15 Phase 4c Eastern gate building 1200–1600 AD

15.1 Results

The presentation of the remains from the eastern gate building (G-524) will be given from two perspectives. Firstly there will be an account of the different features which consists of 33 subgroups including stone foundation and walls, construction cuts, levelling layers within and outside the building, potential activity layers, floors, posthole(s), a suggested retaining wall or buttress, a well and several road surfaces (Tab. 28). The abutting guard- or customs building to the west (G-275) presented here consists of 10 subgroups such as foundations and a brick wall, construction cut, postholes, road- and levelling layers.

All parts of the gate building including a well with Late medieval finds and several road surfaces are included in this chapter, also certain Late medieval additions, since it in most cases has been impossible to separate these from the original structure. With certain exceptions, all road surfaces with associated structures outside Østerport are also presented here, although in some cases there is uncertainty regarding dating – specifically and partly due to survey methodology (machine) but also due to limits of excavation (Guide Wall areas). There are obvious structural similarities between the road surfaces and levelling layers in the gate building and the surrounding areas that also argue that these should be viewed as landscaped and maintained before the extensive changes of Østervold in the early 1600s (see Chapter 18; Phase 6 Eastern gate building and Post medieval fortification 1600–1650 AD).

Some of the robber pits recorded with connection to the building could be of Late medieval origin, but are presented under time Phase 6 (Post medieval fortification and the eastern gate building), in case stratigraphy or find material do not suggest otherwise. The opposite is true for a lot of the demolition material in SG-226 – most likely representing the destruction of Østerport in the mid 1600s, but grouped together with the rest of the medieval building, since it has been difficult to separate these contexts from earlier activities onsite. After the overall description the features are placed in a structural and historical context.

Groups and Subgroups	Type of feature	Subarea	Basic interpretation
524	Different types of features	Phase 5A-1 and 45A	Eastern gate building
226	Construction cut and foundations	Phase 5A-1 and 45A	Eastern gate building
500986	Stone imprints	Phase 45A	Eastern gate building
500988	Single timber	Phase 45A	Construction waste
466	Foundation layers	Phase 45A	Eastern gate building
500959	Foundation layers	Phase 45A	Eastern gate building
500966	Foundation layers	Phase 45A	Eastern gate building
500968	Foundation layers	Phase 45A	Eastern gate building
500977	Foundation layers	Phase 45A	Eastern gate building
500981	Foundation layers	Phase 45A	Eastern gate building
500982	Foundation layers	Phase 45A	Eastern gate building
500991	Foundation layers	Phase 45A	Eastern gate building
500990	Activity layer	Phase 45A	Eastern gate building
265	Floor layers	Phase 45A	Eastern gate building
500933	Floor layers	Phase 45A	Eastern gate building
500953	Floor layers	Phase 45A	Eastern gate building
500954	Floor layers	Phase 45A	Eastern gate building
500967	Floor layers	Phase 45A	Eastern gate building
294	Postholes	Phase 45A	Eastern gate building
500934	Posthole	Phase 45A	Eastern gate building
500969	Postholes	Phase 45A	Eastern gate building
500976	Postholes	Phase 45A	Eastern gate building

500983	Posthole	Phase 45A	Eastern gate building
500994	Postholes	Phase 45A	Eastern gate building
492	Well case	Phase 45A	Eastern gate building
491	Fills in well	Phase 45A	Eastern gate building
281	Road surfaces	Phase 45A	Eastern gate building
284	Wheel ruts	Phase 45A	Eastern gate building
290	Road surfaces	Phase 45A	Eastern gate building
291	Road surface	Phase 45A	Eastern gate building
293	Road surface	Phase 45A	Eastern gate building
500962	Road surface	Phase 45A	Eastern gate building
500989	Road surface	Phase 45A	Eastern gate building
500996	Road surface	Phase 45A	Eastern gate building
815	Timber	Station Box	Revetment for road surfaces
814	Timber	Station Box	Revetment for road surfaces
829	Postholes	Station Box	Revetment for road surfaces
503425	Stones	Station Box	Foundation road surfaces
821	Deposits and postholes	Station Box	Road surfaces
823	Posthole	Station Box	Road surfaces
826	Posthole	Station Box	Road surfaces
839	Postholes	Station Box	Scaffolding?
825	Boulder	Station Box	Foundation stone in road surfaces
824	Pit	Station Box	Foundation stone in road surfaces
503808	Deposit	Station Box	Levelling layer
615	Retaining wall or buttress	Phase 45B	Eastern gate building
616	Foundation layers	Phase 45B	Eastern gate building
275	Different types of features	Phase 1N and 45A	Customs-/guard building
248	Construction cut and foundations	Phase 1N and 45A	Customs-/guard building
500984	Posthole	Phase 45A	Customs-/guard building
500987	Postholes	Phase 45A	Customs-/guard building
501013	Postholes	Phase 45A	Customs-/guard building
501016	Postholes	Phase 45A	Customs-/guard building
501018	Postholes	Phase 45A	Customs-/guard building
501015	Floor	Phase 45A	Customs-/guard building
501019	Levelling layers	Phase 45A	Customs-/guard building
500972	Dump layers	Phase 45A	Customs-/guard building
280	Road surfaces	Phase 45A	Customs-/guard building

Tab. 28. Eastern gate building and interpreted customs- or guard building.

15.1.1 Eastern gate building – building and construction details

The construction cut for the gate building was excavated in stages, of which these were measured separately according to when these were identified and documented in place. Since the construction pits were not measured at the final stage of excavation, the units are based on the outer limits of each context.

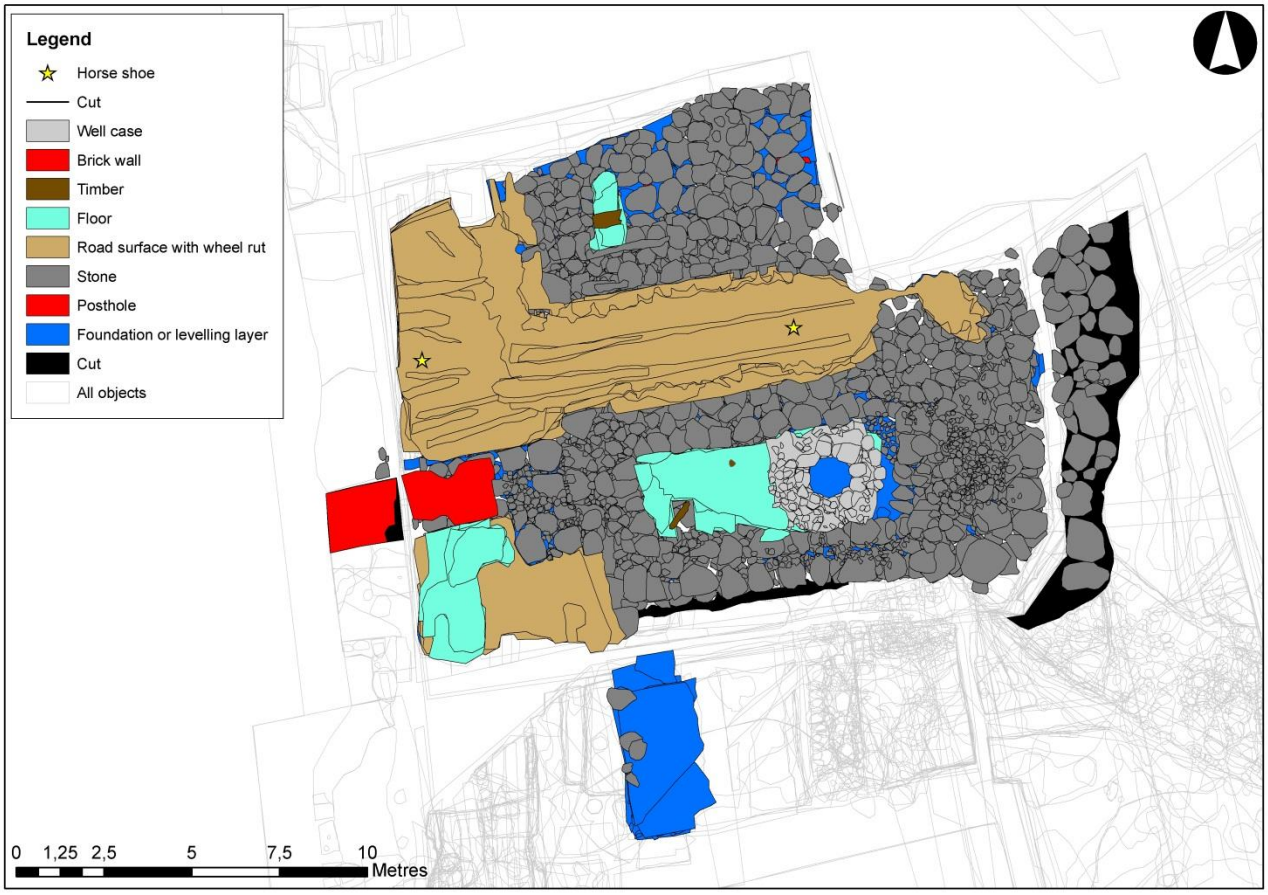

Fig. 98. The inner gate building with different structural elements. Be aware that the features on the figure are not presented in stratigraphical order, but the objective has been to highlight the individual parts, presented and discussed in the text below.

