

4.0 REYNOLDS MILL (7S-C-99): PRESENT

The remains of Reynolds Mill (7S-C-99), a late eighteenth (1790s) and nineteenth century gristmill, located on S.R. 30 at Reynolds Pond, Sussex County, Delaware were identified and partially excavated as part of the Bridge 918 replacement project in August and September 2007. Due to logistical and construction constraints, the project necessitated innovative archaeological techniques during excavation, artifact processing, and curation tasks.

4.1 Excavations

Unlike typical compliance archaeology, where archaeological clearance of a project area is undertaken prior to construction of the proposed project, the excavation of the Reynolds Mill site was carried out concurrently with the demolition of the old bridge and installation of the new box culvert. The decision to complete the archaeological investigations during construction made sense in terms of the project needs and FHWA's/DeIDOT's cultural resource compliance responsibilities. The concurrent archaeology/construction work scenario used for the Bridge 918 project ensured that both the potential for archaeological remains as well as the need for a new bridge were considered in a cost effective and timely fashion.

Daily real-time coordination and communication between the archaeologists, FHWA/DeIDOT, SHPO, inspectors, and the construction contractor were essential for the successful completion of the project. E-mail messages containing daily activities, site, and artifact descriptions, as well as photographs and digitized mapping, kept all participants well informed about the progress of the archaeological excavations during fieldwork. The willingness of FHWA/DeIDOT, the SHPO, the construction crew, inspectors, and archaeologists to work together ensured that the transportation needs of Delaware's residents were met and that some of Delaware's history was preserved for their future.

4.2 Features

Two features, including a wooden structure presumed to be remnants of a penstock and/or wheel pit, and remnants of the brick mill foundation were identified during the archaeological monitoring at Bridge 918. A penstock, sluice, or flume is an artificial channel constructed to direct water to the wheel. A head gate on the penstock regulates the flow of the water into the penstock. The volume of water in turn determines the revolutions of the wheel

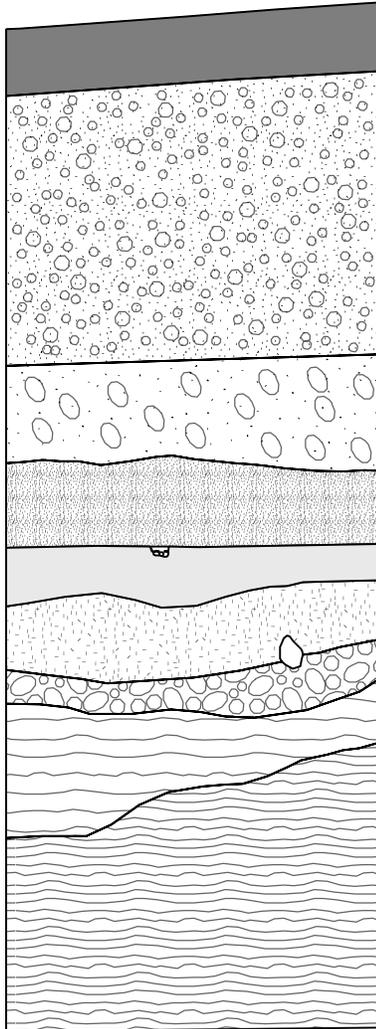
used to power the grinding process. The wooden structure was completely excavated since it was entirely contained within the project APE. Three walls of the brick mill foundation were partially exposed, mapped, and photographed since they were only partially located within the project APE.

The excavated deposits surrounding both the wooden structure and the brick mill foundation are comprised of redeposited fill likely associated with several events including the razing of the burned mill superstructure in the 1970s, and the emplacement and maintenance of the bridge, culvert, and roadway through the years; and some less disturbed natural soils (Figure 7; Photograph 16). Two discreet fill episodes could be discerned stratigraphically; however, functional and/or temporal affiliations are less clear. Immediately under the existing asphalt roadway is Fill 1, which is light brownish gray (10YR 6/2) compacted sand and gravel. Fill 1 ranges from 70.0 to 80.0 cm (27.6 to 31.5 in) in thickness. Fill 2 is a mix of loose sand and gravel, which is light brownish gray (10YR 6/2) in color. Fill 2 is 25.0 to 30.0 cm (9.8 to 11.8 in) thick. All of the recovered artifacts originated in fill.

