



Hudson House, York

Report on an Archaeological Investigation

Part 1: Results and Discussion

Site	Hudson House, Toft Green, York YO1 6JT
Site Code	HHY18
County	North Yorkshire
NGR	SE 59739 51628
Planning Application Reference No.	17/00576/FULM
Development	Erection of 4 buildings comprising of 127 flats (C3), office (B1) use, and office or restaurant (B1 or A3) uses, following the demolition of existing office buildings
Images and text	LS Archaeology
Month of Issue	March 2020
Site Dates	Trial Trenches: 28/01/17-30/01/17 Strip Map and Record: 05/02/18-05/03/18 Watching Brief: 01/07/18-30/11/18
Client	Palace Capital Developments Ltd

Summary

This report summarises the results of an archaeological strip, map and record excavation, as well as a watching brief carried out during the demolition of Hudson House.

The site yielded sealed archaeological deposits and features, which were primarily from the nationally significant 19th century York Old Railway Station.

- A large number of structural remains from the original infrastructure of the 1841 Railway survived amongst the piling associated with the 1967 construction of Hudson House. Most of these structures consisted of the foundations of principle railway auxiliary buildings.
- Evidence of the departure platform, the Railway Stables, the Merchandise Station and the extensive box drainage system were revealed.
- The remains of two 14 foot turntables were located within the structural bounds of the Merchandise Station.
- The structural evidence was comparable to the 1852 Ordnance Survey Map of the railway.

A small number of isolated late Romano British deposits had survived, centred around an alluvial deposit.

- A small number of isolated features dating to the later Romano British period were present. These took the form of a pit, a posthole, and amorphous dumped deposits.
- These features could suggest a period of land reclamation during flooding. Deposits consisting of mixed debris were dumped to shore-up the dry land from floodwaters.

CONTENTS

ACKNOWLEDGEMENTS.....	6
SUMMARY	7
INTRODUCTION	8
PLANNING BACKGROUND	9
IMPACT OF DEVELOPMENT SUMMARY	10
MITIGATION STRATEGY	11
SITE LOCATION AND GEOLOGY.....	12
ARCHAEOLOGICAL SIGNIFICANCE.....	12
AIMS AND OBJECTIVES	13
ARCHAEOLOGICAL AND HISTORICAL BACKGROUND.....	14
METHODOLOGY	26
STRATIGRAPHY	28
EXCAVATION RESULTS	29
SALVAGED ARTEFACTS.....	77
METAL DETECTING SURVEY	78
ARCHIVE.....	81
DISCUSSION	82
CONCLUSION	92
BIBLIOGRAPHY	94
APPENDIX 1.....	97
APPENDIX 2.....	101

FIGURES

FIGURE 1: HUDSON HOUSE DEMOLITION AND THE OLD YORK STATION DEPARTURE PLATFORM.....	7
FIGURE 2: SITE LOCATION OUTLINED IN RED	8
FIGURE 3: PLAN OF ARCHAEOLOGICAL MONITORING.....	10
FIGURE 4: ARCHAEOLOGISTS RECORDING ARCHAEOLOGY AMONGST PILE CUTS	11
FIGURE 5: BRAUN AND HOGENBERG'S <i>CIVITATES ORBIS TERRAM, VOL. VT 1618</i> BASED ON SPEED'S PLAN OF 1610.....	15
FIGURE 6: BENEDICT HORSLEY'S <i>CITY OF YORKE, 1694</i>	16
FIGURE 7: PETER CHASSEREAU'S <i>PLAN OF YORK, 1750</i>	17
FIGURE 8: SKETCH OF FROM TOFT GREEN BY GEORGE NICHOLSON	18
FIGURE 9: YORK STATION, 1861.....	24
FIGURE 10: CONSTRUCTION WORKS FOR HUDSON HOUSE CIRCA 1967 FROM BRITISH RAIL, EASTERN REGION (1968) <i>HUDSON HOUSE YORK</i> (COMMEMORATIVE PAMPHLET)	25
FIGURE 11: ARCHAEOLOGICAL RECORDING	26
FIGURE 12: PLATFORM FOUNDATION WALL [104] WITH ATTACHED METAL WATER PIPE, (107) WITH [108] AND [111] ALL TRUNCATED BY UTILITY TRENCH [41] FACING SE.....	43
FIGURE 13: DEPARTURE PLATFORM STRUCTURES [201], [202] AND [203] IN AREA B WITH PILE [571] TRUNCATING ITS CENTER...	44
FIGURE 14: 'H'-SHAPED SECTION OF DEPARTURE PLATFORM FOUNDATIONS STRUCTURE [203] WITH METAL WATER PIPE (107) FACING SE	45
FIGURE 15: DEPARTURE PLATFORM TERMINUS STRUCTURE [326] FACING SE	45
FIGURE 16: FACING SECTION OF [491] FACING SE	46
FIGURE 17: DRAINAGE SYSTEM [538], [541] AND [556] WITH INTERNAL WALL FOUNDATIONS [535] VISIBLE TO THE LEFT AT GROUND LEVEL AND VERTICAL SCARRING IN [497], FACING SE	47
FIGURE 18: DRAIN [475] CUT BY PILE [485] WITH WALL [484] RUNNING PARALLEL TO THE LEFT FACING NE.....	48
FIGURE 19: DRAIN [481] FACING NW	48
FIGURE 20: SURFACE WATER DRAIN/SINK GULLY [517] FACING SE	48
FIGURE 21: RECTANGULAR BRICK STRUCTURE [514] AND ADJACENT WEEP HOLE [582] TO THE LEFT WITH DRAIN [516] TO THE RIGHT, FACING NE.....	49
FIGURE 22: BRICK WALL [422] FACING SW	50
FIGURE 23: BRICK CULVERT BASE [441] FACING NE.....	50
FIGURE 24: FOUNDATION WALL [393] OF THE MERCHANDISE STATION. VERTICAL CUT [426] INTO NATURAL DARK BROWN SANDY CLAY [561] WITH SANDY YELLOW BACK FILL (425), FACING SE.....	51
FIGURE 25: SONDAGE [416] EXPOSING FOUNDATION LAYERS (414) AND [412], FACING NE.....	52
FIGURE 26: BRICK AND MORTAR GROUND CONSOLIDATION DEPOSIT (414) OF APPROXIMATE DEPTH OF 0.65M, FACING NE.....	52
FIGURE 27: SERVICE TRENCH [422] FOR BLACK METAL PIPE (420) CUTTING THROUGH WALL [393], FACING NE.....	53
FIGURE 28: MERCHANDISE STATION FOUNDATION WALL [436], FACING NE	53
FIGURE 29: MERCHANDISE STATION FOUNDATION WALL PROFILE [393], FACING SW.....	54
FIGURE 30: MERCHANDISE STATION FOUNDATION WALL [433], FACING SE	54
FIGURE 31: PRE-EXCAVATION OF FOUNDATION WALL [436] AND ADJACENT POST 1841 INSPECTION CHAMBER [434], FACING SE	54

FIGURE 32: MERCHANDISE STATION FOUNDATION WALL [490], FACING SW	54
FIGURE 33: TURNTABLE BASE OUTER ARC [376] AND INNER SUB-SQUARE BLOCK PIECE [377], FACING NE.....	55
FIGURE 34: CASTING <i>IN SITU</i> [376] AND [377] FACING SW WITH ASSOCIATED BOX DRAINS [369] AND [372].....	55
FIGURE 35: TURNTABLE BASE [397] AND [398] FACING SW	56
FIGURE 36: TURNTABLE SUB-SQUARE BASE [398]	56
FIGURE 37: PRE-EXCAVATION IMAGE OF BOX DRAIN [188], FACING SW.....	57
FIGURE 38: POST EXCAVATION OF BOX DRAIN [188], FACING NE	57
FIGURE 39: NW/SE ALIGNED WOOD LINED BOX DRAIN [324]	58
FIGURE 40: NE/SW ALIGNED WOOD LINED BOX DRAIN [325]	58
FIGURE 41: BOX DRAINS FROM LEFT TO RIGHT [77], [53] AND [49], FACING E.....	59
FIGURE 42: BOX DRAINS [161] AND [162], FACING W.....	59
FIGURE 43: BOX DRAIN [11], BLACK SEDIMENT FILL (39), METAL PIPE (19) AND RUBBLE MADE-UP GROUND [13], FACING NW	60
FIGURE 44: BOX DRAIN [233] WITH ORANGE BROWN PRIMARY FILL (232), FACING NW	61
FIGURE 45: BOX DRAIN [321] AND SEDIMENT FILL (316), FACING NW.....	62
FIGURE 46: THE STONE CAP FROM [321] WITH GRAFFITI. POSSIBLY WILLIAM/WILL MONT W-I-L M-N--T.....	62
FIGURE 47: BOX DRAIN [350] WITH STONE CAPPING	63
FIGURE 48: BOX DRAIN [350] PROFILE.....	63
FIGURE 49: PILE CAPS [297], [300] AND [303], FACING NE	64
FIGURE 50: PILE CAP [571] CUTTING DEPARTURE PLATFORM [201], [202] AND [203], FACING SW	64
FIGURE 51: PIT [251] WITH PRIMARY FILL (252), SECONDARY FILL (250) AND GREY DEPOSIT (249), FACING SE	65
FIGURE 52: CUT OF PIT [251] FACING SE.	66
FIGURE 53: ALLUVIAL DEPOSIT [292] IN PLAN FACING SE	67
FIGURE 54: ALLUVIAL DEPOSIT [292] IN SECTION.....	67
FIGURE 55: PLAN OF THE LOCATIONS OF AUGURING (GREEN SQUARES) AND MONOLITH SAMPLES (ORANGE)	68
FIGURE 56: AUGER SAMPLE 7 TO A DEPTH OF 0.34M.....	68
FIGURE 57: AUGER SAMPLE 3 TO A DEPTH OF 0.10M.....	68
FIGURE 58: MONOLITH SAMPLING THE SONDAGE THROUGH THE ALLUVIAL DEPOSIT [257] AND [292].....	69
FIGURE 59: DUMP DEPOSITS (267) AND (268).....	70
FIGURE 60: DUMPED DEPOSIT (267) AND (268), FACING NE.....	71
FIGURE 61: FEATURE [259] IN SECTION, FACING SW	71
FIGURE 62: VIEW OF THE RETAINING WALL WITH DECORATIVE ASHLAR PLINTH AND TURNED IRON RAILINGS.....	72
FIGURE 63: WALL BASE PLINTH (500) AND BEVELED SANDSTONE PLINTH WITH PHASE 2 GHOST SIGN (498).....	73
FIGURE 64: WALL BASE PLINTH (500) PHASE 2 RECTANGULAR BEAM SLOTS (501)	73
FIGURE 65: WIDE SPAN SEMI-CIRCULAR BRICK ARCH (523) AND FLUE SCARRING (505) AND (506).....	74
FIGURES 66: FROM LEFT TO RIGHT: CURVATURE OF RETAINING WALL [497] WITH LATER 20 TH CENTURY ADAPTATIONS, CONCRETE DRAINAGE CHANNEL (511) AND CAST IRON SHOES (512).....	76
FIGURE 67: RAILWAY SLEEPER BLOCK. THE RAIL CHAIR WOULD BE AFFIXED WITH TIMBER TRENAILS	77
FIGURE 68: TILE POSSIBLY INDICATIVE OF INTERIOR DESIGN THEME OF THE ORIGINAL OLD RAILWAY STATION	77

FIGURE 69: WROUGHT IRON SINGLE LEAF HINGE WITH A ROLLED END AND FOUR FIXTURES WITH ATTACHED HEXAGONAL BOLTS (APPENDIX 3).....	77
FIGURE 70: RAILWAY KERBSTONES.....	77
FIGURE 71: 1856 ORDNANCE SURVEY MAP SHOWING THE EXTENT OF THE 1841 YORK OLD RAILWAY	85
FIGURE 72: OP01486 GENERAL VIEW SHOWING CUTTINGS TO CITY WALLS © CROWN COPYRIGHT. HISTORIC ENGLAND ARCHIVE .	86
FIGURE 73: YORK OLD RAILWAY ARCHAEOLOGICAL RESULTS AS COMPARED TO THE 1852 ORDNANCE SURVEY MAP	89
FIGURE 74:OP01486 GENERAL VIEW SHOWING ARRIVAL PLATFORM, ROOFING AND IRONWORK © CROWN COPYRIGHT. HISTORIC ENGLAND ARCHIVE.....	90
FIGURE 75: GENERAL VIEW OF WOODEN TURNTABLE AND CUTAWAY PLATFORM © CROWN COPYRIGHT. HISTORIC ENGLAND ARCHIVE	91

PLANS

PLAN 1: ARCHAEOLOGICAL FEATURES IN AREAS A AND B1, B2, B3 AND B4	31
PLAN 2: PHASED PLAN OF AREAS A AND B	32
PLAN 3: PLAN OF AREA A	33
PLAN 4: PHASED PLAN OF AREA A.....	34
PLAN 5: PLAN OF AREA B1.....	35
PLAN 6: PHASED PLAN OF AREA B1	36
PLAN 7: PLAN OF AREA B2.....	37
PLAN 8: PHASED PLAN OF AREA B2	38
PLAN 9: PLAN OF AREA B3.....	39
PLAN 10: PHASED PLAN OF AREA B3	40
PLAN 11: PLAN OF AREA B4.....	41
PLAN 12: PHASED PLAN OF AREA B4	42

TABLES

TABLE 1: GEOLOGICAL NATURE OF THE SITE (BGS.AC.UK) AND ITS ARCHAEOLOGICAL RELEVANCE AND PRESERVATION POTENTIAL (KIBBLEWHITE, TOTH AND HERMANN, 2015)	12
TABLE 2: MONUMENTS IN PROXIMITY TO THE SITE	13
TABLE 3: SUMMARY OF KEY DATES IN THE HISTORY OF RAILWAY INFRASTRUCTURE (FOCUS PERIOD IN BLUE)	19
TABLE 4: YORK RAILWAY STATION CHRONOLOGY	21
TABLE 5: BRITISH RAILWAY STATION CHRONOLOGY, FROM BIDDLE, 1986 (YORK STATION HIGHLIGHTED IN BLUE).....	23
TABLE 6: VISUAL MODEL OF THE STRATIGRAPHIC NARRATIVE	29
TABLE 7: HEAVY METAL ASSESSMENT OF SEDIMENT (39) FROM BOX DRAIN [11]	60
TABLE 8: HEAVY METAL ASSESSMENT OF SEDIMENT (232) FROM BOX DRAIN [233]	61
TABLE 9: HEAVY METAL ASSESSMENT OF SEDIMENT (316) FROM BOX DRAIN [330]	62
TABLE 10: TABLE OF UNSTRATIFIED METAL DETECTED ITEMS FROM AREA A.....	80

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Figure 1: Hudson House demolition and the Old York Station Departure Platform

SUMMARY

A substantial demolition and rebuilding project (Hudson Quarter) is being undertaken by Palace Capital PLC at the former site of Hudson House, York (Figure 1).

Four redundant British Rail Eastern Region office blocks were demolished and will be replaced with four new mixed-use buildings and improved ground level infrastructure.

A three-staged programme of archaeological investigations, as requested by Local Planning Guidance, was undertaken by LS Archaeology on behalf of Palace Capital Developments Ltd.

In January 2017, two trial trenches were excavated to investigate the archaeological potential of the north-east of the site. This area had less below ground disturbance due to its historic function as a car park (Area A).

The initial two trial trenches indicated that archaeological deposits were present within this area. 19th century drains that were

related either to the York Old Railway Station, or to the site's earlier use as a garden nursery were observed.

In February 2018, a more expansive portion of the site (Area A) was machine stripped, recorded and evaluated.

Linear foundation walls and drainage features associated with the 19th century station platform and ancillary railway structures were recorded traversing the site, on the same alignment as the Old Railway. The full scale of the station's drainage and below ground infrastructure was revealed during the third stage; a watching brief that took place simultaneously with the demolition of Hudson House in the summer and autumn of 2018.

The piling and groundworks associated with the 1960's construction of Hudson House were large and intrusive, however amongst areas bordered by Hudson House foundations, remnants of 19th century railway features were intact beneath the made-up ground.

Additional sections of the departure platform foundations lay *in situ*, cut by Hudson House piles and foundations. Extensive drainage systems were abundant and a cobbled floor and structural foundations belonging to the Railway Stables (Monument ID MYO3719) was present. Foundations and two partial turntable bases from the Merchandise Station (Monument ID MYO3718) were still intact amongst the 1960's piling.

Earlier archaeological deposits from the Romano-British were present, albeit on a much smaller scale. The base of a large pit and amorphous black deposits were recorded within an alluvial sand feature. The artifacts from these deposits dated these features to the 4th-5th century.



Figure 2: Site location outlined in red

INTRODUCTION

LS Archaeology was commissioned by Emmaus Consulting Ltd on behalf of Place Capital Developments PLC to undertake a programme of archaeological evaluations at the site of Hudson House, Toft Green in York.

A mixed-use, multi-block, multi-storey development was constructed on the former site of the British Rail Eastern Region Office which comprised of four multi-storey blocks set within a 5562m² plot (Figure 2).

Three phases of archaeological works took place between January 2017 and November 2018. The works comprised of the monitoring and recording of two test pits, a strip, map and recording of a car park area to the north-east (Area A), and a watching brief which took place simultaneously with the demolition of Hudson House (Area B).

The principal demolition contractor, Squibb Group Ltd was required to make allowance in their activity programme for the completion of the watching briefs, as agreed in the Written Scheme of investigation.

Related Texts

Lichfields (2017), Hudson House, Heritage Impact Assessment.

LS Archaeology (2017), Desk Based Assessment: Hudson House.

LS Archaeology (2017), Archaeological Written Scheme of Investigation: Trial Trenches and Strip Map and Record.

LS Archaeology (2017), Trial Trenches Report: Hudson House.

LS Archaeology (2017), Archaeological Written Scheme of Investigation: Watching Brief.

PLANNING BACKGROUND

Due to the site's scale and location within an Area of Archaeological Importance, pre-planning consultations with the City of York Council took place to ensure adequate interventions were undertaken to enable the potential of the site to be evaluated and quantified. The initial phase of evaluation began with an Archaeological Desk Based Assessment, followed by a series of trial trench investigations.

Trial Trenches Results

Evidence from trial trenches excavated within the study area show that the construction of the railway had a major destructive impact on the archaeology that was *in situ* from earlier periods.

The two trial trenches, undertaken as part of this initial evaluation of the site, demonstrated that heavy truncation of the ground is clearly visible, with no archaeological deposits predating the 18th century present.

Some features contained archaeology that may predate, or be contemporary with, the construction of the Old Railway Station (Trial Trenches Report, 2017, Appendix 1).

Hudson House Application 17/019994/FUL was granted planning permission in March 2017 by the City of York Council, subject to an archaeological condition listed within the Town and Country Planning Act 1990.

A condition for planning consent was placed upon this development due to its position within an Area of Archaeological Importance.

“There are five areas designated as areas of archaeological importance under the Ancient Monuments and Archaeological Areas Act 1979: the historic city centres of Canterbury, Chester, Exeter, Hereford and York.

Designation has the general effect of helping to prevent important archaeological sites from being damaged or destroyed without at least allowing for some investigation and recording first.

Critically, the regime applies to all works that disturb the ground and so allows for some investigation of sites proposed to be dug for utility services, such as water and gas pipes, which otherwise do not need planning permission.

The designation does not mean a separate consent is required nor does it, of itself, make planning permission more or less likely to be given” (Historic England).

The condition requested that further archaeological investigations took place via two distinct methods. The first was to strip, map and record the car park area (Area A). Then an archaeological watching brief was assigned to groundworks within the footprint of Hudson House (Area B) (Figure 3).

Excavation (Strip, Map and Record)

No groundwork shall commence on site until the applicant has secured the implementation of a programme of archaeological work (an archaeological excavation and subsequent programme of analysis and publication by an approved archaeological unit) in accordance with the specification supplied by the Local Planning Authority. This programme and the archaeological unit shall be approved in writing by the Local Planning Authority before development commences and the development carried out in accordance with the approved details.

Reason: The site lies within an Area of Archaeological Importance and the development will affect important archaeological deposits which must be recorded prior to destruction.

Archaeological Watching Brief

No groundwork shall commence on site until the applicant has secured the implementation of a programme of archaeological work (a watching brief on all ground works by an approved archaeological unit) in accordance with a specification approved by the Local Planning Authority. This programme and the archaeological unit shall be approved in writing by the Local Planning Authority before development commences and the development carried out in accordance with the approved details.

Reason: The site lies within an Area of Archaeological Importance and the development will affect important archaeological deposits which must be recorded during the construction programme (City of York Archaeologist).



Figure 3: Plan of archaeological monitoring

IMPACT OF DEVELOPMENT SUMMARY

The desk-based assessment and results from the trial trench investigations suggested that there was **low potential for evidence from the prehistoric/Iron Age and moderate potential for Romano-British and medieval periods.**

There was **good potential for archaeological assets to be uncovered from the post-medieval – industrial period, specifically related to the garden/nursery period and the 1845 railway.**

MITIGATION STRATEGY

The impact of the development on any potential archaeological assets was mitigated through a programme of archaeological investigation and recording.

Initially, trial trenches were undertaken to investigate and record types of deposits present.

An open excavation (strip, map and record) was implemented to record archaeological deposits underneath a car park area. This area was targeted due to minimal historic ground disturbance.

All groundworks undertaken during the demolition of the below ground footings of Hudson House were undertaken in stages. This ensured that any archaeological deposits, which would otherwise have been destroyed, could be assessed and recorded.

Hudson House was comprised of four blocks of seven storeys, and required deep and extensive foundations and piling.

All foundations and piles had to be removed so that new structures could be safely erected upon secure footings.

The spaces between the footings and around the piles was extensive and it became apparent that archaeology could be present in areas not impacted during the construction of Hudson House.

The made-up ground within footings was stripped down until archaeological features were revealed. 19th century drains and other structural features could be rapidly identified

and quantified. Project managers from both demolition and archaeology would agree a timetable to enable demolition works to be deployed effectively elsewhere, in turn allowing time for the team of archaeologists to clean, assess and record.

After the archaeology was recorded, the demolition excavator would return to remove the structural footings and piles, work that was watched by an archaeologist.

Large sections that were revealed after footing removal were evaluated to note any deposits in section.

The number of archaeologists required on site would fluctuate depending on the quantity of deposits to be recorded (Figure 4).



Figure 4: Archaeologists recording archaeology amongst pile cuts

SITE LOCATION AND GEOLOGY

The site measures approximately 5 hectares in extent, and is located between George Stephenson House and York City Council's West Offices. York City walls lie to the north-west of the site with Toft Green and Tanner Row to its south-east. The site is centered at SE 59739 51628.

The area consisted of four large offices blocks (Hudson House), a central court with garden and pond, and a car park to the east.

Description	Geology	Characteristic of Natural	Archaeological relevance and preservation potential
1:50,000 scale superficial deposits	York Moraine Member	Glacial till comprising sandy-clay, clayey-sand and clay with erratic pebbles, cobbles and boulders, mainly of Carboniferous sandstone and limestone (bgs.ac.uk). Slightly acid loamy and clayey soils with impeded drainage (landis.org.uk). Soil World Reference Classification: n/a urban deposits.	The natural soil layer's integrity and original characteristics are unlikely to be preserved due to past substantial anthropogenic remodeling (19 th century). Pockets of natural may be likely.
1:50,000 scale bedrock geology description	Sherwood Sandstone	Sandstone coloured red, yellow and brown, part pebbly; conglomeratic in lower part; pebbles generally extraformational quartz and quartzite, with some intraformational clasts; subordinate red mudstone and siltstone (bgs.ac.uk).	

Table 1: Geological nature of the site (bgs.ac.uk) and its archaeological relevance and preservation potential (Kibblewhite, Toth and Hermann, 2015)

ARCHAEOLOGICAL SIGNIFICANCE

The City York Historic Characterisation Project Statement for Archaeological Significance in the Railway Area 22 states:

“This area falls predominantly within the Extramural (west) zone and partly within the Colonia/West Walled City and Ouse Waterfront (west bank) areas as identified by Ove Arup in the Archaeology and Development Study. The study identified the extramural area as containing Roman to medieval deposits while the Colonia area contains deposits relating to all periods at an average depth c.2.0m below ground level. Both areas are described as containing archaeology of medium quality. On the waterfront, high quality deposits are likely to exist at depths of c.5.0m below ground level. Despite the obvious impacts of early 19th century development, investigations beneath the old station platforms at West Offices demonstrate that Roman archaeology at least can survive well” (Claire MacRae, 2013).

Character Area grouping: Grand institutions and monuments set in green space.

Monument ID	Description
MY03614	Romano-British House with three mosaics
MY04169	Site of Royal House
MYO4168	Dominican Friary
MYO3718	York Old Railway Merchandise Station (York & North Midland Railway and Great North of England Railway, 1841) (demolished)
MY03723	York Old Railway 2 nd York & North Midland Engine Shed (demolished)
MYO3719	York Old Railway Stables (demolished)
MY03810	Hudson House (offices for British railways technical departments) 1968

Table 2: Monuments in proximity to the site

AIMS AND OBJECTIVES

- The primary aim of the archaeological investigation is to provide a full archaeological record of the features and finds prior to their loss during development.
- To identify and objectively record any significant features that may have survived from the original nationally significant 19th century York Railway structures which could be disturbed or altered under the new development. To place this evidence chronologically into existing railway narrative.
- To date and record any archaeological features that may relate to the Roman or later periods and to add this data into the York archaeological narrative.

ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

Prehistoric 8000BC to 43BC, Bronze Age 5000BC to 800 BC, Iron Age 800BC to 43AD)

The Vale of York supported human activity from the Mesolithic onwards. The natural landscape consisted of an elevated glacial ridge called the York Moraine ridgeway which crossed a wetland that supported seasonal migratory birds and other animals.

Human presence would mirror the seasonality of the fauna and subsequently any archaeological evidence left behind upon the elevated moraine would be transitory; hunting camps and associated flint losses and detritus such as flint scrapers, flint cores and flakes.

Archaeological evidence from within the City of York is limited (Whyman and Howard, 2005) but has been observed close to the moraine.

Neolithic flint arrowheads and cores were noted at excavations at Blue Bridge Lane in Fishergate (Spall and Toop, 2005).

Residual flint tools were observed during excavations at Heslington East (Neal and Roskams, 2013) and more recently at St Joseph's Monastery, York (LS Archaeology, 2017).

All three sites are located on or close to the moraine ridgeway. The development site is also located on the York Moraine.

Romano-British 43AD to 410AD

York's Roman narrative is well documented with detailed volumes of research and analysis spanning centuries from the Reverend Charles Wellbeloved (1842) *Eboracum, York under the Romans* to Dr. Partick Ottoway (1993), *Roman York*.

Both attest to York's past as a Roman capital of significant importance.

The city was arranged with the Military fortress 71AD, located on a moraine spur at the current site of York Minster.

A wooden bridge spanned the River Ouse to the south, towards the locations of Micklegate and Bishops hill. Later, this was the location of the Colonia; the residential complex for the Roman citizens, and an important thoroughfare to the south of York and beyond.

The site lies within the external fringes of the Colonia.

Observations were made during the 18th-19th centuries (including during the construction of the York Old Railway) by the Reverend Wellbeloved, who noted the presence of a range of complex and high-status Roman structures located in close proximity to the site.

Observed here was: a building housing alters, an apsidal building with mosaic pavements, a baths complex, the Temple of Serapis, a series of pits lined by three foot long oak planks, buildings with hypocausts, colonnade buildings and a public bath complex (RCHM 1962, 51-58).

20th century archaeological interventions include recent works during the remodeling of the West Offices and emergency sewer repairs on Tanner Row.

Extensive bath works were observed (Onsite, 2013) and a high-status house with tessellated pavement and mosaic flooring, (NAA, 2014).

Both these interventions augmented previous 18th-19th century observations with additional evidence.

Post Roman Medieval 410 AD to 1601AD Saxon
410AD to 800AD - Viking 800AD to 1066AD -
Medieval 1066AD to 1601AD

Roman buildings would have remained standing during the early medieval period and may have been reused or utilised for their raw materials (MacRae, 2013).

Any archaeological remains from the early medieval period are likely to be ephemeral and difficult to identify and characterise. Specific evidence of settlement in this area is unclear (Moulden and Tweddle, 1986) however, some artefactual evidence is present: a cross head of potential 8th century date (RCHME 1962) and some Anglian and Anglo-Scandinavian pottery found during archaeological excavation within the study area (Onsite, 2013).

The medieval period has a strong presence within the area, with evidence for activity found within the historical and archaeological records.

The area was known as the King's Toft (Toft derived from Old Norse, meaning site of a house/farm); this included a royal holding of land and the King's Houses, as well as the Royal Free Chapel of St Mary Magdalene c. 1133.

During Norman rule this was also an important administrative centre and was likely to have been the hub for the Domesday inquest (Palliser, D.M., 2014).

In 1227, Henry III granted the Chapel of St Mary Magdalene and plot of land to the Dominican Friars (Monument ID: MYO4168).

This enabled them to establish themselves and their space which grew quickly to encompass close to 3 acres.

'...a historic sketch of them (Friars 'Gardens) must prove very interesting. They were anciently the site of a Roman temple, sacred to the heathen god, Serapis, the foundation of which was discovered in 1770...They were also in succeeding ages, the site of a Monastery, erected by a Christian fraternity called The Friars' Preachers;'

...The building is entirely removed, and all that now remains of this institution, is a curious draw-well, the one before noticed, near which is paced as a trough, a Roman stone coffin.' (Hargrove, 1818).

The dissolution of the monasteries in 1538 saw the friary being sold onto William Blitheman, thereafter being used as the Council of the North's headquarters.

Post Medieval 1601 to 1815

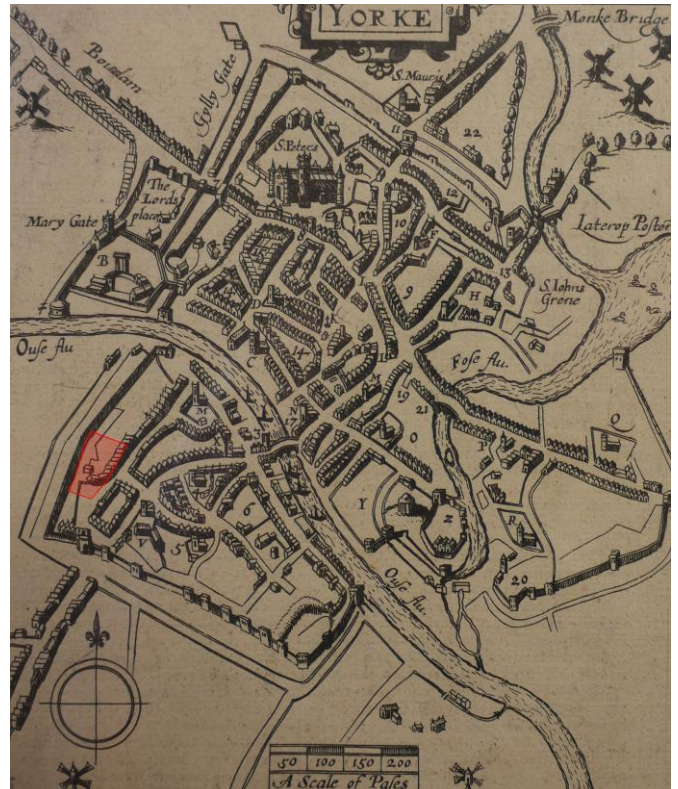


Figure 5: Braun and Hogenberg's *Civitates Orbis Terrarum*, Vol. VT 1618 based on Speed's Plan of 1610

Braun and Hogenberg's 1618 map (Figure 5) depicts Toft Green as gardens or open space and any large specific structures from previous administrative periods are omitted.

One structure is located within the middle of the site with rows of houses established along Toft Green and Tanner Row.

'It was anciently called Les Toftes, and had also the name of Pageant Green; most likely from the fraternity of Corpus Christi drawing up here, in order for their religious procession around the

city. By an ordinance, still on the records of the city, dated 1457, it was then commanded that a weekly market for oxen, cows, hogs, and other animals, should be held on this ground every Friday; but in no other part of the city or suburbs. And though the practice had long been discontinued, a market for swine was held here every Wednesday, till very lately' (Hargrove, 1818).

Included in these structures would be the almshouses built by Lady Sarah Hewley to accommodate women of need (almshouse location is seen more clearly in Figures 11 and 12 below). Hewley's Hospital was located on Tanner Row.



Figure 6: Benidict Horsley's City of Yorke, 1694

'Hewley's Hospital: This is a neat brick building, raised above the street three steps; with wings at each end, both in front and behind; whereby a small courtyard is formed in each.

Over the front entrance are the arms of the

donor, below which is the following inscription: "This Hospital was founded and endowed by Dame Sarah, the relict of Sir John Hewley, of the city of York, knight, Anno Dom.1700. Thou, O God! hast prepared for the poor-Ps.68." The institution is for ten old women of the Unitarian persuasion, to be approved by trustees.' (Hargrove, 1818).

Hewley's charity owned the land and by the 17th century the site was starting to develop into formal gardens.

The development of the land into formal gardens is depicted in Benedict Horsleys' (1694) cartographic record of the area (Figure 5). The gardens are named '*Friers Garding*', hinting at the historical connection of these gardens to the Dominican Friars.

The site's period as open space and gardens was observed during archaeological evaluations (Onsite, 1998) as garden deposits.

By 1694, land use is more defined with linear planting structures similar to the formal planting methods, influenced by the classics that were being revived in the 16th and 17th centuries. Pinpointing an exact date for these changes during the 17th century is problematic and the cartographic evidence is not definitive enough. It is likely that the change in use of the site occurred when the Telford family leased the land to create a nursery garden.

The Telford family of Nurserymen are listed in the Dictionary of British and Irish Botanists and Horticulturists Including Plant Collectors, Flower Painters and Garden Designers (Desmond, R., 1994) as:

'George Telford who died 1704 in York as the founder of a famous firm of nursery men which took a lease of the Friar's Gardens and was stated to have lasted 150 years when it was sold to Thomas and James Backhouse in 1816.'

John Telford was born 1689 and died 1771. He was the son of George Telford and one of the first to introduce the northern gentry into the method of planting and raising forest trees for use and ornament.

1815 to 1841

By 1815, the Telford family had sold the land onto Thomas Backhouse (1792-1845) and the site remained in use as a nursery until it was acquired by the York and North Midland Railway Company.

The Backhouse was a nursery of great repute and former foreman Henry Baines later went on to design the Museum Gardens in York. Thomas Backhouse later relocated to a 100 acre site in Holgate, York: West Bank Park (Cullen, J., 2014).



Figure 7: Peter Chassereau's *Plan of York*, 1750

At West Bank Park, he continued his groundbreaking work and it became known as the 'Kew of the North'.

During this phase, the site also hosted a House of Correction located to the south-west.

'This edifice was designed by Mr. Peter Atkinson, of York, and erected by order of the magistrates of the city and ainsty... The new prison is surrounded with a high brick wall, enclosing the several erections, nearly in the centre of an open and spacious area. The outer entrance is by a neat porter's lodge; and this, are chiefly formed of white bricks.'

One of these is a neat and commodious octagonal erection, entirely for the residence of the governor; excepting a room in the second story, which has been very neatly fitted as a chapel... From this chapel, there are doors and open galleries into the other three buildings; every one of which forms two distinct prisons; and each prison comprises a day-room, a work-room, and a solitary cell on the ground floor, from which a flight of stone cells leads to four lodging -rooms above... the prisons are all uniform, comprising together, twenty-four lodging-rooms, containing thirty beds... To every prison, is a distinct yard, neatly flagged...

The area round those prisons, yards, &c., is neatly cultivated as a garden; and the appearance of the whole, is superior to most places of the kind.'

(Hargrove, 1818).

It was completed in 1814, however, by 1839 the House of Correction, Lady Hewley's Hospital, and Backhouse Nursery's land was acquired by the York and North Midland Railway Company (YNMRC).

Lauded Victorian artist William Etty (1787-1849) passionately described the landscape (Figure 8), before the construction of the railway.

'What a lovely walk it used to be from Micklegate Bar along the Walls to North-Street Postern: ancient fortifications, grey battlements, verdant fields, and smiling gardens on either hand; finished in grand perspective by our noble Cathedral in one of the finest points of view. Go and look what it is now! And for what have the Walls been broken? Absolutely without any real necessity: as it is now, I believe, generally allowed. I am informed that the imminent Engineer, Stephenson, himself declared it unnecessary; and advised against it; I am sorry to say, ineffectually. - The mixture of dwelling-houses and picturesque garden-ground within the Walls reminded me of Rome. - Altera Roma, I used to think with complacency, as I passed along' (Gilchrist, 1855).

By the late 1830's to the early 1840's York and most of England was immersed in a period known as 'Railway Mania' (Table 3).

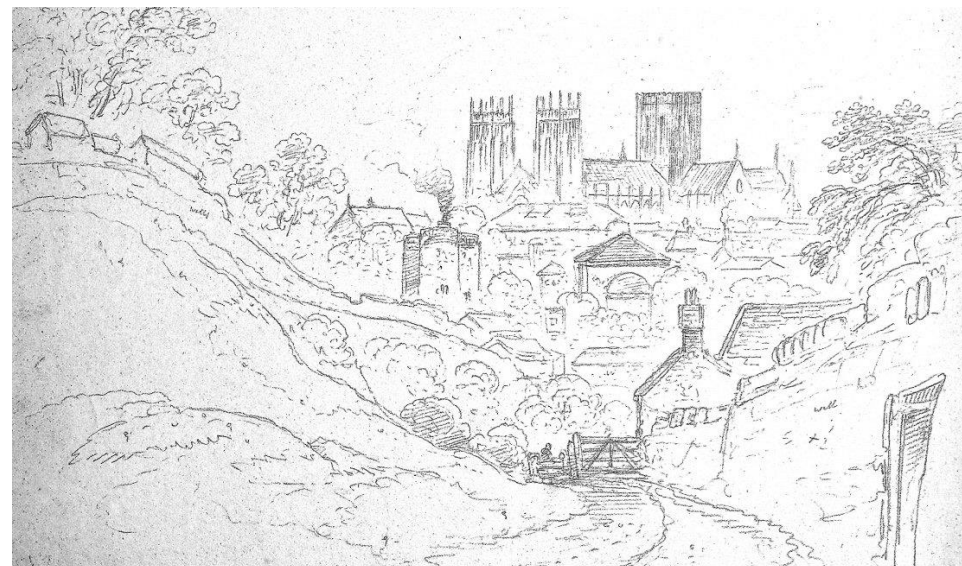


Figure 8: Sketch of from Toft Green by George Nicholson

Date	Railway Development	Significance
1560	Isolated wooden wagon ways (invention originated in Germany and exported to the United Kingdom through mining industry). Early examples include: Caldbeck, Cumbria; Prescott Hall, Liverpool.	These were usually located close to coal mines.
1600+	Isolated wooden wagon ways became more connected, operated by small private rail firms. These include: Wollaton Wagonway, Nottinghamshire, Tanfield Wagonway, Durham.	Expansion and connection between locations- the 1798 Lake Lock Rail Road in Wakefield was the first public railway in the world.
1800+	Advances in Railway technology, infrastructure and station design are made, due to rapid expansion which peaked between 1830-1840 - 'Railway Mania'.	A Golden age of railways and industrial expansion, leading to advances in steam power, locomotion design, station design, rail/line engineering, rail companies created that were expanded and amalgamated, more lines constructed. This

Date	Railway Development	Significance
		was experimental and inventive.
1914	During WW1 rail network was brought under government control.	Advantages of amalgamation noted.
1923	Rail network brought under the control of the 'big four'.	The Great Western Railway; London and North Eastern Railway; London, Midland and Scottish Railway; Southern Railway.
1920's-1940's	Growth and government investment in road networks and underspending by the 'big four'. Public preference for road travel was increasing. The management of the 'big four' amalgamated during WW2.	War, underinvestment and neglect led to the railway networks slow demise.
1948	The 'big four' railways were nationalised to form British Railways.	Post war period Transport Act 1947; nationalisation of the railways to improve service for all.
1994	Privatisation of the Rail network	

Table 3: Summary of Key Dates in the History of Railway Infrastructure (focus period in blue)



'Railway Mania'

Between 1830 and 1840, there was increased construction of railway stations, driven by new developments in steam train, line, and engineering technologies.

Liverpool Crown Street (Figure 9) was the first intercity railway passenger station (Table 5), designed by George Stephenson, a British engineer referred to as the 'Father of Railways' for his steadfast dedication to steam engine design and the infrastructure required to support its ever-developing needs. There were technological advances in steam-powered transportation that on many occasions, quickly outgrew the existing rail frameworks.

Figure 9: Crown Street Station Unknown - Tomlinson, William Weaver, 1858-1916 (1915) The North Eastern Railway; its rise and development, plate XVII, facing p. 250

Nearly a decade after the opening of the passenger station at Liverpool Crown Street (Table 5) in 1839, York had opened its own temporary wooden station, constructed due to weather delays slowing up progress on the permanent one. The temporary station comprised of two rooms, one for the company's secretary and one for the booking clerk (Hoole, 1983). Its opening, on 29th May, was a cause of great celebration within the City of York and the wider hinterlands.