The construction cut for the gate building could be followed both in the northern and southern parts of the structure truncating the natural clay and sand. Only half of the northern part of the gate building was investigated where the foundation cut formed four separate L-formed cuts recorded at a distance of 8.4 x 4.4 m. Four cuts surrounded the southern foundation over a total distance of 7.2 x 6.5 x 9.1 m. Both truncations were limited by the excavation area and by the Late medieval moat cut to the west (Fig. 99).

Fig. 99. Post-excavation. Northern construction cut of the gate building without foundation stones, facing east. Photo: Museum of Copenhagen.

The cut sides were gradual/straight/steep and the base flat. Depth was 0.5 m at the most. Cuts (SC117039) and (SC117060) were part of a secondary, irregular construction cut, diffuse and only possible to follow in the northern part. A lot of smaller stones were present suggesting that these stones were placed here for some sort of drainage purpose (Fig. 100).

Fig. 100. Close-up photo of construction cut (SC105092) by the southern foundation cutting through darker salt marsh layers, gravelly post-glacial sediments and moraine, facing west. Photo: Museum of Copenhagen.

Stones (SS109482) and (SS111867) consisted of smaller stones within the gateway area extending for a distance of 10.0 m up close to the northern and southern foundation walls. These may have functioned as a stabilizer within the created construction cut and the later backfill (Fig. 101).

Fig. 101. Backfill and concentration of smaller stones in the construction cut on both sides of the gateway area, facing east. Photo: Museum of Copenhagen.

The main foundation to the gate building consisted of a dry stone structure comprising of light and mid grey unfinished stones and boulders (Fig. 102). The dimensions varied – the main foundation stones and the outer skin of stones in the foundation had an average of 0.50-1.50 m in diameter, the packing consisted of smaller fill stones with an average of 0.05-0.40 m in diameter. In between, the fill consisted of firm, yellow-brown clay, silt and sand together with smaller stones.

Fig. 102. Southern foundation layer of big boulders and smaller stones (SS130888) dug into natural, facing SE. Photo: Museum of Copenhagen.

The gate building had been divided into four rooms where the NW and SW rooms could be measured to 4 m^2 and 6 m^2 (Fig. 98). The building itself including the outer walls was approximately 140 m^2, where the gateway constituted c. 25 m^2, though the size is uncertain due to later additions in the 15th century (see Chapter 15.2). Context (SS117442) formed an upper row of foundation stones for the northern wall of the two rooms in the northern part of the building. Like the foundations, the walls consisted of light and mid grey roughly unfinished stones and boulders; outer skin stones were an average of 0.50-1.50 m and the packing of smaller stones were between 0.05-0.40 m in diameter.

The natural boulders had been carefully placed in relation to each other where flat side(s) were placed out- or upwards, either to achieve a smooth surface or to facilitate the work with the next layer of stones. After placement, the remaining gap was filled with stones and compact light white-yellow mortar and firm brown-grey sand and clay with inclusions of charcoal, pebbles, small stones and red brick fragments. The foundation material between the stones and boulders within the separated rooms consisted of compact and hard silty clay and sand of different colours and inclusions of charcoal, CBM, pebbles and stones. Nothing implies that the upper and exposed stone walls had been plastered, etc. (Fig. 103-105).

Fig. 103. The NW room (SS107580) in the gate building, facing west. In the foreground – part of the partition wall. Photo: Museum of Copenhagen.

Fig. 104. Investigating the double faced wall in the northern part of the building with infill of mortar and stones, facing east. Photo: Museum of Copenhagen.

Fig. 105. Construction detail. The southernmost and double faced wall (SS108559) with packing material of smaller stones, facing west. Photo: Museum of Copenhagen.

Context (SS45722) consisted of two lengths of a limestone wall of blocks on top of the northern foundation wall in the gateway area. The length was 0.9 m and 2.4 m respectively (Fig. 106). Despite the fact that only a minor part of the structure was recorded, this sequence of limestones had probably existed on both sides of the gateway in connection with the top section of the foundations.

Fig. 106. Cut through the NW gateway showing the two faces of ashlar stones and core consisting of smaller and bigger stones with mortar, facing west. Photo: Museum of Copenhagen.

The largest limestone block was 0.45 x 0.18 x 0.21 m and the smallest 0.21 x 0.11 x 0.20 m (Fig. 107). The pointing was very varied in thickness – from approximately 0.025 m to 0.010 m. The limestones were in some cases tapered at the back. At the northwest corner of the ashlar structure there was one stone that formed a corner with a wall going in a north-south direction keyed into this part of the wall.

Fig. 107. Detail. Close-up photo of limestones (SS45722), facing north. Photo: Museum of Copenhagen.

The bonding material consisted of smooth grey/white compact lime mortar without further description. The limestones in the gateway area and upper layer of the foundation wall could be contemporary since the mortar between the limestones and the pointing on the face of the foundation was the same. Another explanation could be that there had been a considerable rebuild of the foundations when this wall was established/renewed in the 16th century (?) (see further discussion and interpretation below).

Bio-stratigraphic dating and geological provenance analysis was made on some of the limestones from SS45722. The three samples analysed are composed of chalk of the same age, suggesting that they may have the same origin (Rasmussen 2012). Most likely the limestone blocks originate from either the lower, but not very bottom, part of the cliffs at Stevns Klint or from Limhamn in Scania, in the latter case quarry was in use when the gate building was erected. Earlier studies indicate that the zone with the relevant limestone is about 9 m thick at Stevns Klint. The analysed ashlars originate from a level of the cliff that is lower than the one which characterizes the building material analysed from Absalon's Castle under Christiansborg Palace (Lauridsen et al. 2010), but further and more precise dating is not possible (Rasmussen 2016).

The demolition material consisted of mortar and light and mid white, brown, grey and yellow sandy silt and clay with mixed inclusions of charcoal, ash, shell, pebbles, stones and fragments of lime- and “munkesten” (Fig. 108). The cuts were remains of stone imprints and interpreted as robber cuts of different size and depth (for more about the robber cuts; see Chapter 18).

Fig. 108. Demolition material (SD31044) consisting of red bricks, stones, limestone and mortar in the gateway area, facing east. In the middle traces of a modern pipe line cut (SM30245). The truncation in the middle represents a modern disturbance. Photo: Museum of Copenhagen.

A limited number of ceramics was collected in connection with the building phase of the structure and consisted of Late greyware; 1200–1400 AD. Finds from interpreted demolition material consisted of ceramics (Early redware; 1200–1450 AD, Late greyware; 1200–1400 AD, Late redware; 1500–1750 AD and stoneware; 1580–1700 AD), rib bricks, a column fragment, floor tiles, slate roof tiles, iron nails and bones (cattle, cattle/horse, dog, pig, sheep/goat,

sheep, mammals unspecified, goose and bird unspecified). The latter material argues for a demolition or re-building of the structure in the early 17th century (compared with the finds material in the well, below).

Part of a wall was recorded continuing in a N-S direction from the southwestern part of the gate building (SG-226) before this was truncated by the modern Transformer Station from the 1940s.

The feature consisted of a very diffuse north-south orientated layer (5.50 x 1.90 x 0.20 m) with a base of greyish sand, big chunks of yellow clay and several stones of different sizes (Fig. 109). The largest stones were 0.86 x 0.47 x 0.15 m, but there was a great variety in sizes – from larger to smaller stones and rubble. Approximately 55 stones were recorded. Yellow lumps of clay indicated traces of removed stones beside the ones surveyed.

The subgroup was interpreted as traces of a retaining wall or buttress that had been robbed out and where only a few stones and the clay between them were left. There is uncertainty about the interpretation since layer (SD88059) did not clearly interfere with construction cut (SC105092) for the gate building, but this can be explained by the modern shoring dividing subareas phase 45A and phase 45B to the north. A modern cut for cables with mixed fills (SC34649) can be re-interpreted as part of the structure, meaning that there was a physical relationship between the wall and the gate building. Deposit (SD88059) placed on top of interpreted rampart deposits and partially covered by the same type of materials can be explained either by later robbing or the fact that the structure is a later addition to the original gate building and its foundations.

