imprint turns 90^0 and runs horizontally through the entire length of the pier, parallel to the eastern wall of the building. This feature likely pre-dates the insertion of the pier, as the *latericium* in the internal face of the pier respects the irregular line of the fistula imprint (Figure 4.173).

Figure 4.173: View looking south at the pier on the east side of IV, ii, 14. Preserved indentation of lead pipe outlined in dashed lines.

Infrastructure Chronology

Roman Water Footprint #1 (4^{th} century B.C.- AD 50)

No preserved water features date from this period.

Roman Water Footprint #2 (AD 50-200)

No preserved water features date from this period.

Roman Water Footprint #3 (AD 200-300)

Feature 101 shows a marked similarity to other water features running through piers from the same time period and nearby, namely features 37, 38, and 39.

Roman Water Footprint #4 (AD 300-600)

No preserved water features date from this period.

Conclusion

The one preserved water feature from this building informs us that a pressurized water line was present against the eastern wall before the insertion of the brick piers. As this line was part of the wider network running through the central corridor of the insula, it indicates that both a sewer and supply network were present here. This pipe also hydraulically binds building IV, ii, 14 to its neighboring building 4 and 5.

4.1.2: Data Conclusion

Insula IV, ii retained much of its initial architectural shape in the late 2nd century, although major renovations occurred in the Severan period. Yet, in terms of its hydraulic systems the insula changed dramatically over its life. From mostly individual water systems, there is a distinct change in the degree of hydraulic connectivity between buildings after the Severan period. Some buildings, like the Mitreo degli Animali (IV , ii, 11) and the Caupona del Pavone (IV, ii, 6) remained unconnected to these wider changes. Many water features were so as to maximize their accessibility, while at the same time not obstructing the flow of movement through the city block. However, the creation of dividing walls in the 4th century caused more of an east-west split of the insula. With the identification and chronological phasing of the hydraulic systems of each building now presented, the following section will place water features of the same chronological period in context with each other to identify wider trends of supply, usage, and drainage within the insula as a whole.

4.2: The Roman Water Footprints of insula IV, ii

4.2.0 Introduction

In the previous section, the individual hydraulic features of all buildings in insula IV, ii were identified and placed within the hydraulic history of individual buildings. This section turns from the spatial to the temporal. Water features from all buildings that date to the same time period will be examined together, to present an overview of the block´s hydraulic landscape throughout the stages of its life.[542] The infrastructure data is then inserted into the Roman Water Footprint framework, as outlined in Chapter 2. The Roman Water Footprint combines the archaeological traces of water with contemporary evidence for how water was used in public and private oriented spaces, and in the local environment of Ostia. Juxtaposing these three types of evidence produces a holistic view of water in the *insula*, and how the relationship between these three types of data changed over different periods of its life. In the final part of this chapter, trends in the wider hydraulic biography of the insula will be discussed.

[542] For more specific chronologies or technical details of individual water features or individual buildings, see the preceding section, 4.1.

4.2.1: IV, ii-Roman Water Footprint 1 (4th century B.C. – AD 50)

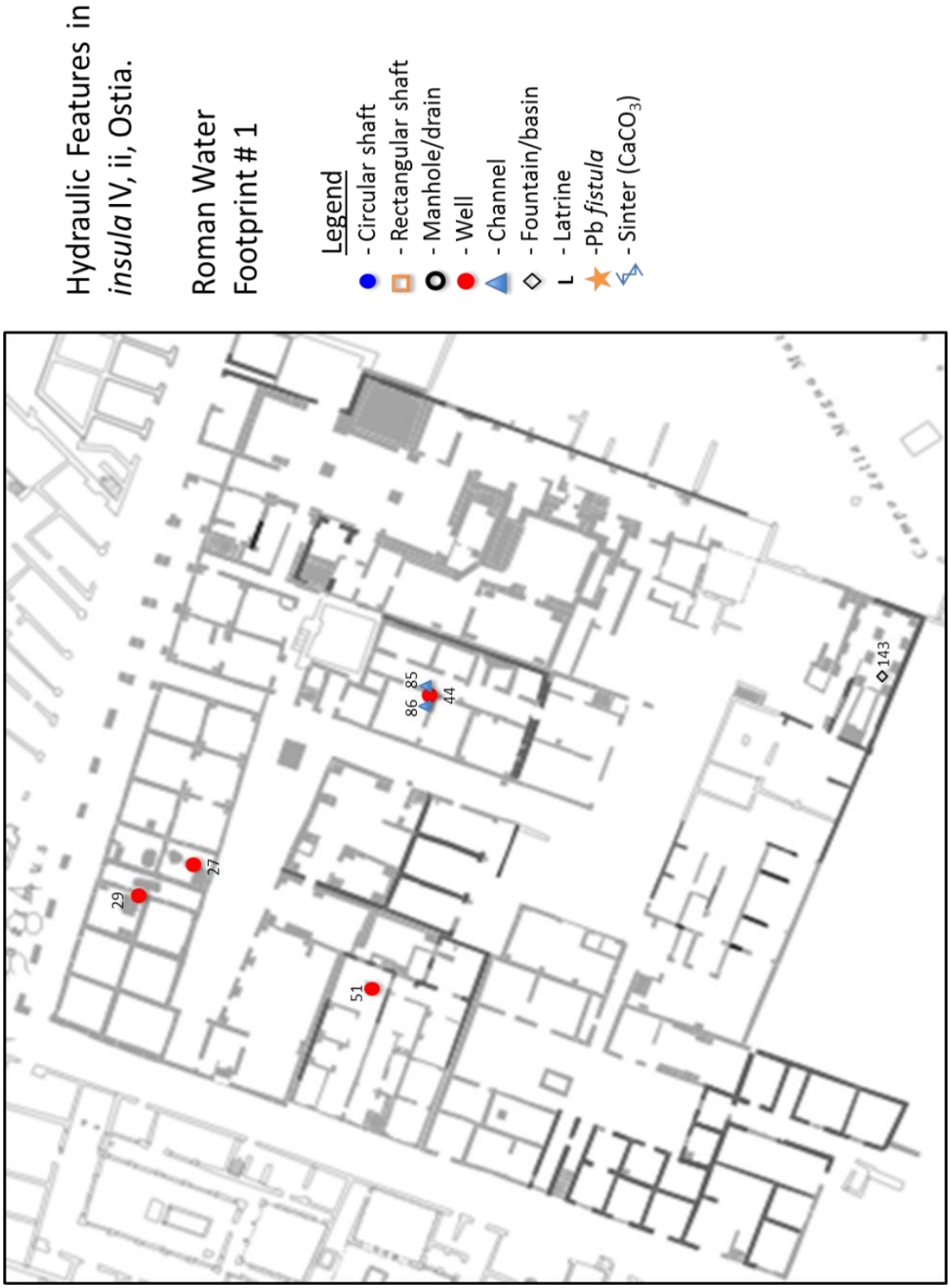

Figure 4.174: Water features identified in insula IV, ii between the 4th century B.C. and AD 50 (plan after Stöger 2011, 158, Fig. 5.112).

IV, ii Roman Water Footprint # 1 (4th century B.C.- AD 50)			
Indicator	Sub-Indicator	Data	Quantity
Infrastructure	Supply Systems	Rain Water	2
		Ground Water	4
		Aqueduct	0
		Total # of Supply Features	6
	Usage Systems	Number of Leisure Water Features	0
		Number of Industrial/Economic Water Features	0
		Number of Domestic Water Features	1
		Total # of Usage Features	1
	Drainage Systems	Sewer	0
		Downshaft	0
		Drains	0
		Total # of Drainage Features	0
	System Resilience	Number of Types of Supply	2
		Number of Types of Usage	1
		Number of Types of Drainage	0
		Total System Complexity	3
		Total # of Features	7
Culture	Private Oriented-insula	Total # of Features	7
	Public Oriented-insula	Total # of Features	0
	Private Oriented-Ostia	Total # of Features	36
	Public Oriented-Ostia	Total # of Features	17
Nature	External	Tiber River Floods	21
	Internal	Urban Garbage	1
		Urban Health (# of Baths)	3

Table 4.37: Roman Water Footprint #1 from insula IV, ii.

4.2.1.1: Infrastructure

Evidence for the water system in this earliest period of the insula's life is relatively simple compared to the complexity of the later periods (Figure 4.174). Starting with supply there are four wells (features 27, 29, 44, and 51) spread out across the insula (Table 4.37). Each of these exhibits a great deal of resilience, surviving numerous ground level changes and altering the position and layout of later buildings. The Caupona del Pavone is resolutely separated from the rest of the insula, implying that this well would have acted as the main water source in the domus for close to two hundred years until it was turned into a Caupona and the swimming-fish bar counter was inserted. Built into the walls of the well in IV, ii, 5 (feature 44), were two ceramic pipes that substantiate a system of rain water collection. This is the only example of this provision strategy in this insula. In terms of drainage, although the sewer line running underneath the *cardo maximus* (feature 114) is broadly dated to the Trajanic period, it may be contemporary with the building of the Republican walls and the Porta Laurentina.[543]

In terms of system resilience of the insula in this period, the total resilience of the water features in the insula is very low (3/9). This means that the supply, usage, and drainage of water in the insula is very rigid and can only be put to very specific uses, and is in a precarious position if one of the supply systems fails. The low figure also is a result of the minor traces of hydraulic evidence found for this period.

[543] Bukowiecki *et al.* 2008, 92 excavated a section of sewer line running under the Republican city wall near the Porta Romana *castellum*.

4.2.1.2: Culture

This earliest period of the city's water usage is fragmentary at best, with three wells found within the forum area.[544] We can expect several other open-air water features in connection with Republican and early Augustan domus houses, such as *impluvia* or storage cisterns.[545] While at least some sections of the city's sewer line date to the late Republican period, there is little top-down urban investment in water features in this period beyond the handful of wells and short traces of sewers in the forum. The insula has more private than public water features in this period, matching the general trend across Ostia. We can imagine the wells in the forum acting as focal points for movement and social action in Republican Ostia, especially before the Ciceronian walls. The majority of the population would likely depend on public wells. The *cippi* of Caninius record the space between the river and the *decumanus maximus* as public space that could be used by all to manage their daily water needs.[546] A private domestic well would surely have been an object of prestige, and merited the elaborate marble well-heads that in some cases remained visible for hundreds of years. (Table 4.38).

insula IV, ii		Roman Water Footprint # 1 (4th century B.C-AD 50)
Private Oriented-insula	Total # of Features	7
Public Oriented-insula	Total # of Features	0
Private Oriented-Ostia	Total # of Features	36
Public Oriented-Ostia	Total # of Features	17

Table 4.38 Private and Public water features in insula IV, ii and in contemporary Ostia in Roman Water Footprint #1 (4th century B.C.- AD 50).

