

bridge was changed, posts were added along its inner edge, and various additional moat elements and bastion elements were added outside the medieval moat over the more than 200 years that it would be used. Finally a mill and mill race was constructed within it, in about AD 1605/06, with the moat being partially backfilled in order to narrow it, and raise its base. It was probably at about this time that much of the organic moat backfills seen in Trench Z 3064 were filled in to the moat.

These deposits (Groups 256 and 46) were located within the medieval moat, and to the northeast of the mill head race. Collectively, they measured c. 3 m in depth. They were dark moist peaty layers, and were very find-rich, with much pottery (Late Redware, German stoneware, Jydepot), glass, a whetstone, stove tiles, leather and general organic waste being recovered. Animal bones were also plentiful, and included cow, pig, sheep/goat, domestic goose, hare and cat. Similar deposits (Group 59 and Subgroup 237) were seen to the southwest of the mill race, but were excavated by machine and recorded in profile, hence we know less about them. Nonetheless it is thought likely that they were similar in form and date to Groups 256 and 46.

Some of the deposits (in Groups 256 and 46) were clearly manure waste from stables or similar, and still smelled strongly of horse manure. Others are likely to be general domestic waste, though this kind of material could also find its way on to the manure pile. Presumably this waste was deliberately collected from houses or the streets in order to be used to fill in the moat. The finds suggest an approximate 17th century date. It is perhaps likely that most of these deposits were dumped here when the mill race was constructed in about AD 1606, though it may be that some deposits were added later, when the first backfills settled, decayed and sank. The majority of these deposits must predate the general moat/mill backfill layers (Group 200) by about 60 years.

One posthole was documented within these deposits (Subgroup 255). This was the negative impression of where a post or large stake was once driven down into the moat fills. As it was isolated, little can be said of its function, but it may be later than the moat backfills by some years.

Road west from the medieval gate decommissioned

Group	Subgroups	Context types
330		Deposits (deconstruction)

Table 65 Road decommissioning related groups and subgroups

Two deposits (Group 330) were excavated in the west end of Area 4 that were composed of a mixture of re-deposited natural and occupation material. The full extent of these deposits was unknown due to truncation by a modern service trench.

This group was difficult to interpret due to the truncations in the area and the scarcity of finds and inclusions within the deposit. It is considered most likely that these layers represented the active deconstruction of the road west from the medieval gate, and/or the levelling off of the area for its next phase of use. Finds included a few sherds of medieval pottery (Late Greyware and Early Redware) but also a sherd of green-glazed stove tile, indicating a date in at least the 15th century or perhaps 16th or 17th century. The relative lack of cultural material is suggestive of this being introduced material, deliberately placed here in an act of ground-raising, an act which would have seen the medieval road to the west taken

out of use permanently. It is thought likely, based on the other changes carried out in the area after AD 1600, that these layers were also deposited in this phase.

Outer gate, outer moat and bastion decommissioned

Group	Subgroups	Context types
25		Moat backfills
42	252	Cut and fills (possible moat)
47		Deposits (moat backfills)
71		Deposits (moat backfills)
266		Deposits (moat backfills?)
347		Deposits (deconstruction rubble)
348		Deposits (levelling)
403	392	Deposits, dumps (moat backfill)

Table 66 Outer gate, outer moat and bastion decommissioning related groups and subgroups

A series of substantial deposits (Group 47), many of them organic in nature, were documented in various trenches along the western side of the excavation area, along the east edge of HC Andersens Blvd, and were excavated in the course of a watching brief. These have been interpreted as being the backfills of the Christian IV era moat, and hence they are likely to have been dumped here in about the 1660s when that moat was filled in, in tandem with constructing a new and bigger set of fortifications. In places the natural clay was encountered beneath this material, and was seen to be sloping down to the west, suggesting that the excavation trenches overlay the moats inner, eastern edge. Significant amounts of find material were recovered, though not in the quantities seen in the moat backfills in Area 3 and 4 (Group 200). It is unclear why this difference exists. Finds recovered included Late Redware, faience and glass fragments.

A series of dumps of rubble and rubble-rich clay (Group 347) were documented further east, also in the outer moat, in the environs of the outer gate. It is considered very likely that these deposits, which contained much brick material, date from the deconstruction of the upper elements of the outer gate, and in turn the filling up of the outer moat. These acts were carried out in order to prepare for the construction of a newer and bigger set of defences slightly further out from the city to the west.

From what was seen on site, and in older excavations, it seems that when this gate was deconstructed, it was only the upper part that was dismantled, and the remainder was buried under the new bastion. When the youngest bastion was itself taken down in the late 1800s, these gate remains were seen again, and documented to a degree. They were also demolished further, as the ground level was lowered to form the square that is now known as Rådhuspladsen. These rubble deposits (Group 347) are thought to date to the original phase of deconstruction however. Finds were few, and generally post-medieval. No samples were taken. These deposits are likely to date to about AD 1670 or so. This is based on written sources which refer to the construction of the youngest moat at this time, and is supported by the finds retrieved.

Adjacent to these deposits further layers of backfill (Group 348) were seen, that appeared to be the uppermost backfills of the moat in this area. These were made up of garden soils and silty clays. Fragments of post-medieval pottery, mainly redwares, were found within the deposits.

Located c. 9 m southwest of the outer gate, several dumps or loads of building material (CBM), cultural waste (however, very little household material) and various sandy and peaty layers (Group 403) were documented in watching brief area Z 77745, filled into the area immediately south of the bastion wall (Group 97). This can be seen as deliberate backfilling of the moat associated with this bastion, and where CBM was encountered it may even represent elements of the bastion that was deconstructed. It was noted that the larger stones that had faced the bastion wall had been removed (leaving large stone sockets behind) prior to this backfilling. As this is likely to be the Christian IV era bastion and moat, it was probably filled up in the 1660s or so, prior to when the latest fortifications in this area were constructed. Finds recovered included clay pipe fragments that date to between 1640 and 1660, and pottery (Late Redware) of similar or earlier dates.

Two layers of rubble and mortar (Subgroup 392), which have been interpreted as deconstruction layers, were contained within, and related to, the upper deposits in Group 403 (above). These layers may well be part of the demolition of the upper parts of the bastion (Group 79, part of Phase 4), which was constructed in the later 16th or early 17th century. This deconstruction however, would have occurred later in the 17th century, perhaps as late as the 1660s or after, when the Christian IV fortifications were taken out of use and replaced with a new set of fortifications.

Elements of a possible moat (Group 42) were seen in a number of watching brief trenches in the northwest area of the site. The eastern edge of this was seen, but not the west, so its full extent is unknown but it appears to be at least 24 m in width. It is very difficult to know what this group represents exactly, but given its depth (at least 2 m) and scale, a moat element, perhaps related to the bastion of the later 16th/early 17th century is most likely. It is not a certainty however, as in some other watching brief trenches between the western end of Group 42 and the post-medieval moat seen in Area 5 for example, no such moat was seen, suggesting that it did not continue right across this area as we would expect. The reason for this is unknown; perhaps the bastions had a different shape in this area than we would expect.

It was filled with dark moist deposits, which were rather homogenous on the whole. If it is a backfilled moat, it is likely to have been constructed in the later 1500s, and to have been deconstructed in the 1660s before the creation of the new moat and fortifications. As it was mostly the backfills that were seen, it has been placed in Phase 5 rather than Phase 4.

A dark organic deposit (Subgroup 252) was seen in a small watching brief trench at the northwest corner of the site. The deposit was quite deep, and some human leg bones were recovered, suggesting a burial in situ lay below. The deposit however was similar to the deposits seen in the possible moat (Group 42) seen nearby to south, and it seems likely that this material is part of the same feature as Group 42. As the trench was very small and deep, it was not possible to go down into the trench, hence the true nature of this deposit is somewhat uncertain. Why there would be human remains dumped in the moat is far from clear, but the possibility cannot be ruled out that that is what happened. A further small watching brief trench located c. 16 m north of Subgroup 252 revealed more dark organic deposits (Group 71). These may also relate to the backfilling of the same moat as the groups above.

Three deposits (Group 266) were seen in section in a watching brief area in the northwestern part of the site, close to the burial area. One deposit was interpreted as an activity layer, since it sealed three cuts, but the limited area which could be documented makes this interpretation very uncertain. The dating of the remaining dump layers is made on the basis of one pottery sherd, a Late Redware sherd found in one of the layers. The group should probably be seen in connection with the work of building the new fortification in the 17th century, or in filling up the former fortification. Hence it should possibly be seen in conjunction with Group 42 to the north. The layers are stratigraphically placed over an early medieval grave (Group 122), and below modern disturbances.

A series of large dumped deposits (Group 25) were seen in a watching brief trench (Z 3444) towards the south of the site, early on in the excavation, at which point it was not certain what they represented. They were mostly quite organic however, and sloping downwards from east to west. It was considered likely that they represented backfills in the moat. Given their location, it now seems likely that they were backfills in the post-medieval moat, and may date to the early 1600s when Christian IV had changes made to the layout of the outer moat, or to the 1660s when the entire outer moat was backfilled prior to the construction of the final set of fortifications.



Figure 135 Possible rampart and moat deposits (Group 25) seen from west

The layers in question can be seen in the photo above, and here it can be seen that there are some very organic layers sitting over a very sterile sandy clay layer, with some repeated washes of material coming off of the sterile clay onto the organic material. It is possible that what we see here is part of the rampart (the sterile clay) and some of the natural build-up of humic material on the base of the ramparts and in the moat (the dark material). The repeated lenses of grey washing over the dark material appear to be evidence for the grey material being washed over time by rain, out over the dark material, suggesting that it was the exposed surface of the rampart for some time. Overall it seems most likely that this rampart dates to about the Christian IV era (c. AD 1600) , when the moat was altered somewhat in this area, with part of it being filled in to alter the shape of the moat in the environs of the outer gate, as was also seen in Trenches 2A and 2B. Hence it was likely filled in finally in the 1660s.

Mill and Mill Race deconstructed

Group	Subgroups	Context types
429	235, 297, 298, 299, 325, 345	Cuts, deposits (deconstruction rubble)

Table 67 Mill and mill race related groups and subgroups

Located in the northeast part of Area 3 and the southeast part of Area 4, Group 429 was made up of several subgroups. As a unit, these comprised various elements of the dereliction and in particular the deliberate deconstruction of the mill building by Vesterport. They were consequently spread over a sizeable area (c. 19 m x 7 m), and two separate excavation areas.

Almost all of the deposits in this group contained material such as mortar or brick rubble, as well as glass and tile fragments, and are consistent with the kind of material one would expect to remain following the deconstruction of a substantial building. This material remained in negative features such as foundation cuts, but also in the general area of the mill which was built lower than street level for practical reasons. Hence, once no longer in use it was demolished and the entire construction cut filled up in order to level the area. This meant that these primary deconstruction layers were preserved in-situ beneath the more organic dumps of urban waste used to level the overall area subsequently.

It is likely that these deposits accumulated over a relatively short period of time during the abandonment and later the deconstruction phase of the mill by Vesterport. Given the fact that the wooden floor of the mill was left in situ, it seems that the decision at the time was to dig down through a certain amount of accumulated debris within the mill, along the line of the walls, and to target the reusable/valuable stone and brick material, leaving the possibly already degraded floor behind. A few localised pieces of the mill wall were left in situ, perhaps where the bonding was simply too hard to break up, and it is thanks to these that we know what its make up was.

There can be little doubt based on the physical evidence that there was a deliberate phase of deconstruction of the mill building. A future examination of the relevant historical material would allow for a more in depth look at the reasons for this, and perhaps who carried out the work and how. These deposits date to the latter half of the 17th century. This dating is based on the finds recovered in the deposits, which are consistent with such a date, and is further backed up by historical references, which would suggest that the mill was demolished sometime around AD 1670, when the new moat further west was being constructed and a mill was no longer desirable or perhaps practical at this location. It therefore represents a key moment in the history of this part of Copenhagen. Its subgroups will be outlined below.

A series of nine deposits (Subgroup 297) were located in the northern part of Area 3, and southern part of Area 4 and overlay the mill floor. They measured c. 17 m in length x c. 4 m in width, with a depth of up to 0,4 m. Two of these are interpreted as abandonment deposits, and appear to relate to the time when the mill building was beginning to collapse during its dereliction. The remaining deposits are more likely to have resulted from the deliberate deconstruction of the mill, and contained more mortar and brick material. This subgroup was very rich in finds, and contained much ceramics (mostly Late Redware), glass (both window, flask and bottle fragments), many decorated stove tiles (thought to be from the same stove), nails, a horse fitting, a chain fragment, a knife with a bone handle, a chisel, a saw blade, a hinge, copper alloy pins and

some clay pipe fragments. Also, no less than 4 silver coins were recovered, with dates between AD 1625 and 1650. The dating of the coins may suggest that they were lost during the latter years of the mill's use.

These deposits have been interpreted as representing the end of the use-phase of the mill building, initially in an informal abandonment phase, and later in a more deliberate phase of (perhaps piecemeal) deconstruction. The interpretation of these deposits is based both on its inclusions, with a substantial amount of building debris included (bricks, brick fragments and stove tiles in particular, but also on its location, lying over the remains of the floor of the mill. This group dates to the late 17th century, based on finds material recovered. This is also in line with historical sources, which suggest the mill was abandoned in the latter half of the 17th century.

Figure 136 An example of the many stove tiles found in the mill abandonment deposits Group 297

These deposits represent the final phase in the life of the mill, namely its dereliction and destruction. Some of the dereliction type deposits in particular may give us some indications of the kind of materials used in and as part of the mill itself.

A linear robber cut and its fills (Subgroup 298) was observed along the northeastern edge of the mill building. Four separate cuts were documented, filled by eight deposits. The overall cut ran in a northwest-southeast direction within Area 3 and Area 4, overlying the eastern edge of the mill building. It measured 22,4 m in length, with a maximum width of 2,2 m and a maximum depth of 0,48 m. It was slightly wider than the mill wall. The deposits all comprised of mortar-rich clay, with a generally high concentration of brick fragments. The cut was clearly following the course of the mill's eastern wall. At its southeast end, it was truncated by a large pit (Group 222). Finds from this group included glass fragments, ceramics (16th to 18th century) including Late Redware, a piece of worked wood, iron nails, leather fragments, animal bone, a stove tile fragment and a copper-alloy button.



Group 298 has been interpreted as a 'robber cut' (a cut made to access and remove structural material for reuse) and its backfills, made when the eastern wall of the mill building was removed to its base, presumably with the aim of reusing the masonry material. The fills, which were rich in mortar and brick fragments, are indicative of material being dumped back into the robber trench once the useful masonry material was removed. As the robber cut was made through some deposits that relate to the abandonment of the mill (see Subgroup 297), it seems likely that the mill had been in a state of disuse and decay for some years prior to the formal deconstruction of the building structure. The robber cut truncated the wooden floor of the mill, removing its eastern edge.

This subgroup appears to date to the late 17th century, based both on the finds material from the deposits dumped into the robber trench and historical references. The mill was probably formally deconstructed in order to fill up the area, in conjunction with the construction of the latest city moat in the late 1660s.

Some rubble deposits (Subgroup 299) were located at the north end of Area 3 and south end of Area 4. Measuring over 14 m in length, they were found along the upper eastern edge of the construction cut for the northeastern wall of the mill building, and consisted of a number of similar deposits of mainly rubble (in particular broken brick fragments), located in a series of shallow cuts. These cuts were very sharp edged, and are likely to represent where the mill wall widened and 'stepped-up', over the scarp in the natural clay, so that the wall was partially resting on the lower level of the main construction cut, and partially on the higher level, therefore having a stepped profile. The deposits, taken as a unit, are linear, following the line of the wall of the building.

