

## 7.4. Phase 4. The Administration Harbour, 1690s-1820s

### 7.4.1. Summary

The beginning of Phase 4 of the Gammel Strand harbour area occurred with the process of land reclamation. The process was then followed by the construction of land ties and bulwarks to facilitate a larger harbour area on land and possibly a deeper harbour. As part of the land reclaiming process the area was levelled out to facilitate a building area and open space or square. Once this was in place, the harbour area was equipped with drains running from the buildings on the north side of the square and buildings were constructed and expanded at the western end of the Gammel Strand area. A strengthening of the land tie system was soon (in the 1740s) necessitated and a new set was constructed. At the same time the bulwark or waterfront was replaced. In front of the bulwark, material deriving from activities at the harbourside as well as dumping of urban waste is seen to have built up continuously, but has possibly been subjected to dredging in order to keep the harbour clean and sufficiently deep.

### 7.4.2. Introduction

In general three large, overall phases are comprised within Phase 4: the first is the creation of a new harbour – expanding the harbour area southwards via land reclamation and the creation of a new bulwark which is kept in position by a new land-tie construction style. The second overall phase is the usage of the harbour once the harbour is created. This comprises construction of new buildings and drains crossing the square as well as activities leaving traces of dumped materials in front of the bulwark, into the harbour. Maintenance, repair and change of the existing bulwarks are also seen as part of this phase of activity.

A third overall phase is the deconstruction of the Phase 4 harbour, to facilitate the establishment of the Phase 5 harbour. However, as this is included in Phase 5, it will only be mentioned here.

Phase 4 consists of 112 groups and 44 sub-groups covering a broad range of context types and including both features and structures.

### 7.4.3. Structures and features

Below is outlined the structures and features related to Phase 4. The outline is undertaken as a simplified chronological line of events based on the interpretations of the excavated structures and features, starting with land reclamation, construction of land ties, construction of bulwark and levelling, construction of buildings, harbour usage and drains and sewers. A number of groups cannot be fitted logically into any of these overall phase parts and will be dealt with singularly at the end of the chapter.

The process of land reclamation, construction of land ties and the early bulwark and the levelling of the harbour area prior to other constructions seem to have been undertaken within a relatively short time span – weeks or months. This is seen in the fact that the stratigraphical relations between land reclamation layers, Phase 4A land tie structures and levelling layers are very difficult to see, which indicate that these processes were not undertaken as single events, but as parts of one large process – possibly also partly including the deconstruction of the former harbour front. This has complicated the grouping and stratigraphy slightly, and will be explained below.