Along the brick mill foundation, Fill 1 and Fill 2 overlie Strata 1 through 5. Stratum 1 is a very dark grayish brown (10YR 3/2) colored sandy loam, which appears to have been exposed to surface weathering at some point in time. This stratum averages 30.0 cm (11.8 in) in thickness. Stratum 2 is comprised of sand that is brownish yellow (10YR 6/6) in color. It averages 20.0 cm (7.9 in) in thickness. Stratum 3 is a brownish yellow (10YR 6/6) gravelly/sand lens that ranges from 10.0 to 15.0 cm (3.9 to 5.9 in) in thickness. The gravel in Stratum 3 is pea to pebble sized. Stratum 4 is a strong brown (7.5YR 5/8) colored clay exhibiting veins or skins, which are gray (10YR 6/1) in color. Stratum 5 is the underlying clay and is gray (10YR 6/1) in color most likely indicating past wet conditions. The veins or skins present in Stratum 4 continue into Stratum 5. No cultural remains were identified in the small amounts of natural soils excavated as part of the construction process.

4.2.1 Wooden Structure

Archaeological excavations during the bridge demolition uncovered a large wooden structure beneath the ca. 1925 concrete bridge/spillway structure (Photographs 17 and 18). The wooden structure appears to be the remains of a penstock and/or wheel pit once associated with the mill operations (Figure 8). Tables containing detailed descriptive and metric data of the individual wood elements, mortises, notches, and pegs comprising the wooden structure are included as Appendixes B, C, D, and E. Due to the



LEGEND:

-  BLACKTOP - roadway
-  FILL1 - 10YR 6/2 Light brownish gray compacted sand and gravel
-  FILL2 - 10YR 6/2 Light brownish gray loose sand and gravel
-  STRATUM 1 - 10YR 3/2 Very dark grayish brown sandy loam
-  STRATUM 2 - 10YR 6/6 Brownish yellow sand
-  STRATUM 3 - 10YR 6/6 Brownish yellow gravelly sand
-  STRATUM 4 - 7.5YR 5/8 Strong brown clay with 10YR 6/1 gray veins
-  STRATUM 5 - 10YR 6/1 Gray clay



DELAWARE DEPARTMENT OF TRANSPORTATION	
BRIDGE 918 ON S.R. 30 AT REYNOLDS POND SUSSEX COUNTY	
PROFILE EXCAVATED DEPOSITS NORTH MILL FOUNDATION WALL	
FIGURE - 7	SKELLY AND LOY, INC. CONSULTANTS IN ENVIRONMENT - ENERGY ENGINEERING - PLANNING