Fig. 109. Foundation layer (SD88059) in connection with the eastern gate building, facing south. Photo: Museum of Copenhagen.

Traces of floors were identified in both the northern and southern rooms of the gate building. In the northern part of the building two parallel horizontal set planks placed in an east-west direction were recorded. The floor abutted the northern gate wall and was built up around a stone and brick structure (SS32215). The stones and bricks were lying on a bed of clay and together with a mortar layer this deposit was part of a floor foundation layer. The subgroup was overlain by (SD31989), a clay layer with inclusions of CBM, which might be a repair following the removal of the wooden floor.

In the SE room of the building a clay floor was recorded in association with and partly overlying the well, together with foundation layers of mortar with inclusions of pebbles, charcoal and CBM underneath an irregular brick built pavement (SG-265 and SG-500967) (Fig. 110). The irregular brick pavement (2.5 x 4.5 m), laid to provide a dry surface close to the well, consisted of various bricks and large brick fragments ("munkesten") mixed with worked limestones.

Fig. 110. Part of brick and limestone floor in connection with the well, facing NE. Photo: Museum of Copenhagen.

The foundation material in between the stones and boulders within the separated rooms consisted of compact and hard silty clay and sand of different colours and with inclusions of charcoal, CBM, pebbles and stones.

No datable finds were collected from the northern floor layers. From the SW room the finds consisted of ceramics (Early redware; 1200–1400 AD, Late greyware; 1200–1400 AD and Proto-stoneware; 1250–1375 AD), bricks, a copper alloy (undated and undefined), iron nails and bones (cat, cattle, dog, pig, sheep, sheep/goat, mammals unspecified, goose, domestic hen, bird unspecified, herring, pike and fish unspecified). One of the iron nails was later analysed consisting of a steel nail (Jouttijärvi 2013:9).

The foundation and levelling layers consisted of mixed and mottled make-up material of different colour, composition and homogeneity, with inclusions of ash, charcoal, bone, red brick fragments, lime fragments, mortar, wood, peat (salt marshes (?)), pebbles and stones (Fig. 111). The deposits represent mainly construction waste overlying and abutting the foundation stones within the building.

Fig. 111. Part of foundation layer (SD34228) north of the foundation wall, facing west. In front – truncation by a 19th century wooden water pipe not yet exposed. Photo: Museum of Copenhagen.

Finds form the levelling layers consisted of different household waste such as ceramics (Early redware; 1200–1400 AD and Late greyware; 1200–1400 AD), bricks, a copper alloy (undated and undefined), slag, a flint blade and -flakes, a bone toy, bones (cattle, pig, sheep/goat, mammals unspecified, goose, bird unspecified, cod, herring and fish unspecified) and blue mussels (*Mytilus edulis*).

In conjunction with the gate building 17 postholes were documented (Fig. 112). Six of these were located close to the northern gateway wall and must be considered as remnants of a scaffold during subsequent work on the gate as these postholes cut through older road surfaces (SD35220) (Fig. 113). This maintenance work cannot be more closely dated than between 1400–1550 AD (see further discussion about this below). In the building's NE part there were three rows of postholes – one running N-S and two running in an EW direction.

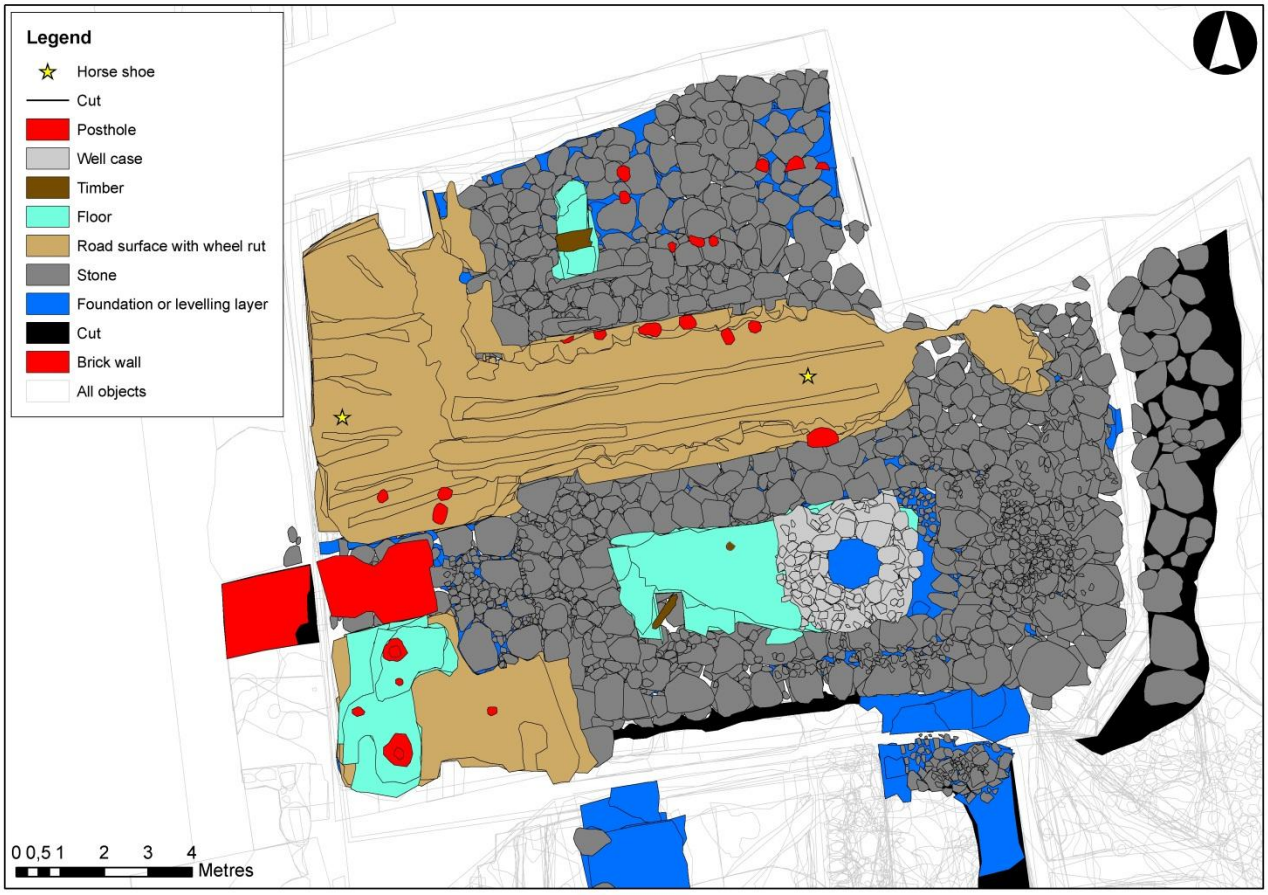

Fig. 112. Traces of scaffolding in the gateway area and other postholes in relation to Østerport and its annex. Be aware that the features on the figure are not presented in stratigraphic order, as the objective has been to highlight the individual parts presented and discussed below.

Eight postholes were recorded within the gate building. Besides having a bearing function considering the size of the truncations, further interpretation is difficult, although, either these postholes represent traces of a partition within the rooms or remnants of repair work on the building.

Fig. 113. Post-excavation. Cuts (SC35347) – row of interpreted scaffolding holes within the gateway area, facing north. Photo: Museum of Copenhagen.

In the SE room of the building a well was recorded. This consisted of a circular dry stone structure, approximately 2.5 m in diameter (Fig. 98 and 114). Depth is unknown since the last stones were removed by machine due to time pressure and inflow of ground water, and therefore the bottom was not fully investigated. This should though have been around 4.0 m at the most.

The stones in the well case consisted of a total of seven courses of mid grey, uneven granite stones, with the exception of (SS32959) at the top, consisting of a line of three squared, well finished chalk blocks (Fig. 114). Construction details show that the stones had been gradually built up together with surrounding clay deposits to keep the well tightly sealed. The stones were placed with flat side inwards. Bigger stones were documented at the top, more squared, shaped stones further down in the underlying courses.

Fig. 114. Top of well case and surrounding packing material, facing west. Photo: Museum of Copenhagen.

The packing material consisted of rubble and smaller stones placed around and butting the larger stones in the well case (SS37290). This was then sealed with bonding material of firm, light and mid yellowish green and grey clay with inclusions of CBM, mortar and bones (SD35476) (Fig. 115).

Fig. 115. Packing material of clay and smaller stones, facing E-NE. Photo: Museum of Copenhagen.