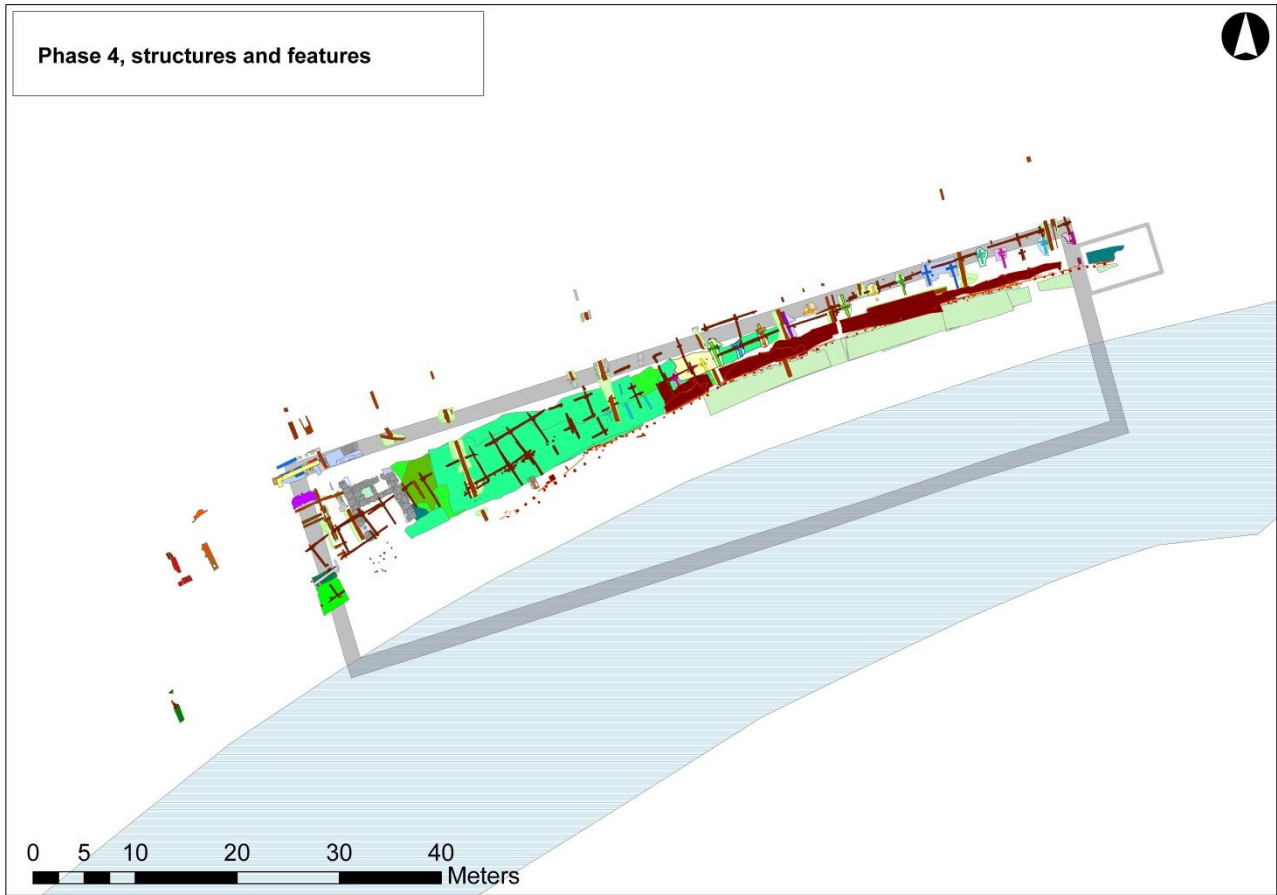


Fig. 133 Plan of all Phase 4 structures and features (See also A3 plan I Appendix D)

### 7.4.3.1 Land reclamation

#### 7.4.3.1.1. Introduction

The land reclamation for Phase 4 comprises of seven groups. One of these (G601) also comprises a very large land tie structure, which will be expanded upon in the land tie sub-chapter.

Group	Sub-groups	Group name
512		Land reclamation
513		Land reclamation
525		Land reclamation
598		Land reclamation
(601)		Land tie with land reclamation
620		Land reclamation
644		Land reclamation

Table 40 Groups related to Phase 4 land reclamation layers

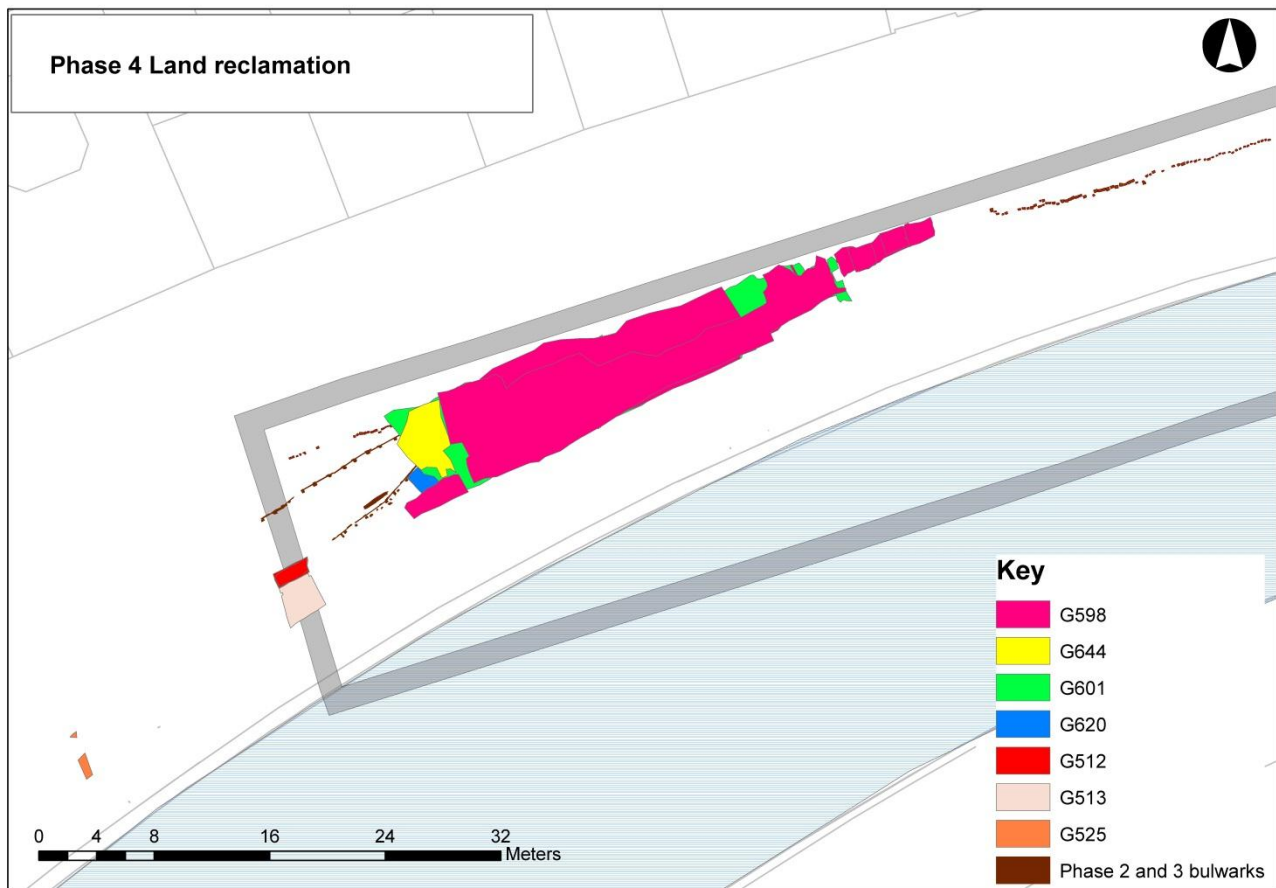


Fig. 134 Groups interpreted as Phase 4 land reclamation

Some of the contexts belonging with the land reclamation groups were excavated during the Guide Wall excavation in 2011-12, and thus, not all were fully excavated due to the 2 metre excavation depth limit. This applies to the deposits related to G512 and G513 as well as G525 which was excavated as part of a watching brief trench in 2012.