The high concentration of brick fragments and mortar within the deposits is consistent with this material having accumulated as the mill wall was being torn down and broken up, and is further evidence for a deliberate act of deconstruction having taken place. The finds recovered included ceramics, glass, clay pipes and iron nails. These deposits are likely to represent traces of the deconstruction of the mill itself. These deposits (Subgroup 299) form part of Group 429, which as a whole represents the abandonment and deconstruction of the mill building. This subgroup was subsequently buried under the large-scale dumps of waste into the former moat and mill, in order to fill up the area and raise ground level when the later moat was constructed further to the west in c. AD 1670.

A series of seven deposits (Subgroup 345) were located near the northeast corner of the mill building in Area 4. They comprised of mostly rubble-like material, in particular brick fragments and were located within two linear cuts measuring 4,7 m in length, 1,66 m in width and c. 0,5 m in depth. The most significant element of the deposits was frequent inclusions of brick fragments, including some pieces that were still mortared together. In general, the deposits were loose and rubble-like in nature. Finds included CBM, some Late Redware fragments and slag fragments.

The deposits have been interpreted as representing backfills consisting mainly of CBM and possibly derived from the demolition of a wall, as they were located within linear cuts. It appears that these were foundation cuts, probably of a small building or annexe attached to the northeast corner of the mill, rather than the mill itself. The deposits in this group therefore represent material dumped back into this construction cut when the wall was being removed, as shown by the high concentration of CBM.

A sub-oval pit (Subgroup 325) was located in the southeast corner of the mill building, filled with a number of deposits, which generally contained a good deal of CBM (brick and roof tile fragments). It measured 2,8 m x 2 m and was 0,6 m deep. The pit was subsequently truncated by another pit (Group 222). It was noted that the base of the pit (which was cut into natural clay) oozed a small amount of dark liquid, and smelled strongly. This may suggest that the pit was partially filled up with manure or human waste, resulting in a residue of effluent at the pits base.

It is likely (based on finds recovered) that the pit post-dates the mill building, and it may be that it was dug in order to remove some structural element of the mill, and was then filled up with general city waste, along with the rest of the structure. One problem with this interpretation is that the deposits within the pit

appeared different to those in the wider area. A further possibility might be that it was a sub-floor pit during the lifetime of the building – perhaps acting as a cesspit. As it is considered more likely to relate to the deconstruction of the mill, it has been related to Group 429, and as such probably dates to the late 17th century. Finds included CBM, slag, an iron nail, window glass, ceramic, leather and an iron hook. One 2 liter sample was taken for possible environmental analysis, and sieving showed that this contained both waterlogged seeds and charcoal (Appendix 2).

A linear cut, which appeared to have been made through the moat backfills, was located along the southern edge of the toilet building in Area 3. This cut (Group 250) was filled by a series of dumps of mainly organic waste, with occasional patches of clay and mortar. It was quite deep (c. 2 m), but an accurate depth was hard to establish as it was excavated in stages over a period of time. It was truncated by the toilet building construction cut, so its true dimensions are unknown, but as it survived it measured 13 m in length, and 4 m in width.



Figure 137 The linear cut Group 250 as seen at the upper levels, from northeast

The 'cut' may in fact represent where the edge of the mill building once stood. It is possible that while the mill was still standing the moat was partially or even largely backfilled, up against its wall. This would mean that the mill was then deconstructed from the inside, with the walls being pulled inwards. This would then have left a partially collapsed edge, and would explain why its edge was so hard to establish at times, and the mixed up nature of the fills within it. It is notable that the southwestern edge of the cut is approximately at a right angle with the northeastern edge of the mill building.

The fills were extremely find-rich, producing huge quantities of CBM, glass (bottle, window and drinking glass), clay pipe, textile, ceramic (redware and faience mostly), cowrie shells, slag and wood, as well as a bone needle, bone comb, floor tile, an embroidery tool, a rapier handle, a copper alloy spoon, a coin (Christian IV), a wooden spoon, a bracelet and possible

whale baleen. This range and quantity of material is in line with the kinds of general waste one might expect to be dumped near a large urban centre at this time, around the end of the 17th century. If associated with the deconstruction of the mill, then based on the historical sources this is likely to have occurred in about AD 1668-1674.

A small pit (Subgroup 235) was cut through the natural clay toward the south-eastern end of the mill building, possibly after the building had gone out of use. It was later truncated to the south by pit Group

222. It was roughly oval in plan, though truncated to the west by the cut for the toilet building. Its primary fills were quite organic in nature, with a high content of twigs and bark. Only a few finds were recovered (nails, ceramics, a possible key), and these did not help to clarify its function.

It is difficult to establish a motivation for digging a waste pit in this location at about the same time as the entire mill building was being back-filled with waste. One possibility is that this pit was the result of the removal of some deeper structural element within the mill, which left a negative imprint in the clay beneath, though why its fills were somewhat different from what lay in the wider area is unclear. Nonetheless it is considered most likely that it related to the deconstruction of the mill in some way.

The final in-filling of the moat and mill race

Group	Subgroups	Context types
31		Deposits (moat backfills)
200	457	Deposits (moat backfills)
228		Deposits (moat backfills)

Table 68 In-filling of moat and mill race related groups and subgroups

An enormous series of dumps (Group 200) were located within the moat in Areas 3 and 4. They consisted of 109 deposits, as well as one possible cut. While these deposits would surely have continued outside the excavation area to the southeast and northwest, within the excavation area they measured 42,5 m in length and 26,5 m max. in width (across the moat). They measured c. 5m in depth. The deposits that made up Group 200 varied in form, colour and shape. They ranged from pockets of sterile clay and sand, to more frequent and larger deposits of dark organic-rich material, sometimes mixed with sand, silt, clay or CBM. These deposits were generally very rich in cultural material.



Figure 138 Moat backfills Group 200 during excavation, February 2012

All deposits seemed to be quite randomly placed, and consequently it seems likely that these layers were dumped, probably tipped from carts or barrows from the edge of the former moat/mill/mill race during a fairly rapid deliberate process of in-filling. Their often loose compaction is further evidence for the

relatively casual way that these deposits have been placed within the moat. Located as they were in a deep and damp cut feature, the conditions for organic preservation were ideal, and consequently a huge range of this kind of material survived (wood, leather, textile, plant matter etc.).



Figure 139 Leather book cover (FO 205017) from backfill Group 200

The range and quantity of finds recovered from Group 200 was very great (see below for a range of the main kinds). As well as ceramics, glass and metal artefacts, large amounts of organic and composite artefacts were recovered, many of which were quite high status, and very well preserved. One find worth particular mention was a Frederik III gold ducat (FO 207833) from AD 1660, though this item was surely a casual loss rather than deliberately dumped.



Figures 140 and 141 Gold ducat (FO 207833) and doctor's stamp (FO 207740) from Group 200

A huge amount of environmental evidence was also retrieved, seeds, nuts, fish and animal bones, and snail shells. The finds have been looked at by a range of specialists, and it is a goal to retrieve as much information from this huge archaeological resource as possible, not all of which is possible within the remit of this report.

Thus far, an examination of the many clay pipe fragments from Group 200, has, where dating based on typology was possible, shown that it is very likely that the deposits in Group 200 were dumped in to the moat in a relatively short time frame, with no particular pattern obvious. The clay pipes typologically dated overall to between AD 1630 and 1720, but generally cluster around AD 1670 to 1690 (Appendix 30). Furthermore, some of the stratigraphically earliest deposits produced pipes that dated to as late as at least AD 1670, while some stratigraphically late deposits produced pipes with date ranges from AD 1660 to 1685.

Overall, the mixed up nature of the clay pipes through the deposits suggest that most of the deposits in Group 200 were probably laid down between c. AD 1675 and 1685. This would tie in quite well with the historical references, which suggest that the mill went out of use sometime between AD 1668 and 1674, when the miller was compensated for the loss of his mill due to the alterations to the city bastions (Nielsen, O 1884: 638-9). Only two deposits produced clay pipes that must date from AD 1690 or later. It is notable that these deposits were both found in the latter part of the stratigraphic sequence, which may point to some deposits being dumped in to the moat/mill race at a slightly later date, perhaps as the original backfills began to settle and compress.

Fifteen coins and tokens were recovered from this group, and where the date could be identified, dated to between AD 1628 and 1680 (Appendix 22). Their dates and relative stratigraphic positions do not conflict with the idea that the layers were dumped in quickly, and also agree with a later 17th century date.

A large amount of samples were also taken from the deposits in Group 200, both environmental samples and 'big bag' samples. These were sieved, and add to the overall picture in terms of the range of artefacts, bone and plant material that were in the deposits, including small items that might not have been noticed on site. For that reason, animal bone was generally not hand retrieved from moat fills, as they would instead be taken from big bag and environmental sieving, which would give a more representative and unbiased result (Appendix 1).

Group 200 has been interpreted as representing the deliberate backfilling of the millrace (former moat) in the later 1600s. This act was carried out in order to allow for the new bastion to be built, further west than the existing defences, and to allow for the raising and levelling out of the area behind it on the city side. The material dumped here was clearly urban waste, both domestic and perhaps waste from streets, squares, workshops and stables. As discussed above, these deposits appear to date to the late 1600s, probably between AD 1675 and 1685. This is based on both finds material retrieved, and to historical references to the destruction of the mill, and building of new defences in AD 1668.



Figure 142 Moat backfills Group 200 exposed in Area 3, from northeast

Group 200 represents the final major phase of activity within the course of the original city moat (Group 334), though by the time it was filled up in this way, it was no longer acting as a moat, but instead as a water channel connected to the mill. The deliberate filling up of this channel can be seen as a deliberate act of deconstruction. Any further activities that happened within the area of the moat (such as the cutting of pit Group 222 into its backfills) have no real connection to its function as a mill race or moat, and so must be seen as new and independent acts.



Figure 143 Moat backfills Group 200, seen from south

Table 69 Find types from Group 200: (selection)

Ceramics	Majolica, Faience, Jydepot, Late Redware, Late Greyware, Stoneware. Also clay marbles, clay pipes and a ceramic lamp.
Glass	Window shards, bottle, drinking glass, vase. Rohmer glass, Pass glass.
Bone	Animal bones. Artefacts, needles, combs (c. 20 of bone, antler, horn), elephant ivory handle.
Iron	Spoon drill, cannon balls (3), keys, knives, knives with bone handles, axe blades, saw, candle holder, frying pans, file, hammer, nails, wire. spurs (x 3
Other Metal	Musket balls, Barrel tap, slag, scabbard, Cu. pins, cloth seals, bridal fragments, snuffle bit, riding), rapier handles, book clasp, window comes, lace chape, lead fragments, Cu. thimbles, Cu. head-dress frames, Cu. buttons, coins (including Frederik III 1 and 2 skilling, and gold ducat, and a Christian IV 2 skilling, tokens/jetons, belt buckles, toy halberd, fish hook, candle snuffers.
<u>Leather</u>	Shoes, book covers, scabbard, gloves, cut offs (waste pieces)
<u>CBM</u>	Stove tiles, floor tiles, roof tiles, wall tiles, bricks.
<u>Cutlery</u>	Knives, wooden spoons, iron fork fragments, Cu. spoons, silver spoon.
<u>Wood</u>	Barrel staves, barrel lids, brooms, plates, bowl, gaming piece, pulley, money box, buttons, gear wheels, lace making tools, awl.
<u>Textiles</u>	Wool, silk, twill, velvet, lace, net, felted wool. Hairnets, wig, cap, rope, socks, cardigan, jacket fragments, gloves.
<u>Various</u>	Mineral seal/stamp, stone styli, gun flint, cowrie shells, lejesten (mill axel-stone), mill stone fragment, bracelet (wire and glass).



Figure 144 Leather glove (FO 210083) from backfills Group 200

A further and less substantial set of backfills (Subgroup 457) was located within the former inner moat of the city, in the northern part of the site in watching brief trench Z 6326. It was recorded within the western half of the moat, in the environs of the sluice that was recorded entering the moat, and clearly post-dating it. It appears to have been dumped here as part of an act of decommissioning of the millrace. Finds included some Late Redware fragments and some stove tile fragments. No samples were taken from this subgroup.

This group also dates to sometime in the later 17th century, when the millrace within the former moat was taken out of use. Subgroup 457 should be seen together with Group 200 (within Area 3 and 4).

A series of extremely organic deposits (Group 228) were documented in watching brief trench Z 3465 in 2011, stratigraphically and physically under the gatehouse/guardhouse. It was considered likely that these were moat backfills, and when the nearby Area 3 was later excavated it was seen that this interpretation was correct. These deposits were extremely find-rich, with a vast array of metal, ceramic, glass and organic finds retrieved. The soil was very moist and peaty, and conditions were optimal for organic preservation, as in the moat generally. Hence shoes, wooden items and even textiles were preserved. Three coins were found in this group (some from sieving), and these dated from between A.D 1621, up to the 1660s. This ties in well with the moat being backfilled shortly before the final fortifications (and gatehouse) were established, in about the 1660s. These layers clearly comprise of general urban waste, and were dumped here in order to clear rubbish from the city, but more importantly, in order to fill up and decommission the medieval moat/post-medieval mill race. This group is directly comparable with and presumably contemporary with, the upper layers in Group 200. In effect it is the same as Group 200, simply documented in a different trench and in a less detailed way.

Some further deposits (Group 31) were seen in the same area as those of Group 228. These were mostly not excavated, or excavated by machine. It is also likely that they represent dumps/fills in the old moat, and so are essentially similar to those deposits in Group 228. These groups should therefore be seen as closely related. These deposits pre-date the guard house, and may have been laid down in about the 1660s.

Other features in Phase 5

Various pits and isolated features

Group	Subgroups	Context types
39		Pit cut and fills
207		Cut and deposit (surface)
211		Cut and fill (pit)
221		Cut and fill (ditch?)
309		Cut and fill (pit?)
310		Cut and fill (pit?)
428		Deposits (levelling)

Table 70 Various pit and isolated feature related groups and subgroups

A pit (Group 39) was partially exposed in the southern corner of Area 1, an area which was excavated as a watching brief. The pit was somewhat disturbed by tree roots, and the placement of an iron pipe, and was not fully excavated. As a result, very little can be said of this feature. It has been tentatively dated to the post-medieval period based on the recovery of several sherds of Late Redware pottery. The function of the pit is unknown.

Three deposits (Group 428) were documented in section in watching brief trench Z 3064. Few details were noted, but it was thought that they may have represented ground raising or ground levelling actions, probably dating to about the time the medieval moat/mill race was filled up, in the 1660s or so.

A discrete cut and fill (Group 309) was excavated in the southwest corner of Area 4. It was relatively small in size and stratigraphically overlay road Group 217. The interpretation of the group is unclear. It is likely to be a posthole or small pit, but given its likely dating (based on finds of post-medieval pottery and clay pipe)

it is then quite isolated, and makes an interpretation of its function very difficult. Group 309 is probably contemporary with nearby Group 310 (see below). They can be viewed as post-medieval features overlying road Group 217. Another discrete cut and fill (Group 310) were observed in the southwest corner of Area 4, some 4,4 m east of Group 309. It was relatively small and stratigraphically overlay road Group 217. As with Group 309, little can be said of its function, other than it is likely to have been a small pit or posthole.

A medium sized pit (Group 211) was found on the edge of the moat in Area 2B. Only one dateable find was recovered in the fill, a single sherd of Late Redware, suggesting a post-medieval date. It is possible that this feature simply represents a small waste pit, particularly as it does not appear to have related directly to the moat, which it is stratigraphically later than.