Context (SD41123) consisted of several (building) layers of greenish yellow clay with inclusions of bigger and smaller stones in the construction sequence around the well (SD38117). A special type of clay was picked for this purpose to achieve desirable qualities. Using this clay as sealing material had also avoided contamination from surrounding layers.

Finds from the well were collected from between the stones and the surrounding packing material and consisted of ceramics (Late greyware; 1200–1400 AD), a flint blade and bones (cattle and mammals unspecified). A variety of finds were also collected from the backfills consisting of ceramics (Early redware; 1200–1450 AD and Late greyware; 1200–1400 AD), iron nails, slag, bones (cat, cattle, dog, horse, mouse undefined, pig, rodent undefined, sheep, sheep/goat, mammals unspecified, domestic hen, -goose, waterfowl and bird unspecified, crested newt, European common frog, moor frog, edible frog, amphibians, toad/frog, common toad, European green toad, cod, common rud, cyprinids, eel, flatfish, haddock, herring, gadids, garfish, perch, pike, plaice/flounder/dab and whiting) and blue mussel.

Several big bags were wet sieved (3 mm and 5 mm) from the deposit(s) in the well which reflects the amount and variation of finds. The material consisted of ceramics (Early redware; 1250–1450 AD and Late greyware; 1200–1400 AD), bricks, daub, roof tile, gunflint, iron nails, slag, wood fragments, a bone dice (FO209440), bones (cattle, European water vole, dog, horse, mouse, pig, rat, rodent unspecified, sheep, sheep/goat, mammals unspecified, domestic hen and -goose, great tit, house sparrow, bird unspecified, amphibians, common frog, European common frog, edible frog, moor frog, European common toad, European green toad, cod, common bream, common toad, cyprinids, eel, flounder, gadids, garfish, gurnards, haddock, herring, perch, pike, plaice, plaice/flounder/dab, roach, stickleback, three-spined stickleback, waterfowl and fish unspecified).

Archaeobotanical analysis was made on seven samples from two contexts from the backfill of the well (SD32036 and SD41890) (Tab. 29):

Weeds	**Numbers**	**Spread in samples**
Chenopodium album	580	1
Corylus avellana	14	4
Lamiaceae sp.	2	1
Prunus avium	2	1
Prunus insititia	3	2
Prunus spinosa	3	1
Raphanus rapistrum	1	1
Meadows		
Carex sp.	3	1

Tab. 29. Combination of seeds in the well.

These results show evidence for about the same weed flora aspect as the rest of the gate building with additions of some larger seed/fruit parts from the genus *Prunus* (plum and cherry) (Ranheden 2015:29).

Due to the digging situation it is also impossible to say for sure if the pottery represents secondary waste or lost jugs originally from the bottom of the well, but the latest dating to the 15th century constitutes an absolute upper time limit for the usage phase. The occurrence of amphibians is interesting, suggesting that the well remained open for a while before being filled with different types of material. The amount of animal bones clearly shows that the well was used as a garbage dump when it went out of use.

The road surface had been repaired several times and at least five major maintenance works could be identified within the gateway area. The height difference of c. 1.3 m between the top road surface (SG-500962) and the oldest foundation layers in SG-293 (z = 1.2 and 2.5 m) can partly be explained by the fact that the surface was sloping east-west c. 0.5 m, but still the different deposits and levelling layers constitute as much as 0.8 m. There was a slight

difference between the material used in the foundation/levelling layers which consisted of mixed deposits of different colour, composition and homogeneity – though mainly silty sand or clay with inclusions of charcoal, CBM, mortar, lime fragments, wood, pebbles and stones.

In one phase of the maintenance work (SD108782) the foundations consisted of light yellowish white sandy mortar with inclusions of pebbles and stones. Limesstones had in a great degree been used as foundation material. The layer covered the entire gateway area and continued eastwards overlying some of the boulders in the former moat. In the western part of the excavation area the deposit continued in a north-south direction immediately west of the foundation layer in the northern part of the gate building. Context (SD34564) was deliberately spread on the surface; a mixture of stones (0.20 x 0.12 m in diameter), pebbles/rubble, small pieces of limestone together with CBM.

The road surface consisted of brown-grey silty sand and clay with inclusions of soot, charcoal, red brick fragments, pebbles and stones. Some of the deposits had a high content of decomposed organic material and still contained pieces of twig and straw. The average stone fragment size was 2.0-3.0 cm in diameter where in some places the surface had sunk into (or filled) the wheel ruts (Fig. 116).

Fig. 116. Road surface (SD42684) with wheel ruts, facing west. Photo: Museum of Copenhagen.

Different wheel ruts were recorded within the gateway area and in the area west of the gate building at a length of c. 13.4 m (Fig. 98). With the exception of (SD117076) represented by four imprints in the direction of the current Østergade and two running in a NE-SW direction, all wheel ruts had an east-west orientation.

The sides of the ruts were irregular/gentle and the depressions had a concave and irregular base. The deepest parts of the ruts were 0.08-0.20 m wide and the maximum depth varied from 0.04 m to 0.18 m. The ruts became much deeper and wider just at the western end of the gate, where they were about 0.15 m deep and 0.60 m wide. The width and

depth indicates heavy loads and wear which had necessitated the subsequent maintenance work filling the depressions with smaller stones and pebbles. The cart wheel spacing varied from 0.9-1.1 m and shows that the spacing had not changed during the time the gate building was in use. In places, it seemed like there were identifiable hoof marks from horses (Fig. 117).

Fig. 117. Road surface (SD105986) with wheel ruts, facing west. Note how the mortar layer overlaps the foundation stones in the wall. Photo: Museum of Copenhagen.

No datable material was collected from the foundation layers (roof tiles, part of a button, an iron nail, a flint blade and bones), but finds from the different road surfaces consisted of ceramics (Early redware; 1200–1400 AD and Late greyware: 1200–1400 AD) and an iron horseshoe (FO206684; Fig. 118) from one of the oldest road surfaces was dated to between 1150–1350 AD and most likely between 1200 and 1270 AD (cf. Clark 1995:95-96). Horseshoe (FO206844) was registered as iron waste, but looking at the images this clearly represents a horseshoe, perhaps of the same type as FO206684.

Fig. 118. Horseshoe (FO206684) in situ from above. Photo: Museum of Copenhagen.

15.1.1.1 Dating

Ceramics from different contexts and parts of the structure date the first construction and usage of the gate building to between 1200 and 1400 AD, where the presence of Proto-stoneware in one of the deposits can be dated to 1250–1375 AD. A horseshoe dates one of the road surfaces to between 1200 and 1270 AD. Stoneware among the demolition material suggests a deconstruction or rebuilding of the medieval gateway which corresponds with the written sources and the reconstruction of the fortification in the early 17th century.

Wheel ruts can also be used as a dating proposal – at least as a *terminus ante quem* for the road usage phase. Early medieval wheel ruts have been investigated at Rådhuspladsen (KBM 3827) with a width of approximately 1.0 m (Lyne and Dahlström 2015:89), similar to the gauge for the coaches which passed through Østerport. Horse-drawn carriages in the countryside do not change much over time. A width of 120 cm is older than the 1500s for the farmers' wagons concerned. Transport wagons and high status wagons in the 1500s (and later) were 130-140 cm wide and this was one of the reasons why Frederik the 2nd established royal roads, roads which farmers were forbidden to use with their narrow carts. After Christian IV introduced vehicles that could drive on the same roads as the farmers, the peasants started a new trend where the gauge was reduced to c. 90 cm (Schovsbo 2016).

The goal for the AMS-analysis was to conduct this on different types of material and from different contexts within the gate building including foundation, walls, interpreted activity layers and other features belonging to the structures' oldest construction phase. Several samples were also collected from different levelling layers (Fig. 119) but since these may contain secondary deposited material not related to the building process, none of these contexts were used for further analysis. It also proved to be difficult to obtain usable material which can be seen from the following ^{14}C results:

Two AMS-samples collected under foundation stones (SS123571) consisted of mixed seeds and common knotgrass. The first sample represented older seeds on site and did not relate to the construction phase. The same can to a certain part be said for the other sample which dates the structure to the mid 12th century (Tab. 30).

Fig. 119. Imprints in natural after removing (SS123571). Sampling for C14-analysis. Photo: Museum of Copenhagen.

Lab. No.	^{14}C year BP	Cal. 1 σ	Cal. 2 σ	Context No.	Negligible own age	Material
LuS 11354	4500±35	3340–3100 BC	3360–3025 BC	SD123571	Y<1	Unidentified mixed seeds
Lus 11355	860±40	1055–1240 AD	1040–1260 AD	SD123571	Y<1	Common knotgrass, *Polygonum aviculare*

Tab. 30. ^{14}C results from SG-226.