Groups that are interpreted as land reclamation are found on the south side of the former, Phase 2/3 waterfront and/or partly covering the top of this. The former waterfront consisted in the west end of the bulwark G510/G648 with storm posts G511/G649 (Phase 3) and in the central and eastern end of the excavation area by the stone quay wall G532 and the associated bulwark, G602 (Phase 2). The groups interpreted as land reclamation layers excavated during in the Guide Wall and Main Excavation cover an area measuring 52.2 m (ENE-WSW) by 7.1 m (NNW-SSE). When adding the measurements from G525, excavated west of the station box area in a narrow trench in 2012, the sheer size of the land reclamation is better seen.

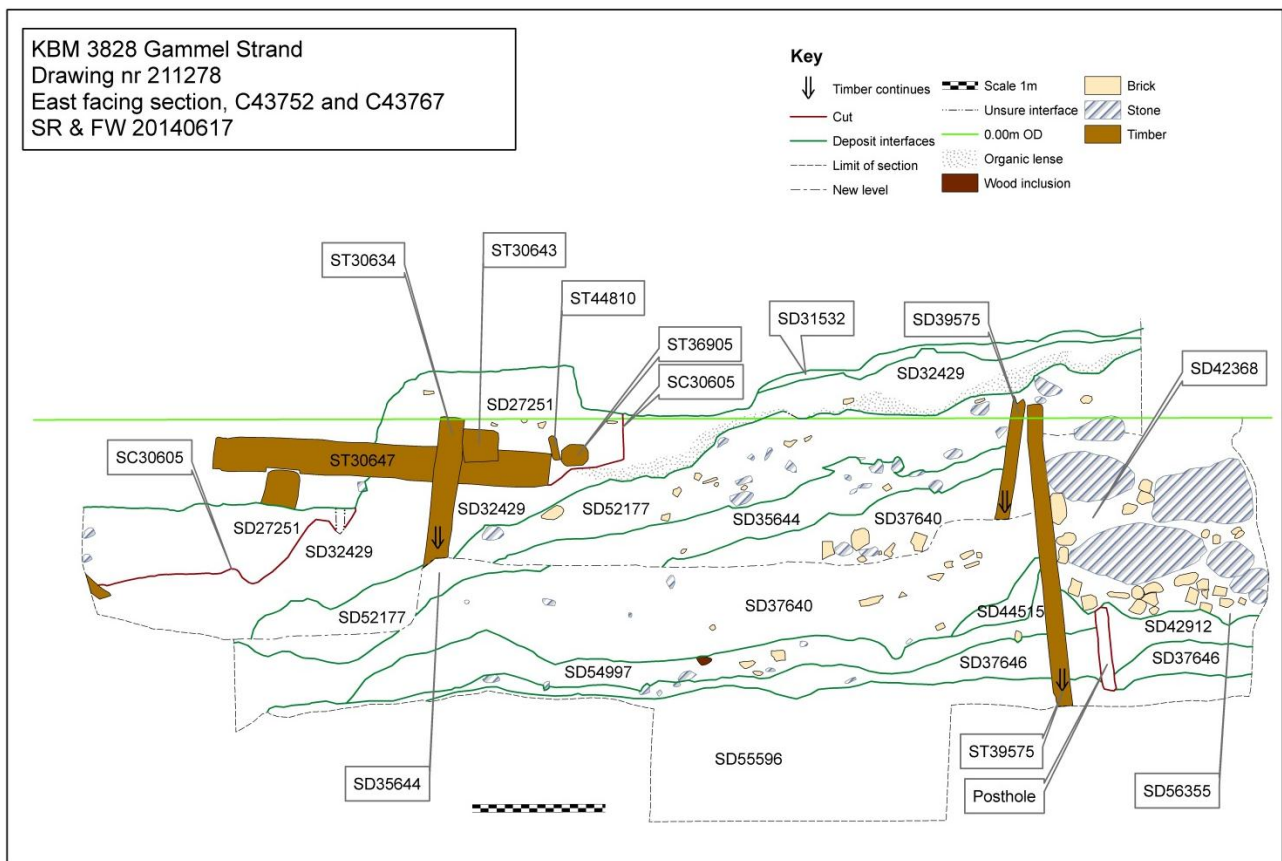


Fig. 135 Digitized drawing 211278 of east facing section, C43752 and C43767.

Due to the wish to keep the IntraSiS database simple, most deposits in these groups were registered with the basic interpretation, levelling layer. However, they should be interpreted as land reclamation layers. In general, deposits interpreted as levelling layers and land reclamation respectively do not differ much in composition and content, and the argument for the interpretation being land reclamation is based on where the deposits were located – south and in front of the former harbour front, overlying what is interpreted as activity layers related to the usage of the former harbour front from Phases 2 and 3. Some deposits, however, seem to stretch over the former harbour front as well, but this is interpreted as being

due to the deposition process, which seems to have been undertaken from the land side. This is particularly clear, when investigating the section drawings made where the large baulk was (see Fig. 135 ) as well as the survey slots in the Main Excavation.