“The train destined to convey the party to Milford and back was in readiness at the appointed hour; and consisted of nineteen carriages and two engines, in the following order: -the "Lowther" engine and its tender, 1 third class carriage for the band, 7 second class carriages, 2 third class, 1 second class, 5 first class, 2 second class, 1 third class, and the "Leeds of York" engine with its tender.

The tickets admitting to seats for the trip distinguished by their colour the several classes of carriages to which the holders were entitled; and through the admirable arrangements but a very few minutes were consumed in taking places; and all was speedily ready for the start, of which a preliminary notice was given by the ringing of a bell, and at the moment of creeping into motion by the piercing whistle of each engine. The huge snake-like body was then seen making way with an imperceptibly accelerated speed, and stealing away under the broad arch of the Holgate-lane bridge was soon lost to the sight of the crowds who thronged the station, the adjacent bar walls, and the ramparts, while the gay travelers experienced the exciting swiftness, till they were borne along with speed of the race-horse past the admiring spectators that still for many a mile thronged the line.

The number of passengers was about 400, including a considerable number of the fairer sex. Many, however, of those who had accompanied the procession to the station contented themselves with witnessing the start, not venturing to join in the formidable excursion. But the precautions that had been taken were such as to prevent not only accidents but even the appearance of danger; and the most timorous may ride in conscious security. The rails upon the whole line had been carefully swept, to remove all impediments; and every possible care and forethought had been exercised by Mr. Carey, the resident engineer, to whose zealous and in indefatigable pains the auspicious and successful performance of the journey may be fairly attributed, and to whom the warmest thanks and highest praise are due”. (The Opening of the Line, York Gazette 29th May, 1839).

The temporary station at Queens Street in York functioned until the permanent station, York Old Railway, opened 20 months later at Toft Green (Table 4).

Date	Name	Company	Where	Engineer	Architect	Significance
1839 30th May	Temporary Wooden Building (Quick, 2009)	York and North Midland Railway	Queen Street	Thomas Cabrey	George Townsend	First Railway Station in York.
1841 4th January	York Old Railway Station	York and North Midland Railway	Junctions of: Toft Green, Tanner Row, Station Rise	Thomas Cabrey	George Townsend	First Railway Station with an incorporated Hotel (Pevsner & Neave, 1972).
1877 25th June	York Railway Station	North Eastern Railway	Station Road	Thomas Elliot Harrison	Thomas Prosser, Benjamin Burley*, William Peachy	At that time, it was the largest station in the world (Sheffield Daily Telegraph, 1877).

Table 4: York Railway Station Chronology

George Hudson (1800-1871) Rise to Power



Born in the rural village of Howsham to the north of York, George Hudson was one of a family of 10 children of parents John, a tenant farmer (1756-1808) and Elizabeth Ruston (1768-1806); the Hudsons being a well known and respected extensive local family. His father John was the Constable of the Wapentake of Buckrose and this role and that of head of the family passed onto John Hudson, the eldest of the family, when George was 8 years old. When he was 15, George left Howsham, and became an apprentice draper in Goodramgate, York, becoming a partner of the firm in 1821. Hudson married Elizabeth Nicholson and when 27, George was bequeathed approx £30 000 by his wealthy great uncle, Matthew Bottril. During the 1830's, George became firmly embedded in York society, through involvement with charities and the local Conservative party. In 1833, Hudson helped establish the York Union Bank, then in 1835, George was made treasurer of the newly formed York and North Midland Railway, later becoming the largest shareholder (Bailey, 1995). 'Railway mania was driven by profit, and Hudson was a promoter who aimed to make York the premier railway city of the north of England (Burton, 1992).

- Known as the 'Railway King' due to his pivotal role in linking the railway network, from London to Edinburgh, via York. Was a promoter of York and the railway, insisting the city walls were breached, enabling the line to pass through to the centre the ancient city, showcasing its ancient landmarks.

- Lord Mayor of York (1837-1839) and (1846-1847). Fell out of favour due to accusations of financial wrongdoing

YORK OLD RAILWAY 1841

The four key principles that introduced the age of the railways were: mechanical traction on all trains, more elaborate civil engineering works than before, and complete control of traction and traffic and speed (Biddle, 1990). Engineers such as George Stephenson (1771-1848) 'The Father of Railways' would oversee the construction of lines due to their thorough knowledge of the engine and its line requirements.

George Hudson, chairman of the YNMR, disagreed with Robert Stephenson over the final location of the new station. The first temporary station on Queen Street lay just outside the City Walls, but Hudson was determined to have the new station inside the city walls, and so in 1840, the city walls were breached to enable the tracks to be laid. Other stations such as Liverpool Crown Street had already opened, closed, and relocated prior to this time- due in part to an increased demand for city central locations by the influx of passengers and their needs. Alighting the train at the city fringes before travelling the remainder of the trip to the city by horse and cart, was not desirable. Railways Stations which were traditionally located on the fringes of a city to be closer to goods and coal yards, were proving inadequate for commuters.

British Railway Station Chronology 1830-1841

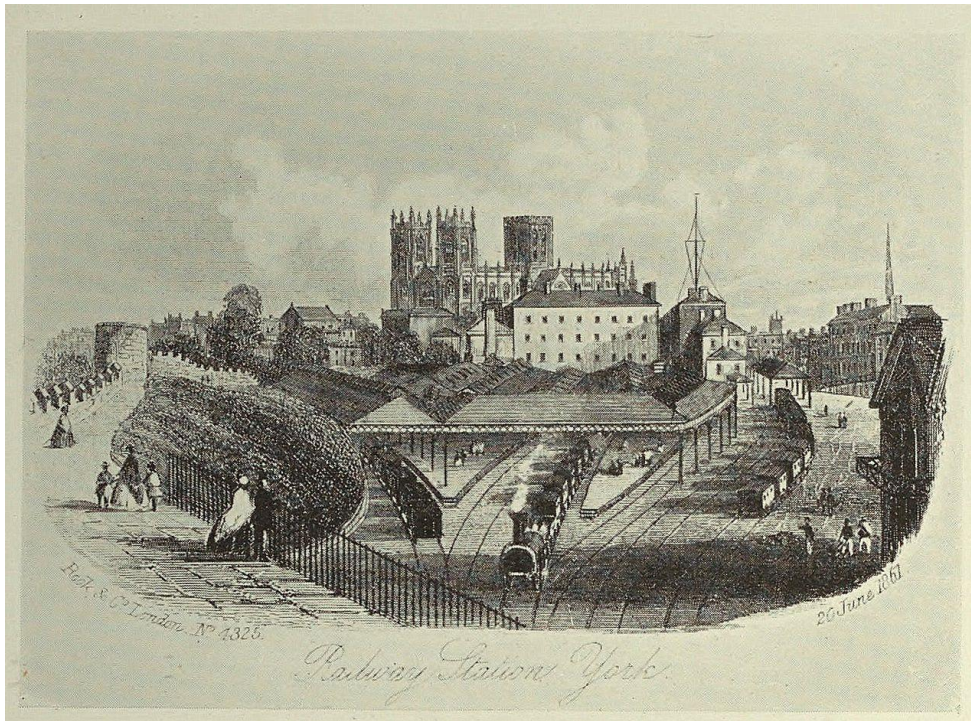
Date	Name	Company	Where	Engineer	Architect	Significance
1830	Liverpool Crown Street	Liverpool and Manchester Railway	Liverpool	George Stephenson	John Foster Jr?	World's first intercity railway passenger station
1836	Liverpool Lime Street	Liverpool and Manchester Railway	Liverpool		John Cunningham, Arthur Holme, John Foster Jr.	Oldest grand mainline station still operational in the World.
1837	Euston	London and Birmingham	London	William Cubitt	Phillip Hardwick, Charles Fox	First example of an iron truss roof. Main Entrance had a portico- Euston Arch. First railway hotel in London.
Post 1838	Preston I	North Union	Preston			
1838	Nine Elms	London and Southampton	London		Sir William Tite	

Date	Name	Company	Where	Engineer	Architect	Significance
1838	Birmingham Curzon Street	London and Birmingham	Birmingham	Charles Fox	Phillip Hardwick, Joseph Franklin	Former station entrance remains as a Grade I monumental railway architecture. To be incorporated into new HS2 station buildings.
1839	London Bridge I	London and Croydon	London	J. Gibbs		Oldest London terminus still in operation.
1840	Bristol	Great Western Railway	Bristol	I.K Brunel		First railway and station designed by Brunel. Built to house Brunel's broad-gauge railway.
1840	Bath	Great Western Railway	Bath	I.K Brunel		Asymmetrical Tudor style building 'sympathetically styled'.
1840	Derby Tri Junct (Tripartite)	North Midland & Others		Robert Stephenson	Francis Thompson	
1841	York I	York and North Midland Railway	York	Thomas Cabrey?	George Townsend	First Railway Station with an incorporated Hotel.
1841	Brighton I	London and Brighton	London	Sir John Rennie	David Macotta J.U. Rastrick	Large-scale excavations works were required to create a good gradient from Patcham Tunnel.

Table 5: British Railway Station Chronology, from Biddle, 1986 (York Station highlighted in blue)

The construction of the York Old Railway, completed in 1841, was a significant undertaking, with both local support and condemnation. For example, William Etty, describes the site after the construction of the railway.

“What is it now? Altera inferna more like! We walk side by side with trains of interesting coal-wagons; have the satisfaction of being smoked by the passing Engines, and the pleasure of hearing the music, -not of the robin, the blackbird, and the thrush, - but (the whistle) of the train from Leeds. The battering rams of a Railway Company have laid thy honours, Old Ebor, in the dust! Green Mounds and Walls which have stood thy friends in the hour of danger, when hostile armies threatened, are now not worth a thought. Those who ought to have been their guardians have been the first to let in the enemy. They have destroyed those beautiful gardens and that magnificent beech-tree!” (Gilchrist, 1855).



In contrast, the excitement and potential prosperity that this new railway offered, as displayed during its public opening on the 29th of May was monumental (The Opening of the Line, York Gazette 29th May, 1839).

The construction of the York Old Railway began in February 1839 and was completed by the 4th of January 1841 (Figure 10). An excellent and succinct description of the station is found at the online site: engineering-timelines.com.

Figure 9: York Station, 1861.

“The station was built as the terminus of the York & North Midland Railway, engineered by George Stephenson. Company chairman was George Hudson. This line connected York to Leeds, and it was closely followed by the construction of the Great North of England Railway, connecting York to Darlington and sharing the terminus. Other lines soon followed and York became a major route from London to the north.

The train shed was designed by Cabry, who was a member of Stephenson's team. It has cast iron columns, arched cast girders and wrought iron trusses in three bays. These bore a strong resemblance to old Euston station in London, which isn't surprising as Euston was the starting point for the journey north at the time. Cabry looked around at other stations before making his design for York. A small portion of the train shed remains but it is not normally accessible to the public. The range of offices (and a hotel) that served the station were designed by local architect George Andrews. They housed both station functions and the administration of the railway companies. They are still standing and can be seen in Toft Green.

To bring the rail tracks inside the city walls, the walls had to be breached. Several arches were made. Two large pointed arches can be seen in Queen Street. The most southerly was made first and carried the footpath on the wall over the YNMR track. It spans some 20m. Cabry produced a design for it that was rejected in favour of one by Andrews. Andrews subsequently designed the second arch to serve the station yard. A third was made near York's Lendal Bridge for access to the coal wharves on the River Ouse.

The station was replaced by the present York Station in 1877, located on a new site outside the walls.” (2020, engineering-timelines.com).

For a more in depth assessment and study of the York Old Station refer to:

- FAS, (2006), *Old Railway Station, York. Historic Buildings Assessment*
- Fawcett, B. (2011), *George Townsend Andrews of York 'The Railway Architect'*.
- Trotti, A.M. & Corbett, G.S. (1998), *Historical Report on the Workshop and Warehouses, Toft Green*

1841-1968

After the station opened in 1841, it underwent a series of remodelling and extensions to accommodate the growing demands placed upon its infrastructure. It could no longer effectively function as a passenger/goods station due its terminus design. There was a requirement for trains to pass north-east through the city towards Scarborough, whose line opened in 1845- so by 1877, a new station had opened on the opposite side of the city walls. The old station tracks continued to be used as carriage storage space, whilst the station buildings were converted into offices.

Demolition of the site started in 1967 to make way for a new phase of use (Figure 11).

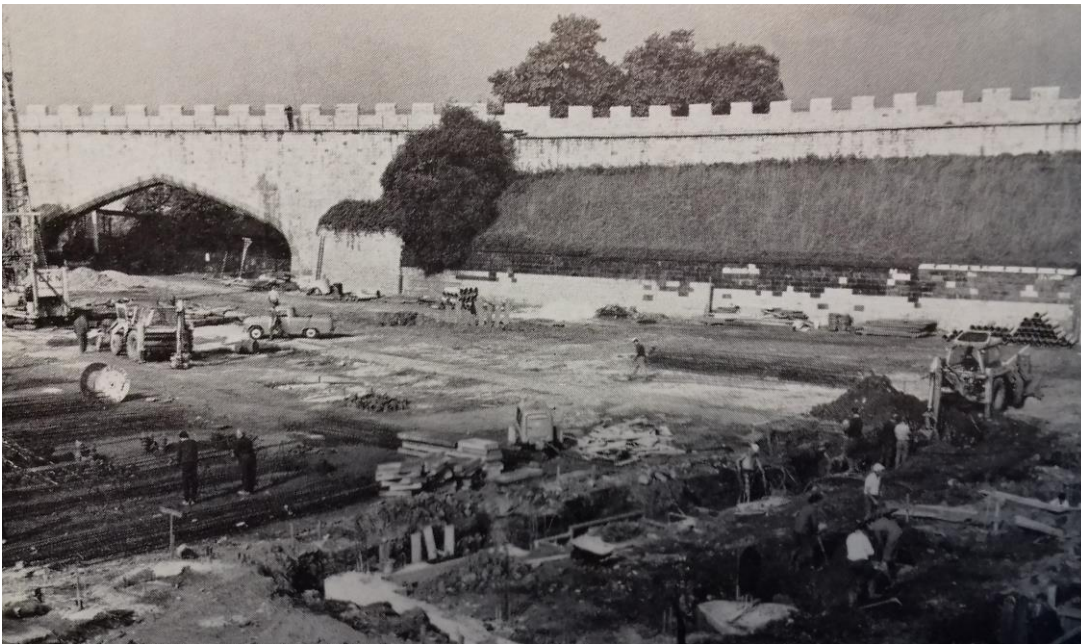


Figure 10: Construction works for Hudson House circa 1967 from British Rail, Eastern Region (1968)
Hudson House York (Commemorative Pamphlet)

Completed in 1968, Hudson House was built to accommodate 1,200 staff, which drew together a team of railway staff from York, London, Doncaster and Peterborough (British Rail, Eastern Region, 1968). Hudson House was designed by the British Railways Architect S. Hardy and was approved by the Royal Fine Arts Commission. It was constructed from concrete in the style of the 1950-1970's brutalist architectural movement, and was formally opened on the 7th November 1968 by Sir Henry Johnson (Chairman of the British Railways Board). It consisted of four blocks of offices, set out in a pinwheel, around a central courtyard comprising of two four storey blocks and two six storey blocks to an approximate size of 134,000 square feet (British Rail, Eastern Region, 1968; *Hudson House York*, Commemorative Pamphlet).

METHODOLOGY



Figure 11: Archaeological recording

Archaeological investigations, undertaken at Hudson House, involved three stages of works as agreed with the City of York Archaeologist: trial trenches (January, 2017), an area of strip, map and recording (February-March, 2018) and an archaeological watching brief (July-November 2018).

Two trial trenches were excavated to assess the archaeological potential and associated depths. Both test pits revealed stratigraphic deposits from the 1841 York Old Railway, differing geological composition, and truncation.

Box drains were observed at depth of approximately 0.20-1.00m below the made-up ground of the car park surface.

The trial trenches suggested that archaeological levels for deposits fluctuated and truncation may be problematic in the car park area.

Previous archaeological investigations within the vicinity suggested that earlier archaeological deposits could remain undisturbed at a similar level to later railway drainage systems (Onsite, 2013). A programme of strip, map and record was undertaken in the car park area (Area A). The area was machine levelled down to the first archaeological horizon which had structural evidence relating to the 1841 York Old Railway Station; located at a depth of approximately 0.55m below ground level.

All features observed were structural and formed part of the original 1841 Old York Railway, or post 1841 utility trenches and structural extensions constructed during the station's further 125 years of use.

The final phase of work at the site involved a watching brief undertaken during the active demolition phase. Machine stripping in-between the ring beam foundations and piles of Hudson House revealed 1841 Old Railway York features that were truncated in places, as well as isolated areas of late Romano-British features and associated alluvial deposit.

The excavation primarily focused on the recording and identification of industrial archaeological features pertaining to the 1841 York Old Railway.

Depths of machine excavation were, after the first horizon of archaeology, dictated by the demolition works and removal of below ground piles and footings associated with Hudson House.

Earlier deposits were not expected to be *in situ* due to years of remodelling and ground levelling, as observed in the results from the previous interventions.

The guidelines for archaeological excavation issued by the *Chartered Institute for Archaeologists* (2014) were adhered to throughout.

The strip, map and recording and watching brief was fulfilled in accordance with the following criteria: all ground works that intrude below the level of the topsoil (or other 'modern' made ground layers) have been completed; all necessary archaeological recording has been completed.

A back-acting mechanical excavator fitted with a toothless bucket was used for all excavations, to assist with the identification of archaeology. The hard-standing surface was initially cut with a mechanical saw and further broken with a mechanical pecker.

One residual isolated fragment of human skull was encountered.

The Roman deposits were compact and sticky, therefore to aid finds retrieval, all these deposits were coarse wet sieved using a 4mm mesh.

The local science advisor for Historic England was consulted regarding the alluvial deposit with associated Romano-British deposits. It was suggested that a programme of monolith and auguring sampling be undertaken to assist interpretation.

Active results during excavation were shared with the City of York Archaeologist, who attended site on multiple occasions, to monitor progress.

Jane McComish of the York Archaeological Trust attended site for *in situ* identification of ceramic building materials and large stone artefacts for consultation of their potential significance.

Paul Durdin and Steve Timms undertook the 3D photography of a box drain, alluvial and Romano-British deposits, and the 19th century retaining wall respectively. All three images are available on Sketchfab and their links are included below.

Professor Martin Millet and Doctor Patrick Ottoway visited site to offer advice and information regarding the significance/interpretation of the Romano-British deposits.

Nick Beilby attended site to support with the identification of the 19th century railway structures. Further meetings were held with Nick Beilby and Ian Mackenzie during the post excavation phase. They identified features of railway structures, post-medieval metal artefacts, and imparted railway terminology, functionality and processes.

A standard paper single context recording system was used to keep a document record of all archaeology encountered.

All of the archaeological features were sample excavated to the following criteria: pits 100%; post-holes 100%; linear structures (walls etc.) 20% to 100%.

All archaeological features were drawn and surveyed in plan as well as being photographed as appropriate using a minimum of 10-megapixel digital colour camera.

All archaeological finds were retained.

On completion of work, all records, photographs were catalogued in accordance with the *Institute for Archaeologists* guidance (2008).

No finds were identified as treasure trove.

John Carrott of the Palaeoecology Research Services Ltd was consulted during post-excavation regarding the retained deposits. An initial assessment was undertaken to assert potential and based upon this, a selection of samples underwent full assessment.

Specialist advice was consulted on all finds and samples as follows:

- Post-Roman Pottery: Dr Chris Cumberpatch
- Roman Pottery: Ian Rowlandson
- Samian Pottery: G. Monteil
- Flint: George Loffman of the York Archaeological Trust
- Animal bone: Ewan Chipping
- Environmental soil analysis: John Carrot of the Palaeoecology Research Services
- Metal objects and Conservation: Ian Panter at the York Archaeological Trust with assemblage assessment undertaken by Nicola Rogers
- Slag: Dr. Gerry Mc Donnell Archaeometals
- Small finds: Nicola Rogers
- Ceramic Building Materials and Stone: Jane McComish of the York Archaeological Trust
- Heavy Metal Sediment testing: Precision Decisions
- Mortar Assessment: Womersleys
- Glass: Dr Rose Broadly

STRATIGRAPHY

Table 6 represents a simple visual overview of the heavily truncated stratigraphy encountered.

It comprised of three distinct phases of remodelling:

- Deep piling and truncation during the 1960's for the construction Hudson House.
- Vast landscaping and remodelling to facilitate the construction of the 1841 York Old Railway Station and later use as a carriage storage space.
- Late Romano-British dump features which had survived, deeply sunk into alluvial flood deposits.

The natural superficial layers of the site, when encountered, consisted of sandy boulder clay and occasional glacial till.

Hudson House and Associated Car Park, Garden, Ponds and Walkways.	
Hudson House truncation and remodelling- shallow and deep foundations, piles, associated utilities and made-up ground.	
Brick foundations belonging to late 19 th – 20 th century ancillary structures and associated utilities; developed during the remodelling of the York Old Railway Station into a Carriage Storage Space.	
Heavy truncation and levelling of the site to support the construction of 1841 York Old Railway Station foundations, structures and drainage.	
Redeposited Romano-British 4-5 th century waste material situated at the fringes of alluvial deposits.	Isolated pockets of natural amongst heavily truncated made-up ground.
Alluvial Deposits.	

Table 6: Visual model of the stratigraphic narrative

EXCAVATION RESULTS

The strip, map and record of Area A and the watching brief in Area B revealed (Plans 1-2):

Residual prehistoric flint tools and flakes

- The natural flint is likely to be re-deposited due to glacial fluvial processes and retained within isolated Romano-British deposits.
- The worked flint dates from the Late Neolithic, however it is uncertain if they were residual or transferred within Victorian railway construction materials.

Late 4-5th century Romano-British features: some clustered around an alluvial deposit, others associated with thick black deposits

- A small number of isolated features dating to the later Romano-British period were present. These took the form of a pit, posthole, and amorphous deposits.
- All dated to the 4th-5th century and were associated with low intensity alluvial flooding into a pre-existing surface; possibly a terrace. Over time, the alluvial flood waters eventually sealed them.

- These features could suggest a period of land reclamation during flooding. Deposits consisting of mixed debris were dumped to shore-up the dry land from floodwaters. The posthole may have supported a submerged wooden structure, with discarded material dumped behind it for reinforcement.

Substantial features associated with the 1841 Old Railway York

- Departure Platform Foundations
- Stables
- Merchandise Station
- Box Drains
- Retaining Wall

Part 1: Appendix 1 and 2 Drawing Index, Feature Section and Plan Drawings.

Part 2: Context Index, Context Data and Specialist Reports.

Plan of Areas A and B



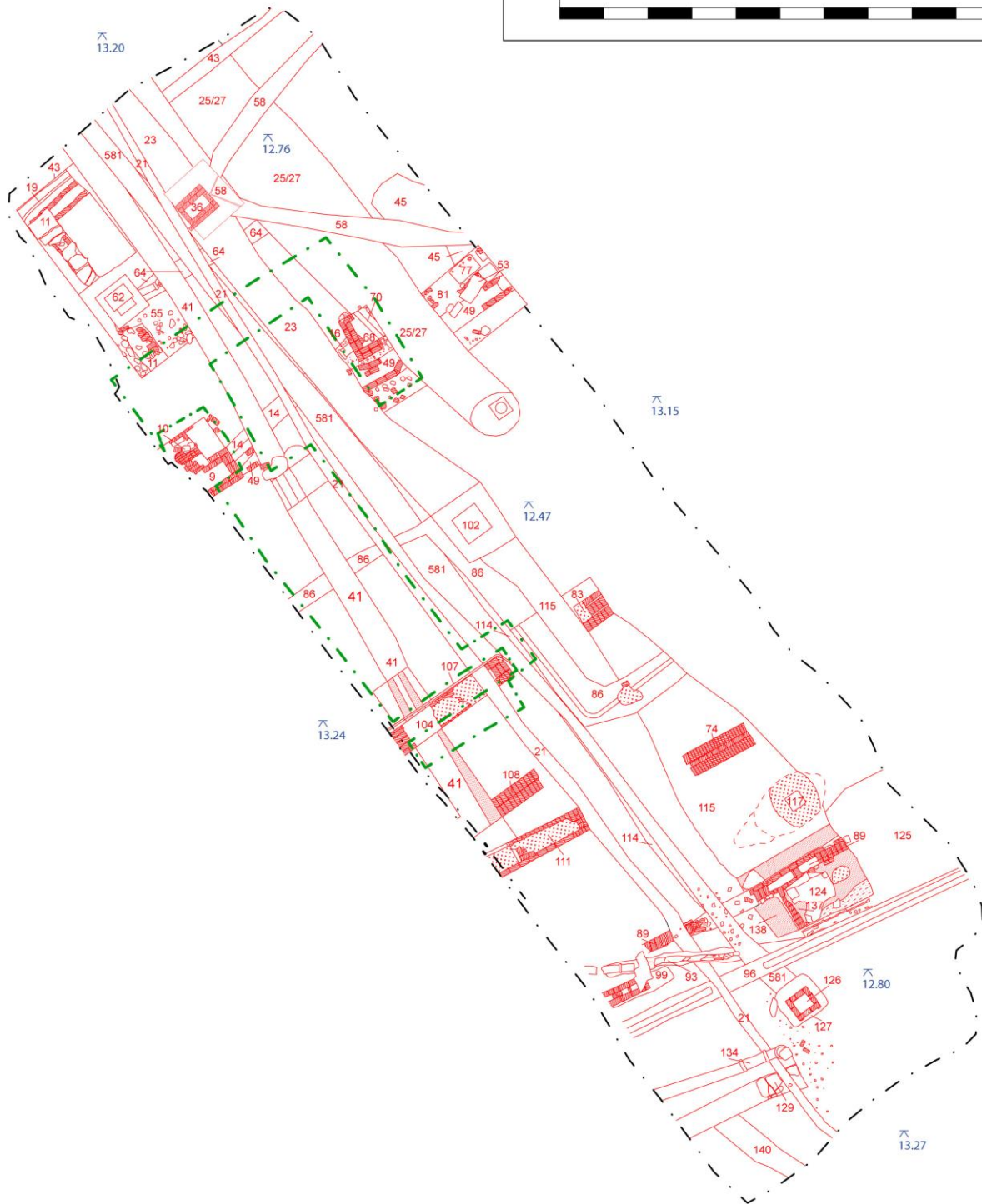
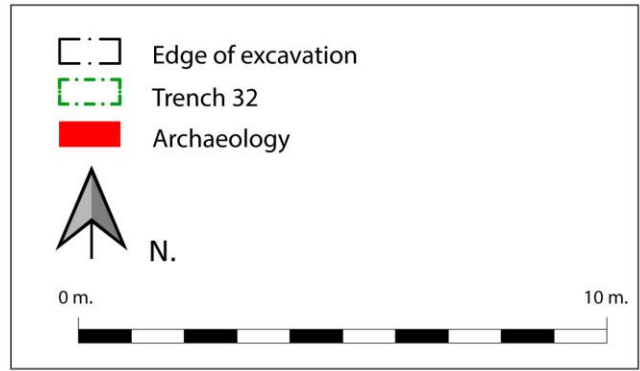
Plan 1: Archaeological features in Areas A and B1, B2, B3 and B4

Phased Plan of Areas A and B



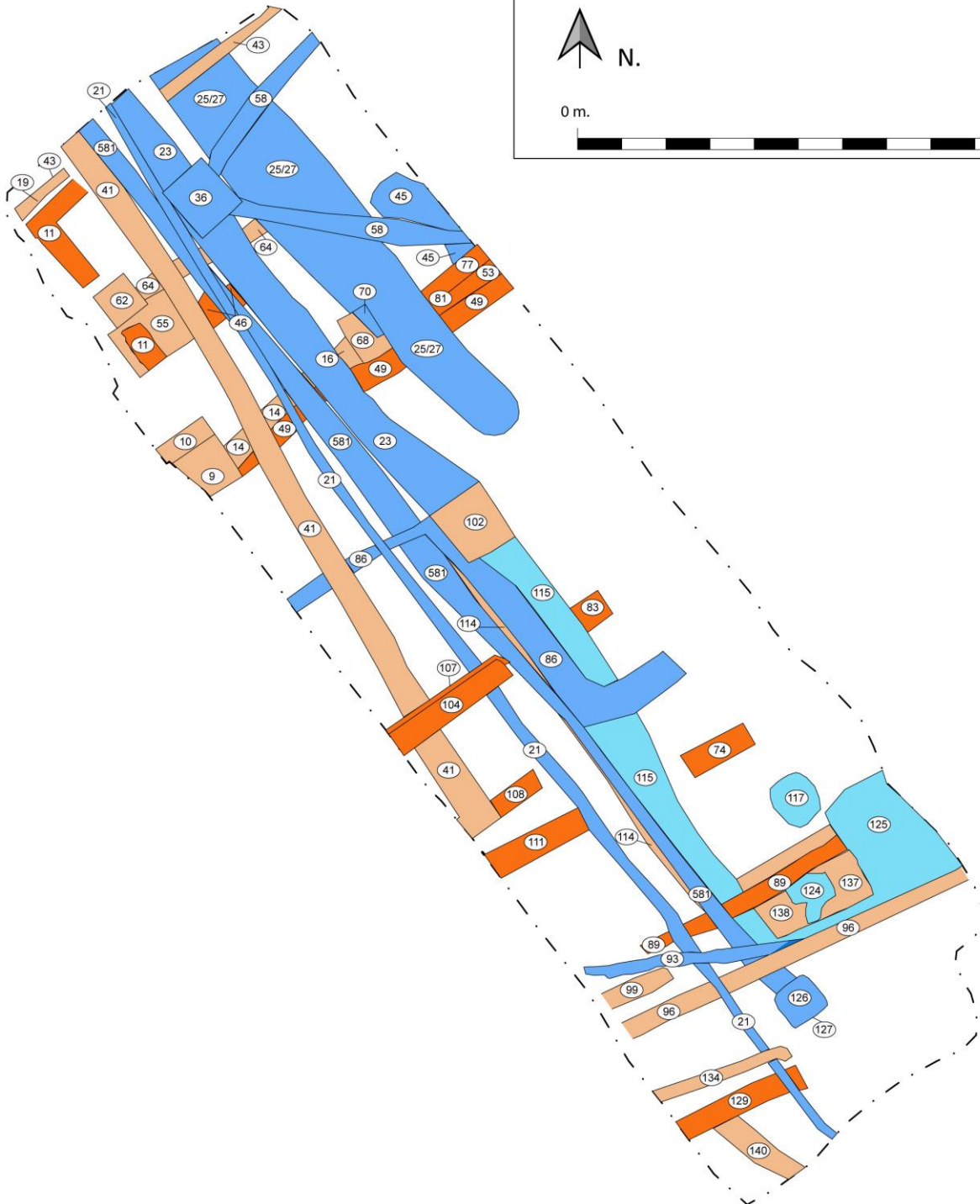
Plan 2: Phased Plan of Areas A and B

Plan of Area A



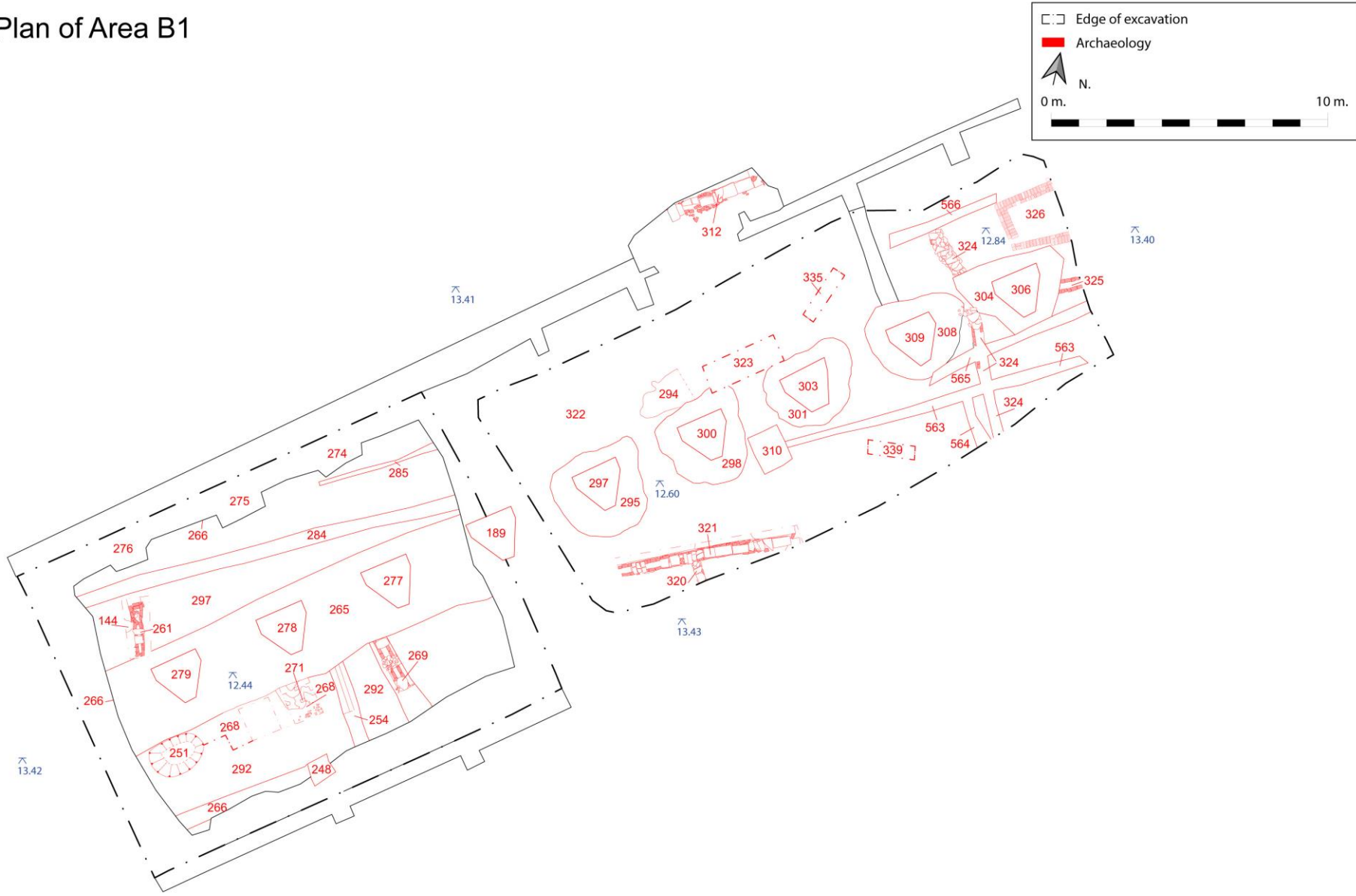
Plan 3: Plan of Area A

Phased Plan of Area A



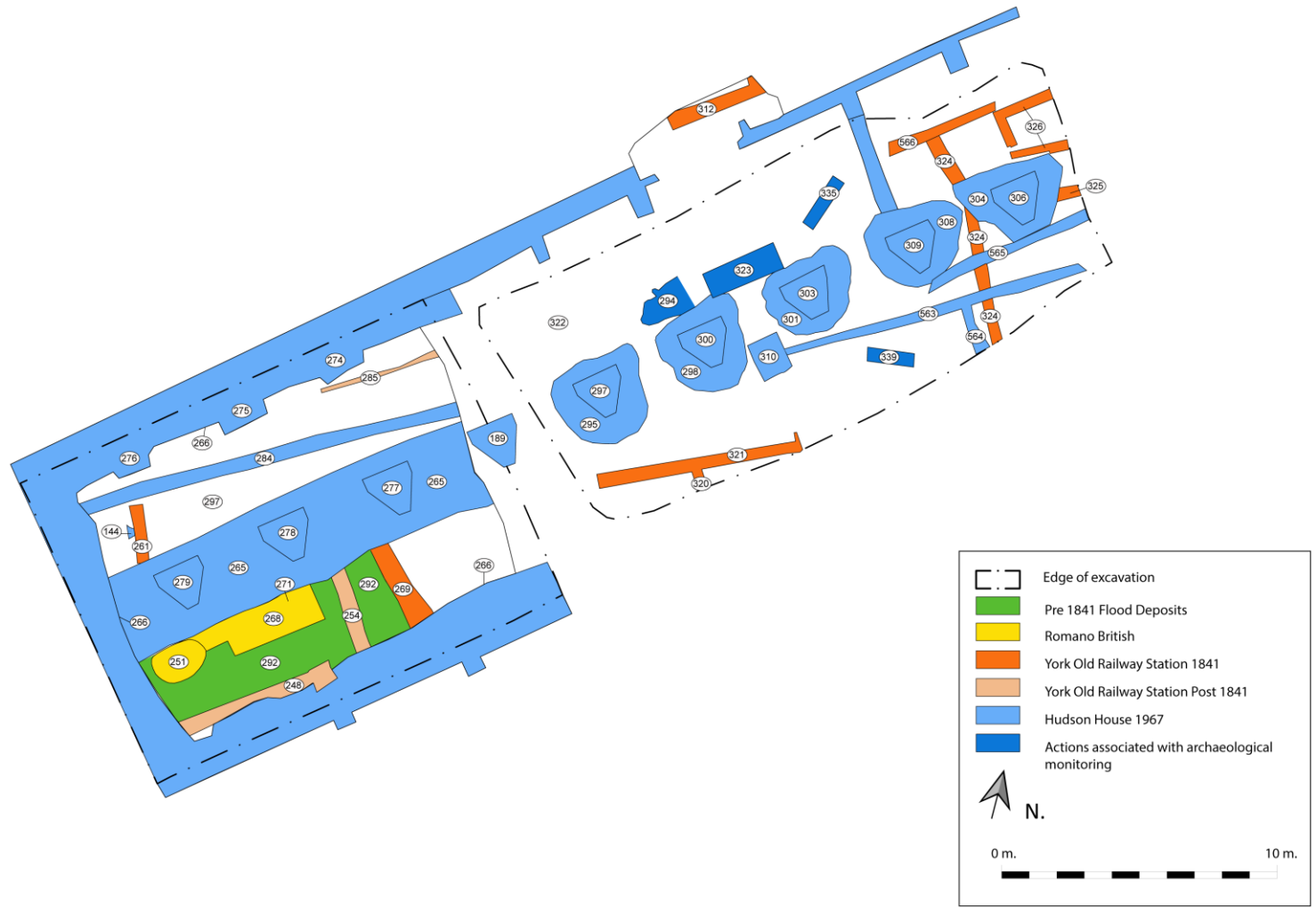
Plan 4: Phased Plan of Area A

Plan of Area B1



Plan 5: Plan of Area B1

Phased Plan of Area B1



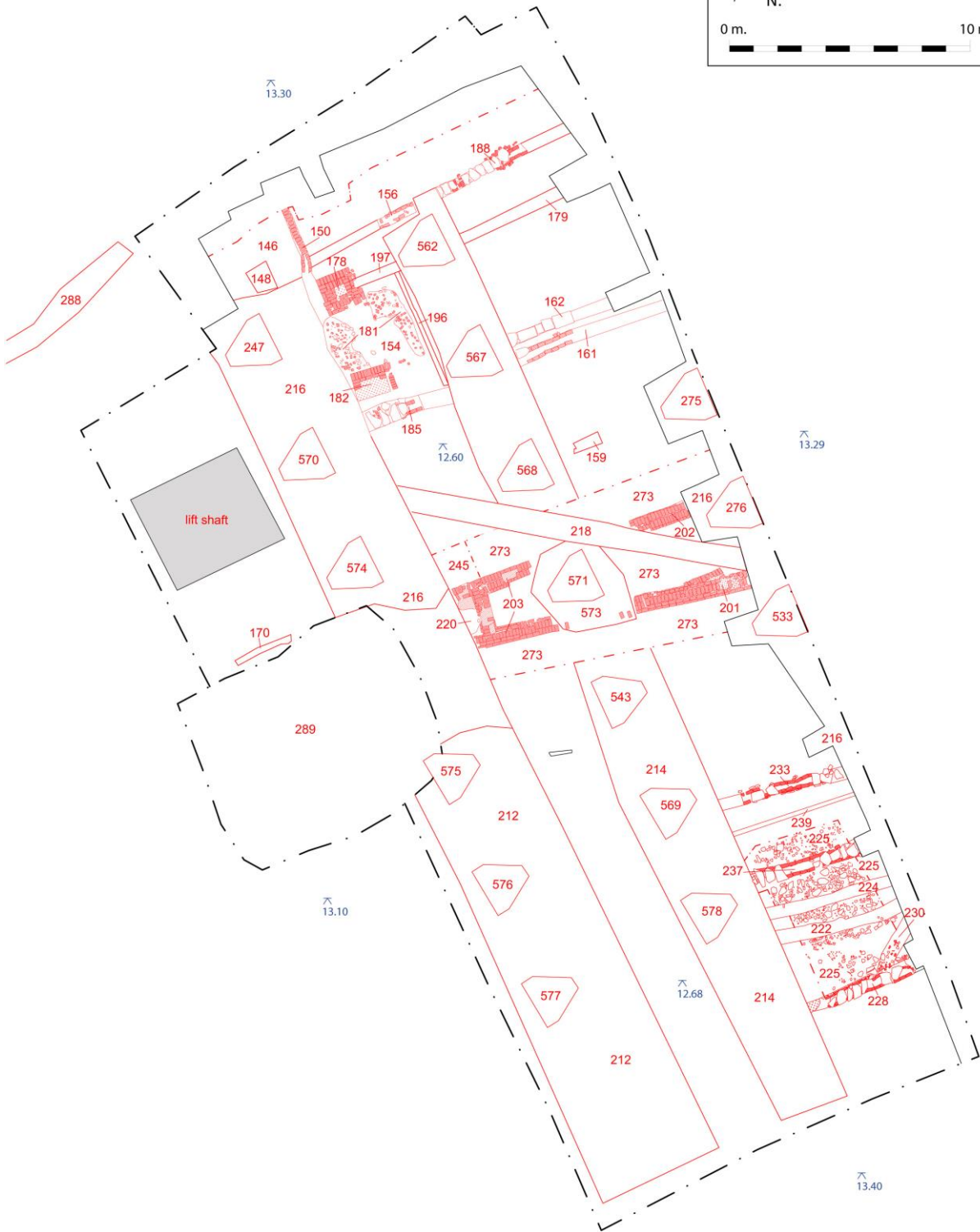
Plan 6: Phased Plan of Area B1

Plan of Area B2

□ Edge of excavation
■ Archaeology

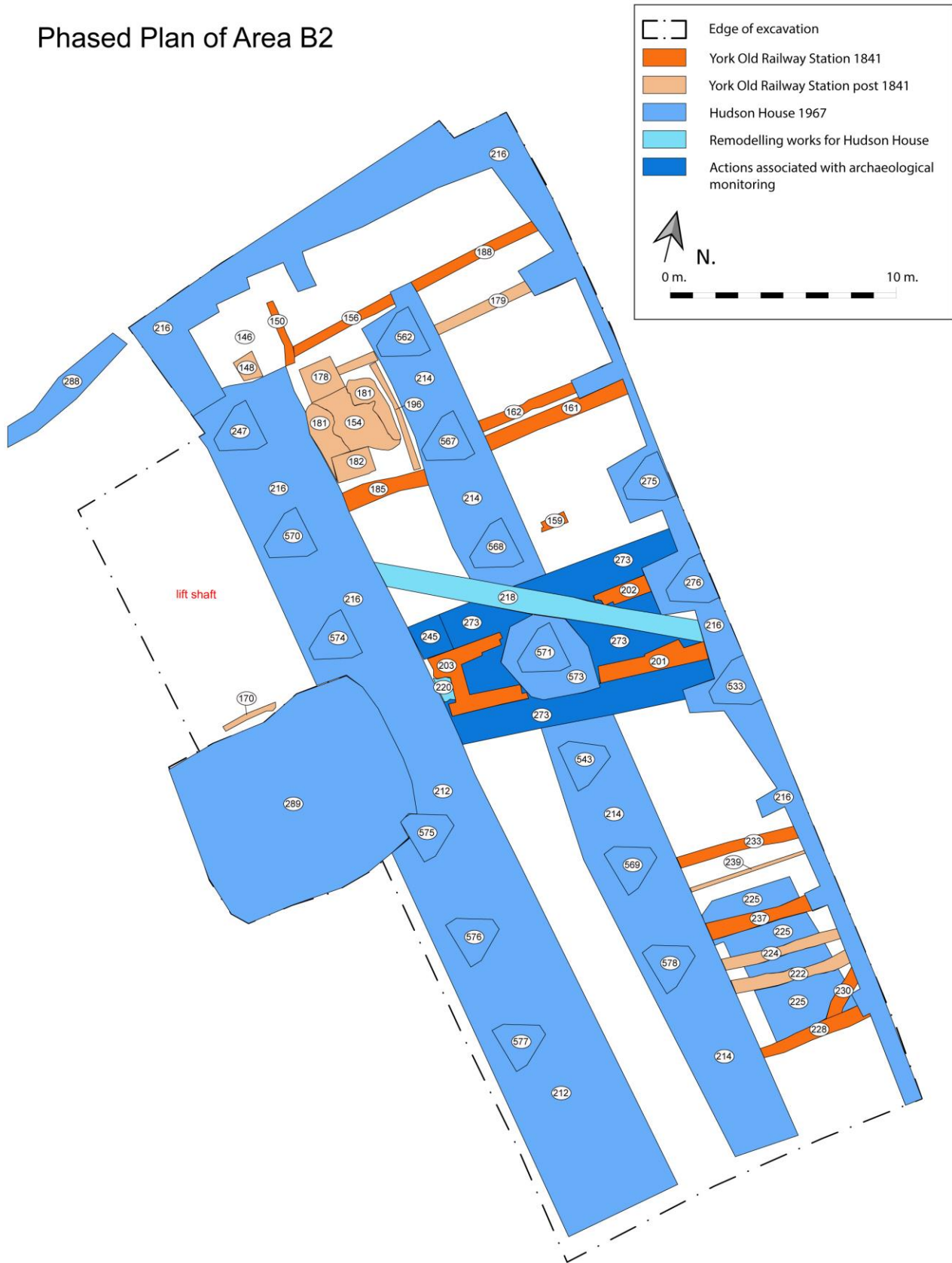
N.

