Stage 4 Excavations and Archaeological Monitoring:
Don Valley Brick Works, City of Toronto

FINAL REPORT

Prepared for:

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Archaeological Licence P049 (Steiss)
MCL CIF P049-384-2009, P049-511-2010
ASI File 09SP-13

January 2011

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Don Valley Brick Works, City of Toronto

EXECUTIVE SUMMARY

The 2009-2010 Stage 4 assessment and mitigation program at the Don Valley Brick Works involved archaeological excavation of the full extent of Kiln 6 and the partial exposure of the remains of Kiln 13 and the "Works" chimney. These archaeological excavations were undertaken to document the surviving remnants of these features and to assess the load-bearing qualities of the other kiln bases and associated infrastructure located throughout the parking lot. This led to the identification of a revised parking lot bed design that will minimize impacts to the kiln remains while still meeting required load-bearing capacities.

This work was followed by archaeological monitoring of construction excavations for public utilities installations in the Welcome Court, Chimney Court and adjacent areas and of other large scale construction excavations within the various portions of the site. It should be noted that the public utilities plans underwent numerous revisions, in part due to the desire to avoid, as much as possible known or potential remains. The monitoring documented a variety of remains, including limited portions of Kilns 4, 5, 7, 10, 11, 13, 14 and 15 and their associated flue systems, footings, piers or floor surfaces associated with Buildings 11B, 11C and 12, a limited portion of the circa 1893-1922 coal-fired kiln that was replaced by Building 16, as well as various pavements and utilities.

The report concludes with the recommendation that the 2008-2010 Evergreen Brick Works revitalization project may be considered free of further archaeological concern.

Any future undertakings within the Brick Works that may require excavation or subsurface disturbances should be subject to review in order to determine if archaeological mitigation of such initiatives is required.

ARCHAEOLOGICAL SERVICES INC.

PLANNING DIVISION

PROJECT PERSONNEL

Project Manager:	David Robertson, MA, Senior Archaeologist & Manager, Special Projects
Project Director:	Debbie Steiss, MA, Senior Archaeologist & Partner (P049)
Project Archaeologists:	David Robertson Andrew Clish, BES, Senior Archaeologist Denise McGuire, MA, Staff Archaeologist (P315) Lisa Merritt, MSc, Staff Archaeologist (P094) Wesley Oldham, BA Hons, Staff Archaeologist (R292)
Backhoe Operator:	Jonathon Tipping, *Wm. Petrie & Sons Contracting Ltd.*
Graphics:	Andrew Clish David Robertson
Report Preparation:	David Robertson

ACKNOWLEDGEMENTS

Our thanks are due to David Stonehouse of Evergreen, David House of Earth Development, Megan Torza of du Toit Allsopp Hillier/du Toit Architects Limited, and to Mike Adams and John Della Serra of Eastern Construction for their assistance with various aspects of this project. We are also grateful to Ed Freeman for providing information on the history of the Don Valley Brick Works and aspects of kiln technology.

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1.0 INTRODUCTION

Archaeological Services Inc. (ASI) was retained by Evergreen Brick Works to carry out Stage 4 archaeological excavations, as well as monitoring and documentation of construction excavations, as part of the redevelopment of the Don Valley Brick Works complex (Figure 1) as a natural and cultural heritage facility.

The Stage 4 assessment and mitigation program was designed in a manner consistent with the recommendations set forth in ASI's January 2009 report entitled "Stage 2 Archaeological Assessment of Public Utilities Installations in the Chimney and Welcome Courts, Don Valley Brick Works, City of Toronto." Figure 2 identifies the various project areas and components, which may be summarized as follows:

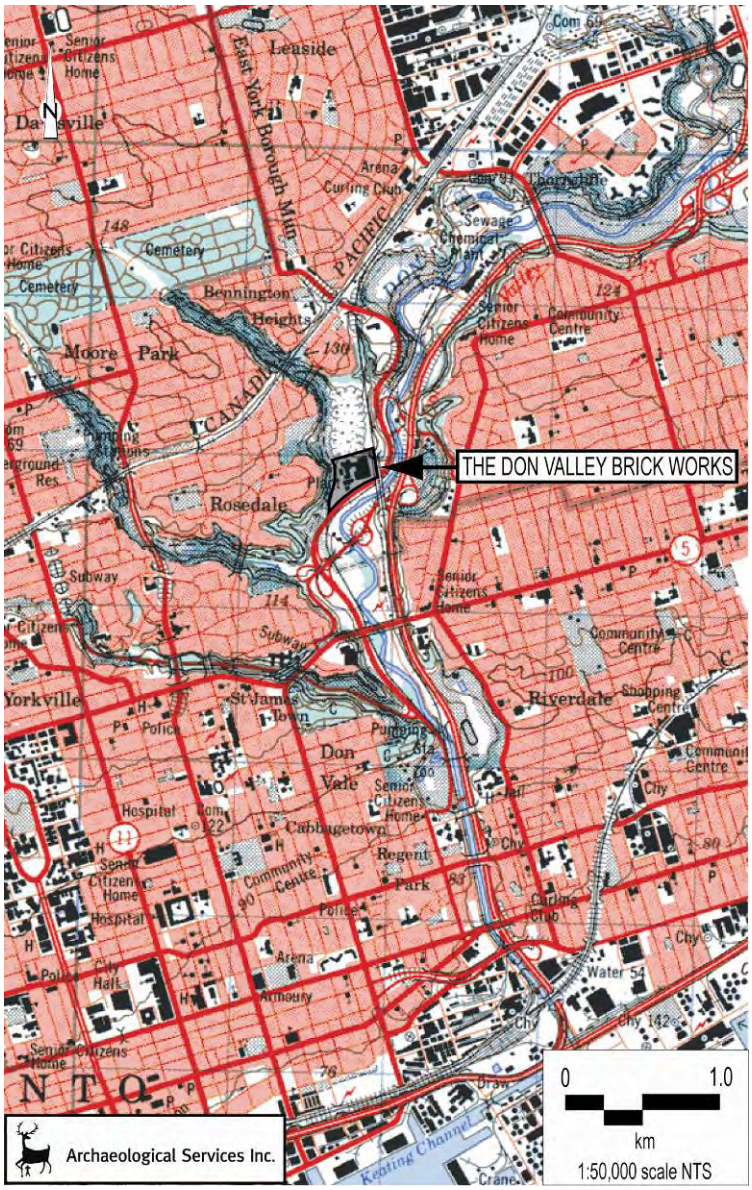


Figure 1: Location of the Don Valley Brick Works
NTS Sheet 30 M/11 (Toronto), edition 7, 1985

- Archaeological excavation and documentation of Kiln 6, as per Recommendation 6 in the 2009 Stage 2 report, but exceeding the anticipated scope of work in that the full extent of Kiln 6 was exposed and the excavations were extended south of Kiln 6 to precisely determine the location and elevation of the remains of Kiln 13 and the "Works" chimney.

- Archaeological monitoring of construction excavations for public utilities installations in the Welcome Court, Chimney Court and adjacent areas as per Recommendations 2, 3 and 5 in the 2009 Stage 2 report; and

- Archaeological monitoring of other large scale construction excavations within the various portions of the site (note that the 2009 monitoring also included the excavation of the basins for the Storm Water Management Pond, which uncovered portions of the 1912 gas-fired Youngren kiln, as described in ASI 2009: Appendix A).

KEY TO PROJECT AREAS

2008-2010 MONITORING AREAS

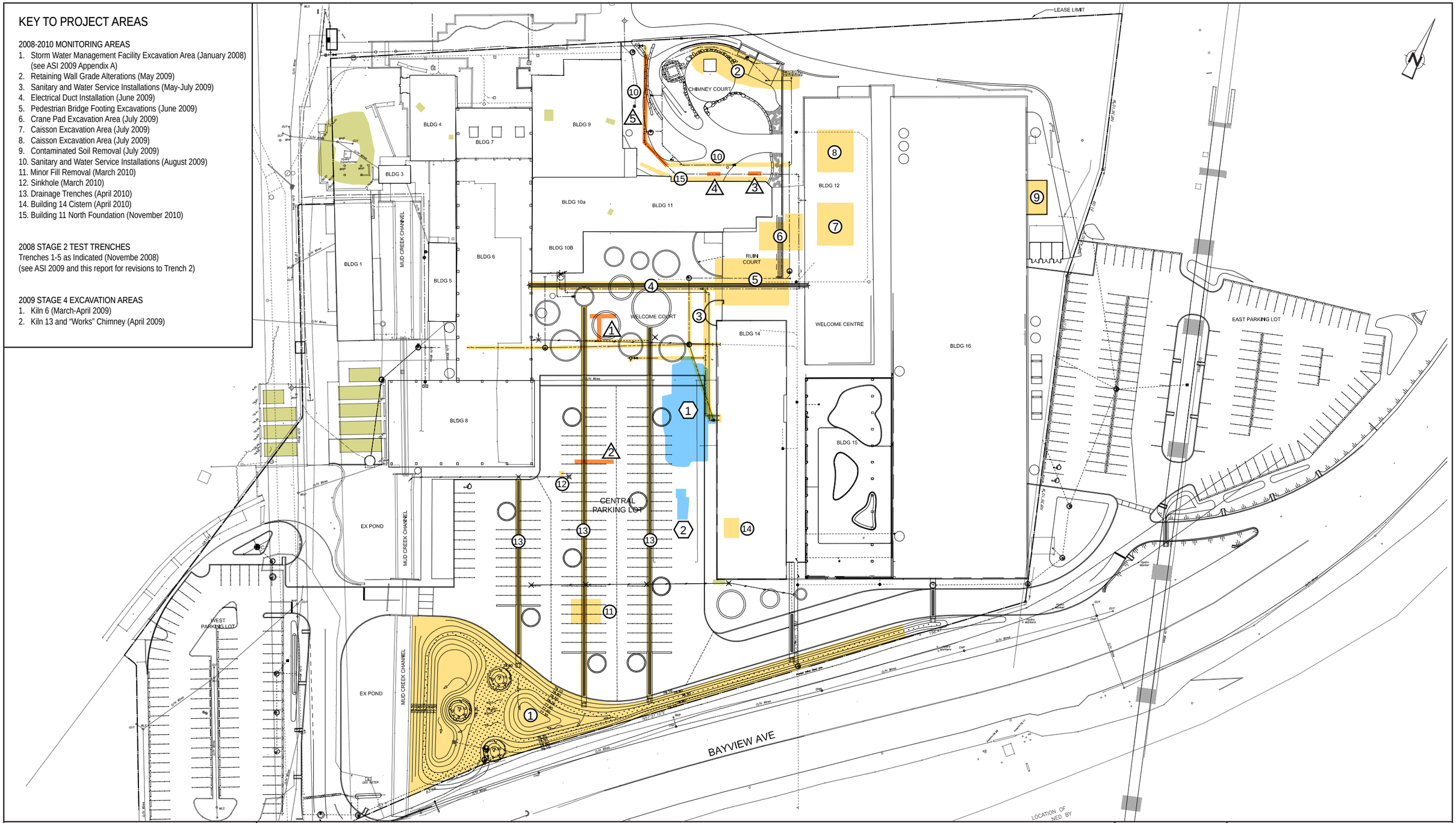
1. Storm Water Management Facility Excavation Area (January 2008) (see ASI 2009 Appendix A)
2. Retaining Wall Grade Alterations (May 2009)
3. Sanitary and Water Service Installations (May-July 2009)
4. Electrical Duct Installation (June 2009)
5. Pedestrian Bridge Footing Excavations (June 2009)
6. Crane Pad Excavation Area (July 2009)
7. Caisson Excavation Area (July 2009)
8. Caisson Excavation Area (July 2009)
9. Contaminated Soil Removal (July 2009)
10. Sanitary and Water Service Installations (August 2009)
11. Minor Fill Removal (March 2010)
12. Sinkhole (March 2010)
13. Drainage Trenches (April 2010)
14. Building 14 Cistern (April 2010)
15. Building 11 North Foundation (November 2010)

2008 STAGE 2 TEST TRENCHES

Trenches 1-5 as Indicated (Novembe 2008)
(see ASI 2009 and this report for revisions to Trench 2)

2009 STAGE 4 EXCAVATION AREAS

1. Kiln 6 (March-April 2009)
2. Kiln 13 and "Works" Chimney (April 2009)



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LEGEND

① 2008-2010 ARCHAEOLOGICAL MONITORING AREA

OTHER EVERGREEN MONITORING AREAS (see ASI 2007a, 2008)

1 2008 STAGE 2 AREA

1 2009 STAGE 4 AREA

BASE:
Evergreen Brick Works
Public Utilities Plan
Dwg. C201

AECOM January 21, 2009

0 50m
SCALE

ASI PROJECT NO.: 09SP-13 DRAWN BY: DAR
DATE: JULY 22, 2009 FILE: 09SP-13 figure 2.ai

Figure 2: The General Locations of the 2008 Stage 2 Test Excavation, 2009 Stage 4 Salvage Excavation and 2008-2010 Archaeological Monitoring Areas at the Don Valley Brick Works.

The work was structured, in large part, by the Public Utilities Plan (Dwg.s C201 C202, C203) Site Grading Plan (Dwg. C301), Site Paving Plan (Dwg. C501) and the site landscaping plans (Dwg.s L1-1, L1-2, L1-4, L2-1, L2-3) dated January 21, 2009, with subsequent modifications, the most significant of which was the redesign of the Central Parking Lot, involving minimal removals of the existing brick rubble fill, use of recycled crushed concrete resting on the existing subgrade, and a fibre-reinforced concrete pavement rather than an asphalt pavement as previously planned. The rationale behind this design change was two-fold; it will provide longer term viability for the parking lot surface in that it will reduce the potential for collapse of the many intact sections of flues that traverse the area, the locations of which still are largely unknown, and it will result in substantially reduced potential for impacts to the upper surfaces of the buried bases of the circa 1890 coal-fired, intermittent down-draught kilns (Kilns 3-6 and 13-15), and the north range of the circa 1912 coal gas-fired Youngren kiln to their south, as well as the remains of the "Works" chimney in the parking lot area.

Permission to access the project area and carry out the activities necessary for the completion of the monitoring and documentation was granted to Archaeological Services Inc. by Evergreen on March 23, 2009. All work was undertaken in accordance with the protocols of the risk management plan developed for the site (CH2MHill 2008).

The Kiln 6 excavations and all monitoring work were carried out under the management of David Robertson, and project direction of Debbie Steiss (P049-384-2009, P049-511-2010).

The archaeological excavations within the Kiln 6, Kiln 13 and "Works" chimney areas were carried out between March 30 and April 20, 2009, on all days during which weather conditions were suitable (i.e., there were no heavy showers). Archaeological monitoring of construction activities was carried out, as required, between May 11, 2009 and November 12, 2010. Weather conditions were appropriate for the completion of the monitoring work.

2.0 BACKGROUND

Discussion of the general history of the Don Valley Brickworks complex and the previous archaeological assessments that have been carried out on the site may be found elsewhere (e.g., ASI 2006, 2007a, 2007b, 2008, 2009; UMCA 1994). This information is not repeated herein.