In the northern corner of Area 3, a linear feature (Group 221) was documented. This feature consisted of a northeast to southwest aligned linear cut and its associated rubble backfill. It is somewhat unclear how to interpret this group. It is most likely to be a ditch of uncertain function (perhaps drainage) although the rubble backfill could suggest a robber trench of a structural cut. A further interpretative possibility is that the cut is related to modern truncations although no modern finds were recovered in the fill, so this is perhaps unlikely. The majority of what lay beneath this ditch was medieval in date, but the recovery of a stove tile fragment suggests that it belongs in the post-medieval date range. A drainage function is perhaps most likely, perhaps to take rain water from the street that would have ran along present day Vester Voldgade.

In the eastern corner of Area 2B, a feature interpreted as a possible linear surface (road, or path) was identified. This surface (Group 207) was set in a shallow cut, made into the natural clay beneath, and comprised of small rounded cobble-like stones, set in an informal way into the natural clay beneath. Very little of the cut survived, so it is difficult to determine an exact purpose for it, but it may well be an element of a road or pathway. It is also possible that this feature represents a metalled drain of some form. Finds were mainly ceramic, and post-medieval in date, and so this feature has been placed in Phase 5, though this dating is not a certainty. It is likely to postdate the filling up of the adjacent section of the outer moat however, which would place it sometime after c. AD 1600. Its precise function, as stated, is not clear, due mainly to its partial nature.

New infrastructure – waterpipes

Group	Subgroups	Context types
16		Wooden structure (pipe), cut and fill
120		Wooden structure (pipe), cut and fill
121		Posthole and fill
306		Wooden structures (pipes), cut and fill
346		Wooden structure (pipe), cut and fill

Table 71 Waterpipe related groups and subgroups

From at least the 16th century, a citywide investment was made in a municipal water system, which saw water pumped into the city through wooden waterpipes. These waterpipes were essentially tree trunks that were drilled through the centre so that they were hollow. They were connected end to end, bringing the water several kilometres to the city from various sources. The pipes were generally placed in trenches, which much like today were then filled in, meaning that they were not visible on the surface. Within the

city they generally followed the streets, and in many cases probably started on the peripheral streets such as Vestervoldgade, before having side pipes connected to them to take water down the various side streets. A gravity feed was used in some cases, with the water coming from a more elevated source outside the city, but a second system of pumped water was constructed in the 17th century, and soon became the more popular of the two (Topcagic, 2014).

Located in Area 4 and Area 3, a series of four waterpipes (Group 306) were documented running in a NW-SE direction, parallel to the former city moat. These were found in a vertical-sided trench cut, and were covered in a mixed backfill. The cut was made through the foundations of the former medieval gateway (Group 111), which shows that this was surely demolished by this time, as the level of truncation caused by the waterpipe trench was quite severe. There was a height change, dropping 0,2m from the north-west to the south-east indicating that the water flowed in this direction. As with the later Group 307 pipes, these had an internal bore diameter of c. 11 cm, which suggests as we might expect, that these pipes were part of the main water network, rather than being part of the system that lead from the pump to the main water network (these pipes would have a narrower bore diameter of c. 8-9 cm (Topcagic, 2014). Group 306 can be interpreted as a major water pipe construction pre-dating nearby waterpipe Group 307 to the north. The location of this group suggests the waterpipes would have run inside the city defences, probably following a route corresponding to modern day Vestervoldgade.



Figure 145 and 146 Evidence for cleaning of pipes in Group 306



Figure 147 Left: Waterpipe Group 306 (to the right), cutting through gate foundation Group 111, seen from NW

The finds and stratigraphy suggested an approximate mid-17th century date for these pipes. Two dendrochronology dates were retrieved, and both dated to the winter of AD 1666/7 (Appendix 4), suggesting that the pipes were probably laid down en masse in AD 1667. This group either pre-dates or coincides with the 'closing down' of this area, the deconstruction of the mill and millrace and filling up of the former moat. Indeed it was clear during excavation that the backfill of the mill and moat overlay this pipe trench; it was definitely laid down before the area was backfilled with urban waste. It is likely that the pipes were placed here as part of the same large scale phase of works that saw the mill decommissioned and the area prepared for the placement of the new bastion and ramparts.

Located just east of the outer gate, and running in a southwest-northeast direction towards its southeast corner, was a single wooden water pipe, laying in a trench backfilled by typical waste-rich soil (Group 120). The cut had been made through the backfilled moat deposits to the east of the gate, and the fill was probably the same material dumped back in to the trench. It is thought that this part of the moat was filled in already by about the early 1600s, so this pipe cannot be older than this. A dendrochronology sample was taken, but a date could not be retrieved. This pipe had survived in very poor condition, and was not a very large example, both factors that probably contributed to the negative result.

An iron ring joint was seen on the eastern extent of the pipe although the next pipe was absent. This could in theory have been the end of the pipe, either simply spilling in to the moat, or more likely feeding a pump at this location. It is considered likely that the outer gate was in use at the same time as this pipe, and that the gate was where it was intended to finish, and what the pipe was supplying. A possible posthole (Subgroup 121) was excavated which was interpreted as somehow relating to this water pipe. It is not clear how it related however, perhaps it was placed in the trench to stabilize the pipe before the trench was backfilled. It had been partially removed by a modern truncation, so it was difficult to be certain of its form and function.

Another waterpipe system (Group 16, 346) consisted of a construction trench, a heavily decayed wooden waterpipe and a backfill deposit. This pipe ran in a northwest to southeast direction across the site, and was seen in three trenches. Two parts of Group 346 were identified, over 31 m apart, but due to a lack of other pipes in either area, and given how well the pipes lined up, it was clear that the two sections of pipe correlated.

The pipe trench cut through the deposits placed around the late medieval bridge (Group 359) and also the actual side walls of the bridge itself (Group 377), which had had holes punched through them for the pipe to pass through. As these holes seem to have been made quite roughly and with no repairs to the brickwork subsequently, it seems likely that the bridge was no longer in use when the pipe was placed here. Group 16, recorded to the northwest, was almost certainly another part of the same waterpipe line, simply seen in another area (Z 6326). Therefore its construction date and function can be seen as the same.

To the northwest it was truncated by an air-raid shelter (Group 93). One dendrochronology sample was taken from Group 346, but unfortunately due to the decayed and partial nature of the wood, it was not possible to retrieve a date. Taking the stratigraphic evidence into account, it seems most likely that this pipe post-dates AD 1600, and probably predates AD 1670. It may well be that it dates to around the same time as Group 306 (above), which was laid down just before the placement of the youngest bastion, and in fact, it is possible that pipe Group 306 was a side connection to pipe Group 346.

Overall conclusions for Phase 5, AD 1600 – 1670

Phase 5 at Rådhuspladsen saw a myriad of changes made, in what was archaeologically perhaps the busiest phase of the site, particularly in relation to the short span of time represented. It partially overlapped with the reign of Christian IV, who was known for his interest in promoting construction projects, and he was almost certainly the driving force behind several of the large scale changes seen in Phase 5. These included the transformation of the former medieval moat into a mill race, and also the construction of a watermill within the former moat. It included the alteration of the ravelin, and its conversion into a more up to date bastion. It is also believed, based on historical documentation, that he had the outer gate partially rebuilt, or at least given a new, presumably more ostentatious, façade, evidence of which was also seen (Jensen 1938, 220).

Also within Phase 5, evidence was found for the demolition of much of the work outlined above, towards the end of the reign of Frederick III (reigned from AD 1648-70). By the late 1660s moves were made to upgrade the fortifications by the western gate once again, in a very large-scale fashion. This may have been because it was seen as being not effective enough during the Swedish attacks of AD 1659, or possibly because of trends in fortification construction in the wider region.

This work saw the mill taken down, and eventually both it and its mill race filled in, removing the last visible traces of the moat built in AD 1370. It also saw the deconstruction of the upper parts of the outer gate and associated bastion, and the filling up of the outer moat. All this work was done to allow for the construction – slightly further west – of a new, much broader, more regularly built and more modern set of fortifications. When these were constructed, much of the former defences, including the lower parts of the gate and bastion, were buried beneath the new larger bastion. Hence all of the remnants that survived the deconstruction of the 1660s were in fact protected by the new bastion, sealed beneath it for the next two hundred years or so.

Phase 6 The Final Phase of Fortifications – c. AD 1670 – c.1860

The sixth recognised phase of activity at Rådhuspladsen corresponded approximately to the later post-medieval period (between about AD 1670 – 1860), and saw a final and very large-scale re-development of the city's defences in the environs of the western gate. The defences were modernised and upgraded, in line with changes elsewhere in Europe, with an emphasis on the construction of a broad moat and ramparts, which required the fortifications in this area to be pushed out even further to the west. For this reason much of the actual moat lay outside of the excavation area at Rådhuspladsen, as it had been moved so far out of the city. The ramparts themselves would have been placed partially within the excavation area, but had been almost entirely removed in the past. Elements of the associated gateway were identified however, along with parts of the associated gatehouse.

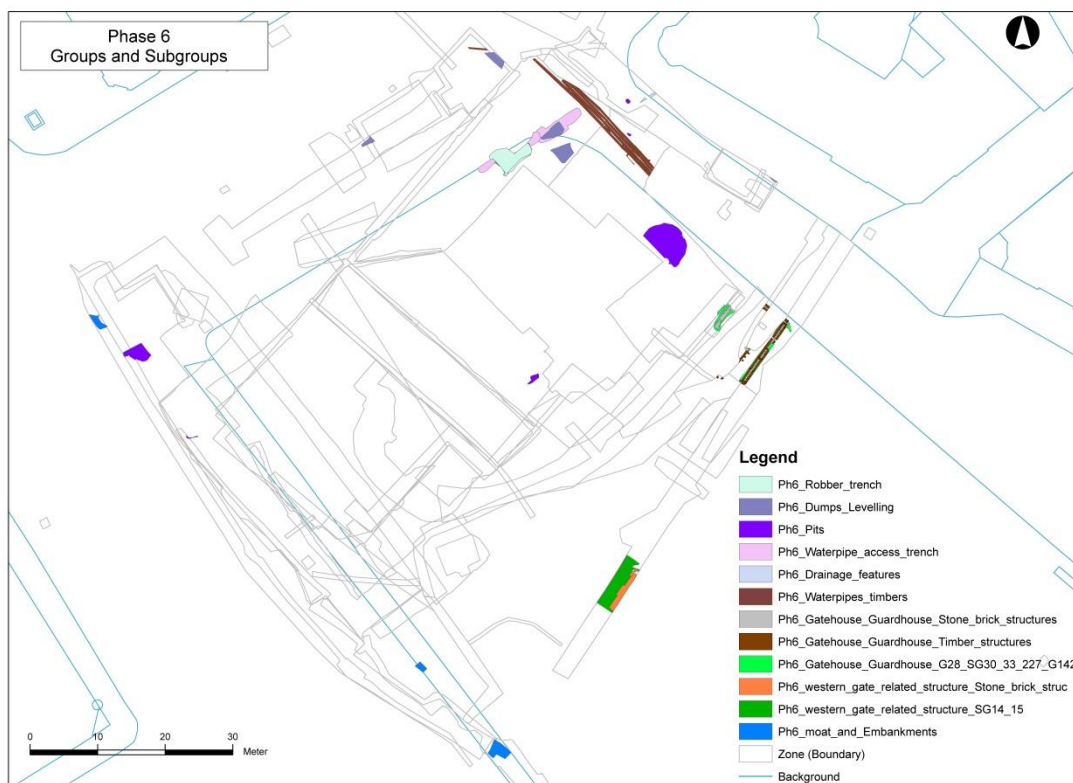


Figure 148 Phase 6 Groups and Subgroups

This final set of defences were decommissioned in the 1860s/1870s, by which time it was deemed that the traditional form of urban defence (moat and ramparts or wall, in close proximity to the city) had become obsolete, based mainly on the developments of warfare, in weaponry in particular. The features found at Rådhuspladsen add new knowledge to our understanding of Copenhagen's defences during this period, adding concrete information to what is already known from mapping and other sources.

The post-medieval remains seen at Rådhuspladsen were heavily impacted by later activities in the area such as modern service trenches and bunkers, but also by the deliberate levelling out of the ramparts and in-filling of the moat as part of their deliberate removal, along with the creation of a new square in the late

19th century. The post-medieval contexts themselves impacted on earlier archaeology too, particularly in the case of the outer moat which may have truncated the previous moat in some areas.

The types of features excavated that can be dated to the later Post-Medieval period include new moat elements, gate or bridge related elements and a good deal of evidence for the associated guardhouse, as well as evidence for the deconstruction of all of the above. Several water pipes were also recorded from this period, and a range of pits, dumps and miscellaneous other features. This phase primarily consisted of large scale structures however, mostly indicative of defence.

Overall then, Phase 6 saw the establishment of significant new urban defences in the Vesterport area. The possible reasons for this – apart from general defensive needs – may relate to a desire to keep up with current trends in urban defence, as well as an increased need for defence, particularly given the ongoing political climate with regard to Sweden. These construction works would have been organised centrally, by the king, or by his administration, requiring significant planning and organisation, and a large expenditure of labour, time and money.

The presentation of the features and finds from this phase will be divided into the different feature types as outlined above, beginning with the larger defensive-related features, such as the moat and gatehouse, which will be discussed together under the heading ‘Fortifications’. Thereafter the general infrastructural remains such as water pipes will be discussed under the heading ‘Infrastructure’, and finally the remaining miscellaneous structures will be discussed under the heading ‘Other Features’.

Fortifications

Introduction

In Phase 6 of the site (AD 1670 – 1860) the final version of the city moat and bastions was established, and by the end of this phase had already become obsolete and was being dismantled. These developments will be outlined in the following sections.

Moat and Embankments

Group	Subgroups	Context types
203		Possible moat cut, moat fills
431		Possible moat fills
465		Possible moat fills

Table 72 Moat and embankment related groups and subgroups

Phase 6 at Rådhuspladsen effectively began with the establishment of an entirely new set of fortifications around this part of the city; a vast construction project carried out to modernise and upgrade the cities defences. This project would also see the fortifications pushed further out from the city, with very broad ramparts, and a very wide moat. While this moat was in most areas (including at Rådhuspladsen) back-filled and the rampart levelled out in the latter decades of the 19th century, some elements of both have been preserved in localised areas, mainly in parks (Ørstedsparken, Botanisk Have, and Østre Anlæg) and in the grounds of Tivoli. Very little of the actual moat and rampart from this period was seen at Rådhuspladsen; this is because the rampart/bastion was removed very thoroughly in the past, and the moat was located, for the most part, beyond the limits of the archaeological excavation.

Located to the south-southwest of the main excavation area, two deposits and a possible cut were identified (Group 203) which have been interpreted as representing moat backfills, relating to the backfilling of the moat which was constructed in about the 1670s, and the cut is likely to be simply the interface between these layers. It is likely that these deposits were placed here in the later 19th century, when the fortifications were taken out of use. These deposits were only seen in a small watching brief trench (Z 13825) and were seen to extend beyond the limits of the trench. Hence little more can be established about their nature. It is apparent however that they were located directly outside where the city gate once stood, far enough from the remains of the gate (as seen on site) that these deposits have to have been located over the former moat. These deposits were seen c. 1,75 m below street level, under more modern layers of gravel, sand and asphalt. They were seen to have a depth of at least 0,6 m. They comprised of pale grey-blue clay and dark organic clay.

The only pottery sherd recovered from Group 203 was part of a late redware dish. It was dated to between AD 1550 and 1650. It is considered to be an intrusive older artefact, and not likely to indicate a date for the deposit it was found in.



Figure 149 Phase 6 fortification related features

Some 15 m north of Group 203, another small trench (Z 6802) revealed more probable dark moat backfill (Group 431), located just 0,7 m below modern ground level, under a layer of modern gravel. This mottled dark deposit is probably similar to the layer seen in Group 203, but there was some uncertainty, due to its location, whether it should be seen as backfill of the 1670s moat (laid down in the 19th century), or if it could be backfill of the previous moat, filled up in about the 1660s. No finds were retrieved to answer this question, so it remains uncertain.