As a complement and to get a more reliable date for the gate building and its construction several mortar samples were collected from the structure (both from the foundations and the walls) to separate charcoal from the mortar.

AMS-analysis of charcoal (trunk) in mortar from bounding in the limestone wall in the northern part of the gate building and from backfill between the north and south faces of the northern gate wall dates the structure to the mid and second half of the 12th century (based on the 2 sigma results and a maximum old-wood effect of 70 years) (Tab. 31).

Lab. No.	^{14}C year BP	Cal. 1 σ	Cal. 2 σ	Context No.	Old-wood effect	Material
LuS 11722	975±35	1015–1150 AD	995–1155 AD	SD45777	Y<70	Beech, *Fagus sylvatica L.* (trunk)
LuS 11723	925±40	1040–1155 AD	1020–1205 AD	SD47398	Y<70	Beech, *Fagus sylvatica L.* (trunk)

Tab. 31. ^{14}C results from SG-226.

Compared with another AMS-dating of beech from the first foundation phase of the building (see below), the two C14-datings are respectively 37 and 75 years too old. The best (and only?) reasonable explanation for the dates is that the chosen charcoal represents old building material, re-used when burning limestone to produce mortar (cf. Rundgren 2015; Ringbom 2015). See also discussion and results using the same type of charcoal in Lilja och Juhlin Alftberg (2012).

Charcoal from an interpreted activity layer was sent for AMS-analysis, dating the activity to the first half of the 12th century and again did not represent the early usage phases of the gate building (Tab. 32).

Lab. No.	^{14}C year BP	Cal. 1 σ	Cal. 2 σ	Context No.	Old-wood effect	Material
LuS 11727	940±35	1030–1155 AD	1020–1170 AD	SD46459	Y<30	Beech, *Fagus sylvatica L.* (branch)

Tab. 32. ^{14}C results from SG-500990.

Timber and building material (ST135490; SG-500988) consisted of a piece of beech with a clear axe mark in one end documented in situ between foundation stones (SS130888) and the natural moraine. It was not possible to date the timber through dendrochronological analysis and the piece of wood was therefore later C14-dated. The AMS-analysis with respect of the old-wood effect (using the maximum of 5 years) dates the timber to 1210 AD (Tab. 33).

Lab. No.	^{14}C year BP	Cal. 1 σ	Cal. 2 σ	Context No.	Old-wood effect	Material
LuS 11805	820±35	1185–1260 AD	1160–1270 AD	ST135490	Y<5	Beech, *Fagus sylvatica L.* (trunk)

Tab. 33. ^{14}C results from timber (ST135490).

AMS-analysis of bones from retaining wall or buttress dated this structure to the early 13th century (Tab. 34).

Lab. No.	^{14}C year BP	Cal. 1 σ	Cal. 2 σ	Context No.	Negligible own age	Material
LuS 11362	830 ± 35	1180–1255 AD	1150–1275 AD	SD85356	Y<?	Pig, *Sus domesticus*

Tab. 34. ^{14}C results from SG-616.

Typical for the 13th century are two buttresses at each corner set at right-angles to each other. At the turn of the 14th century this form was abandoned and replaced by a single buttress set at a diagonal to the corner and known as the French buttress. At the end of the Gothic era there was a return to paired corner buttresses, but unlike in the 13th century, the corner of the building was allowed to project between the two buttresses because they were set back,

providing a more interesting composition (Wyatt 2015). The presence of a set back buttress to support or reinforce the wall argued that the gate building consisted of several floors as seen on older prospects of Copenhagen.

15.1.2 Revetment and road surfaces outside the gate building

Different types of revetments and several road surfaces was recorded outside the gate building (Fig. 120).

Fig. 120. Østerport with traces of revetments and road surfaces. The void among the foundation stones and the road surfaces is caused by modern shoring on the building site and a NW-SE running central heating trench.

Two rows of standing timber and postholes were documented east of the gate building. Structure (G-815) consisted of a row of vertically set timber posts running in a NE-SW direction, partly truncated by the central heating trench and not fully exposed due to the excavation limit in 2012. The other row of posts (G-829) was recorded 6.0 m to the north and represented a NE-SW post line consisting of 20 postholes (Fig. 120). Despite the stratigrapical relation being unclear, and the height difference is as much as 0.9 m (kote = +1.8 m and +2.7 m), the spatial location and direction argue respectively that the structure is connected in some way to the road surfaces.

Fig. 121. Partly exposed row of timber posts (ST175883-ST175964) in a created test trench, facing NW. Photo: Museum of Copenhagen.

South of the identified road surfaces and between the timber structures two lines of NE-SW running, unfinished granite stones was documented. The height above sea level varied between 1.9-2.2 m. The 26 stones were interpreted as part of foundation line for the overlying road surfaces. The gap to the west and some missing stones are related to machining/safety concerns and due to machining it is uncertain whether the stones could have been structural and related to the N-S running stones in fortification group G-503795 (see Fig. 120).

Fig. 122. Stones (SS173669) beneath and up to the road surfaces, facing NE. Photo: Museum of Copenhagen.

The road surfaces were heavily truncated by a modern central heating pipe trench (SM304006) running in a NW-SE direction. The surfaces consisted of a mixture of dense gravel, rounded pebbles, broken flints and brick fragments. The crushed flints were approximately 1-5 cm in diameter. Some fragments of medieval bricks and bones had been incorporated, but these were not common and constituted less than 5%. The material between the stones consisted of silty brown and grey sand with decomposed organic material. The stones used ranged from cobbles > 10 cm to pea gravel, but most were between 3 and 7 cm. With the exception of the cobble surfaces, the deposits were very hard and the gravel matrix very cohesive compacted.

The south-western half of surface (SS175761) was generally intact and smooth, but sloped down to a much more rough uneven and possibly rutted surface with larger cobbles. This north-western sunken portion of the pavement would have continued towards the centre of the road and was probably exposed to more heavy traffic (wagons and horses), while the margin of the road probably carried primarily pedestrians. Despite the generally pitted or uneven character of the NW margin of this road surface no continuous well defined wheel ruts were visible.

Fig. 123. Road surface (SS173067), facing east, with interpreted post imprints (SC173121) and (SC173134) to the left. Photo: Museum of Copenhagen.

Cobble surface (SS173965) had been laid along the edge and part of the structure had been robbed. Along the SE side was an edge defined with six bigger stones. The stones in the curb were worn on one surface and could represent some sort of boundary between SS173965 and pebble surface SS175184, though the functional or practical difference between these two surfaces is unclear (median in the middle of the road?).

Fig. 124. Paved surface with edge stones (SS173965) together with road surface (SS175184), facing NE. Photo: Museum of Copenhagen.

There was a slight difference between the material used in the foundation/levelling layers which consisted of mixed deposits of different colour, composition and homogeneity – though mainly silty sand or clay with inclusions of charcoal, CBM, mortar, lime fragments, wood, pebbles and stones.

Additionally, wheel ruts were seen as depressions in surface (SS176002), approximately 0.4 m wide and 0.1 m deep, with a distance of approximately 1.0-1.2 m in between. Context (SD308582) was exposed during the watching brief in 2012. Two wheel ruts running NW-SE with a separation distance of 1.0 m were recorded on the surface. Road surface (SS176172) also had a depression that can be interpreted as part of a wheel rut SW of a big stone (SS176255). The NE end of the surface sloped very significantly down to the NE – likely caused by wear from traffic over the boulder.

The road surface had been repaired several times and at least four major maintenance works could be identified. The height difference was c. 0.8 m between the top road surface and the oldest, but this difference can also be explained by the fact that the road area sloped from the east to the west. The latter together with modern truncations has made it difficult to compare and merge the different road surface, and wheel ruts with the documented surfaces inside the gate building, but a suggestion is that G-821 could be comparable with road surface SG-281 with its mixture of packed gravel, rounded pebbles, broken flints and brick fragments.

The road surfaces can be dated to the 16th and 17th century. The gauge for the coaches which passed the gate building was approximately 1.0 m, suggesting a relatively late date (cf. Schovsbo 2016). No datable finds were collected from the bedding and levelling deposits, the road surfaces included ceramics (Late redware; 1550–1650 AD) and a “kobbersterling” (FO235421) dated to c. 1420–1440 AD. Late redware (1400–1750 AD) was found in one of the activity layers, the deconstruction phases are represented by ceramics (Late redware; 1600–1750 AD), stove tiles and an iron

nail. The coin from road surface (SS173067) consists of a "kobbersterling" connected to Eric of Pomerania, c. 1420–1440 AD, but whether this accurately dates this uppermost road surface in this area or not is uncertain.