It should be noted, however, that the results of the Stage 4 investigations have led to refinements in our understanding of the former locations of various features within the site, most notably the down-draught kilns that occupied the central part of the complex between the 1890s and 1961. In the course of the Stage 2 assessment, for instance, it was assumed that the portions of the kiln bases uncovered in Trench 2 were associated with Kilns 5 and 6, as identified on the historic mapping. In fact, Trench 2 intersected the remains of Kilns 3 and 4. Accordingly, the discussion of Trench 2 that appeared in the Stage 2 assessment report (ASI 2009) is provided again in Section 3.0.of this report, with the appropriate revisions.

3.0 THE 2008 STAGE 2 ASSESSMENT TRENCH 2 RESULTS

Trench 2[1] intersected portions of Kilns 3 and 4, two of the six rectangular coal-fired down-draught kilns located to the south of the wire cut brick plant (Figure 2). These were among the earliest kilns built at the site and serviced the dry press brick production line in Buildings 10 and 11. Most of these kilns were demolished circa 1961 (UMCA 1994) although Kilns 4, 5, and 6 appear to have stood as late as 1964 (ASI 2006:Figures 5-8).

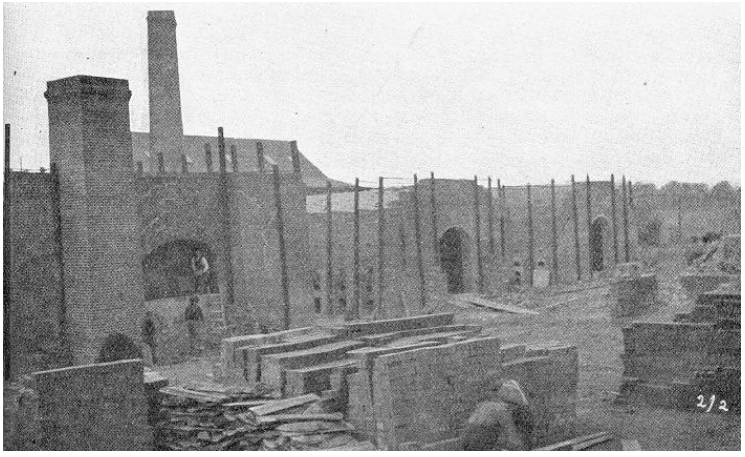
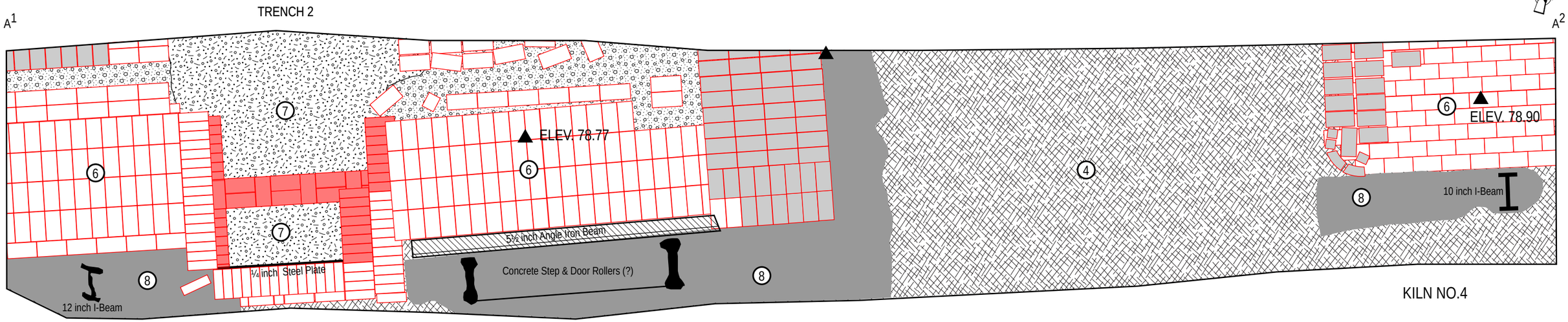


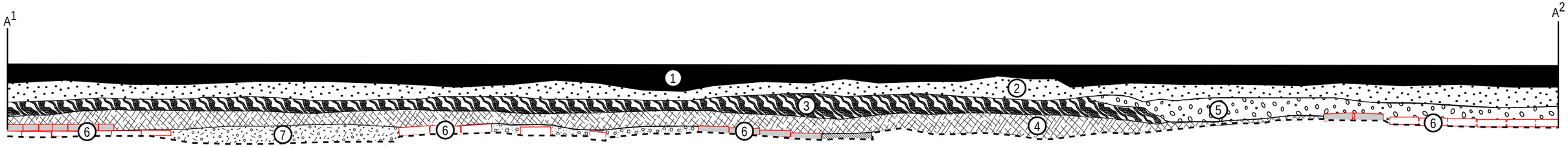
Figure 3: View of down-draught kilns at the Toronto Fire Brick Co. works. Reproduced from the Ontario Bureau of Mines *Annual Report* for 1906.

Down-draught kilns were developed in the effort to reduce the rates of brick loss due to the uneven distribution of heat within the kiln. While the principles involved had been long understood, the use of the technology varied through time and space, due to the permanent nature of the installations that were required. Down-draught kilns were constructed such that the hot air from the firing chambers was channelled through flues, or "bag walls" that deflected the gases to the top of the kiln, which had a curved or domed roof. The shape of the roof, together with the draught of the chimney forced the hot air downward through the stacked bricks and out through openings in the floor to a central exhaust flue (Searle 1906; Bourry 1911; Hammond 1977, 1990; Ritchie 1980; Gurke 1987; Douglas and Oglethorpe 1993). Down-draught kilns could be either circular (beehive) or rectangular in plan. Those at Don Valley were rectangular. A number of individual kilns could be built in a row and serviced by a single flue and chimney system, giving rise to the eventual development of the "continuous" kiln. Figure 3 depicts kiln structures that are probably comparable in terms of design to those at the Don Valley Brick Works.

The 11 m long trench uncovered portions of both kilns (Figure 4; Plates 1-4), which had been razed to floor level. Only a small portion of Kiln 4, at the east end of the trench was exposed. Associated elements consisted of drylaid brick flooring (Lot 6) and a segment of poured concrete footing (Lot 8), portions of which appear to have been jack hammered away. The remnant of a 10″ (25 cm) I-beam reinforcing member was set in this footing. It had been cut away during the demolition process. It did not appear that any superstructure elements were directly built into the brick base. The use of a "floating" superstructure that simply sat on the kiln base was a measure to reduce the damage to the footings that would arise from the high internal temperatures reached during the kiln's operational cycles, and from the consequent expansion of the structural fabric (Searle 1906:152).

[1] Mechanical excavation of the test trench was carried out using a smooth bucket, except for removal of surface asphalt and granular when a claw bucket was employed. Excavations were halted whenever potentially significant deposits were observed. The floor plan of Trench 2, together with representative stratigraphic profiles were recorded and photographed. The Parks Canada convention of designating each unique stratigraphic unit as a "lot" (e.g., Cary and Last 2007) was followed during the excavation and recording process.





TRENCH 2: NORTH WALL PROFILE

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Brick Key
- Upper course of flooring
- Lower course of flooring
- Subfloor brick work

1. Asphalt
2. Granular
3. Crushed brick and brick rubble
4. Yellowish brown sand with brick fragments and coal cinders
5. Dark greyish-brown sand with coal cinders, brick, and decayed mortar
6. Brick-built kiln strutural remains (floors/substructures)
7. Brick rubble and sand and gravel fill
8. Poured concrete footing

BASE:
Stage 2 Field Drawings
Prepared by AC/DR Nov. 25, 2008

0 1.0m
SCALE

ASI PROJECT NO.: 09SP-13
DATE: July 23/09
DRAWN BY: DAR
FILE: 09SP-13 figure 4.ai

Figure 4: The Stage 2 Archaeological Assessment of the Don Valley Brickworks Utilities Installations, Trench 2 in the Central Parking Lot South of the Welcome Court.

Plate 2: Kiln 3, viewed from the south.

Plate 1: Trench 2 with Kiln 4 (foreground and Kiln 3 (background), following exposure, viewed from the west.

Plate 4: The flue of Kiln 4 viewed from the south.

Plate 3:Kiln 4 following exposure, viewed from the west.

The bricks used in the construction of the floor were a mixture of frogless and rectangular frogged forms and typically measured 8½″in length, 4¼″ in width and 3″ in thickness (21x11x7 cm). None of the exposed bricks bore maker's marks.

A more extensive section of Kiln 3 was exposed in the west half of the trench. The section uncovered consisted of the floors of two chambers (Lot 6) which flanked the demolition debris-filled central flue (Lot 7), bounded by poured concrete footings (Lot 8). A 12″ (30 cm) I-beam reinforcing member was set in the west footing. It had been both cut and twisted during the demolition. The east footing featured a concrete step, two steel fittings and a length of 5½″ (14 cm) iron beam that together may represent the base of a rolling door system. As in the case of Kiln 4, the superstructure was not built into the footings.

The bricks used in the construction of Kiln 3 typically measured 8½″ in length, 4¼″ in width and 2½″ in thickness (21x11x6 cm) and were frogless. None of the bricks exposed bore any maker's marks. The debris from the flue was not removed to any great depth, but it was noted that a two wythe Flemish bond brick wall had been built across the flue and extended under the floor surfaces.

The area between the two kilns was not excavated below the level of the surviving kiln surfaces and was occupied by brick rubble and a yellowish-brown sand fill that also contained coal cinders (Lot 4). The remains of a steel-toed safety shoe were observed in this context. This item was not retained. This deposit is likely associated with the 1960s demolition and grading events. This material was not excavated given the risk of damaging the kiln floors in the process.

The general stratigraphy encountered within Trench 2 consisted of asphalt and granular (Lots 1 and 2) to a depth of 0.20-0.30 m, crushed brick and brick rubble that also appears to have been used as granular (Lot 3), a dark greyish-brown sand mixed with coal cinders, brick debris and mortar (Lot 5) overlying Lot 4 and the remnants of the kilns, the upper surfaces of which lay 0.4 m below grade. The brick rubble was made up of a wide variety of types.

4.0 STAGE 4 ARCHAEOLOGICAL EXCAVATIONS

4.1 Introduction

Following the completion of the Stage 2 test excavations and review of the servicing plans for the Welcome Court and Central Parking Lot areas, it was initially proposed that the Stage 4 salvage excavations should be focused on the north half of Kiln 6 where a number of utility lines were expected to pass through the structure. The servicing plan was subsequently modified to reduce, but not entirely eliminate, the impacts. Nevertheless, in consultation with Evergreen, the Ontario Heritage Trust and City of Toronto Heritage Preservation Services, it was decided that the Stage 4 excavation program should actually be expanded to expose the remains of Kiln 6 in their entirety, following the demolition of Building 13, which had been built in 1972 to occupy the former Kiln 6, Kiln 13 and "Works" Chimney area. Kiln 6 was to be fully documented in plan, and the fills from the flues in and below the floor removed, to the degree possible, in order to document the design and operational features of the kiln. This work was also intended provide the project design team with the opportunity to assess the load-bearing

qualities of the kiln bases (using Kiln 6 as a proxy for the other kilns located throughout the parking lot) and the many flues that run through this part of the site, and to identify a solution with respect to the design of the parking lot bed that would minimize impacts to the kiln remains while still meeting required engineering specifications.

The work plan was further expanded to include excavation of a trench to intersect the remains of the "Works" chimney and of Kiln 13, located to the south of Kiln 6. This work was intended to provide additional data concerning the depth of these features below grade, determine their state of preservation, and allow similar consideration of a preferred solution for the parking lot construction vis-à-vis reconciling the engineering requirements with the objective of preserving these and the other features in the Central Parking Lot.

The Stage 4 excavations proceeded in the same manner as the Stage 2 work. The asphalt, crushed brick, granular and clay fill overburden was removed using a backhoe under archaeological supervision. Excavations were halted when intact surfaces were encountered, although the identification of these was hindered by the massive quantities of displaced bricks, most likely derived from the razed superstructure, which had been used to fill the various voids in the subsurface remains of the structures. The entire feature was then cleaned by hand, using shovels, trowels, brooms and brushes (Plates 5-8). This work included removal of demolition debris from the fire boxes, floor vents and, to the degree possible, the main flues.

Plate 5: The initial exposure of the central part of Kiln 6, viewed from the west.

Plate 6: Hand excavation following the initial exposure of Kiln 6.

The stratigraphy of the demolition and fill materials overlying the features was identical to that encountered in the Kiln 3 and 4 Stage 2 test trenches and so was not recorded in detail. Examination of these strata provided no additional insights into the demolition process and the regrading of the area prior to the construction of Building 13. Moreover, these deposits were entirely irrelevant to the construction and operation phases of the site's history.

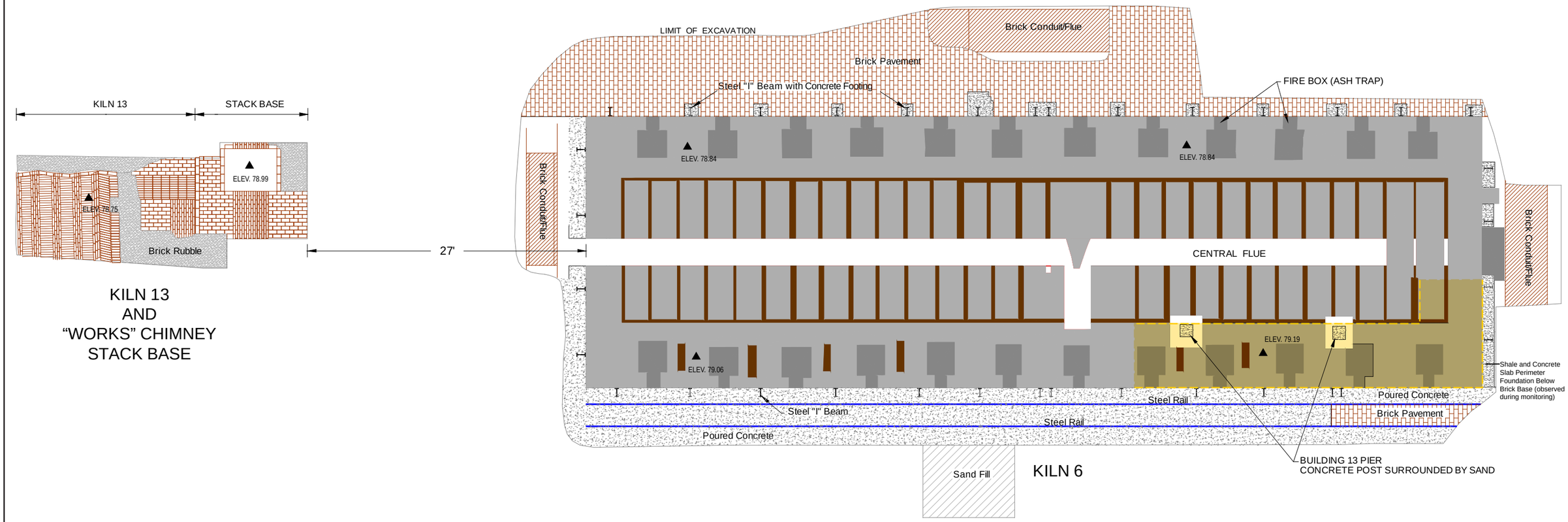
Following the Stage 4 documentation, the two excavation areas were carefully backfilled. The voids of the flues were first backfilled using fine granular to achieve a uniform grade. Woven non-degradable geotextile was laid on all horizontal surfaces within the trenches and topped with 50-100 mm of granular. The balance of the backfilling made use of the previously excavated fill materials.