The city is perched between the river and on the sea, and had a 4th century B.C. river port that had already silted up by the 1st century B.C.[547] In terms of bathing structures, only fragmentary evidence survives from the Republican period, although in general in this time period they are small and may have been seen as decadent or immoral.[548] From a religious point of view, we have contemporary evidence of the veneration of water deities in Rome and the impact of these on patterns of ritual movement and urban toponyms, with the worship of father Tiber as the most important. While there is little evidence for his worship at Ostia, we should certainly view him as a key figure, especially based on the particular vulnerability of Ostia to frequent river flooding.[549]

4.2.1.3: Nature

At the beginning of this period of Ostia's life the Tiber is the least filled with debris coming downstream from Rome, yet this changes with the urban growth in the Augustan period. There are no natural springs within the urban area of Ostia, and thus we assume its blossoming population from its foundation until the creation of the aqueduct sustained itself with water from the river and from rain collection. Additionally, we cannot exclude the use of marsh water from the nearby *Stagno Ostiense* for a wide

[544] RS I, 21-23 for these wells; SO 1, 73 for the earliest forum situation at Ostia.
[545] Meiggs 1987, 192-195 discusses the economic situation in Republican Ostia and mentions that wealthy *duovirate* families likely owned central atrium-style homes in the late Republican and early Imperial period.
[546] C.I.L. XIV, 4702, 4703; For nearby examples in Rome: Frontinus *De Aq.* 1.4 *"For four hundred and forty-one years from the foundation of the City, the Romans were satisfied with the use of such waters as they drew from the Tiber, from wells, or from springs."*
[547] Goiran *et al.* 2014; Hadler *et al.* 2015, 86 both offer a view of the Tiber during the early period of Ostia's life.
[548] Bruun 2016 for changing categories of what was considered "luxuria" in the Roman world; Medri & Di Cola 2013, 101 for Republican bath at Ostia known only epigraphically.
[549] Edlund 2006 for water in Roman Republican religion; Rieger 2004, 243-249 for attributing the temple in the center of the Piazza della Corporazioni to Pater Tiber.

variety of purposes, such as agriculture, salt harvesting, and small scale industrial purposes.[550] The marshes likely also acted as a baseline source for local foods, such as certain species of birds and plants. The highest number of recorded floods in the history of the city dates to this period, and we can imagine that while not as dramatic at Rome, it is undeniable that flooding was a real concern at Ostia, exacerbated locally by the inland marshes. The city is at its earliest and lowest levels, with minimal relief above the river plain. The after-effects of flooding on a low-lying area can be just as catastrophic as the flood event itself, which perhaps contributed to the minimal amount of preserved material from this period across the city.[551] These after-effects include structural damage, latent disease, and loss of biodegradable items. In terms of internal urban health, this low number of bath buildings would equal a low degree of bacterial interaction, although many other cultural practices could equally accomplish this. The amount of internal garbage begins at its lowest and starts to increase rapidly toward the end of this period.[552]

4.2.1.4: Conclusion

When considering the hydraulic aspect of insula IV, ii in its earliest period, the meagre evidence preserved accords well with the wider trend of privately focused water features. Access to water would be easier for wealthier people who could install wells within their home, while the remaining majority of the population must go either to the center of the *castrum* to public wells or to the river bank for their water. This is not to say that domus dwellers did not also use water from the river, just that they had an added degree of complexity available within their immediate surrounding for their needs. By incorporating rain water collection, *insula* IV, ii begins to diversify its collection strategy, which may also add to its social prestige.

[550] Giraudi 2011 gives a detailed look at the formation of these marshes.
[551] Aldrete 2007, 129-158 for the after effects of a flood and pp. 242 for recorded flooding of the Tiber river.
[552] MacKinnon 2014, 187-189 for faunal evidence in Ostia.

4.2.2: IV, ii-Roman Water Footprint 2 (AD 50-200)

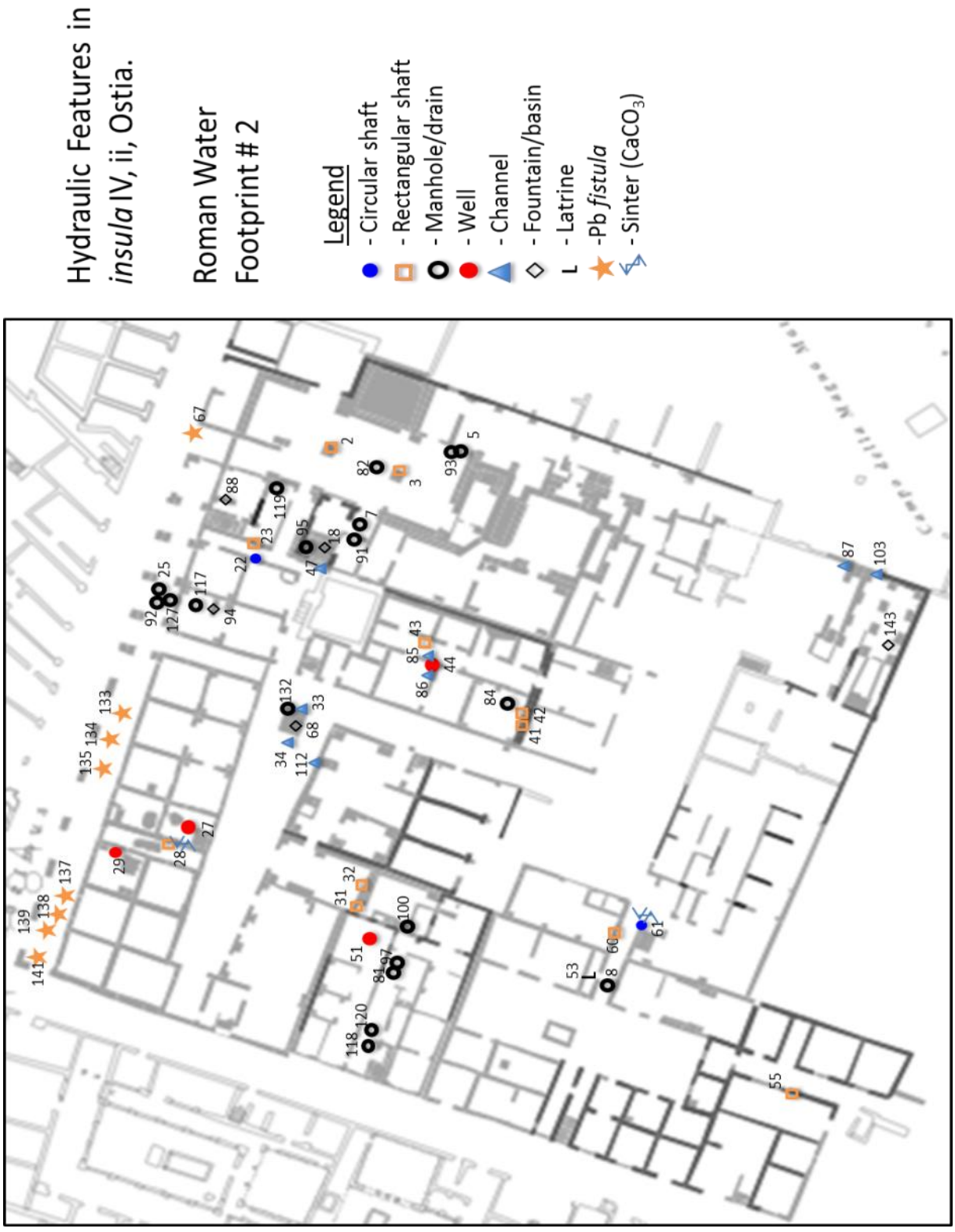

Figure 4.175: Water features identified in insula IV, ii between 50-200 AD (plan after Stöger 2011, 158, Fig. 5.112).

IV, ii Roman Water Footprint # 2 (AD 50-200)			
Indicator	Sub-Indicator	Data	Quantity
Infrastructure	Supply Systems	Rain Water	2
		Ground Water	4
		Aqueduct	11
		Total # of Supply Features	17
	Usage Systems	Number of Leisure Water Features	5
		Number of Industrial/Economic Water Features	2
		Number of Domestic Water Features	1
		Total # of Usage Features	8
	Drainage Systems	Sewer	16
		Downshaft	13
		Drains	4
		Total # of Drainage Features	33
	System Resilience	Number of Types of Supply	3
		Number of Types of Usage	3
		Number of Types of Drainage	3
		Total System Complexity	9
		Total # of Features	58
Culture	Private Oriented-insula	Total # of Features	35
	Public Oriented-insula	Total # of Features	23
	Private Oriented-Ostia	Total # of Features	122
	Public Oriented-Ostia	Total # of Features	72
Nature	External	Tiber River Floods	6
	Internal	Urban Garbage	3
		Urban Health (# of Baths)	21

Table 4.39: Roman Water Footprint # 2 from insula IV, ii.

4.2.2.1: Infrastructure

The first phase of the Terme del Faro (IV, ii, 1) dates to this phase, when it was supplied with aqueduct water by means of an epigraphic lead pipe (feature 67) (Figure 4.175). Based on the position and orientation of the ceramic pipes in the well (feature 85) in IV, ii, 5, the newly installed downshaft 43 was likely be connected to this earlier system of rain collection (Table 4.39).

Evidence of aqueduct supply in this period is present mostly in buildings in the northern section of the insula. The majority of this evidence comes from the area around the Portico dell'Ercole (IV, ii, 3), where numerous epigraphic fistulae were found. As mentioned in section 4.1, several of the same names were found stamped onto pipes in the neighboring Molino (I, xiii, 4) and in the Semita dei Cippi, implying perhaps a neighborhood's favourite lead-pipe maker (*plumbarius*), or some kind of social relationship connecting the inhabitants of this part of the city. The central courtyard fountain (feature 68) also dates to this period, offering a centralized location foraqueduct water for the inhabitants of the *insula*. It is hypothesized here that a branch of the lead pipe (feature 112) fed this fountain, entering through channel 33. This courtyard "bauletto" fountain will continue to be a central fixture of the insula's water supply into the Late Antique period. The presence of pressurized water supply comes from two Z-shaped channels found in the Terme del Faro.[553] In both cases a vertical channel set within a wall takes a sharp

[553] Room 7a (feature 23) and room 13b (feature 1).

90° turn and passes through the wall itself. While only one of these (feature 1) is known in direct connection with a bath basin, it is hypothesized that the same can be said for the other vertical channel, perhaps in connection with the Terme del Faro's contemporary *apodyterium*.[554] Rain water collection is identified by a downshaft (feature 43) in building IV, ii, 5, where it was created directly opposite a well that had several ceramic pipes built into its wall.

Usage of water in this period is mostly related to the bath building, but is also present in the tabernae fronting the *cardo maximus*. Domestic evidence for usage comes from building IV, ii, 5, as well as for the basin identified underneath the Mitreo degli Animali (feature 143). The complexity of the usage features expands from 1 to 3 types.