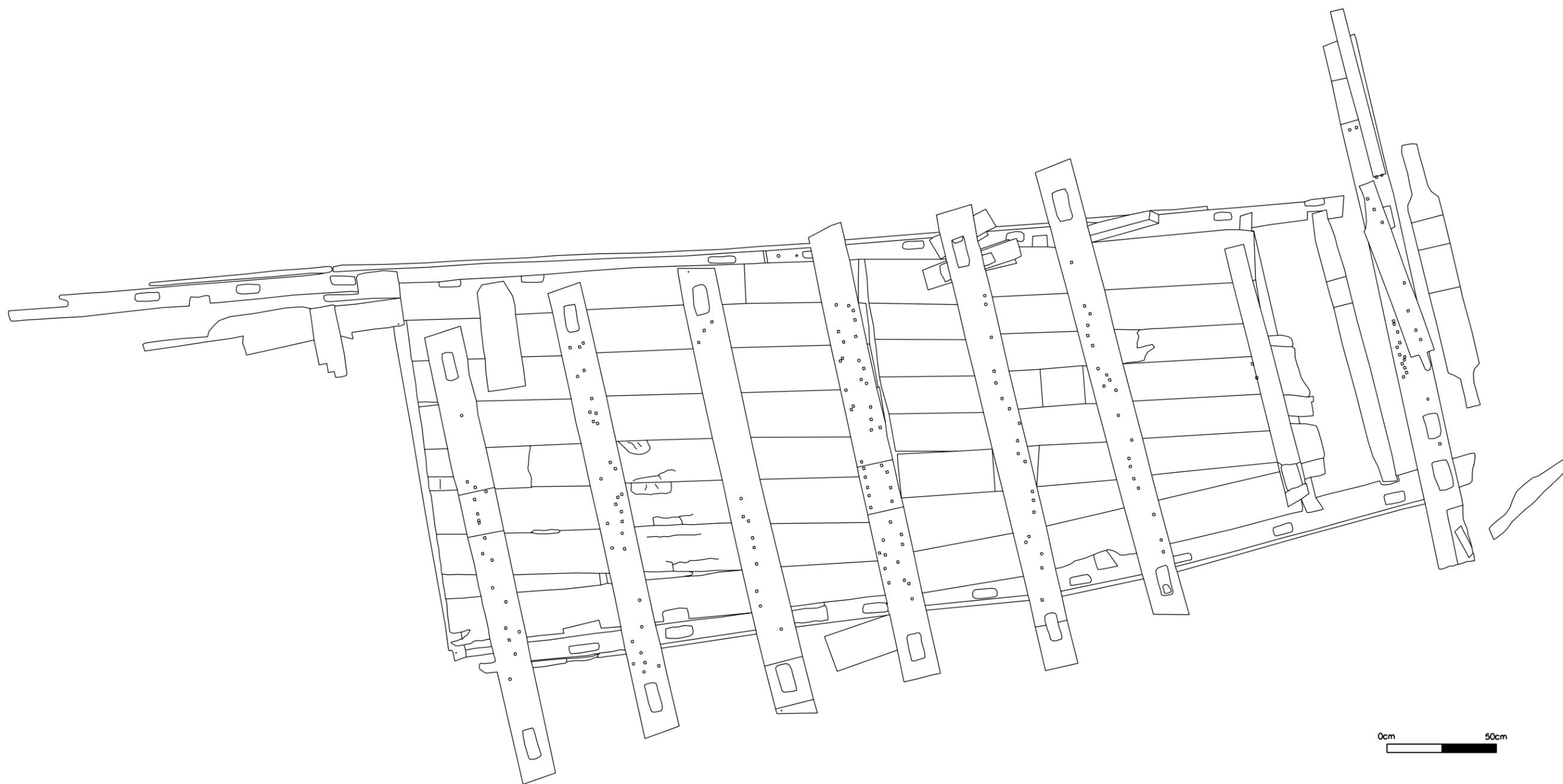
Photograph 16. Stratigraphic profile outside of the north mill foundation wall.



Photograph 17. First glimpse of west end of wooden structure under the culvert, facing southeast.



Photograph 18. First glimpse of east end of wooden structure under the bridge/spillway, facing southeast.



0cm 50cm



DELAWARE DEPARTMENT OF TRANSPORTATION	
BRIDGE 918 ON S.R. 30 AT REYNOLDS POND SUSSEX COUNTY	
PLAN VIEW WOODEN STRUCTURE	
FIGURE - 8	SKELLY AND LOY, INC. CONSULTANTS IN ENVIRONMENT - ENERGY ENGINEERING - PLANNING

concrete bridge demolition construction process, the western half of the concrete bridge/culvert was removed first, exposing the western portion of the wooden structure (Photograph 19). The western portion of the wooden structure was then excavated, documented, mapped, and removed prior to the demolition of the eastern half of the concrete bridge/culvert. After removal of the eastern half of the concrete bridge/culvert, the eastern portion of the wooden structure was exposed, excavated, documented, mapped, and removed (Photograph 20). The wooden structure was comprised of three courses of timbers and planking and appears to have been a penstock and/or wheel pit associated with the mill operations. In addition, it appears that the remains of the wooden structure were also re-used as the foundation/base for the ca. 1925 concrete bridge/spillway structure.