Additional details concerning the original construction of Kiln 6 were revealed during subsequent monitoring of the installation of the 100Ø sanitary sewer line through the northeast corner of the kiln and the 200Ø watermain to the immediate east of the kiln base. These are incorporated in the description of the kiln provided in Section 4.2 rather than in the Section 4.4 summary of monitoring results.

Plate 7: Kiln 6 viewed from the north following complete exposure and excavation.

4.2 Kiln 6

The historic mapping that depicts the locations of the kilns in the Central Parking Lot area indicates that Kiln 6 measured approximately 76′ long by 24′ wide (23.1x7.3 m). This contrasts with internal dimensions of 86′ by 16′ 6″ (26.2x5.0 m) reported by Montgomery (1930:162), a discrepancy that is not necessarily surprising, given the inaccuracies with respect to the mapped locations of these features that have been revealed as a result of the archaeological investigations. On the basis of the archaeological excavations, Montgomery's reported measurements are much more reliable. Overall, the exposed brick-built base of Kiln 6 (Figures 5-9) measured 86′ 6″ long and 28′ 6″ in width (26.4x8.9 m). While the basic



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LEGEND

BASE:

FIELD DRAWINGS
PREPARED BY AC/DM/WO
APRIL 2009

0 2.5m

0 15'

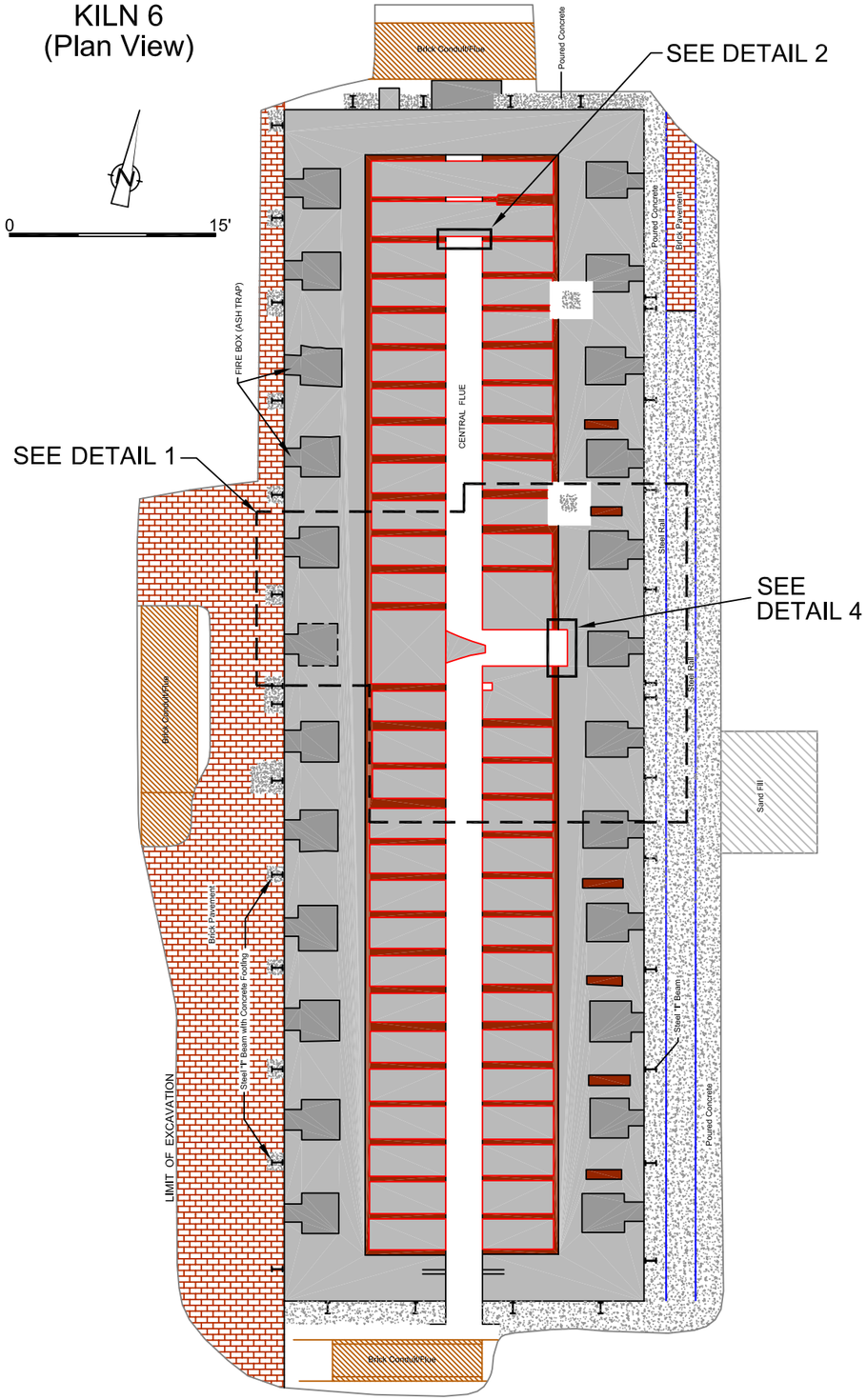
SCALE

ASI PROJECT NO.: 09SP-13
DATE: MAY 18, 2009

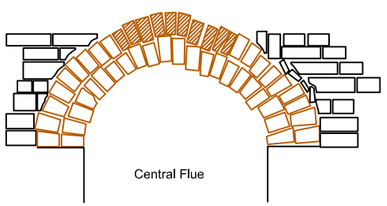
DRAWN BY: AC
FILE: Kiln 6 Overall Plan

Figure 5: Plan view of the full base of Kiln 6 and the partial exposures of Kiln 13 and the "Works" chimney as documented during the Stage 4 archaeological excavations.

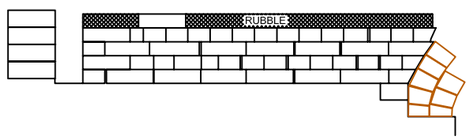
KILN 6
(Plan View)



DETAIL 1
CENTRAL KILN AREA

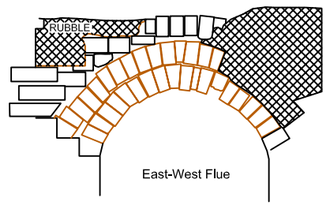


DETAIL 2
NORTH ARCHWAY
(Central Flue)



DETAIL 3
BLOCK (Cross-Section)

0 5'
SCALE



DETAIL 4
EAST ARCHWAY
(East - West Flue)

FIELD DRAWINGS
PREPARED BY AC/DM/WO
APRIL 2009

ASI PROJECT NO.: 09SP-13
DATE: JULY 29, 2009

DRAWN BY: AC
FILE: Kiln 6 Details

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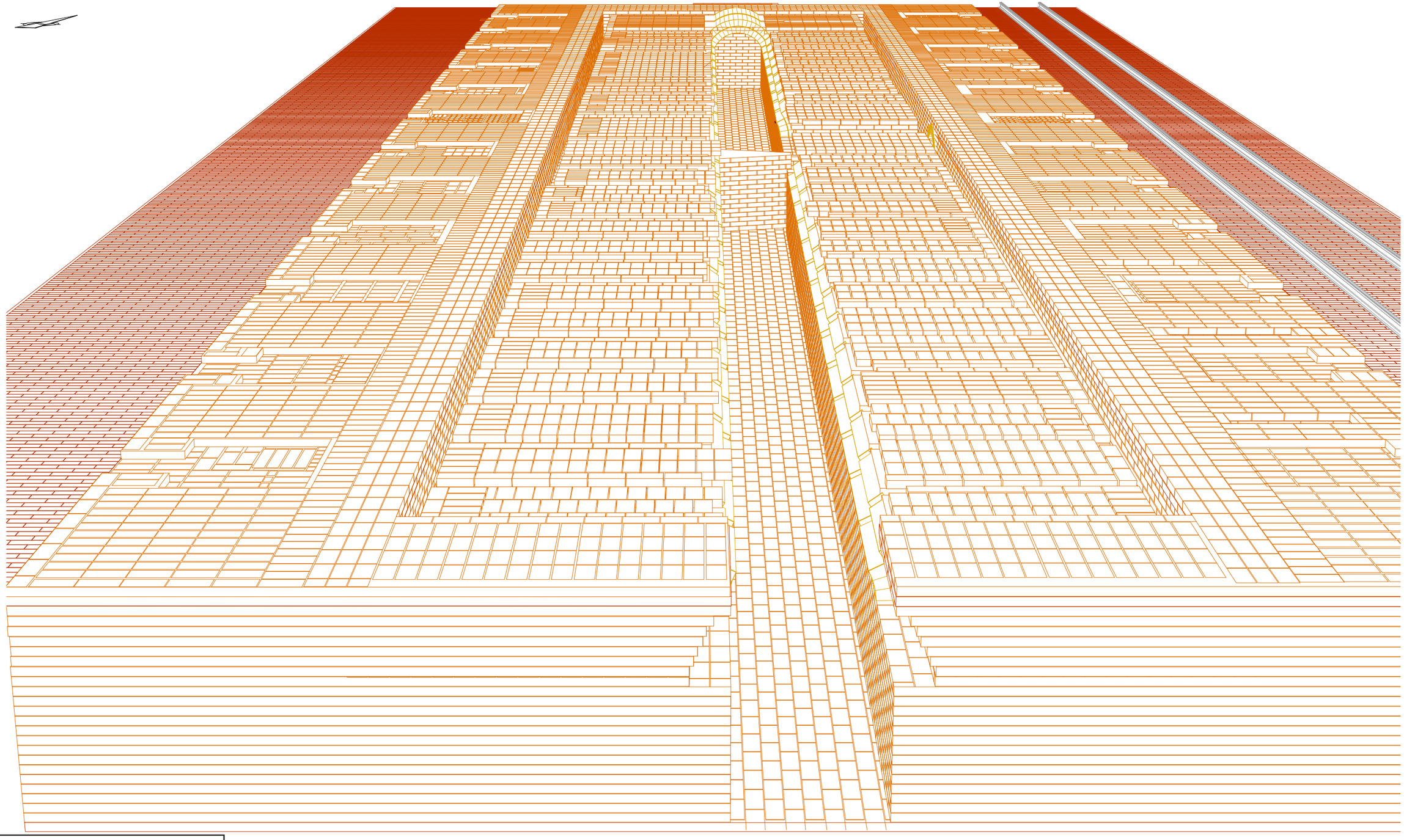
Figure 6: Representative Detail Views of Kiln 6 as Revealed by the Stage 4 Archaeological Excavations.



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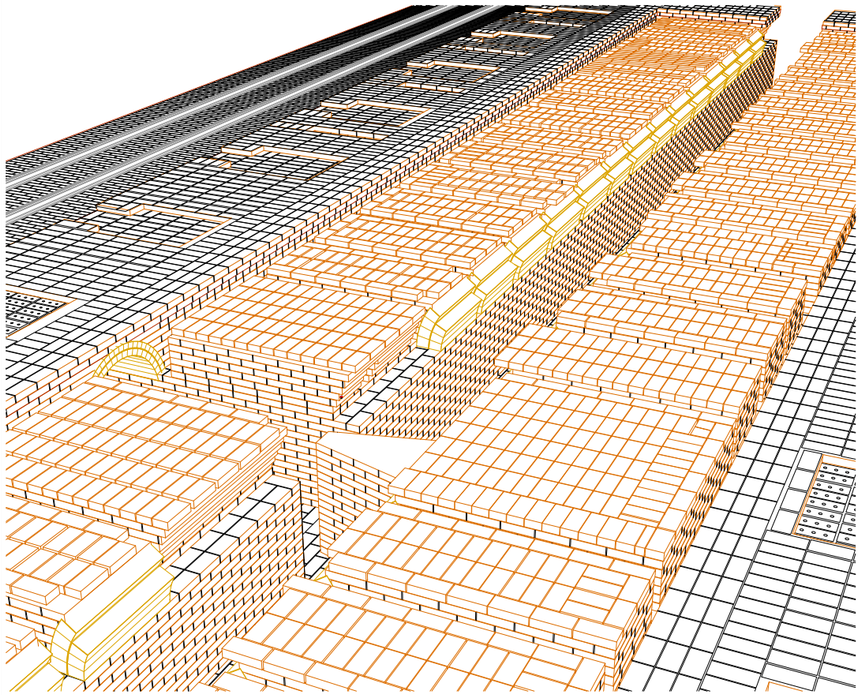
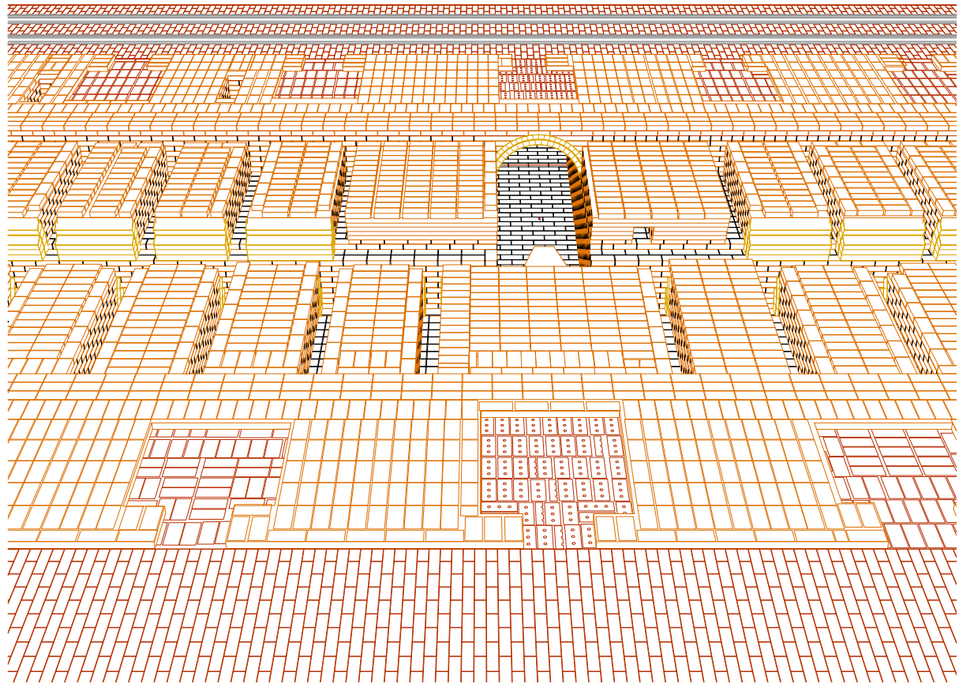
ASI PROJECT NO.: 09SP-13
DATE: FEBRUARY 24, 2010
DRAWN BY: AC
FILE: 09SP-13 FIGURE 7.AI