Several small sewer lines were installed to support individual or groups of buildings across the insula. A sewer line (feature 82) was created within the Terme del Faro, capturing waste from bath basins and downshafts. Together with the creation of the Caseggiato and Portico dell'Ercole came a smaller sewer line running parallel to the street front. A section of the sewer is preserved for several meters along the eastern section of the Portico, collecting the waste from the taberna in room 8 of IV, ii, 3 (feature 117), as well as the drain of the courtyard fountain (feature 132). The short stretch of sewer identified in IV, ii, 5 (feature 84), also headed toward this sewer in the portico, continuing in a northward direction under the space of the later cistern, and through hallway 5 of IV, ii, 2. A relatively large sewer system was also installed at this time in the Caupona del Pavone (IV, ii, 6: features 97, 100, 120), taking advantage of the raising of the ground level. This domestic sewer connects to the larger urban sewer network running under the Via della Caupona (feature 121). Also taking advantage of a major construction phase and a favourable location in a hallway is the sewer servicing the latrine in IV, ii, 7 (feature 8). This line ran in a linear (east –west) direction towards the Via della Caupona.

The downshafts in this period offer a dynamic mixture of locations and functions. While one of these was mentioned above in connection with rain collection, several downshafts directed rain water to secondary sewer lines, not collecting the water for any subsequent purposes. This is the case for the twin downshafts in several buildings.[555] The downshafts in IV, ii, 4 likely drained to the north towards the *cardo*, passing through the Portico dell'Ercole (IV, ii, 2, room 20). While the two downshafts of IV, ii, 9, 13 (features 60, 61) were connected to the latrine sewer of IV, ii, 7 (feature 8), it is their location and different shape which are of interest here (Figure 4.176). These two downshafts are directly across a narrow hallway from each other and probably had a shared upper floor spaces. The rectangular shaft is too shallow to have held a large vertical ceramic pipe and likely was reserved for rain water drainage, while the semi-circular downshaft could easily hold a vertical drainage pipe for upper-floor latrines. In the extreme southwest of the insula comes a similar rectangular downshaft (feature 55) that was also likely for drainage purposes. The drain could have led out towards the sewer under the Via della Caupona, using the hallway and skirting the southern rooms of IV, ii, 8. To further complicate the evidence from the downshafts is the variable presence of calcium carbonate (i.e. sinter) they contain. Although this material is only present in some downshafts (features 28, 61), they must indicate a large or at least consistent flow of aqueduct water on upper floors.

In terms of system resilience, the insula reaches a level of 9/9, meaning that there is a maximum level of diversity in all aspects of the insula's water system (supply, usage, and drainage). This comes from an expanding number uses to which water is put in this period, and the need to create enough infrastructure to support this diversity of uses within neighboring buildings.

[554] In room 7a of the baths; Similar Z-shaped channels are known in larger nymphaea, such as the one discussed in Chapter 5 within the Domus del Protiro (V, ii, 4-5, features 37, 38).

[555] Rain downshafts in the Terme del Faro (IV, ii, 1: features 2, 3); IV, ii, 4 (features 31, 32) and in IV, ii, 5 (features 41, 42)

Figure 4.176: Different shaped downshafts in insula IV, ii indicate a division of upper floor waste removal. At right is the semi-circular downshaft in building IV, ii, 9 (feature 61), and at left is the rectangular downshaft from building IV, ii, 13 (feature 60).

4.2.2.2: Culture

This period witnessed the introduction of aqueduct lines from the Malafede hills, first leading to the large cistern now under the *palaestra* of the Terme di Nettuno (II, iv, 2), and the second to the large *castellum aquae* directly south of the Porta Romana.[556] These were revolutionary to the hydraulic landscape of Ostia, and heralded a period of widespread bath and public fountain creation, as well as transforming the possibilities for water distribution and display throughout the city. This was contemporary with a large jump from mostly private hydraulic infrastructure to a combination of public and private systems (Table 4.40). Together with public urban systems like the street sewers there is a much larger increase in private structures. Private buildings like a domus invested in complex internal supply and drainage structures, such as the Caupona del Pavone (IV, ii, 6).

The buildings of the insula mirror the general urban trend of an increasing overall number of water features, as well as the proportion of private to public features (Tab. 6.4). This diversity reflects the wider situation across Ostia with the dramatic spread of multi-story *insulae* across the city.

[556] Bukowiecki 2008, 57 for this initial aqueduct line.

insula IV, ii		Roman Water Footprint # 2 (AD 50-200)
Private Oriented-insula	Total # of Features	35
Public Oriented-insula	Total # of Features	23
Private Oriented-Ostia	Total # of Features	122
Public Oriented-Ostia	Total # of Features	72

Table 4.40: Private and Public water features in insula IV. ii and in contemporary Ostia between AD 50-200.

4.2.2.3: Nature

On a larger ecological level, water was brought in from a separate hydraulic basin in the Malafede hills, as local supply was insufficient. However, this is not a case of urban centers depriving rural communities of water, and it is likely that rural communities benefitted from these lines as well.[557] In terms of the Tiber river, this period saw fewer floods compared to the previous Roman Water Footprint period (4th century B.C.- AD 50).[558] The river was certainly more polluted in this period, and not simply by modern standards. Contemporary authors describe the negative impact of Rome's pollution on local fish populations, which we can imagine as a direct result of the increase in urban manufacturing industries such as leather processing, and fulling.[559] However, as discussed above, the increased pollution likely had little effect on the acquisition of water for certain applications. Additionally, the expansion of Portus reduced the strength of the Tiber flowing by Ostia as a result of the digging of the *fossa Traiana*.[560] This action increased the rate of delta progradation near Ostia, ensuring its departure from the stage of large-vessel trade. The amount of internal urban garbage jumps exponentially from the previous period, tied in with the boom in population, production, and building. The highest number of functioning bath buildings also exist in this period (21 baths), surely facilitating the spread of water-borne parasites at an equally exponential rate.

4.2.2.4: Conclusion

This period witnessed one of most massive changes to the total urban landscape of Ostia. With widespread socio-economic change, came a parallel increase in the complexity and diversity of the hydraulic infrastructure in the insula. The majority of these systems encompass, or at least pass through the space of other buildings, especially in terms of sewer lines. There is a definite clustering of water features in the north (IV, ii, 1, 2, 3, 4, 5), central (IV, ii, 6), and southern (IV, ii, 7-14) parts of the insula. The presence of existing sewer lines dictated the location of later structures. There is also a clear subdivision in types of downshafts, and it is possible to use these features to sketch out the position and diversity of upper floor structures. While the number of floods decreases in this period, the overall health of the city must surely have decreased with the incredible surge in proportion to the city's growth. Many more people coming from a wide range of places mixed with large-scale building projects, and all of it washed into the high number of bath basins would have potentially promoted the spread of water-borne diseases.

[557] Wilson 1999 for an overview of rural aqueduct usage.
[558] Aldrete 2007, 242 for floods recorded in this period.
[559] MacKinnon 2014, 191 for the surprising lack of fish bones in the osteological assemblages throughout Ostian history.
[560] Keay *et al.* 2014b for the canal system at Portus.

4.2.3: IV, ii Roman Water Footprint 3 (AD 200-300)

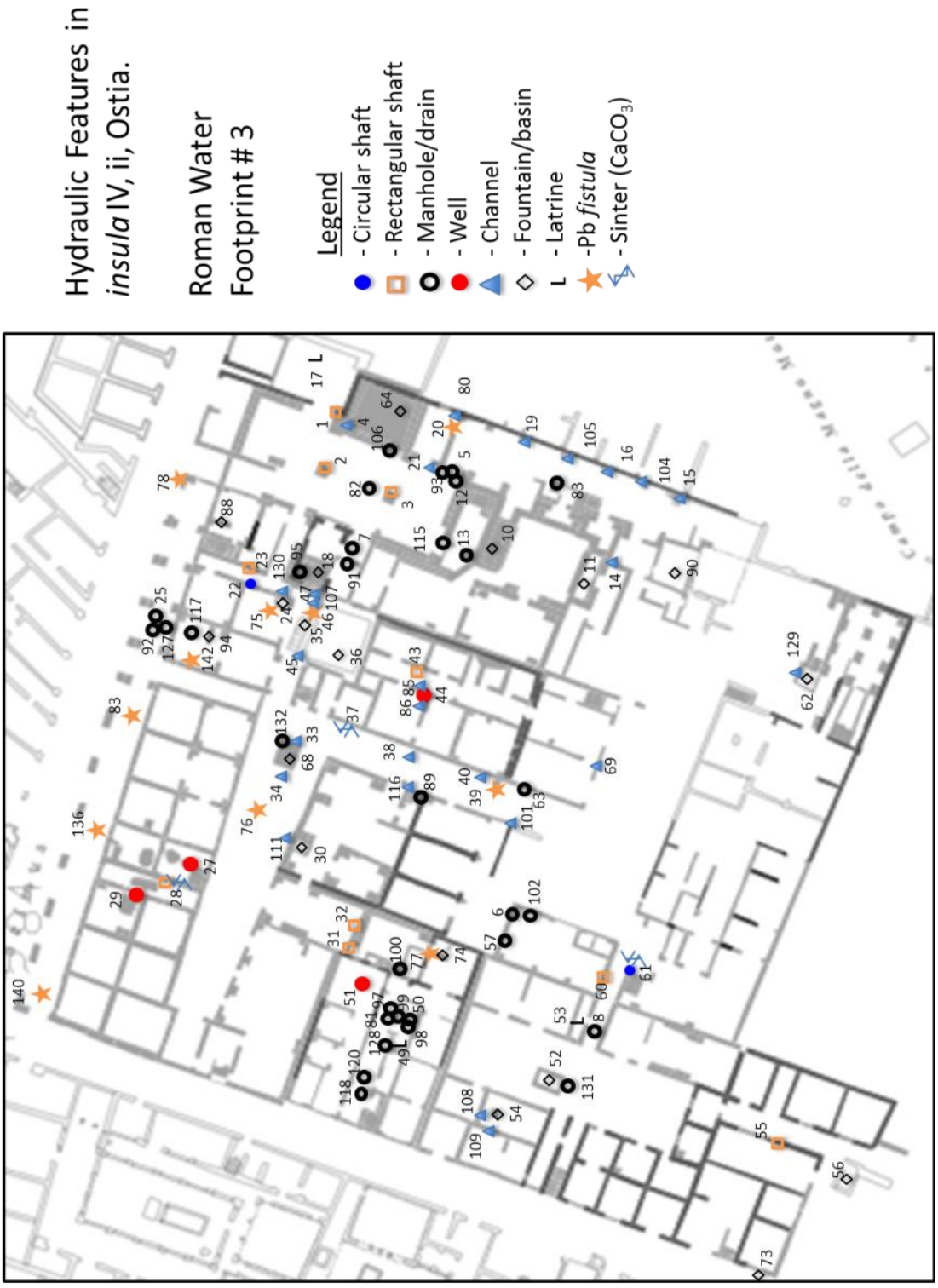

Figure 4.177: Water features identified in insula IV, ii between 200-300 AD (after Stöger 2011, 158, Fig. 5.112).