Land reclamation seems in general to have been done in close connection with the construction of the timber land ties (see below). This is most clearly seen in G601 which comprises both land reclamation and land tie structures. However, to facilitate the land reclamation an outer/waterside boundary must have been present for the purpose of keeping the soil in place so it would not float away during the construction of the new harbour. Such preliminary structures, which could be named land reclamation fences or boxes, were not seen on Gammel Strand during Phase 4. It is not clear what the reason for this absence would have been, but it is possible that the land reclamation bulwark would have been placed in the same line as – or rather have been identical to – the early parts of the bulwark recorded as SG604/SG606 and SG712.

#### 7.4.3.1.2. Groups interpreted as land reclamation

##### *Land reclamation G525*

G525 is a group of two deposits (SD9029 and SD9068), partly uncovered during a watching brief when excavating service trench (ZT9047) in 2012, approximately 18 m southwest of the Main Excavation area. Based on the deposits' relation to underlying land tie, G524 (probably Phase 4) and posts, G526 (maybe Phase 4), the deposits were interpreted and dated as Land reclamation for Phase 4. No finds were collected to support this interpretation, but the descriptions of the deposits as light brownish grey, clay and sand of soft compaction and dark greyish brown, soft sand with frequent inclusions of wood and some CBM, respectively. These are similar to other descriptions of land reclamation layers in various Gammel Strand excavations. The surveyed top levels of the deposits (between OD 0.61 m and 0.73 m) match the levels of other land reclamation layers for the construction of Phase 4.

##### *Land reclamation G512 and G513*

G512 and G513 were both excavated during the 2012 Guide Wall excavations and were located in Trench 4/ZT19000, immediately west of the south-western corner of the Main Excavation. Unfortunately the area just east of where G512 and G513 were located was not fully investigated during the 2014 Main Excavation due to the placement of a soil ramp to facilitate the machine's access to the trench.



Fig. 136 Fragment of CBM (FO203222) found in SD19095 (G513). Museum of Copenhagen

G513 was the lowest and only comprised of one deposit, SD19095, which was recorded as 3.7 m long (N-S) and 2.8 m wide. The deposit was recorded as one large deposit, but it is indicated that it may have included more than one deposition, which, however, could not be determined due to difficult excavation conditions. SD19095 was not fully excavated because of the 2 m excavation depth limit. The top levels surveyed ranged between OD 0.20 m and 0.32 m.

SD19095 consisted of mid brownish-grey, sandy silt of medium compaction. The deposit was formed as a mixture of organic material and a lot of CBM. SD19095 was initially interpreted as a levelling layer, but based on its location primarily south of the Phase 3 bulwark (G510 and G511), as well as the deposition being just over the water table, it seems reasonable to suggest that the deposit is a land reclamation layer, dumped to create more land in front of the Phase 3 bulwark. The deposit comprised a wide variety of finds which may indicate that the deposit material was originally household waste – possibly with some butchering activities resulting in a large proportion of cattle mandibles.

G512 consisted of three deposits, of which SD19045 was the lowest. It was a layer of mid greyish-brown, silty sand of medium compaction. It was seen in the entire width of the trench (2.6 m, E-W) and was 1.05 m N-S and was recorded as being 0.1 m thick. The top levels of the deposit were at OD 0.43-0.56 m. Found within the deposit were a few fragments of clay pipes, ceramics and glass. The glass sherd derived from a square sided bottle, produced in the late 17<sup>th</sup> or early 18<sup>th</sup> Century and not worn.

Above SD19045 was SD18906 which was a smaller deposit, only 0.6 m by 0.5 m and 0.05 m thick. This consisted almost entirely of crushed mortar and may originally be from a demolished building, but reused as infill or levelling material. Within the deposit was a piece of ceramic roof tile, a few ceramic sherds of stoneware, late redwares and late grey ware, as well as fragments of clay pipes and animal bones.

The last deposit in G512 was SD18897, which, like SD19045, was seen to extend out of the trench to both the east and west. The deposit was recorded as 2.0 m by 0.7 m in plan and 0.4 m thick and the top levels were at OD 0.70-0.84 m. The layer consisted of mid greyish brown, silty sand of medium compaction. Within it were concentrations of yellow brick fragments and the collected finds material consisted of animal bones (cattle and pig), CBM, ceramics (late redwares, Chinese porcelain and industrial ware), a flint blade and the base sherd of a worn glass medicine flask.

The stratigraphical observations are not very clear, but the location of the G512 deposits south of the Phase 3 bulwark, G510, and approximately 0.32-0.84 m above sea level, makes it probable that these, along with the underlying SD19095 of G513, are land reclamation layers deposited as part of the construction of the Phase 4 new land. Based on the dendrochronological dates from the earliest Phase 4 land ties (Phase 4A), this land reclamation process may well have occurred during the last decade of the 17<sup>th</sup> Century and with repairs (e.g. land tie G508) being made through the 18<sup>th</sup> Century. This is not contradicted by the production dates of the finds material.

#### *Land reclamation G620*

Group G620 was excavated during the 2014 Main Excavation. The group was located in the western part of the Main Excavation trench and comprised eight deposits covering an area measuring 7.8 m (NE-SW) by 3 m. It was recorded as approximately 1 m deep. The lower deposits in G620 rested on the southern part of Phase 3 bulwark G648 and usage group G664. G620 is interpreted as partly linked with the activities related to the use of harbour front G648 (Phase 3) in the late 17<sup>th</sup> Century but primarily the build up of land reclamation layers in front of this for construction of new land at the beginning of Phase 4.