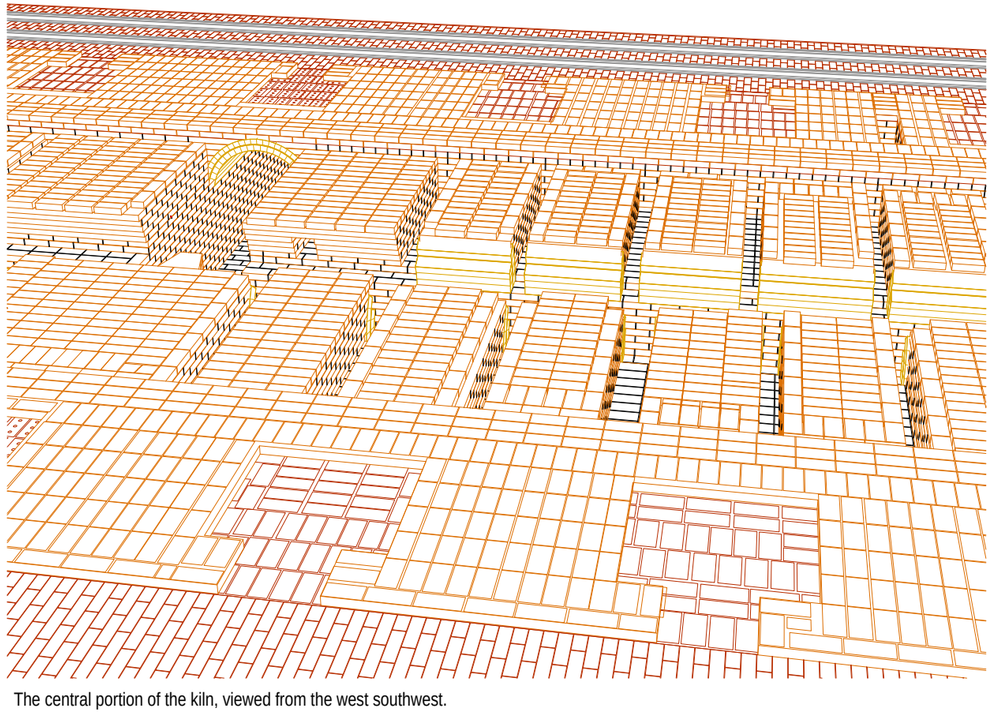
Figure 7: Overall isometric drawing of the base of Kiln 6 as documented during the Stage 4 excavations. Viewed from the south.



The central portion of the kiln, viewed from the northwest.



The central portion of the kiln, viewed from the west.



The central portion of the kiln, viewed from the west southwest.

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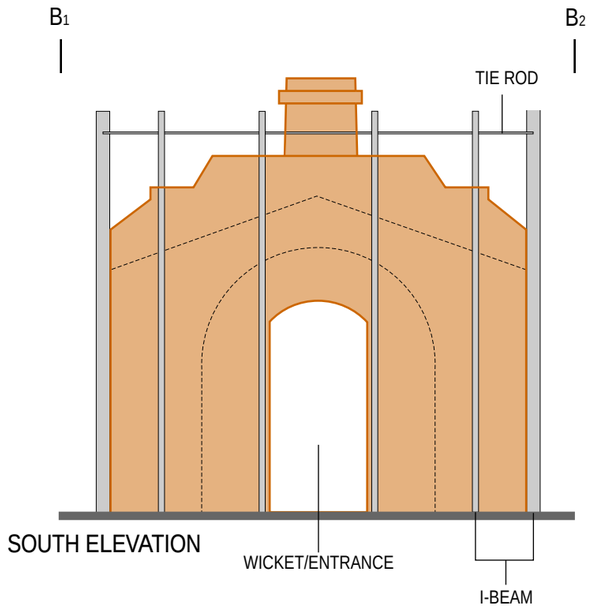
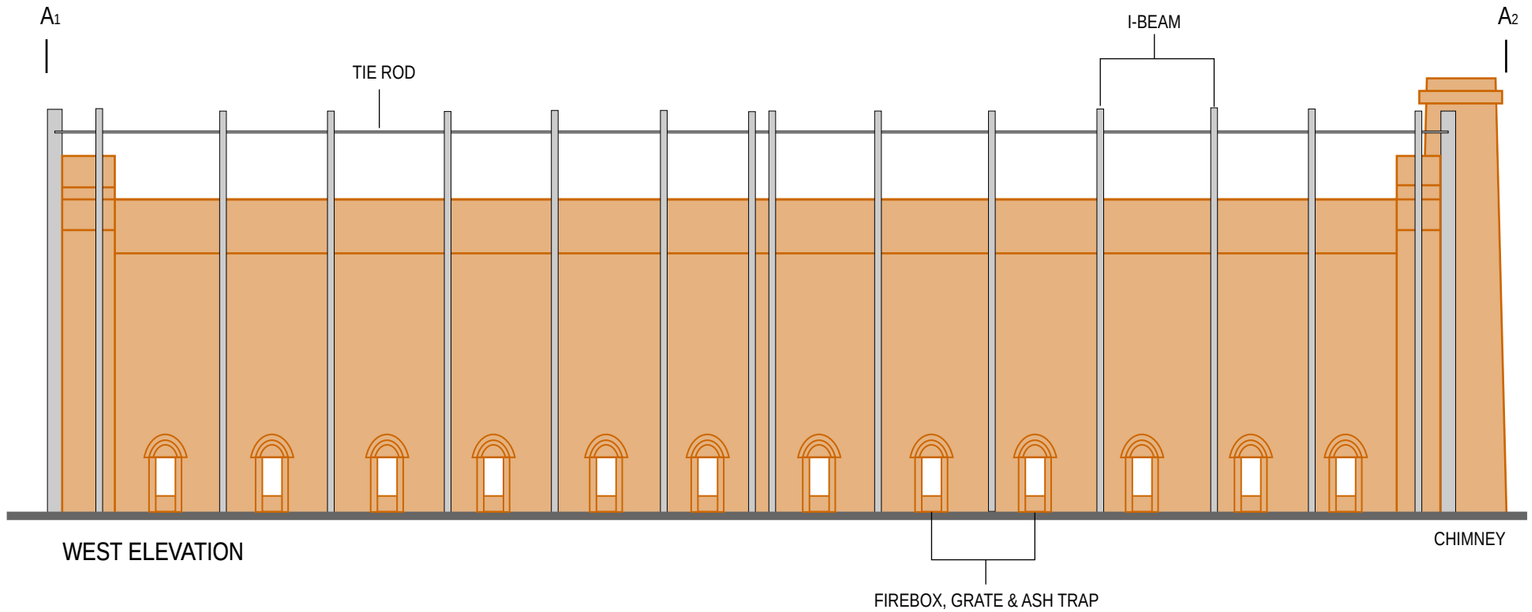
ASI PROJECT NO.: 09SP-13 DRAWN BY: AC
DATE: FEBRUARY 24, 2010 FILE: 09SP-13 FIGURE 8.AI

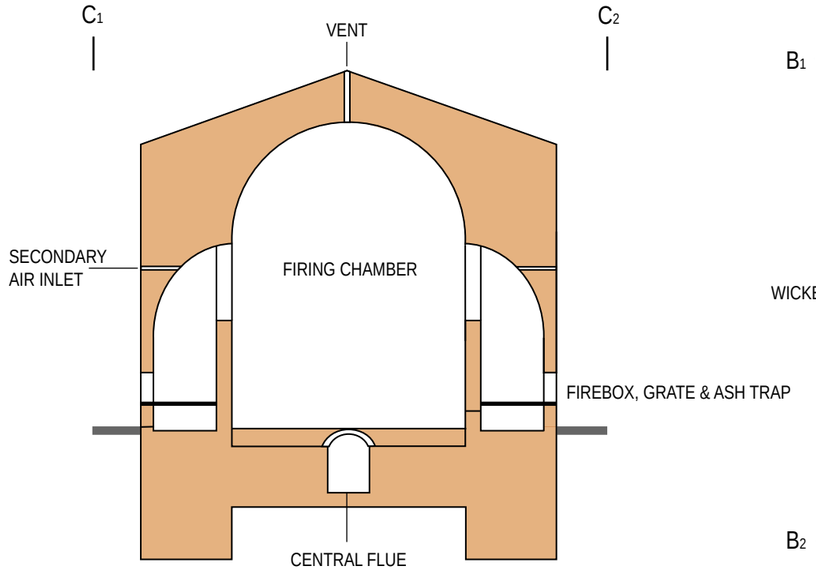
Figure 8: Details of aspects of the base of Kiln 6 in isometric view.



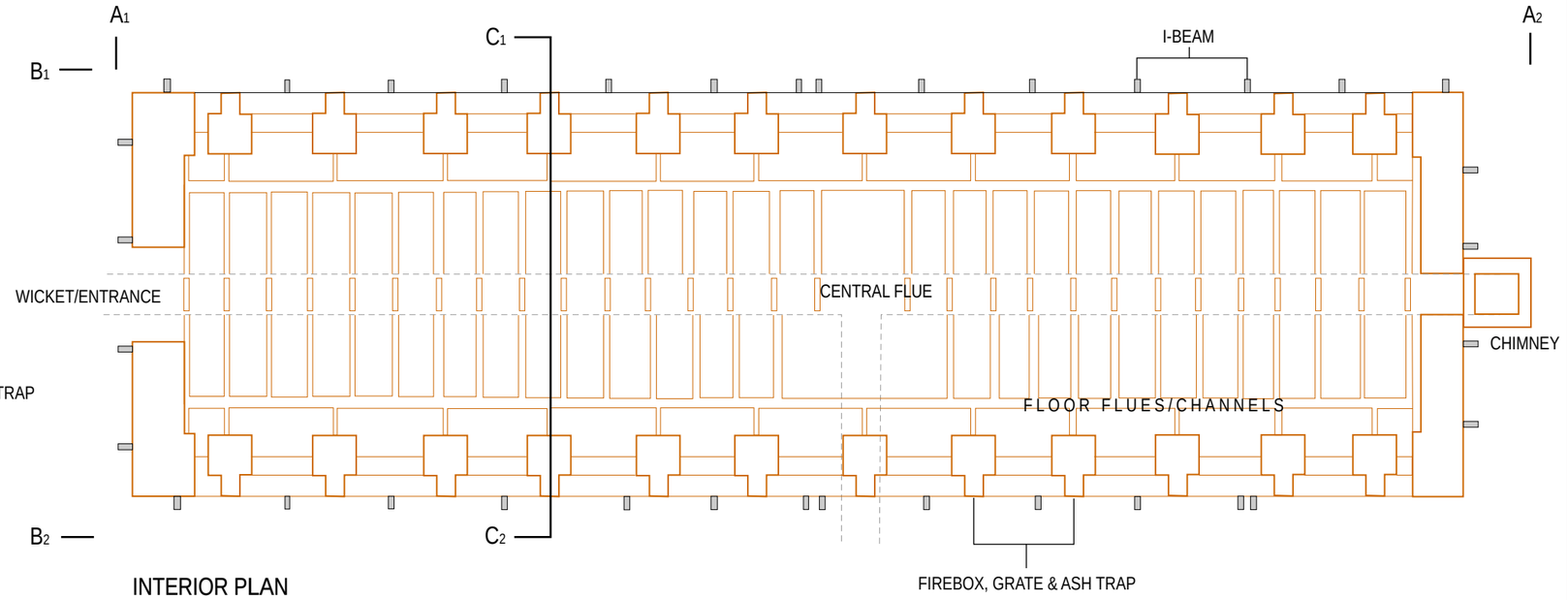
SOUTH ELEVATION



WEST ELEVATION



SCHEMATIC INTERIOR CROSS-SECTION



INTERIOR PLAN

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0 2.5m

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SCALE

ASI PROJECT NO.: 09SP-13 DRAWN BY: DAR
DATE: FEBRUARY 21, 2010 FILE: 09SP-13 FIGURE 6.AI

Figure 9: Conjectural reconstruction of the exterior elevations and interior cross-section of Kiln 6, based on the archaeological remains of the kiln base and comparable superstructures.

width measurements do not agree, the average distance of 18′ (5.5m) between the internal edges of the fire box floors along either side of the structure is a more accurate reflection of the internal width of the firing chamber. Allowing for the walls of the firing chamber, of which no traces survived the demolition of the structure, brings the recorded dimensions and Montgomery's description closer together. The fact that no remains of any structural elements above the kiln floor were found confirms that the kilns had "floating" superstructures that were not tied into the foundations. Figure 9 provides a *highly* conjectural reconstruction of the appearance of the superstructure of the kiln based on the archaeological evidence and comparison with structures documented elsewhere (cf. Hammond 1977; Douglas and Oglethorpe 1993).

4.2.1 The Kiln Base

Kiln 6 was set on a six foot wide, three foot high perimeter foundation composed of shale slabs and concrete slab rubble. This structural element was only revealed during the monitoring of the servicing excavations (Plate 8) as the archaeological investigations did not involve dismantling of any parts of the structure. To the inside of the foundation a highly variable mixture of sands, gravels, shale and concrete rubble and coal ash fills formed the substratum on which the kiln base rested.

Plate 8: Exposure of the shale and concrete slab perimeter foundation of Kiln 6 during the service installations carried out after the Stage 4 documentation.

Contemporary technical manuals (e.g., Bourry 1911; Searle 1906), emphasize the importance of both drainage and a well-consolidated base in ensuring the long term viability of a kiln, recommending use of a prepared bed of either concrete or stones and clay with the addition of drainage features:

> The prospective kiln-builder must watch carefully to see where the water runs and stands after rain, and must choose the driest spot. If the kiln is in the vicinity of a river or underground springs, it is necessary to ensure that these shall have no effect on the foundations. It is in fact, essential that the kiln bottom be kept dry, and it must be well drained so as to remain so even in the wettest weather…. The depth to which a foundation must be taken to ensure dryness of the kiln floor depends, to a large extent, on the nature of the ground, but it is usually much greater than is generally expected…. No kiln should be built on ground in which the water stands at a less depth than six feet in the subsoil, and, where floods are likely to rise, the floor should be raised above ground level and arrangements made for draining beneath the kiln. This matter of raised floors is also important in connection with kilns built near to the banks of a tidal river. Of the various materials used for rendering the floor of a kiln damp-proof, asphalt or bitumen is undesirable because it is affected by the heat, and concrete, although excellent when new, is apt to crack and is then useless. A simple yet effective foundation consists of a layer of moderate sized stones about 18 inches deep, well drained with pipes and covered with a layer of gravel, over which a bed of clay or loam is well rammed into place. A bed of sand may be added if desired and the whole paved with hard-fired bricks. Where the ground is very wet properly built flues should take the place of the stones, these flues being connected so as to drain from one channel. Small wooden chimneys are also added in some cases to secure proper ventilation of these flues, but if the chimney draught is strong enough the flues may be more conveniently connected to the chimney stack (Searle 1906: 152).