A big boulder was recorded within the road surfaces to the west. Boulders of this type were typically used as foundations in massive masonry structures or at the base of earthen ramparts. This was probably the original use of this boulder, but its surface had been exposed and it formed a part of the lower gravel pavement (SS176172). The stone was presumably reused from a foundation, perhaps as a northern boundary stone for the entrance, as it was apparent that traffic had polished the surface, and it was presumed to be contemporary with road surfaces (G-821) which are later according to the matrix, although the layers between could amount to levelling and foundation layers for the construction of the road.

Fig. 125. Boulder (SS176255) and road surface (SS176172), facing NW. Photo: Museum of Copenhagen.

What the posts in the road surfaces represent is unclear.

15.1.3 Customs- or guard building next to the gate building

The L-shaped annex interpreted as part of a customs- or guard house consisted of a brick wall partly made of "munkesten" abutting the southern part of the eastern gate building (Fig. 126).

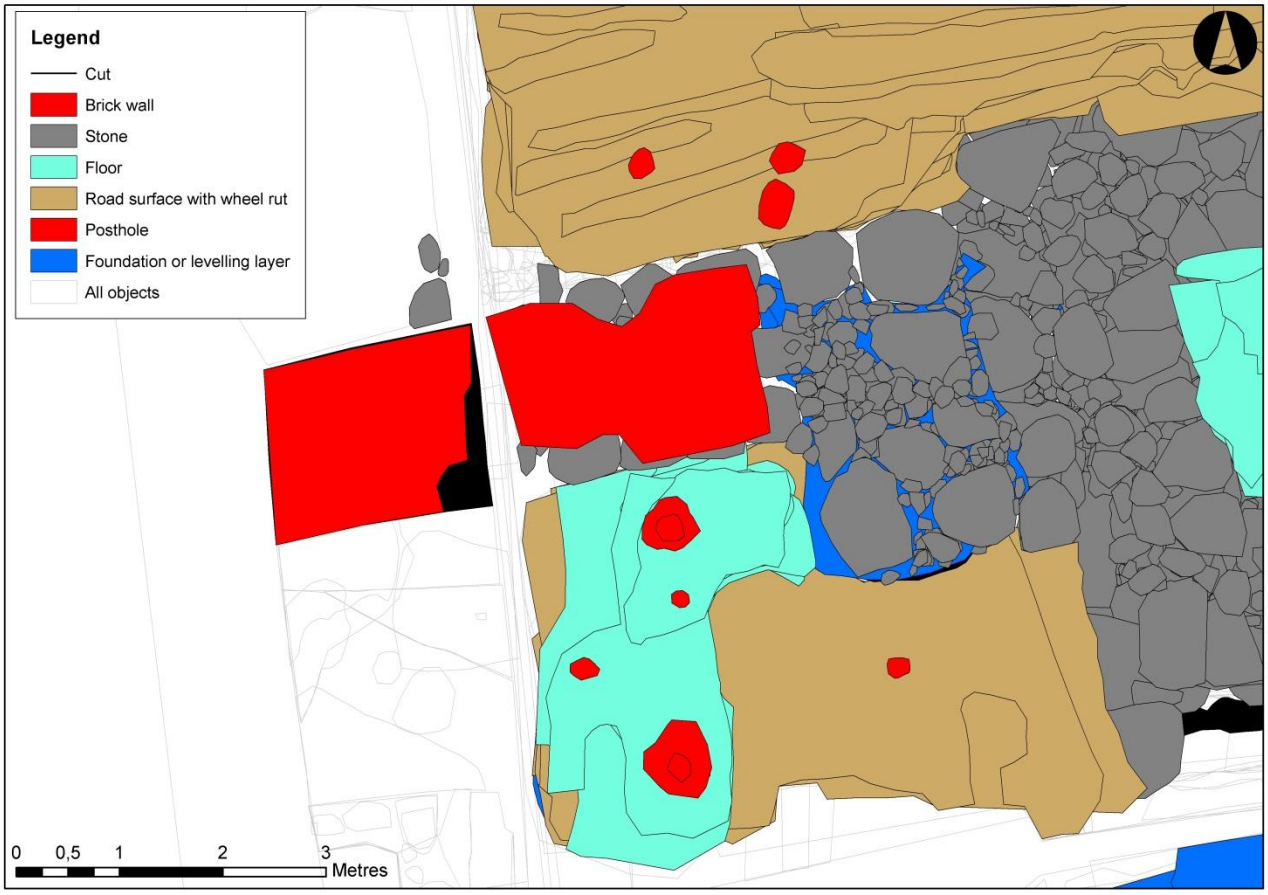

Fig. 126. Customs- or guard building west of the inner gate building.

The construction cut consisted of an irregular truncation in the natural moraine with moderate, straight sides and a flat base together with imprints from the removed foundation stones. The backfill in the construction cut consisted of mottled light and mid brownish grey sandy clay and silt with lime- and CBM fragments, charcoal, pebbles and smaller stones.

The 1.9 m wide and 4.5 x 3.4 m long foundation consisted of a dry stone structure of unfinished and uncoursed mid grey granite boulders (Fig. 127). The number of courses varied between one and two. The fill between the boulders consisted of smaller stones and loose, brownish and yellowish grey silty sand with inclusions of CBM. On the north side of the brick wall in subarea phase 1N there were two or three stones (SS30556) that could possibly be part of the foundation, however, this relationship remained unclear as no more excavation was carried out in the area (limit of documentation). The boulders had their flat side to the ground.

Fig. 127. Foundation stones (SS136525), facing west. Photo: Museum of Copenhagen.

The wall was a mixture of large granite stones (c. 0.8 m) and coursed brickwork, where the bricks had been broken to fit around the larger stones (Fig. 127-129). The stones built into the faces of the wall were flat and smooth, and flush with the brickwork. At the most – six to seven courses of fully laid fragmentary “munkesten” with smooth and struck mortar were recorded. The middle of the wall consisted of smaller stones and red brick fragments mixed with mortar.

Fig. 128. Brick wall (SS29955) in trench phase 1N consisting of a core of brick fragments and mortar, facing west. Photo: Museum of Copenhagen.

Fig. 129. Cut through brick wall (SS136416), facing west. Photo: Museum of Copenhagen.

With the exception of the medieval bricks and indication of monk coursing, no datable material was collected in relation to the construction or usage phase of the stone foundations and brick wall, though finds from interpreted demolition layers included ceramics (Late greyware; 1200–1400 AD and Late redware; 1500–1650 AD), where the latter can be used as a *terminus ante quem* date for the structure and fits well with the larger construction work on the fortification and gate building known from the early 1600s.

From interpreted floor layers inside the building (SG-501015) ceramics were collected – from levelling deposits; Late greyware (1200–1400 AD) and usage deposits; Early redware (1200–1400 AD), which suggest a dating of the annex to the 14th century. Based on finds (ceramics) the deconstruction of the building is dated to between 1500–1650 AD.

Macrofossils from one of the foundation layers (chosen because of the lack of datable material and despite source critical arguments) and fill in one of the postholes (SD129224) within the building were AMS-analysed. These samples date the construction to the mid 14th century (Tab. 35) which together with the pottery above argue that the structure is a later extension to the gate building and probably built at the same time as the city wall in the 14th century.

Lab. No.	^{14}C year BP	Cal. 1 σ	Cal. 2 σ	Context No.	Negligible own age	Material
LuS 11356	615±40	1295–1395 AD	1285–1410 AD	SD129224	Y<1	Unidentified mixed seeds
LuS 11353	590±40	1305–1405 AD	1295–1420 AD	SD117955	Y<1	*Carex*, Common fig, *Ficus carica* and Seaside Buttercup, *Ranunculus Sceratus*

Tab. 35. ^{14}C results from contexts belonging to the custom or guard building.

Like the gate building mortar samples were collected from the structure to separate charcoal for later radiocarbon dating, though AMS-analysis of charcoal (branch) from mortar in the brick wall dated the structure to the mid 12th century (Tab. 36).

Lab. No.	^{14}C year BP	Cal. 1 σ	Cal. 2 σ	Context No.	Old-wood effect	Material
LuS 11724	915±35	1040–1165 AD	1025–1205 AD	SS136416	Y<30	Beech, *Fagus sylvatica L.* (branch)

Tab. 36. ^{14}C results from SG-248.

Bricks were not common building material in Denmark before the early 1200s and the only explanation for this date must be the same as for the mortar samples from the eastern gate building and the city wall (see above and Chapter 14 and 15), where the charcoal originated from an older timber (cf. Rundgren 2015; Ringbom 2015).