IV, ii Roman Water Footprint # 3 (AD 200-300)			
Indicator	Sub-Indicator	Data	Quantity
Infrastructure	Supply Systems	Rain Water	3
		Ground Water	4
		Aqueduct	27
		Total # of Supply Features	34
	Usage Systems	Number of Leisure Water Features	15
		Number of Industrial/Economic Water Features	5
		Number of Domestic Water Features	1
		Total # of Usage Features	21
	Drainage Systems	Sewer	25
		Downshaft	10
		Drains	17
		Total # of Drainage Features	52
	System Resilience	Number of Types of Supply	3
		Number of Types of Usage	3
		Number of Types of Drainage	3
		Total System Complexity	9
		Total # of Features	107
Culture	Private Oriented-insula	Total # of Features	46
	Public Oriented-insula	Total # of Features	61
	Private Oriented-Ostia	Total # of Features	101
	Public Oriented-Ostia	Total # of Features	49
Nature	External	Tiber River Floods	2
	Internal	Urban Garbage	4
		Urban Health (# of Baths)	16

Table 4.41: Roman Water Footprint #3 from insula IV, ii.

4.2.3.1: Infrastructure

Infrastructure expands in all areas in this period (Figure 4.177). The total number of supply features doubles in this period when compared to the previous phase (from 17 to 34 features); the majority of this growth comes from aqueduct-supplied features (Table 4.41). These are clustered in the Terme del Faro (IV, ii, 1), which received a large-scale reconstruction in this period, and perhaps a new owner (Figure 4.178).[561] The line of brick piers added along the eastern side of the building contained at least two lines of lead supply pipes; in addition to the lead pipe known from the area of the *cardo*, these features suggest a secondary supply system. This secondary system would be represented by the newly installed *castellum divisorium*-nymphaeum (feature 90) in the southern part of the baths, and be connected to the supra-mural aqueduct line of the city. Rain water and ground water continue to be used into this period as well, ensuring a diverse supply system in the insula.

Other than the activity in the baths, the largest change in this period comes from the insertion of a large cistern (feature 36) against the north face of IV, ii, 5. Aqueduct water first reached a small distribution box on the northern wall of the cistern and was split through four different channels (Figure 4.179). Water from the cistern directly supplied the baths (IV, ii, 1) and basin 24 in the Caseggiato dell'Ercole (IV, ii, 2).

[561] See section 4.1 (IV, ii, 1) for the *fistula* pipe naming Scipio Orfitus (feature 78).

Figure 4.178: Two details of the Severan fresco added in the Terme del Faro, showing Europa astride Zeus at right, and maritime attendants at left.

Figure 4.179: Looking south at the flight of stairs leading to the top of the cistern, with the distribution basin indicated by dashed lines.

An elevated channel (feature 45) within the cistern probably acted as an additional off-take, leading water from the northwest corner of the cistern, before turning south and heading along the external western side of building IV, ii, 5. Based on the sinter evidence, water would then turn 90° towards the ground, perhaps leaking from the pressure and causing the formation of irregularly spread sinter (feature 37). Such pressure breaks are a well-known symptom of *fistulae*. Throughout the insula, large basins are installed in this period (features 30, 52, 54, 56, 73), and although a new connection to the

aqueduct is known for only one of these basins (feature 76) , the others were also likely supplied in this way. Also in this period, the domus in IV, ii, 6 was converted into the Caupona del Pavone, and gained a new bar basin with its optical illusion fish.

With the renovation of the bath building (IV, ii, 1), new sewer lines were created and attached to pre-existing ones. Geophysical prospection within the central room carried out in the summer of 2015 has indicated the approximate path of these drains (Figure 4.180).[562] The ground penetrating radar was carried out using a 250 MHz transmitter with an approximate depth of 30-50 cm, and identified the outline of the large rectangular drain (feature 115) in the south part of the room, as well as the central drain (feature 82). While additional geophysical work would further define these channels, these initial results do prove the potential for further geophysical prospection within thermal structures.

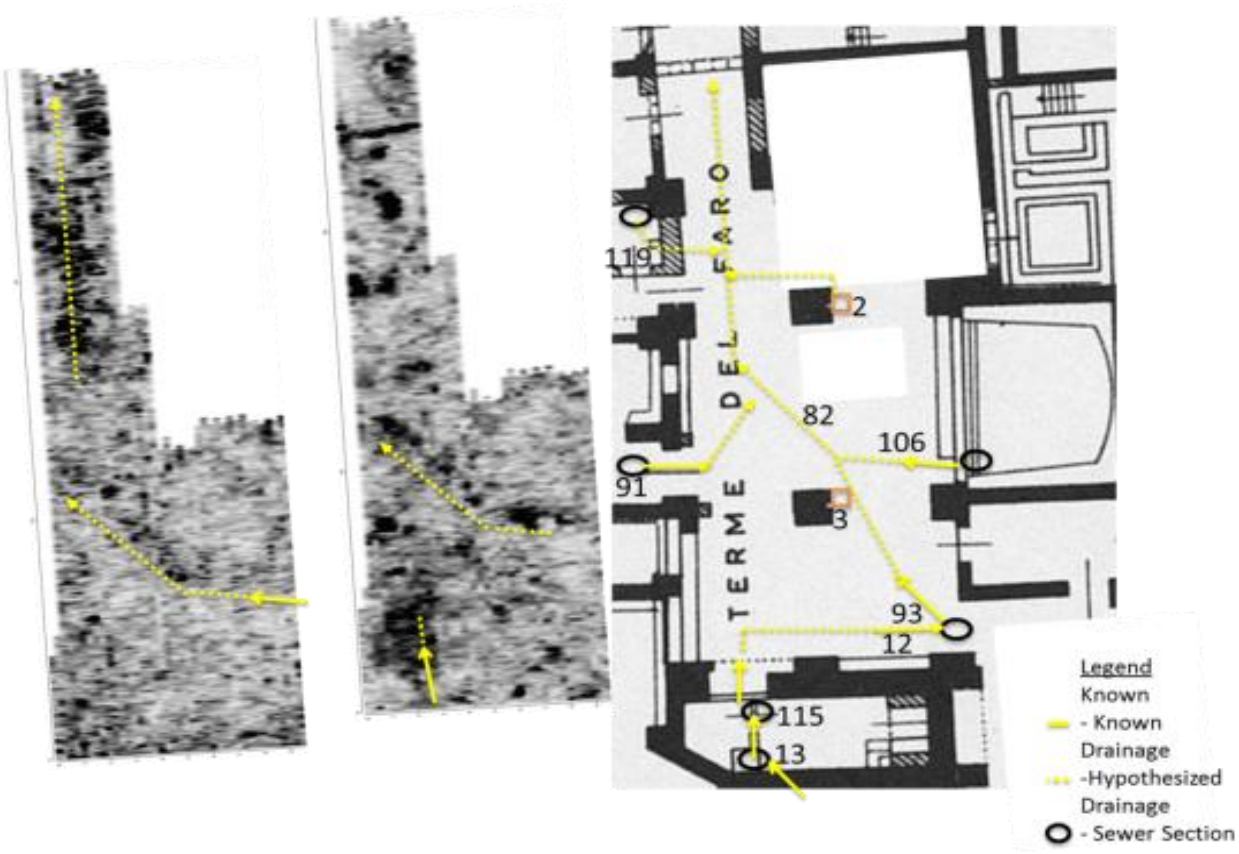

Figure 4.180: Two depth slices of the ground penetrating radar study of the Terme del Faro (IV, ii, 1), with identified and hypothesized sewer features indicated by solid and dashed lines respectively.

Fill material recovered from the sewer line running from IV, ii, 5 toward the *cardo* (feature 84) dated its destruction in the 3rd century, and is connected with the insertion of the large cistern.[563] However, the sewer was only destroyed under the cistern: water from building 5 was now directed out into the central corridor of the insula. The northern extension of the sewer that ran through the Caseggiato dell'Ercole (IV, ii, 3) continued to function. In this period, the ground level within the rest of the insula was raised to a level higher than at present: the exact height difference is estimated to have been ca. 50 cm above the current ground level. This is substantiated not only by the current position of many drainage features, but also from the height of the bonding course within brick piers that were added at this time.

[562] Conducted by T. Sonneman with the support of H. Stöger and assisted by bachelor students from Leiden University and TU Delft.

[563] See section 4.1 for a description of the 1994-1995 excavation carried out in building IV, ii, 5.

While only secondary channels and isolated sewer sections remain, they are all roughly contemporary and must have been part of a centralized supply and drainage system. This was composed of three main sections (Figure 4.181).

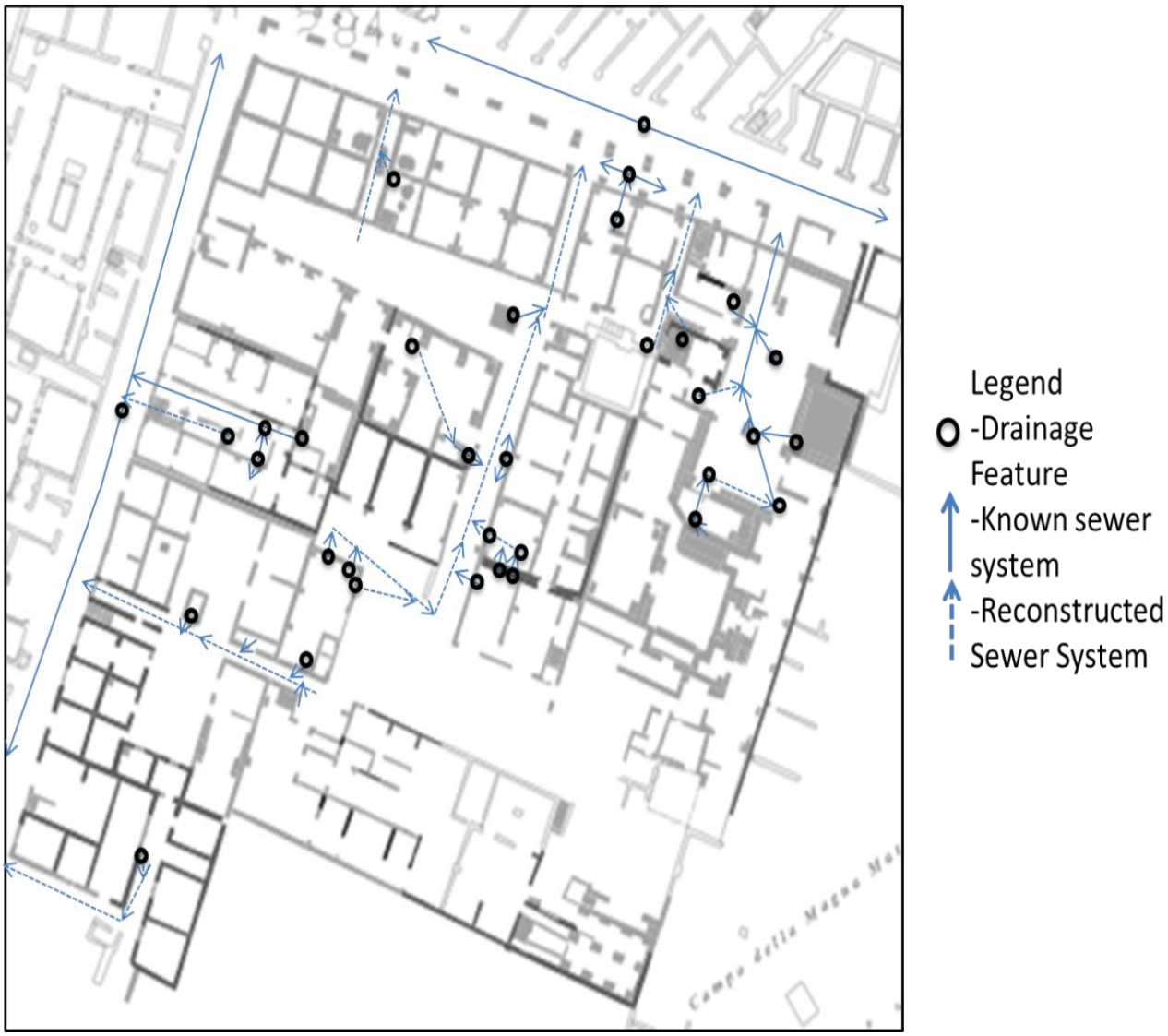

Figure 4.181: Reconstructed drainage and sewer systems in insula IV, ii in RWF #3 (after Stöger 2011, 158, Fig. 5.112).