0 m. 10 m.






Plan 7: Plan of Area B2


Phased Plan of Area B2




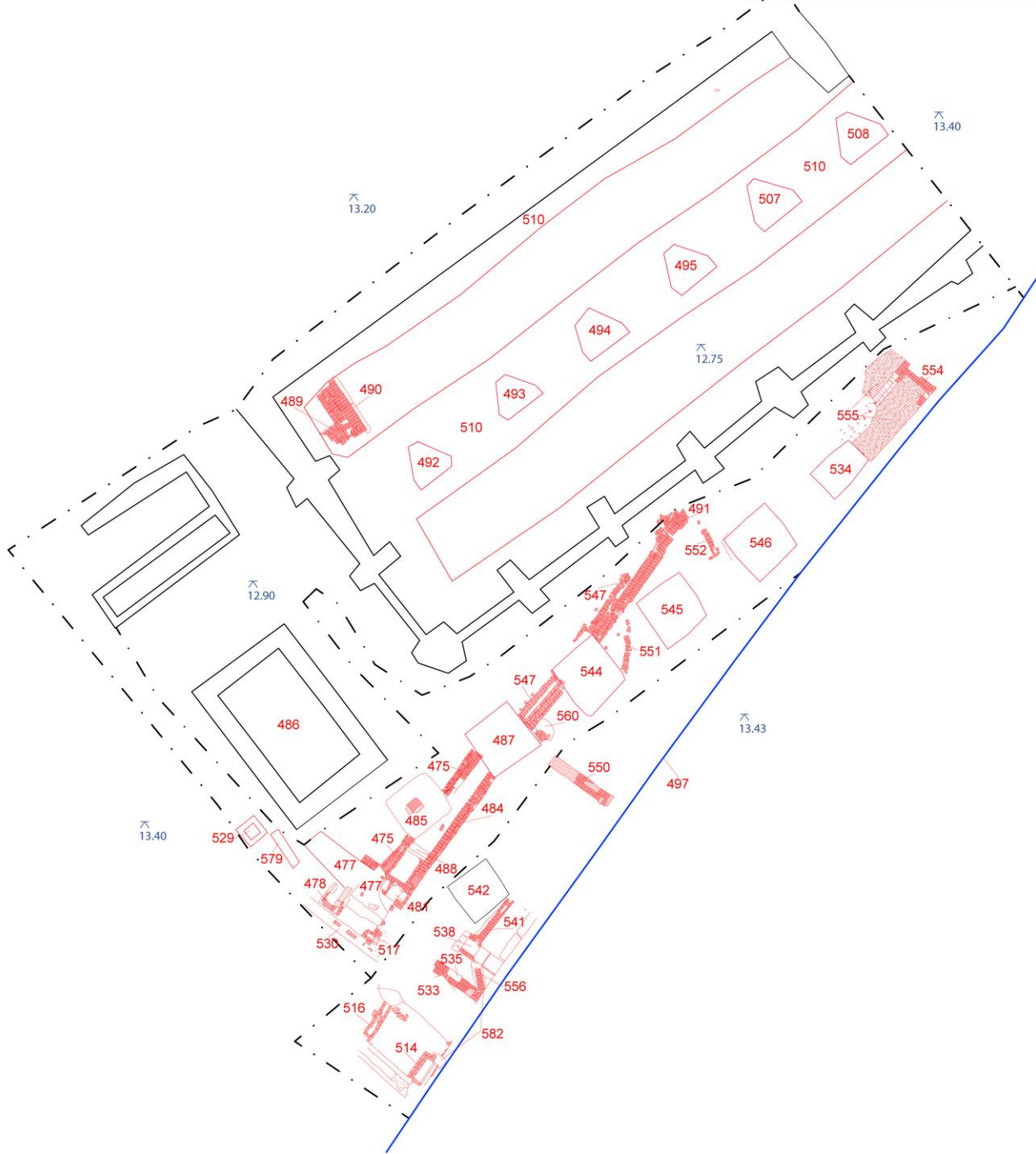
Plan 8: Phased Plan of Area B2

Plan of Area B3

-  Edge of excavation
-  C 19th Retaining Wall
-  Archaeology

 N.

0 m.  10 m.



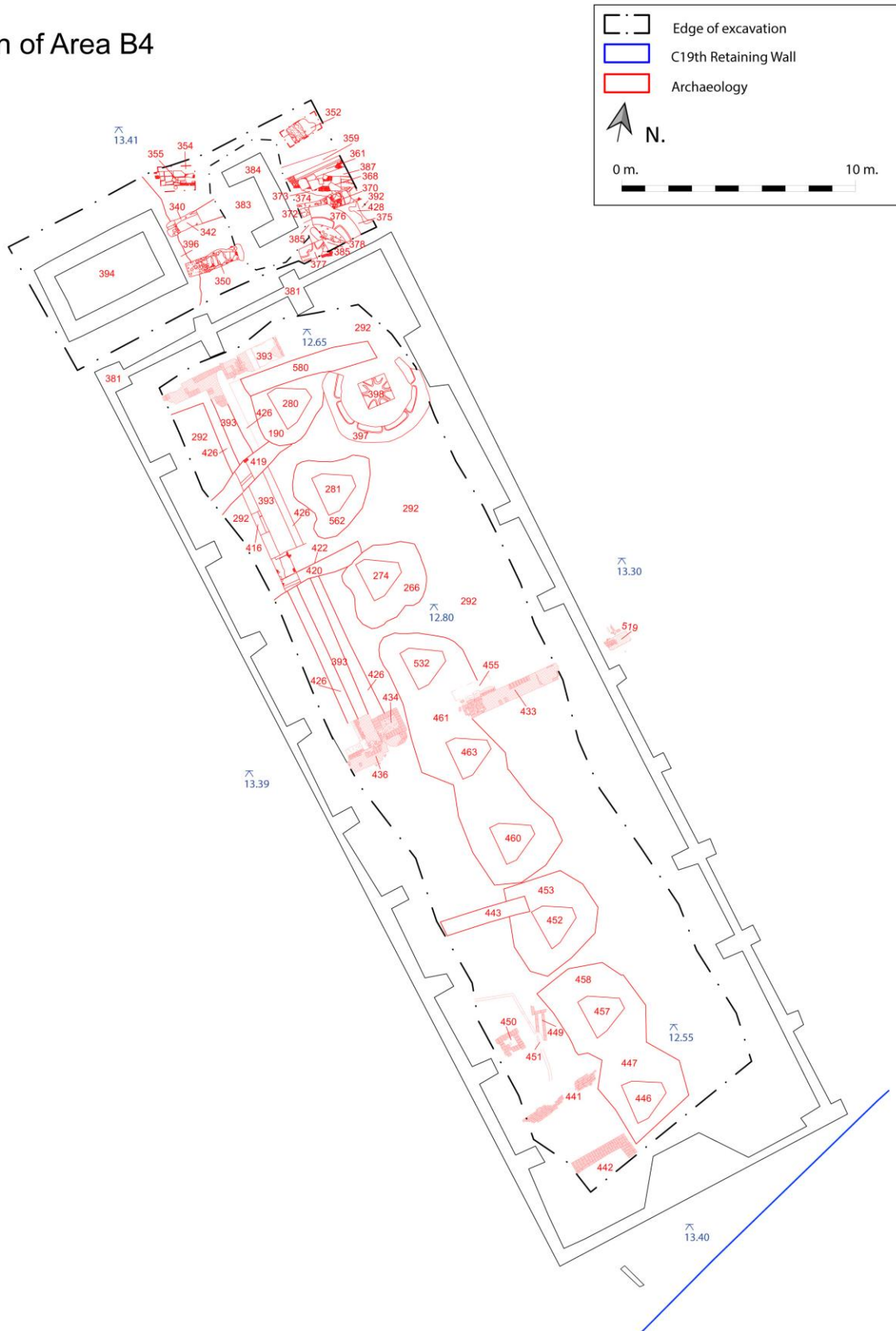
Plan 9: Plan of Area B3

Phased Plan of Area B3



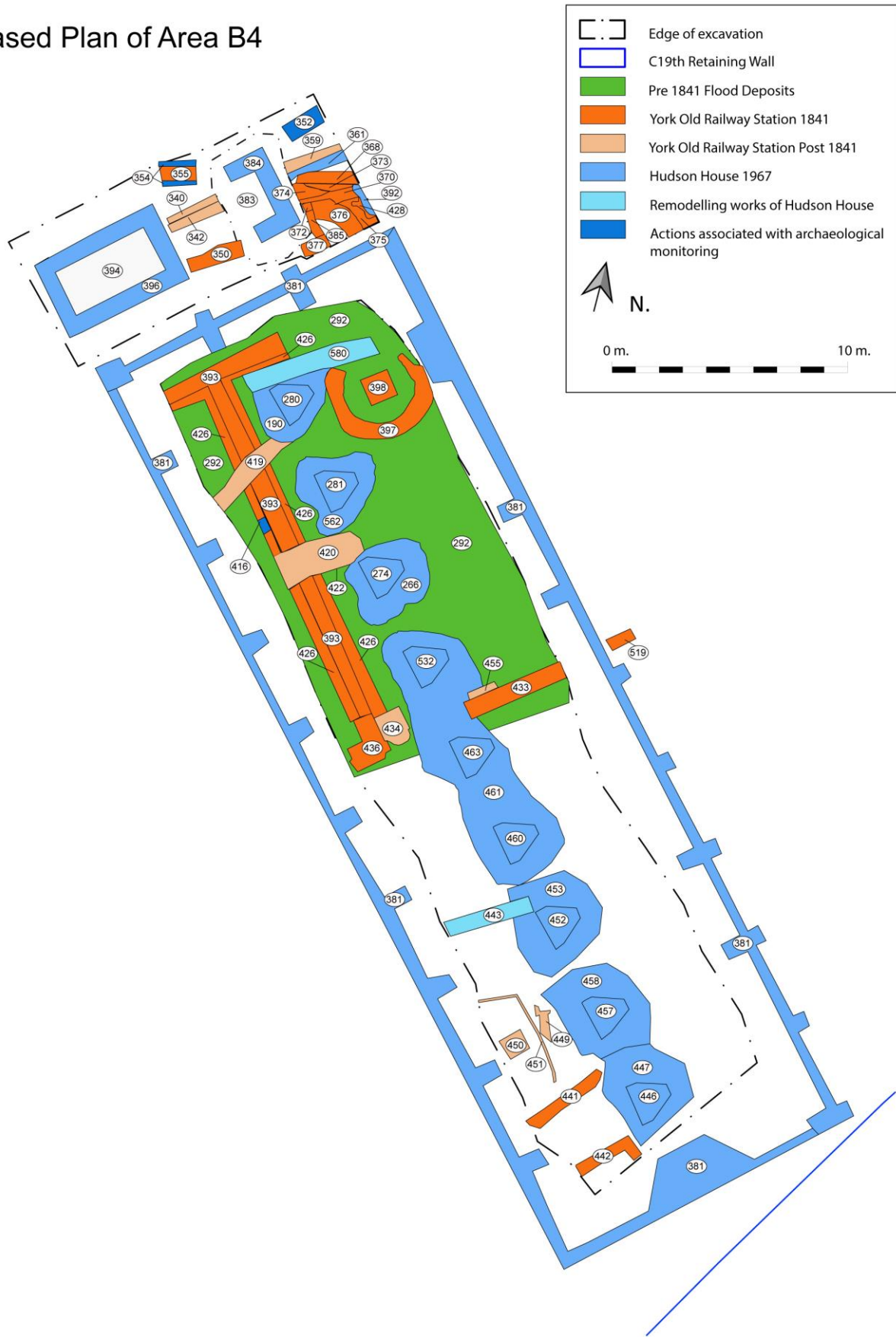
Plan 10: Phased Plan of Area B3

Plan of Area B4





Plan 11: Plan of Area B4



Phased Plan of Area B4




Plan 12: Phased Plan of Area B4




Identifier	Image	Results
<p>1841 York Old Railway</p> <p>Departure Platform</p> <p>Platform Foundations [74], [83], [104], (107), [108] [111], [201], [202], [203] and [326]</p> <p>Plans 3-4</p>	 <p>Figure 12: Platform Foundation wall [104] with attached metal water pipe, (107) with [108] and [111] all truncated by utility trench [41] facing SE</p> <p>40.41m of the 1841 departure platform footings were observed in both Area A (Structures [74], [83], (107), [108] and [111]) and Area B (Structures [201], [202], [203] and [326]), measuring a maximum 4.90m width and 1.87m minimum width at its terminus [326].</p> <p>In both areas the structures were sealed below made-up ground contexts (2) and (3) and had been heavily truncated by later utilities associated with the post 1841 phase of the Old Railway.</p>	<p>Within Area A, three brick structures [104], [108] and [111] ran parallel to each other and were aligned roughly NE/SW. [104] (Figure 13 foreground) was 3.13m long NE/SW, 0.61m wide and survived to a height of 0.59m (3 courses). The bottom course was laid in frogless red bricks, header bond, and stretcher on edge. The top two courses were laid in frogless red bricks, and stretcher bond with mortar visible across the exposed upper layer.</p> <p>The southern extent had been truncated by trench [41] for drainage pipe [20], and a modern water pipe truncated the northern extent. A metal water pipe (107) was attached to the western edge of the structure and was not disturbed by the service trenches.</p> <p>[108] (Figure 13 centre) was a single layer of frogless, red bricks that were 1.22m long, 0.46m wide and 0.11m high, laid directly on the natural clay, sand and cobbles, and running NE/SW. Laid in a standard Header Bond, the southern extent had been truncated by trench [41], a utility trench laid underneath the metal water pipe (107). Trench [41] was cut during the later 20th century phase of the York Old Railway.</p> <p>The construction of [111] (Figure 13 background) was similar to [104] but was 2.44m long NE/SW, 0.66m wide and 0.29m (3 courses) high.</p>


Identifier	Image	Results
<p data-bbox="188 260 365 331">1841 York Old Railway</p> <p data-bbox="188 384 320 456">Departure Platform</p> <p data-bbox="188 509 360 703">Platform Foundations [201], [202], [203] and Pile [571]</p> <p data-bbox="188 756 304 783">Plans 7-8</p>	 <p data-bbox="427 874 1218 938">Figure 13: Departure platform structures [201], [202] and [203] in Area B with pile [571] truncating its center</p>	<p data-bbox="1279 256 2083 408">The construction technique employed a mix of bonds, including Stretcher Bond on the facing edge of the easternmost footing [201] and English Bond on the facing edge of the westernmost footing [202].</p> <p data-bbox="1279 464 2092 536">The frogless red bricks of the structures were bonded with grey lime mortar.</p> <p data-bbox="1279 584 2069 655">The central extent of the platform footings had been truncated by pile [571] (Figure 13).</p> <p data-bbox="1279 711 2092 823">The southernmost 'H'-shaped portion of the platform footings [203] showing English Bond facing edge with metal pipe (107) work still attached. This metal pipe would have carried water (Figure 7).</p> <p data-bbox="1279 879 2080 991">The same metal water pipe (107) was initially observed in a section [104] of the departure platform uncovered during excavations in Area A (Figure 14).</p>
	<p data-bbox="416 1010 1252 1121">In Area B the exposed portion of the brick-built platform footings [201], [202] and [203] were over 5.40m long NE/SW and survived to a height of up to 0.25m (three courses).</p> <p data-bbox="416 1177 1240 1289">The individual walls which made up the structure, were between 0.62-0.86m wide. The platform tapered towards the southern extent ('H'-shaped [203]).</p>	<p data-bbox="1279 1042 2063 1153">Pipe (107) would carry water to specific points along the track to supply standpipes and water cranes, which would have been vital for the steam-powered engines.</p>



Identifier	Image	Results
<p>1841 York Old Railway</p> <p>Departure Platform</p> <p>Platform Foundations (107), [203] and Terminus [326]</p> <p>Plans 5-6</p>	 <p>Figure 14: 'H'-shaped section of Departure Platform foundations Structure [203] with metal water pipe (107) facing SE</p>	<p>The terminus [326] of the Departure Platform was observed 19.71m approximately to the south-west of the 'H'-shaped section [203] (Figure 15).</p> <p>One course of red frogless brick was exposed and was bound with grey mortar.</p> <p>Structure [326] measured 1.90m in length, 2.30m in width and had an exposed height of 0.08m (Figure 16).</p> <p>This layer of bricks had one row of stack bond soldiers topped with stack bond headers, partially along the interior elevations and exterior.</p>
	 <p>Figure 15: Departure Platform Terminus Structure [326] facing SE</p>	<p>The bricks appear to have been utilised to create a non-standard shape that tapers at its end, with the bricks positioned as appropriately as possible.</p>


Identifier	Image	Results
<p>1841 York Old Railway</p> <p>Monument ID MYO3719</p> <p>Railway Stables</p> <p>Railway Stable foundation walls [484], [491], [535], [547], [550] and [560]</p>	 <p data-bbox="445 842 904 871">Figure 16: facing section of [491] facing SE</p>	<p>The partially complete wall foundations of the external elevations of the 1841 stable block [484], [491] and [547] extended for approximately 19.25m aligned NW/SE parallel to [497] following the retaining wall's slight curved angle. There was evidence that the stable foundations were comprised of a mortar base, as seen in wall structure [491]. The wall was constructed of frogless red bricks laid in English bond, 6 courses of bricks were observed (Figure 17).</p> <p>The mortar sampled from [547] was visually homogenous to other structures from 1841 across site. <i>'It comprised of a combination of 1 part feebly hydraulic lime, although this hydraulic nature could have been created by the finer ash content, to 1.5-2 parts of silica sand, unburnt lime and waste ash'</i> (Womersley, 2020).</p> <p>Partial foundation walls [550] and [560] consisted of an English bond, frogless red brick and mortar wall that extended NW, perpendicular to retaining wall [497]. Structures [550] and [560] had been truncated by pile [487].</p> <p>Partial foundation wall [535] extended NW for 4.60m, at a right angle to wall [497], and was laid in English bond in frogless red bricks and grey mortar. Wall [535] was truncated at its north end by a concrete deposit associated with Hudson House [521]. Wall [535] functioned as an internal partition wall separating two spaces within the Railway Stables, as indicated on the 1852 OS Map (Figure 74).</p>
<p>Plans 9-10</p>	<p>Approximately 30.50m of structural evidence pertaining to the Railway Stables was observed situated parallel to the Retaining Wall [497]. Partial sections of frogless red brick and grey mortar foundation walls [484], [491], [535], [547], [550] and [560], associated drains [475], [481], [517], [538], [541] and [556] and stable flooring [554] and [555] were uncovered during the removal of made-up ground (2) and (3). During the construction of Hudson House [521] the Stable remains were heavily truncated by concrete piling [485], [487], [534], [542], [544], [545], [546] and redeposited back fill (478).</p>	



Identifier	Image	Results
<p>1841 York Old Railway</p> <p>Monument ID MYO3719</p> <p>Railway Stables Internal Drains [538], [541] and [556]</p> <p>Plans 9-10</p>	<div data-bbox="450 284 1200 826" data-label="Image"> </div> <p data-bbox="450 831 1227 935">Figure 17: Drainage system [538], [541] and [556] with internal wall foundations [535] visible to the left at ground level and vertical scarring in [497], facing SE</p> <p data-bbox="421 1031 1256 1142">Internal and external drainages systems, [538], [541], [556] and [475], [476] and [517] respectively, were identified within the Railway Stables.</p> <p data-bbox="421 1187 1178 1259">Extending to the North of wall [535] were three interconnected drains [538], [541] and [556], (Figure 18).</p>	<p data-bbox="1279 296 2063 408">Small, red brick and grey mortar drain [556] extended north from wall [535] and served to expel hydrostatic discharge contained in the earth behind retaining wall [497].</p> <p data-bbox="1279 453 2092 564">Discharged water passed through a Weep Hole into drain [556] then flowed into the more substantial frogless red brick and mortar, sandstone slab capped drain [538], [481].</p> <p data-bbox="1279 609 2047 721">Drain [538] was truncated at its northern extent by construction works related to Hudson House [512] and extended south under retaining wall [497] to a length of at least 1.00m.</p> <p data-bbox="1279 766 1865 796">It had a clay-silt black sediment internal fill (558).</p> <p data-bbox="1279 841 2069 912">This main drain carrier would collect and disperse water from Toft Green, down through a backdrop manhole.</p> <p data-bbox="1279 957 2011 1067">Drain [538] sandstone slab capping had five carved slots; two carved as squares with edges approximately 0.01m and three diamond shaped with approximate edges of 0.08m.</p> <p data-bbox="1279 1112 2047 1184">The function of the slots is uncertain; they may have supported vertical pieces of wood or metal utilised for a range of purposes.</p>

Identifier	Image	Results
<p>1841 York Old Railway</p> <p>Monument ID MYO3719</p> <p>Railway Stable's External Drains [475], [481] and [517]</p> <p>Plans 9-10</p>	 <p data-bbox="539 740 1061 804">Figure 18: Drain [475] cut by pile [485] with wall [484] running parallel to the left facing NE</p>	<p data-bbox="1279 300 2085 576">Aligned with the Railway Stable front elevation walls, was a narrow drain [475] (Figure 19). It was constructed of frogless red brick walls, bound with grey mortar, with a grey slate base and grey, soft clay-sand, internal fill (474). A metal pipe (476) ran parallel to the drain [475] for approximately 1.00m, then disappeared beneath [475]. Drain [475] was truncated by concrete pile [485] but continued to the NE, surviving for 4.40m.</p> <p data-bbox="1279 632 2085 826">External drain [475] would collect downpipe water runoff from the Railway Stables roof guttering, the water running south-west into larger drain [481] (Figure 20). [481] intersects with wall [484] and drain [475] flowed into it. The internal faces of the bricks in drain [481] are stained black similar to [538].</p>
	 <p data-bbox="501 1240 1016 1303">Figure 20: Surface Water Drain/Sink Gully [517] facing SE</p>	<p data-bbox="1279 879 2085 1031">Surface water drain/sink gully [517] (Figure 21) are constructed with the standard frogless red bricks, bound with grey mortar, and had a black, oily industrial sediment fill (531).</p>  <p data-bbox="1279 1235 1518 1299">Figure 19: Drain [481] facing NW</p>




Identifier	Image	Results
<p>1841 York Old Railway</p> <p>Monument ID MYO3719</p> <p>Railway Stables</p> <p>Rectangular Brick structure [514] and narrow drain [516] to the south-west of partition wall [535]</p>	 <p>Figure 21: Rectangular brick structure [514] and adjacent Weep Hole [582] to the left with drain [516] to the right, facing NE</p>	<p>A rectangular brick structure [514] is positioned parallel and adjoining to wall [497]. Mortar is visible at the top of the exposed bricks, suggesting there were once more courses. This may have been constructed to support a fire/small furnace for a blacksmith. It is located within the stable area underneath possible flue scarring (505) and (506).</p> <p>Weep hole [582] protrudes from retaining wall [497] and consisted of the fragmented end of a 0.01m in diameter ceramic pipe. This pipe discharged into a drain/open gutter (visible through staining) that was linked to drain [516].</p> <p>Drain [516] was aligned NE/SW, and had been badly disturbed, surviving to a length of 1.56m. It contained oily, black sediment (531) and was similar to fill (515) of drain [516], which was located approximately 2.00m to the north-west.</p>
<p>Plans 9-10</p>	<p>A partition wall [535] separating two defined areas of the stables is indicated on the 1852 OS Map (Figure 74).</p> <p>Three features were observed to the south-west of the partition wall [535]: a rectangular brick structure [514] adjacent to retaining wall [497], a small weep hole [582] protruding [497] and a narrow frogless red brick and mortar drain [516] (Figure 22).</p>	<p>This black sediment was not observed in the drains serving the more eastern extent of the stables. This and the possibility of a furnace [514] with associated flues [505] and [506] could suggest that blacksmithing may have been taking place in western extent of the Railway Stables.</p>

Identifier	Image	Results
<p>1841 York Old Railway</p> <p>Monument ID MYO3719</p> <p>Railway Stables</p> <p>Curved based drain [441] and Brick Floor [442]</p> <p>Plans 9-10</p>	 <p data-bbox="472 695 869 722">Figure 22: Brick Wall [442] facing SW</p>	<p data-bbox="1279 252 2089 363">Structure [442] was 'L'-shaped, constructed of frogless red brick and grey mortar. It was possibly a wall or a pathway/walkway (Figure 23).</p> <p data-bbox="1279 408 2051 560">The bricks are arranged in a stretcher bond with a soldier edging. The wall's western edge is uneven and was truncated or possibly removed later. The eastern return of the 'L' appears to butt the north/south part of the structure, as the bricks are not tied in.</p> <p data-bbox="1279 604 2078 756">Given the location of this wall [442] as seen on the 1852 OS Map, it is likely that this was either a tapering wall of uncertain height constructed to create an enclosed area, or the foundations of a narrow external walkway.</p>
	 <p data-bbox="472 1302 949 1329">Figure 23: Brick Culvert Base [441] facing NE</p>	<p data-bbox="1279 804 2069 916">A 4.94m length of the base of a culvert/drain [441] aligned NE/SW was situated towards the western edge of the Railway Stables (Figure 24).</p> <p data-bbox="1279 967 2074 1078">The culvert was 0.56m in width and had a depth of 0.18m. Red frogless bricks were placed directly onto natural silty-clay sand in a rowlock, running bond arrangement, with bull header prominent.</p> <p data-bbox="1279 1129 2085 1329">A defined, curved cut [439] for gutter [441] was observed in section and a fine black/grey clinker and mortar fill (440) was packed into gaps at the structure's edges and between bricks. The NE portion of the [441] had evidence of ground shifting compared to the SW portion, which was still intact.</p>



Identifier	Image	Results
<p>1841 York Old Railway</p> <p>Monument ID MYO3718</p> <p>Merchandise Station (York & North Midland Railway and Great North of England Railway) 1841</p> <p>Foundation Wall [393]</p>	 <p>Figure 24: Foundation wall [393] of the Merchandise Station. Vertical cut [426] into natural dark brown sandy clay [561] with sandy yellow back fill (425), facing SE</p>	<p>Foundation walls associated with the rear elevation [433], [436], [489], [490], [519] of the Merchandise Station and one central partition wall and adjoining front elevation [393] were present.</p> <p>The internal wall and adjoining front elevation [393] were seen cut [426] into the dark brown sandy-clay natural [561], with striking yellowish sand backfill (425). This feature was a 3.90m long, NW/SE orientated, 1.70m wide, brick-built foundation wall [393] (Figure 25).</p> <p>[393] was a central internal wall, located within the Merchandise Station and situated between two turntables, with turntable [398] located approximately 3.50m to its east.</p> <p>Sondages [416] and [422] were excavated to investigate foundation wall [393].</p>
<p>Plans 9-12</p>	<p>The foundation walls of the 1841 Merchandise Station were observed and investigated in eight areas [393], [416], [422], [433], [436], [489], [490] and [519].</p> <p>The remaining layers of the walls were revealed during machine stripping, after the removal of contexts (2) and (3).</p>	<p>Sondage [416] was excavated in line with the construction cut [426] through the yellow sand backfill (425), to the side elevation of [393]. This was to investigate the construction methods applied to the Merchandise Station's foundation walls [393].</p> <p>Ground consolidation deposit (414) was approximately 0.60m deep, consisting of a mixture of brick rubble and degraded mortar.</p>



Identifier	Image	Results
<p>1841 York Old Railway</p> <p>Monument ID MYO3718</p> <p>Merchandise Station (York & North Midland Railway and Great North of England Railway) 1841</p>	 <p>Figure 25: Sondage [416] exposing foundation layers (414) and [412], facing NE</p>	<p>The substantial size and height of the Merchandise Station and the instability of the natural determined that it was necessary to consolidate the ground beneath wall [393] to provide a solid base.</p> <p>Including fragmented brick rubble/mortar ground consolidation deposit (414), and flagstone leveling layer (412), the structure was 1.14m deep.</p> <p>Figures 18 and 19 show the fragmented brick rubble and mortar consolidation deposit (414), and coarse grain sandstone flagstone leveling layer (412). The flagstones were up to 1.31m in length, 0.98m in width and 0.19m in depth.</p>
<p>Foundation Wall [416]</p> <p>Plans 9-12</p>	 <p>Figure 26: Brick and mortar ground consolidation deposit (414) of approximate depth of 0.65m, facing NE</p>	<p>The red bricks to the edge of wall [393] above [412] were laid in Header Bond, stretched to the base. A layer of greyish white mortar concealed the central extent of the wall.</p> <p>The vertical construction cut [426] for [393] (Figure 26) was approximately 2.30m wide and was backfilled with soft, yellow sand (425).</p> <p>The north-western extent of the wall was truncated by trench [419], which contained a black metal service pipe (417).</p> <p>The central extent of the wall was truncated by trench [422], which also contained a black metal service pipe (420) (Figure 28).</p>



Identifier	Image	Results
<p>1841 York Old Railway</p> <p>Monument ID MYO3718</p> <p>Merchandise Station (York & North Midland Railway and Great North of England Railway) 1841</p>	 <p data-bbox="510 719 1095 783">Figure 27: Service trench [422] for black metal pipe (420) cutting through wall [393], facing NE</p>	<p>The foundation walls associated with the rear elevation of the Merchandise Station displayed the same construction techniques as those observed in the central partition wall and front elevation [393] (Figures 28-33).</p> <p>The rear foundations had more courses of bricks still <i>in situ</i> and had examples of a post pad and floor slabs [436] and [433]. A large yellow, fine-grained sandstone socket slab was positioned abutting an internal corner [436] and two square sandstone slabs were located parallel to an internal wall [433].</p>
<p>Foundation Wall with Socket Slab [436]</p> <p>Plans 9-12</p>	 <p data-bbox="510 1273 1104 1337">Figure 28: Merchandise Station Foundation Wall [436], facing NE</p>	<p>The socket slab seen in [436] is positioned within the corner of the walls on a layer of crushed mortar and ceramic building material—two courses of brick above the bearer course (Figure 29). This slab was identical to salvaged socket slab, context (410) in McComish 2020.</p> <p>This socket slab may represent a post pad for an internal wooden structure.</p> <p>Internal wall [433] slabs are positioned three courses above the flagstone leveling (412) on a bearer course of red bricks.</p> <p>These slabs indicate a flooring level and suggest the Merchandise Station had a solid thick stone floor (Figure 31).</p>



Identifier	Image	Image
<p>1841 York Old Railway</p> <p>Monument ID MYO3718</p> <p>Merchandise Station (York & North Midland Railway and Great North of England Railway) 1841</p>	 <p>Figure 29: Merchandise Station Foundation Wall Profile [393], facing SW</p>	 <p>Figure 30: Merchandise Station Foundation Wall [433], facing SE</p>
<p>Foundation Walls [393], [433], [436] and [490].</p> <p>Plans 9-12</p>	 <p>Figure 31: Pre-Excavation of Foundation Wall [436] and adjacent post 1841 inspection chamber [434], facing SE</p>	 <p>Figure 32: Merchandise Station Foundation Wall [490], facing SW</p>

Identifier	Image	Results
<p data-bbox="188 304 376 416">1841 York Old Railway Turntable Base</p> <p data-bbox="188 464 376 528">Monument ID MYO3718</p> <p data-bbox="188 576 376 847">Merchandise Station (York & North Midland Railway and Great North of England Railway) 1841</p> <p data-bbox="188 983 376 1046">Turntable Base [376] and [377]</p> <p data-bbox="188 1102 376 1134">Plans 11-12</p>	<div data-bbox="506 272 1099 703"> </div> <p data-bbox="506 711 1099 775">Figure 33: Turntable Base outer arc [376] and inner sub-square block piece [377], facing NE</p> <div data-bbox="506 807 1099 1254"> </div> <p data-bbox="506 1262 1099 1326">Figure 34: Casting <i>in situ</i> [376] and [377] facing SW with associated box drains [369] and [372]</p>	<p data-bbox="1276 304 2072 408">The structural foundation remains of two turntables [376], [377], [397], [398] were found situated within close proximity to the Merchandise Station walls.</p> <p data-bbox="1276 464 2072 528">Both of these turntables were contemporary with the Merchandise Station.</p> <p data-bbox="1276 584 2072 655">The formed concrete turntable base [376] was the outer arc fragment and [377] was the inner sub-square block (Figure 34-35).</p> <p data-bbox="1276 711 2072 823">Structure [376] was up to 2.62m length, 0.86m in width and up to 0.39m in depth. Sub-square block [377] was 1.20m long NE/SW, 0.64m wide and up to 0.25m deep.</p> <p data-bbox="1276 879 2072 1031">The turntable base was cast <i>in situ</i> with rough cast concrete and a fine concrete shuttered surround to top, with tamped or float finish with spider casting. It was partially cast on top of the box drain [372].</p> <p data-bbox="1276 1086 2072 1158">The spider casting formed raised sections, creating a roughly curvilinear triangular shape across both portions of the turntable.</p>

Identifier	Image	Results
<p>York Old Railway Turntable Base</p> <p>Monument ID MYO3718</p> <p>Merchandise Station (York & North Midland Railway and Great North of England Railway) 1841</p>	 <p>Figure 35: Turntable Base [397] and [398] facing SW</p>	<p>The area between the outer arc and the sub-square block was filled with a loose, black clinker material (413). Turntable [397] was cut to the north by service trench [580].</p> <p>The central sub-square block [398] (Figure 37) was lifted by machine after archaeological recording. The lifted block sat at a height of 0.60m; 0.20m consisting of the fine concrete shuttered surround to top with tamped or float finish with spider casting. The lower 0.40m is rough cast <i>in situ</i> concrete.</p>
<p>Turntable Base [397] and [398]</p> <p>Plans 11-12</p>	<p>Located to the southwest of turntable base [376] and [377] was a near complete, formed concrete turntable base. The outer arc [397] surrounded the central sub-square block [398] (Figure 36).</p> <p>[397] was 2.94m in length, 1.18m in width, while [398] was 1.22m in length and 1.18m in width. The overall diameter of the turntable was 4.18m.</p>	 <p>Figure 36: Turntable sub-square base [398]</p>

Identifier	Image	Results
<p>York Old Railway</p> <p>1841 Box Drains</p> <p>Box Drain [188]</p> <p>Plans 5-12</p>	 <p data-bbox="506 762 1133 826">Figure 37: Pre-Excavation Image of Box Drain [188], facing SW</p>	<p>A railway requires substantial and effective drainage to ensure the tracks remain functional. This was evident in the large quantity (total 35) of well-constructed box drains found in all areas of the site:</p> <p>[6], [11], [49], [53], [77], [89], [129], [150], [156], [159], [161], [169], [188], [233], [237], [261], [269], [288], [311], [321], [324], [325], [330], [347], [350], [355], [368], [372], [475], [481], [499], [516], [538], [541], [556].</p> <p>The vast majority of box drains were aligned SW/NE with water being directed close to the lines, down the slope and out of the City Wall Arches, towards a larger drainage system that discharged into the River Ouse via Holbeck Beck.</p>
	 <p data-bbox="506 1329 1104 1361">Figure 38: Post Excavation of Box Drain [188], facing NE</p>	<p>Box Drains were:</p> <ul style="list-style-type: none"> • Aligned west-east, close to rail tracks and the Departure Platform • Next to the external turntable associated with the Merchandise Station • Perpendicular to the retaining wall • Located internally and externally to the stables <p>The characteristics of the drains were primarily the same: a base, sides constructed of brick, and with a stone slab or brick cap as seen in Box Drain [188] (Figures 38-39).</p>