Located along the extreme western edge of the overall excavation area, a number of dark find-rich deposits were identified that appeared to be moat backfills (Group 465). These were initially thought relate to the

Christian IV era moat, but based on finds evidence it was realised that these deposits were too young, and must relate to the backfilling of the youngest moat in the later 19th century, or perhaps the levelling out of the bastion from the same time. Hence they have been placed in Phase 6.

It can be seen then that very few traces of the 1670s bastion, rampart and moat were seen during the work carried out at Rådhuspladsen, and as far as these structures are concerned, quite little new knowledge was gained. It should be borne in mind however, that it was not expected that much of this phase of fortifications would be seen at Rådhuspladsen.

Western Gate related structure

Group	Subgroups	Context types
27	14, 15	Structural elements relating to western gate, deconstruction deposits

Table 73 Western gate related groups and subgroups

A number of structural elements (Group 27) were seen during a watching brief in 2011, which were interpreted as being part of, or at least related to, the city gate (Vesterport) built in about A.D 1668 and torn down in the 19th century.

Seen in a watching brief (Z 3231) at the beginning of the Rådhuspladsen excavations in 2011, the remains of a redbrick wall (Subgroup 15) were found, placed quite centrally in the square, and with a southwest-northeast orientation. An examination of available mapping and some illustrations from the 19th century suggest that this wall, based on its form, was almost certainly part of the flanking wall which led from the gate out towards the bridge over the moat, in effect connecting those two structures.

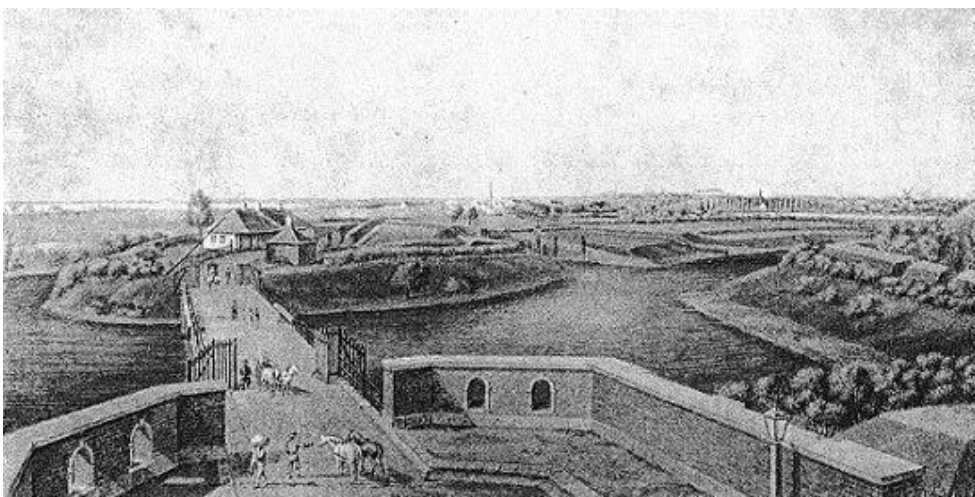


Figure 150 A depiction of the flanking wall by vesterport, painted by FL Bradt (c. 1800) and reproduced by F Hendriksens (Dansk Centre for Byhistorie)

The wall survived up to five courses in height, and in some areas foundation stones were observed. Two deposits were also recorded, which are likely to have been foundation layers for the wall. These were not fully excavated.



Figure 151 The wall seen from what would have been the outside (from north).

This watching brief trench was not very deep, so it was not possible to see what the structure overlay. It was also noted that the wall remains were not very deep below the present day ground surface of the square, so it is likely that any future work on the square might expose elements of this wall and the associated gate foundation. The part seen in 2011 however, was removed during the laying of services in the trench.

A series of five deposits (Subgroup 14) were documented immediately adjacent to the west side of wall Subgroup 15. These were generally quite mixed and mottled deposits with a lot of brick fragments, mortar and stones. These have been interpreted as relating to the deconstruction of the adjacent wall and perhaps gate, and as such are likely to date to the 19th century.

Gatehouse/Guardhouse

Group	Subgroups	Context types
28	30, 33, 227	Structural cut and various structural elements, of timber and stone mainly, representing guardhouse. Deconstruction deposit.
142		Structural cut, foundation deposits and structures

Table 74 Gatehouse/guardhouse related groups and subgroups

A number of elements of a building were documented c. 31 m northeast of the wall (Group 27) outlined above, roughly in the direction of present day Strøget. This building as a whole has been interpreted as being the remains of the former gatehouse or guardhouse (Group 28), located just to the north of the inner side of the western gate. This structure is seen on a number of paintings, and its size and position as seen on site seems to correlate well with these (Figure 150). It would then be considered likely to date to about AD 1668 or shortly after, when the western gate was constructed. Indeed dendrochronology dates (see below) point to a likely construction date of c. AD 1677, suggesting that the gatehouse was built some years after the gate itself.

The larger and main part of the gatehouse was seen in watching brief trench Z 3465, while a further element, a probable annexe to the rear of the building, was seen in the southeast edge of Area 3. Both structures survived as foundations only. The two elements were constructed in quite different ways. The foundation of the main structure (Subgroup 33) was constructed from a number of different elements. Firstly a linear foundation cut was made into the soft organic moat/millrace backfills below, then a series of foundation piles were driven down through the base of this cut and in to the soft layers below. These were placed in sets of three, each set taking up the width of the base of the foundation cut.



Figure 152 Foundation Subgroup 33 seen in section, from northeast

The sets of piles (all of oak) were each 1,25 m long, placed between 2 m and 3 m apart along the base of the foundation cut. On top the outer piles and supported by them, linear beams were placed horizontally within the foundation cut, running parallel along its edges with a row of sizeable stones placed in the gap in between. Finally some clay was packed into the foundation cut around all the elements, to hold them together. The top of the foundation was at a height of 5,05 m above sea level.



Figure 153 A section of the timber and stone foundation (Subgroup 33)

Some cross-pieces were also seen; these were shorter wooden pieces that linked the two sides of the timber linear foundations, and it may be that it was on top of these cross-pieces that the timber frames of the walls above would have rested. As these did not survive however, we cannot be certain. Overall the main building was quite substantial, measuring almost 13 m in length, and almost 5 m in width. Four dendrochronology samples were taken, and returned dates of as early as AD 1651, and as late as AD 1692 +/- 15 (Appendix 4). However, taken as a group, they appear to suggest a construction date for the building of somewhere between AD 1677 and 1685. Furthermore the timbers used appear to have all originated in Halland in Sweden.

A further smaller section of foundation (Subgroup 30) found within the building may have related to an internal wall, or perhaps to the placement of a fireplace and chimney at the centre of the building. It was built in the same basic style as the main structure, with wooden piles and horizontal wooden beams.



Figure 154 The foundation of the possible fireplace (Subgroup 30). Seen from southeast.

Some similar gatehouses survive in Copenhagen today (for example on the ravelin between Christianshavn and Amager), and may be able to suggest something of how the upper elements of this building would have looked – though of course to what extent these gatehouses/guard house have been rebuilt and repaired down the last almost 350 years is uncertain.

An element of a probable rear-annexe (Group 142) to the gatehouse/guardhouse was seen in the south-eastern edge of Area 3. This comprised of a foundation cut into moat/millrace backfills, and a combination of stones and broken bricks laid in random fashion within to form a foundation, upon which was placed a brick and mortar laid foundation.



Figure 155 Annexe structure (Group 142) seen from northwest

This structure measured 3,8 m in length, and is likely to have extended c. 3 m out from the main gatehouse/guardhouse. Given the fact that this structure is both smaller than the main structure and built in a completely different way, it is likely that it was a later addition/extension to the building. Hence we cannot say when it dates from, other than post-1668. Its function is also unclear; it may have acted as a storage area, or it may simply reflect a need for more space within the building.

One deconstruction deposit (Subgroup 227) was documented as relating to the building Group 28. This was located by its north-eastern corner, and comprised of silty sand containing much mortar and CBM fragments, consistent with the demolition of a brick and timber building. If so, it is likely to date to sometime in the mid to late 19th century, and represents the decommissioning of the gatehouse/guardhouse building.

Infrastructure

Introduction

In Phase 6 of the site (AD 1670 – 1860) the infrastructure in this area was improved in a number of ways, most obviously of course in relation .to defence, but also in non-defence related ways. Perhaps the most

important of the improvements was the expansion of the water system, with many new water pipe lines established. These developments will be outlined in the following sections.

Water pipes

Group	Subgroups	Context types
45		Wooden structure (pipe) and associated cut and fill
199		Probable water pipe trench
307		Wooden structures (pipes) and associated cuts and fills.
444		Wooden structure (pipe) and associated cut and fill

Table 75 Water pipe related groups and subgroups

We have already seen in Phase 5 that water pipe lines were being established in Copenhagen, since at least the 1600s. These comprised of wooden pipes, made from hollowed tree trunks, laid end to end and jointed together. These were part of an increasingly complex water system, supplying the city of Copenhagen with fresh water, taken from lakes well outside the urban area; indeed many kilometres away.

Phase 6, post-1670, saw the renewal and expansion of this system in the Rådhuspladsen area, and thanks to dendrochronology dates retrieved, we can outline these developments and their chronology with some confidence. In Phase 5, water pipe Group 306 were described – a set of 4 pipes running more or less parallel to and along the edge of, Vester Voldgade. That set of pipes was dated to c. AD 1667, and was probably established around the time the mill was being decommissioned. Located directly beside Group 306, a second set of 5 wooden water pipes (Group 307) was recorded running in an almost identical alignment. These pipes, at the north-western extent of Area 4 were directly adjacent to Group 306, then they veered over 1 m apart, before moving close to each other again at the south-eastern limit of where they were seen. In fact in this area one of the Group 307 pipes runs slightly under the edge of one of the



Group 306 pipes. It was clear however, that this must have been deliberately placed under the older pipe, as stratigraphically it was very clear that the Group 307 pipes were later. This was because the Group 306 pipes were clearly sealed by the backfilling of the mill/moat, with the cut for the pipe-trench only appearing when these dumps were removed. The cut for Group 307 on the other hand, was apparent much earlier in the excavation, and was clearly cut through the moat backfills.

Figure 156 Water pipe Group 307 (on the right) seen from southeast

Group 307 consisted of a vertical sided trench cut, containing in total five water pipes, one of which was placed under the others, and which did not continue beyond the boundary of Area 3 and 4. The reason for this pipe not continuing is not

clear, but it may suggest that some of the pipes were replaced at some point, with the old pipes sometimes being left in situ in the trench. Approximately 24,5 m of the pipes length was exposed during the excavation at Rådhuspladsen. Laid over the pipes was a mixed backfill deposit, very similar to the moat backfills, but looser and more mixed.

Timbers were recorded in Area 3, which appear to have been laid as a sort of foundation or levelling aid for the pipes to be placed on. A re-cut of the trench was also recorded in Area 3. This re-cut was 'shored' with timber which had been left in situ, and appears to point to some sort of repair work carried out in this area. The Group 307 pipes were notably bigger, with broader diameters (0,35 m – 0,4 m) than those in Group 306. Another notable difference was that these pipes had had their bark removed, whereas those in Group 306 still had much of their bark attached. As with Group 306 however, the pipes had an internal bore diameter of c. 11 cm, which suggests as we might expect, that these pipes are part of the main water network, rather than being part of the system that lead from the pump to the main water network (these pipes would have a narrower bore diameter of c. 8-9 cm (Topcagic, 2014).



Figure 157 Timber shoring (part of Group 307) in situ, possibly for accessing the pipes to carry out repairs. Seen from south

Group 307 can be interpreted as a major water pipe construction. It was probably constructed as a replacement or perhaps an addition to Group 306 recorded immediately to the west. A further possibility is that one line might represent 'pumpevand' (pumped water), while the other might be coming straight from the source (Topcagic, 2014). Both pipelines ran along Vester Voldgade, using the open street as it would be easier to dig up. Dendrochronological analysis indicates a felling date of winter 1822-1823 for one water pipe suggesting that this was one of the later sets of water pipes in the city. This tree was identified as having originated in Småland in Sweden (Appendix 4).

A linear cut and its fill (Group 199) were located in Area Z 112934, a small trench located to the northeast of the main excavation on Vester Voldgade. Directly adjacent to this group was an area of high to late

medieval activity (floor layers), which was truncated by Group 199. This group comprised of a linear near-vertical sided cut, and its fill. The cut ran in a northwest to southeast direction, and only its eastern side was seen. The fill comprised mostly of clay. As only one real edge was seen the true dimensions of this cut are unknown. No finds were recovered, and no samples were taken.

Group 199 has been interpreted as a wooden water pipe trench. As a linear cut of at least 0,75 m wide and at least 0,5 m deep, the interpretation that it was used for the placement of a wooden water pipe is based on its location and orientation mainly, as it lines up well with some of the water pipes observed in Areas 3 and 4 to the south. Also the vertical sided linear nature of the cut is typical of water pipe trenches. However this interpretation is not certain, as the base of the cut was never reached. Group 199 is likely to date to between the 17th and 19th century, when wooden water pipes were widely used in Copenhagen. If Group 199 has been correctly interpreted as a wooden water pipe trench, then it is most likely to relate to Group 307 (see above) observed to the south in Area 3 and 4. This dates to the early 19th century, based on dendrochronology analysis.

Located in the northern corner of watching brief trench Z 3064, a single wooden water pipe (Group 45) was recorded early on during the excavation at Rådhuspladsen. The group consisted of a vertical-sided, flat-bottomed trench cut, with a water pipe laid along its base, and back-filled with mixed material. The water pipe was of a whole trunk of wood, with bark still attached. The pipe measured just 0,24 m in diameter, while the hole in the water pipe had a diameter of 12 cm. The trench and pipe ran in an E-W direction, perhaps towards the west end of Vestergade. It was not clear if it would have linked into to any of the other pipes seen during excavation. As this pipe trench was documented in a watching brief where the opportunities for documentation were somewhat less, little more can be said about this group. No date was retrieved; however based on the form of pipe with bark still attached, it can be tentatively suggested that it is relatively old, perhaps 17th century or a little later.

Seen in a small part of watching brief Trench Z 112934, a single wooden water pipe (Group 444) was documented. This pipe was roughly parallel to the two pipes mentioned in Phase 4 (Groups 109 and 115), but further north, and clearly running towards the top of Vestergade. It was observed over a length of just 1 m, and was recorded as being 0,21 m in width. Due to limitations of the watching brief in question, no further documentation was possible other than to locate this pipe, and no sample was taken. It is not certain that it belongs in Phase 6.

Seen in different trenches across the site at Rådhuspladsen, the various pipes dated to (or likely dated to) Phase 6 suggest an increasing need or desire to have fresh running water in the city, and points to a city-wide level of organisation and planning to ensure the same. We have seen from the dates retrieved at Rådhuspladsen that as early as AD 1590 (Phase 4) wooden pipes were being laid beneath the streets of western Copenhagen, and that this process continued in a technologically similar way until at least AD 1822/23.

Drainage features

Group	Subgroups	Context types
81		Linear cut and fill
204		Linear cut and fill

Table 76 Drainage related groups and subgroups

A number of probable drainage related features were documented at Rådhuspladsen which are believed to date to the period between AD 1670 and 1860.

One such feature (Group 81) was located in Area 1, and ran in a northeast-southwest direction across the area. It was a narrow and shallow linear cut feature, and its fill was very disturbed, with many inclusions. Some glass and a nail suggested a late dating. It was also discovered to be post-dating a number of underlying wooden water pipes. Consequently it has been assumed that this drain is post-medieval, and most likely belongs in Phase 6.