The first runs down the central corridor of the insula, connecting the features of building 4, 5, 12, and 14.[564] This sewer would have connected to the 2nd century sewer line already in place to drain the courtyard bauletto fountain. The second section is made up of the features in the north part of IV, ii, 13, and likely connected to the first section.[565] The third section comprises features from buildings 7, 9, and 13.[566] In addition to these more integrated drainage systems, existing lines continued to be used and modified in the Caupona (IV, ii, 6) and building IV, ii, 8.[567]. Also in the Caupona, a new latrine was installed (feature 49) that connected directly to the sewer under the Via della Caupona del Pavone. The multi-

[564] IV, ii, 4: features 89, 116; IV, ii, 5: features 37, 38, 39, 40; IV, ii, 12: feature 63; IV, ii, 14: feature 101.
[565] IV, ii, 13: features 6, 57, 102.
[566] IV, ii, 7: features 8, 131; IV, ii, 9, 13: features 60, 61.
[567] IV, ii, 6: features 98, 99, 50; IV, ii, 8: feature 56.

seater latrine in the Terme del Faro was also installed in this period (feature 17); similar latrines are common in bath buildings, such as in the Terme del Foro (I, xii, 6), and Terme di Nettuno (II, iv, 2).[568]

The hydraulic system of the insula remains at its maximum level for all parts of the hydraulic system (9/9). This means that there are many different types of contemporary supply sources, and that water is being used in many different ways. The drainage systems are also composed of different drainage types, with water draining from upper apartments, ground level basins, and through larger sewer networks. A maximum level of resilience also means that the entire hydraulic system is flexible, and can react and adapt if one part of the system breaks down.

4.2.3.2: Culture

This period is characterized by a much more water being used in spaces with a public orientation than in inward facing private spaces (Table 4.42). This trend is opposite to the previous Roman Water Footprint #2 phase (AD 50-200). Most of this public water usage comes from the new phase of the Terme del Faro (IV, ii, 1), and the transformation of the Caupona del Pavone (IV, ii, 6) from a domestic into an outward facing building. This runs against the wider trends in the city, which has more evidence of private investment in this period. Accepting the Severan chronology proposed for the Mitreo degli Animali (IV, ii, 11), it suggests that the mithraeum was created almost in the same year as the renovations to the bath building, which could suggest a much wider program of building involving the entire eastern section of the city block.[569]

insula IV, ii		Roman Water Footprint #3 (AD 200-300)
Private Oriented-insula	Total # of Features	46
Public Oriented-insula	Total # of Features	61
Private Oriented-Ostia	Total # of Features	101
Public Oriented-Ostia	Total # of Features	49

Table 4.42: Private and Public water features in insula IV, ii and in contemporary Ostia between AD 200-300.

4.2.3.3: Nature

In this period, the Tiber had a very low number of recorded flooding episodes, with only two floods known.[570] The highest number of preserved urban landfills date to this period, which is connected with the wider ground raising for new building projects.[571] This high amount of waste is indicated by the peak in faunal material identified for the 3rd century. The number of bath buildings in the city decreases from the previous Roman Water Footprint period, from 21 to 16 functioning thermal establishments. Evidence from recent wide-scale Late Antique surveys of Ostia have shown that there were numerous collapsed and abandoned buildings in Ostia in this period, which would have been excellent places for the accumulation of vermin and bacteria.[572] When taken together with the maximum amount of preserved internal faunal evidence, the evidence of a high number of functioning bath buildings point to the least healthy period in the city's history. Accumulated disease from the city would have been sloughed off into the pools of the 3rd century bath buildings.

[568] Jansen 2002, 178, note 240 identifies this as a latrine.
[569] White 2012, 446-451 for this dating.
[570] Aldrete 2007, 242 for the flood evidence.
[571] MacKinnon 2014, 192-194.
[572] Lavan 2012, 677 for this survey.

4.2.3.4: Conclusion

Numerous buildings were connected with the water supply from the cistern. Also in terms of drainage, almost the entire insula becomes connected in three large sewer systems that all drain outwards towards the main streets. The raising of the ground level offered the opportunity for collaboration between different structures, but equally took advantage of existing systems. Similar now-lost, or "floating" ground levels are beginning to be identified across Ostia.[573] This connection implies more than a hydraulic opportunism, but suggests a deeper social connection between the owners of these structures, or perhaps an action taken by only one owner of several structures. It also adds a new understanding to the modern and ancient history of the insula. The excavation practices and agendas of 1938-42 campaigns excavated into the more southern areas of the insula following the ground level of the Portico dell'Ercole, and must have removed the drainage and supply systems here. This is not to besmirch these earlier projects, but rather to contextualize their activities, and to use similarly placed water features as proxies for reconstructing now-lost urban systems.

[573] Gering 2013, 258, Fig. 3 for this now-lost ground level in the Caseggiato del Sole (V, vi, 1).

4.2.4: IV, ii Roman Water Footprint 4 (AD 300-600)

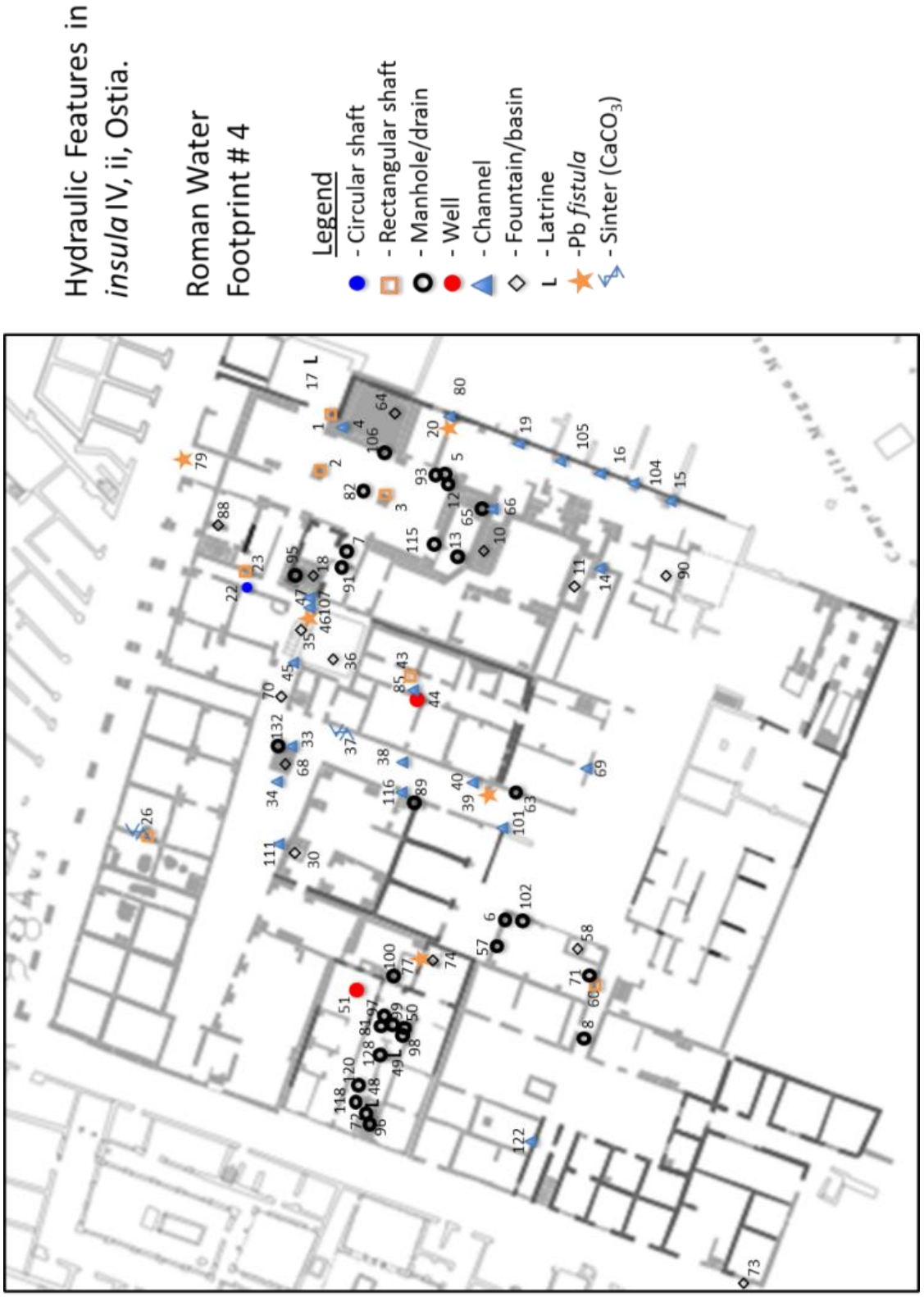

Figure 4.182: Water features identified in insula IV, ii between AD 300-600 (after Stöger 2011, 158, Fig. 5.112).

IV, ii Roman Water Footprint # 4 (AD 300-600)			
Indicator	Sub-Indicator	Data	Quantity
Infrastructure	Supply Systems	Rain Water	2
		Ground Water	2
		Aqueduct	20
		Total # of Supply Features	24
	Usage Systems	Number of Leisure Water Features	12
		Number of Industrial/Economic Water Features	3
		Number of Domestic Water Features	2
		Total # of Usage Features	17
	Drainage Systems	Sewer	20
		Downshaft	7
		Drains	17
		Total # of Drainage Features	44
	System Resilience	Number of Types of Supply	3
		Number of Types of Usage	3
		Number of Types of Drainage	3
		Total System Complexity	9
		Total # of Features	85
Culture	Private Oriented-insula	Total # of Features	40
	Public Oriented-insula	Total # of Features	45
	Private Oriented-Ostia	Total # of Features	63
	Public Oriented-Ostia	Total # of Features	36
Nature	External	Tiber River Floods	6
	Internal	Urban Garbage	3
		Urban Health (# of Baths)	14

Table 4.43: Roman Water Footprint #4 from insula IV, ii.