The earliest dumped deposit was SD54734, a rather local deposit measuring 2.9 m (NNW-SSE) by 1.22 m (ENE-WSW). It continued eastwards into the baulk, but was not seen on the east facing section of this. The surveyed top levels of SD54734 were between OD -1.02 m and -0.28 m, sloping down from north to south

and the deposit was recorded as being approximately 0.2 m thick. The layer rested on the southern face of bulwark G648 and overlay a usage alluvial layer, SD38150 of alluvial group G664 (Phase 3). SD54734 consisted primarily of sand, but also had some silt and clay components. The deposit contained moderate amounts of animal bones and ceramics (not prioritized for registration) and a few items of glass (comprising pas-glass, a glass pedestal and window glass), clay pipes (mostly clay pipe stems and a single, coarse, used bowl), CBM (not registered) and organic material (not registered).

Overlying SD54734 was deposit SD38122, which however extended further west than SD54734 and thus also overlay the western half of SD38150 (G664, Phase 3 harbour usage). In total SD38122 was recorded as 7.74 m (ENE-WSW) by 2.83 m (NNW-SSE), and appeared to extend into the baulk towards the northeast (it was however not defined in the section on the eastfacing side of the baulk) and into the non-excavated area under the machine's access ramp to the southwest. The top levels surveyed were between OD -1.04 m and -0.16 m, and like the underlying deposits, it sloped downwards from north to south. Towards the northern limit, which was up against the bulwark structure G648 (Phase 3), the deposit was rather thin, but



Fig. 137 Leather shoe fragments (FO218182) collected from SD38122 (G620). Museum of Copenhagen

it grew thicker towards the bottom of the slope. The deposit was very organic and consisted of dark greyish-brown, silty clay of medium compaction. Zoological material was found frequently and comprised vast amounts of fish bones and scales (at least 12 species, including salt water, fresh water and migrating species), a few bird bones (geese) and bones from mammals, dominated by cattle mandibles. The mandibles seemed to be from cattle of the same age and may suggest that they derived from skinning activities of a more industrial scale rather than household waste. The rest of the zoological collection indicated household remains. (Bangsgaard et al 2016). The documentation material states that the cow jaws were found mainly near the bottom of the deposit at the interface SD38150 of G664. The deposit was also noted for a large quantity of ceramics, dominated by Dutch redware and faience, but also including *gydepotte*, Westerwald and Rhineland stoneware. The collected clay pipes were all stems of which two were produced

within a relatively narrow date range, after AD 1690 (FO215471 and FO215477). Several fragments of leather shoes were also retrieved (FO218182).

From the environmental analysis there is a clear appearance of wild/sour cherry (*Prunus avium/cerasus*), raspberry (*Rubus idaeus*) and stone bramble (*Rubus saxatilis*) along with hazelnut (*Corylus avellana*), whereas there was a visible appearance of other collected or grown species, some weeds and meadow plants as well as species related to brackish/sea shore areas (widgeon grass/*Ruppia maritima* and horned

pondweed/*Zannichellia palustris*) within the deposit (Ranheden 2016). The retrieved materials indicate that SD38122 consisted of primarily household waste dumped into the low water – probably as a result of combined waste disposal and land reclamation.

Deposits containing primarily light silt and sand are represented by SD54725 and SD37998. SD54725 was a small deposit of yellowish grey sandy silt, recorded as only 0.8 by 0.5 m in plan, but extending NE into the baulk, where it was not seen on the east facing side. The top levels were surveyed between OD -0.40 and -0.18. No finds were collected from this. SD37998 was a very large deposit, recorded as extending at least 7.9 m (ENE-WSW) and approximately 3 m (NNW-SSE). It was, however, not fully excavated as it continued into the area of the machine's access ramp towards SW. The surveyed top levels ranged between OD -1.05 m and -0.15 m. SD37998 consisted of yellowish grey silty sand, which was loose and seen as mottled with pockets of almost pure sand and of brown silt. It was very thin in the northern part, towards the bulwark structure, G648 (Phase 3), but was thicker further south. Some ceramics and animal bones were collected (not prioritized for registration) as well as a few clay pipe fragments of which one unused bowl was produced in the period 1640-1660 (FO212669). The interpretation of these layers was difficult as the sandy content and increasing thickness further away from the former bulwark indicate fluvial activity within the harbour, whereas the mottled character merely points towards materials being dumped, rather than deposited by water.

Overlying SD37988 was SD37951, a dark grey brown silt and clay deposit, recorded as extending at least 7.77 m (ENE-WSW) and 2.26 m (NNE-SSW), but also extended into the baulk towards the NE. The surveyed top levels were between OD -1.04 m and -0.15 m, being deepest in the south like the underlying SD37998. The deposit was very thin in places – only millimetres – and in general it was thickest just in front of the bulwark structure, G648 (Phase 3) and from there, thickness decreased towards the south. The deposited material probably consisted entirely of remains of an urban rubbish deposition. This was represented by clay pipes of which a single bowl (FO212665) was produced in the period AD 1650 to 1670. Small quantities of pottery and animal bone were not prioritized for registration. SD37951 was overlain by SD37931, a small spread of sandy material found immediately south of the bulwark structure, G648 (Phase 3).