A further ditch (Group 204) was observed in a narrow watching brief trench (Z 213559) on H.C. Andersens Blvd, north of the main site. It appeared to be running in an almost N-S direction. A good edge for the cut of this ditch was present to the east but the boundary to the west was more diffuse; it was estimated to be between 1.63m and 2m from the eastern edge.

This may have been a post-medieval ditch, but could also be an earlier ditch or moat filled at the end of its period of usage with post-medieval deposits. It was not excavated, so its depth and exact function could not be firmly established. The ditch emerged approximately 1,22m below street level. A fragment of 17th century stove tile and a fragment of redbrick were present within the fill. Two animal bones were also recovered and a piece of glazed red earthenware with combed horizontal lines on the exterior. It may be that this ditch belongs in an earlier phase, for example Phase 5, but given the uncertainties about its dating it has been decided to place it in Phase 6.

Water pipe Access-trench

Group	Subgroups	Context types
328		Linear trench and fills
332		Linear trench and fills

Table 77 Water pipe access-trench related groups and subgroups

A linear ditch or trench thought to relate to accessing some of the wooden water pipes was documented in two parts (east and west) – Groups 328 and 332.

One part of this trench (Group 328) was located in the eastern half of Area 4, running in a roughly southwest-northeast direction. It consisted of a trench dug for accessing wooden water pipes, perhaps for the purpose of repair/maintenance of the pipes. The northeast terminus of the trench exposed the top of 4 wooden water pipes which ran at 90 degrees to this trench (Group 306). These had not been damaged in any way, (though the bark was missing here) and there was a wooden peg driven in to a drilled hole on top of each, located centrally in the trench - suggesting possible maintenance work. However, the reason for the extension of the trench to the southwest is unclear.

One possibility is that there was uncertainty as to exactly where to find the pipes, another possibility is that the trench was dug to access the pipes, which were then tapped, and that the purpose was in fact to use water from the pipes. The trench appears to lead toward the water canal, and though the mill must have been out of use by this time, the millrace might have been kept open somewhat longer. The cut was filled with similar material to the backfills of the mill and moat, and probably was simply the material that was dug through while making the trench.



Figure 158 Water pipe access-trench Group 328 seen from northeast

The terminus at the southwest end is unclear. The feature appears to continue and it is likely therefore that Group 332 is in fact the continuation of Group 328 leading water into the former millrace. Group 328 was very rich in finds, which dated to the late 17th century, including faience and china. No samples were taken from this group, as the fills were seen as simply being disturbed backfills of the moat/mill deconstruction. It appears to date to the late 17th or early 18th century, and was demonstrably one of the younger archaeological features in Area 4.

Group 328 should be seen together with Group 332, as they appear to be essentially the same feature, surviving either side of a somewhat disturbed area. Group 332 was located in the eastern half of Area 4, running in a roughly southwest-northeast direction. It consisted of a trench dug possibly for the purpose of repair/maintenance of wooden water pipes. The trench (particularly Group 332) appears to lead toward the water canal, and though the mill must have been out of use by this time, the millrace might have been kept open somewhat longer. Having said that, the cut was actually made through the base of the upper final phase of the millrace, so it is unclear how this water would have escaped further from here. The cut was filled with similar material to the backfills of the mill and moat, and probably was simply the material that was dug through while making the trench.

Group 332 was very rich in finds, which dated to the late 17th century, including faience and china. It also produced hundreds of fragments of clay pipes, particularly stems, which generally appeared to be unused (see Appendix 30). No samples were taken from this group, as the fills were seen as simply being disturbed backfills of the moat/mill deconstruction. It appears to date to the very late 17th or early 18th century based on finds.

Other Features

Pits

Group	Subgroups	Context types
69		Pit cut and fill
125		Pit cut and fills
156		Pit cut and fill
172		Possible pit cut and fill
220		Pit cut and fill
222		Pit cut and fills

Table 78 Pit related groups and subgroups

A number of pits excavated across the site have been dated to the period AD 1670 – 1860 and so have been placed in Phase 6.

One quite large and extremely significant pit (Group 222) consisted of a large circular cut, located within the eastern edge of the former moat/mill, in Area 3. Group 222 has been interpreted as a pit, which was cut into the already back-filled moat/mill. It was subsequently filled up with a large amount of waste material, mainly organic waste, but with a large amount of cultural material. This cultural material was in many cases very rich in nature, more so than the moat back-fills, and may suggest that this pit was filled with the household waste from a nearby wealthy household. The largest deposit by volume was also the most find-rich, and was very organic in nature. It is probable that it had a high concentration of either (or both) latrine waste or animal manure. The remaining fills mostly comprised of localised patches of heterogeneous material, some clayey in nature, possibly suggesting periods of flooding or slumping occurring while the pit was in use.



Figure 159 Pit Group 222 post-excitation. Seen from northwest.

Figure 160 Wig FO 205962 from pit Group 222

This group appears to date to the late 17th century, and must post-date the backfilling of the mill/millrace/moat, suggesting that it dates to after AD 1670. This is based on the fact that it is cut through the backfills in question, and also on the artefactual evidence from its own fills. Indeed some of the clay pipe fragments recovered point to a date of at least AD 1690, or perhaps slightly later. What remains unclear is why a pit would be cut through the back-filled moat/mill deposits, only to be filled up with similar material again. One possibility is that the backfills were already somewhat 'sanitised' with time, whereas the material dumped into this pit was fresh 'unclean' waste, which required burying. Another possibility is that the cut in itself is the significant element, that perhaps a structural element of the mill, previously left in-situ, was now being searched for, and had to be uncovered - though this scenario seems somewhat unlikely.



Figure 161 Spur FO 206642 from pit Group 222, post-conservation

Group 222 was extremely rich in finds as stated above, and indeed in what appear to be high status finds. Material recovered included textile, leather (including shoes and a hat), clay pipes, wood chips, straw, animal hair, kitchen utensils (e.g. wooden spoons, bone handled knives and forks), combs, horseshoes, a cannonball, tokens, a buckle, a metal stylus, scissors, nails, pins, nuts, walnut, sea shells, animal bones (some clearly butchered), bucket staves, a glove, a wig, an iron key, a spur and many drinking glass fragments. 3 samples were taken from Group 222, all from the main fill. These comprised of one big bag sample for sieving, and two environmental samples. Dietary information recovered from these showed the presence of walnuts and hazelnuts, while a huge amount of animal bone was recovered, including haddock and ling, goose, hen, duck and swan, cattle, pig, sheep, goat and red deer (antler only), as well as cat and horse. Many cattle and sheep horn fragments (as well as the antler fragments) are thought to be evidence for horn working, but overall the bone assemblage reflects a domestic assemblage (see Appendix 1).

Another pit (Group 125) was placed in the northwest part of the excavation area, within the area of the early medieval cemetery. A large amount of modern service trenches and truncations were present in the area. The pit was cut into the moat which was backfilled in the 17th century, and was itself truncated by a modern service box. Two fills and a cut were documented, but were not fully excavated. The fills were organic and smelly and the pit was on the basis of that interpreted as a refuse pit. It seems most likely to belong in Phase 6.

A small pit (Group 69) was recorded in Area 1, cutting through the medieval embankment material. Its fill which was quite loose and mixed, was either late post-medieval or potentially modern in date, but as no modern finds were recovered, it has tentatively been placed in Phase 6.

A possible pit (Group 156) was documented in Area 2B, located between two modern disturbances. Its fill was quite loose, and it is possible that it was modern in date, though overall, based on stratigraphy, it is

thought to belong to Phase 6. No finds were found within its fill, so its dating and function remain unknown.

The remains of a possible pit (Group 172) were documented between modern truncations in watching brief trench Z 114012. This survived only as a narrow deposit in a possible cut, and it is highly possible that this is not a true feature, but instead disturbed archaeological layers, moved during the placement of bomb shelters in the 1940s (see Phase 7).

A further small pit (Group 220) was excavated in the northern part of Area 3. This was very small with no finds recovered, and was truncated by the cut for wooden water pipe Group 307. This very fact however shows that the pit predates AD 1822/23 when the pipes were laid down. How much before 1822/23 is less certain however; it is possible that this small feature could date back as far as the high medieval period. It has been decided however to place it in the same phase as the water pipe Group 307, which it has a stratigraphic relationship with. No function was apparent for this feature.

Dumps/Levelling

Group	Subgroups	Context types
64		Dump deposit
(21)	238	Dump/levelling deposit
432		Dump deposits
458		Dump deposits

Table 79 Water pipe access-trench related groups and subgroups

A small dump of material (Group 64) was noted in the southeast corner of Area 1. This was seen only in a watching brief, and hence only examined briefly. Based on its location, close to present ground level, and given there was no dateable material recovered, it has been placed in Phase 6, though this dating is not certain.

Located in the eastern edge of watching brief trench Z 3064, two dumps of material were observed in profile (Group 432). These were heavily organic and contained much charcoal. A range of finds were recovered, including several sherds of late redware. Nonetheless, the dating of these layers to Phase 6 is tenuous, and it should be borne in mind that they sealed probable medieval layers, but were located just under modern deposits. As they were seen in profile only, little more can be said of these dumps.

A series of three dumps (Group 458) were excavated in the northern part of Area 4. These were very similar to the moat backfills, but were perhaps more disturbed, and seemed to overlie Group 332, suggesting that they post-dated the main moat backfills. It may be that they simply represent some of the moat backfills which were dug out when that trench was made, but the presence of significant quantities of cut metatarsals and clay pipes for example, might suggest that this material has a different, and perhaps later, origin. These deposits were stratigraphically some of the latest encountered in Area 4. Hence it is considered that they belong in Phase 6.

In watching brief Trench Z 6326, a dump or levelling deposit (Subgroup 238) was located immediately adjacent to wall Subgroup 223, to the west. It comprised of a single deposit, which has been interpreted as

a levelling deposit, placed into the wall construction cut some considerable time after the wall was built. Consequently it has been classed as deconstruction, rather than construction, though the interpretation is not certain. This is partially because only a very small amount of this deposit was exposed.

No samples were taken, and a single sherd of 17th to 18th century pottery was recovered. This sherd forms the basis for the dating of the Subgroup. As a much later levelling deposit, Subgroup 238 can be seen as representing the deconstruction phase of Group 21 (Phase 4).

Robber Trench

Group	Subgroups	Context types
418		Robber trench cut and fill

Table 80 Robber trench related groups and subgroups



A large pit or cut feature (Group 418) was documented in Area 4, between the medieval gate and the mill race. This cut was made through some of the backfills deposited to fill up the former mill and moat, but it was also cut through a significant amount of the north-eastern side of the bridge that was built in 1500. This structure was extremely well built and solid where seen elsewhere, so it would not have been easy to cut through it in this way, and it is therefore unlikely one would do so unless that was the primary objective. Hence it has been assumed that this feature (Group 418) was in fact a robber trench, the purpose of which was to retrieve reusable material from the bridge, in particular stone and brick. This cut and its backfills are likely to belong in Phase 6, based on stratigraphy.

Figure 162 Robber trench Group 418 post-excavation. Note the missing corner of the bridge. Seen from southeast.

Overall conclusions for Phase 6, AD 1670 – 1860

Phase 6 at Rådhuspladsen saw a series of alterations to the defences and infrastructure at this western edge of the city, changes which reflect the further advancement of Copenhagen's western defences, and also the advancement of more large scale civilian infrastructural developments, particularly the water pipe system. The changes to the fortifications were very significant in scale, and saw the replacement of all previous defences in this area with new massive 17th century type bastions and moat. These were very broad, very regularly laid out, and very much in line with what was in use elsewhere in Europe by this time. As well as traces of the earthworks, elements of the wall leading from the gate to the 17th century bridge (not seen) were encountered, and substantial parts of the foundation of the former gatehouse/guardhouse were also documented and excavated.

The other significant development as stated above, was the continuing establishment of more wooden water pipe lines through the area, both expanding and upgrading the system already in place. Evidence for their maintenance and possibly repair was also seen.

Finally, traces were also seen of the deliberate deconstruction of many of the fortification elements in the latter part of Phase 6, including the moat itself and the gatehouse/guardhouse. This was done, as stated at the outset, because the traditional form of urban defence – moat and ramparts or wall in close proximity to the city – had become obsolete, based mainly on the developments of warfare. These defences near the western gate – which could have been left in situ even if obsolete – were also removed as part of an opening up of the western boundary of the city, allowing for the city to expand in that direction, and also allowing for the future creation of a new square in this location.

Phase 7 The Modern City –1860 –Present Day

The seventh recognised phase of activity at Rådhuspladsen relates to the modern period, from c. AD 1860 up to the present day. In this period the square known as Rådhuspladsen was established, and saw many changes thereafter, including both the placement and later removal of a tram system, and in more recent times the construction of a bus terminal. Not all of these events were recognisable in the archaeological record however, but some events were, such as the construction of a number of air raid shelters during the 1940s, and also an underground toilet building that would remain in use right up until the beginning of this excavation in 2011. The defences had by this phase been removed in this area, though more modern fortifications were instead established far outside the urban area.

Despite their modern nature, the features found at Rådhuspladsen from this period, particularly the air raid shelters, do add new knowledge to our understanding of Copenhagen, and indeed its defence, during this period. The modern remains seen at Rådhuspladsen heavily impacted on earlier activities in the area such as the post-medieval mill structure and the outer gate, but instead left behind interesting traces of more modern activities in the urban area.

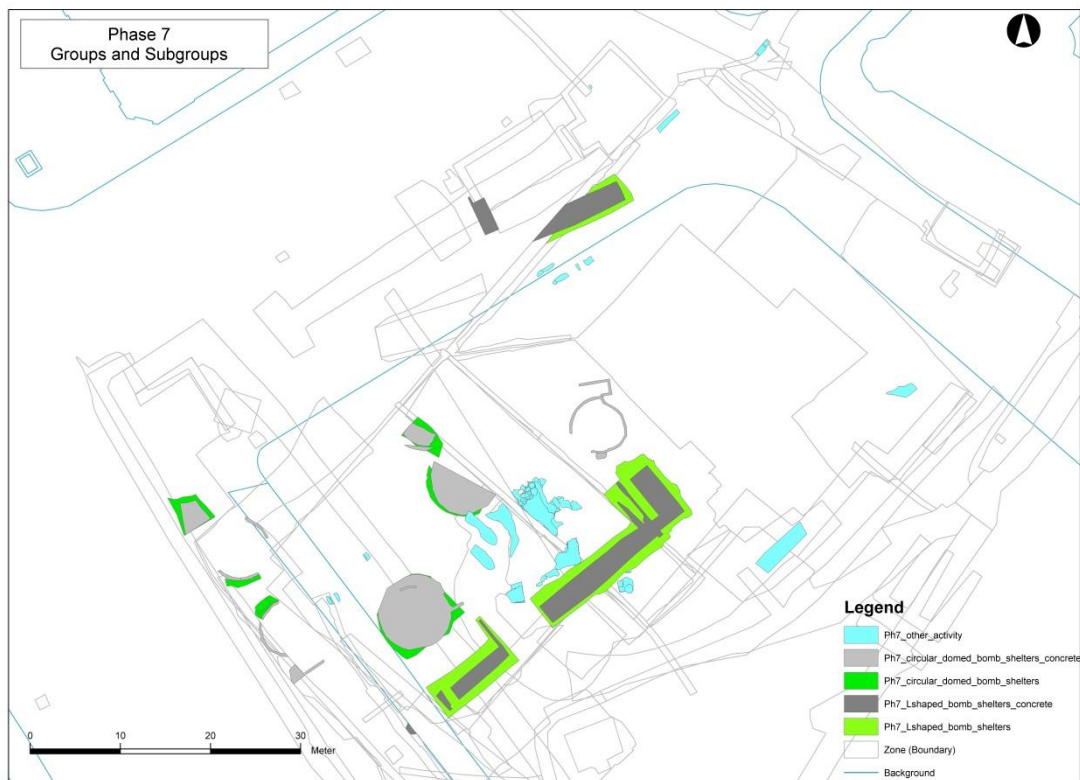


Figure 163 Plan of groups and subgroups in Phase 7

Overall then, Phase 7 saw evidence for a range of modern activity, perhaps most interestingly, several reminders of the city during German occupation in the 1940s. It is worth bearing in mind that the air raid shelters constructed during World War II were in a sense the modern ‘equivalent’ of the city fortifications, defence for the urban population in an era when enemy attack could no longer be kept out with the use of

physical barriers on the ground. The shelters were in a sense the last resort, not so much urban defence, as places of temporary refuge to be used while the city itself might be destroyed overhead.