4.2.4.1: Infrastructure

In the overall number of supply features there is a slight decline from the previous Roman Water Footprint period (Table 4.43). This pertains mostly to aqueduct based sources, as ground water and rain water supply systems remain largely stable (Figure 4.182). The baths (IV, ii, 1) continue to function, as attested by an epigraphic lead pipe (feature 79). At some point later in the 5th century, several walls in the baths were blocked up with rough *opus mixtum* walls; as these walls blocked off access to the *caldaria*, it remains unclear to what degree the baths still functioned. Based on the late type of *opus latericium*, the water tower in IV, ii, 2 also dates to this period. Its characteristic rectangular shaft and coating of calcium carbonate represent a much later *comparandum* than the more famous examples at Pompeii and Herculaneum.[574] All of the features supplied by the aqueduct can no longer function with the demise of this system, out of use at some point in the 6th century CE.[575] The wells from the 1st century in buildings, 2, 5, and 6 continue to function into this period.[576] Together with the separate aqueduct lines feeding different fountains and cisterns, this implies a flexibility of water supply needs in this insula.

The total number of usage features declines slightly in this period, compared to the previous Roman Water Footprint period (AD 200-300), but the majority of water features from the previous period continue. As in the bath building, several stretches of walls were added throughout the insula. The most

[574] Locicero 2017 for further literature and computational fluid dynamic modeling of this water system.
[575] Bukowiecki *et al*. 2008, 190 for 4th-5th century repairs on the supra-mural aqueduct line.
[576] IV, ii, 2: features 27, 29; IV, ii, 5: feature 44; IV, ii, 6: feature 51.

important of these for the present discussion are the ones dividing the insula into an eastern and western half. These walls continued the line of hallway 1 in the Caseggiato dell'Ercole (IV, ii, 3), and reduced access to the central courtyard fountain (feature 68). A new fountain basin was added (feature 70) against one of these *opus vittatum* walls. This implies that both fountains are working at the same time, but perhaps were accessible only to different halves of the insula. Further evidence for the closure of doorways comes from the double chambered basins in buildings IV, ii, 7, and 9. Both of these are built in connection with a blocked doorway, and their extremely rough exterior indicates that these basins were originally sunk into the ground. The height of these basins and their associated thresholds supports the theory of a higher ground level in this period. The identification of these basins as related to industrial processes comes from their robust size and depth.

The sewage system outlined in the previous phase continues to function, although it is not possible to identify continuity in all of the secondary sewers or downshafts. The basins described in the previous section connect to these lines. New drainage features are installed in the bath building indicating newly added upper floor drainage needs. In the Capuona del Pavone, a new latrine was installed next to the main entrance (feature 48). The latrine drains directly out to the Via della Caupona del Pavone, under the building's staircase (Figure 4.183). This line had already been created with the previously installed latrine in room 5 of the same building, continuing the hydraulic isolation of this building from the rest of the insula.

The overall hydraulic system maintains its resilience of 9/9, the maximum achievable level. This is interesting to observe, given that the total number of features declines compared to Roman Water Footprint #3, from 107 to 85 features in Roman Water Footprint #4.

Figure 4.183: Latrine installed in the Caupona del Pavone (IV, ii, 6).

4.2.4.2: Culture

Across Ostia in this period there are many examples of the re-division of space within *insulae*. At the beginning of this period, the available evidence indicates a small but robust burst in hydraulic features across Ostia. This entails the insertion of large nymphaea into Late Antique domus structures or in public spaces, as well as the creation of *ex novo* bathing structures. Together with this hydraulic investment, many buildings across the city are known to be abandoned or in a ruinous state. While it is difficult to identify structural continuity in several buildings of insula IV, ii, the closure of walls and sections of the

insula off from each other point to new divisions of space. This has implications for access to water features as well as highlighting changing needs within the insula.

The gap between publicly and privately oriented water features shrinks to its smallest margin in the entire history of the insula, although there are still slightly more public water features functioning at this time (Table 4.44). This runs against the wider urban trend of Ostia, in which private water features are nearly double the number of public features.[577]

insula IV, ii		Roman Water Footprint # 4 (AD 300-600)
Private Oriented-insula	Total # of Features	40
Public Oriented-insula	Total # of Features	45
Private Oriented-Ostia	Total # of Features	63
Public Oriented-Ostia	Total # of Features	36

Table 4.44: Private and Public water features in insula IV, ii and in contemporary Ostia between AD 300-600.

4.2.4.3: Nature

This period experienced the same amount of flooding events as in Roman Water Footprint #2 (AD 50-200), with 6 floods. This is higher than the two floods known from the previous Roman Water Footprint #3 period, with 2 floods. In this period of the city's life, the number of abandoned buildings increases. These could be used as *ad hoc* garbage dumps, or places for less regularly organized economic practices, or even as shelter for squatting populations. Evidence for internal faunal depositions is still high in this period, with only a slight decrease from the previous period.[578] A similar trend is present in the number of bath buildings, with 14 bath buildings known at least for the beginning of this period.

4.2.4.4: Conclusion

In this period we see a similar trend across the insula in all areas of its infrastructure (supply, usage, drainage). The existing infrastructure decreases, but only slightly in all aspects of the system. The structure of the hydraulic system changes very little, which is comparable to the minimal structural change observed in the broader insula at this time. The same hydraulic opportunism as in previous phases is present here as well. However, the insula remains largely a product of the initial 2nd century phase of creation. In this final phase of the insula's life, both the hydraulic infrastructure and the architectural composition of the insula do not match the wider urban trend of Ostia; no large *ex novo* buildings were created in the insula in this final period of its life.

4.3: Diachronic Analysis

The indicators of the Roman Water Footprint will now be discussed diachronically, to highlight larger trends over the complete life of the insula. This will highlight what features make insula IV, ii unique. The data in the subsequent charts comes from the Roman Water Footprint table directly below (Table 4.45).

[577] Lavan 2012, 689.

[578] MacKinnon 2014, 194-195 for the Late Antique faunal evidence across Ostia.

IV, ii Roman Water Footprint # 1-4						
Indicator	Sub-Indicator	Data	Roman Water Footprint #1 (4th century B.C.- AD 50)	Roman Water Footprint #2 (AD 50-200)	Roman Water Footprint #3 (AD 200-300)	Roman Water Footprint #4 (AD 300-600)
Infrastructure	Supply Systems	Rain Water	2	2	3	2
		Ground Water	4	4	4	2
		Aqueduct	0	11	27	20
		Total # of Supply Features	6	17	34	24
	Usage Systems	Number of Leisure Water Features	0	5	15	12
		Number of Industrial/Economic Water Features	0	2	5	3
		Number of Domestic Water Features	1	1	1	2
		Total # of Usage Features	1	8	21	17
	Drainage Systems	Sewer	0	16	25	20
		Downshaft	0	13	10	7
		Drains	0	4	17	17
		Total # of Drainage Features	0	33	52	44
	System Resilience	Number of Types of Supply	2	3	3	3
		Number of Types of Usage	1	3	3	3
		Number of Types of Drainage	0	3	3	3
		Total System Complexity	3	9	9	9
		Total # of Features	7	58	107	85
Culture	Private Oriented-insula	Total # of Features	7	35	46	40
	Public Oriented-insula	Total # of Features	0	23	61	45
	Private Oriented-Ostia	Total # of Features	36	122	101	63
	Public Oriented-Ostia	Total # of Features	17	72	49	36
Nature	External	Tiber River Floods	21	6	2	6
	Internal	Urban Garbage	1	3	4	3
		Urban Health (# of Baths)	3	21	16	14

Table 4.45: Complete Roman Water Footprint for insula IV, ii.

Similar to the conclusions reached by Stöger in her spatial analysis of IV, ii, the buildings of the insula are hydraulically integrated together and should be seen as a unit, rather than as a sum of discrete parts. This is true not only in terms of the sewer lines, but also in terms of supply (Figure 4.184). The large cistern (feature 36) and the water distribution tower (feature 26) indicate not only that buildings of ostensibly different functions were connected and shared water, but allow us to sketch out the insula’s connection to the wider urban systems of Ostia. At the same time as this increased connectivity, several buildings do not connect to the wider system of the insula, such as the Caupona del Pavone (IV, ii, 6). Despite its functional change from a private domus to an outward facing inn, the successive owners of the building did not want to connect spatially, socially, or hydraulically with the rest of the insula.

Ground water acquisition via wells act as a constant baseline in the hydraulic story of insula IV, ii. The four wells (features 27, 29, 44, 51) each persisted into later periods of time, causing sometimes awkward architectural negotiations. This offers an important piece to the discussion on ancient sustainability introduced in Chapter 2, and helps us to look beyond the idea of volumetric "needs" towards other sources of water supply. This is especially clear when we compare the nigh number of aqueduct features present in each Roman Water Footprint. If there are multiple sources of aqueduct supplied water throughout the insula, why go to the trouble of incorporating an older well into your building? The answer must lie in a division of water sources for different uses and preferences.

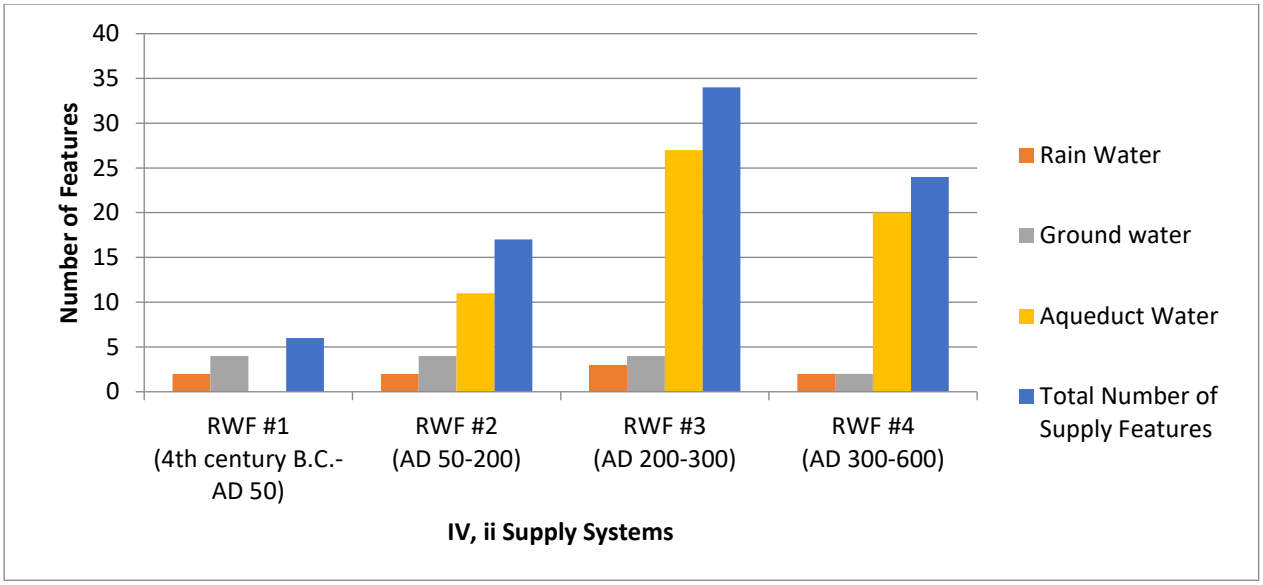

Figure 4.184: Supply Features in IV, ii for each Roman Water Footprint.