Fig. 138 Stove tile, FO213821 collected from SD37744 (G620).  
Museum of Copenhagen

Both physically and stratigraphically over SD37951 was SD37744, a small, dark organic deposit, mottled with patches of light grey clay. It was located immediately south of the bulwark, G648 (Phase 3) and the surveyed top levels ranged between OD – 0.40 m (south) to – 0.07 m (north). SD37744 was relatively rich in finds, containing large amounts of CBM, among other things two fragmented stove tiles with “sea unicorns” (FO213821 and FO213822). Other registered finds comprise clay pipe fragments, of which was a bowl with a maker's mark consisting of two letters, SH, and a crown. The “S” was portrayed backwards (FO212713). Other finds of leather,



ceramics and animal bone were not prioritized for registration and no samples were taken.

The final deposit, SD37720 consisted of a few fragments of urban waste, consisting of a clay pipe fragment and a stove tile piece (and ceramics, leather, animal bones, glass and shell, not registered) in a sand rich, homogenous matrix. This was like the underlying deposits located in front of the Phase 3 bulwark (G648), and extended into the baulk to the east. The surveyed top levels were between OD – 0.36 m and + 0.08 m, south and north respectively. The deposit was interpreted as a land reclamation layer dumped in front of the former bulwark.

The deposits related to G620 were all sloping downwards from north to south and seem therefore deposited from the landward side. There were no clear physical relations to the land ties belonging with Phase 4, e.g. G639 and G652 as these were recorded with top levels higher above sea level.

#### *Land tie with land reclamation G601*

G601 was a group comprising both land tie structures (see section Fig.135) as well as two extensive deposits (SD52177 and SD211109), interpreted as land reclamation layers. The features and structures belonging with G601 covered the majority of the western part of the Main Excavation trench, primarily on the eastern side of the baulk. SD52177 was surveyed with top levels ranging between OD – 1.22 m and 0.28 m and the layer was sloping down considerably from north to south as also seen on the section drawing made of the east facing side of the large baulk (see Fig. 135 above). On the western side of the baulk, SD52177 was surveyed later than it was on the eastern side and there seems to be a few issues with the deposits belonging with G620, as these are found in the same area and within the same level range as the western part of SD52177.

SD52177 was a large (approximately 31.7 m by 6 m) greyish brown deposit consisting primarily of sand with a large proportion of organic material. From the baulk section it appeared to be 0.4-0.6 m thick and sloping downwards from north to south.

The deposit was seen as the result of naturally built-up material, combined with dumped elements – especially building rubble, which possibly derived from the deconstruction of the former quay wall (G532, Phase 2). The deposit comprised a broad range of finds. The more than 20 kg of collected ceramics were of rather mixed character, regarding the production dates of the material. The ceramics were dominated by late redwares, but also comprised Chinese porcelain, Dutch redware, Dutch whiteware, Early redware, Faience, *Jydepots*, Late light fired, late greyware, light fired, Majolica, Stonewares (both Medieval and Post-medieval), whiteware and even a Medieval sherd of Baltic ware and two sherds of industrial ware. The majority of the sherds had production dates between 1625 and 1725, but some of the Chinese porcelain



Fig. 139 Clay pipe bowl with letters IWB. FO213483, SD52177 (G601). Museum of Copenhagen

and industrial wares were produced in the period between ca. 1730 and 1800 (Kristensen 2016b, 40). 20 fragments of Post-medieval floor tiles, both glazed and unglazed (Kristensen 2015, 5) were retrieved along with a large number of clay pipe fragments. Most of the clay pipes were broadly dated between 1600 and 1700 or between 1600 and 1800, but a few was dated more narrowly. One of these was a bowl with the letters IWB stamped on the heel – a maker's mark used in Gouda from 1662-1690 (FO213483) (Pedersen 2016b).

Among the glass finds were large amounts of window glass, glass bottle fragments and drinking glasses. As with the ceramics, the production dates of the glasses ranged far beyond the deposition time, and glass produced from the middle of the 14<sup>th</sup> to early 15<sup>th</sup> Century and even into the late 18<sup>th</sup> or early 19<sup>th</sup> Century were registered (Haggrén 2016).



Fig. 140 FO213534, Leather child's shoe, from SD52177 (G601). Museum of Copenhagen

Other finds comprised of leather shoes, among which a well preserved child's shoe (FO213534), a few metal artefacts and vast amounts of animal bones (in total more than 44 kg). The zoological material included a wide variety of fish (14 different species), representing salt water, fresh water and migratory species all of which could be part of meals. Gadids, flatfishes and herring were the three main meal species followed by eel. The collection of mammals and birds was dominated by the Main domesticated species;

sheep/goat, cattle, and pig as well as including a number of other domesticated or probable domesticated species, such as domestic hen, domestic goose and cat. A small wild species component was also identified, including hare, red-throated loon and the probable commensal species of rat. The species distribution along with the distribution of elements and cut-marks clearly indicated that the majority of the material from SD52177 represented waste from household consumption.

The collection of mammal remains included a group of some 48 mandible fragments, which is a clear overrepresentation in comparison to any other elements from cattle. Furthermore, the mandibles also stood out as uniquely uniform in age distribution and in the near identical pattern of chop-marks and fragmentation to the majority of the mandibles. Although the exact reasons behind the phenomenon is not clear, it does have an element of industry or production to it and the mandible bones likely represent something beyond the household consumption (Bangsgaard et al 2016).