Identifier	Image	Results
<p>York Old Railway</p> <p>1841 Box Drains</p> <p>Wood Lined Base, Box Drain [324] and [325]</p> <p>Plans 5-6</p>	 <p data-bbox="495 759 1070 786">Figure 39: NW/SE aligned wood lined Box Drain [324]</p>	<p>Variations in the box drains included:</p> <ul data-bbox="1328 347 1848 592" style="list-style-type: none"> • drains with wood lined bases • box drain alignment (NE/SW or NW/SE) • parallel groupings of box drains • sediment consistency and colour • graffiti • preservation <p>An 8.00m section of a box drain with a wood lined base [324] (Figure 40) in varying degrees of completeness narrowly missed the cuts required for Hudson House concrete and rebar piles [306] and [309]. Box Drain [324] was later cut by service trenches [563], [565], and [566].</p>
	 <p data-bbox="495 1302 1070 1329">Figure 40: NE/SW aligned wood lined Box Drain [325]</p>	<p>Box Drain [324] was unusually aligned NW/SE; only four NW/SE aligned box drains [269], [324], [481] and [538] were present on site. [324] was 0.45m wide and approximately 0.40m in height, constructed of three courses of red frogless bricks in running bond and capped with stone.</p> <p>Box drain [324] contained dark brown/black pliable silty-clay sediment (336) on top of its wooden base (337).</p> <p>Six wood lined base box drains were observed on site [129], [233], [321], [324], [325] (Figure 41) and [350]. The wood used to line [129] was assessed as oak (Carrott, Barker and England, 2020).</p>



Identifier	Image	Results
<p data-bbox="188 347 365 419">1841 York Old Railway</p> <p data-bbox="188 475 389 587">Parallel Box Drains [49], [53] and [77]</p> <p data-bbox="188 639 378 671">[161] and [162]</p> <p data-bbox="188 762 356 794">Plans 3-4, 7-8</p>	 <p data-bbox="495 794 1122 858">Figure 41: Box Drains from left to right [77], [53] and [49], facing E</p>	<p data-bbox="1276 347 2074 419">Examples of parallel drains were observed on three occasions: box drains [49], [53] and [77]; [161] and [162]; [368] and [372].</p> <p data-bbox="1276 475 2098 587">Three brick-built and stone capped structured box drains listed from left to right, [77], [53] and [49] (Figure 42) were encountered underneath made-up ground contexts (2) and (3) within Trench 33.</p> <p data-bbox="1276 639 2074 834">Aligned NE/SW, box drain [49] survived to the longest length of 7.54m. Between 0.28m-0.43m in width and up to 0.35m in depth, all three box drains [49], [53] and [77] appeared to be constructed in a similar manner; with red bricks laid in Stretcher Bond and capped with limestone slabs.</p>
	 <p data-bbox="495 1361 1003 1393">Figure 42: Box Drains [161] and [162], facing W</p>	<p data-bbox="1276 879 2098 1031">Box drains [161] and [162] were similarly constructed (Figure 35) with identical black clay-silt sediments (160) and (192). Both drain sediments had evidence of lamination which may indicate different periods of heavy water activity.</p> <p data-bbox="1276 1075 2074 1230">[161/185] and [162] measured 1.76m and 2.17m in length, 0.43m and 0.45m in width and <0.20m and 0.24m in depth, respectively (Figure 43). They were constructed of red frogless bricks in a running bond, both capped with angular limestone flags.</p> <p data-bbox="1276 1275 2098 1386">Box drain [161] survived [185] beyond the cut for pile [567]. Alternatively, box drain [162] does not survive beyond the same pile cut.</p>

Identifier	Image	Results																		
<p data-bbox="188 304 365 376">1841 York Old Railway</p> <p data-bbox="188 555 383 707">York Old Railway Box Drain Sediment (39) in [11]</p> <p data-bbox="188 759 304 786">Plans 3-4</p>	<div data-bbox="445 277 1200 847" data-label="Image"> </div> <p data-bbox="445 850 1200 914">Figure 43: Box Drain [11], black sediment fill (39), metal pipe (19) and rubble made-up ground [13], facing NW</p> <p data-bbox="416 962 1218 1034">Most box drains contained a sediment deposit, which was sampled and retained. The purpose was to investigate their potential.</p> <p data-bbox="416 1086 1234 1158">Three drain sediments were assessed [11], [233] and [321] for heavy metals, based upon colour (Tables 6-8).</p>	<p data-bbox="1276 304 2063 499">Box drain [11] was NW/SE aligned and was 1.96m in length, up to 0.41m in width and 0.31m in depth (Figure 44). The box drain was constructed of red frogless bricks laid in Stretcher Bond, capped with slabs. The fill (39) was a firm, black silt, most likely laid down by water moving through the drain (Table 7).</p> <table border="1" data-bbox="1384 539 1986 1046"> <thead> <tr> <th data-bbox="1384 539 1771 600">Analysis</th> <th data-bbox="1771 539 1986 600">Result</th> </tr> </thead> <tbody> <tr> <td data-bbox="1384 600 1771 655">Lead (mg/kg)</td> <td data-bbox="1771 600 1986 655">937.66</td> </tr> <tr> <td data-bbox="1384 655 1771 711">Nickel (mg/kg)</td> <td data-bbox="1771 655 1986 711">38.32</td> </tr> <tr> <td data-bbox="1384 711 1771 767">Zinc (mg/kg)</td> <td data-bbox="1771 711 1986 767">205.32</td> </tr> <tr> <td data-bbox="1384 767 1771 823">Copper (mg/kg)</td> <td data-bbox="1771 767 1986 823">556.25</td> </tr> <tr> <td data-bbox="1384 823 1771 879">Arsenic (mg/kg)</td> <td data-bbox="1771 823 1986 879">24.95</td> </tr> <tr> <td data-bbox="1384 879 1771 935">Cadmium (mg/kg)</td> <td data-bbox="1771 879 1986 935">1.02</td> </tr> <tr> <td data-bbox="1384 935 1771 991">Mercury (mg/kg)</td> <td data-bbox="1771 935 1986 991">0.42</td> </tr> <tr> <td data-bbox="1384 991 1771 1046">Chromium (mg/kg)</td> <td data-bbox="1771 991 1986 1046">20.45</td> </tr> </tbody> </table> <p data-bbox="1276 1102 2040 1129">Table 7: Heavy Metal Assessment of sediment (39) from box drain [11]</p>	Analysis	Result	Lead (mg/kg)	937.66	Nickel (mg/kg)	38.32	Zinc (mg/kg)	205.32	Copper (mg/kg)	556.25	Arsenic (mg/kg)	24.95	Cadmium (mg/kg)	1.02	Mercury (mg/kg)	0.42	Chromium (mg/kg)	20.45
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Identifier	Image	Results																		
<p>1841 York Old Railway</p> <p>York Old Railway Drain Sediment (232) in [233]</p> <p>Plans 7-8</p>	<div data-bbox="452 284 1182 837" data-label="Image"> </div> <p data-bbox="461 853 1079 917">Figure 44: Box Drain [233] with orange brown primary fill (232), facing NW</p> <p data-bbox="416 943 1240 1054">[233] was a 3.30m long E/W aligned, exposed portion of box drain. The brick-built, stone capped structure was up to three courses deep (0.21m), 0.39m wide, and was wood lined to the base (Figure 45).</p> <p data-bbox="416 1107 1196 1177">The culvert contained two fills. The primary fill (232) was a sterile orange-brown sand (Table 8).</p> <p data-bbox="416 1230 1207 1342">The secondary fill (240) was a dark grey silt-clay. The pronounced difference between the two fills suggested a change in the type of waste water that was washing through the box drain.</p>	<table border="1" data-bbox="1382 301 1977 850"> <thead> <tr> <th data-bbox="1382 301 1762 368">Analysis</th> <th data-bbox="1762 301 1977 368">Result</th> </tr> </thead> <tbody> <tr> <td data-bbox="1382 368 1762 429">Lead (mg/kg)</td> <td data-bbox="1762 368 1977 429">73.55</td> </tr> <tr> <td data-bbox="1382 429 1762 489">Nickel (mg/kg)</td> <td data-bbox="1762 429 1977 489">12.78</td> </tr> <tr> <td data-bbox="1382 489 1762 550">Zinc (mg/kg)</td> <td data-bbox="1762 489 1977 550">62.91</td> </tr> <tr> <td data-bbox="1382 550 1762 611">Copper (mg/kg)</td> <td data-bbox="1762 550 1977 611">61.13</td> </tr> <tr> <td data-bbox="1382 611 1762 671">Arsenic (mg/kg)</td> <td data-bbox="1762 611 1977 671">5.64</td> </tr> <tr> <td data-bbox="1382 671 1762 732">Cadmium (mg/kg)</td> <td data-bbox="1762 671 1977 732">0.42</td> </tr> <tr> <td data-bbox="1382 732 1762 793">Mercury (mg/kg)</td> <td data-bbox="1762 732 1977 793">0.46</td> </tr> <tr> <td data-bbox="1382 793 1762 850">Chromium (mg/kg)</td> <td data-bbox="1762 793 1977 850">12.19</td> </tr> </tbody> </table> <p data-bbox="1279 887 2069 914">Table 8: Heavy Metal Assessment of sediment (232) from box drain [233]</p> <p data-bbox="1279 999 2069 1069">A 6.40m long NE/SW segment of box drain [321] was encountered in the western extent of the development area.</p> <p data-bbox="1279 1121 2085 1233">The 0.46m wide, 0.28m deep drain was constructed using red frogless bricks, capped with limestone slabs. A second, roughly E/W aligned box drain [330] adjoined the central extent of [321].</p>	Analysis	Result	Lead (mg/kg)	73.55	Nickel (mg/kg)	12.78	Zinc (mg/kg)	62.91	Copper (mg/kg)	61.13	Arsenic (mg/kg)	5.64	Cadmium (mg/kg)	0.42	Mercury (mg/kg)	0.46	Chromium (mg/kg)	12.19
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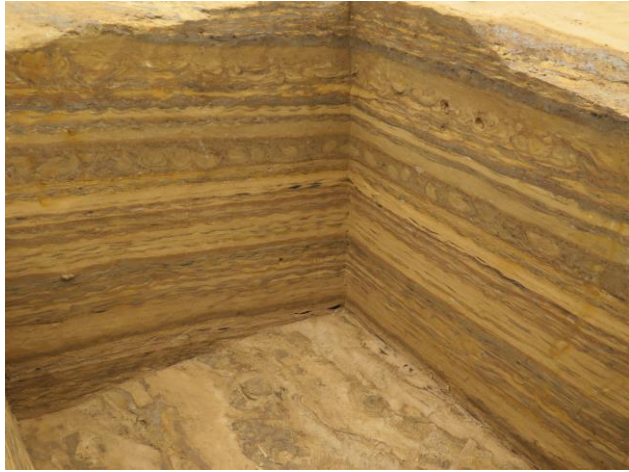
Identifier	Image	Results																		
<p>1841 York Old Railway</p> <p>Box Drain [321]</p> <p>Sediment (316)</p> <p>Stone Cap</p> <p>Graffiti</p> <p>Plans 5-6</p>	<div data-bbox="427 280 1088 783" data-label="Image"> </div> <p data-bbox="427 799 1088 826">Figure 45: Box Drain [321] and sediment fill (316), facing NW</p> <div data-bbox="551 884 943 1182" data-label="Image"> </div> <p data-bbox="551 1230 943 1334">Figure 46: The stone cap from [321] with graffiti. Possibly William/Will Mont W-I-L M-N--T</p>	<p>[330] was 0.84m in length, 0.50m in width and 0.40m in depth (Figure 38). Constructed in a similar fashion to [321], the respective fills differed somewhat. [321] contained a single fill (316) (Table 8) which was a mid-grey clay with lenses of sand throughout, whilst (329) the fill of [330], was orange-brown sand in the lower two thirds and a medium grey clay in the upper third (Figure 46).</p> <p>3D Model: https://sketchfab.com/3d-models/hudson-house-york-victorian-box-drains-bcf8ac1bbbc248b4b7366543fca9ec29</p> <p>Graffiti, possibly the work of one of the construction navvys, was present on one of the limestone caps on box drain [321] (Figure 47).</p> <table border="1" data-bbox="1323 715 1928 1257"> <thead> <tr> <th>Analysis</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Lead (mg/kg)</td> <td>59.75</td> </tr> <tr> <td>Nickel (mg/kg)</td> <td>16.05</td> </tr> <tr> <td>Zinc (mg/kg)</td> <td>91.80</td> </tr> <tr> <td>Copper (mg/kg)</td> <td>70.31</td> </tr> <tr> <td>Arsenic (mg/kg)</td> <td>6.58</td> </tr> <tr> <td>Cadmium (mg/kg)</td> <td>0.53</td> </tr> <tr> <td>Mercury (mg/kg)</td> <td>0.17</td> </tr> <tr> <td>Chromium (mg/kg)</td> <td>15.80</td> </tr> </tbody> </table> <p>Table 9: Heavy Metal Assessment of sediment (316) from box drain [330]</p>	Analysis	Result	Lead (mg/kg)	59.75	Nickel (mg/kg)	16.05	Zinc (mg/kg)	91.80	Copper (mg/kg)	70.31	Arsenic (mg/kg)	6.58	Cadmium (mg/kg)	0.53	Mercury (mg/kg)	0.17	Chromium (mg/kg)	15.80
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Identifier	Image	Results
<p data-bbox="188 304 365 376">1841 York Old Railway</p> <p data-bbox="188 472 383 501">Box Drain [350]</p> <p data-bbox="188 555 333 584">Plans 11-12</p>	<div data-bbox="533 284 1108 721" data-label="Image"> </div> <p data-bbox="533 735 1028 764">Figure 47: Box Drain [350] with stone capping</p> <div data-bbox="533 802 1108 1240" data-label="Image"> </div> <p data-bbox="533 1254 893 1283">Figure 48: Box Drain [350] profile</p>	<p data-bbox="1276 304 2078 539">Box drain [350] was substantial and had preserved its rubble packing, sealing its stone caps (Figure 48). Rubble packing was not present on the majority of box drains on site, which were by comparison, not as complete. The upper layers of most box drains were probably lost during demolition works for the construction of Hudson House.</p> <p data-bbox="1276 595 2078 707">[347] was the vertical cut for box drain [350] and was excavated to 2.32m x0.50m x0.50m. Cut [347] was marginally larger than drain [350].</p> <p data-bbox="1276 762 2045 914">Within this cut was the drain structure, which comprised of four courses of red frogless bricks laid in running bond. The bricks measured 0.21m x0.15m x0.70m, which were positioned to the outer edges on top of a wooden base (391).</p> <p data-bbox="1276 970 2056 1121">The wood base provided a firm platform to build upon. The drain top was covered with large, flat, roughly hewn limestone slabs of varying dimensions. Gaps at the edges of the stone caps were sealed with smaller angular limestone pieces (Figure 40).</p> <p data-bbox="1276 1177 2038 1289">The sediment fill (351) of drain [350] was a dark orange-grey, mottled sandy-silt which was formed by residual matter carried along the drain (Figure 49).</p>


Identifier	Image	Results
<p>1967 Hudson House</p> <p>Pile Caps [297], [300], [303] and [571].</p> <p>Plans 5-8</p>	 <p data-bbox="624 689 981 753">Figure 49: Pile Caps [297], [300] and [303], facing NE</p>	<p data-bbox="1272 248 2047 402">Hudson House consisted of four multi-storey blocks laid out in a pinwheel, centered on a courtyard. The blocks ranged from four to six storeys, and therefore required substantial piled foundations.</p> <p data-bbox="1272 450 2047 520">Deep piling was required and 48 pile caps were observed during the demolition and stripping of the site:</p> <p data-bbox="1272 561 2047 759">[189], [247], [274], [275], [276], [277], [278], [279], [280], [281], [297], [300], [303], [306], [309], [446], [452], [457], [460], [463], [485], [487], [492], [493], [494], [495], [507], [508], [532], [533], [534], [542], [544], [545], [546], [562], [576], [568], [569], [570], [571], [572], [573], [574], [575], [576], [577] and [578].</p>
	 <p data-bbox="501 1260 1115 1324">Figure 50: Pile Cap [571] cutting Departure Platform [201], [202] and [203], facing SW</p>	<p data-bbox="1272 801 2047 916">The caps were sub-triangular and approximately 0.34m of the cap would protrude above the level that contained features associated with the 1841 railway (Figure 50).</p> <p data-bbox="1272 960 2047 1075">The caps were generally 1.80m in length from vertex to base and were reinforced with rebar, which protruded from the cap centre (Figure 51).</p> <p data-bbox="1272 1120 2047 1190">The foundation ring beams and lift shaft [394] were present on site below the 1841 archaeological level.</p>


Identifier	Image	Results
<p data-bbox="188 260 385 284">Romano-British</p> <p data-bbox="188 344 342 456">Pit [251] cut Primary fill (252)</p> <p data-bbox="188 467 356 539">Secondary fill (250)</p> <p data-bbox="188 592 304 616">Plans 5-6</p>	<div data-bbox="481 233 1151 735" data-label="Image"> </div> <p data-bbox="481 743 1151 807">Figure 51: Pit [251] with primary fill (252), secondary fill (250) and grey deposit (249), facing SE</p> <p data-bbox="409 863 1240 1094">Pit [251] was sealed underneath contexts (2), (3) and a 0.45m layer of alluvial sand [257] (Figures 51-52). The pit was observed in plan after further machine excavation testing of the sand deposit. This alluvial sand [257] had not been observed in quantity anywhere else on the site, therefore further investigation was prompted and the pit was revealed.</p> <p data-bbox="409 1150 1240 1299">Pit [251] was ovate and was 2.28m in length, 1.31m in width and had a depth of 0.53m. A disturbed deposit of greyish-brown clayey-silt (249) was lightly spread over SW edge of pit [251] and had inclusions of brick and clinker.</p>	<p data-bbox="1276 260 2047 619">Finds within this deposit were varied and ranged in date from the 4th century to the 19th century. A 19th century olive green glass sherd from a utility bottle, and a sherd of pale blue Roman window glass were present in this deposit. Similarly, the pottery was mixed in date; the assemblage included a medium sized group of late 4th to early 5th century sherds including calcite-gritted Huntcliff jars, Crambeck grey ware, grey ware and colour-coated sherds, as well as two sherds of 1st to 3rd century residual Samian ware.</p> <p data-bbox="1276 675 2047 823">Animal bone comprised 174 fragments, including pig, sheep and chicken. Metal and small finds comprised of a mixed bag of early 17th to mid-19th century fired clay Tobacco pipe fragments, Stone Tesserae, Jet Offcuts, and flowed slag and cinder.</p> <p data-bbox="1276 871 2047 1062">The cut for pit [251] edges sloped at about 45 degrees and the break of slope at its base was curved. The base was generally flat with some undulation. The edges of the pit were difficult to define as fill (252) was similar to the natural and may represent slumping or intrusion through flooding.</p> <p data-bbox="1276 1110 2047 1262">The primary fill (252) of pit [251] consisted of a mottled clayey-sand with rare inclusions of stone. The fill was very similar to the natural, so may represent slumping or intrusions from episodes of flooding.</p>



Identifier	Image	Results
<p>Romano-British</p> <p>Pit [251] cut</p> <p>Primary fill (252)</p> <p>Secondary fill (250)</p> <p>Plans 5-6</p>	 <p>Figure 52: Cut of Pit [251] facing SE.</p> <p>The primary fill (252) of pit [251] contained ceramic building material in the form of Roman Imbrex, Roman brick, Tegula, Tessera Stone floor tiles; three small sherds of colourless and blue/green glass (of unknown function), 2 sherds of pale blue/green glass (Roman window); a natural till flint (associated with glacial moraine); a medium sized group of pottery including late 4th-early 5th century sherds from Dressel 20 type amphorae, a mortarium (with a reeded rim), grey ware, Crambeck grey ware, calcite-gritted ware, Black Burnished ware 1, sherds from colour-coated beakers, 7 sherds of 1st to 3rd residual Samian ware; 396 animal bone fragments including young pig, cattle, sheep and chicken; iron nails; a bone or antler object (possible inlay); stone tesserae; fired clay tesserae; jet offcuts; smith slag, slagged lining; fired clay; and cinder.</p>	<p>Sealing the primary fill (252) of pit [251] was secondary fill (250). The fill comprised of black clayey-silt with abundant inclusions of cobbles, limestone, and ceramic building material. The fill was amorphous- possibly due to build up over time. Oyster shell was visible in the fill but was too fragile to recover completely. The fill appears to have built with material apparently being deposited from the NE edge of the feature.</p> <p>Fill (250) contained ceramic building material in the form of Roman Box flue, Imbrex, Roman brick, Tegula, Tessera, Roman Stone floor tiles, Tessera, lime based mortar and Opus Signinum; a colourless glass rim sherd (from a 2nd-4th century cup or bowl); a large mixed group of mostly late Roman pottery (late 4th-early 5th) including sherds from Dressel 20 amphora, Crambeck mortaria, colour-coated beakers, a colour-coated bead and flange bowl, a Crambeck red ware paint-decorated bowl, a sherd of Derbyshire ware, calcite-gritted Huntcliff jars, grey ware, Crambeck grey ware (including a straight sided bead and flange bowl), an unusual mortarium with a grooved bead, 11 sherds of 1st to 3rd century residual Samian ware; 976 fragments of animal bone including cattle, chicken, sheep, horn cores, deer antler, horse, dog, bird and bone from young pigs (most prevalent); iron nails; stone tesserae; and jet offcuts.</p>

Identifier	Image	Results
<p>Alluvial Deposit (292) (257)</p> <p>Plans 5-6, 11-12</p>	 <p>Figure 53: Alluvial Deposit [292] in plan facing SE</p>	<p>3D model: https://sketchfab.com/3d-models/hudson-house-periglacial-deposits-67e69a7e433347249292fa9993739567</p> <p>(257) and (292) were natural alluvial deposits of layered sand and clay particles. Pure sand layers were interspersed with silt and clay layers (Figures 54-55).</p> <p>A sampling programme was undertaken: 8 auger samples (320) and 5 monolith samples (319) were extracted.</p> <p>Evidence of low energy turbulence or 'fluvial rollers' were present in some layers. There was no evidence of peat or organic matter in the auguring samples extracted from the base of the sondage. Only a gravel layer was present and this became impenetrable at a minimum depth of 0.10m and a maximum depth of 1.55m from the base of the sondage and pit [251] (Figures 56-58).</p> <p>The sand, clay and silt layers sloped downwards towards the south-west at a maximum angle of 10 degrees, suggesting that the slope could be due to subsidence into an unknown void/pre-existing surface (Carrott, Barker and England, 2020).</p> <p>Deposit (257) and (292) were cut by a Romano-British pit [251] and amorphous deposits (267), (268), and (270); 19th century drainage [269]; post 1841 railway utilities [248]; piling [266] and utilities [254] for Hudson House.</p>
	 <p>Figure 54: Alluvial Deposit [292] in section</p>	

Identifier	Image	Results
<p data-bbox="188 264 291 419">Alluvial Deposit (292) (257)</p> <p data-bbox="188 472 304 499">Plans 5-6</p>	<div data-bbox="436 264 1370 550"> <p data-bbox="488 459 638 550">Plan of sondage and pit [251] Auguring samples ■ Monolith samples ■ Drv. No. 83</p> </div> <p data-bbox="367 639 1350 667">Figure 55: Plan of the locations of auguring (green squares) and monolith samples (orange)</p> <div data-bbox="367 699 633 726">Auger sample results:</div> <p data-bbox="367 740 1429 807">Auger 1: 0.50m deep, extracted from alluvial (257) beneath deposit (258). Auger stopped at a thick silty deposit.</p> <p data-bbox="367 821 1435 975">Augers 2 and 3: extracted from beneath deposit (286). Auger would not penetrate further than 0.10m in both of these examples. Cobbles were visible in the base of the sondage- may have been more beneath the sandy layer. Material retrieved was a mix of sand and material similar to (286).</p> <p data-bbox="367 989 1442 1222">Auger 4: made through base of pit [251]. This auger sample began 0.56m higher than auger 5-7, and reached a depth of 1.15m. At this point it encountered a gravelly sand, which was also seen in auger 5-7. This suggests that the ground falls away to the SW, mirroring the thin bands seen in section. A sandy gravel layer was encountered in auger 4-7- a soft yellow sand with 2-5mm sand. Gravel was flat, rounded and grey. Auger would not penetrate through this layer.</p> <p data-bbox="367 1236 1361 1303">Augers 5-7: taken from alluvial (292). Depths were between 0.28m to 0.34m before encountering gravelly sand.</p>	<div data-bbox="1496 288 2004 675"> </div> <p data-bbox="1496 699 1995 726">Figure 57: Auger sample 3 to a depth of 0.10m</p> <div data-bbox="1496 802 2004 1189"> </div> <p data-bbox="1496 1203 1995 1230">Figure 56: Auger sample 7 to a depth of 0.34m</p>

Identifier	Image	Results
<p data-bbox="188 264 387 376">Alluvial Deposit (292) (257)</p> <p data-bbox="188 472 304 496">Plans 5-6</p>	 <p data-bbox="456 823 1227 890">Figure 58: Monolith sampling the sondage through the alluvial deposit [257] and [292]</p>	<p data-bbox="1256 264 1877 288">A summary of assessment of the monolith samples:</p> <p data-bbox="1256 344 2047 624"><i>“Investigation of the column samples through the undated alluvial deposits, Contexts 257 and 292, provided little additional information. Interpretatively valuable microfossils (e.g. diatoms which could provide information regarding deposition or pollen which could indicate habitats in the local environment and wider landscape) were entirely absent from the subsamples examined; only occasional fragments of fungal hyphae were noted.</i></p> <p data-bbox="1256 679 2033 831"><i>Two principal mineral components were consistently recorded, a light yellow/yellow-brown (occasionally light/mid brown or grey-brown) fine sand and a light/mid to mid grey-brown fine sandy silt/silty fine sand”.</i></p> <p data-bbox="1256 887 1688 911">(Carrott, Barker and England, 2020).</p>
	<p data-bbox="450 999 1234 1102">Monolith sampling (319) was extracted from alluvial deposit [292] and [257] for further environmental assessment (Figures 56 and 59).</p> <p data-bbox="450 1166 1234 1270">These isolated silty-sand alluvial deposits and late Romano-British deposits were unusual for the site and were specifically confined to the far north-western extent of the site.</p>	<p data-bbox="1256 967 1995 1070">These silty sands were interpreted as flood deposits from the River Ouse, formed during the late Romano-British period, or earlier.</p> <p data-bbox="1256 1134 2047 1286">An attempt at ground consolidation was observed through the presence of amorphous black deposits (267), (268) and (270), as well as a large pit [251]. All of these were situated at the northern extent of the alluvial sand deposits.</p>

Identifier	Image	Results
<p>Romano-British</p> <p>Amorphous dumped deposits (267) & (268)</p> <p>Posthole [271] (270) associated with Alluvial deposit (292)</p> <p>Plans 5-6</p>	 <p>Figure 59: Dump deposits (267) and (268)</p> <p>3D model: https://sketchfab.com/3d-models/hudson-house-periglacial-deposits-67e69a7e433347249292fa9993739567</p> <p>Amorphous, sticky, silt-clay, dense black deposits (267), (268) and (270) were observed to be embedded and sealed within alluvial deposit (257/292).</p>	<p>Deposits (267) and (268) were finds rich, therefore due to the impacted and dense nature of the fill, both (aside from the retained sample) were coarse wet sieved to aid retrieval (Figure 60).</p> <p>Contexts (267) and (268) were excavated to a length of 1.10m NE/SW and varied in width and depth, from 0.42m-1.10m and between 0.13m-0.24m, respectively.</p> <p>The deposits sloped down towards the south-east, suggestive of dumped materials at the edge of a wetland/flood land.</p> <p>Below and to the front of contexts (267) and (268) was the sub rectangular cut of a posthole feature [271]. This was 0.30m in length, 0.16m in width and 0.20m in depth.</p> <p>Dumped deposit (267) abuts the posthole [271] at the base of the sondage. This posthole extended to an equal distance into the sand layers as the dumped deposits did, suggesting a barrier/shoring may have been positioned along this wetland/flood land.</p> <p>The fine bands of silty-sand seen in alluvial (257/292) change- they become more disturbed and appear to end at a vertical angle.</p>

Identifier	Image	Results
<p>Romano-British Amorphous dumped deposits (267) & (268) associated with Alluvial deposit (292)</p>	 <p data-bbox="517 751 1115 778">Figure 60: Dumped deposit (267) and (268), facing NE</p>	<p data-bbox="1263 266 2049 419">These bands also display a different energy: <i>“swirled’ appearance as if disturbed by a subsequent higher energy inwash or deposited in a backwash against an obstacle not previously or subsequently present”</i> (Figure 61).</p> <p data-bbox="1263 472 1688 499">(Carrott, Barker and England, 2020).</p> <p data-bbox="1263 552 2029 831">A truncated pit/dump feature [259] with fill context (258) was observed in section (Figure 62), sealed underneath alluvial sands (257/292). It had an approximate width of 0.79m and was comparably shallow in depth 0.19m. The deposit was generally amorphous but showed sloping to the south-west. Fill (258) comprised of a sticky silt-clay with small to medium sized stone inclusions.</p>
<p>Romano-British feature [259] within Alluvial deposit (292)</p> <p>Plans 5-6</p>	 <p data-bbox="517 1289 1115 1316">Figure 61: Feature [259] in section, facing SW</p>	<p data-bbox="1263 884 2018 1082">As noted in the other deposits (267) and (268), the finds within these were mixed; including ceramic building material, fragmented animal bone, and a small group of 3rd to 4th century sherds which included grey ware and a body sherd from a large Soller type mortarium.</p> <p data-bbox="1263 1134 2049 1332">Originally thought to be a pit, further excavation revealed that this deposit was more likely to have been washed into a natural depression within the alluvial deposit (257/292). The shape of this deposit follows the general contours of the silt and sand layers seen in alluvial deposit (257/292).</p>

C19th Retaining Wall Feature [497] 3D Model <https://sketchfab.com/3d-models/hudson-house-york-victorian-retaining-wall-c59600f2b730435393e850d05a446f42>

Phase 1 (1840-1841)



Phase 1 describes the retaining wall at the first stage of completion c.1841.

Feature [497] was fully exposed after the demolition of Blocks 3 and 4 of Hudson House. Blocks 3 and 4 of Hudson House were structurally attached to [497] to afford an entrance at Toft Green level (Phase 3).

Earth retaining wall [497], constructed by applying gravity methods, is orientated NE/SW and extends in a curvilinear fashion from the SW at Toft Green Chambers (Monument ID: MYO714) to the NE Main Gates and Wickets (Monument ID: MYO711) of the North Eastern Railway Company Offices (Figure 63).

Wall (Feature [497]) total length is approximately 250m. Of this, 90.00m was exposed within the site of Hudson House, and is constructed of red bricks laid in English Bond style bound with grey mortar. Feature [497] has a wall base plinth (500), enabling the weight of the structure to be distributed more evenly through the ground.



Figure 62: View of the retaining wall with decorative ashlar plinth and turned iron railings

A wall base plinth (500) of the same brick construction as the rest of the wall (including a decorative trim and consisting of one course of bevelled sandstone), is situated at approximately 1.10m from the ground level. The decorative trim comprised of coarse-grained yellow bevelled sandstone ashlar blocks, which slightly protrude (Figure 64-65).

The retaining wall [497] was complete at its top with a decorative plinth of ashlar, finished with turned, spear-tipped railings (Figure 63) as is seen in the remaining intact portion of the wall located towards West Offices (Monument ID MYO713).

Feature [497] has a curved slope of <35 degrees from its top to its base. Eight buttress wing walls (522) were noted within the 90.00m section and are constructed in red brick English Bond with grey mortar. They are 5.15m in height and 1.78m in width (Figure phase 3) and were (522) were regularly spaced at 7.23m intervals, with two in the centre located underneath the Hudson House walkway remaining intact. Out of the other six, four had their top halves partially removed due to later alterations in Phase 3.

The other two buttress wing walls have been completely removed along with any associated structures to the far SW of [497] the buttress wing wall (522) abutting archways (503) and (523) was completely removed.



Figure 63: Wall base plinth (500) and beveled sandstone plinth with Phase 2 Ghost sign (498)



Figure 64: Wall base plinth (500) Phase 2 rectangular beam slots (501)

Phase 2 (1842-1968)



Phase 2 includes post 1842 additional changes to [497] associated with the York Old Railway Station and its use after 1877 as a carriage storage yard.

A ghost sign (498) was located to the far NE of the exposed retaining wall [497]. It was painted in white directly onto the brick surface, with brush marks still visible. It read 'Dumping of Litter is Strictly Forbidden' and may have been written during the station's time as a carriage yard (Figure 65).

Rectangular beam slots (501) (Figure 64) were located in various positions along [497] with most of them in the SW half. The Station's auxiliary buildings had various alterations during its 126 years of operation, and structures both temporary and semi-permanent were constructed as required.

Post 1841, rectangular beam slots (499) were observed in discrete areas, cut into the ashlar blocks (Figure?) of the wall base plinth (500). Their approximate dimensions were 50-90mm in depth and 60-80mm width; their function is unknown.

Three semi-circular segmental brick arches (502), (503) and (523), were observed to the far SW of Feature [497]. This part of the retaining wall had multiple alterations indicative of structures being attached (Figure 66). All three of the segmental arches are constructed of red bricks with grey mortar, and have differing spans: (502) 1.80m, (503) 1.60m and (523) 4.25m. Neither arch has a keystone.



Figure 65: Wide span semi-circular brick arch (523) and flue scarring (505) and (506)

Arches (503) and (523) are located abutting the scarring produced by the removal of the wing wall buttress (522). Archway (523) incorporates a red brick and grey mortar column (524) rising from the level of the wall base plinth (500) to the central point of the rise (523). This column (524) had makeshift stone plinths at its top and base; the plinths were rough stone and not cut to exact sizes.

An additional wall base plinth (520) was constructed over the original (500) to the left of archway, (503). (520) was constructed of 20th century red bricks with a smoothed concrete topping.

Two diagonal fills (505) and (506) were located either side of the scarred wing wall buttress (522).

Context (505) sits on a lintel base (525) and extends upwards to Toft Green. (505) is a thin, diagonally angled fill of coarse-grained yellow sandstone. The sandstone was worked into thin blocks, which was inserted into the gaps of (505). (505) projects up from the piecemeal red brick lintel (525), which sits atop the 20th century wall base plinth (520).

(506) is a thin, diagonally angled fill of sandstone and brick which is very similar to (505). The sandstone fill is coarse-grained yellow sandstone and the brick is red ceramic. (506) does not extend from a lintel base. Both diagonal (505) and (506) extend to Toft Green street level. The function of these two contexts is uncertain; it could indicate some type of stair access, or may be structural support for a flue system (Figure 66).

Phase 3 (1967-1968)



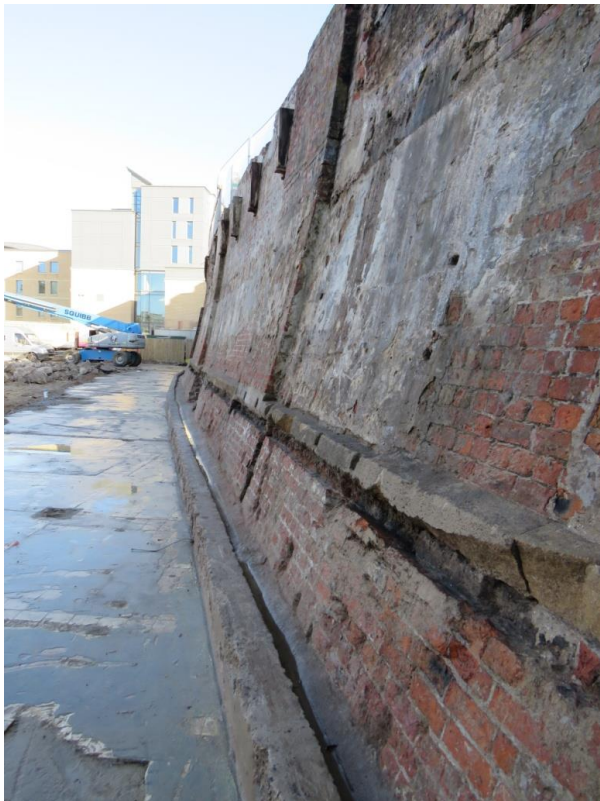
Phase 3 refers to additions to [497] during the construction of Hudson House (Headquarters for the British Rail Eastern Region).

During the construction of Hudson House in 1968, the retaining wall [497] was utilised as an additional support mechanism to enable access from both the West Offices and Toft Green. There is a height discrepancy of approximately 7.00m from Toft Green to the ground level at West Offices, therefore, an elevated platform was created to enable pedestrian access from Toft Green into the new office building from street level.

Structural impact of these works on wall [497] was evident in the form of five cast iron shoes (512) which would have supported the walkway into Hudson House (Figures 67).

Structural scarring was caused to [497] during the demolition of Hudson House. 18 horizontal rectangular pockets of concrete and embedded rebar (504) remain, indicating where Blocks 3 and 4 were attached to the retaining wall [497].

At the base of [497] was a grey concrete drainage channel (511) which was set *in situ*, with the drainage channel gauged out of the concrete from (Figures 67). The concrete had been smoothed upwards to create a seal between [497] and (511).



This drainage system would divert any water associated with the wall away from the foundations of Hudson House.

Individual features of the retaining wall are depicted over leaf, from the far left, to the right.



Figures 66: From left to right:
Curvature of retaining wall [497]
with later 20th century

SALVAGED ARTEFACTS

Non-Stratified Artefacts

Non-Stratified building materials were scattered amongst the disturbed interface that existed within the backfills and truncations made during the construction of Hudson House and above the York Old Railway *in situ* structural remains.

Some examples of worked stone and tile was retained for further identification, while others were assessed on site by Ceramic Buildings Materials specialist, Jane Mc Comish (Part 2).

Infrequent ashlar blocks of medieval and Romano-British date were present, however the majority of items can be dated to the 1841 Old Railway (Figures 68-71).



Figure 67: Railway sleeper block. The rail chair would be affixed with timber trenails



Figure 68: Tile possibly indicative of interior design theme of the original Old Railway Station



Figure 69: Wrought Iron single leaf hinge with a rolled end and four fixtures with attached hexagonal bolts (Appendix 3)



Figure 70: Railway kerbstones

METAL DETECTING SURVEY

The benefits of metal detecting within archaeological principles and the potential for it to elucidate upon the past has been seen in the study of Iron Age coins (Dobson and Denison, 1995). More recently, the British Museum's Portable Antiquities Scheme has spent decades cataloguing metal detected finds, and has resulted in a trove of comparable data to support finds identification (Leahy and Lewis, 2018). Metal detecting upon archaeological sites, after formal investigations and recording has been completed, can enhance the stratigraphic record by tracing lost and misplaced treasured metal artefacts which have eluded to transient places.

A metal detecting survey took place in Area A to investigate the potential presence of unstratified artefacts. It was surmised that 19th century landscaping for the York Old Railway Station had removed all earlier archaeological evidence. However, it was possible that earlier Romano-British or Medieval unstratified metal finds may have remained within residue not removed from site. If that was the case, the only way to locate these finds would be through metal detecting.

Moreover, it was possible that the 19th century levelling of pre 19th century deposits involved the material's reuse during the railway landscaping to create made-up ground, or to level areas more prone to water logging. A metal detecting survey would help to identify any unstratified finds.

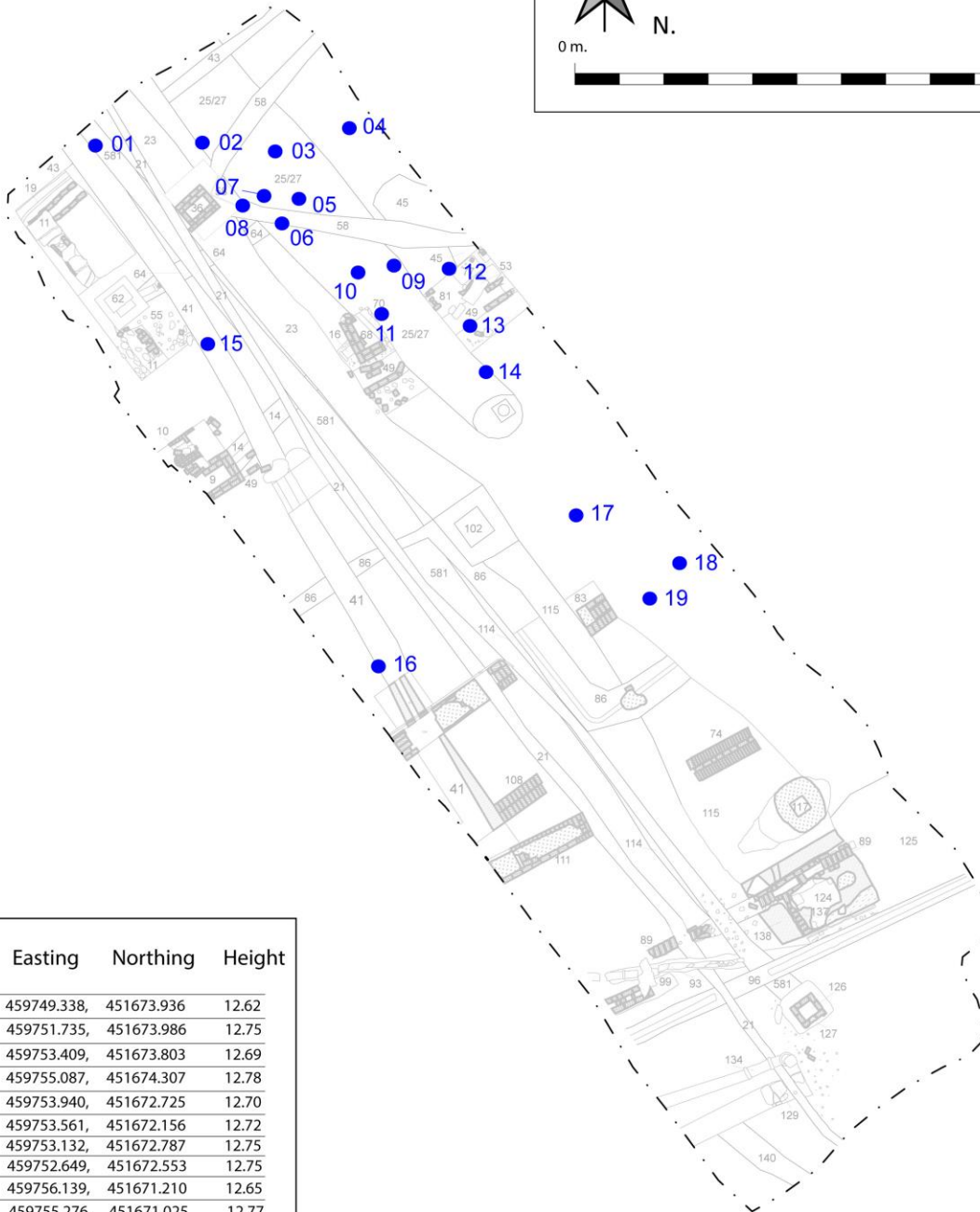
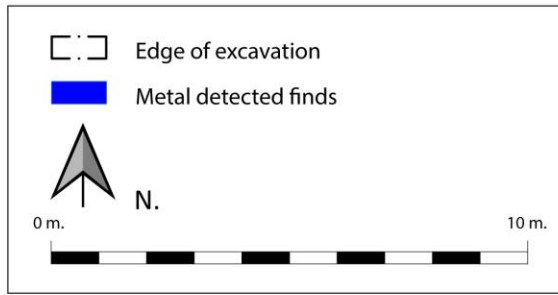
- Landscape remodelling of the whole area was undertaken in 1840 during the construction of the Old Railway.
- Did this involve the whole site being levelled- with earlier deposits removed from site and dumped elsewhere in the City?
- Area A would act as a test sample to investigate the potential presence of metal artefacts predating the 19th century.