Given the profound drainage problems that characterize the Don Valley Brick Works site (i.e., its high water table and periodic flooding), it would be expected that efforts would have been made early on to ensure that the kilns would withstand water damage (Plate 9). While the perimeter footings were certainly well-built, and the numerous flues that were found flanking the kiln base (and which connect to the other kilns within the overall system) undoubtedly served to mitigate the effects of the high water table, the interior fill deposits under the kiln base were surprisingly heterogeneous.

Plate 9: Cleaning up a down-draught kiln at the Don Valley Brick Works following a flood, 1920. Photo courtesy of E. Freeman.

Where the floor of the kiln had survived, it was composed of 18 courses of dry-laid bricks, 13 courses of which were recorded during the archaeological excavations, while monitoring revealed an additional five courses below the floor of the lateral flue exiting the east side of the kiln). A wide variety of brick types (i.e., fire bricks, common bricks [solid, frogged and perforated forms], and specialty architectural bricks) were used in the base and floor (Plate 10) reflecting the ongoing need to repair or reconstruct sections kiln base over the years. Indeed, most bricks making up the base proved to be comparatively modern, suggesting that little of the fabric from the original construction remained. With the exception of

the fire box areas (Section 4.2.3), in which fire bricks tended to predominate, any form of brick produced by the Don Valley plant was suitable for use in the kiln base. Maker's marks visible among the common bricks used in the construction of the kiln base were either DON or TORONTO BRICK CO., both brands that were produced at the site.

Plate 10: Detail of one of the blocks between the floor channels showing the diverse range of bricks, in this case including enameled specimens, used in the construction/repair of the kiln base.

To the immediate exterior of the kiln base, on all four sides were the remains of 10″ (25 cm) I-beams set in concrete footings, generally at seven foot intervals. The I-beams had all been cut off during demolition. These served as reinforcements for the walls of the superstructure, which was subject to considerable pressure as the fabric expanded during firing. The beams were likely connected to one another by tie rods and may have also supported an external shelter over the entire kiln:

> A good roof for protection from snow, rain, etc., is beneficial for permanent kilns, and their life will be increased, and the quality of goods often improved, by extending the roof some distance around, so as to keep the approaches to the kiln dry. Above all, care must be taken that the water draining from the roof is properly removed; it must on no account be allowed to soak into the masonry of the kiln (Searle 1906:153).

The north and south ends of the kiln base had been extensively damaged as a result of the demolition of the structure. At one or both ends would have been a wicket or entrance to the kiln interior, through which the bricks were moved on carts. It is also possible that the north end of the kiln featured a chimney, such as those that can be glimpsed on a photo of the site that dates to the 1890s (Plate 11), for at the north end of the structure the remains of a square box-like brick structure was appended to the kiln base in line with the central flue (Plates 12 and 13).

Plate 11: The brick works operations in the 1890s, viewed from the northwest. Note the series of chimney stacks behind and to the right of the "Don" chimney, which appear to be the rectangular downdraught kilns. Toronto Reference Library, Baldwin Room SC128.

Plate 12: Remains of the possible chimney stack, viewed from the west.

Plate 13: Remains of the possible chimney stack, viewed from the north.

This chimney most likely functioned during the preliminary stages of firing, when the bricks were dried or smoked:

> The ordinary fireman never seems to realise how much water there is in the goods in a kiln; 300lbs. per ton of goods is by no means an uncommon quantity, and as each pound of water forms roughly 27 cubic feet of steam, this means over 8100 cubic feet of steam must be driven out of each ton of goods before the firing can commence! Hence the necessity of ample ventilation…inside the kilns, and for sufficient time being allowed to effect the evaporation of water without causing it to boil and so spoil the surface of the goods. It is on this account that a "smoky" fire is used at the commencement of the firing (Searle 1906:180).

Wood was used as the fuel in this process at the Don Valley Brick Works (Montgomery 1930:162).

4.2.2 Flues and Floor Channels

The main flue of the kiln formed the centreline of the structure and measured 2′ 8″ in width (0.83 m) and would originally have been at least four feet high (1.2m). This flue continued southward beyond the excavation area towards the "Works" chimney and Kiln 13. It also intersected a lateral flue that extended from the mid-point of the structure eastward to Kiln 7. A triangular pier of bricks laid against the west wall of the central flue served to deflect hot air through the T-shaped intersection. Except at the extreme north end of the kiln, the roof of the flues within the firing chamber had been removed at the time of the demolition and the brick rubble packed within the remaining portion of the features. Those portions of the flues that were exterior to Kiln 6, and could be examined during the excavations, remained fully intact (Plates 14-16).

Plate 14: View east within the central lateral flue entering on the east side of Kiln 6.

Plate 15: View of the flue below the brick pavement on the west side of Kiln 6.

Plate 16: View eastward from within the flue at the south end of Kiln 6.

Within the kiln interior, the flues featured straight side walls, built with all manner of brick types and a barrel vaulted roof that was generally, but not exclusively, formed using arch type fire bricks. The roof of the central flue was interrupted at 2′ 7″ to 2′ 10″ intervals (0.78-0.86 m) by openings that connected to lateral channels in the floor of the firing chamber. These channels, which measured one foot deep and approximately six inches wide (15 cm), were in turn connected to a channel that ran around the perimeter of the main chamber. The channels and openings in the roof of the floor flue served to exhaust the hot gases that had been deflected down from the roof of the chamber and through the brick stock being fired (Figure 10).

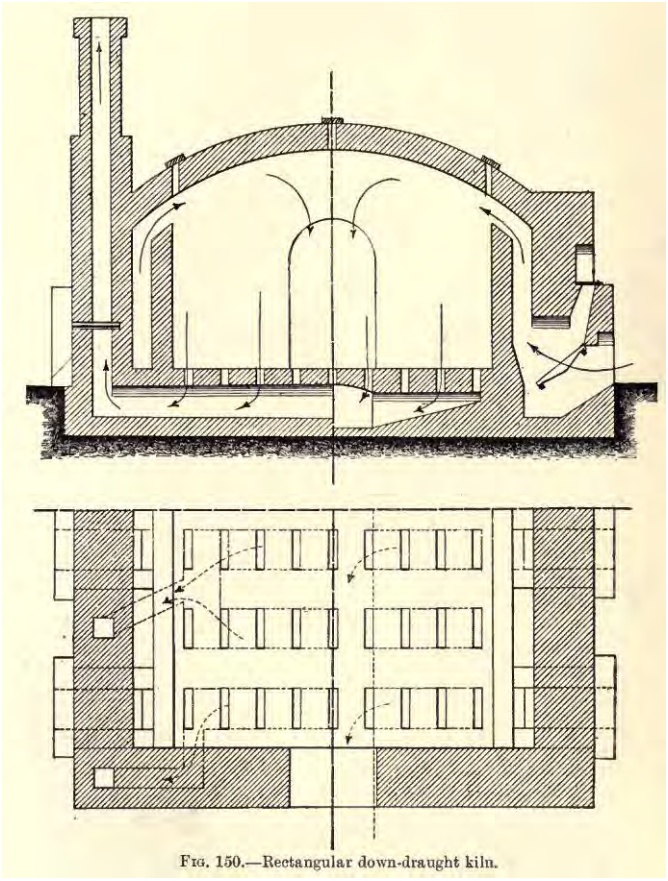


FIG. 150.—Rectangular down-draught kiln.

Figure 10: The flow of gases in a down-draught kiln (Bourry 1911:213). Note that the left and right halves of the images depict two different systems.

4.2.3 Fire Boxes

The kiln boasted 24 fire boxes, 12 along either side of the central chamber. Each fire box measured four feet long and three feet wide. Only the floors of the fire boxes, basically the ash traps, survived the demolition of the kiln (Plate 17). The floors and remnant sides of the fire boxes as well as the immediately surrounding portions of the kiln base and exterior pavement surrounding areas showed extensive indications of repair and reconstruction. For the most part, the bricks used in the construction of the boxes were fire bricks, although in some instances, regular bricks were used for repair work. Common brands of fire brick used in the boxes were BUCKEYE (a mark used by the Dover Fire Brick Company of Dover, Tuscarawas County, Ohio between 1870 and 1927), LACLEDE and LACLEDE CROWN (Laclede Brick Co., based in St. Louis, Missouri) and WW CO. (a brand made by Robinson Clay Products of Strasburg, Ohio). The WW CO. trademark was used from 1921 to 1942. Minor marked types included LIBERTY, NATIONAL, OHIO WOODLAND, BRIGHTON, and ELK-STEELE.

Plate 17: An example of one of the better preserved fire grate floors.

Little can be said concerning the likely form of the grates that stood above the floors of the fire boxes. Many different forms of such features had been developed over the nineteenth and early twentieth centuries, often with complex feeding systems. Nevertheless, Montgomery (1930:162) reports that the grates were of a horizontal type, basically the simplest of forms, which were loaded by hand through an external wicket. The fuel would have been fed through an exterior door and air drawn through the ash pit below the grate (Plate 18 and Figure 11).

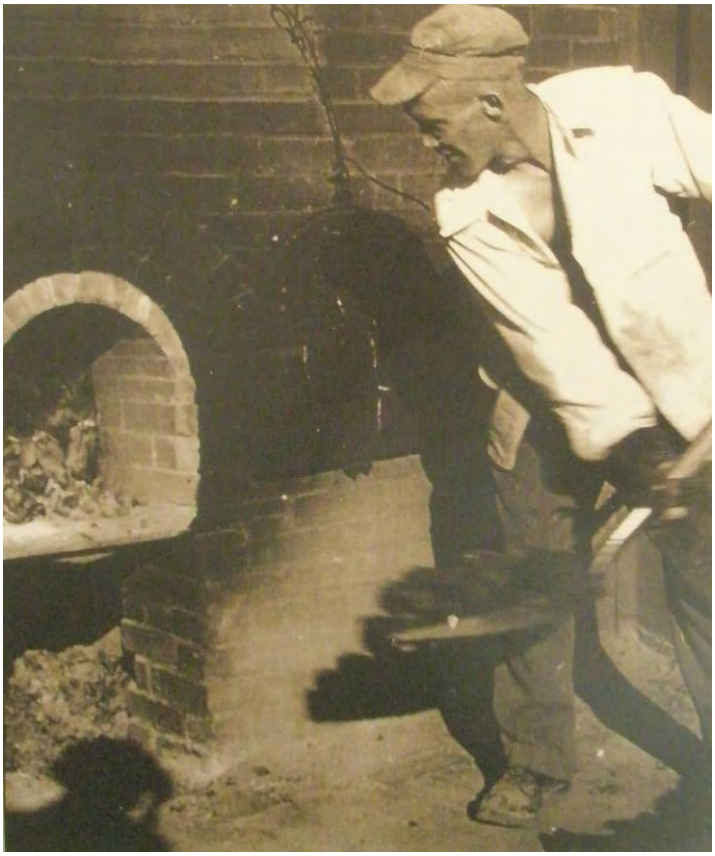


Plate 18: Feeding coal through a wicket equipped with a steel plate door into a fire grate of a kiln at the Toronto Brick Works. Note the ash trap below the grate.

4.2.4 Exterior Work Areas

To area to the immediate west of the kiln was paved with red three-hole cavity bricks, which were dry-laid as stretchers, on edge. Repairs to the pavement around the mouths of the fire boxes were typically made using with wire brush-finished, five-hole cavity specimens. In one area, the pavement had been broken through to expose a flue, which was then partially destroyed. This flue was built in the same manner as the flues servicing Kiln 6, but because of the difference in elevation appears not to have been connected to them.

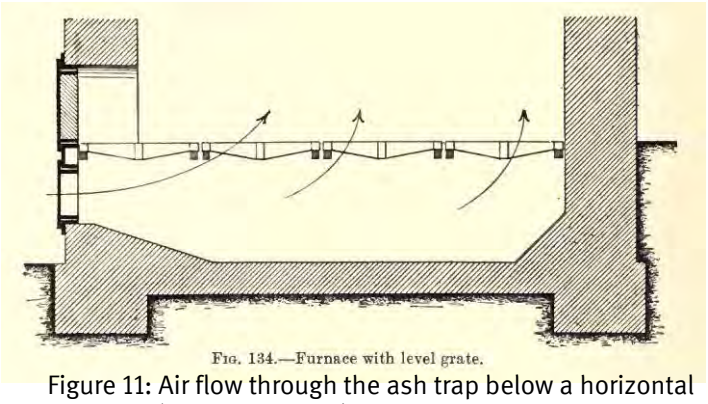


Figure 11: Air flow through the ash trap below a horizontal fire grate (Bourry 1911:200).

Along the west side of the kiln, the former work surface was made up of a poured concrete slab, which extended approximately five metres east of the kiln, to be truncated by excavations related to the construction of Building 14. A rail track ran along this side of the kiln. Part of the track area between the rails had been repaired using red bricks.

The north and south sides of the kiln were also bounded by poured concrete footings, although these were much damaged by previous site alterations.

4.3 Kiln 13 and the "Works" Chimney

Limited excavations were carried out to determine the location of the base of the "Works" chimney stack and of Kiln 13 to the south of Kiln 6 (Figure 6) and the depth of these features below the existing grade. This resulted in the exposure of the southeast corner of the chimney base and a small portion of the north end of the kiln floor.

The "Works" chimney (Plate 19) was reported to stand 175 feet high (22.8 m) with a four foot (1.2 m) square, presumably internal, cross-section (Montgomery 1930:162). The base of the chimney was built using the same bricks used in the extant "Valley Chimney." Plates 20-25 illustrate the exposure of the chimney base, part of an associated flue, and Kiln 13.

Plate 19: View of the brick works from north of the quarry, showing the height of the "Works" chimney.

Plate 20: Exposure of the corner of the "Works" chimney base and a flue, looking south.

Plate 21: Exposure of the "Works" chimney base and a flue, looking south.

Plate 22: The initial exposure of the surface of Kiln 13.

Plate 23: Removal of surface rubble to uncover channels in the floor of Kiln 13

Plate 24: View of the exposed portions of chimney base and Kiln 13

4.0 ARCHAEOLOGICAL MONITORING

In the following discussion of the results of the archaeological monitoring of construction excavations, it should be noted that attention was only focused upon major structural remains. The pace of the construction excavations, the frequently limited subsurface exposures involved, periodic flooding of trenches, and issues of safety did not permit extensive documentation of the various fills and demolition layers which were heterogeneous in the extreme and often massive in scale, or the isolated segments of minor infrastructure (e.g., decommissioned drains, power lines, etc.) that were encountered throughout.