The uppermost course in the structure was comprised of six large timbers (Wood Elements Q, R, S, AK, AL, and AM) arranged parallel to one another, but not adjacent to one another, with their long axes oriented in a north/south direction (Figure 9; Photographs 21 and 22). The timbers were spaced at fairly regular intervals approximately 65.0 cm (25.6 in) apart. Four of the six timbers were identified as white oak while the other two were not speciated. All six of the timbers exhibited rectangular mortises on both ends and the mortises were oriented up when the timbers were emplaced. The 10 mortises on the timbers (Mortises M1Q, M2Q, M1R, M2R, M1AW, M2AW, M1AL, M2AL, M1AM, and M2AM) are regular in size and shape measuring approximately 18.4 cm (7.25 in) in length, 8.3 cm (3.25 in) in width, and 12.1 cm (4.75 in) in depth (Photograph 23). Clearly these mortises indicate that these timbers were originally meant to receive other wood elements, most likely upright supports for the penstock/wheel pit wall. Each of the timbers measures approximately 3.1 m (10.3 ft) in length and is square in cross section measuring approximately 20.3 x 25.4 cm (8.0 x 10.0 in). The size of these timbers indicates that they would have played a major role in the basic support structure of the penstock/wheel pit. Five of the timbers have both cut and wire nails hammered into them, while Wood Element AM has only cut nails (Photograph 24). The cut nails are most likely associated with the use of the timbers during mill operations. The wire nails are most likely associated with the installation of the ca. 1925 concrete bridge/spillway.

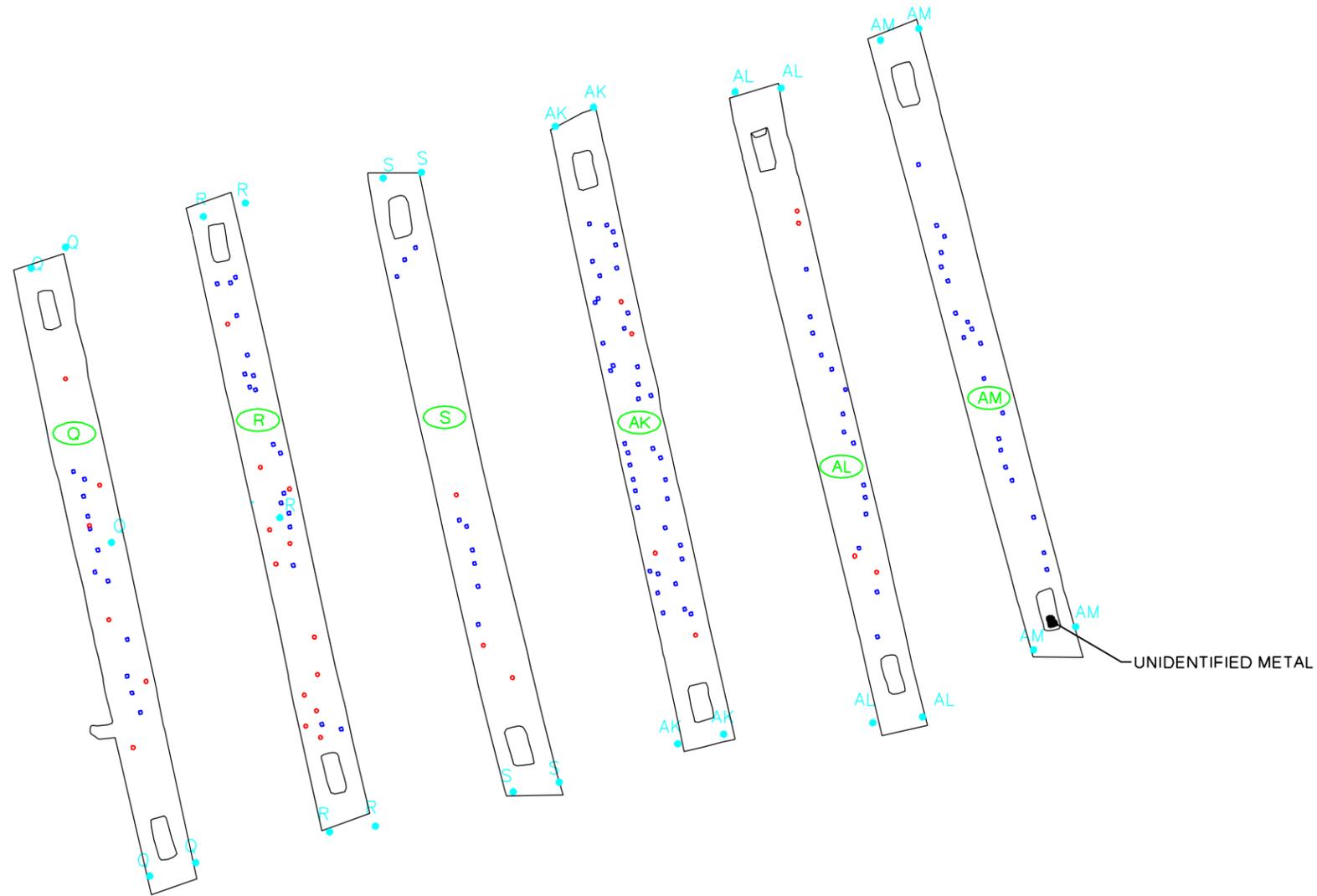
This uppermost course of six large timbers sat upon a 5.0 to 10.0 cm (2.0 to 3.9 in) thick layer of densely packed sand on top of a flat plank platform (Figure 10). The timbers were not mechanically attached to either the underlying sand or the plank