15.2 Overall discussion and interpretation

The oldest Østerport, probably a tower gate, is C14-dated to the early 13th century and known from *Roskildebispens Jordebog* from 1294. It was called *Røde port* (*rubeam portam*) and placed at the end of Østergade (KD I:105; Thorsen 1926:214; Christophersen 1985:109; Skaarup 1998a:38; Fabricius 1999:120). Røde port is a common name, and demarking important or main gates to the medieval towns (Altenberg 1996). In former Danish towns as such Flensborg in Slesvig-Holsten and Lund in Scania the southern gate was called Røde port and in Roskilde Østerport had the same name (cf. Thorsen 1926:214).

As the archaeological excavation shows there had been extensive maintenance and modification work on the eastern gate throughout the years, especially in the 1600s, before the final reconstruction of the building in the early 17th century. These results fit well with what we know from the written sources:

At Kong Hans' last reign considerable work was done on the fortification particularly with respect to the gate; in 1505 a bulwark was built outside Østerport. In 1510 the accounts for the city's amount *"till then bghningh thill Østhre porth"* is mentioned. Since the money mentioned is being used to *"kalck oc stheen"* this must represent masonry, either to an extension and appearance of the present gate building or to a new gate building outside the moat (Thorsen 1926:229-231). In 1511 Mayor Oluf Adsersen accounted his outlays spent on the *"then hommeydh weeth Øster porth"* (extension in the wall or entrenchment) at Østerport and in 1512 Alderman Mogens Lavridsen reported the costs for the gate's vault and thatching (Nielsen 1877–1892; Thorsen 1926:229f.). The latter information is of interest since there are several traces of construction work within the gate building – not only the several road and surfaces, traces of scaffolding, but also on the foundation walls themselves. As seen on Figure 130 the second course of foundation stones is placed nearly 0.35 m into the gateway area compared to the uppermost boulders and limestone ashlars.

Fig. 130. Extended entrance and rebuilding work in the 1500s? Foundation stones (SS43532) and (SS45115), facing south. Photo: Museum of Copenhagen.

There is also a suggestion that the well could represent the public well that Christoffer Valkendorf reportedly had constructed at Østerport in 1579, but this assumption is less likely considering the collected finds material.

The estimated size of the gate building with its 140 m^2 (where the edge of the Late medieval moat constitutes an eastern limitation) is much larger than both Nørreport (c. 50 m^2) and the remains of Västerport (c. 81 m^2). The size probably reflects rebuilding and expansion of the gate building during the 1500s (see further discussion below). Medieval Västerport in Malmö with its 100 m^2 is also smaller in comparison. The gateway has been c. 32 foot long (c. 9.8 m) and the archway at least 2.5 m high. If two carriages had to pass each other the entrance must have been at least 2.5 m, preferably 3.0 m wide. Østerport with its width of 2.7 m must have impeded such passage.

It has not been possible to determine the exact height of the building, but on the basis of surveys of Nørreport and the suggested height of the city walls to c. 5.0 m, this should have been at least 10 m for effective defence in case the city wall was captured by enemies.

The design of the gate is unknown, but based on the demolition material within the gateway area the latest version of the inner gate building was walled in red brick with rows of limestone ashlars – common for these types of buildings in the Late Middle Ages and especially seen on high status buildings from the 16th century. This is also suggested through *Rentemesterregnskaberne* from 1608, describing both the destruction and re-use of bricks from the old gate building (cf. Kristiansen 1998:Appendix 8).

Fig. 131. Overview. The southern part of the gate building with gate walls and well, facing west. Photo: Museum of Copenhagen.

Østerport during the 1400s had probably been a High Gothic building with a pointed arched door. It does not seem to have been equipped with a roof, but with upper parts that formed a platform with surrounding parapet (cf. Thorsen 1926:227). This suggested description differs from the oldest known depiction of the gate building seen on a prospect of Braun and Hogenberg from 1587 and Resen's Atlas from c. 1596 [1677] showing a building with Late Gothic blinds, pointed gables and a circular rose (Fig. 132 and 133).

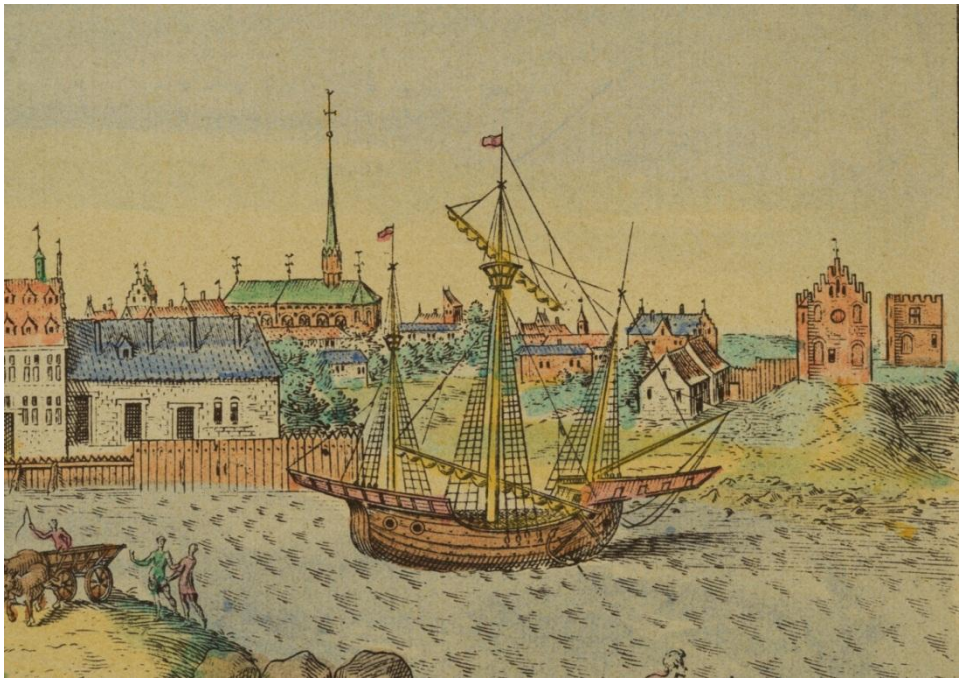

Fig. 132. The eastern part of Copenhagen and the interpreted gate building to the right. The image is cropped. From Braun and Hogenberg 1587.

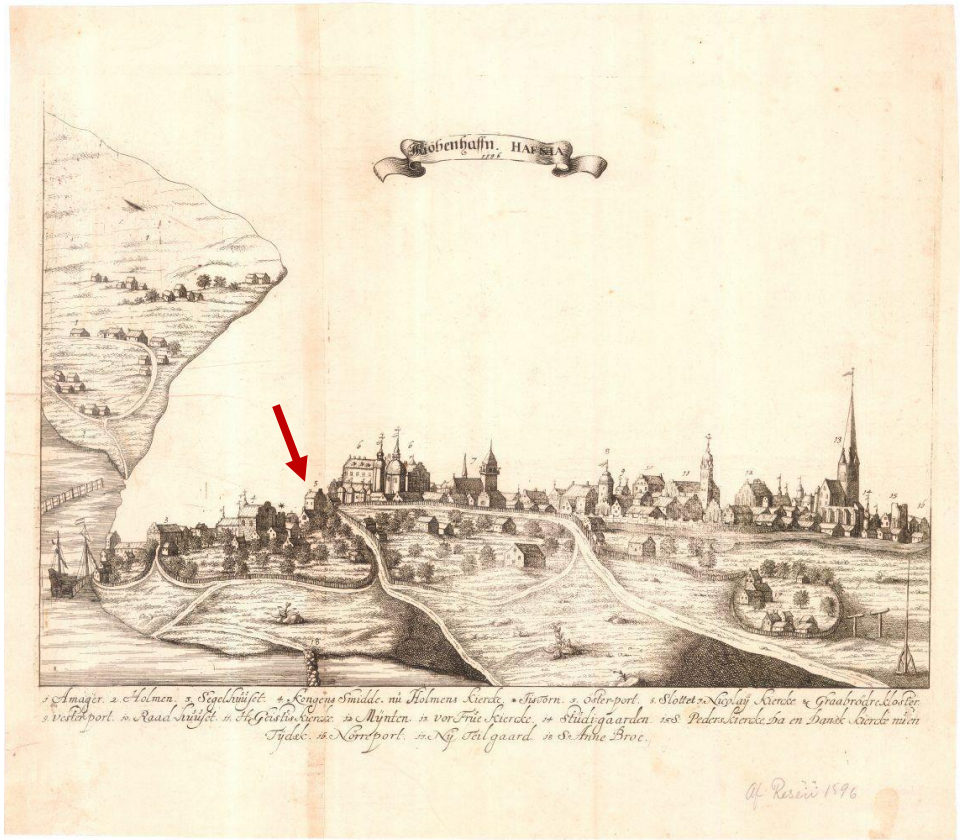

Fig. 133. Prospect of Copenhagen with Østerport seen from the northeast c. 1596. From Resen's Atlas Danicus 1677. Photo: Copenhagen City Archives.