The Usage trends in the insula fluctuate over time, however leisure features remain dominant from Roman Water Footprint #2 to #4 (Figure 4.185). Industrial/Economic features have their peak in Roman Water Footprint #3, with the bars in the Caseggiato dell'Ercole (IV, ii, 2), and in the Terme del Faro (IV, ii, 1). Domestic water usage is very low in comparison and remains almost unchanged over the entire history of insula IV, ii.

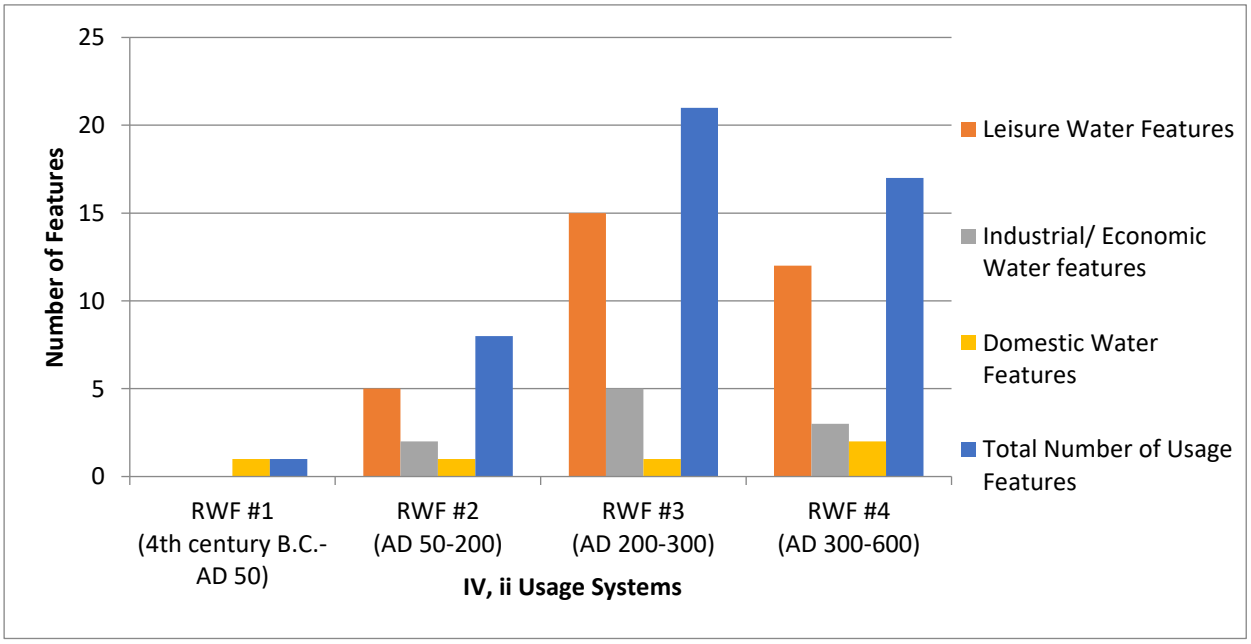

Figure 4.185: Usage Features in IV, ii for each Roman Water Footprint.

Drainage features have their highest distribution in Roman Water Footprint #3 as a result of three main sewer lines installed to connect nearly all the buildings of the insula (Figure 4.186). The presence of this insula-wide drainage system suggests that a single property owner, or a group of owners worked together and mutually benefitted from this system. The number of downshafts decrease over time, but the number of drains stays stable from Roman Water Footprint #3 into #4.

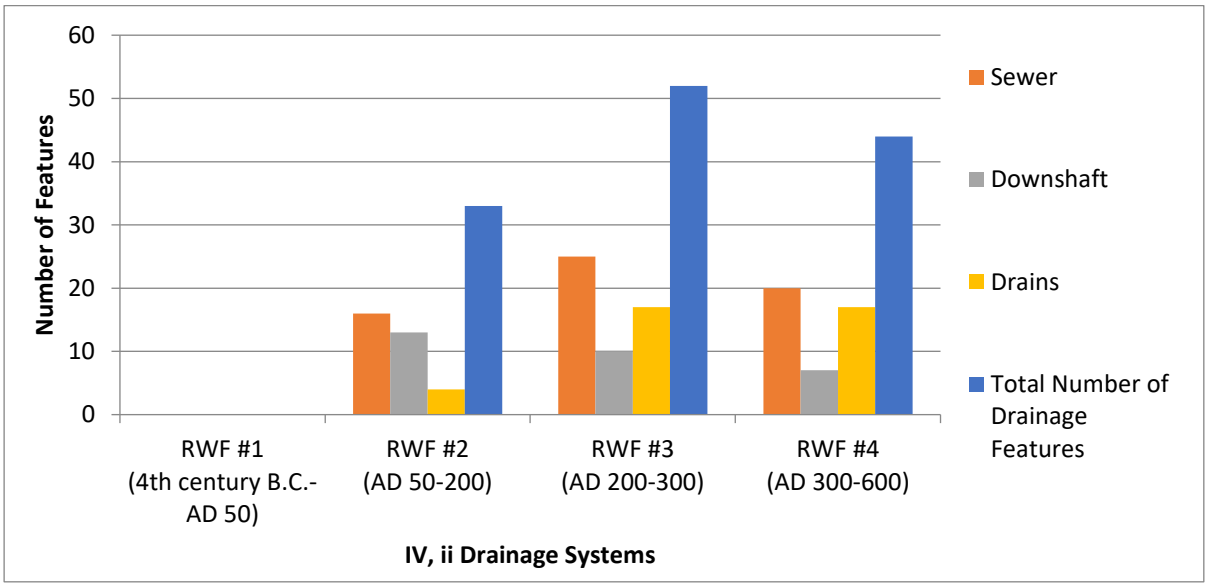

Figure 4.186: Drainage Features in IV, ii for each Roman Water Footprint.

Although Roman Water Footprint #3 has the highest number of water features, the degree of complexity remains stable at 9/9 from Roman Water Footprint #2 into #4 (Figure 4.187). The architectural skeleton of the insula is created in Roman Water Footprint #2, yet #3 is the most dynamic time in the entire history of the insula. Once created, the hydraulic systems maintains its sustainability into the Late Antique period, adapting to changes in individual buildings, or even a group of buildings.

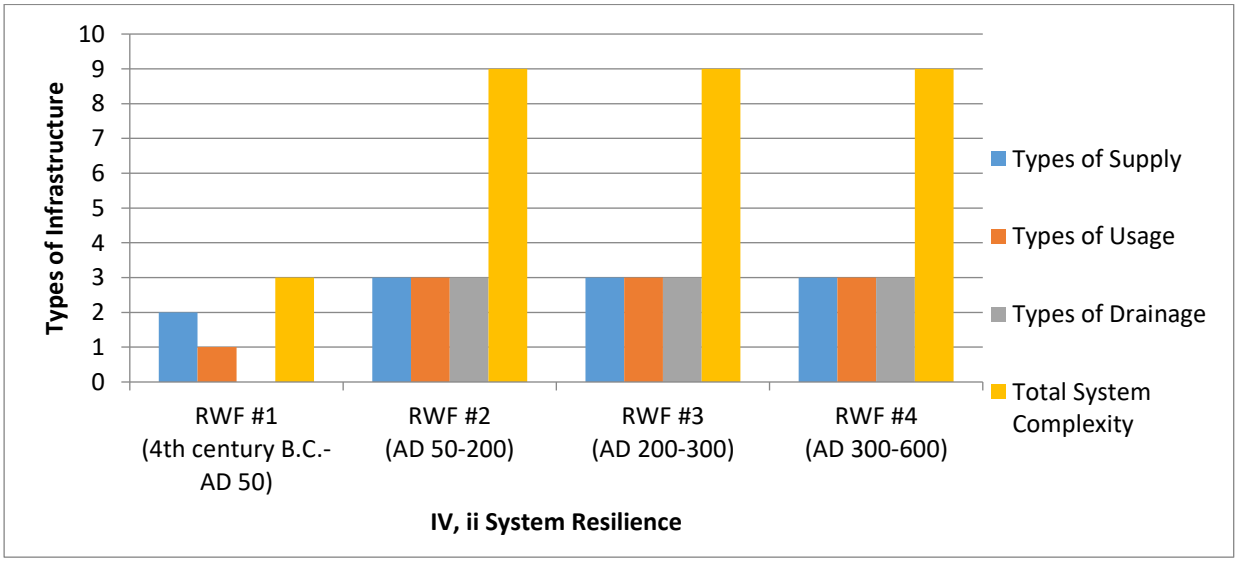

Figure 4.187: System Resilience of IV, ii for each Roman Water Footprint.

Breaking down the infrastructure system to its individual components, some diachronic strengths and weaknesses are visible (Figure 4.188). While the number of water features in many different categories increases from RWF #2 to RWF #3, aqueduct supply features and sewer features are present in the highest number in every period. We can also observe the only gradual decline from RWF #3 into #4, indicating that the insula's water system remained relatively stable into the Late Antique period.

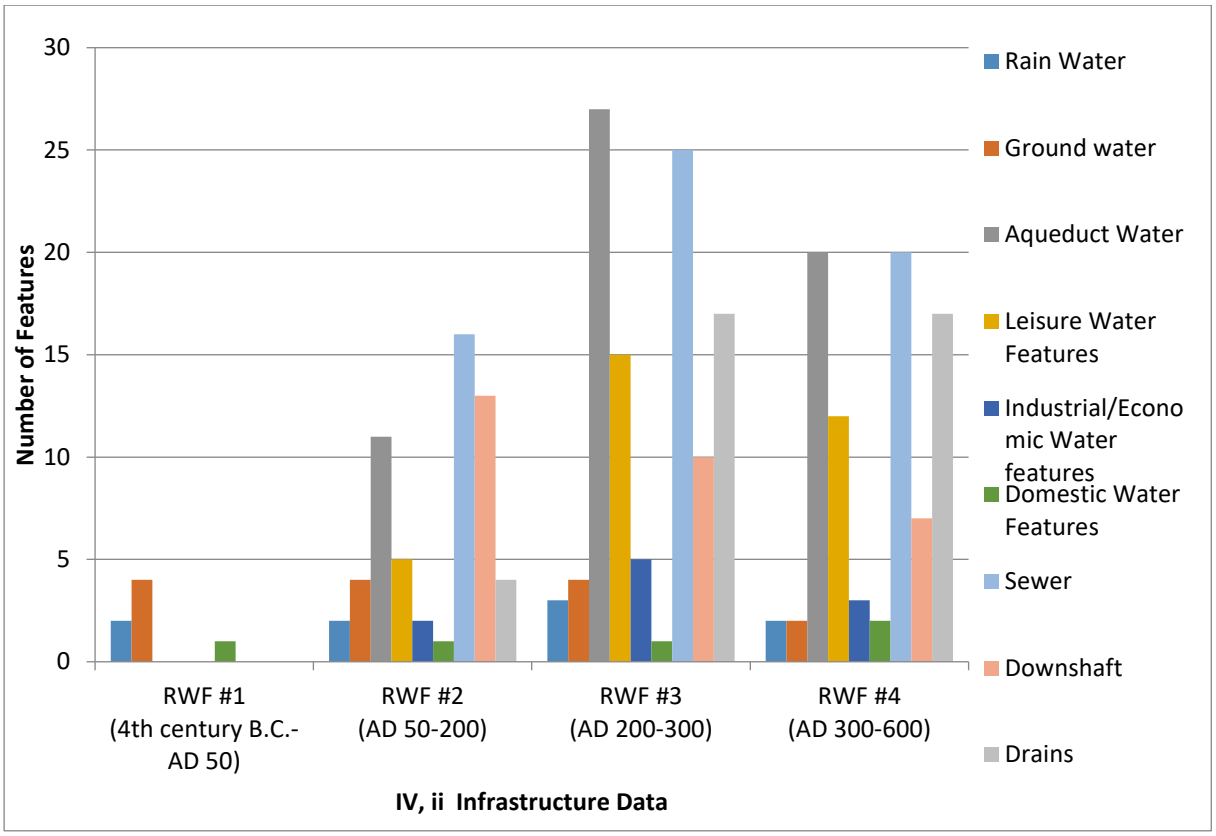

Figure 4.188: Infrastructure Data for insula IV, ii.