Photograph 19. Describing and mapping the west end of the wooden structure, facing northeast.



Photograph 20. Describing and mapping the east end of the wooden structure, facing southwest.



LEGEND:

- TOTAL STATION POINTS
- CUT NAIL
- WIRE NAIL
- ELEMENT IDENTIFICATION



DELAWARE DEPARTMENT OF TRANSPORTATION	
BRIDGE 918 ON S.R. 30 AT REYNOLDS POND SUSSEX COUNTY	
PLAN VIEW UPPERMOST COURSE OF WOODEN STRUCTURE	
FIGURE - 9	SKELLY AND LOY, INC. <small>CONSULTANTS IN ENVIRONMENT - ENERGY ENGINEERING - PLANNING</small>



Photograph 21. Cleaned and labeled west end of the wooden structure, facing south-southeast.



Photograph 22. Cleaning the east end of the wood structure, facing southeast.

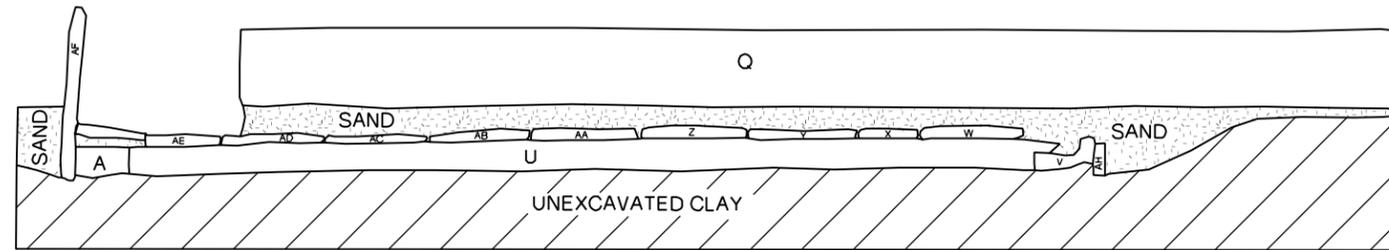


Photograph 23. View of Mortise M1AL.