The gate building had several floors above the archway built into the rampart with windows/loopholes above the fortification line similar to the gate buildings exposed at Nørreport when the 17th century fortification was demolished in the mid 1800s (Fig. 134 and 135). The medieval Nørreport was squared (c. 7.0 x 7.0 m) with a gateway width of 4.0 m and with a round arched vault. The southern wall was 1.0 m wide and the north and east 1.26 m (cf. Lassen 1855:Planche III; Thorsen 1926:239).

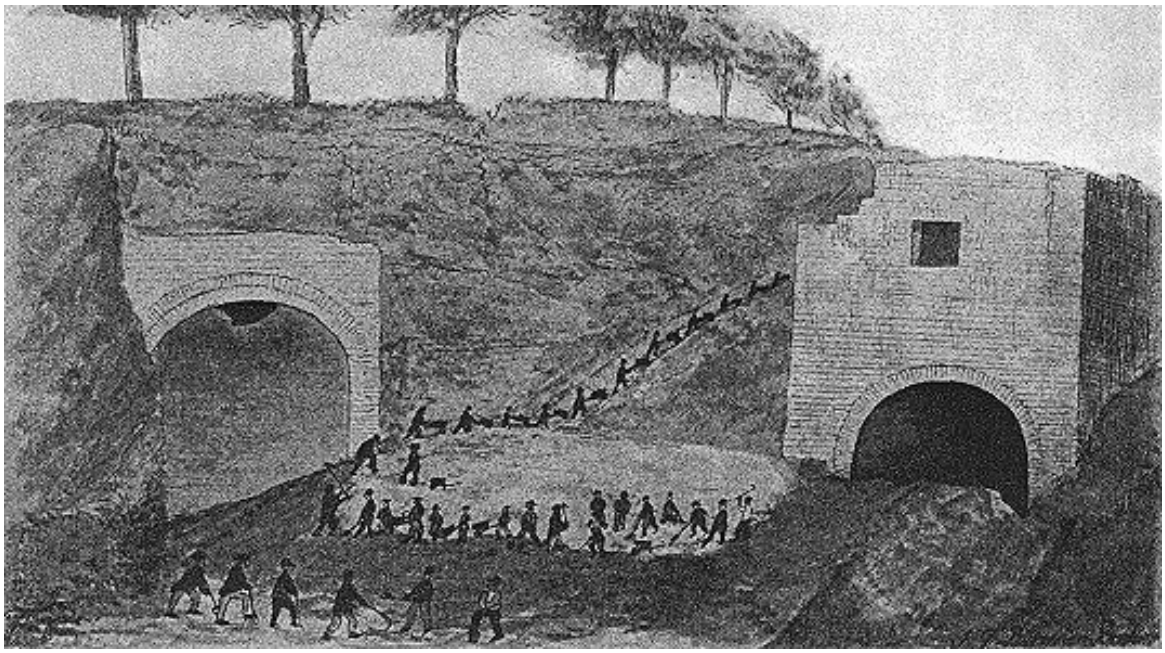

Fig. 134. Nørreport's inner and outer gates exposed in the 1854. Drawing from Pontoppidan (1936). Omkring Københavns gamle Volde og Stokhuse, København and taken from Dansk Center for Byhistorie (2015).

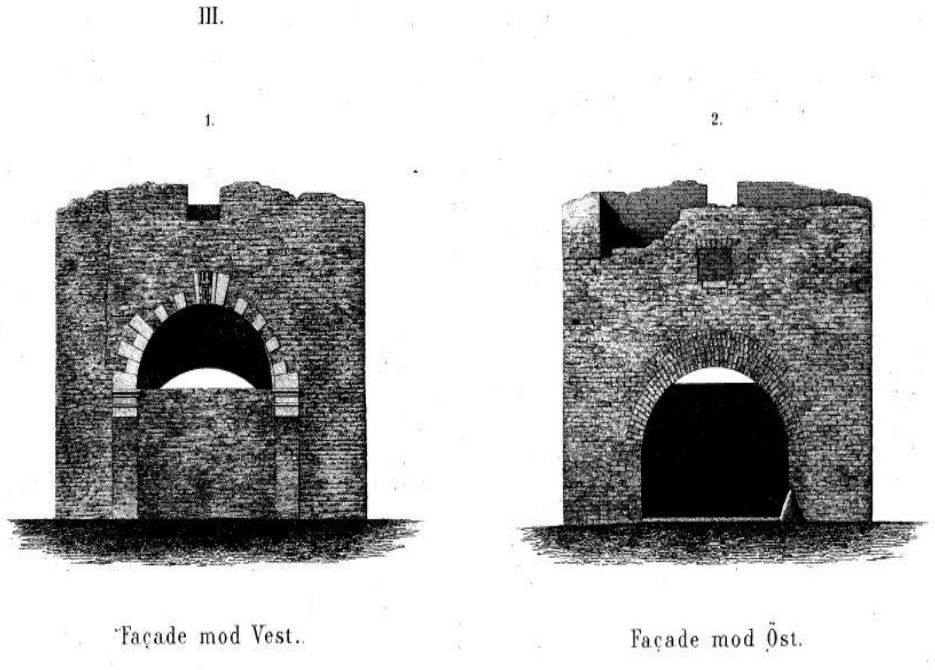

Fig. 135. Nørreport's outer gate building with facade facing west and east. From Lassen 1855:Planche III.

Part of Vesterport was investigated at the Metro excavation at Rådhuspladsen in 2011–2012. The gate itself, based on the foundation remains, measured 9 x 9 m, where the gap between the foundations of the outer gate was 2.75 m, while a projecting wall extended c. 5.1 m to the southwest of the gate's western corner (Fig. 136). The projecting walls would have connected the gate structure to a bridge which spanned the city moat to the gates immediate southwest, possibly preventing the embankment from slumping on to the road. It seems most likely from the way the layers of stone were laid, that the gate and the projecting wall were built at the same time. The building was dated to 1375 AD (Lyne and Dahlström 2015:180-181 and 200).

Fig. 136. Part of medieval Vesterport investigated at Rådhuspladsen, facing SW. Photo: Museum of Copenhagen.

With a gate building dating to the early 13th century it can be interesting to do comparisons with other similar and dated structures in Copenhagen. The presence of rough hewn stones has similarities to the limestone ashlars seen in Absalon's Castle from the late 12th century (Fig. 137) – though there are also dissimilarities if one compares the wells in the same castle (carefully built with lime ashlars) and the natural granite stones used in the gate building (Fig. 138a and 138b).

Fig. 137. Limestone ashlars in Absalon's Castle under Christiansborg. Compare with the limestone blocks in the eastern gate building; figure 107. Photo: Morten Steineke.

Fig. 138a and 138b. Well in Østerport and well in Absalon's Castle. Photo: Museum of Copenhagen and Morten Steineke.

The pavement was often made of tightly packed pebbles, so-called "knadder". Moreover the investigation revealed small areas with cobbled surfaces just outside the Late medieval moat. Though pebbles were the most represented and preserved pavement, this does not mean that it has been as dominant in the past. Its conservation benefits from the fact that pebbles, compared to more easily picked cobblestone, are labour intensive to remove, and thus not economical to re-use.

Since the road and foundation layers lacked datable finds it has been impossible to get a more precise dating for most of the surfaces, but those which nevertheless were dated, were all landscaped in the period between 1300 and the 1600s. Mixed roads of pebbles have been used from the 13th to the 17th century. Preserved cobbled surfaces were preserved in the eastern part, and may have been constructed during the late 16th century. The upper layers from the 16th and 17th century contained components and leftover materials from building, material either taken from nearby building sites or mixed up with material from maintenance work on the gate building itself.

The road surfaces were as was the main fortification a substantial investment in the form of civil works, procurement of soil and transport, and should therefore have been organized and funded by municipal taxes. This fits well with Christian II's not persistent city law from the beginning of the 1500s, where the precedents being set there are that it is the cities (councils) responsibility to keep the streets serviceable for the passage of vehicles (cf. Anderssen 1991).

In front of the gate semi-circular islands known as redoubts were built at the beginning of the 16th century for defence, as it was necessary to pass through these on the way into the gate. The gate was demolished with the relocating of the city wall in 1647.

The annex west of the main building is interpreted as a separated customs- or guard house often seen in association with gate buildings in the High Middle Ages (cf. Middle Holsten Gate in Lübeck) (Fig. 139).

Fig. 139. House for riding servants connected to the Middle Holsten Gate in Lübeck from the 15th century. Photo: Morten Steineke.