Insula IV, ii saw a sharp increase in the number of functioning water features between Roman Water Footprint #1 and #2. This growth continued between periods #2 and #3, although in this case we see roughly double the number of water features (Figure 4.189). While the total number of water features shows a distinct peak and drop, the proportional relationship between the three categories of infrastructure remain stable from Roman Water Footprint #2 to #4. Drainage features are always most plentiful, with fewer supply features, and with the fewest number of usage features. This hydraulic stability matches the architectural stability of the insula, which mostly retained its late 2nd century shape.

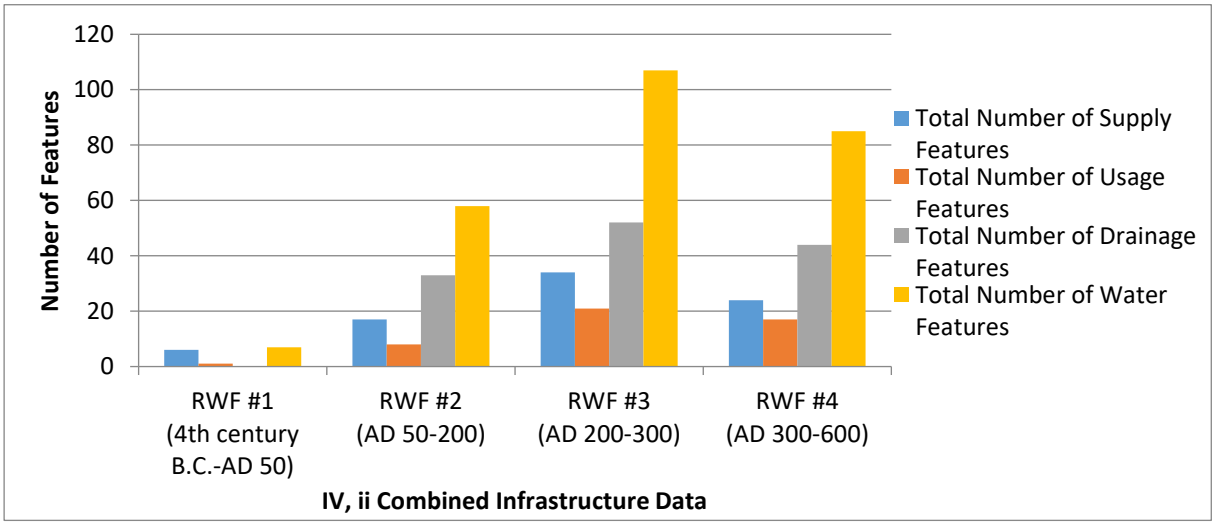

Figure 4.189: Combined Infrastructure data from insula IV, ii.

In Roman Water Footprint #3, the ratio of private to public water features inverts, with more public features continuing throughout the remaining life of the insula (Figure 4.190). The main cause for this

change comes from the large-scale rebuilding of the bath building (IV, ii, 1), but equally important is the creation of the three main branches of the underground sewer system.

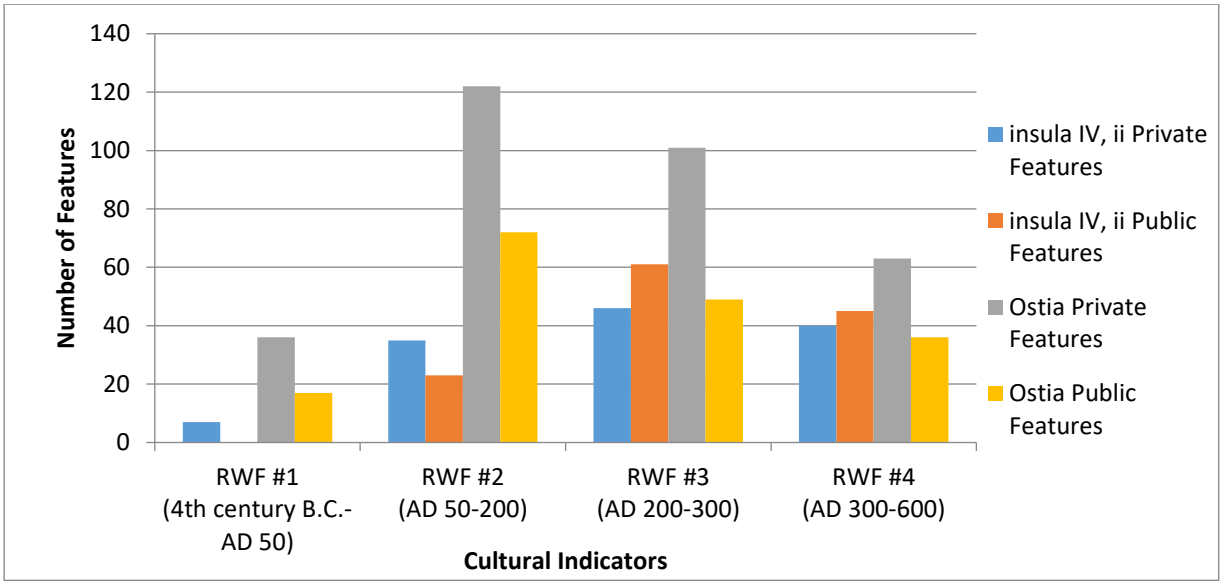

Figure 4.190: Cultural Indicators in IV, ii for each Roman Water Footprint period.

While the insula appears quite removed from the riverside activity, it in fact lies only ca. 400 m from the Tiber river, and with the low relief of Ostia, would certainly have experienced some issues in cases of flooding (Figure 4.191). This may have been exacerbated by the neighbouring Campo della Magna Mater (IV, i): its much lower Republican level and encircling brick walls would have made it a perfect structure for retaining flood water and debris. Having this water resting directly against the wall between the Campo and the insula would cause damage to the hypocaust systems of the bath building, which may provide a reason for the bath building's eastward expansion. The distance from the Tiber may have meant at least a decrease in smell from the downstream material from Rome. There is no evidence of internal waste dumps, or abandoned structures in insula IV, ii, yet this may just be a result of the excavation practices of the past rather than the true situation.

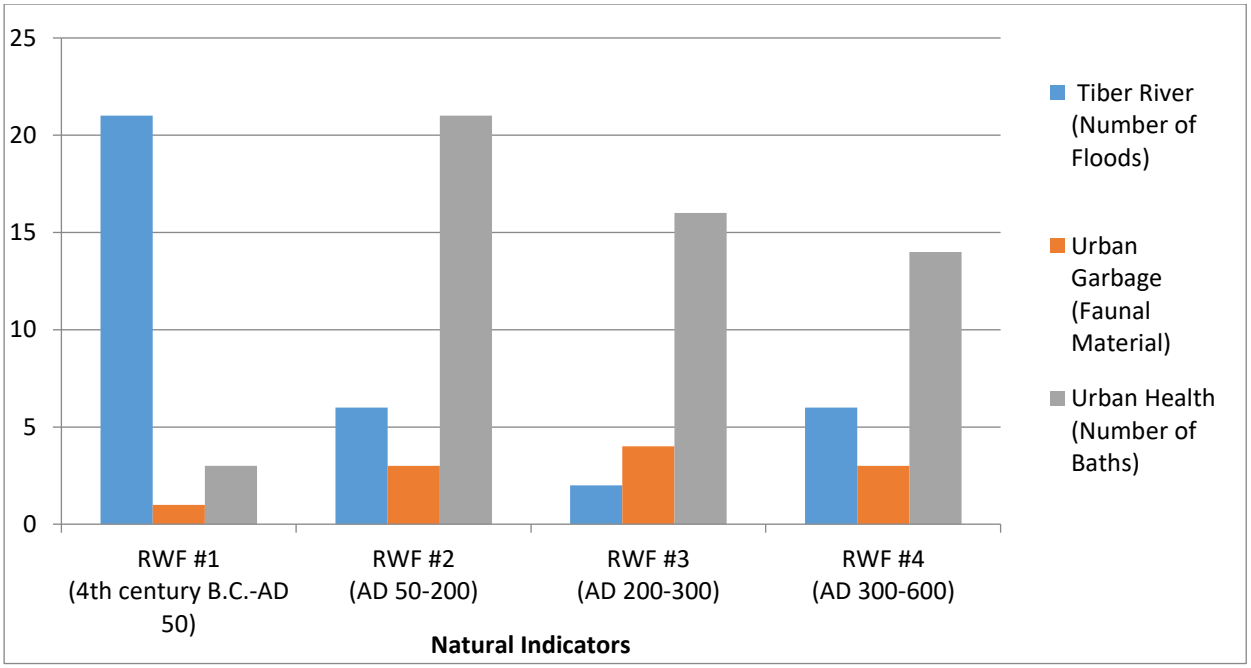

Figure 4.191: Natural Indicators in IV, ii and Ostia for each Roman Water Footprint period.

4.4: Insula IV, ii Conclusion

Many questions remain not only about the infrastructure of the insula, but its wider connection to Ostia. In terms of infrastructure, it appears as though the southern part of the insula was connected to the supra-mural water aqueduct of the city, but little trace of the city's Republican wall or any connection remains. Equally, it is unclear exactly how the 3rd century supply and drainage system connected to the earlier systems, and in turn, how the drainage systems of the Portico dell'Ercole connected to the sewer underneath the *cardo maximus*. Yet, the integration of almost every building in this period adds a new dimension to our understanding of the insula's history, and, as mentioned above, may act as a new proxy for reconstructing 3rd century community history of the insula. Topographically, the disparity in ground levels within the insula can now be seen as a result of 20th century excavation techniques, but this does little to help us interpret the ca. 1.50- 2.00 m height discrepancy between the southern buildings of the insula and the area directly south of it. Despite these caveats, adding a hydraulic level onto the existing archaeological and spatial data provides a new perspective on the history of insula IV, ii and its relationship to the wider city.