Methodology and Results

The Code of Practice for Responsible Metal Detecting in England and Wales (Portable Antiquities Scheme, 2017) was adhered to during the survey. The detectorist, Peter Smith, metal detected upon Area A after full archaeological investigation and recording. The instrument used for this process was a XP Deus with a 9-inch coil. Area A was scanned and signals would be tagged to allow further exploration after the survey completion. Tagged areas were explored and any finds were excavated by trowel. Finds were then bagged and given a unique finds number, and each finds spot was spatially recorded through a survey. In total, only 19 non-stratified items were detected in Area A- 1 of which was located in the spoil heap and is not included below.

Of the detected items, materials were mostly iron. Nick Beilby and Ian Mackenzie, both retired Railway Engineers, identified the railway associated metal detected and non-detected metal artefacts.

Plan of Area A



No.	Easting	Northing	Height
(1)	459749.338,	451673.936	12.62
(2)	459751.735,	451673.986	12.75
(3)	459753.409,	451673.803	12.69
(4)	459755.087,	451674.307	12.78
(5)	459753.940,	451672.725	12.70
(6)	459753.561,	451672.156	12.72
(7)	459753.132,	451672.787	12.75
(8)	459752.649,	451672.553	12.75
(9)	459756.139,	451671.210	12.65
(10)	459755.276,	451671.025	12.77
(11)	459755.821,	451670.106	12.67
(12)	459757.361,	451671.132	12.30
(13)	459757.835,	451669.821	12.30
(14)	459758.198,	451668.804	12.65
(15)	459751.850,	451669.430	12.50
(16)	459775.759,	451662.081	12.53
(17)	459760.224,	451665.510	12.66
(18)	459762.605,	451664.421	12.69
(19)	459761.940,	451663.600	12.60

Results of the Metal Detecting Survey

Context	Finds No.	Metal	Identification	Identification
136	1	Iron	Component	Triangular Steel Bar- Dowel or Reinforcements
136	2	Iron	Bolt	Dog Spike Square Shank beneath Head
136	3	Iron	Fragment	Iron fragment
136	4	Iron	Nail, Plate Fragment	Iron Bracket/Pipe Support
136	5	Iron	Fragment	Iron fragment
136	6	Iron	Fragment	Iron fragment
136	7	Iron	Bolt?	Length of iron bar 25mm diameter
136	8	Iron	Nail	Brad or cut nail
136	9	Iron	Nut	Wrought Iron Nut
136	10	Lead Alloy	Fragment	Lead Alloy fragment
136	11	Iron	Lump	Hearth residue
136	12	Iron	Fragment	Lost head nail
136	13	Iron	Object	Ridged iron object
136	14	Iron	Bolt	Cup Head Bolt Evidence of Concrete Surrounding
136	15	Iron	Fitting	Fitting
136	16	Iron	Object	Corroded Iron Fixing
136	17	Iron	Wire, Fragments	Iron wire fragment
136	18	Iron	Wire	Iron wire
136	19	Slag	Slag?	Slag
136	20	Copper Alloy	Object	Pipe Bracket/Fixing with Machine Screw.

Table 10: Table of unstratified metal detected items from Area A

Most of the 19 detected items were made from iron and were associated with industrial waste and off cuts associated with the railway. The majority were found in heavily disturbed backfilled contexts.

No early artefacts were detected or found in unstratified contexts. This could indicate that reduced ground deposits were removed off site.

ARCHIVE

The site archive will be deposited with the Yorkshire Museums Trust.

Accession number: **YORYM : 2018.167**

The archive contains:

Digital Report

- Selected Photographs.
- Spreadsheets- context data, specialist data, finds index, context index and survey data.
- Reports- all associated specialist reports and papers.
- Digitised sections and plans.
- 3D Photographic Models available on Sketchfab.

<https://sketchfab.com/3d-models/hudson-house-york-victorian-box-drains-bcf8ac1bbbc248b4b7366543fca9ec29>

Box Drains [320] and [321]

<https://sketchfab.com/3d-models/hudson-house-york-river-ouse-alluvial-deposits-67e69a7e433347249292fa9993739567>

Alluvial Deposits (257) and (292)

<https://sketchfab.com/3d-models/hudson-house-york-river-ouse-alluvial-deposits-67e69a7e433347249292fa9993739567>

Retaining Wall [497]

Physical

- Bound paper copy of the excavation report (Parts 1 and 2).
- Original site context records, context index, sample index, drawing index.
- Photographs per feature, pre-excavation and post-excavation, phased area group shots, working shots, outreach, metal detected finds.
- Metal artefact X-rays.
- Field Drawings.
- All finds as advised by specialists and in consultation with the York Museum Trust.

DISCUSSION

8,500BC-43AD PREHISTORIC

Mesolithic 8,500 – 4,000 BC

Neolithic 4,000 – 2,200 BC

Bronze Age 2,200 – 700 BC

The presence of flint (worked and unworked) within an archaeological context may indicate prehistoric activity- be it settled or transitory/seasonal activity.

Flint was present on this site and consisted of six pieces, of which four were natural and two were anthropogenic in origin. The human struck flint were located in two different contexts and were of the same period. This could indicate late Neolithic activity within this vicinity of the site, or could suggest that the flint pieces were brought to site during the 19th century from another location, perhaps within railway construction materials (Loffman, 2020).

The site is partially located to the south-west upon glacial moraine, and to the north-east on alluvial deposits. The glacial moraine supplied useful elevation as a thoroughfare during the prehistoric period (Radley, 1974), passing through the wetlands created by the silting up of the glacial Lake Humber (Whyman and Howard, 2005) which once covered the Vale of York. Prehistoric seasonal camps are likely to have been located along the moraine as it enabled hunting and other related pursuits.

Flint does not occur naturally in this geological location, so the natural flint pieces may have been brought to site to be worked upon, or transported through fluvial or glacial processes (Loffman, 2020).

The four pieces of natural flint (North East coast till/speckled flint and Wolds flint) were located in backfills belonging to a 19th century box drain (42) in [41], a 4th-5th century pit (252) in [251] and a 4th century irregular dark deposit (267). The 19th century box drain backfill (42) contained material from a range of dates spanning from the 1st century to the 19th century. The Romano-British deposits were coarse wet sieved which may account for the observation and retention of these small pieces of flint.

The two pieces of worked flint comprised of a till flint/speckled side scraper combination tool and a till flint/speckled flake; both date to the Late Neolithic. Both these pieces were found in the backfills of Victorian drains; context (255) in box drain [233] and context (369) in box drain [372]. Both these box drains were backfilled with soil and angular limestones. It is possible that both these flint pieces were brought to site in construction materials used during the building of the Victorian York Old Railway. Alternatively, it is possible that both worked flint pieces were residual and present in the ground prior to the construction of the railway.

- The natural flint is likely to be redeposited due to glacial fluvial processes and retained within isolated Romano-British deposits.
- The worked flint dates from the Late Neolithic, however it is uncertain if they were residual or transferred within Victorian railway construction materials.

AD43-410 ROMAN

The site is located on what used to be the western fringes of the Colonia- the urbanisation of villas, temples and bath houses occupied by civilians.

- A small number of isolated features dating to the later Romano-British period were present. These took the form of a pit [251], posthole [271] and amorphous deposits (259), (267) and (268).
- All dated to the 4th-5th century and were associated with low intensity alluvial flooding into a pre-existing void. Overtime, the alluvial flood waters eventually sealed them.
- These features could suggest a period of land reclamation during flooding. Deposits consisting of mixed debris were dumped to shore-up the dry land from floodwaters. Posthole [271] may have supported a submerged wooden structure using discarded material dumped behind it to for reinforcement.

The exemption of earlier Romano-British pottery could suggest that the vast levelling of the site during the remodelling for the 1841 railway removed most above ground features- including residual debris. It is possible that pit [251] was truncated during this remodelling with only its base surviving.

The amorphous deposits [259], (268) may have formed as they sank into the aquatic setting during attempts to help shore-up encroaching floodwaters.

There is evidence to suggest that during the late 4th to 5th centuries there was a period of demise within York (Ottoway, 1999) and that extensive flooding may have been a catalyst for this decline (Ramm, 1971).

All deposits and features contained Romano-British materials of a similar date and comprised of a wide range of artefacts. These included glass, metals, ceramic building materials, tile, tesserae, opus signinum, opus sectile, slag, shell, animal bone, metal small finds, worked jet and antler.

The ceramic building material, which accounted for 14.46% of the total volume, was typical for York and included roof tiles, tesserae, and box flues. Many sherds were too degraded to identify a form.

The forms were indicative of high status buildings with the box flue tiles likely originating from a nearby bathhouse (McComish, 2019).

Other artefacts and debris found within the Romano-British fills and deposits indicated wealth.

Four sherds of glass were present, with one small sherd of colourless glass being from a Roman cup or bowl; representing a good quality dining set (Broadley, 2019). The high status quality of the contents of the deposit and pit debris was also noted in the animal bone assemblage.

The animal bone assemblage for this period was typical, comprising of nine species. Chop marks and bone size suggest meat was being butchered into small pieces. The assemblage indicated that a higher ratio of pig was being consumed in comparison to cattle.

The consumption of young pig was adopted towards the transitional period as a way of associating with a Roman past (Gerard, 2007 as cited in Chipping, 2019).

Amongst the high status building materials and domestic debris was evidence of industrial activity. Cut deer antler, worked shale jet fragments and smithing material was located in the amorphous deposits (259), (267) and (268) and pit [251].

The smithing material included slagged lining, fired clay, cinder and flowed iron working slag (McDonnell, 2019).

The pottery assemblage was generally typical for this part of York and was heavily abraded. Within the fills of pit [251] Southern Spanish globular Dressel and other Spanish amphora were the most prevalent types (Rowlandson and Fiske, 2019).

Pit [251] was located on the edge of the alluvial deposit and may indicate deliberate dumping to form a compact surface.

The original source of the dumped waste is not certain. To the east of the site towards Micklegate and Bishophill, significant structural evidence has been observed: high status house with mosaic flooring, mortar floors, house with plunge baths, and widespread terracing on the sloping incline from Micklegate towards the Ouse banks. Within Toft Green and Tanner Row, there was evidence of more high status houses and bath complexes.

Recycled refuse from a range of sources may have been collected and used during periods of extreme localised flooding for ground consolidation and enforced structural platforms.

There was an abundance of amphorae sherds in pit [251] and this practice of material amalgamation has previously been observed in York. For example, in the 4th-5th century there is evidence that fragmented amphora were used to create structural bases at Wellington Row, York (Rowlandson and Fiske, 2019).

The small isolated archaeological features and deposits found on site were dated to the 4th-5th century and all were located on the edge of or within alluvial flood deposits sands. Increased flooding from the River Ouse may have exasperated a community already in decline.

1841- YORK OLD RAILWAY STATION



Figure 71: 1856 Ordnance Survey Map showing the extent of the 1841 York Old Railway

Historical and cartographic evidence identified that the development site was located within the bounds of the 1841 York Old Railway Station. Features revealed on site included the departure platform, the Railway Stables, Merchandise Station, turntables, and numerous box drains.



Figure 72: OP01486 General View showing cuttings to city walls © Crown copyright. Historic England Archive

During the excavation of these structural foundations and below ground features, the quality of the workmanship was visible. Moreover the huge ground clearing works required to level the site and to construct a retaining wall from Toft Green is testimony to the hundreds of navvies that would have been employed in York to complete the works.

Drawing on expertise from canal construction, gangers and supervisors would follow projects whilst the majority of the workforce were local. Railway worker's rates in the mid 1830's totaled 3-5 shillings a day- which was three times that of agricultural work. They could move up to 12 cubic yards of earth per day, equivalent to digging a trench 3 feet wide, 3 feet deep and 36 feet long (Simmons and Biddle,1997). This huge input of manpower was key to delivering the infrastructure that would support the requirements of the engines and loads which tracked on them. Between 1835 and 1849 more people were employed constructing railways than were running them (Arnold, 2004).

Individual lines such as the 1830 Liverpool to Manchester, were constructed by a local workforce who were supervised by workers who had gained experience under George Stephenson on the lines of Durham and Northumberland (Brooke, 1983).

The contracts for works in the York Old Railway Station were given to Holroyd and Walker of Sheffield with the tarnished ironwork to Bingley and Company of Leeds. Architectural design was made by George Andrews and

engineering was undertaken by Thomas Cabrey. This was overseen by Robert Stephen and George Hudson of the York and North Midland Company.

The York Old Railway consisted of extensive infrastructure within the city walls and out with them (Figure 72).

- Merchandise Station (YNM and GNE, 1841).
- Stables.
- Toft Green Chambers: housing for two railway officers (YNM 1840s).
- 1st GNE Engine Shed (1839-40) taken out of use before 1851 and then cut back and adapted as two houses. These were demolished in 1875-6 for approach lines to the new coal depot.
- Engine Shed – probably replacement for No. 4 (built between 1844 and 1851).
- Railway arches through City Wall (1839 and 1845-6).
- Keeper's cabin for Queen Street level crossing.
- Passenger Station (YNM and GNE January 1841, enlarged 1846).
- Wagon Shop (late 1840s).
- YNM Water Tower and Coke Store (1839) and Store Houses (1840s).
- YNM Workshops (1842 et seq., but incorporating 1st YNM Engine Shed of 1839).
- 2nd YNM Engine Shed. 11. DAD 3rd YNM Engine Shed (roundhouse c1849-50).
- North Lodge villa and gardens (YNB c1845 for John Close, company secretary).
- Holgate Villa and gardens (YNM c1842-3 for Thomas Cabry, engineer).
- Former YNM coal depot (1839, abandoned 1845-6).
- GNE (later YNB) coal depot (1840) and 2nd YNM coal depot (1845).
- YNB Signal Cabin.
- YNM housing (1840s); demolished 1875-6 for diversion of Queen Street into new bridge.

(Fawcett, John, Ives and Sinclair 2013)

The railway station terminus and associated passenger platforms, station buildings, Merchandise Station and the Railway Stables were located inside the City Walls (Figure 73).

The railway station was located inside the city walls to accommodate the preference for passengers to alight close to the city center. George Hudson insisted that the medieval city walls were breached to enable this. During the 1840's other historic cities such as Chester, Conway, Shrewsbury and Newcastle had also allowed trains into their centre's (Arnold, 2004).

Although Hudson's vision was highly contentious, it could be viewed as shrewd. For example, Liverpool Crown Street, the world's first intercity passenger station (1830), had been rapidly outgrown due to an influx of passengers requiring a more central station.

Six years later a new station was built and opened at Liverpool Lime Street, which was closer to the city center.

Freight was an important commodity to the railways, however passenger numbers and demands were increasing, and arriving on the outskirts of a city close to the merchandise warehouses was not convenient.

The period of early railway design was fluid, so localised companies funding this new technology had to be flexible and able to sell their 'products' to their shareholders.

The drama and flair of a train passing through York's historic walls into the city centre would have been a spectacle. It was a way to entice more visitors to the historic city, which was of primary concern for Hudson and other city officials.

The location of a railway site was also influenced by local, commercial and civic pressures; access and financial costs of land (Biddle, 1986). The site at Toft Green with its proximity to the Ouse for river bound cargo, the undeveloped land to the north-west of the city walls, and its reasonable land price all made this site an ideal location for the station to be built.

Excavations at the site revealed some of the foundations of this former station's infrastructure.

The foundations of the Departure Platform, The Railway Stables, Box Drainage and the Merchandise Station and associated turntables, were identified and mapped against the 1856 Ordnance Survey Map (Figure 74).

The majority of features observed on site were structural- the foundations of the infrastructure required to support the railway and its merchandise and passengers.

Structures and foundations were generally standardised, as seen in the consistent use of: frogless bricks, limestone mortar (consisting of a combination of 1 part feebly hydraulic lime to 1.5-2 parts of silica sand), unburnt lime and waste ash (Womersley, 2020), and roughly hewn slabs for foundations and caps.

With many different companies constructing stations and lines, albeit under a select group of engineers and architects, a degree of standardisation would be critical to ensure lines could be connected and that wagons and carriages could travel with minimal disruption.

This degree of standard practice is a legacy of the British Railways and standardised features (Appendix 3 and 4), such as those revealed on site, can be identified in seminal works such as:

- Brees, S.C. (1847); *First Series of Railway Practice, A Collection of Working Plans and Practical Details of Construction in the Public Works of the Most Celebrated Engineers*
- North Eastern Railway (1908); *Book of Standards*.

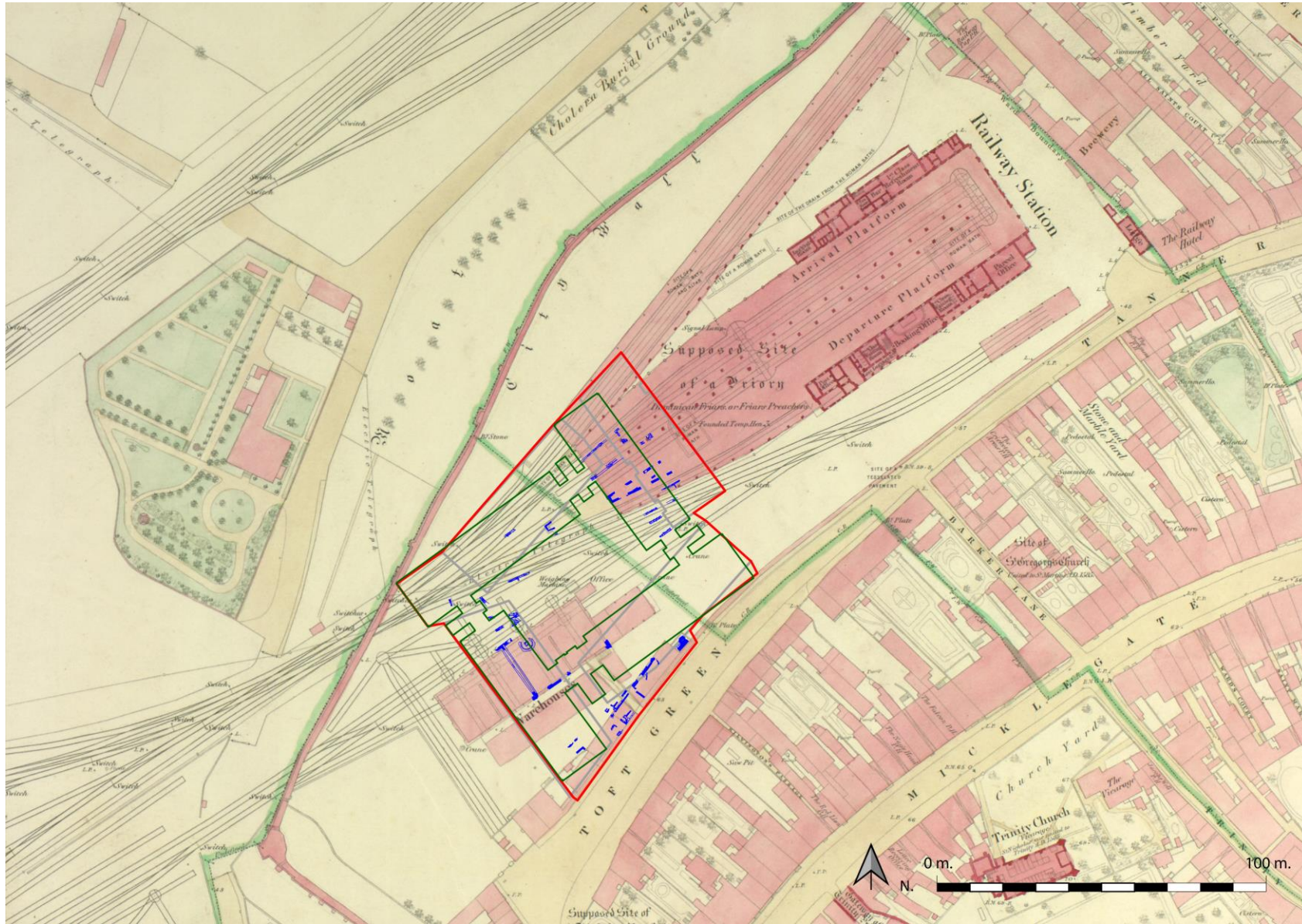


Figure 73: York Old Railway archaeological results as compared to the 1852 Ordnance Survey Map



Figure 74:OP01486 General View showing arrival platform, roofing and ironwork © Crown copyright. Historic England Archive

Assessment of the post medieval pottery concluded that the area had not seen large scale dumping of solid refuse as a construction material, as observed in other cities such as Sheffield (Cumberpatch, 2019). The glass sherds were indicative of soda bottles, such as the Hamilton type, possibly consumed by some of the workers during construction (Broadly, 2019).

The small finds included the broken tip of a slate pencil, fired clay tobacco pipes (although the pipes forms and design (Rogers, 2019) suggest an 18th century date) so may have been residual. Slag and soldering debris was observed, suggesting that some aspects of blacksmithing was undertaken at the site (McDonnell, 2019).

The box drainage system was extensive and the majority were aligned south-west/north-east, draining any water and discharge out of the breached arches of the city walls into the River Ouse via Holbeck Beck.

Heavy metal testing of the sediment contained within these redundant box drains elucidated higher concentrations of lead in drains located underneath the station canopy. Creosote was widely used in the railways for wood preservation and so this could account for these increased levels of lead in the box drain sediment.

The other two sediments from box drains that lay out with the station's canopy recorded significantly lower levels of heavy metal toxicity.

In total 38.63m of the departure platform foundations survived albeit truncated at two points by later piling and groundworks associated with the construction of Hudson House. The foundations to this structure would have supported raised walls and pedestrian surface as captured in Figure 75.

The foundations of the Merchandise Station involved neat layers of made up ground, stone leveling slabs and stepped brickwork. This building was tall and so an upstairs level and would require extremely solid foundations. These foundations, which were more than 1.00m in depth were extraordinarily well built and cut.

The quality of workmanship was impressive as the foundation cut into the natural was of machine precision.

The Merchandise Station turntables and their size were 14 feet in diameter. An *in situ* cast concrete base, with internal and external spider casting, was all that remained. Positioned on top would originally have been a bridge unit which would have supported one to five plank open freight wagons or vans, measuring between 9 feet 6 inch wheel bases to 10 feet. The bridge unit would rotate on the central bearing, which was seated on a pedestal. Small wheels attached to the bridge unit would run on a track. Due to the small size and weight of these early wagons and vans, the turntable could be moved laterally by either hand or by horse on a trod path. Figure 76 indicates the relative size of these early turntables.



Figure 75: General View of wooden turntable and cutaway platform © Crown copyright. Historic England Archive

In 1841, thirty-four 14 foot turntables were constructed, along with one engine shed. Sixteen turntables were constructed within the city walls at the Station, ten of which served the Merchandise Station and eight the Passenger Station. A further sixteen were located in and around the Fitting Shop and Wagon Shop (Figure 74).

Early railway goods yards could be compromised for space and locomotive power was expensive, therefore the ability to hand/horse move freight wagons into positions for loading was important. On account of this, small turntables were preferable to points, as they required less space and supported quick transfers between adjacent sidings (Foster, 1986).

During recent excavations at the York South Motive Power Depot, the remains of an early straight shed and a combination of three roundhouses was observed. The straight shed and one of the roundhouses was contemporary to the 1841 station (Figure 72). The straight shed and roundhouses remained in use for 120 years and 109 years respectively.

The turntables were 42 feet tall, which secured a degree of longevity as they could support increases in locomotion size. Thereafter they remained in use for handling tank engines, piloting trains and shunting duties (Emery and Haskam, 2018).

The remodeling and deployment of the 1841 railway infrastructure on the Queens Street site of the York Old Railway was more certain, due to it being central to the location of the new station, which was constructed in 1877.

The survival of the infrastructure of the Old Railway Station was less secure, due to its redundancy in function over time. Its terminus design became problematic due to the opening of new lines and so subsequently it retired into a carriage storage space, with the station and attached hotel becoming offices.

The development of the station into the sympathetically designed current Council Offices is testimony to the quality of Andrew's architectural flair and its important historical standing within this grand Victorian architectural backdrop (The Grand Hotel and the Toft Green retaining wall).

The recording of the below ground structural features of this nationally important station has been the primary concern of the evaluations.

The evidence recorded from this site is the only remaining accurate up-to-date survey of the surviving below ground infrastructure; where it was and how it was constructed.

The structural remains identified and recorded during excavations at Hudson House will exist as a legacy to local and national railway engineering, constructed during a period of active and fluid technological innovation.

The York Old Railway Station and its associated human back-story should stand amongst other early examples of railway design as one that championed high quality craftsmanship with the determination and bravado to bring the future to the developing Victorian historic city of York.

CONCLUSION

The archaeological investigations at the site of Hudson House revealed:

- The natural flint is likely to be redeposited due to glacial fluvial processes and retained within isolated Romano-British deposits.
- The worked flint dates from the Late Neolithic, however it is uncertain if they were residual or transferred within Victorian railway construction materials.
- A small number of isolated features dating to the later Romano-British period were present. These took the form of a pit [251], posthole [271] and amorphous deposits (259), (267) and (268).

- These were all dated to the 4th-5th century and were associated with low intensity alluvial flooding into a pre-existing surface. Overtime, the alluvial flood waters eventually sealed them off.
- These features could suggest a period of land reclamation during flooding. Deposits consisting of mixed debris were dumped to shore-up the dry land from floodwaters. Posthole [271] may have supported a submerged wooden structure, with discarded material dumped behind it for reinforcement.
- Historical and cartographic evidence identified that the site was located within the bounds of the York Old Railway Station. Features revealed on site included the departure platform, the Railway Stables, Merchandise Station, turntables and numerous box drains.
- The majority of features observed on site were structural i.e. the foundations of the infrastructure required to support the railway and its merchandise and passengers.
- Foundation walls, box drains, culverts and flooring associated with the Railway Stables were uncovered adjacent to Toft Green retaining wall.
- The retaining wall had scars and features indicating three phases of extensive development: it's original construction in 1841, later remodeling post 1841, and it's incorporation into the engineering and design model for Hudson House.
- The box drainage system was extensive and the majority were aligned south-west/north-east to drain any water and discharge out of the breached arches of the city walls into the River Ouse via Holbeck Beck. Heavy metal testing of the sediment contained within these redundant box drain elucidated higher concentrations of lead in drains located underneath the station canopy.
- The foundations of the Merchandise Station involved neat layers of made-up ground, stone leveling slabs, and stepped brickwork. This building was tall and would require extremely solid foundations. These foundations, which were more than 1.00m in depth, were extraordinarily well built and cut. The quality of workmanship was impressive as the foundation cut into the natural was of machine precision.
- In total, 38.63m of the departure platform foundations survived albeit truncated at two points by later piling and groundworks associated with the construction of Hudson House.
- The Merchandise Station turntables and their size were 14 feet in diameter. The *in situ* case concrete base with internal and external spider casting was all that remained.
- The recording of the below ground structural features of this nationally important station has been the primary concern of the evaluations. The evidence recorded from this site is the only remaining accurate up-to-date survey of the surviving below ground infrastructure; where it was and how it was constructed.

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Online Resources

www.heritagegateway.org.uk

<http://www.engineering-timelines.com/scripts/engineeringItem.asp?id=718>

APPENDIX 1

Drawing Index

Drawing Number	Sheet Number	Type	Description	Scale
1	14a	Section	Section of [13]	1:10
2	14a	Plan	Plan of [13]	1:20
3	14a	Section	Profile [11] an [19]	1:10
4	14a	Plan	Plan of [11] and [19]	1:20
5	1a	Section	Profile of [9] and [10]	1:10
6	1a	Section	Profile of [9] and [16]	1:10
7	4a	Plan	Plan of [6] [9] [10] [17] and [18]	1:20
8			Void	
9			Void	
10	5a	Section	Section of [33]	1:10
11	5a	Section	Section of [33]	1:10
12	8a	Section	Section across [5] [6] [17] [41] in Trench 32	1:10
13	2a	Section	Section in Trench 31	1:10
14	2a	Section	Section in Trench 31	1:10
15	2a	Section	Section (1) Trench 31	1:10
16	1a	Section	Section of (2) Trench 31	1:10
17	1a	Section	Section Trench 30 [36]	1:10
18	3a	Section	Section Trench 32	1:10
19	3a	Section	Section Trench 32	1:10
20	5a	Section	Section Trench 32	1:10
21	1a	Section	Section Trench 29	1:10
22	1a	Section	Section Trench 32	1:10
23	3a	Section	Section Trench 29	1:10
24	8a	Section	Section Trench 32	1:10
25	6a	Plan	Plan of Northern Corner of SMR Area	1:20
26	5a	Plan	Plan of Trench 33	1:20
27	6a	Plan	Plan of Trench 30 and [36]	1:20
28	6a	Plan	Plan of [68]	1:20
29	7a	Section	Section [41] and [104]	1:10
30	7a	Section	Section [108] and [109]	1:10
31	7a	Section	Section [111] and [112]	1:10
32	15a	Plan	Plan of [74] [83] and (88)	1:20
33	7a	Section	Section [83] and [84]	1:10
34	9a	Section	Section [74]	1:10
35	10a	Plan	Plan of [104] [108] and [111]	1:20
36	9a	Section	Section of [77]	1:10
37	9a	Section	Section of [80]	1:10
38	9a	Plan	Plan of [77] and [80]	1:20
39	12a	Section	Section of [89]	1:10
40	12a	Section	Section of [90]	1:10
41	11a	Plan	Plan of [89] and [99]	1:20
42	13a	Plan	Plan of [126] and [129]	1:20

Drawing Number	Sheet Number	Type	Description	Scale
43	13a	Section	Section [126]	1:10
44	13a	Section	Section of [137]	1:10
45	1b	Plan	Plan of [150 and [156]	1:20
46	1 & 3b	Section	Section of [152]	1:10
47	1b	Plan	Plan of [159]	1:20
48	2b	Plan	Plan [161] and [162]	1:20
49	3b	Section	Section [167] [169] [172] [174] and [192]	1:10
50	2b	Section	Section (163) (164) (165) (166) (176) and [177]	1:10
51	2b	Section	Section of [161] and [162]	1:10
52	3b	Plan	Plan of [188]	1:20
53	4b	Plan	Plan [178] [182] and [185]	1:20
54	3b	Section	Section of [188]	1:10
55	3b	Section	Section of [185]	1:10
56	Photo	Section	4 Photo Points [198]	1:10
57	Photo	Section	4 Photo Points [199]	1:10
58	Photo	Section	4 Photo Points [200]	1:10
59	7b	Plan	Plan of [203] [212] [214] [218] and [220]	1:20
60	5b	Plan	Plan of [201] [202] [204] and [218]	1:20
61	4b	Plan	Plan of [201] [216] and [218]	1:20
62			Void	
63			Void	
64			Void	
65	6b	Plan	Plan of [225]	1:20
66	8b	Section	Section of [228]	1:10
67	9b	Plan	Plan of [233]	1:20
68	9b	Section	Section [233]	1:10
69	9b	Section	Section [237]	1:10
70	Photo	Section	4 Photo Points [242]	1:10
71	Photo	Section	4 Photo Points [243]	1:10
72	10b	Plan	Plan of [261]	1:20
73	11b	Section	Section of [251]	1:10
74	10b	Section	Section of [261]	1:10
75	10b	Section	Section of [261]	1:10
76	11b	Section	Section of [245] [256] [257] and [259]	1:10
77	10b	Section	Section of [267] and [268]	1:10
78	11b	Plan	Plan of [269]	1:20
79	12b	Plan	Plan of [264] [265] [267] and [271]	1:20
80	12b	Section	Section of [267] [268] and [286]	1:10
81	11b	Plan	Plan of [251]	1:20
82	12b	Section	Section of [268] and [286]	1:10
83	14b	Plan	Plan of [251] (253) [254] (255) [256] (267) (269)	1:50
84	13b	Section	Section points of Column samples 1 and 2	1:10
85	13b	Section	Section points of Column sample 3	1:10
86	13b	Section	Section points of Column sample 4	1:10
87	14b	Section	Section of (291)	1:10
88	14b	Plan	Plan of (291)	1:20
89	14b	Plan	Plan of [311]	1:20

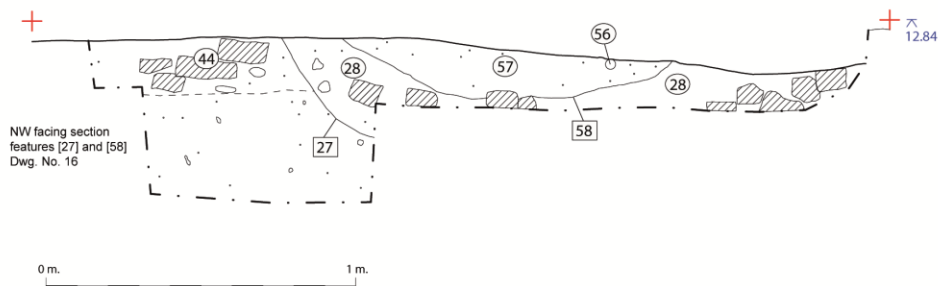
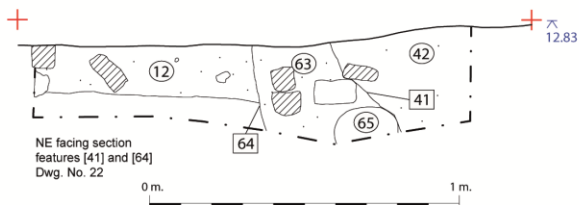
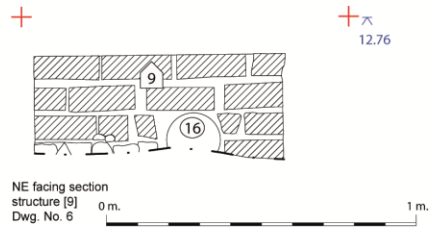
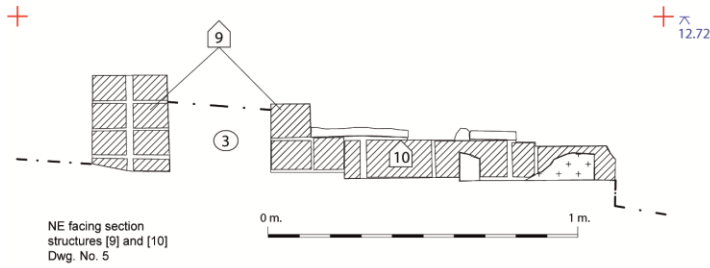
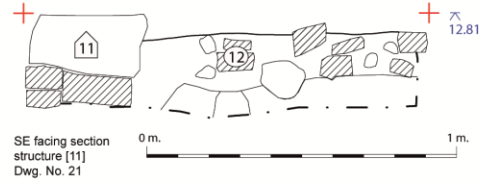
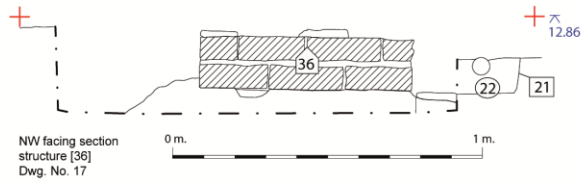
Drawing Number	Sheet Number	Type	Description	Scale
90	14b	Section	Section [311]	1:10
91	16b	Plan	Plan of [321]	1:20
92	16b	Section	Section [321]	1:10
93	15b	Section	Section (322)	1:10
94	16b	Plan	Plan of [326]	1:20
95	16b	Plan	Plan of [325]	1:20
96	16b	Section	Section [325]	1:10
97	16b	Section	Section [330]	1:10
98	15b	Section	Section [324]	1:10
99	15b	Plan	Plan of [324]	1:20
100	18b	Section	Section of [340]	1:10
101	18b	Plan	Plan of [340] and [342]	1:20
102	20b	Plan	Plan of [355]	1:20
103	20b	Section	Section [355]	1:10
104	17b	Plan	Plan of [350]	1:20
105	20b	Section	Section [350]	1:10
106	19b	Plan	Plan of [361] [366] [368] [370] [372] [376] [377] [380] and [428]	1:20
107	17b	Section	Section [352]	1:10
108	17b	Plan	Plan [352]	1:20
109	20b	Section	Section [393]	1:10
110	18b	Section	Section (375 and (392)	1:10
111	18b	Plan	Plan of [393]	1:20
112	20b	Plan	Plan of [368] and [372]	1:20
113	18b	Section	Section [393] and [416]	1:10
114	18b	Section	Section [393] and [422]	1:10
115	22b	Section	Section [419]	1:10
116	22b	Plan	Plan of [416] [419] and [422]	1:20
117	21b	Plan	Plan of [397] and [398]	1:20
118	22b	Section	Section (441) and [437]	1:10
119	23b	Plan	Plan of [437] (441)	1:20
120	24b	Plan	Plan of [449] [450] and [451]	1:20
121	24b	Section	Section of [433]	1:10
122	24b	Section	Section of [433]	1:10
123	25b	Plan	Plan of [433]	1:20
124	24b	Section	Section [442]	1:10
125	26b	Section	Section of [456]	1:10
126	26b	Section	Section of [456]	1:10
127	26b	Plan	Plan of [456]	1:20
128	27b	Section	Section of [436]	1:10
129	30b	Section	Section of (472)	1:10
130	30b	Section	Section of [475]	1:10
131	27b	Section	Section of [484]	1:10
132	27b	Section	Section [481]	1:10
133	27b	Section	Section [475]	1:10
134	28b	Plan	Plan of [475] [481] [484] [485] and [486]	1:20
135	29b	Section	Section of [489] and [490]	1:10

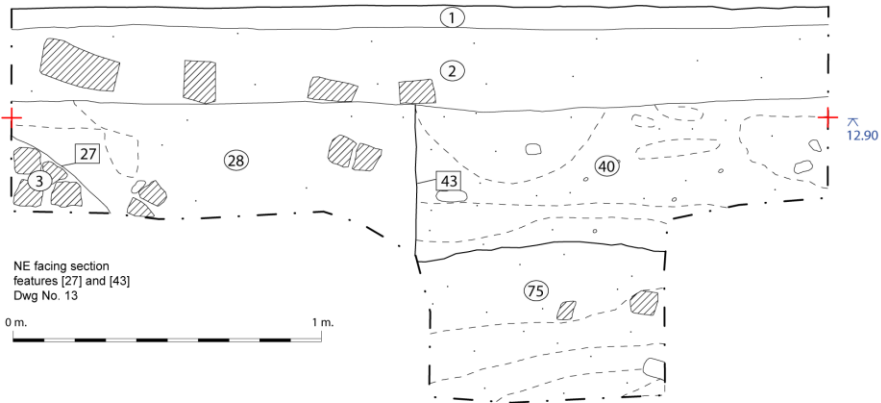
Drawing Number	Sheet Number	Type	Description	Scale
136	29b	Plan	Plan of [489] and [490]	1:20
137	30b	Section	Section of [491]	1:10
138	30b	Plan	Plan of [491]	1:20
139	30b	Plan	Plan of [529]	1:20
140	31b	Section	Section of [518]	1:10
141	31b	Plan	Plan of [518]	1:20
142	31b	Plan	Plan of [519]	1:20
143	32b	Plan	Plan of [514] and [516]	1:20
144	32b	Plan	Plan of [517] and [530]	1:20
145	32b	Plan	Plan of [547] and [560]	1:20
146	33b	Plan	Plan of [457] [551] and [552]	1:20
147	33b	Plan	Plan of [535] [538] and [541]	1:20
148	32b	Plan	Plan of [550]	1:20
149	34b	Plan	Plan of [544] and [555]	1:20