From the environmental analysis there was a clear presence of seeds of figs (*Ficus carica*) and remains of hops (*Humulus lupulus*), but other collected or grown plants were also seen. Among the weeds there was a clear presence of fat hen (*Chenopodia album*) but in general this deposit showed a wider range of weeds than others analysed along with more articulated signs of wet/fresh meadows, including sedges (*Carex sp.*) (Ranheden 2016).

Another deposit, SD211109 was created in the office, when it was realised that the overlying SD32429 (G598) could not stratigraphically be under parts of the land tie timber elements, and therefore SD211109 has the same extent as SD32429 in plan, but is stratigraphically belonging with G601. It consisted of dark grey-brown sandy silt and was seen as having built up as a combination of natural deposition (alluvial) and dumping of material. No finds were related to SD211109.

#### *Land reclamation G598*

G598 was excavated during the 2014 Main Excavation. The contexts relating to the group were in the middle and western half of the excavation area, partly covering over the same area as the deposits belonging with G601. In retrospect, these two groups could be seen as one in many respects, but for the sake of not complicating things further, they are here kept apart.

The lowest context in this group was a large boulder (SS40369), which was interpreted as a part of the Renaissance quay wall (G532) which had been partly deconstructed, and the boulder had ended up in front of the wall as a part of the land reclamation fill. Thus, the boulder was not structural in-situ.

The deposit directly on top of the boulder was SD32429, which was dark grey-brown, and consisting of sandy, organic material. SD32429 was approximately 41.6 m long (ENE-WSW) and 6.7 m wide (NNW-SSE) and extended over the middle and much of the western part of the excavation area from the Guide Wall and towards the bulwark belonging with Phase 4 (G626/G604). The deposit was 0.05-0.5 m thick and sloping downwards from north to south as it was deposited on top of the also sloping deposit SD52177 (G601 land tie with land reclamation material). The surveyed top levels ranged from OD-1.21 m to OD +0.79 m. In the northern part, near the bottom of SD32429, the organic material seemed to have sunk down and had created a dark black-brown lense. SD32429 contained animal bones, CBM, ceramics (dominated by late redwares, but also Chinese porcelain, Dutch redware, Dutch whiteware, faience, *Jydepots*, late lightfired, late greyware, Majolica, Stoneware, and two sherds of a Spanish/Portuguese olive jar), clay pipes, glass, leather, metal and organic materials, interpreted as dumped household waste.

From the environmental analysis it was evident that SD32429 were included a wide range of weeds but also indications of marine and freshwater/brackish material. Remains of molluscs were frequently found along with plant remains of widgeon grass (*Ruppia maritima*) and horned pondweed (*Zannichellia palustris*).

Parts of the zoological material from SD32429 analysed (from sieving of a big bag as well as fine sieving) – in total 537 g. It was concluded that the species, the distribution of elements and cut-marks clearly indicate that the material, in its entirety represents the waste from household consumption. The majority appear to be from normal households, but part of the fish indicates a higher status (Bangsgaard et al 2016).



Fig. 141 FO218268, Leather shoe (Medieval?) from SD31532 (G598). Museum of Copenhagen

Above SD32429 were five other deposits, of which SD31532 was the largest. This was approximately 20 m by 6.5 m and 0.3 m thick and extended over the middle and western parts of SD32429. The surveyed top levels were between OD -0.17 m and OD +0.86 m and the layer seemed to slope down towards the south. SD31532 consisted of light yellow-grey silty sand. This contained animal bones, CBM, ceramics, clay pipes, a coin, glass, iron, leather, slag,

stove tiles and floor tiles. SD31532 was truncated by the construction cut for a wooden drain pipe (G235, Phase 4). In the eastern end of G598's extent, SD25825 and SD25874 were excavated on top of SD32429. These deposits were both mid grey-brown and sandy and described as possibly the same. Together they covered a large area measuring 4.15 m by 1.8 m, but they were split by a truncation made by the construction cut for the Phase 4B land tie, G555. The top levels of the two deposits were surveyed between 0.05 m and 0.49 m above sea level and both were sloping downwards from north to south. The deposits contained animal bones, ceramics, clay pipes and glass. Overlying the southeastern part of SD32429 was deposit SD39507. This was 6.20 m long (ENE-WSE), 1.50 m wide and 0.4 m thick. The top levels were surveyed between OD -1.16 m and OD -0.16 m and the deposit was sloping downwards towards the south. SD39507 deposit consisted of brown-grey, loose sand and was seen as being naturally deposited, by alluvial activity. The deposit contained very few finds – stone and ceramic.

Linked to G598 was a N-S oriented timber beam, ST21351, which was first seen as a land tie anchor beam, but later re-interpreted as not being structural and merely an inclusion within the land reclamation deposits. Likewise was the E-W oriented timber beam, ST21412 first seen as structural and delimiting SD25874 towards the south, but as it could not be linked to anything, it must be an out of-situ inclusion. ST24085 was a vertical post seen in the middle of the area covered by G598. It was not linked to anything else and the interpretation of it being part of the land reclamation fills is dubious.