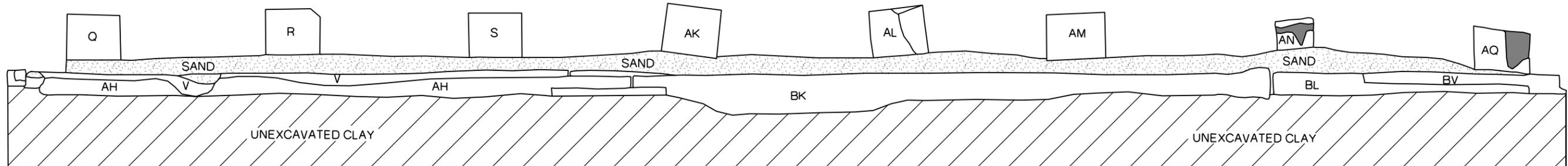


Photograph 24. View of cut and wire nails in Wood Element AK.

EAST PROFILE OF WEST END



NORTH PROFILE OF WEST END

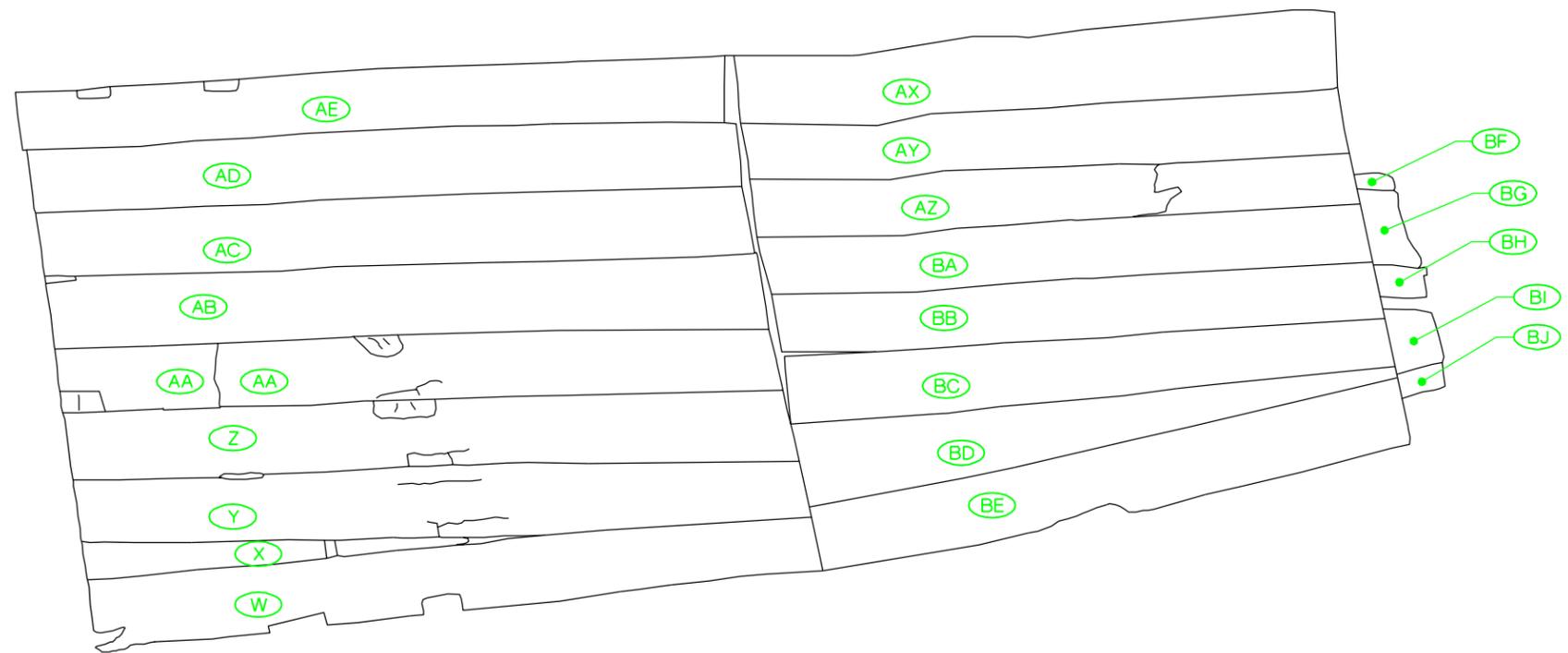


PENNSYLVANIA DEPARTMENT OF TRANSPORTATION	
BRIDGE 918 ON S.R. 30 AT REYNOLDS POND SUSSEX COUNTY	
PROFILES WOODEN STRUCTURE	
FIGURE - 10	SKELLY AND LOY, INC. CONSULTANTS IN ENVIRONMENT - ENERGY ENGINEERING - PLANNING

platform below the sand. The spaces between the six timbers were also filled with compacted sand. Five pieces of non-articulated wood (Wood Elements BO, BP, BQ, BR, and BS) stacked in two stacks of two and three pieces each were found beneath the north end of one of the six timbers (Wood Element AL). These pieces of wood are plank fragments, which are either 2.5 or 5.1 cm (1.0 or 2.0 in) thick and may have been used to shim the large timber. One other piece of 10.2 by 10.2 cm (4.0 by 4.0 in) wood (Wood Element BN) was found under the north end of Wood Element AM. The piece of wood was found at an angle indicating that it might have been dislodged from its original position during the mechanical excavations. The most logical explanation of its use is as a shim for the large timber. The in-filled sand and shimmed timbers would have provided a level surface on which to place the ca. 1925 concrete bridge/spillway. The re-use of large timbers has been noted at the Cabbage Mill in Delaware, and may relate to issues of material supply (Crane 1998:5).

The second course in the wooden structure was a plank platform (Figure 11). The plank platform was comprised of approximately 22 wood planks (Wood Elements W, X, Y, Z, AA, AB, AC, AD, AE, AX, AY, AZ, BA, BB, BC, BD, BE, BF, BG, BH, BI, and BJ) laid side to side and end to end with their long