APPENDIX 2

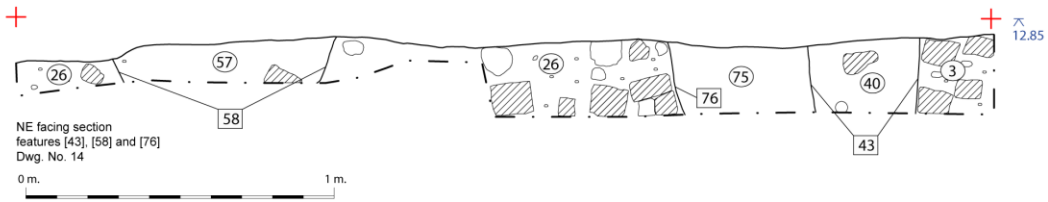
Plans and Section Drawings

Sheet 1a

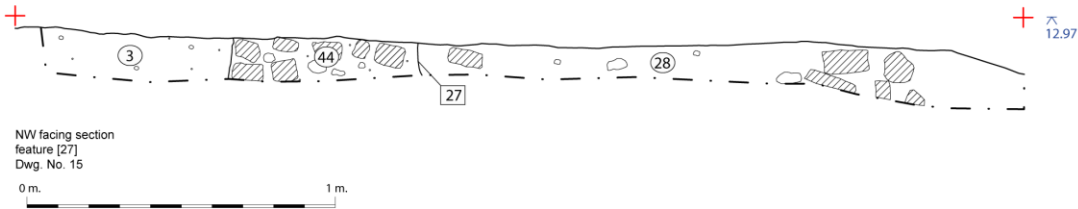




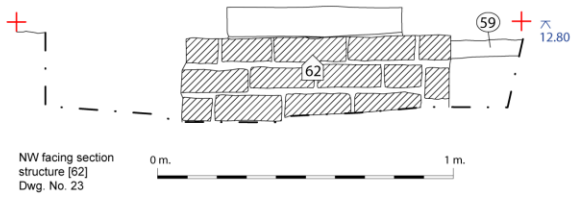
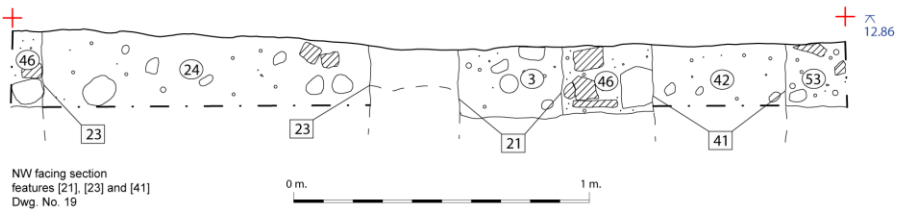
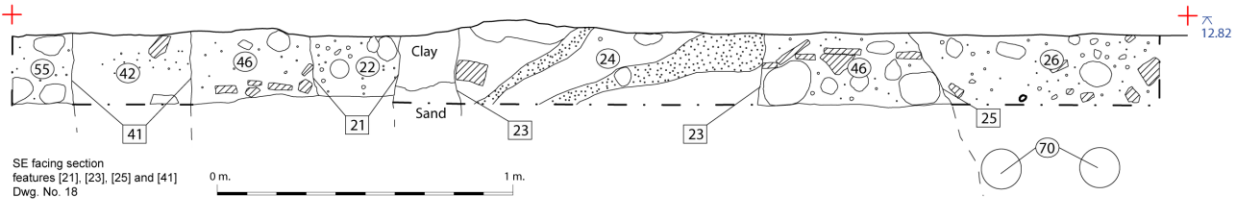
NE facing section
features [27] and [43]
Dwg. No. 13

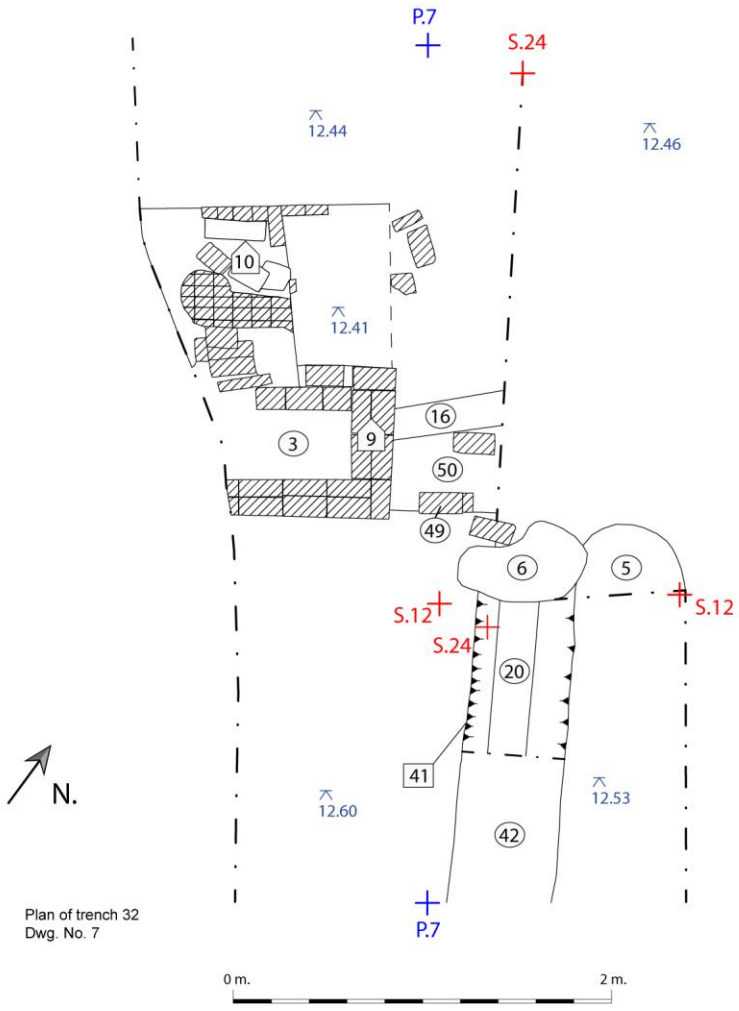


NE facing section
features [43], [58] and [76]
Dwg. No. 14

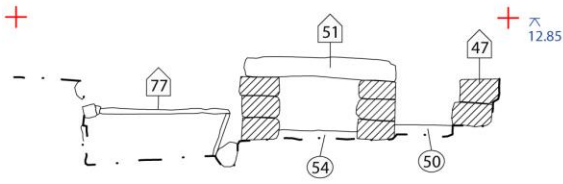


NW facing section
feature [27]
Dwg. No. 15

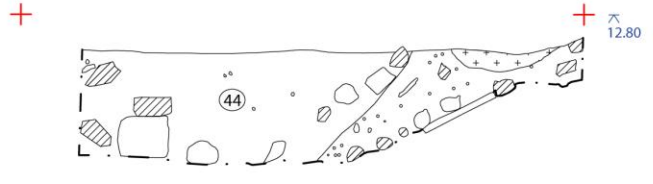




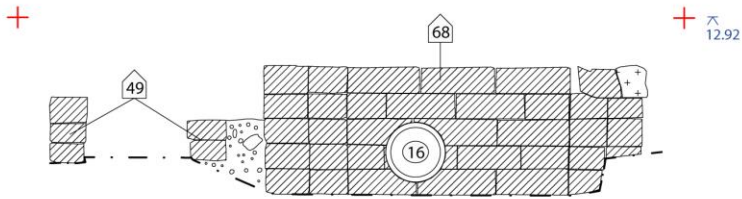
Plan of trench 32
Dwg. No. 7



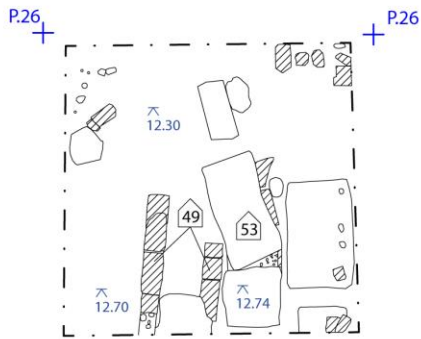
SW facing section
structures [47] [51] and [77]
Dwg. No. 10



SE facing section
deposit (44)
Dwg. No. 11



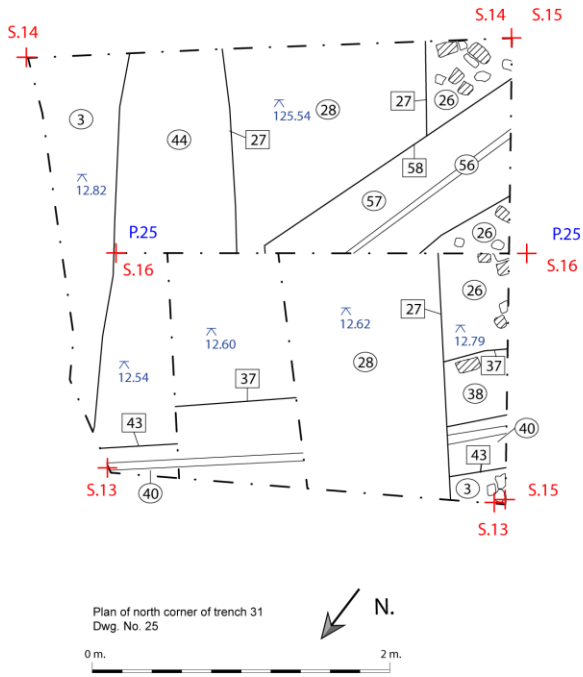
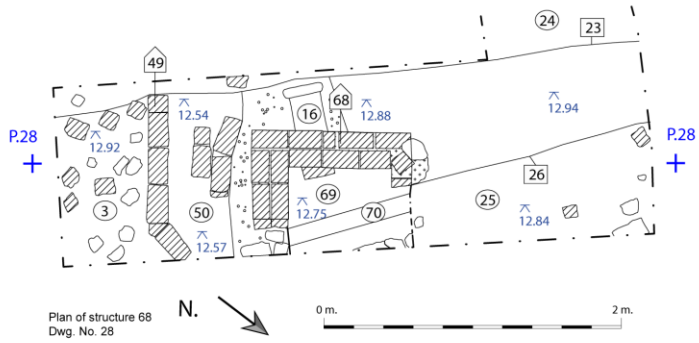
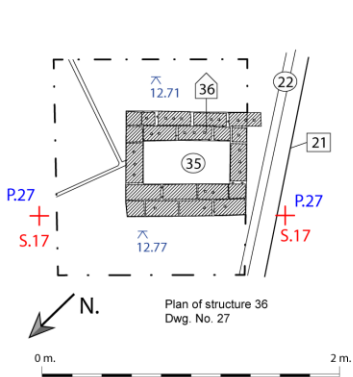
NE facing section
structures [49] and [68]
Dwg. No. 20

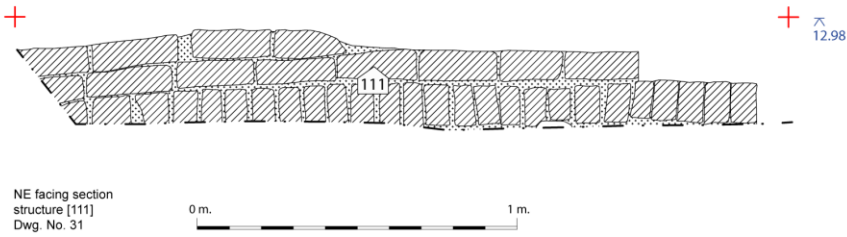
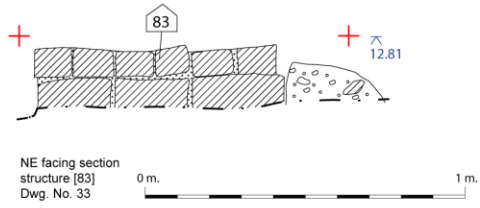
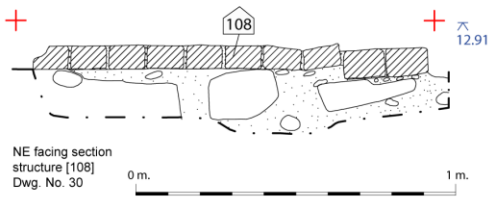
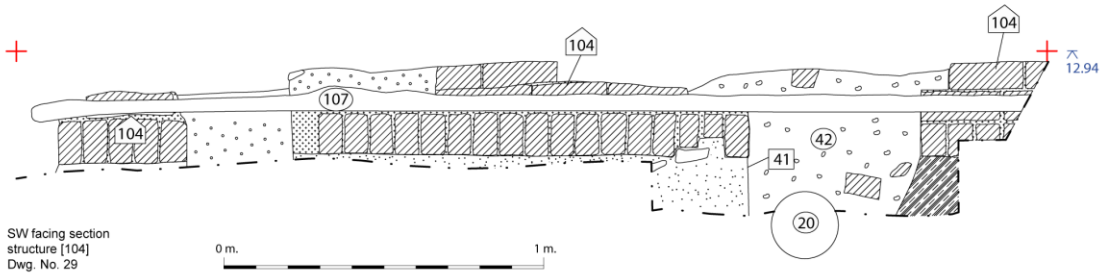


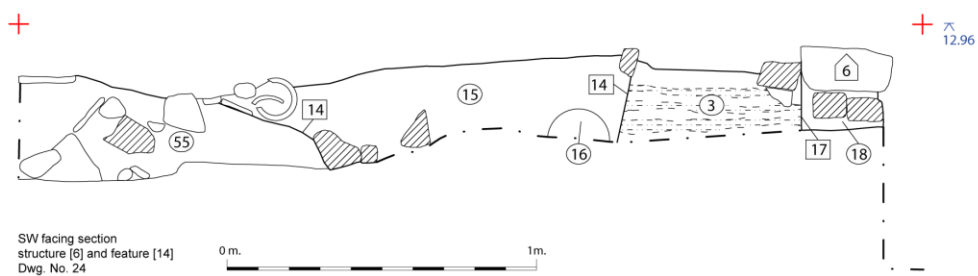
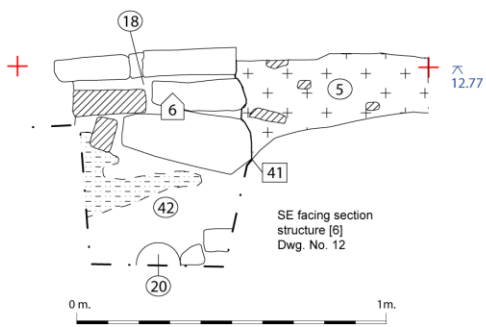
0 m. 2 m.

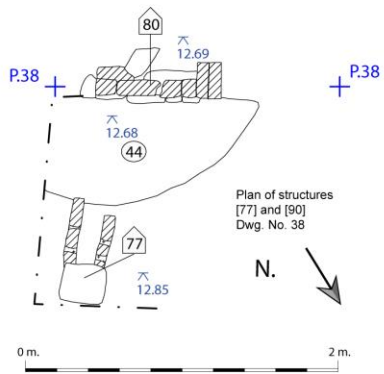
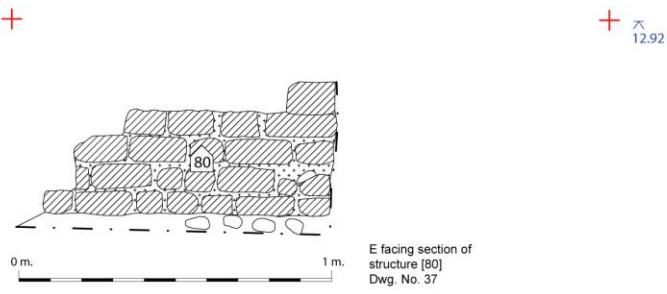
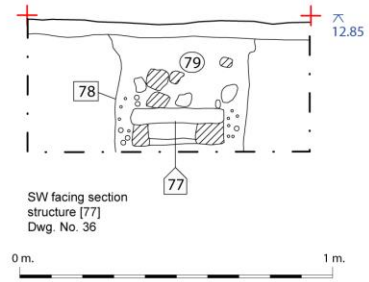
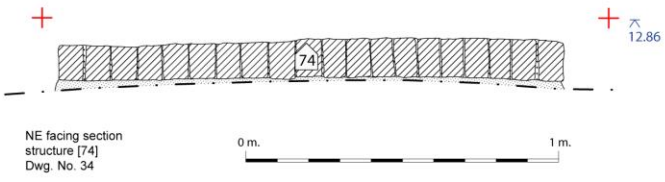
Plan of trench 33
structures [49] and [53]
Dwg. No. 26

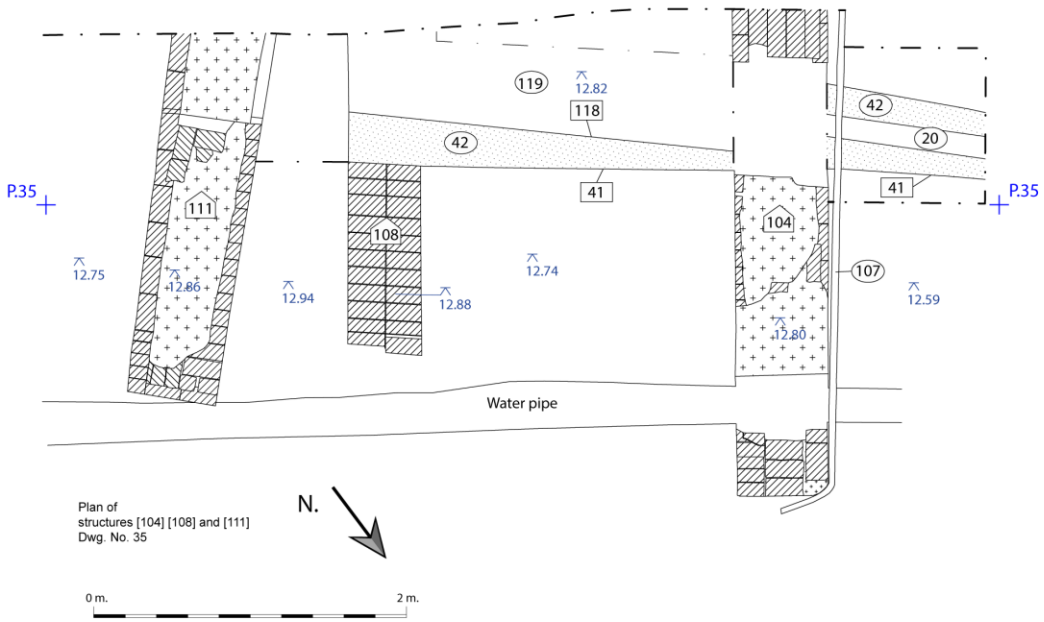


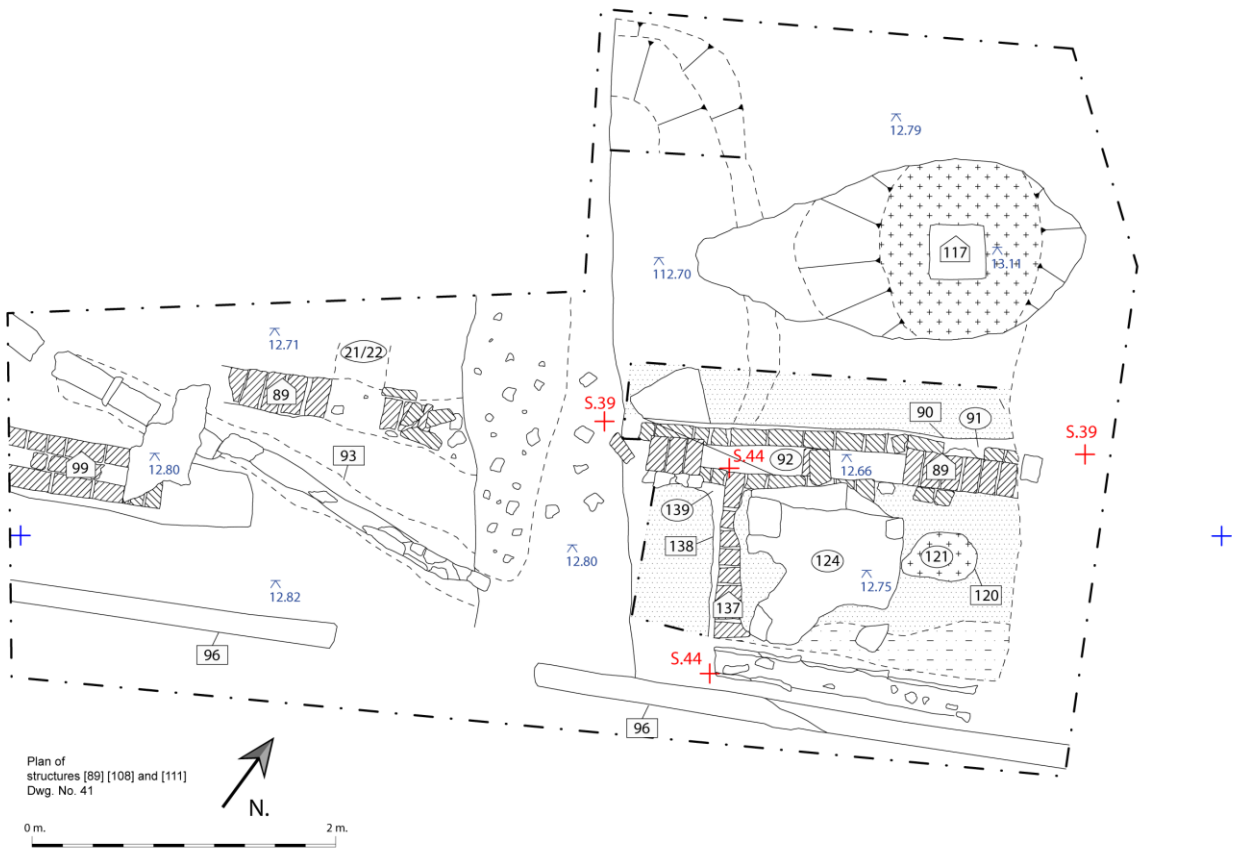




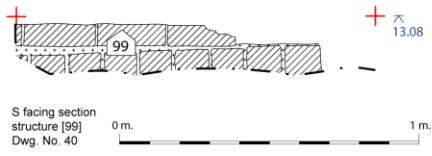
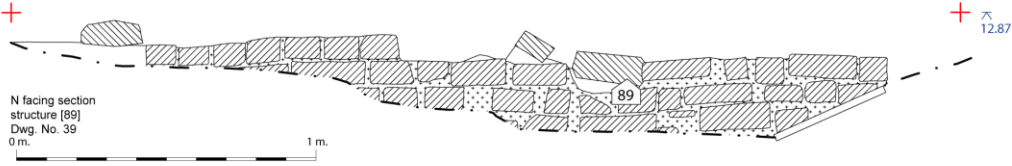


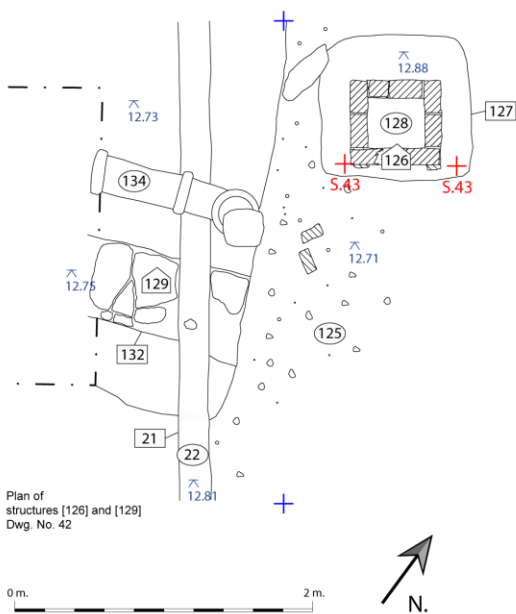
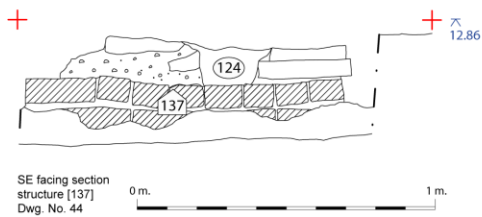
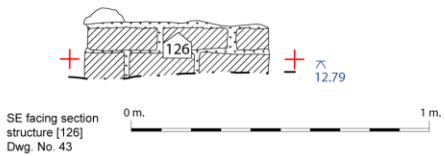


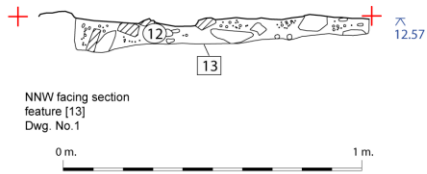




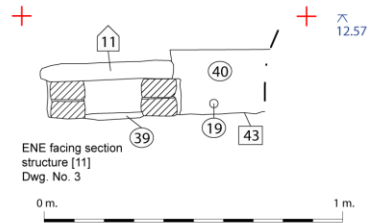
Plan of structures [89] [108] and [111]
Dwg. No. 41



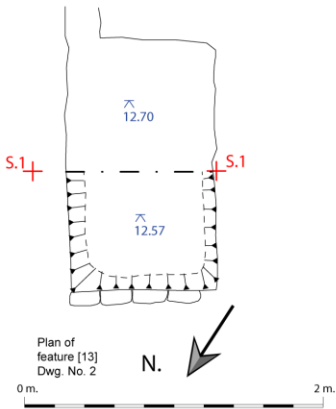




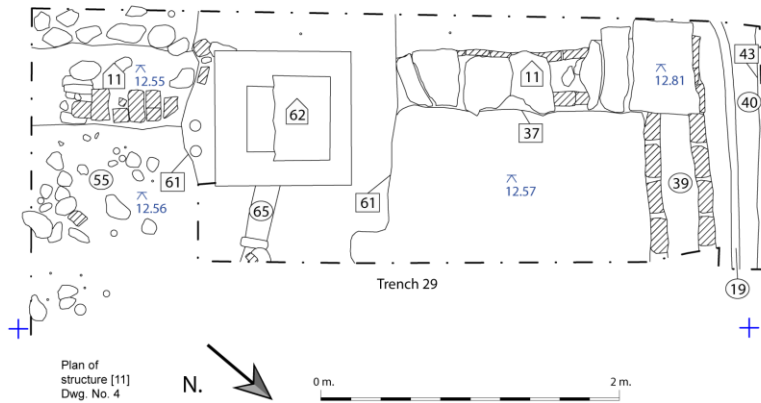
NNW facing section
feature [13]
Dwg. No. 1



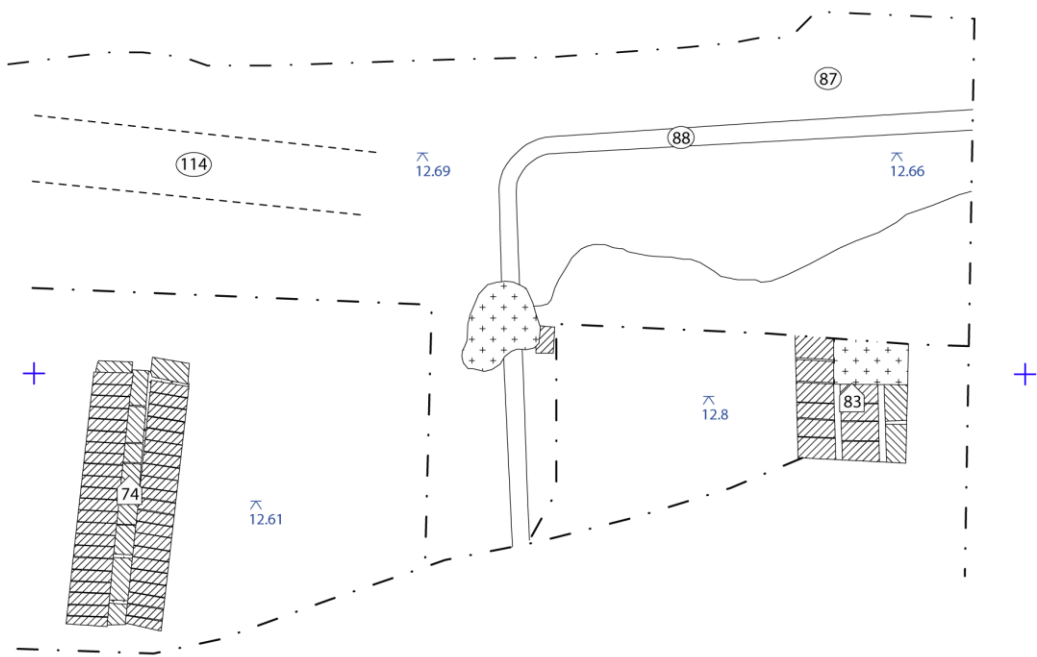
ENE facing section
structure [11]
Dwg. No. 3



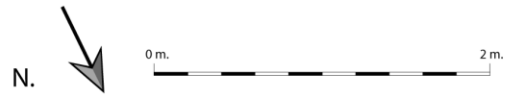
Plan of
feature [13]
Dwg. No. 2

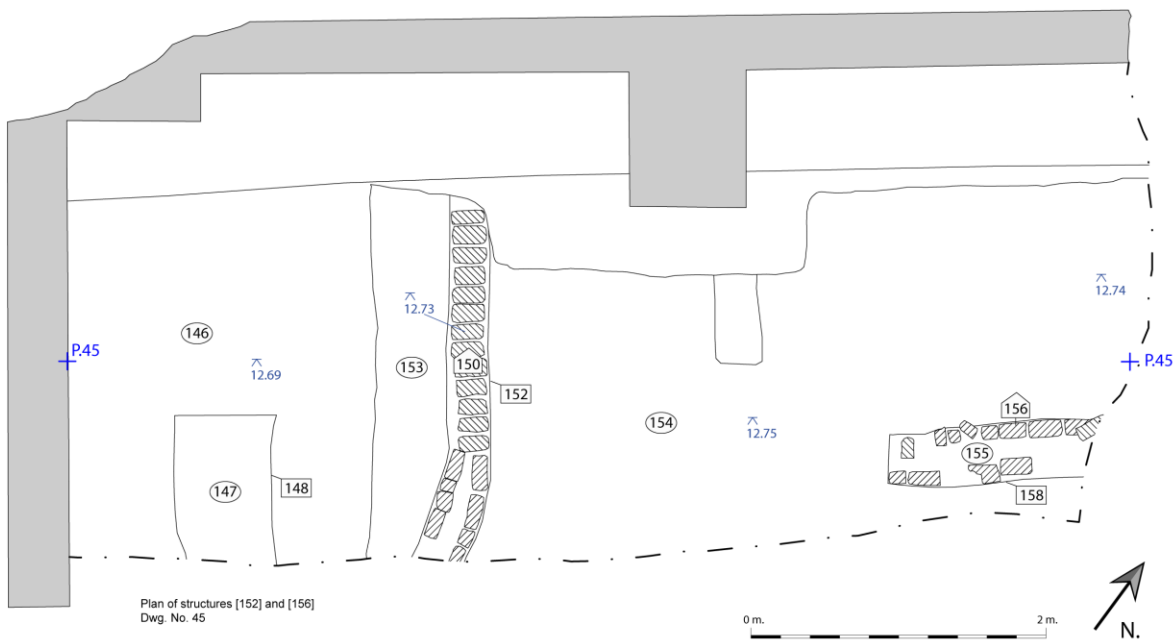


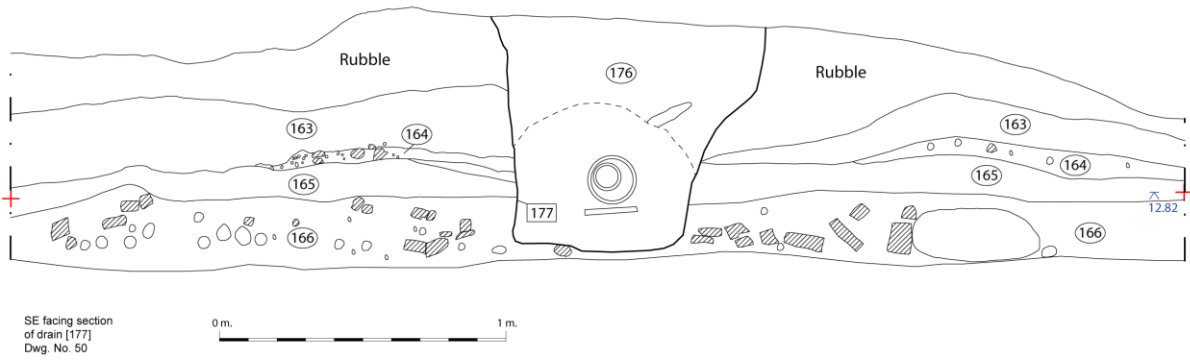
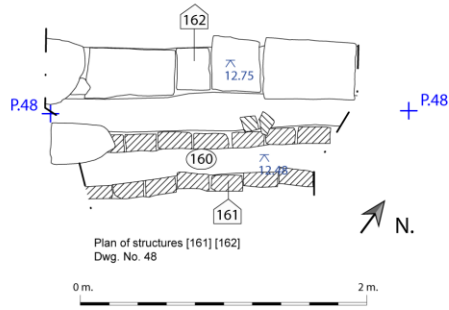
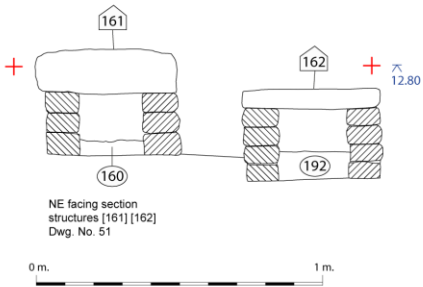
Plan of
structure [11]
Dwg. No. 4

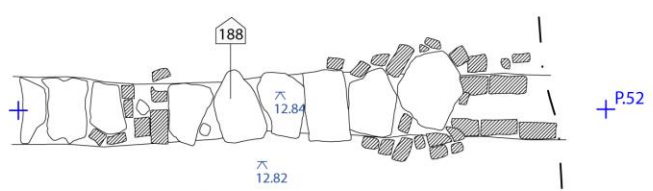
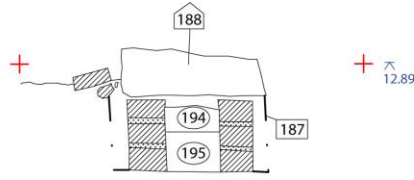
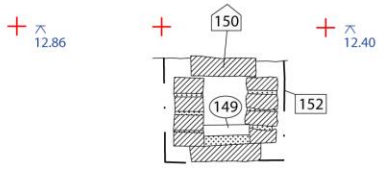
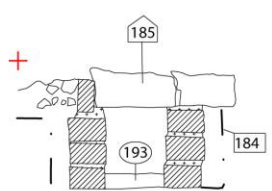
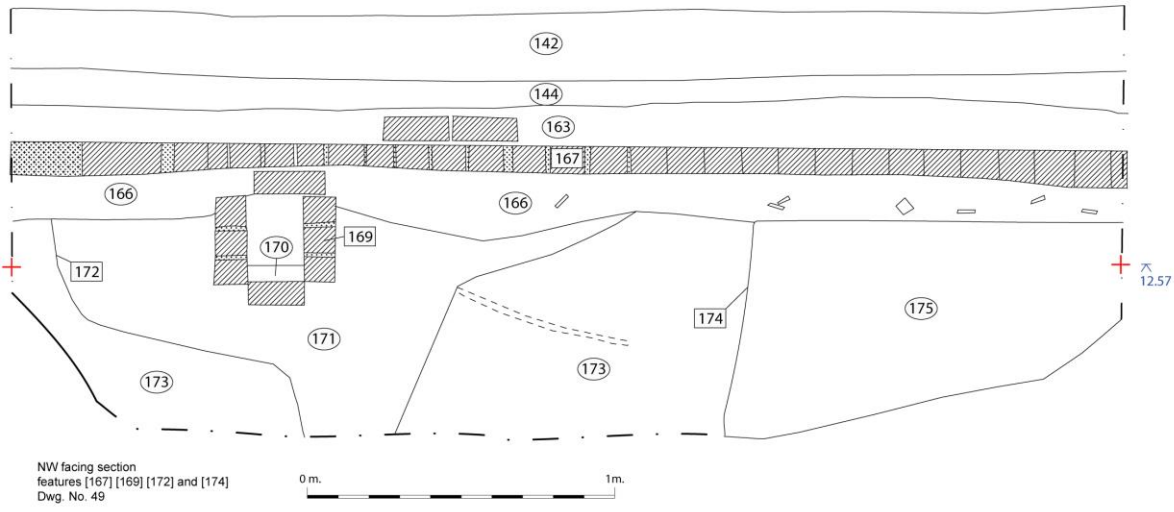


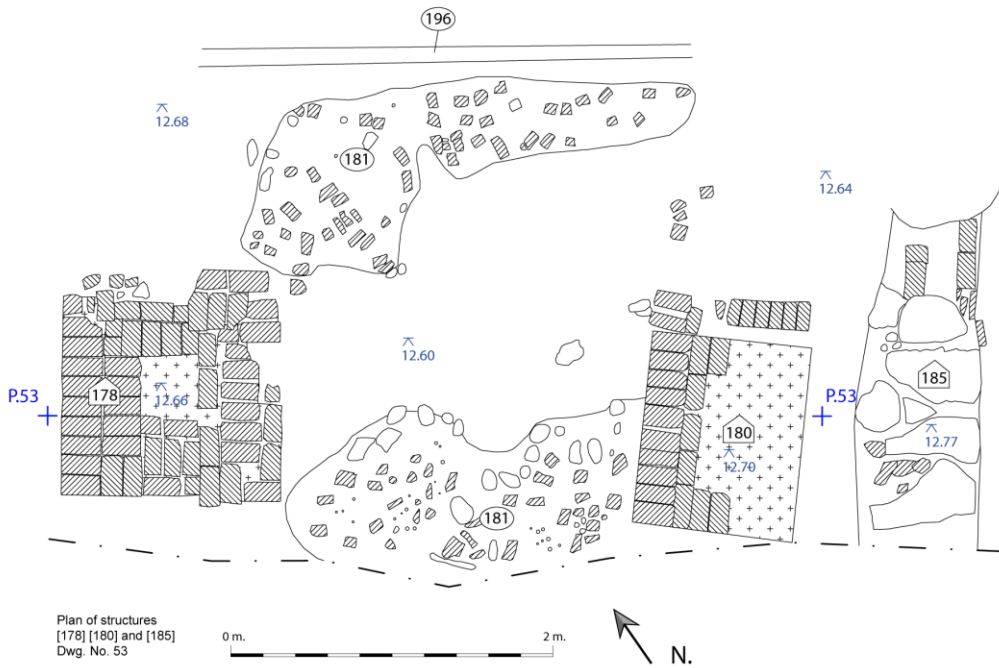
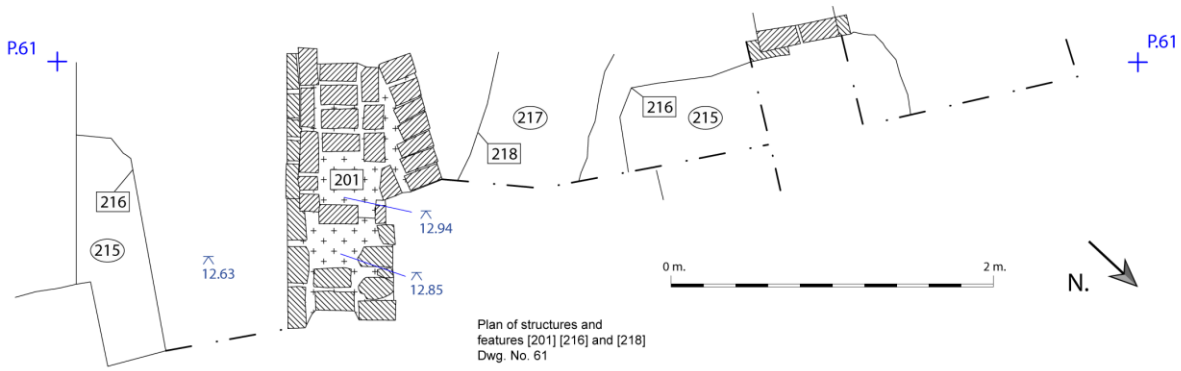
Plan of structures [74] and [83]
Dwg. No. 32