The presentation of the features and finds from this phase will be divided into the different feature types as outlined above, beginning with the defensive structures (the air raid shelters), and concluding with the more general activity. This will be done under the headings 'Modern Urban Defence' and 'Other Activity'.

Modern Urban Defence

Introduction

In Phase 7 of the site (AD 1860 – present day) the city would once again be the scene for hostile military activity, with the arrival of the German army in 1940. While no major battle was fought, the city (and country) was taken over by Germany, which was of course very much at war. It was this fact, and the possibility of aerial attacks by Allied forces that would require the construction of air-raid shelters across the cityscape in the early 1940s. The remains of these structures as seen during excavation at Rådhuspladsen will be described in the following sections. In general two types of shelter were seen, L-shaped or linear shelters (in some cases still intact), and round or domed shelters (all of which had been partially demolished previously).

Sources indicate a date of as late as AD 1944 for the construction of these shelters, by which time (we can say in hindsight) the war was approaching its end. It seems the construction of the shelters was prompted by the news of the heavy bombing that many German cities were taking from Allied forces, and a fear that Copenhagen could at some point be bombarded in a similar way. It is understood that these shelters, constructed in public areas such as city squares, were built for people on the streets to run to in the event of an air raid. Elsewhere, basements in residential buildings were also set up to function as bomb shelters.

L-shaped bomb shelters

Group	Subgroups	Context types
43		Linear concrete structure
93		Linear concrete structure
95		Linear concrete structure

Table 81 L-shaped bomb shelter groups

During the excavation carried out at Rådhuspladsen, three linear or L-shaped air-raid shelters were uncovered. In some cases they were seen across multiple trenches, and so recorded in a number of elements.

The first encountered and most intact example (Group 93), was first seen in watching brief trench Z 6326 and later the remainder of the shelter was exposed in Area 4 of the main excavation. The main entrance to the shelter was at its north-western end, located in Z 6326, and following the removal of concrete slabs sealing the entrance stairs and the pumping out of water, it was possible to examine the interior of the structure using portable electric lights.



This shelter consisted of a linear reinforced concrete structure. It was set within a large and quite deep construction cut, and it is clear that the entire structure would have been below ground level, apart from the top of a centrally placed small square turret, which presumably was both a lookout and potential escape route should the main entrance become blocked.

The structure was surveyed in two parts. The first was the stairway and entrance area, measuring 1,1m wide by 2,05m high (at the bottom of the stairs). Above the entrance 'Misbrug straffes efter Løven. Luftværnchefen' (misuse punishable by law. Air Force commander) was painted in black lettering. Fragments of a wooden inner door survived, though lying broken in the doorway. The door measured 1,69m high and 0,925m wide, with 'C.L' painted in red letters. This is probably an abbreviation of Statens Civile Luftværn (The State Civil Air Defence). The stairway joined to the main tunnel section seen in Area 4 at a right angle.

Figure 164 Entrance to shelter Group 93, inner door visible on left side

The main section consisted of a vaulted arch of c.16 m in length (16,7 m in length externally). The internal width was c. 2,5 m, c. 3 m externally. It seems that the linear part of these shelters was effectively a reinforced concrete cylinder, but with a flat concrete floor poured on the inside to make it more user friendly. A cylinder was probably both easy to make, but also quite strong.

A deeper groove ran along both sides of the flat floor, presumably for any water that might get in to the shelter to flow along. Its likely that there would have been a drain for excess water to flow out somewhere, but this was not seen. This type of shelter would have had benches running along its length on both sides, but either they had been removed or they had rotted away. Rusted iron attachments could still be seen along the walls.



Figure 165 The interior of shelter Group 93

Some sandy sediment had collected in the shelter over the years, presumably washed in by flood water etc. Finds comprised of the door remains as described above, and some glass beer bottles, manufactured in the 1940s. The latter objects would suggest that the shelter was probably sealed off shortly after the war, and left untouched thereafter, though of course we cannot be certain. The structure was still very solid, with no obvious deterioration to the concrete. The majority of the structure was however removed during the excavations at Rådhuspladsen, all of the part within Area 4, and much of that in trench Z 6326. Some elements of the south-western end of the structure were left in situ. Breaking up the structure, as with all of the bunker remains, required the use of a mechanical excavator fitted with a hydraulic hammer, and took considerable effort, which shows how well built these shelters were.

The second linear or L-shaped air-raid shelter (Groups 43) seen at Rådhuspladsen was seen first in Area 2 (A and B), and later in Area 5. In this case the shelter itself was actually L-shaped, with a 90 degree angle in the main structure. The stairwell was built parallel to the shorter north-eastern part of the shelter, to its west. The main construction cut for this shelter generally extended up to 1 m out from the structure itself. The cut for the stairwell was sloping at approximately 45 degrees. At the western end of the structure, the cut had been made through the remains of the outer gate façade, which must have taken considerable effort. It is quite surprising that it was not simply decided to place the shelter in a slightly different position. In general the cut for this shelter appears to have truncated a considerable amount of archaeological features, including a range of medieval pits in Area 2B.

Both parts of the shelter were constructed in a similar way to shelter Group 93 of reinforced concrete, though where the two sections were connected, a short 'corridor' area built with concrete blocks was used. It could be seen in this shelter, that the concrete of the main structure had been shuttered during construction, and so was presumably built in situ. The main section was only seen inside briefly, as it had been damaged and blocked off by the steel shoring around Area 2A. The shorter eastern section however,

could be accessed from the roof hatch/turret in Area 2B (this had been capped with concrete – presumably when the shelter went out of use), and was found to be in good condition.



Figure 166 The eastern part of shelter Group 43, within Area 2A. Seen from north.

It was similar in form to the other shelter (Group 93), but two unusual features are worth mentioning. Along the north-eastern wall, a timber plank was attached to the wall, and at regular intervals along it, grey electrical wires were attached, which had been cut off at the ends in the past. Their purpose is uncertain, but it is possible that this end of the bunker was set up to be an emergency communication point, with phones or telegraph installed.



Figure 167 The northern end of shelter Group 43. Note the wooden panel and wires to the right, and the ceramic pipe in the corner.

The other unusual feature was the presence of a raised concrete plinth in the north-western corner, and a ceramic pipe which came through the roof/wall above it, where it ended. The inside of this pipe appeared to have a slightly sooty texture, and it seems likely that some form of stove had been fitted in this corner, sitting on the plinth and with its exit flue attached to the ceramic pipe. The combination of these unusual features certainly points at this end of the shelter having had some special function, and being set up for at least slightly more long term use.

Finds from this shelter included scraps of old newspaper, a ceramic plate fragment, a rusted can, and a Frederik IX coin. The year on the coin was unclear, but must have been between 1947 and 1972. The discovery of a tiny white plastic skull in the bunker showed that some intrusive material was present. This may have come from the chimney pipe, which may have been open to the surface in later years.

One further linear air-raid shelter (Group 95) was documented on site, in trench Z 77745. This shelter had been truncated by many modern services in the past (including a large district heating trench), and so survived in a very partial state. Its basic construction appears to have been similar to the shelters described above, but its overall size and shape are unknown. It is worth noting that while they did not physically connect, this shelter and Group 43 had a very similar alignment, and were quite close together (see plan of air-raid shelters). This may suggest they were built at the same time, in what may have been one large construction cut.

Circular/domed bomb shelters

Group	Subgroups	Context types
41		Concrete structure
126		Concrete structure
182		Concrete structure
185		Concrete structure
374		Concrete structure
387		Concrete structure
391		Concrete structure

Table 82 Circular/domed bomb shelter groups

Across the excavation area at Rådhuspladsen several circular/domed air-raid shelters were recorded. In every case these survived only partially. It seemed in general that the domed top, which would have protruded above ground, had been deliberately broken up, to below ground level, in order to remove the visible traces of the shelters from the square. The bases of the shelters, to a height of c. 1m generally survived, often with remnants of the top of the shelter lying broken up within. The staircases survived to varying degrees.

Seven circular shelters were seen in total, and these occurred in two clusters of three, with one more isolated shelter in between. The first cluster was located along the west side of the excavation area, close to HC Andersen's Blvd. These three shelters (Groups 41, 126 and 185) seemed to have been placed in one construction cut, and were more or less placed in a straight line parallel to the edge of the square/street.

Shelter Group 41 was the most southern one, and measured c. 7,5 m across as documented. It had some traces of a stairs surviving to its southeast side. It was very badly damaged in the past, and its eastern half had been removed completely by a fjernvarme (district heating) trench. Located c. 3 m to the northwest

was shelter Group 185. This structure survived in two parts, as the fjernvarme trench had gone through it. It measured c. 7 m across as documented, and again was in very poor condition, with much of it having been destroyed previously. It seems that while it was very close to shelter Group 41, they would each have had their own staircase. Located immediately to the northwest of Group 185 was shelter Group 126. This was only seen briefly, and documented very hurriedly. It seems possible that it could even simply represent an element of shelter Group 185. Alternatively it seems to have been the very partial remains of another circular shelter.

The second cluster of shelters occurred further east, in Areas 2 and 5. These might have survived quite well, but the foundations of the Movia bus terminal had interfered with the structures to quite an extent, even to the point that there may have been more shelters in this area that did not survive at all. The best preserved shelter (Group 182) was located furthest east, close to the underground toilet building, though even in this case only parts of the walls, floor and staircase were preserved. It was possible to document this shelter to a greater extent than the others.



Figure 168 Air raid shelter Group 182 as it survived. Seen from southwest

The diameter of the shelter was documented (at the base where it was widest) at c. 7 m, while the staircase measured c. 1,6 m. The thickness of the concrete dome was app. 25 cms, and marks left on the concrete showed that it had been shuttered and poured in situ. It appears that the shelters would have had an internal height at the centre of c. 3,5 m. The staircase and entrance was in the north. This bomb-shelter was not physically connected to any of the others. It was largely destroyed, probably in 1947 when other bombshelters on Rådhuspladsen were destroyed (Selskabet for Københavns Historie <http://www.kobenhavnhistorie.dk/kbhkronik/ejlensen.html>). It was apparent from close inspection that the staircase to the bunker was constructed after the dome. Benches would have been fitted around the edge of the shelter, but no trace of these survived.



Figure 169 Some of the circular bunkers at Rådhuspladsen during construction in 1944

In the base of the stairwell a drain was located in the floor. From inside the bombshelter there was also a drain, connected to a sandtrap in the entrance. In or around the drain/entrance a small orange bakelite or plastic flask was found. On the bottom of this container was written "Hautentgiftungssalbe" "eje" "115" "1943" and "44". This was part of the military equipment given to German soldiers during World War II (e.g. http://www.mp44.nl/equipment/skin_decontamination.htm). It contained skin decontamination cream for any toxic "war substance" one might come in contact with during combat, f.x. blister gas. The "eje" probably refers to the factory where the bottle was produced. 1943 is the year the bottle was produced. The 44 is melted into the plastic and this refers to the date where the ointment was filled in the bottle. The lid was (still) attached to the bottle with a nylon string, and based on photos of other bottles, it would originally have been stored in a small container of plastic coated cardboard, along with some cotton swabs. This was the only clearly military artefact relating to World War II recovered on site.



Figure 170 'Hautentgiftungssalbe' from shelter Group 182

Located c. 10 m southwest of shelter Group 182, another partial air-raid shelter (Group 387) was briefly documented in a watching brief phase towards the end of the excavation. This was c. 7,5 m in diameter, and constructed in the same way as the other domed shelters. Only its western half was seen, in trench Z 77745. Its eastern half was probably removed when the Movia terminal was constructed. No further details were noted.

Located immediately northwest of shelter Group 387 was the last of the eastern shelter-cluster, Group 391. Only the western edge of this structure seemed to have survived, again presumably as it was probably destroyed when the bus terminal was constructed. While only a small part of the shelter was seen, it was clear that it was constructed in the same way, and presumably at the same time, as the other circular/domed air-raid shelters seen on site.

Located in a more isolated location within trench Z 77745 was one further circular/domed air-raid shelter (Group 374). This was documented as being c. 7 m in diameter across its base, and was constructed in the same fashion as the others. No further details were noted.

It would appear that these domed air-raid shelters were all built at about the same time, in precisely the same fashion, and quite possibly with the use of standard shuttering moulds. As such, it is likely that they were very close to being identical. The measurements taken at Rådhuspladsen suggest a diameter of c. 7 m was standard, though variations in survival condition and varying levels of possibility to document the structures probably explains the slight variations apparent above.

Other Activity

Introduction

In Phase 7 of the site (1860 – present day) various infrastructural and construction-related developments have taken place in the area around Rådhuspladsen. These developments have left various kinds of traces in the ground, which will be outlined in the following section.

Group	Subgroups	Context types
136		Various disturbed deposits
251		Small cut feature and fill
304		Linear (construction?) cut, fills
308		Shallow cut and fills
329		Possible deconstruction related deposits
355		Modern sandy deposits
367		Possible modern pit
378		Modern ditch and fill
390		Modern postholes
439		Modern or disturbed deposits
443		Possible modern timber structure
450		Levelling deposit

Table 83 Various modern activity related groups

A series of 23 deposits (Group 136) were recorded overlying the remains of the outer western gate (Group 75), which are thought to date to sometime after the gates secondary deconstruction in the 19th century. While some of these deposits might belong in Phase 6, some modern material was seen in at some of the deposits, and it seems likely that overall these layers have been disturbed by modern activities in the late 19th or 20th centuries. A number of modern service trenches had been placed in the area, for electric cables or pipes of various forms, cutting some of the upper parts of the deconstructed gate. The placement of these services probably explains the disturbed nature of many of the Group 136 deposits.

Finds included a range of dates including some medieval pottery, but more significantly date-wise, several shards of modern glass, and modern industrial pottery fragments. Overall then, the deposits in Group 136 are of little archaeological significance, probably representing some archaeological layers which have been disturbed in the modern era.

A linear cut and its fills (Group 304) was noted in Area 5, which could possibly (originally at least) be related to the placement of the outer gate facade. However, the boulders which rested in this cut seemed to have been disturbed in the relatively recent past, and it could be that the cut relates only to the excavation of the foundation for the adjacent linear air-raid shelter in the 1940s. At the very least it is likely that the boulders within the cut were disturbed somewhat. Hence this feature is considered to be of low archaeological significance, and has been placed in Phase 7 as it may date to the 1940s.

Located in Area 3, over the moat/millrace backfills, was a shallow flat based cut and its fill (Group 308). The fill was a very gritty, sandy/pebbly deposit with lots of slag and burned material, and was 4-5cm thick. The bottom part of the fill was more sandy and yellow. In the middle of the western part of the deposit (in the side of the cut) a small square wooden stake stood. The slag material seemed very regular and industrial in nature, and appeared to have a modern origin. It may have been used as a base layer (levelling) for some modern construction, set into a shallow foundation cut. It is not clear for what kind of structure however. It is likely to date to the late 19th or even 20th century. It was not considered to have any archaeological significance.