4.1 Chimney Court Retaining Wall Grade Alterations (May 26, 2009)

Removal of soil along the slopes north of Chimney Court and around the west north and east faces of the "Valley" chimney (Figures 2:2 and 12) uncovered brick pavement formed in the same manner as encountered in Trench 5 during the Stage 2 assessment (ASI 2009:9-11), using dry-laid checker or soap bricks laid as stretchers (Plate 25). In this area, however, the bricks were laid on a north-south alignment. The variable alignments seen in the exposed sections of paving in the Chimney Court may be the result of different episodes of installation and/or repair as use of this portion of the site evolved over time.

Plate 25: Exposure of brick paving along the north side of the Chimney Court.

4.2 Welcome Court Utilities Installations (May 22-May 29, June 11-12, 2009)

The utilities installations in the Welcome Court area included sanitary and water lines, storm sewers and an electrical duct (Figures 2:3 and 2:4 and 13). The former entailed excavations to approximately 2.5 metre depths within trenches that were between approximately 1.5 and 2.5 metres in width. The duct bank excavations extended to approximately 3.5 to 4.5 metres depth and were two metres wide.

The significant features encountered during these excavations occurred in the trenches located to the north and east of Kilns 5 and 6.

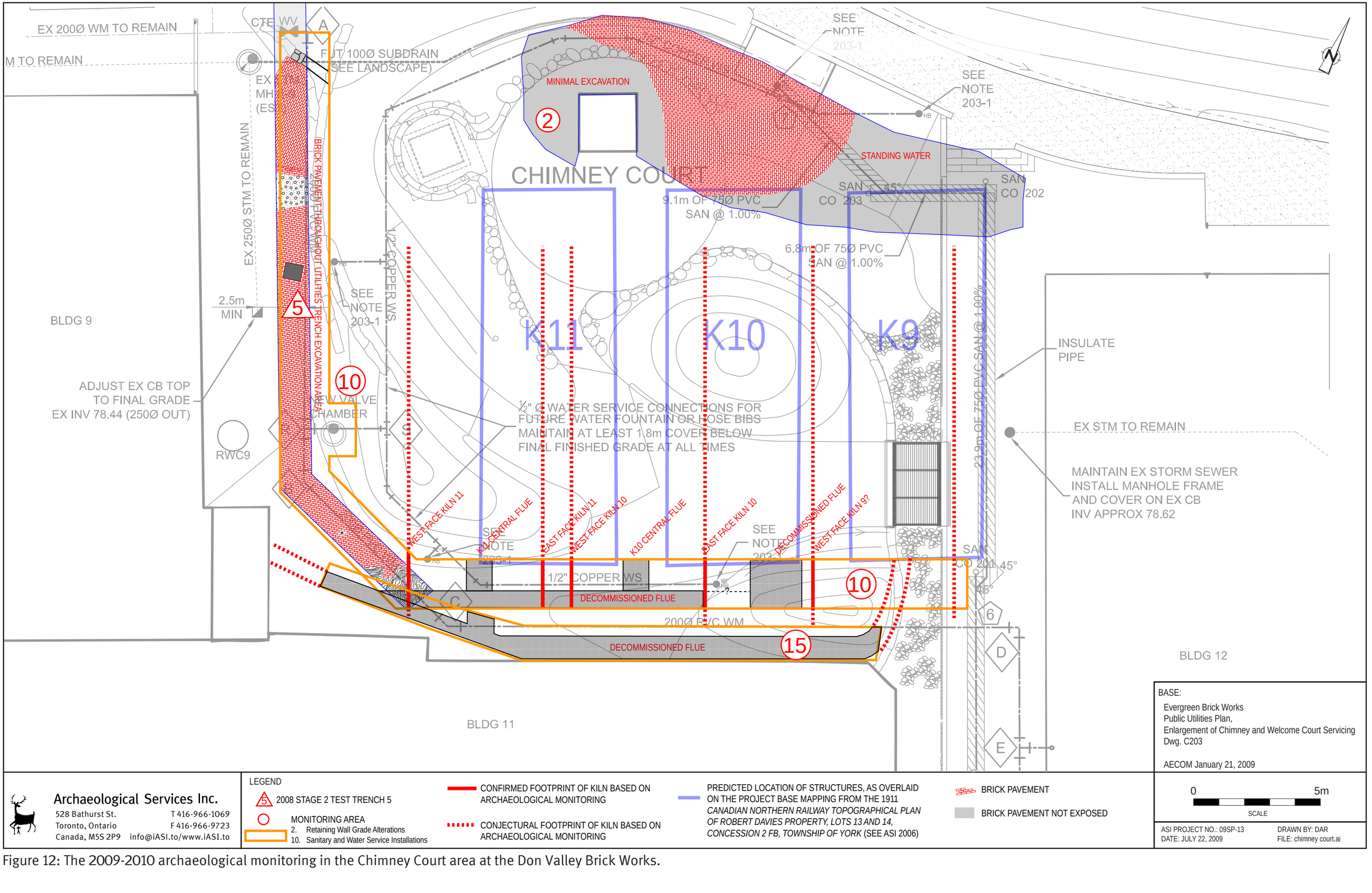
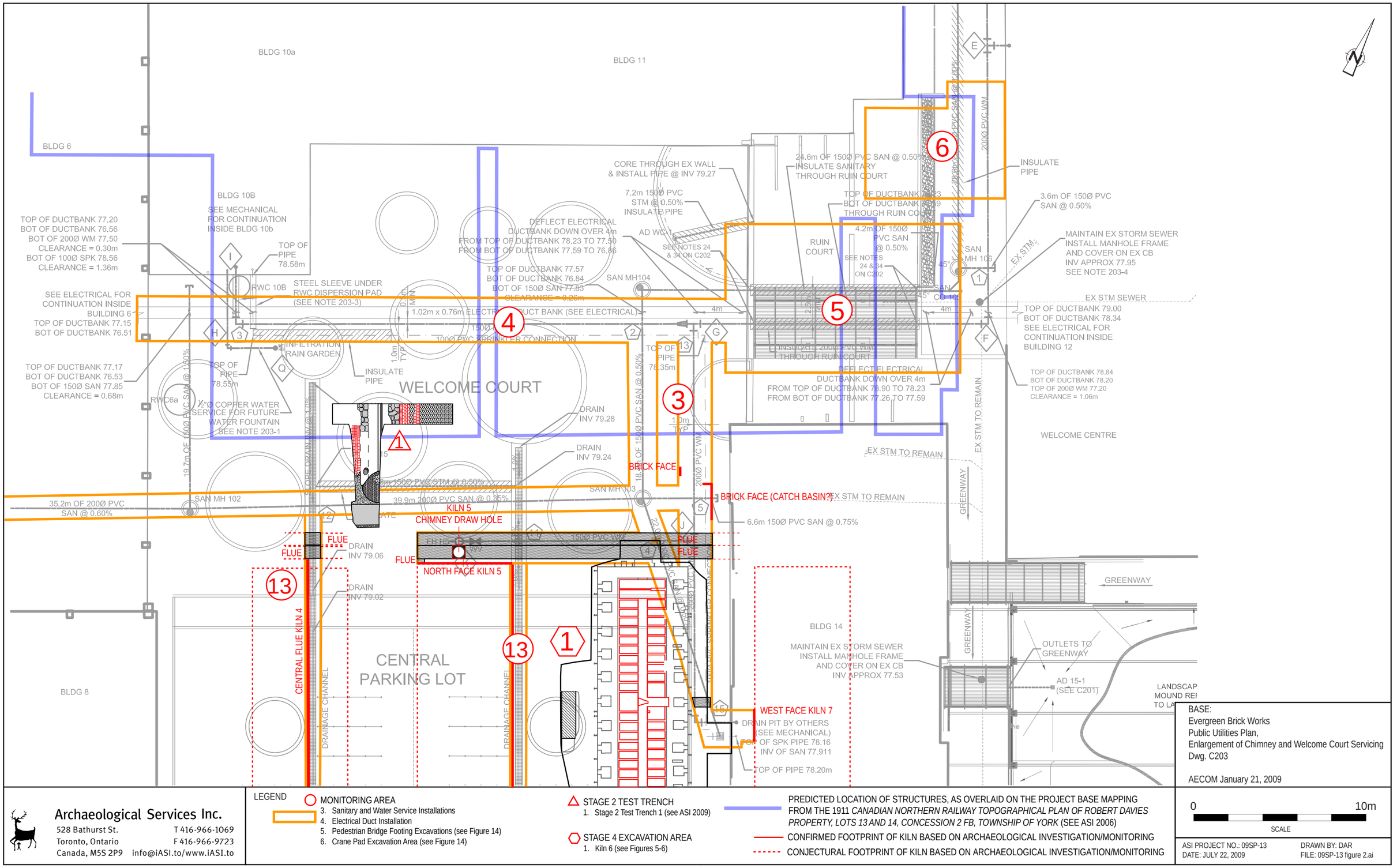


Figure 12: The 2009-2010 archaeological monitoring in the Chimney Court area at the Don Valley Brick Works.



BASE:
Evergreen Brick Works
Public Utilities Plan,
Enlargement of Chimney and Welcome Court Servicing
Dwg. C203

AECOM January 21, 2009

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LEGEND

- MONITORING AREA
  3. Sanitary and Water Service Installations
  4. Electrical Duct Installation
  5. Pedestrian Bridge Footing Excavations (see Figure 14)
  6. Crane Pad Excavation Area (see Figure 14)
- STAGE 2 TEST TRENCH
  1. Stage 2 Test Trench 1 (see ASI 2009)
- STAGE 4 EXCAVATION AREA
  1. Kiln 6 (see Figures 5-6)
- PREDICTED LOCATION OF STRUCTURES, AS OVERLAID ON THE PROJECT BASE MAPPING FROM THE 1911 *CANADIAN NORTHERN RAILWAY TOPOGRAPHICAL PLAN OF ROBERT DAVIES PROPERTY, LOTS 13 AND 14, CONCESSION 2 FB, TOWNSHIP OF YORK* (SEE ASI 2006)
- CONFIRMED FOOTPRINT OF KILN BASED ON ARCHAEOLOGICAL INVESTIGATION/MONITORING
- CONJECTURAL FOOTPRINT OF KILN BASED ON ARCHAEOLOGICAL INVESTIGATION/MONITORING

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SCALE

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Figure 13: The 2009 archaeological monitoring in the Welcome Court area at the Don Valley Brick Works.

The excavations for the east-west 150Ø and north-south 200Ø watermain as well as the intersecting length of the 100Ø sanitary sewer in this area uncovered portions of the east-west running flue on the north side of Kiln 6 that had been documented during the Stage 4 excavations, and revealed that it was, in fact, one of a pair, as a second flue was located to its immediate north (Plate 26). Portions of these flues had been demolished in the past, other sections remained intact.

Plate 26: The exposure of the pair of east-west flues located to the north of Kilns 5 and 6 in the 150Ø watermain in the Welcome Court.

To the north of the north flue, and seemingly tied into it, a major section of a brick wall face was exposed in the east edge of the excavations at the intersection of several lines (Plate 27). This feature may have been a catchbasin. A limited exposure of a second brick face along the opposite edge of the trench seems to have been unconnected to the possible catchbasin.

Plate 27: Remains of a possible catchbasin exposed in the 150Ø watermain trench in the Welcome Court.

A variety of features related to Kiln 5 were encountered in the excavations carried out for the installation of fire hydrant H5 at the west terminus of the east-west 150Ø watermain. These included the north edge of the base of the kiln, which was constructed in the same manner as Kiln 6, as the excavations exposed a brick face and the remains of an I-beam along the south side of the trench (Plate 28). At the very west end of the trench, a limited portion of a flue running north-south from Kiln 5 to connect to the east-west flue system was encountered. To the immediate east of this connection, a square brick chamber (Plate 29) had been set into the south east-west running flue. This chamber was capped by a steel plate with a four foot diameter circular cut-out. This chamber may represent the draw hole for the Kiln 5 chimney, although no structural elements of the base of the chimney stack could be discerned.

Finally, the installation of a drain pit at the south end of the 100Ø sanitary sewer line and the temporary terminus of the 200Ø watermain on the interior of Building 14 resulted in the exposure of the west edge of the base of Kiln 7 (Plate 30). Ironically, the west limit of this feature was located just beyond the east edge of the exploratory trench cut eastward into Building 14 during the Stage 4 documentation of Kiln 6 (see Section 4.1 above). It should be noted that the excavation of the 100Ø sanitary sewer trench through the northeast corner of Kiln 6 also revealed additional details concerning the foundation of this feature, as reviewed in Section 4.1 above.

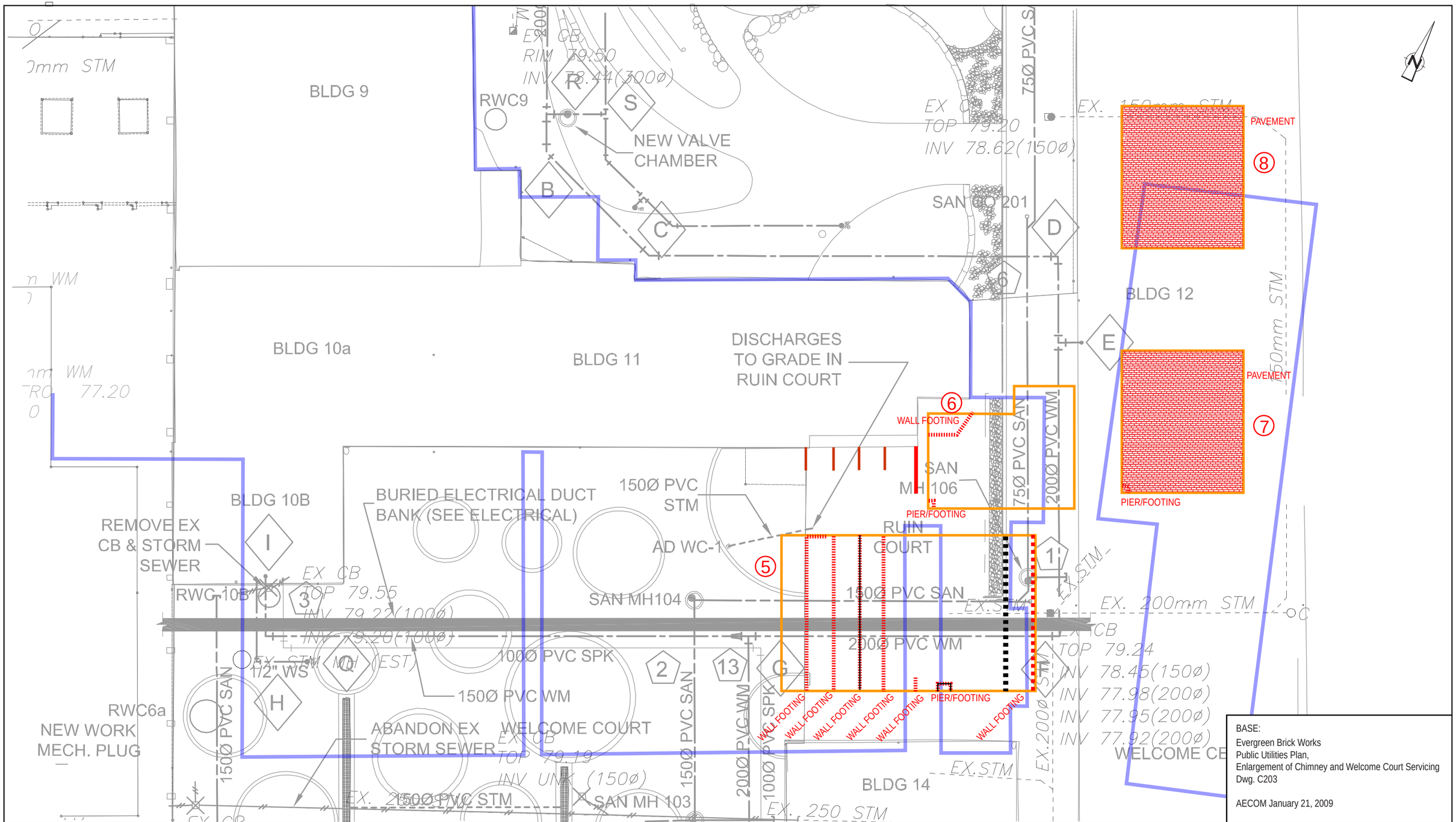
Plate 28: Exposure of the north face of the base of Kiln 5 in the 150Ø watermain trench in the location of Fire Hydrant 5.