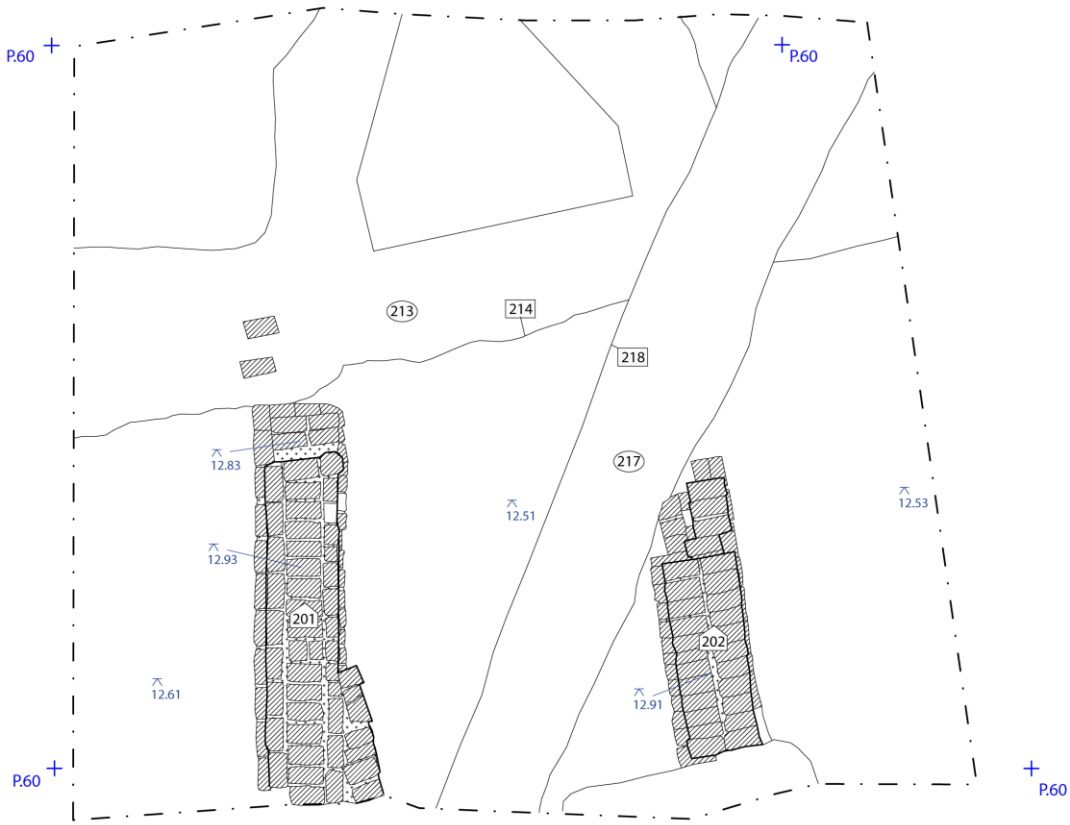








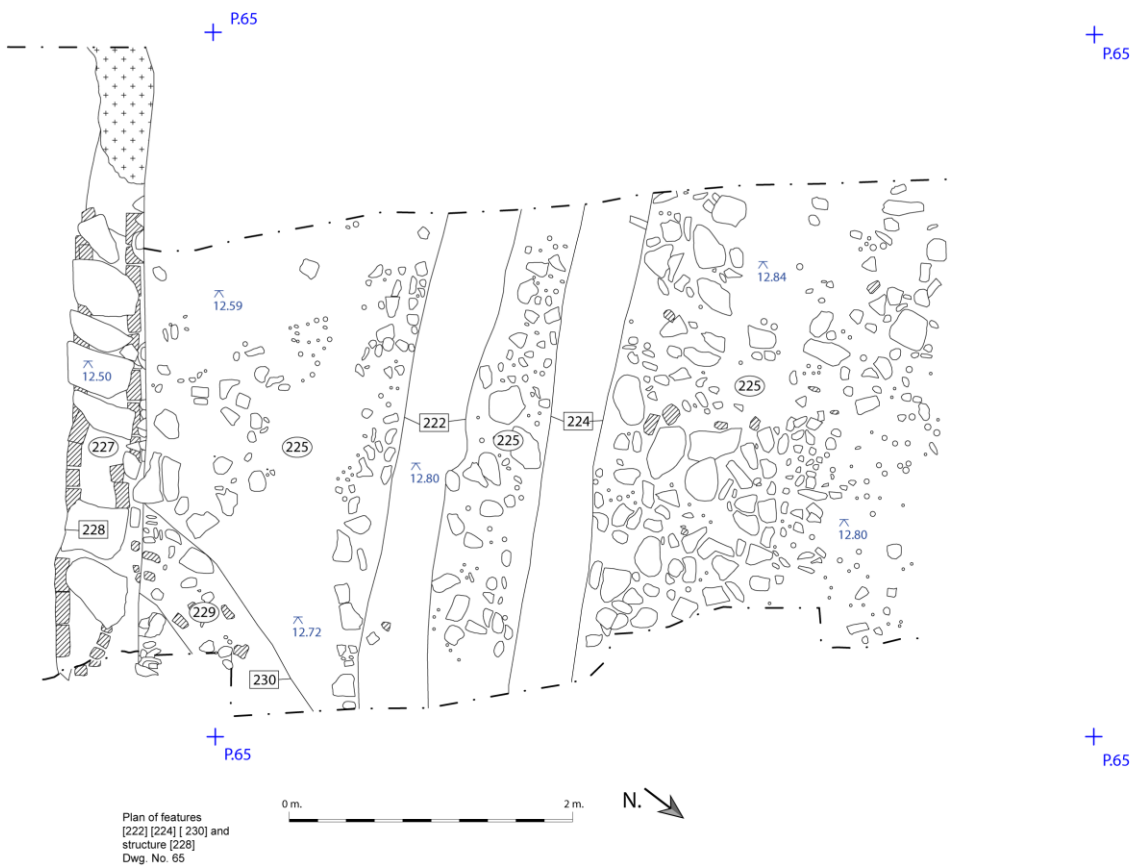


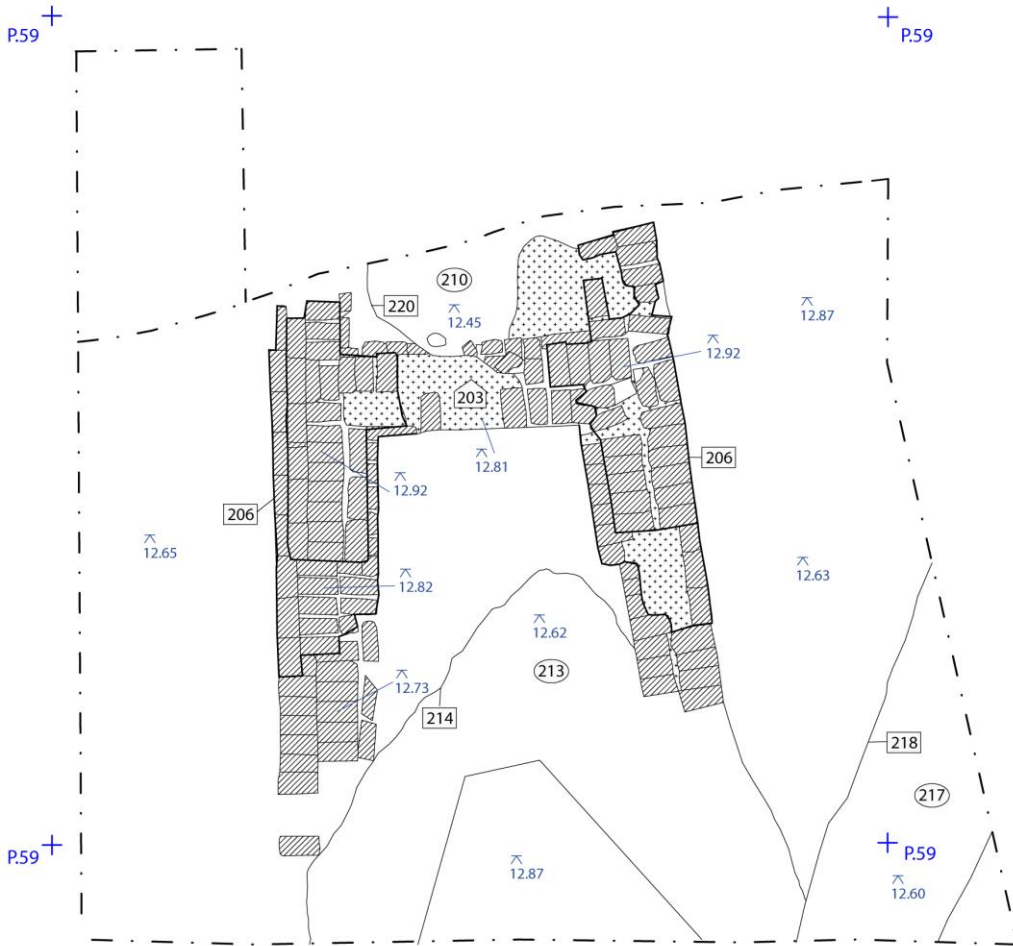


Plan of structures
[201] and [202]
Dwg. No. 60

0 m. 2 m.

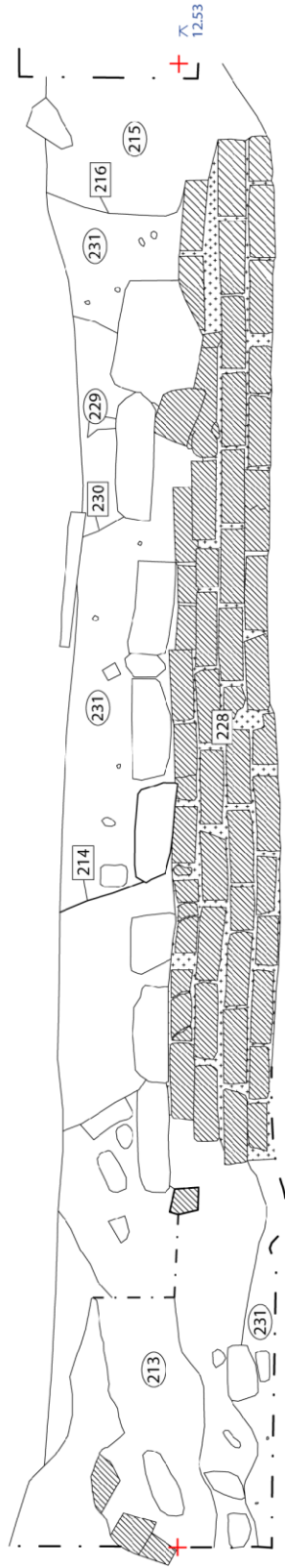






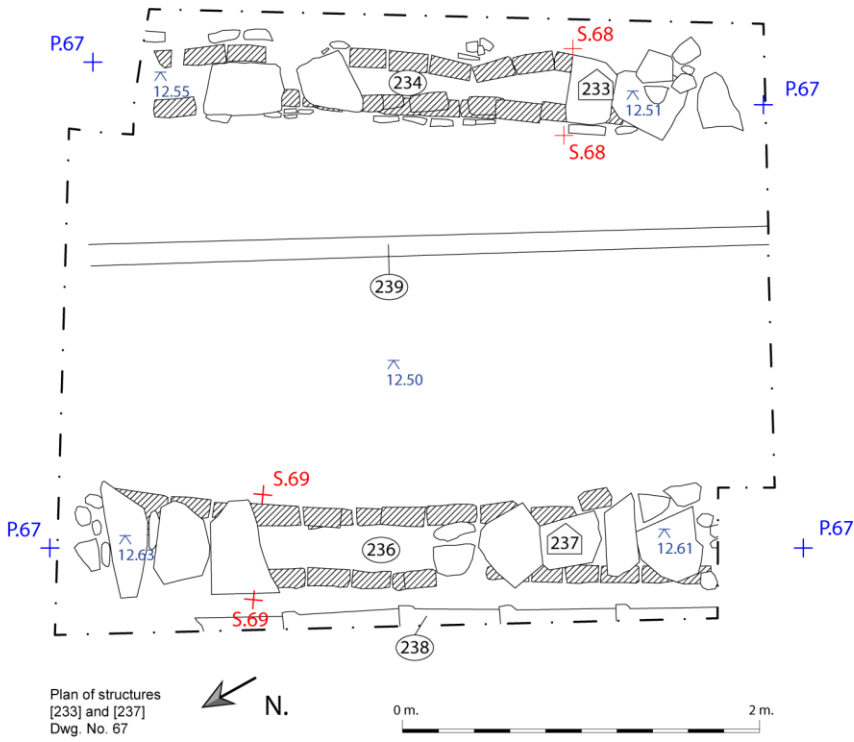
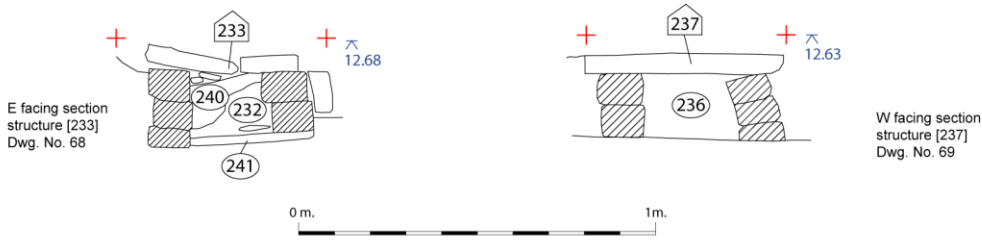
Plan of structure [203]
features [214] [218] and [220]
Dwg. No. 59

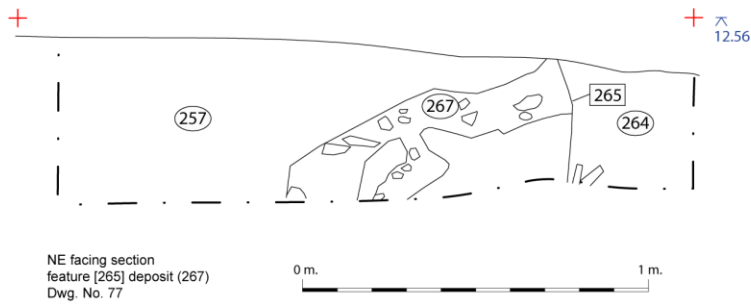
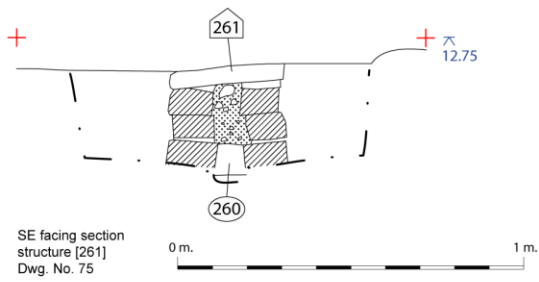
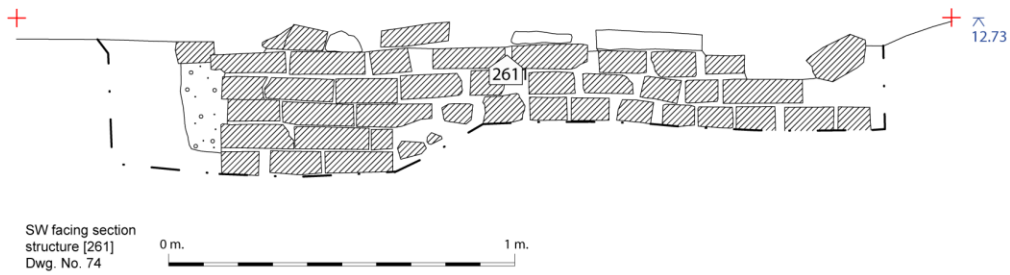
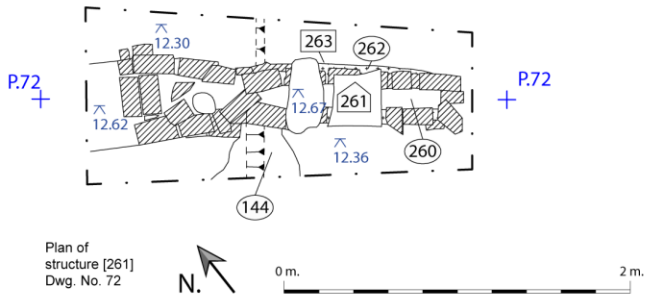


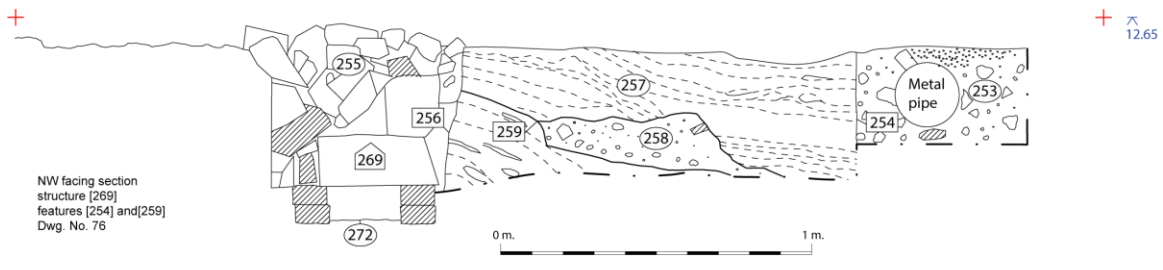
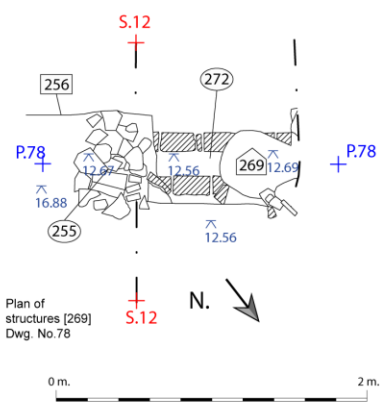
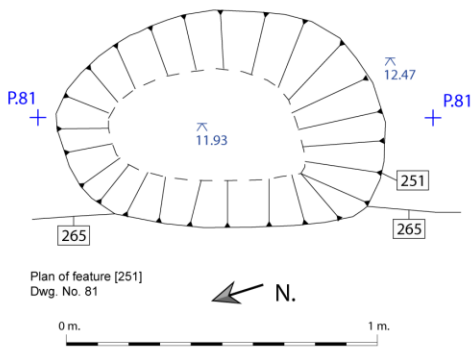


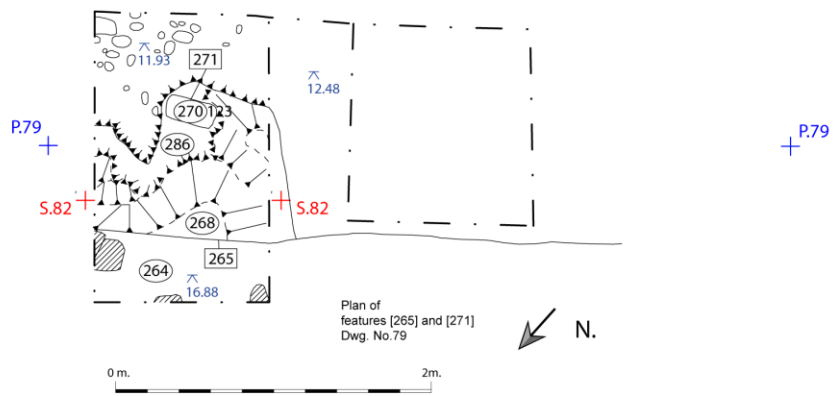
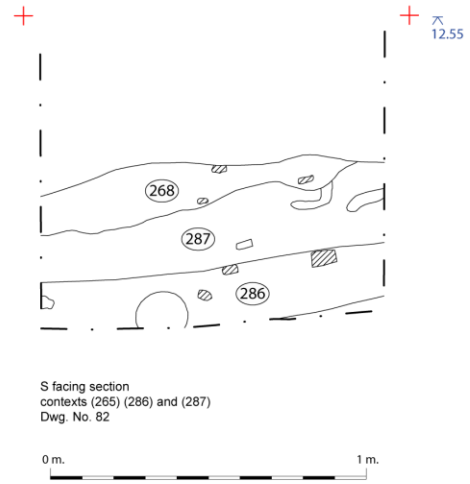
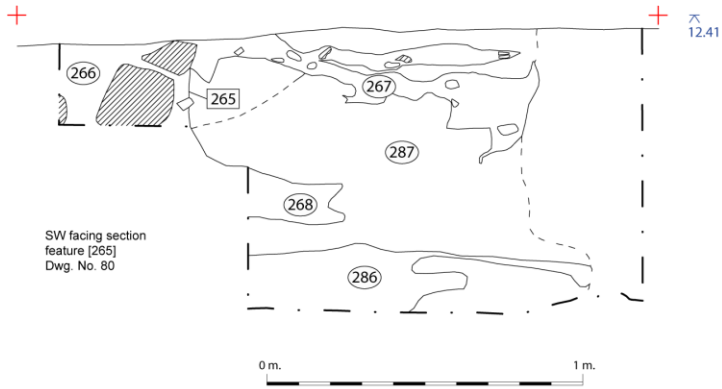
SE facing section
structure [228]
Dwg. No. 66

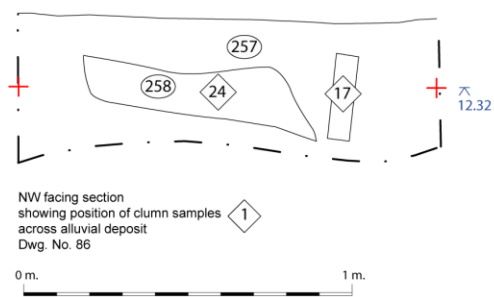
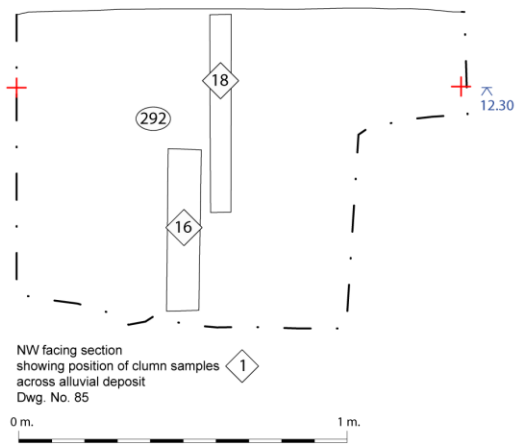


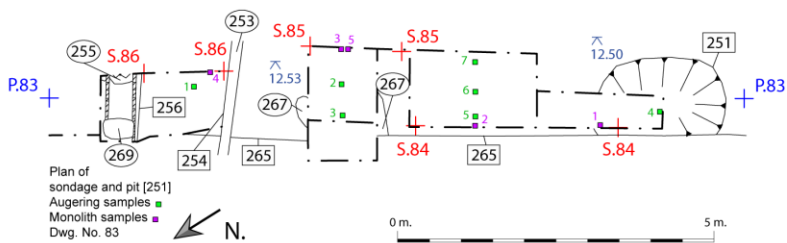
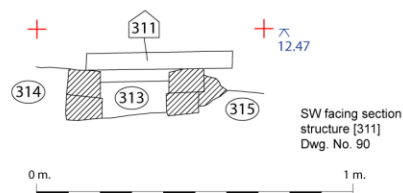
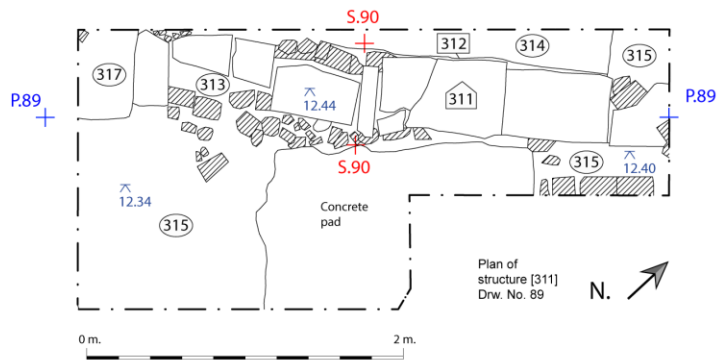
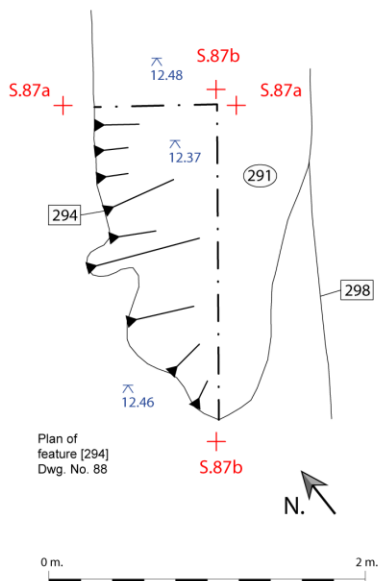
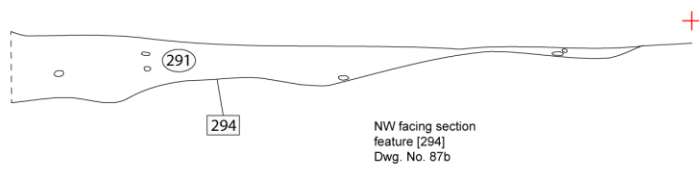
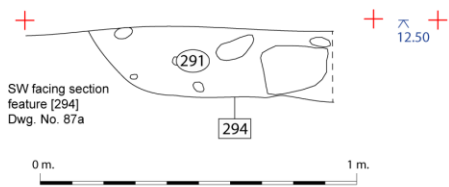


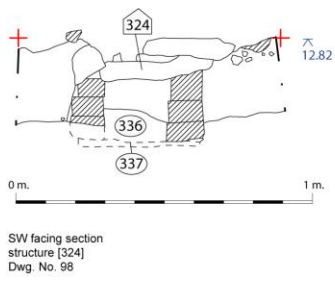
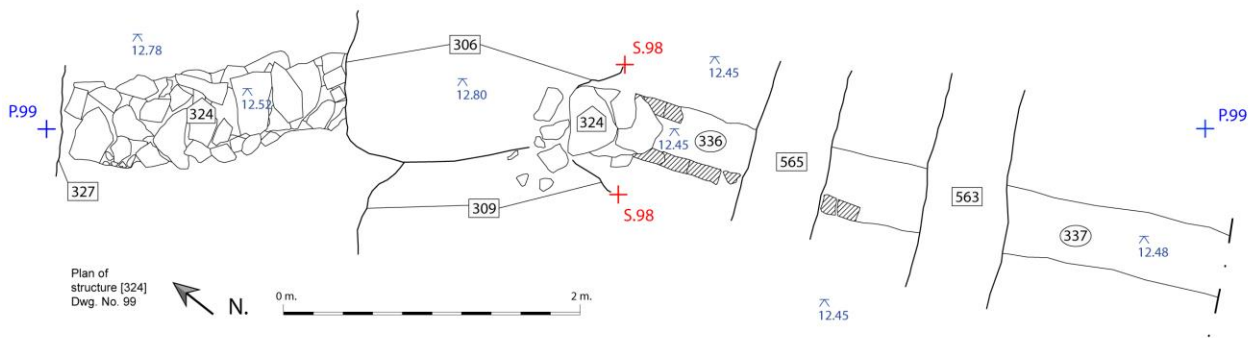
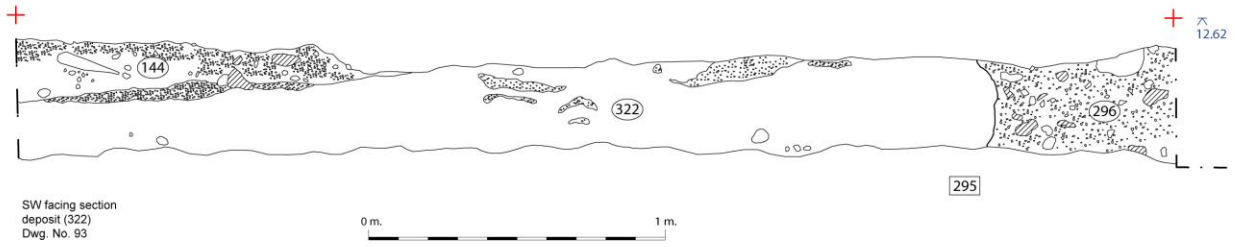


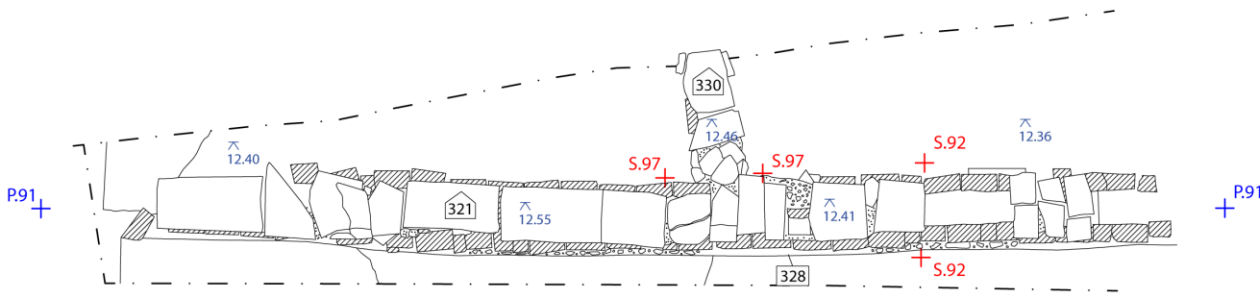






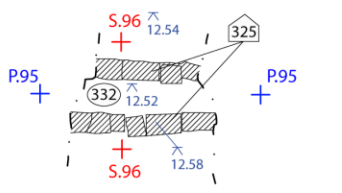






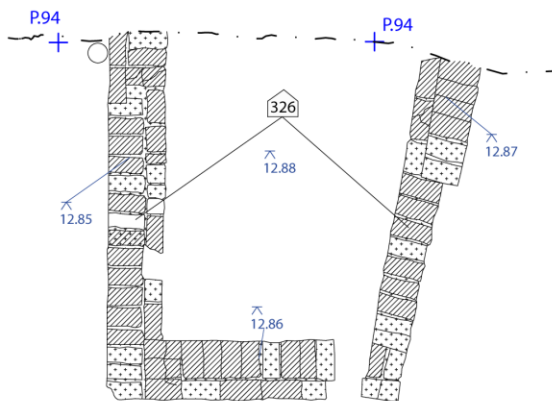
Plan of structures [321] and [330]
Dwg. No. 91

0 m. 2 m.



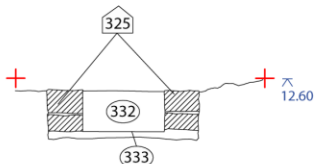
Plan of structure [325]
Dwg. No. 95

0 m. 2 m.

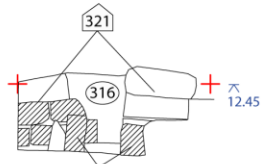


Plan of structure [326]
Dwg. No. 94

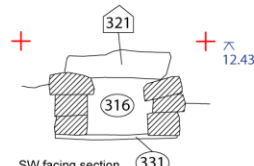
0 m. 2 m.



E facing section structure [325]
Dwg. No. 96

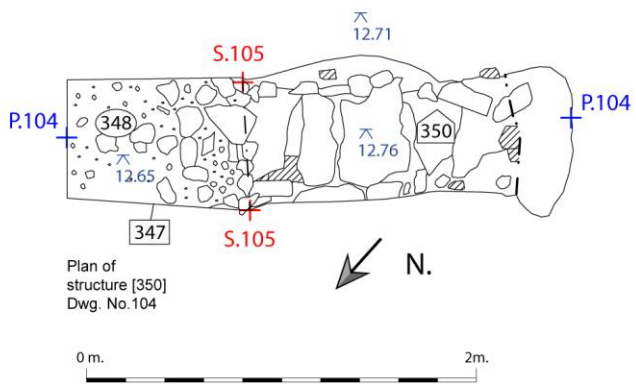
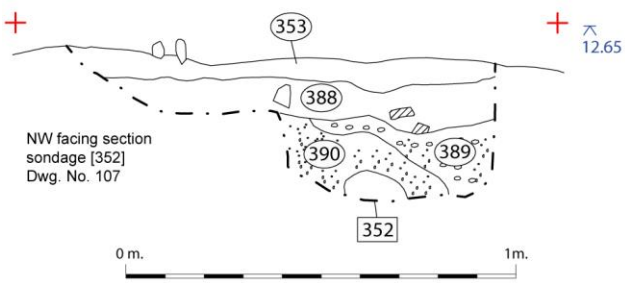
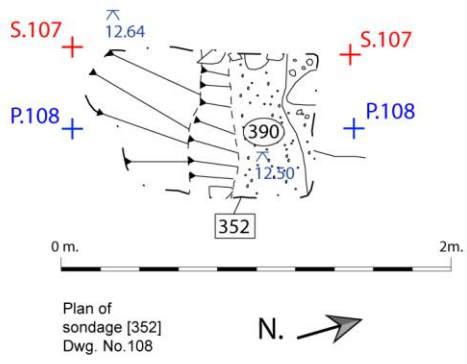


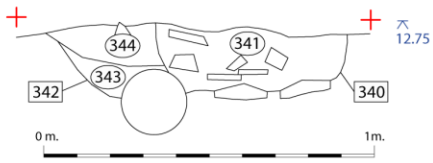
SW facing section structure [321] and [330]
Dwg. No. 97



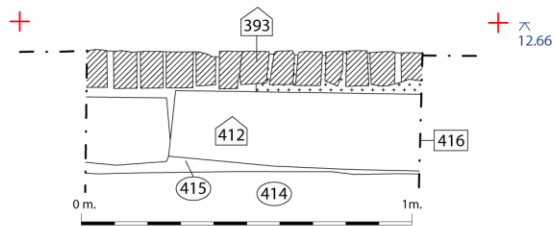
SW facing section structure [321]
Dwg. No. 92

0 m. 1 m.

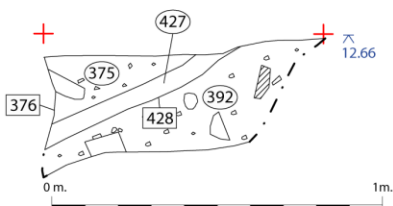




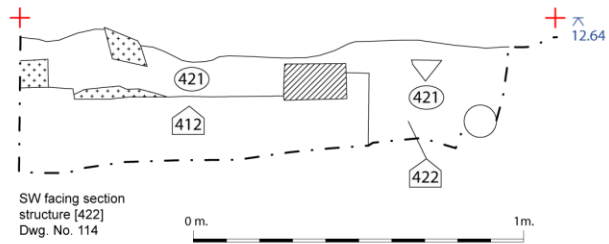
SW facing section
features [340] and [342]
Dwg. No. 100



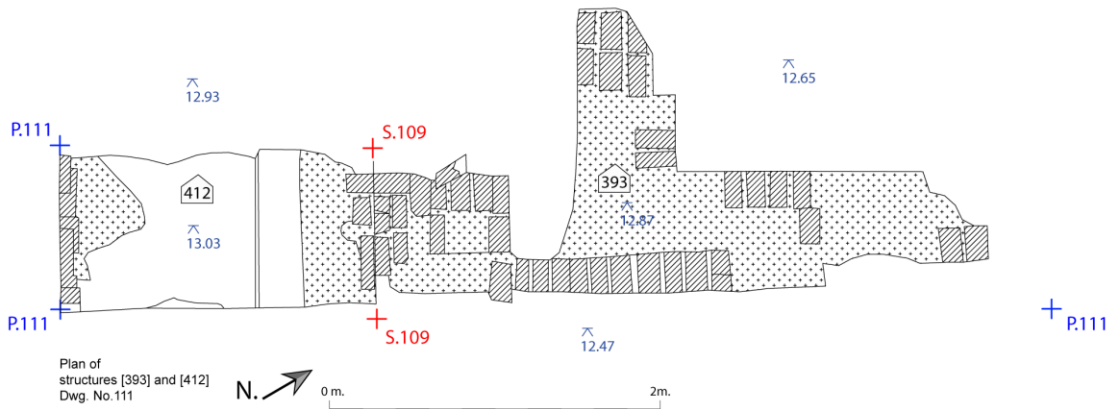
SW facing section
structures [393] and [412]
Dwg. No. 113



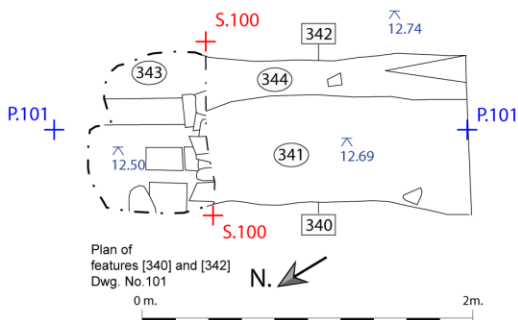
SE facing section
of deposits [375] and [392]
Dwg. No. 110



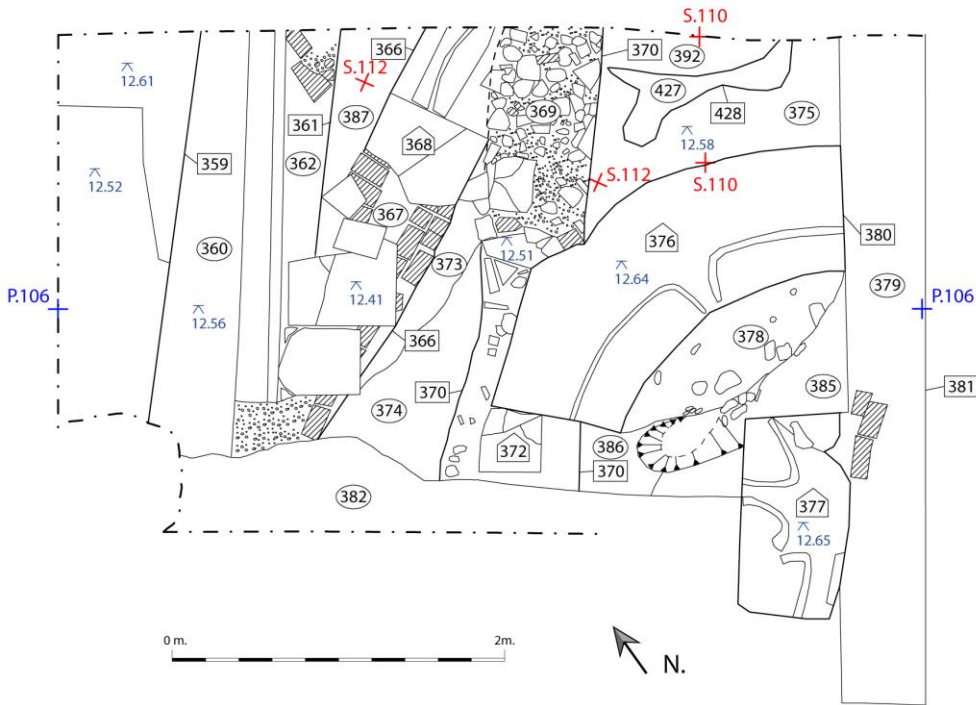
SW facing section
structure [422]
Dwg. No. 114



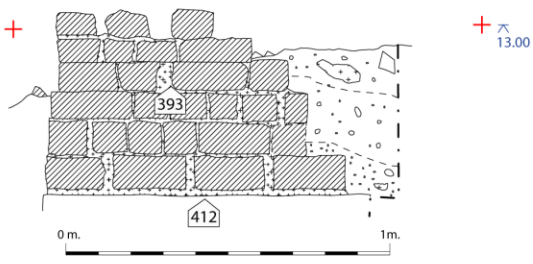
Plan of
structures [393] and [412]
Dwg. No. 111



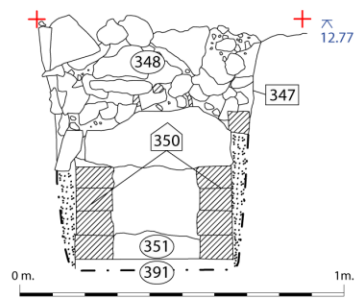
Plan of
features [340] and [342]
Dwg. No. 101



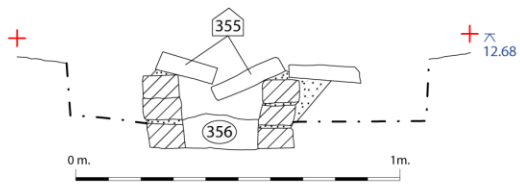
Plan of structures [368] [376] and [377]
Dwg. No. 106



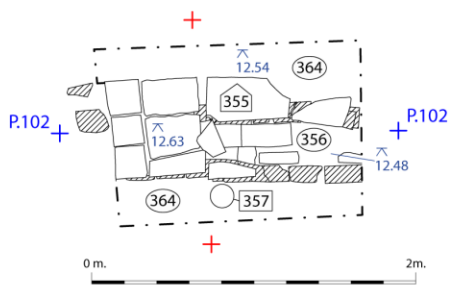
NE facing section
structure [393]
Dwg. No. 109



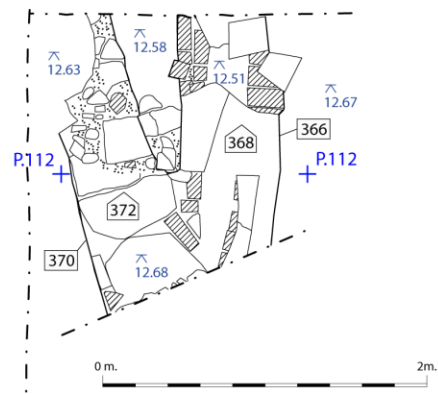
SW facing section
structure [350]
Dwg. No. 105