A series of CBM-rich deposits (Group 329) were excavated to the immediate west of the outer gate facade. While these contained a range of post-medieval finds such as late redware pottery, and no obvious later material, it was the excavating archaeologist's opinion that these demolition like deposits were most likely related to the secondary phase of demolition of the outer gate in the late 19th century. It is not inconceivable however that the deposits in question could relate to the construction or perhaps more likely *reconstruction* of the outer gate facade in the early 17th century. However, we cannot be certain of this, and hence they have been placed in Phase 7.

Three probably modern quite sandy deposits (Group 355) were recorded in Area 4, overlying the medieval layers west of the moat. It is possible that these could represent levelling/consolidation/landscaping before the creation of modern Rådhuspladsen. The layers are considered to have little archaeological significance, and have been loosely classified as topsoil, perhaps of 19th or early 20th century date. For that reason it could probably be grouped together with Group 2 as representing relatively modern dumps and levelling.

A linear feature (Group 378) was noted in Area 4 in the environs of the outer gate, running in a northeast to southwest direction. It resembled a small ditch or gully, of uncertain function. Although it contained 17th century material, its stratigraphical position led the excavator to interpret it as likely to be modern, even 20th century in date. Consequently it is seen as of having little archaeological significance.

A pair of related postholes (Group 390) was excavated in watching brief Trench Z 77745. These were directly adjacent to one another, and had very similar fills. Few finds were seen, but a shard of green bottle

glass was thought to be relatively modern in date, and so this group has been placed in Phase 7. No further related postholes were observed, and consequently the function of these features is uncertain.

Located in Area 5, a large deposit (Group 439) was seen in three areas, separated by modern truncations. While this deposit contained some post-medieval artefacts, it also produced some finds of a more modern date. Consequently it was interpreted as having been disturbed in the fairly recent past, and probably dates to the late 19th or early 20th century. It may relate to the secondary deconstruction of the outer gate in the 19th century, but it may also simply relate to the modern truncations cutting through the deconstructed gate remains. It is seen as having very little archaeological significance.

Located in the shoring trench for Area 1, a vertical timber, a horizontal timber and a dump of organic clay were observed (Group 443). At the time these were seen it was unclear what their function was. In hindsight it can be surmised that they may relate to a nearby wooden water pipe trench (Group 115), as timber supports and backfill. However this is not certain, and it is also possible that they relate to more modern work carried out in the area, and hence may be of no archaeological significance. Consequently they have been placed in Phase 7.

Located in watching brief Trench Z 81681, a deposit (Group 450) was documented at a relatively high level, close to modern ground level. This was dark in colour, but mottled with blue clay. It could relate to the backfilling of this part of the outer moat in the early 1600s. Alternatively it could simply relate to levelling of the area, perhaps in connection with the establishment and landscaping of the square – Rådhuspladsen – in the later 19th century. While this is uncertain, this group has been placed in Phase 7.

Documented briefly in watching brief Trench Z 3064, pit Group 251 was a small cut and fill of indeterminate function and dating. In the absence of useful dateable material or stratigraphically useful information, it has been placed in Phase 7, but this is simply a possibility. It was not considered archaeologically significant.

A possible pit or stone imprint (Group 367) was excavated in trench Z 77745. The feature was seen and partly excavated at two separate times - the western half in September 2011, when a trial trench, ZT 29584, for the shoring was dug and the eastern part in August 2012 as part of the watching brief area ZT 77745. The feature was truncated by a modern service trench running northwest-southeast through the feature. The cut had rather straight, vertical sides and the depth was measured to 0,28m in the eastern side. A large stone was observed when the western part was excavated and seemed to have been deliberately placed within the cut. The fill around the stone was grey and uniform and quite compact - possibly due to the weight of the stone. The fill contained few finds but a glass bottle base suggested a post-medieval or modern date.

The feature may have been dug to contain the stone – in order to bury it, and therefore is probably a relatively modern action. It therefore has been placed in Phase 7, and is seen as having little if any archaeological significance.

Overall conclusions for Phase 7 1860 – Present Day

Phase 7 at Rådhuspladsen saw ongoing activity around the square, mostly related to landscaping and the placement of various modern services. The traces of some of this activity were documented to a degree during the excavation, either because it was not initially certain if these traces were archaeological or not, or because of the impact they had on archaeological features, and the need to explain the condition of the impacted archaeology.

Also documented in Phase 7 were the various air raid shelters seen during excavation. These painted an interesting picture of an occupied city at war, and of the potential effect that war might have had on the city's residents. Given the increasing interest in conflict and battle-field archaeology, it was deemed appropriate to treat these structures as archaeologically and historically interesting, and hence they were documented – albeit briefly – in an archaeological way, particularly the more intact ones. These structures had also had a quite severe impact on the earlier archaeological features.

The underground toilet building, also constructed in the 1940s, was still in use up until early 2011. This building also had a major impact on the archaeological features at Rådhuspladsen, particularly the former mill. This building however, was not documented archaeologically, but can be seen on many of the site plans, often simply as the blank area at the centre of the main excavation area.

It is generally the case in urban excavations that modern activity such as service trench digging will have a notable impact on the archaeological record, and at Rådhuspladsen, as can be seen in Phase 7, this was certainly the case. Nonetheless, a great deal of fascinating archaeology of various ages from Phase 1 to Phase 7 did survive, and thanks to the excavations carried out from 2011 to 2012, we now have a much greater understanding of the archaeology of this part of Copenhagen, and indeed of the whole city.

8 Assessment of results and future research potential

The excavation at Rådhuspladsen carried out between 2011 and 2012 in advance of the construction of the Metro Cityring station at that location, identified very significant archaeological remains surviving in situ under the present day square. This material was documented thoroughly, and will provide a wealth of information regarding the origins and development of the town and later city of Copenhagen and its inhabitants through the centuries.



Figure 171 The construction work at Rådhuspladsen, 2013. Seen from southeast

The early and high medieval remains which were documented, including road surfaces, pits, wells, leveling layers, fragments of buildings, and a hitherto unknown burial ground, represent the first large-scale archaeological settlement material excavated from this period in Copenhagen, and is therefore a very important source of information on the early development of the town and of life in the town. The material has given reason to rethink earlier interpretations of the extent and fabric of early medieval Copenhagen. This material will be studied within the remit of a PhD project to be carried out by Hanna Dahlström. The project will focus on exploring what activities, people and networks have been important in the early urbanisation process of Copenhagen, and if and how urban ways of life and urban identities can be seen in the material culture.

The high medieval remains were also significant in nature, both relating to everyday life (street layers, pits, wells and structures) but also to urban fortification. New dates for some of the fortification elements give reason to re-examine the time period and process of constructing the high medieval fortification around the city. The new dates point to this being a prolonged process, which raises questions as to why this was, on whose initiative and in whose interest the fortification was built and what the main purpose of it was. It is hoped that the new evidence relating to the fortification can form part of a future research project,

perhaps in association with the evidence uncovered at Kongens Nytorv, and at other excavations around the city.

The post-medieval remains dominated the excavation at Rådhuspladsen, with a wealth of structures, pits and of course fortification elements documented across the excavation area. The new evidence adds considerably to our knowledge of the development of the city's boundary area and fortification, including the civil use of the area around the western city gate right up to the mid-19th century.

Furthermore, vast amounts and a great variety of artefactual material were recovered, particularly from the backfilled moat and mill and mill race (material dumped there in the later 17th century). This assemblage holds great potential to enlighten us regarding life in the city in the 1600s. Already, two PhD projects are ongoing which are looking at aspects of this assemblage as part of their remit, namely the shoe assemblage (Vivi Lena Andersen) and the textile material (Charlotte Rimstad). Vivi Lena Andersen's project has the objective to explore what factors decided how shoes were made and worn in the medieval and renaissance periods, and looks at questions of display of identity as well as more practical concerns. Charlotte Rimstad in her project is exploring fashion and how the average lower class and middle class inhabitants in Copenhagen in the mid-17th century dressed.

The sheer scale of the finds assemblage creates opportunities for material studies relating to a variety of different object and material types. Pottery, glass, household objects and personal related objects are categories with potential to give new information on consumer culture and the way people promoted themselves in public or in their homes.

The emphasis put on scientific and specialist analyses of different materials has also yielded a source material which holds potential for further studies and research. As an example, the metal working residue from the medieval period has potential to add to the knowledge of the medieval development of this craft in Denmark, and the role of iron production and the smith in the medieval trade networks and in society. The dendro-chronological analysis, tool mark analysis and osteological analysis are other potential research areas.

There are many possibilities for further research projects which could address aspects of this assemblage. For the Renaissance moat finds, the potential is not only in the individual finds categories, but also an opportunity - and a challenge - lies in placing the entire assemblage into a contextualized view of consumer culture and the display of urban identity in 17th century Copenhagen.

Clearly the excavation at Rådhuspladsen has already added significantly to our understanding of Copenhagen's past, and the research projects both ongoing and upcoming illustrate the value of the information gained, and its potential going forward to form the basis for further studies. The material is large and varied enough to stand on its own, but perhaps its greatest value is as part of the collective archaeological and historical source material relating to Copenhagen, and also in comparison with other cities in Denmark and Europe.

Objectives of the project

As outlined above, the results of the Rådhuspladsen excavation hold great potential for research from a range of perspectives. The expected character of feature types and themes believed to have potential prior to the excavation as presented in Chapter 5, very much met expectations in most cases. However, some themes proved to hold little or no potential for further study; for example, a lack of settlement remains from the late medieval period means there is no possibility to investigate what the transition into being a capital meant for urban culture in the city. Also, a lack of suburban settlement traces means there is no potential to examine differences in settlement inside and outside the town borders. On the other hand, some unexpected results have helped address other parts of the overall questions posed.

The early and high medieval settlement, craft-related remains and not least, the cemetery remains found outside the area previously thought to have been the extent of the early town, provide more possibilities than expected to highlight issues related to the background and course of early urbanisation and development of urban life in Copenhagen. The very extensive material related to the fortification from the high medieval period to the late 17th century is another aspect of the results which has provided a greater detail of information than expected. This means there is potential to more closely examine the development of the defence of the city, as well as the roles of the town's border through time. The third obvious example which has exceeded expectations is the immense volume and diversity of find's material from the 17th century moat fills, which can be used in a variety of ways to investigate the daily life, urban identity and network connections for the people of Copenhagen.

In conclusion, the results will be assessed from the perspective of the three overall themes appointed for the Metro Cityring project: 1 - Background, organisation, direction and characterization of urbanisation; 2 - Economic and demographic fluctuations; 3 - Cultural and social implications and consequences of town life.

Background, organisation, direction and characterization of urbanisation

The excavation at Rådhuspladsen produced a large body of evidence related to the outlined theme. Public spaces were identifiable in the form of roads/streets, and in the form of the city gates and bridges. An identified cemetery area could also be defined as a form of public space. It may be that some of the wells identified should be seen as for public use. Certainly the wooden waterpipe system seen in a number of areas was part of a large scale urban project. One of the surfaces defined, under present day Vester Voldgade, might relate to a square rather than a street. In most areas where street surfaces were encountered, substantial evidence existed for their ongoing use, and intermittent replacement or renewal with new surface material. This can surely be seen as centrally organised work. It could also be seen that Vestergade, or a street in the same place, appears to have existed from the earliest stages of Copenhagen, as well as a continuation of that street, out of the city to the west.

Evidence for crafts and industry were seen in the many pits and well-like features seen. From the earlier period, evidence was seen for possible comb making, leather working (tanning) and iron working. From the later period, possible evidence was seen for brewing, for textile manufacture, pottery making, bone working and again iron-working. Fish processing was clearly going on in the area, as well as butchery. Trade was readily apparent in the artefactual remains, particularly in relation to the later period. Perhaps most

obvious of all trades was that of milling, in the form of the remains of the watermill building and associated millrace.

A wealth of evidence was uncovered relating to the town boundary, in the form of various fortification elements. These fortifications, and the many alterations to them, have given a vast amount of physical evidence for the chronology and morphology of the fortifications through time. Interesting evidence was unearthed regarding the land use inside and outside of the town. Perhaps most surprising, is that no evidence was seen for a boundary in this area prior to c. 1372 A.D, and furthermore, a range of evidence (such as pits, wells, buildings and the burial area) outside of the later medieval fortification, suggests that this area was part of the urban area of the town from a time predating the first known defences.

Economic and demographic fluctuations

The excavation at Rådhuspladsen produced evidence for trade and craft, in considerable quantities. This varied from (for example) fish processing waste to butchered and/or processed animal bone, much evidence for milling, wood working, needle craft, pottery making, comb making and tanning. Even begging, in an official sense, was evident. All of this points to a healthy urban centre, fulfilling many different functions.

From the 17th century moat/mill race deposits, there came a wealth of evidence for a growing economy, and for a growth in consumerism. This came in the form of the amassed urban refuse, dumped into the defunct moat/millrace in the later decades of the 17th century. Due to excellent conditions for preservation, great quantities of organic material survived as well as the more typical inorganic finds material. This gave a very complete picture of the kinds of material being discarded in this period, including fine glassware, ceramics, clay pipes, textiles, shoes, cutlery, food waste, weapon and tool parts, timber waste, building material (bricks and tiles) and horse equipment. Other more accidentally dumped material such as coins, tokens, a doctor's stamp and intact knives, showed how important objects could end up being lost within refuse. The artefacts also reflected the ongoing trade in the city.

The scale of the finds assemblage clearly points to the growth of consumerist society, and also to the nature of trade at the time, with many foreign wares included amongst the waste (particularly German and Dutch). It has also been seen – in the pottery assemblage for example – that during the post-medieval period while there was large-scale importation, there was also local manufacture of imitation foreign goods. The brewing of beer was clearly thriving, as was the importation of tobacco and wine. It can also be seen however, that though consumerism was on the rise, on the other hand there was also much repair and reuse going on, of things such as clothing and shoes. The invaluable source material from the former moat certainly opens up opportunities for research into topics related to consumerism and trade, and their consequences for society.

Infrastructure and organisation can be seen in the construction, repair and reconstruction of the roads, the planning and construction of the various fortifications including the bridges, and of course the building of the mill. Furthermore, the placement and replacement of the wooden waterpipes are evidence for large-scale infrastructural works, with the aim of supplying fresh water to at least some of the citizens. It should also be remembered that even the filling up of the moat with urban waste reflects centralised organisation,

not just in the terms of the decision to re-landscape the area, but also in terms of the organised collection and transportation of the waste. In a much more modern sense, the air-raid shelters also point to large-scale projects with central organisation.

Cultural and social implications and consequences of town life

The evidence from Rådhuspladsen will certainly create opportunities for studying themes relating to urban culture. The material evidence left behind implies many kinds of social interactions, at various social levels. It also tells us much about the kinds of lifestyles that existed in the city, particularly in the 17th century, for which the greatest volume of evidence survives.

With few structures surviving to any great extent, the aim of examining spatial layout of actual individual structures may prove elusive. However, there is evidence that provides information on the organisation of activities and consumption, i.e. in the early and high medieval remains of pits used for refuse disposal including a diversity of household and production refuse. For example, food evidence did survive, and much has been established about the diet of Copenhageners through the centuries, particularly in relation to meat and fish resources, and also cereal and plant consumption. The majority of this food evidence came from secondary locations such as waste pits and the moat however, and is difficult to directly associate with particular households, with the exception of one high medieval house structure seen in Vester Voldgade (see Chapter 7).

Household items were also recovered in considerable quantities, but the same caveat applies as to that with the food evidence. Nonetheless, particularly where the 17th century is concerned, there is much potential to address trends across society, if not individual households.