Plate 29: The initial exposure of the top of the possible Kiln 5 chimney draw hole chamber in the 150Ø watermain trench near Fire Hydrant 5.

Plate 30: Exposure of the west face of the base of Kiln 7 at the terminus of the 200Ø watermain in Building 14.

4.3 **Pedestrian Bridge Caisson Excavations** (June 10-11, 2009)

Excavation of a substantial area between Buildings 11 and 14 for the installation of piers for the pedestrian bridge through the Ruin Court uncovered portions of five brick wall footings, running north-south (Figures 2:5 and 14). These footings appear to have been associated with the wire-cut brick dryer that formerly abutted the southeast corner of Building 11 (Building 11B). All five wall footings were four wythe common bond, and were using a wide range of brick types (Plates 31 and 32). They survived between approximately 0.1 and 1.5 metres below grade. One of the footings stood on a concrete and shale rubble foundation; the remainder did not. These sections of footings all line up with the surviving segments of the Building 11B exterior and interior partition walls.



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LEGEND

MONITORING AREA
5. Pedestrian Bridge Footing Excavations
6. Crane Pad Excavation Area
7. Caisson Excavation Area
8. Caisson Excavation Area

STANDING WALL
BURIED BRICK WALL FOOTING/PIER
BURIED BRICK WALL FOOTING/PIER ON CONCRETE-SHALE FOUNDATION
BURIED CONCRETE AND STEEL RAIL & BEAM FOUNDATION
BURIED BRICK AND STEEL RAIL & BEAM WALL FOOTING
BRICK PAVEMENT
PREDICTED LOCATION OF STRUCTURES, AS OVERLAID ON THE PROJECT BASE MAPPING FROM THE 1911 *CANADIAN NORTHERN RAILWAY TOPOGRAPHICAL PLAN OF ROBERT DAVIES PROPERTY, LOTS 13 AND 14, CONCESSION 2 FB, TOWNSHIP OF YORK* (SEE ASI 2006)

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Figure 14: The 2009 archaeological monitoring in the Pedestrian Bridge, Welcome Centre and adjacent areas at the Don Valley Brick Works.

Plate 31: View of the remains of the Building 11B brick walls in the south face of the Pedestrian Bridge excavation area.

Plate 32: View of the remains of the Building 11B brick walls in the north face of the Pedestrian Bridge excavation area. The surviving portions of these walls are visible in the background.

The above grade portions of these remnant walls, however, are built of buff bricks and the exterior walls are three wythes, while the interior partitions are two wythes.

A limited exposure of a wall running east from the westernmost of the wall footings encountered along the north face of the pedestrian bridge excavation. It stood to a height of approximately 0.8 metres below grade. Its depth could not be determined due to the sloping face of the excavation, but its intersection with the west exterior wall footing of Building 11B seemed to be underlain by a six inch thick concrete pad.

Towards the east limit of the pedestrian bridge excavation area were two more footings that appeared to correspond with the east façade of Building 11C Fan Room (of which the first floor was removed in the 1950s to leave part of the second storey surviving). The westernmost of the footings consisted of an approximately one foot high, four foot wide concrete and shale rubble pad upon which were laid six inch steel I-beams and 120 pound steel rails, which would have served as additional reinforcing for the superstructure, as has been documented elsewhere on the site (ASI 2006). Below the main concrete footing was a four inch (10 cm) thick concrete pad that extended up to four metres west of the footing. This feature had been much broken up by previous demolitions. The east footing was a complexly built brick wall (Figure 15) reinforced with 120 pound rails. Sets of three rails laid parallel to one another formed the cores of two courses of the wall. Below this level footing widened. As this wall was located at the east edge of the excavation, only the west faces of its uppermost courses were exposed.

Finally, part of a pier was exposed in the south face of the excavation in an area that corresponds to the former west wall of the Fan Room. It was an approximately three foot square brick feature surviving to a height of five courses of yellow bricks laid on a concrete pad.

The Fan Room contained a 25 horsepower motor fan used to divert waste heat from the neighbouring kilns via overhead piping to wire-cut brick dryers located in Building 11B (UMCA 1994:2-18, 59).

4.4 Crane Pad Excavations (July 15, 2009)

Excavations for the crane pad in the northeast portion of the Ruin Court area (Figures 2:6 and 14) uncovered portions of two wall footings (Plates 33 and 44). Both appear to be related in some way to the former southern extension to Building 11 that comprised the Building 11C Fan Room.

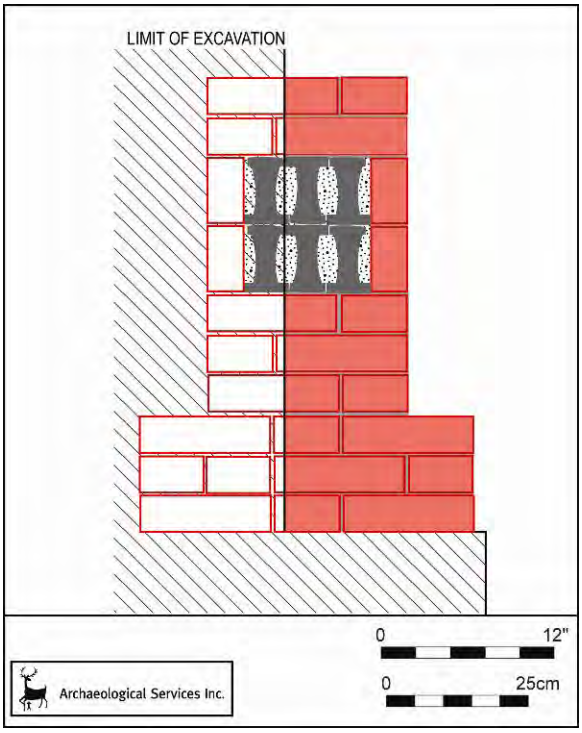

Figure 15: Schematic drawing of the construction of the wall footing partially exposed along the west edge of the Pedestrian Bridge excavations.

Plate 33: Exposure of a Building 11C footing in the north part to the Crane Pad excavation area.

Plate 34: Exposure of a Building 11C footing in the south part to the Crane Pad excavation area.

4.5 **Building 12 Caisson Excavations** (July 15, 2009)

The excavation of two approximately 10 metre by 12 metre areas for the installation of caissons for the new Welcome Centre structure within the Building 12 footprint (Figure 2:7 and 2:8 and Figure 14) revealed that this area featured a pavement (Plate 35) that was subsequently capped by the concrete slab floor of Building 12 (which was built in 1960-1961 [UMCA 1994:61]). No other remains were documented within the north excavation area.

Plate 35: Brick paving in the interior of Building 12.

In the southwest corner of the south excavation area was a very limited exposure of a brick wall. As the exposed section appeared to have been a return or corner section (Plate 36), it may be part of the southwest exterior wall of the building that housed part of the sand-lime brick production line in the 1920s, and which had previously (circa 1910) housed a soft-mud brick production line (UMCA 1994:2-12, 2-15), or an interior feature associated with this building.

Plate 36: Exposure of a section of brick wall with a return, possibly the exterior wall of the production line building that preceded Building 12.

4.7 **Building 16 Electrical Room** (July 15, 2009)

Removal of approximately 1.2 metres (four feet) of PCB-contaminated soils from below the floor of the Electrical Room appended to the east wall of Building 16 (Figures 2:9 and 16) resulted in the discovery of a section of the former east wall of the circa 1893-1922 coal-fired continuous kiln. In places, the wall survived to a height of at least four courses and consisted of a mixture of wire-cut unfrogged red and yellow common bricks that measured 9″ x 4½″ x 2½″ (22x11x6 cm) and 8″ x 4″ x 2½″ (20x10x6 cm) respectively. The wall measured 16″ in width (40 cm) and the mortared brickwork was highly variable in terms of the patterns in which it had been laid.

The area to the west of the wall was characterized by a mixture of displaced bricks and shale slabs in a matrix of sand fills and coal ash. It is possible that this area was formerly occupied by a brick pavement, laid as two courses of stretchers laid in a north-south alignment, which would indicate that the remnant foundation is related to the exterior wall of a sheltered side bay rather than the main kiln itself.

A section of a concrete pad that was laid to join the exterior face of the kiln wall survived in the extreme northeast corner of the Electrical Room.

BUILDING 16 INTERIOR

CONCRETE SLAB

REMNANT BRICK WALL FOUNDATION

ELECTRICAL ROOM

THE EXPOSURE OF THE FOUNDATION WALL

LEGEND

CONTAMINATED SOIL REMOVAL TO 1.2m (4') DEPTH BELOW FORMER FLOOR (MIXED SAND AND COAL ASH)

PREDICTED LOCATION OF THE EAST WALL OF BURNING KILN, AS OVERLAID ON THE PROJECT BASE MAPPING FROM THE 1911 *CANADIAN NORTHERN RAILWAY TOPOGRAPHICAL PLAN OF ROBERT DAVIES PROPERTY, LOTS 13 AND 14, CONCESSION 2 FB, TOWNSHIP OF YORK* (SEE ASI 2006)

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BASE: Evergreen Brick Works
Public Utilities Plan
Dwg. C201

AECOM January 21, 2009

0 5.0m
SCALE

ASI PROJECT NO.: 09SP-13 DRAWN BY: DAR
DATE: JULY 23/09 FILE: electrical building monitoring detail.ai

Figure 16: The 2009 archaeological monitoring in the Building 16 Electrical Room at the Don Valley Brick Works.

4.7 **Chimney Court Utilities Installations** (August 14-17, 2009)

The utilities installations in the Welcome Court area included a watermain, water servicing, and sanitary sewer lines (Figures 2:10 and 12). These entailed excavations to approximately 2.5 metre depths within trenches that were between approximately 2.0 and 2.5 metres in width.

The configuration of the 200Ø watermain and ½″ water service lines along the south and west sides of the Chimney Court was modified from the January 21, 2009 design plans. Both services were installed in a single trench, which along the north side of Building 11, followed the proposed alignment of the water service line and was extended slightly further east to turn north along the side of Building 9 and follow the original course of the watermain.

The east-west section of the trench on the north side of Building 11 traversed the south portions of Kilns 9-11 and appears to have followed the course of a decommissioned three foot wide flue that appears to have been unrelated to the three kilns. Definition of the flue east of Kiln 10 was problematic, as was the identification of Kiln 9 itself, as only the west face of the kiln base could be discerned with any confidence. Previous demolitions/disturbances appeared to have been extensive in this area. Between Kilns 9 and 10, another decommissioned flue, measuring six feet in width ran north-south and appears to have continued south, possibly into Building 11. It was evident largely as a rubble-filled void, with only minimal intact structural remains. The presence of this feature likely explains the much wider spacing between Kilns 9 and 10 on the one hand and between Kilns 10 and 11 on the other. The differential spacing is not reflected on the historic plans.

Based on the structural elements that were observed, Kilns 10 and 11 (and presumably Kiln 9) each measured approximately 18′ (5.4 m) wide. Kilns 10 and 11 each were bisected by a 2′ 8″ (0.80 m) wide central flue, these flues also extended south beyond the limits of the servicing trench (Plates 37 and 38). How they may have articulated with the decommissioned east-west flue, if they did at all, was not clear. If the Kiln 6 excavations are any guide, the east-west flue should mark the south limit of the kiln bases, however, substantial brick blocks that would have made up the floors of kilns were present in both the north and south profiles of the trenches, indicating that the south ends of the kilns must extend slightly closer to Building 11. It is possible that the east-west flue is an earlier feature and did not have any role in servicing the three kilns, since the only intact portion that was observed was located in the west wall of the trench as it turned on a 45 degree angle northwest towards Building 9 (Plate 39).

Where well-preserved, the bases of Kilns 10 and 11 stood to a height of 13 courses of bricks and the upper surfaces of the features occurred at about 30 cm below grade. The west side of Kiln 10 had been built on a shale slab foundation. No such remains were observed on its east side. Kiln 11 also featured a shale footing (Plate 40). The kilns were reinforced with vertical I-beam supports set in concrete or concrete and brick footings (Plate 41) along the perimeters of the bases. In these regards, the kilns in the Chimney Court are consistent with the more fully documented Kiln 6 in terms of design and construction.

The open areas between Kilns 10 and 11 — and between Kilns 9 and 10 so far as could be discerned — were brick paved. On the immediate west side of Kiln 11 was a poured concrete apron that measured three feet wide and one foot thick (1.0x0.3 m).

Plate 37: The Kiln 10 central flue in the north wall of the combined service trench north of Building 11. Note the brickwork making up the base of the kiln to the left of the flue.

Plate 38: The Kiln 10 central flue in the south wall of the combined service trench north of Building 11. Note the brick kiln base flanking the flue.

Plate 39: The only intact portion of the east-west flue, seen beyond the west limit of Kiln 11.

Plate 40: The southwest corner of Kiln 11 following removal of the adjacent section of the concrete apron within the trench. Note the shale footing and the brick paving to the west of the kiln base, which is the same surface as documented during the Stage 2 excavations (Trench 5).

Plate 41: An I-beam support on the east side of Kiln 11.

Monitoring of the north-south section of the combined service trench along the east side of Building 9, which had previously been excavated to the depth of the brick pavement during the Stage 2 assessment (Trench 5) did not result in the discovery of any other remains of interest. Although the Stage 2 report did not recommend monitoring of this section of trenching, it was undertaken as a precaution and in the hope that a lateral flue extending east-west through the mid-point of Kiln 11 might extend into the trench, thereby allowing more precise plotting of the locations of the kilns.