G598 is interpreted as a series of land reclamation dumps, consisting of both sandy and more organic material. The deposits were generally sloping downwards from north to south and were probably deposited from the north – land – side. The organic deposit, SD32429 was possibly made up by a mixture of both large proportions of household waste, including a wide range of artefacts, and material from marine and/or brackish environments. The sand rich deposit, SD31532, was likewise finds rich, but may have derived completely from dry land environments (no environmental analysis of this). Likewise may the smaller, sand rich depositions represent either single or multiple dumping into the area as part of the land fill process. The deposition possibly occurred from the northern, inland, side, as the deposit is sloping downwards towards the south, but there are no other indications of how the deposition process was undertaken. However, it seems likely, with the very large deposits in mind, that these are the result of numerous cartloads of fill taken from the same areas for the purpose of using the waste as land fill material.

G598 can be dated on the basis of stratigraphy as well as finds materials. It seems clear that the deposition of the land reclamation fills occurred only shortly after the construction of the Phase 4A land ties, e.g. G601 – or as part of the same construction work. The timbers used for the G601 land tie were felled in AD 1689-1692 and the construction is likely to have been undertaken around AD 1692.

Among the dateable finds is a leather shoe (FO218268), which appears Medieval (Andersen 2016), a copper alloy coin (FO212503, not yet conserved – no date yet), clay pipes, of which the narrower dated ones were all produced in the late 17<sup>th</sup> Century, glass from early and late 17<sup>th</sup> Century, and ceramics of similar date. A few artefacts have later production dates, a Chinese porcelain plate (FO217669, SD32429) is produced 1730-1780, industrial wares (FO217541 and FO217542, SD32429) have a production period from 1760-1800, but the occurrence of these few items in G598 may be due to later truncations, which were not clearly visible in the field.

Glass sherds found in SD32429 (FO214635 and FO214669) derive from the same tankard/vessel as a sherd found in underlying SD52177 in G601 (FO214660), indicating either that these deposits were excavated in a way that allowed finds to be split between them, or they were in fact contemporary and parts of the same depositional process.

#### *Land reclamation G644*

G644 was excavated during the Main Excavation. The single deposit related to this, SD34904 was located in the western end of the trench, west of the large baulk.

SD34904 was recorded as a brown grey sand layer of medium compaction with inclusions of mortar, pebbles, stones and CBM, and was described as a rubble layer. In plan the deposit covered an area measuring 5.16 m (NNW-SSE) by 3.48 m (ENE-WSW) and it was recorded as being approximately 0.13 m thick. The surveyed top levels were not showing a consistent slope from north to south, but ranged in general between OD 0.03 m and OD 0.17 m. The deposit extended over the southern part of the top of the former quay wall (G532, Phase 2) and also covered parts of the two early land ties, G641 and G652 (Phase 4A). The deposit was truncated in the south end by the construction cut for a later land tie, G551 (Phase 5), an undefined pit (G544, Phase 5) and by the construction cut for a 19<sup>th</sup> Century concrete structure (G589).

The deposit contained a few clay pipe fragments and some window glass, along with bones, shell, CBM, iron and a floor tile, which was however not registered. G644 was interpreted as backfill over the land ties, G652 and G641. This is very similar to the land reclamation layers recorded with the land tie, G601 as well as the deposits related to land reclamation group G598 and the interpretation of G644 is therefore the same.

#### **7.4.3.1.3. Discussion**

The land reclamation groups of Phase 4 are very difficult to exclude stratigraphically from the construction of the Phase 4A land ties as well as from the levelling layers placed above the actual land reclamation (see sub-chapter 7.4.3.4.). This can be taken as an indication of them being part of one overall event – one large construction phase. Furthermore, the materials used for the land reclamation and the levelling process were the same type of soils, possibly including vast amounts of household and building rubbish taken from streets and open places and dumped purposefully as land reclamation and levelling material.

The distribution of deposits interpreted and grouped as land reclamation layers is not evenly spread, when seen in plan (see Fig. 134 and Fig. 142). In the westernmost end of the excavation area, the area between the western Guide Wall trenches and G620 is empty in terms of land reclamation layers. This is due to circumstances, of which one is the fact that the area was partly not excavated as it was used as a ramp for facilitating the access of the machine into the trench. The machine ramp was of course placed at the limit of the excavation and hence the area south of the ramp was outside the excavation area. The construction of the eastern building, G707 (see sub-chapter 7.4.3.6.) would have truncated and possibly removed some of the upper land reclamation layers. This would have produced a gap north of the machine ramp, while the construction of the large Phase 6 structures, G589 and G533 also removed considerable amounts of land reclamation material. Another factor is that there were difficulties in differing between land reclamation layers and former usage/activity layers, as well as between land reclamation and levelling layers.



Fig. 142 Phase 4 land reclamation and later truncations

At the eastern end of the excavation area, no deposits, interpreted as Phase 4 land reclamation were seen. This area was not extended as far from the existing harbour front (bulwark G602, Phase 2/3) as the area at the west end was, when Phase 4 was initiated. Probably most of what had originally been land reclamation fills in the eastern end of the excavation was removed by the construction/repair cuts related to SG713 as part of the renewal of the Phase 4 bulwark, G626 (see bulwark sub-chapter, 7.4.3.3.).

On the water side of the former harbour front, the land reclamation layers would have been deposited directly on top of the layers related to usage of the former harbour and in most instances it is very difficult to differ between these types of depositions, as both the usage/activity layers of the former harbour phase and many of the land reclamation layers consisted of waste material, possibly deriving from households both nearby and further away around the city.

In general the land reclamation seems to have occurred from the land side of the harbour, which is evident from the depositions partly overlying the former harbour front and sloping downwards from there and towards the south.