Items such as repaired clothing and repaired and recycled shoes point to the stratification of society, with the wealthy purchasing new and fashionable items, and later the same items working their way down the social ladder, through resale, charity or scavenging, and end up in the hands of the poorer people. The recovery of a gold ducat for example, also points to the wealthy (perhaps merchant) class, while a beggars badge recovered from the fills over the millrace is reflective of relative poverty, and also to the social and administrative organisation of the town, where an activity such as begging was in effect subject to licence. Clearly there were well established different levels in the 17th century social topography of Copenhagen.

From the establishment of the town boundary in this area in the 14th century, it does not appear that there were any structures of a domestic or industrial nature in the immediate vicinity of the outside of the western gate. Consequently there were also few finds recovered from that area during the late medieval or post-medieval period, apart from in the backfilled moats. As a result, there is little opportunity to examine 'differences' in the material culture or structures inside versus outside the fortifications, other than to observe the relative lack of them outside the town area.

9 Future site potential

The excavation at Rådhuspladsen carried out in advance of the Metro Cityring station construction, saw a large area of the square excavated down to natural geology, with all archaeology encountered documented fully. This means that an approximately rectangular area measuring c. 72 m NE-SW x 38 m NW-SE (2.736 m²) was completely cleared of archaeological remains during the investigations in 2011 and 2012. This area (between approximate coordinates 55°40'34.6"N 12°34'03.5"E, 55°40'34.0"N 12°34'04.9"E, 55°40'36.3"N 12°34'06.4"E, 55°40'35.7"N 12°34'07.7"E) therefore has no further archaeological potential going forward.

In the areas around this rectangle (the station box), further work was carried out in the environs of the main station box in an overall area measuring c. 88 m NE-SW x 63 m NW-SE (c. 5.500 m²), to various depths and in trenches of different sizes. The archaeology in these areas was dealt with to the extent that it would be impacted by the construction and associated ancillary works; sometimes this meant that all archaeology was removed down to the sterile geological clay below, but in some cases deeper archaeological stratigraphy remains in situ, where the construction work did not reach the depth of the sterile clay. Consequently, some of this area continues to have archaeological potential, and future groundworks in this area should be archaeologically monitored.

Beyond the zone of the Metro Cityring station and associated work, particularly the entire southeast half of the square (up to c.90 m from the townhall), the northwest end of the square (up to c.40 m from Rådhuspladsen 4), under HC Andersen's Boulevard and under the pavement outside of Vester Voldgade 3-11, the area continues to have significant archaeological potential. While it was seen during the Metro Cityring excavation that many modern truncations existed across Rådhuspladsen, it was nonetheless clear that significant amounts of archaeological material remain in situ, and furthermore, that this material is very significant in nature.

Consequently, while this excavation has provided a wealth of evidence relating to early medieval, high medieval and post-medieval Copenhagen, there are still many questions that remain unanswered, and future archaeological excavations in the Rådhuspladsen area have the potential to reveal much regarding the origins and development of the early town and city, and about its inhabitants through time. Therefore Rådhuspladsen – outside of the area of the Metro station – continues to be an archaeologically sensitive area, and all future development there must be considered likely to have impacts on the archaeological record.

Note: The main area and phase plans (Figures 172 -180) are contained as A3 figures at the end of this report

Bibliography

- Bager, E. 1971. Malmö byggnadshistoria til 1820. O. Bjurling (ed.). *Malmö Stads Historia I*. Allhems Förlag, Malmö.
- Carelli, P. 2001. En kapitalistisk anda. Kulturella förändringar i 1100-talets Danmark. *Lund Studies in Medieval Archaeology* 26. Almqvist & Wiksell Internation, Stockholm.
- Christophersen, A. 1980. *Håndverket I forandring. Studier i horn- og beinhåndverkets udvikling i Lund c:a 1000-1300*. Bonn/Lund: Lunds Universitet.
- Christophersen, A. 1985. København og omegn gennem 6000 år. *En kortlægning af de arkæologiske interesseområder i Københavns Kommune*. Københavns Bymuseum, Copenhagen.
- Christophersen, A. 1990. Dwelling houses, workshops and storehouses. Functional aspects of the development of wooden urban buildings in Trondheim from c. A.D. 1000 to A.D. 1400. *Acta Archaeologica*. Vol. 60-1989. Munksgaard, Copenhagen.
- Dahl, B. W. 1996. De bastionære befæstninger 1600-1870. In: Christensen, P. T. (ed.): *Guide til Københavns Befæstning. 900 års befæstningshistorie*. Skov- og Naturstyrelsen, Copenhagen.
- El-Sharnouby, H. 2007. *Rapport over de arkæologiske forundersøgelser på "Klasse 1 lokaliteterne" i forbindelse med Cityringen*. Unpublished report, Københavns Bymuseum 2007.
- El-Sharnouby, H. & Høst Madsen, L. 2008. København – fra fiskerleje til middelalderlig købstad. In: Andersson, H., Hansen, G. & Øye, I. (ed.). *De første 200 årene. Nytt blikk på 27 skandinaviske middelalderbyer*. UBAS Nordisk. Universitetet i Bergen Arkeologiske Skrifter 5. Bergen.
- Ersgård, L. 1988. *Vår Marknad i Skåne. Bebyggelse, handel och urbanisering i Skanör och Falsterbo under medeltiden*. Lund Studies in Medieval Archaeology 4. University of Lund, Stockholm.
- Fabricius, H. 2006. *Gader og mennesker i middelalderens & renæssancens København. Inden for middelaldervolden*. Aschehoug. Copenhagen.
- Fenger, O., Møller Knudsen, B. & Reinholdt, H. 1982. *"I være have". Om rett til hus og jord i middelalderbyen*. Projekt Middelalderbyen. Statens humanistiske forskningsråd. Aarhus.
- Frederiksen, R. 1979. Københavns Befæstning 1100-1380. In: Egevang, R. (ed.): *Strejflys over Danmarks bygningkultur*. Festskrift til Harald Langberg. Nationalmuseet. Copenhagen.
- Gabrielsen, K. 1999. At dekonstruere Ramsing. *Historiske Meddelelser om København* 1999. Københavns Kommunalbestyrelse, Copenhagen.
- Giles, K. 2000. *An archaeology of social identity. Guildhalls in York, c. 1350–1630*. Archaeopress, Oxford.
- Heimer, O., Mårald, I., Sjöstrand, U. & Thomasson, J. 2007. Malmös äldre gatunät. Arkeologisk förundersökning i form av schaktningsövervakning i Baltzarsgatan, Skomakaregatan och Södergatan. *Malmö Museer, Arkeologienheten, Rapport 2007:064*. Malmö.

- Jark Jensen, J. & Dahlström, H. 2009: *Beretning for Skt. Clemens I og III. Udgravning af den nordlige del af kirkegården tilhørende den middelalderlige Skt. Clemens kirke, København – februar til juli 2008*. Unpublished report, Københavns Bymuseum 2009.
- Jensen, C. A. 1938. Københavns Anden Vesterport. Fundamenter Under Raadhuspladsen, *Historiske Meddelelser om København*, 3 Rk. BD II. Københavns Kommunalbestyrelse, Copenhagen.
- Jensen, T.B. *in prep.* ASR 13, Lindegården, Ribe. Udgravningsberetning. Sydvestjyske Museer.
- Jørgensen, C. 1990. *København før og nu – og aldrig. Bind 9. Vestervold falder*. Bramsen, B (ed.). København.
- Karg, S. & Lafuente, P. 2007. Food. In: J. Graham-Campbell, ed. *The Archaeology of Medieval Europe. Vol 1. Eighth to Twelfth Centuries AD*. Denmark: Aarhus University Press.
- Kanstrup, M. & Heinemeier, J. 2013. Resultater fra AMS 14C Dateringscenteret. Preliminary, unpublished report. Institut for Fysik og Astronomi, Aarhus Universitet.
- Kieffer-Olesen, J. 1993. *Grav og gravskik i det middelalderlige Danmark : 8 kirkegårdsudgravninger*. Afd. for Middelalder-arkæologi Aarhus Universitet. Højbjerg.
- Kristensen, R. 2009: *Rådhuspladsen. Forundersøgelse forud for Metroanlæggelse. Arkivgennemgang vedrørende fundene fremkommet ved tidligere gravninger på Rådhuspladsen*. Unpublished report, Københavns Bymuseum 2009.
- Kristiansen, M. S. 1998. *Kongens Nytorv. Beretning for udgravningen foran Magasin i forbindelse med anlæggelse af metrostation., KBM 1410/1910*. Unpublished report, Københavns Bymuseum 1998.
- Kristiansen, M. S. 1999a. En tidlig middelalderlig bebyggelse ved Kongens Nytorv. *Historiske Meddelelser om København 1999*. Københavns Kommunalbestyrelse, Copenhagen.
- Kristiansen, M. S. 1999b. Den middelalderlige bybefæstning på Kongens Nytorv. *Historiske Meddelelser om København 1999*. Københavns Kommunalbestyrelse, Copenhagen.
- Kristiansen, M. S. 1999c. Renæssancens bybefæstning på Kongens Nytorv. *Historiske Meddelelser om København 1999*. Københavns Kommunalbestyrelse, Copenhagen.
- Larsson, S. 2000. Stadens dolda kulturskikt. Lundaarkeologins förutsättningar och förståelsehorisonter uttryckt genom praxis för källmaterialsproduktion 1890-1990. *Archaeologica Lundensia IX*. Kulturhistoriska Museet, Lund 2000.
- Lassen, G. F. 1855. *Documenter og Actstykker til Kiöbenhavns Befæstnings Historie*. Gyldendal, København.
- Linde, P. 1927. Drypstenshule under Rådhuspladsen. *Berlingske Tidende* 25. maj 1927. København.
- Linvald, S. 1950. *Rådhuspladsen i Fortid og Nutid*. Nielsen & Lydiche (Axel Simmelkiær), Copenhagen.
- Lorenzen, V. 1930. *Haandtegnede kort over København 1600-1660*, Henrik Koppels Forlag, Copenhagen

- Magnusson Staaf, B. Eriksdotter, G. & Larsson, S. 1995. The Street as a Monument. *Lund Archaeological Review*. University of Lund, Institute of archaeology, Lund.
- Mosekilde, J. 2012. Kultorvet og Trinitatis kirke KBM 3959. Unpublished Excavation report. Museum of Copenhagen.
- Nielsen, O. 1877. *Kjøbenhavn i Middelalderen, kap. V* (http://www.eremit.dk/ebog/khb/1/khb1_5.html) accessed 16.06.2015.
- Nielsen, O. (ed.) 1872. *Kjøbenhavns Diplomatarium*. Vol. I. Thiele, Copenhagen.
- Nielsen, O. (ed.) 1874. *Kjøbenhavns Diplomatarium*. Vol. II. Thiele, Copenhagen.
- Nielsen, O. (ed.) 1884. *Kjøbenhavns Diplomatarium*. Vol VI. Thiele, Copenhagen.
- O'Connor, K. 2011. Fortification in the North (1200-1600), In: Carver, M. and Klápste, J. (eds.) *The Archaeology of Medieval Europe, Vol. 2 – Twelfth to Sixteenth Centuries*, Aarhus University Press, Aarhus.
- Philippsen, B. 2013. The freshwater reservoir effect in radiocarbon dating. In *Heritage Science* 2013,1:24, 19 pages. Open access: <http://www.heritagesciencejournal.com/content/1/1/24>
- Ramsing, H. U. 1940. *Københavns Historie og Topografi i Middelalderen*. Volume I-III. Ejnar Munksgaards Forlag, Copenhagen.
- Rosenkjær, N. H. 1906. *Fra det underjordiske København. Geologiske og historiske Undersøgelser*. Det Schønbergske Forlag, Copenhagen.
- Roskams, S. 2001. *Excavation*. Cambridge Manuals in Archaeology, Cambridge University Press. Cambridge.
- Rørdam, H. F. 1859. *Kjøbenhavns Kirker og Klostre i Middelalderen*. Selskabet for Danmarks Kirkehistorie. Copenhagen.
- Skaarup, B. 1988a. Møllerende eller voldgrav. *Hikuin* 14. Forlaget Hikuin, Højbjerg.
- Skaarup, B. 1988b. Arkæologiske undersøgelser i København. *Københavns Kronik* nr. 42, oktober 1988. Selskabet for Københavns Historie, Copenhagen.
- Skaarup, B. 1996a. Absalon og byen Havn. In: Birkebæk, F., Christensen, T. & Skovgaard-Petersen, I. (eds.) 1996: *Absalon – Fædrelandets fader*. Roskilde Museums Forlag, Roskilde.
- Skaarup, B. 1996b. Befæstningsleksikon 1100-1600. In: Christensen, P. T. (ed.): *Guide til Københavns Befæstning. 900 års befæstningshistorie*. Skov- og Naturstyrelsen, Copenhagen.
- Skaarup, B. 1996c. Middelalderbefæstningerne 1100-1600. In: Christensen, P. T. (ed.): *Guide til Københavns Befæstning. 900 års befæstningshistorie*. Skov- og Naturstyrelsen, Copenhagen.
- Skaarup, B. 1999a. Strandenge og kystlinien i den ældste tid. *Historiske Meddelelser om København* 1999. Københavns Kommunalbestyrelse, Copenhagen.

- Skaarup, B. 1999b. Vestergade 7. *Historiske Meddelelser om København* 1999. Københavns Kommunalbestyrelse, Copenhagen.
- Steineke, M. og Jark Jensen, J.: In prep. Kongens Nytorv, Metro Cityring project KBM 3829. Museum of Copenhagen excavation report.
- Thomasson, J. 2008. S^oVillanorvm de Malmøghae. Landskap, urbanitet, aktörer och Malmö. *De første 200 årene. Nytt blikk på 27 skandinaviske middelalderbyer*. I: Andersson, H., Hansen, G. & Øye, I. (eds.). UBAS Nordisk, Universitetet i Bergen Arkeologiske Skrifter 5. Bergen.
- Thorén, Malin & Otfors, Matthias 2009: *Artefact analyses Rådhuspladsen – Copenhagen. Artefacts found during the excavations in 1941*. Unpublished report, Københavns Bymuseum 2009.
- Tittler, R. 1991. *Architecture and Power. The Town Hall and the English Urban Community c. 1500 – 1640*. Clarendon Press, Oxford.
- Thomasson, J. & Høst-Madsen, L. 2009. Project design Metro Cityring. Museum of Copenhagen.
- Topcagic, Z 2014 *Københavns langdistance vandforsyning fra 15-1800-tallet – en arkæologisk undersøgelse, analyse og tolkning af Københavns vandkunst og trævandrørene*, Unpublished Master's Thesis, University of Copenhagen
- Ulriksen, J. 1998. *Anløbspladser. Besejling og bebyggelse i Danmark mellem 200 og 1100 e.kr.* Vikingeskibshallen i Roskilde, Roskilde.
- Wiene, I 2010 Vestergade,. Beskrivelse af Vestergade 29-31 samt 22-28 med baggrund i arkivalier. KBM 3827. Unpublished report, Københavns Museum 2010
- Wozniak, Stine. 2009. Byen Havn og dens befæstning – de tidligeste arkæologiske spor. Unpublished dissertation, University of Copenhagen 2009.

Web:

Radiocarbon dating online <http://www.calpal-online.de/> Accessed latest on 30.9.2015.

Dansk Center for Byhistorie <http://dendigitalebyport.byhistorie.dk/byporte/?billede=151> Accessed on 20.07.2015

Morocco Desert Private Tours <http://www.morocco-desert.com/trip-9-days-from-fez-to-marrakech.html> Accessed on 14.08.2015

Selskabet for Københavns Historie <http://www.kobenhavnshistorie.dk/kbhkronik/ejlersen.html> Accessed on 17.07.2015