4.8 **Central Parking Lot Drainage Channel Excavations and Grade Alterations** (March, 29, April 6-9, 2010)

Plate 42: Exposure of brick paving immediately below the asphalt in the area north of the Youngren kiln.

Given that the design of the Central Parking Lot bed was revised to avoid the need for excavations below the depth of the lowermost elevations of the rubble fill that overlay the kiln bases, etc. within this part of the site, the only significant discoveries were sections of brick pavement that were uncovered during some preliminary excavations at the southern end of the parking lot that were carried out to determine the depth of fills below the existing asphalt and gravel surfacing. The most extensive exposure of the paving (Figure 2-11 and Figure 17) lay to the north of the location of 1912 Youngren kiln (ASI 2009:Appendix A). It was laid using the same range of brick types seen in other areas where the pavement had been exposed, and with similar variability in terms of orientation, most likely in consequence of repeated repairs (Plate 42). Additional exposures were seen during the excavation of the southern portions of the central and west drainage channels leading to the storm water management facility at the south end of the site (Figure 2-13 and Figure 17).

The three drainage channels that run from the Welcome Court through the Central Parking Lot resulted in the limited exposure of several of down-draught kilns (Figure 2-13, Figure 13 and Figure 17).

The east channel skirted the east edge of Kiln 5, resulting in the exposure of the concrete footing and the bases of the 10″ (25 cm) I-beams that reinforced this side of the kiln.

To the south of Kiln 5 in the east channel, the bases of three seemingly isolated 12″ (30 cm) I-beam supports were encountered. These may lie along the east side of Kiln 14, however, the excavations along this section of the channel were too shallow to permit confirmation of this suggestion.

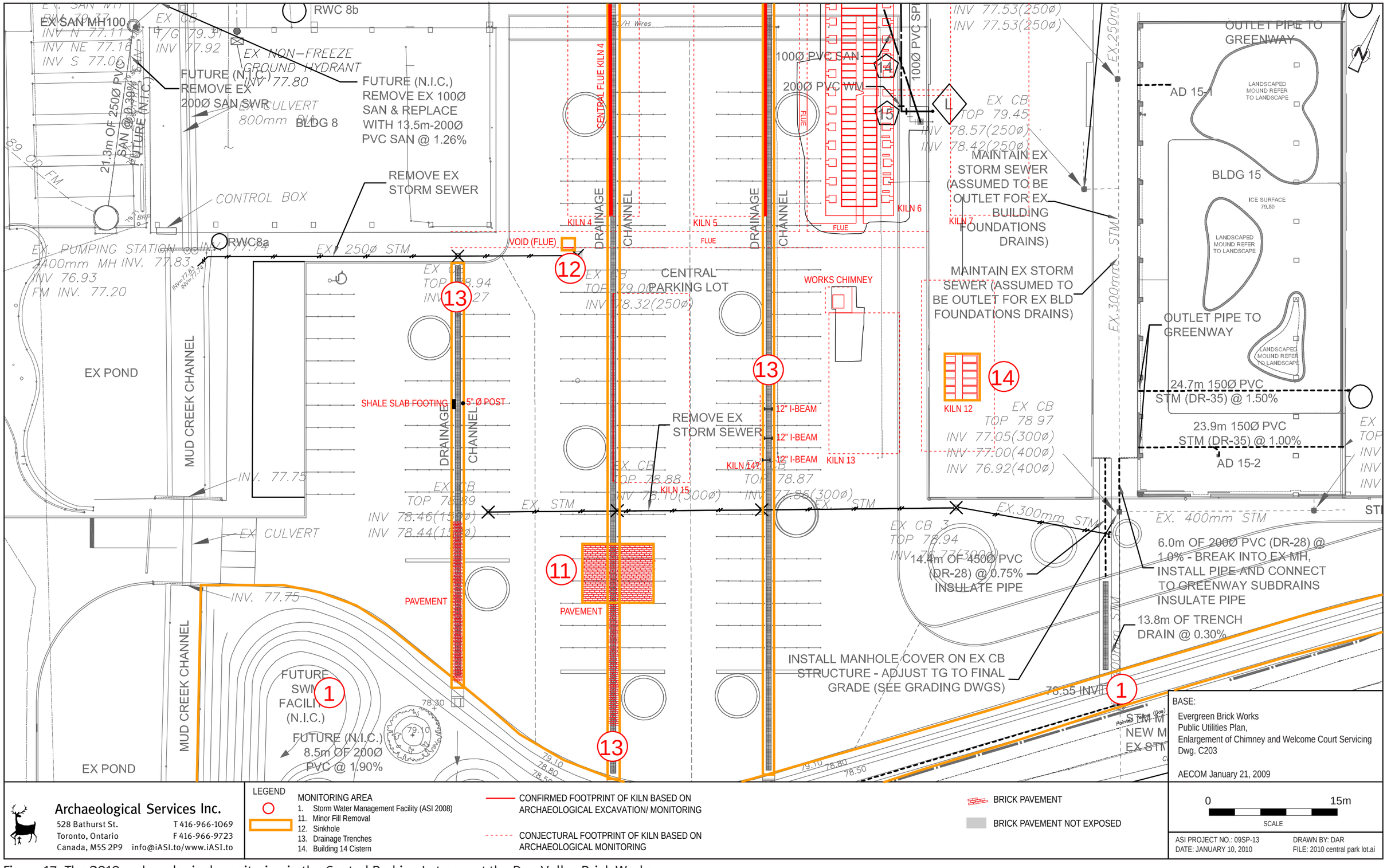

Figure 17: The 2010 archaeological monitoring in the Central Parking Lot area at the Don Valley Brick Works.

The north part of the central drainage channel intersected the east-west flues originally encountered during the monitoring of the utilities installations in the Welcome Court (Figure 2-3 and Figure 13, see Section 4.2). As the excavations of the drainage channel proceeded south from these flues, it proved to coincide with the alignment of the central flue of Kiln 4. Most portions of the Kiln 4 flue had been destroyed during the demolition of the structure, although it was evident that it was connected to the east-west flues to the north. At one point where the demolition of the roof ceased, a brick wall had been built across the flue (Plate 43), possibly to divert the flow of hot air and gases to other parts of the overall system that were still functioning after the abandonment of Kiln 4.

Plate 43: The central flue of Kiln 6. To the right (north) of the brick wall built across the conduit, the flue had been decommissioned at the time of demolition. The wall was then installed to close off this break in the system.

The south section of the central drainage channel skirted the west edge of Kiln 15, as it exposed the remains of a line of 10″ (25 cm) I-beam supports set in concrete at 6'6″ (1.98 m) intervals (Plate 44) over a distance of 83'6″ (25.5 m), which is very close to the recorded length of 86' 6″ (26.4 m) for Kiln 6. While the extreme south end of Kiln 15 had been severely disturbed by later activity, areas of pavement survived further south in the former open area between the down-draught kilns and the Youngren kiln.

Plate 44: Exposure of west edge of Kiln 15 in the central drainage channel, looking south.

The excavation of the west drainage channel (Figure 2-13 and Figure 17) revealed more of the brick paving that lay to the north of the Youngren kiln and also exposed the east face of a shale slab footing that was located approximately 18 metres south of the south edge of Building 8. This feature was only partially exposed in the west wall of the trench. Directly opposite the footing, and only partially exposed in the east wall, was a 5″ (13 cm) round support post. These features (Plate 45) are likely associated with either the large shelter depicted on this part of the site on the 1911 plan or the stock shed for pressed brick that succeeded it on the 1929 and 1952 plans (ASI 2006:Figures 5-7).

Plate 45: Exposure of edge of shale slab footing in the west wall of the drainage channel south of Building 8 that is likely part of one of the covered storage buildings that stood in the area.

Finally, prior to the onset of the construction of the Central Parking Lot it had been noted that a sinkhole had opened near the southeast corner of Building 8 (Figure 2-12 and Figure 17). This proved to be a flue running east-west. It was presumably the same as the one documented at the south end of Kiln 6 during the Stage 4 excavation or one related to it, although it was not seen in any of the drainage channels due to the fact that these excavations were comparatively shallow.

It should be noted that concomitant with the redesign of the parking lot, the construction of the various planting features throughout the central part of the site was also revised to ensure that impacts to depths of potential concern were eliminated.

4.9 **Building 14 Cistern Excavations** (April 23, 2010)

The excavation of an approximately 5.5 x 4.0 metre area through the concrete slab floor of Building 14 to facilitate the installation of a cistern (Figure 2-14, Figure 17), encountered a portion of the base of Kiln 13, including its central north-south flue, which had been decommissioned and filled at the time the kiln was demolished Plate 46). In terms of its construction, the exposed remains were consistent with those documented in detail during the Kiln 6 excavations.

Plate 46: Exposure of a portion of Kiln 13 under the floor of Building 14. Note the rubble filled void of the flue at the upper left of the photo.

4.10 **Building 11A North Foundation Remediation** (November 12, 2010)

Prior to the final landscaping of the Chimney Court in late 2010, which again involved raising the grade, concerns were raised concerning the long-term stability of the north wall of Building 11A. It was suggested that continuing water damage to the foundations was a significant factor in the deterioration that was apparent. In order to evaluate this situation, a small test pit was excavated at the base of the wall, south of Test Trench 3 (Figure 2-3), which had been minimally explored during the 2008 Stage 2 assessment. The stratigraphic profile that could be observed in Trench 3 had consisted of asphalt to a depth of 4" (0.1 m), a concrete rail line bed that was 4" (0.1 m) thick, an 8" (0.2 m) thick layer of brick and clay fill, a 4" (0.1 m) thick concrete apron, and a brick, clay and gravel fill layer of undetermined depth. Trench 3 flooded to the level of the concrete apron within seconds of excavation, and was therefore abandoned (ASI 2008:9).

The foundation test pit revealed the presence of an open channel below the concrete apron, immediately adjacent to the Building 11A wall. The apron itself was set on a seemingly haphazard arrangement of steel plates, rails and pieces of metal scrap that had been laid across the top of the channel. The channel was full of water.

It was therefore decided to remove the apron and overlying fills to fully expose the channel along the length of the building in order to determine the most appropriate means of waterproofing and stabilizing the foundation. This work (Figure 2-15 and Figure 12) revealed that the channel was, in fact, a flue that tied into those previously found to service Kilns 9-11 to the immediate north (see Section 4.7). The south wall of the flue and the north foundation of Building 11A were essentially the same structure (Plates 47-49), although the course of the flue swung north away from the building at both its eastern and western ends, such that it appears to have been part of a loop linking the kilns and the "Valley" prior to proceeding west into or through Building 9.

Plate 47: View west along the north wall of Building 11A, following the complete exposure of the flue at its base.

Plate 48: View of the flue at the base of the wall of Building 9 where it begins to turn north to connect to Kiln 9.

Plate 49: View of the connection of the connection to the central flue of Kiln 10 (foreground) and of the point where the flue turns northwest away from the base of Building 11A and heads towards Building 9 (background in front of the excavator). The connecting flue to Kiln 10 is located at the point where the east-west flue turns away from the building wall.

The flue at the base of the wall measured 2'6" (0.80 m) in width and at least 3'6" (1.10m) in depth. Sections of the flue walls were built, repaired and rebuilt with all manner of solid, frogged and perforated plain and brushed bricks. The south wall of the flue was battered out slightly from the wall of Building 11A.

The relationship between this flue and those observed during the monitoring of the service installations (Section 4.7) a short distance to the north is not entirely clear. Some connections are evident, but others that might have been expected were not observed. Once again these findings highlight the complexities of the infrastructure at the site as it was modified and reconfigured to meet the evolving needs of the operations.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The 2009 Stage 4 excavations at the Don Valley Brick Works resulted in the documentation of the complete foot print of Kiln 6, one of the 15 rectangular intermittent down-draught kilns built at the site by 1893, as well as documentation of portions of Kiln 13 and the base of the "Works" chimney stack. These features were all demolished in the early to mid-1960s. Once these remains were documented, they were carefully reburied, although a small portion of Kiln 6 was subsequently destroyed during the installation of public utilities.

The Stage 4 work fully documented the surviving remnants of the design and operational features of Kiln 6 and also provided the opportunity to assess the load-bearing qualities of the kiln bases (using this particular kiln as a proxy for the others located throughout the parking lot) and the many flues that run through this part of the site. This led to the identification of a revised parking lot bed design that avoids impacts to the kiln remains while still meeting required load-bearing capacities. The parking lot consists of a reinforced concrete slab, approximately 0.15 m thick, set on an approximately 0.10 m thick granular base. This is an ideal solution. The kiln remains lie below the level of the excavations required for the granular base; compaction of the granular had little to no impact on the archaeological resources because of the buffer provided by the existing granular, brick rubble and clay fills that were left on top the kiln remains; and the concrete paving provides its own structure that will prevent failures created by the underground voids. Similarly, the excavations required for the installation of the tree planter basins in the Welcome Court and Central Parking Lot areas avoided impacts at depths of potential concern.

Within potentially sensitive areas of the site, all excavations carried out for the purposes of the 2009 public utilities installations, which as far as possible were rerouted to avoid known or potential remains, were subject to archaeological monitoring, as were some other construction/remediation activities. This work documented a variety of remains, including limited portions of Kilns 5, 7, 10 and 11 and their associated flue systems, footing, piers or floor surfaces associated with Buildings 11B, 11C and 12, a limited portion of the circa 1893-1922 coal-fired kiln that was replaced by Building 16, as well as various pavements and utilities. Additional monitoring carried out in 2010 in the Central Parking Lot and adjacent areas resulted in the documentation of portions of Kilns 4, 5, 13, 14, and 15, while limited work in the Chimney Court uncovered a flue system that appears to have been built into the north foundation wall of Building 11A.

The construction excavations required for the Evergreen Brick Works project were completed in November 2010. In light of the results of the monitoring of this work, and the documentation of the remains that were encountered, it is recommended that:

1. The 2008-2010 Evergreen Brick Works revitalization project may be considered free of further archaeological concern.

2. Any future undertakings within the Brick Works that may require excavation or subsurface disturbances should be subject to review in order to determine if archaeological mitigation of such initiatives is required.

The following conditions also apply:

- This report is submitted to the Minister of Culture as a condition of licensing in accordance with Part VI of the Ontario Heritage Act, RSO 1990, c 0.18. The report is reviewed to ensure that the licensed consultant archaeologist has met the terms and conditions of their archaeological licence, and that the archaeological fieldwork and report recommendations ensure the conservation, preservation and protection of the cultural heritage of Ontario.

- Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48 (1) of the Ontario Heritage Act. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with sec. 48 (1) of the Ontario Heritage Act.

- The Cemeteries Act requires that any person discovering human remains must immediately notify the police or coroner and the Registrar of Cemeteries, Ministry of Small Business and Consumer Services.

- The documentation related to this archaeological assessment will be curated by Archaeological Services Inc. until such a time that arrangements for their ultimate transfer to Her Majesty the Queen in right of Ontario, or other public institution, can be made to the satisfaction of the project owner(s), the Ontario Ministry of Culture, and any other legitimate interest groups.

6.0 SOURCES

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