NE facing section
structure [355]
Dwg. No. 103

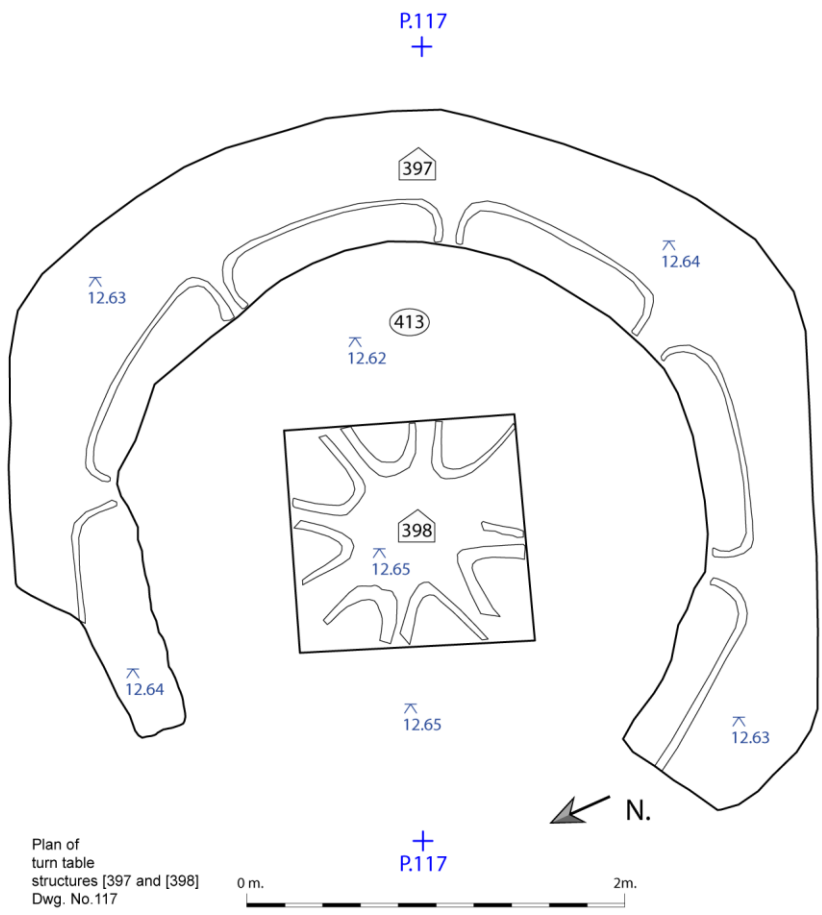


Plan of
structure [355]
Dwg. No. 102

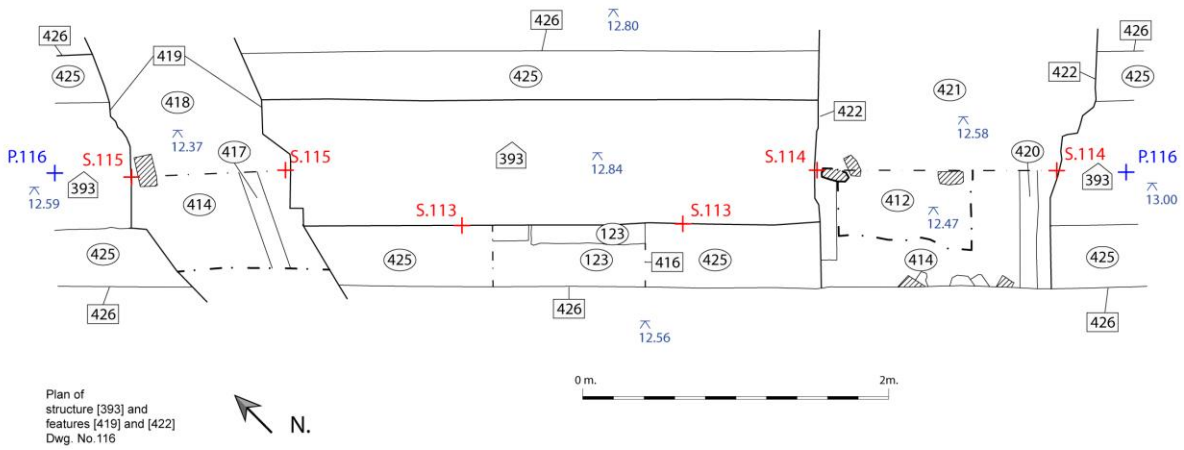
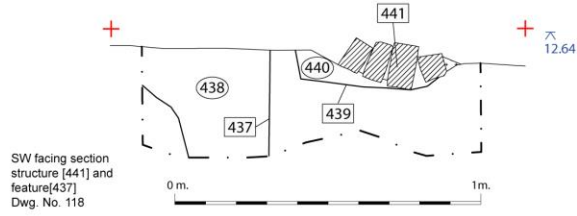
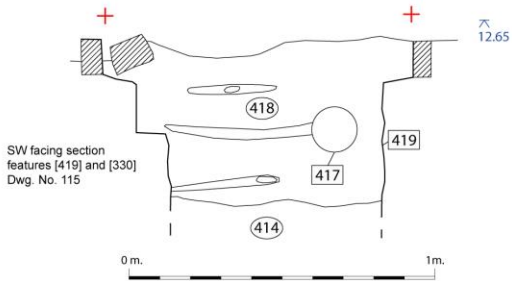


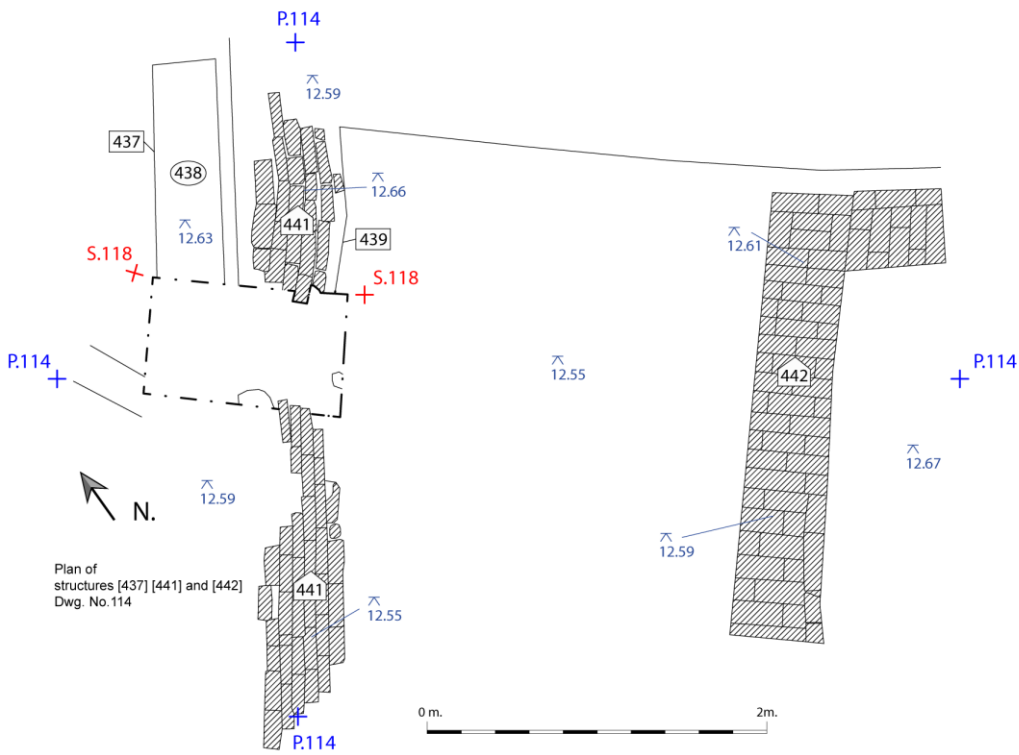
Plan of
structures [368] and [372]
Dwg. No. 91

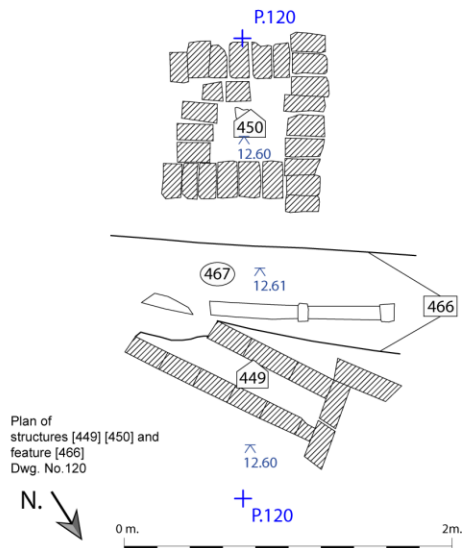
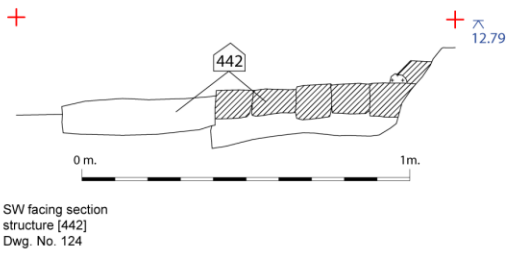
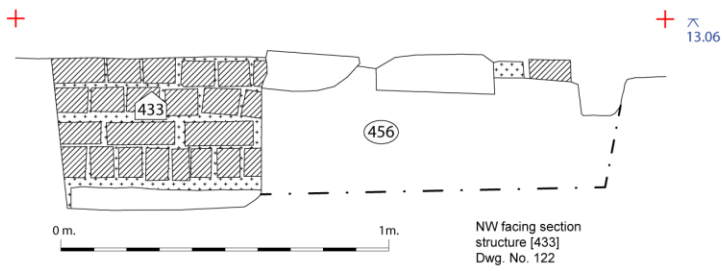
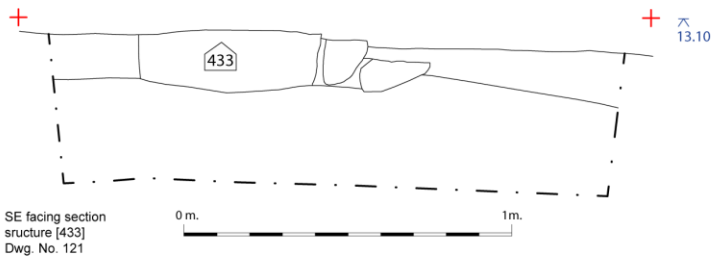


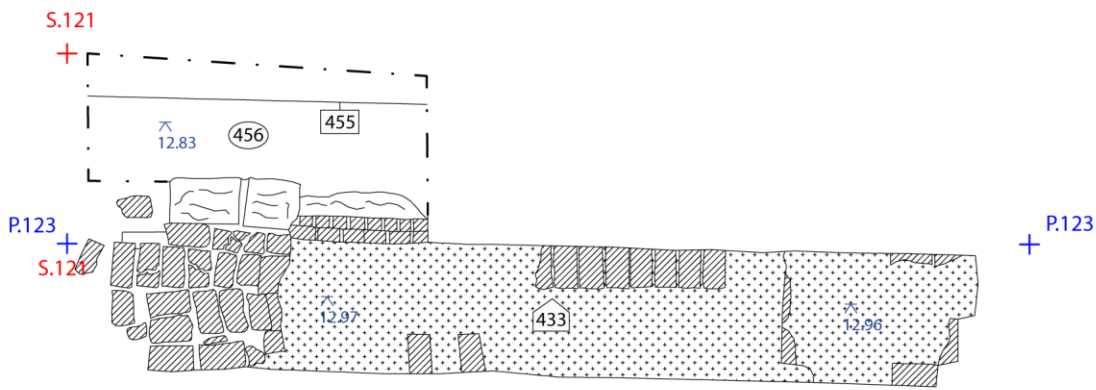


Plan of
turn table
structures [397 and [398]
Dwg. No.117



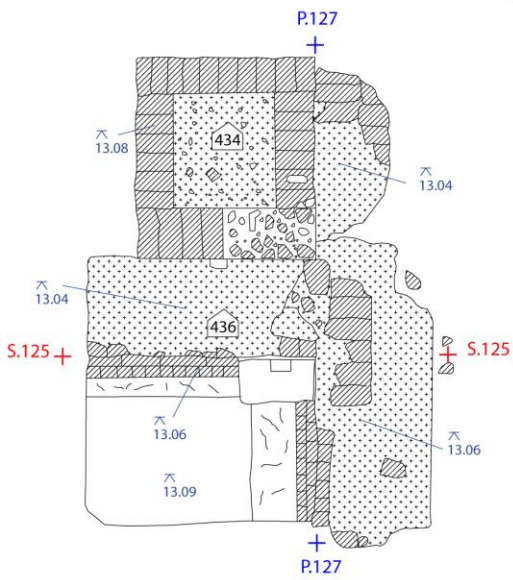
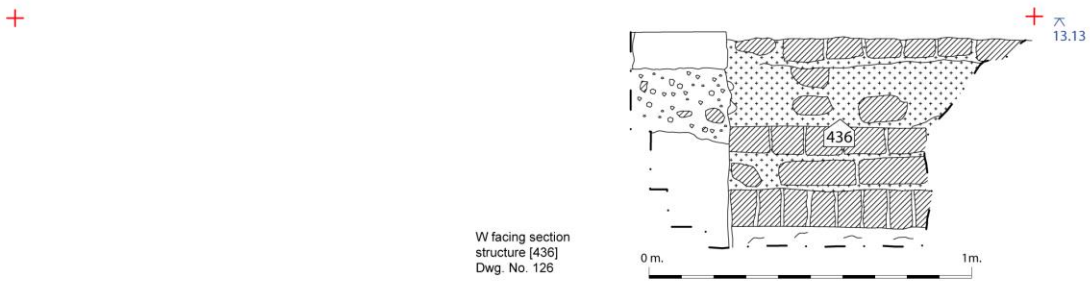
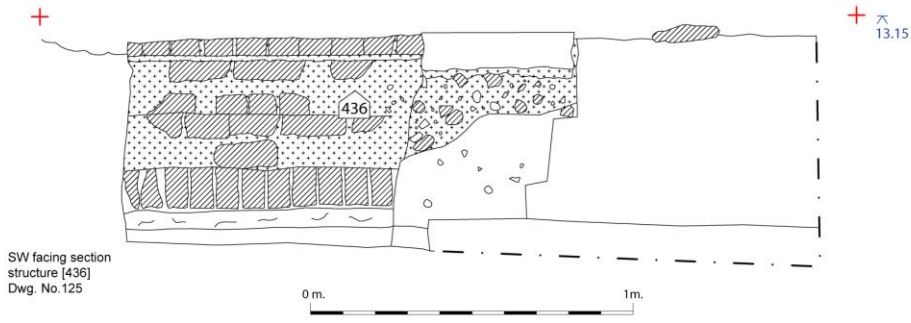


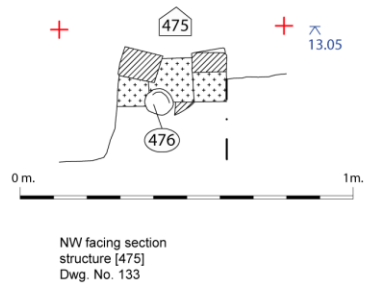
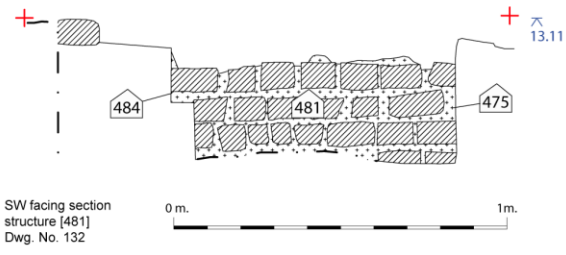
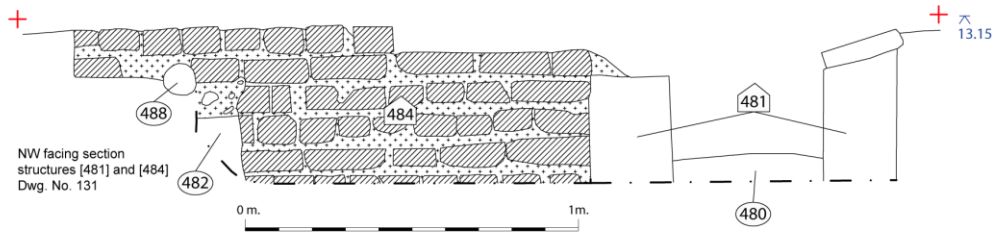
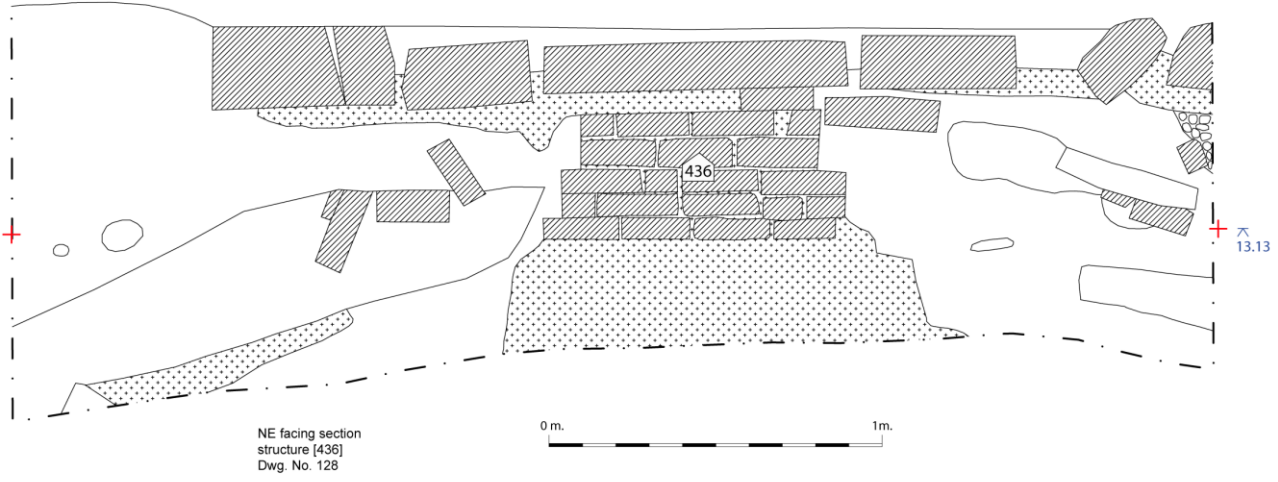


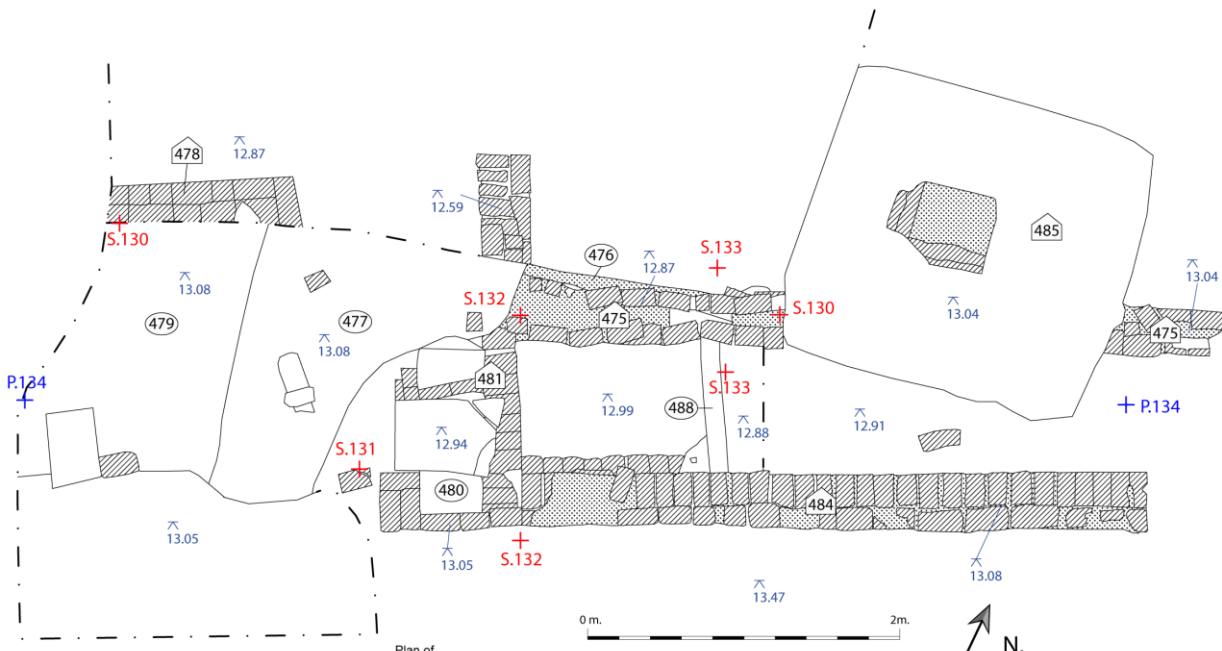


Plan of structures [433]
Dwg. No. 123

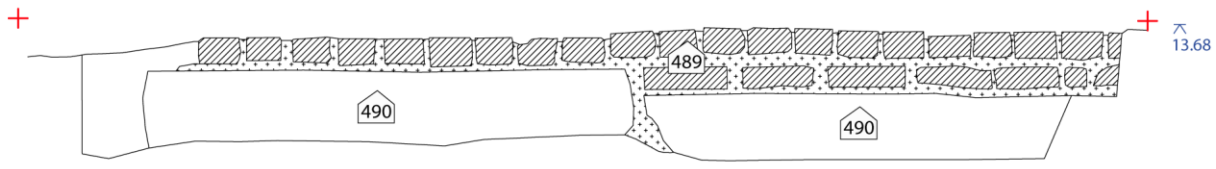
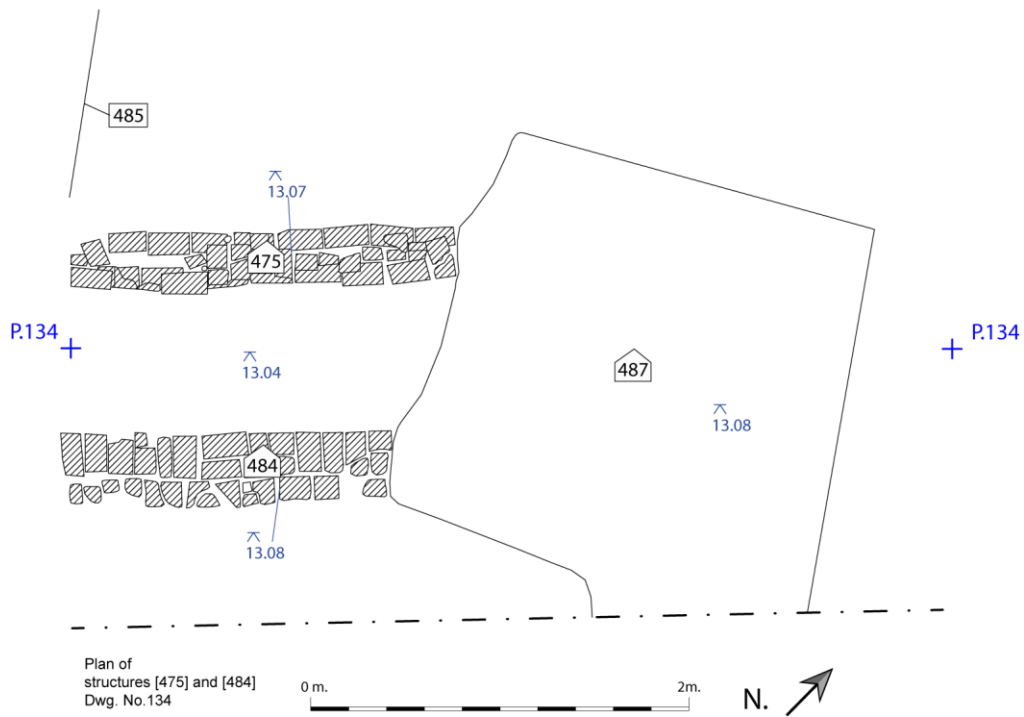


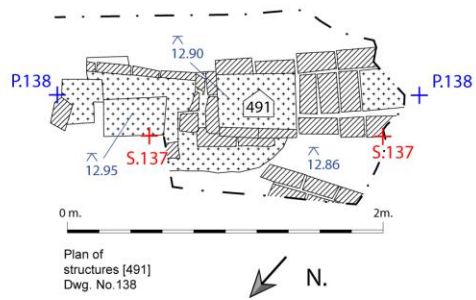
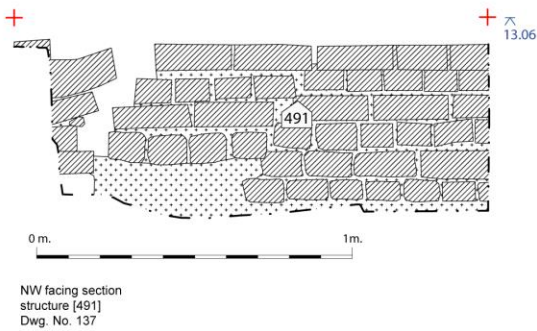
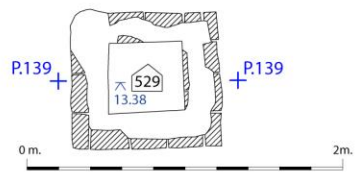
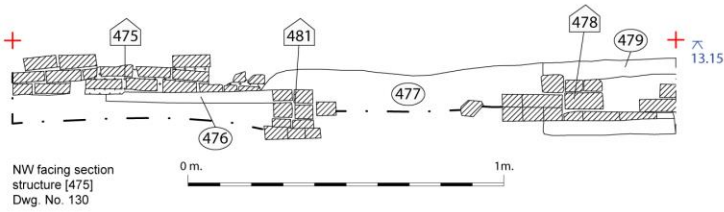
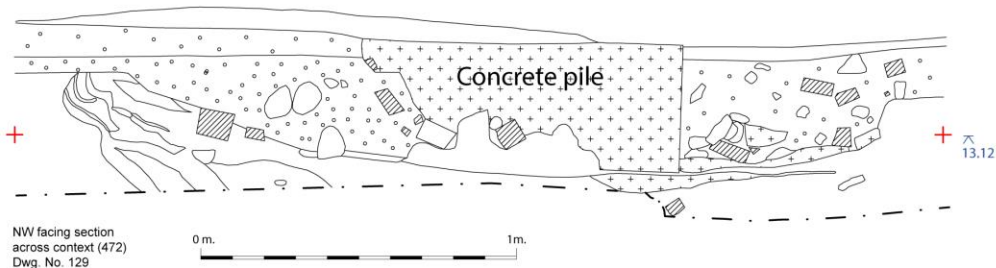


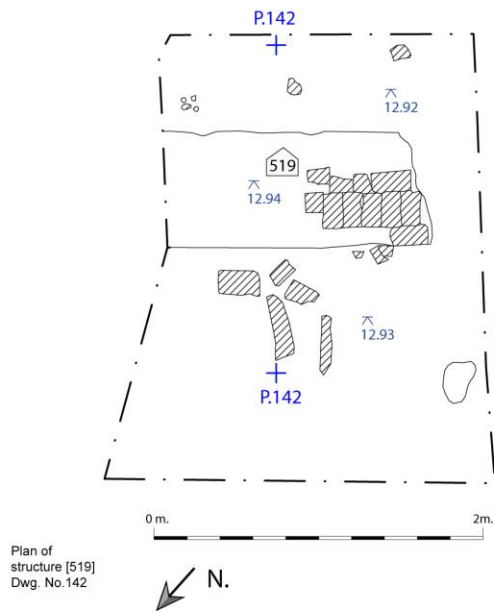
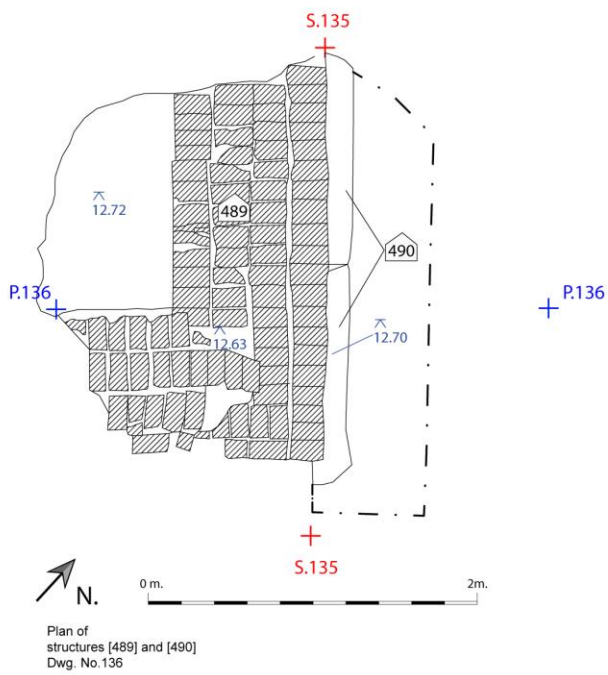
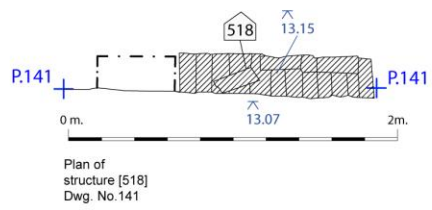
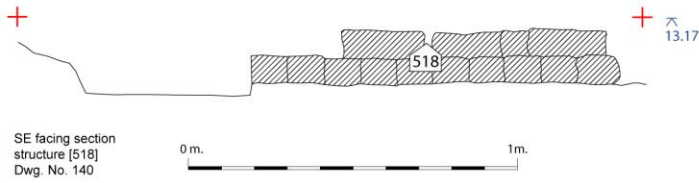


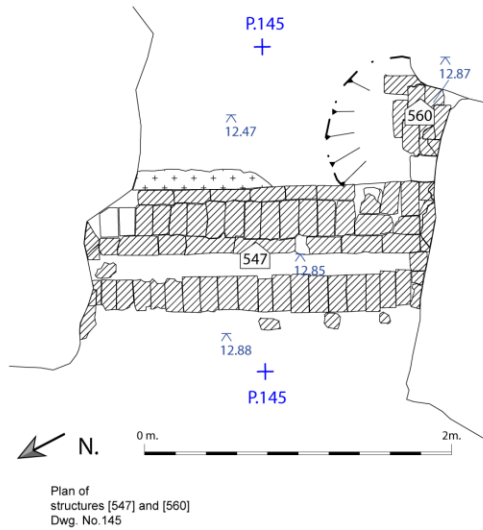
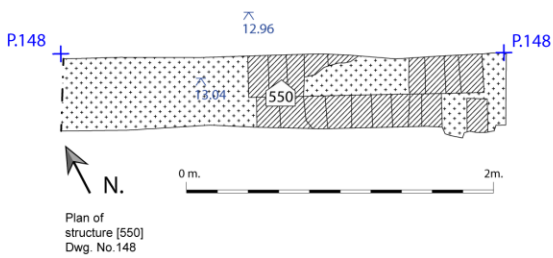
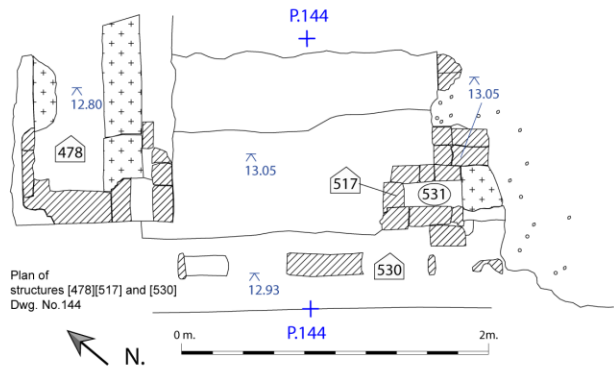
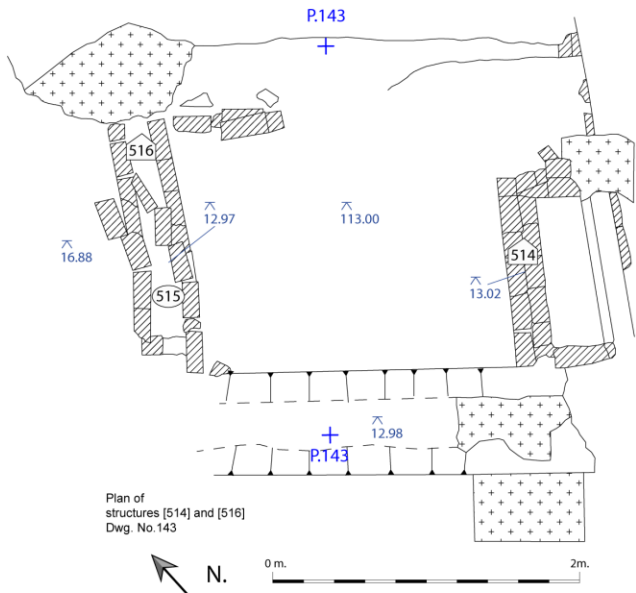


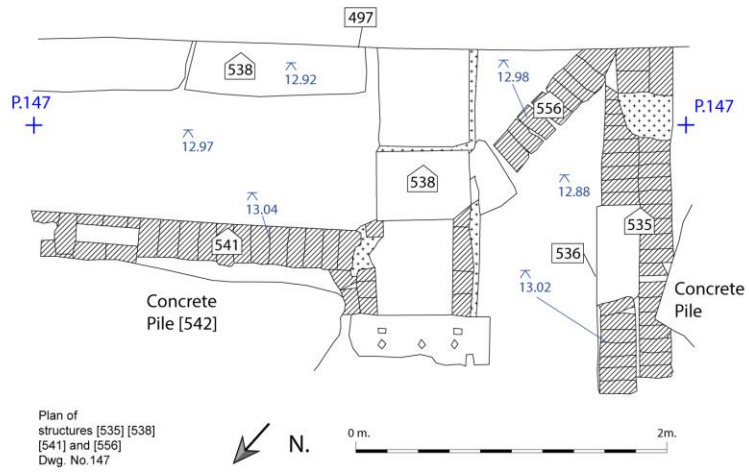
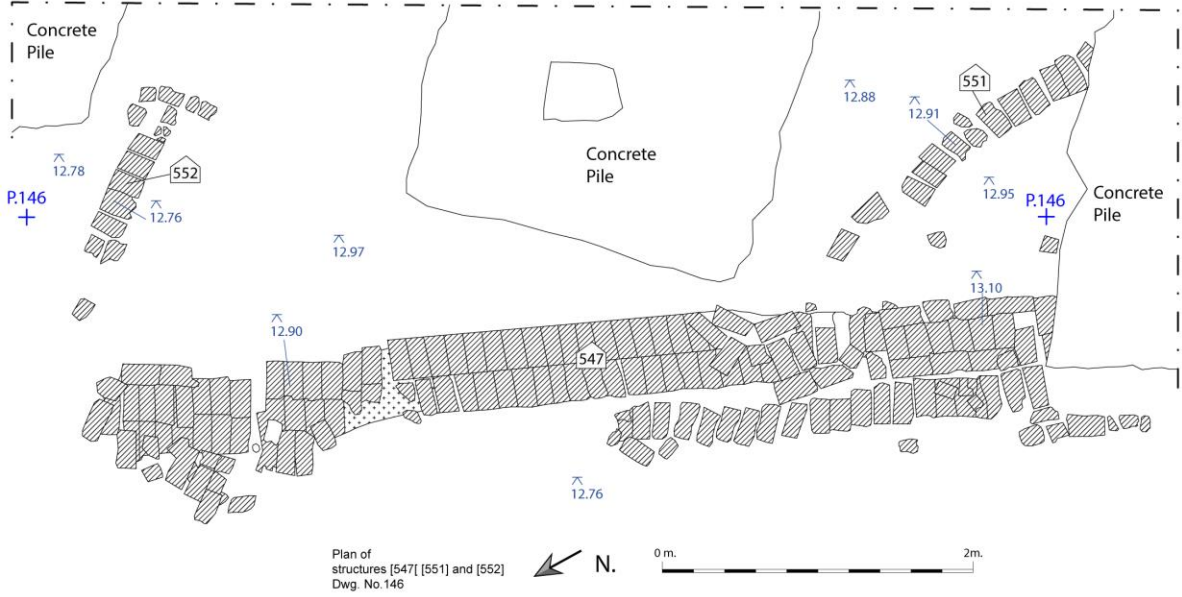
Plan of structures [475] [481] and [484]
Dwg. No.134

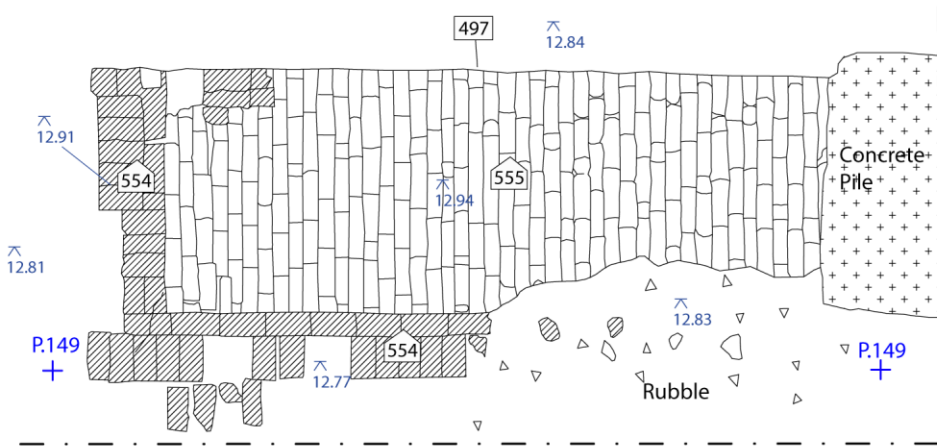








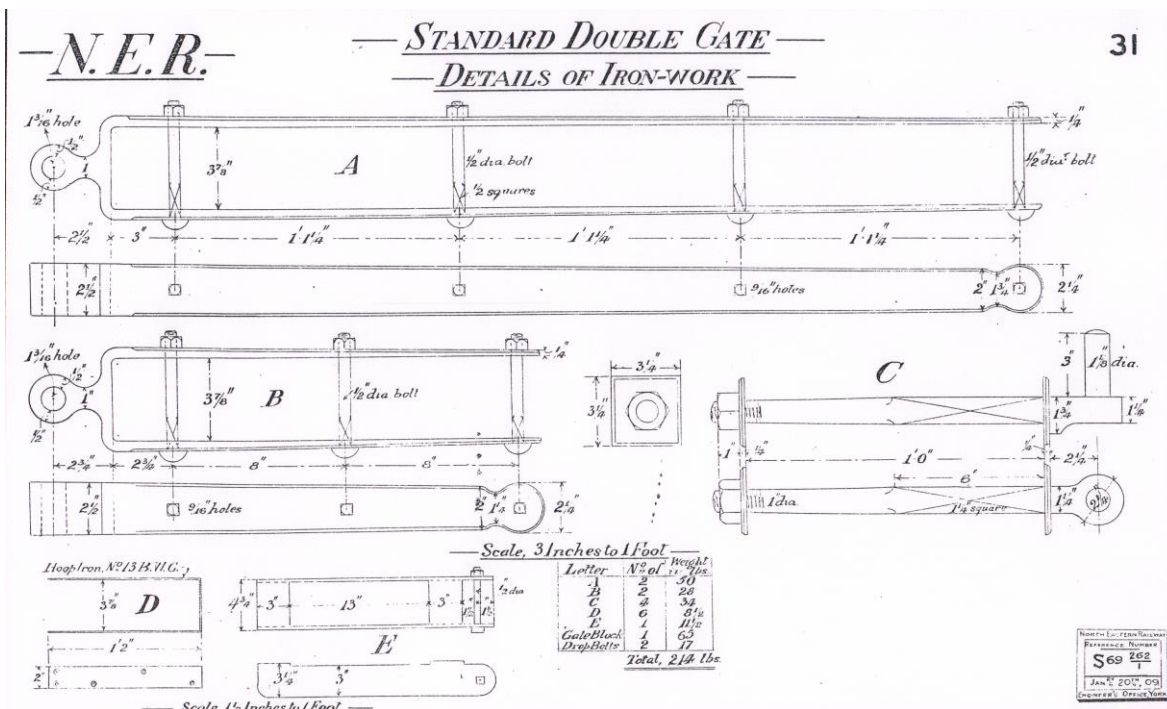




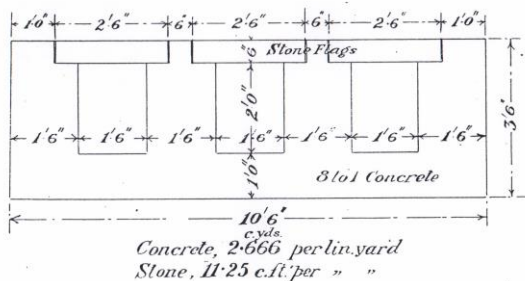
Plan of structures [554] and [555]
Dwg. No.149



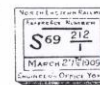
Appendix 3



STANDARD BOX DRAINS



Scale, 1/2 Inch to 1 Foot.



Appendix 4

Turntable Plans from 'First Series of Railway Practice'.