axes oriented in an east/west direction (Photographs 25 and 26). Approximately eight planks laid side to side make up the width of the plank platform. Most of the planks are what appear to be complete boards, but two (Wood Elements BD and X) have been tapered to fit in smaller voids between the complete planks as the platform is not completely rectangular but rather slightly wider (ca. 2.7 m [8.9 ft]) at the west end and narrower (2.3 m [7.6 ft]) at the east end. Several planks (Wood Elements BF, BG, BH, BI, and BJ) located at the eastern end of the platform have also been shortened and some are narrower than most others. Most of the uncut individual planks are roughly the same size and average approximately 30.0 cm (11.8 in) in width, 3.0 m (9.7 ft) in length, and 2.5 cm (1.0 in) in thickness. Based on sample speciations, all of the planks appear to be pine. The ends of the planks comprising the plank platform were nailed down, using cut nails, to the underlying cross beams of the crib frame. The plank floor most likely represents the floor of the penstock/wheel pit.

The lowermost course of the wooden structure is a crib frame (Photographs 27 and 28) comprised of large red and white oak timbers (Wood Elements A, V, AT, AU, and BV) with oak (type unknown) and white oak cross members (Wood Elements U, AI, AW, AV, BT, BW, and BX) (Figure 12). The crib frame is set onto dense clay with the



LEGEND:

 ELEMENT IDENTIFICATION

DELAWARE DEPARTMENT OF TRANSPORTATION	
BRIDGE 918 ON S.R. 30 AT REYNOLDS POND SUSSEX COUNTY	
PLAN VIEW PLANK PLATFORM	
FIGURE - 11	SKELLY AND LOY, INC. CONSULTANTS IN ENVIRONMENT - ENERGY ENGINEERING - PLANNING



Photograph 25. West portion of plank platform after large timbers and clay/sand has been removed, facing south.



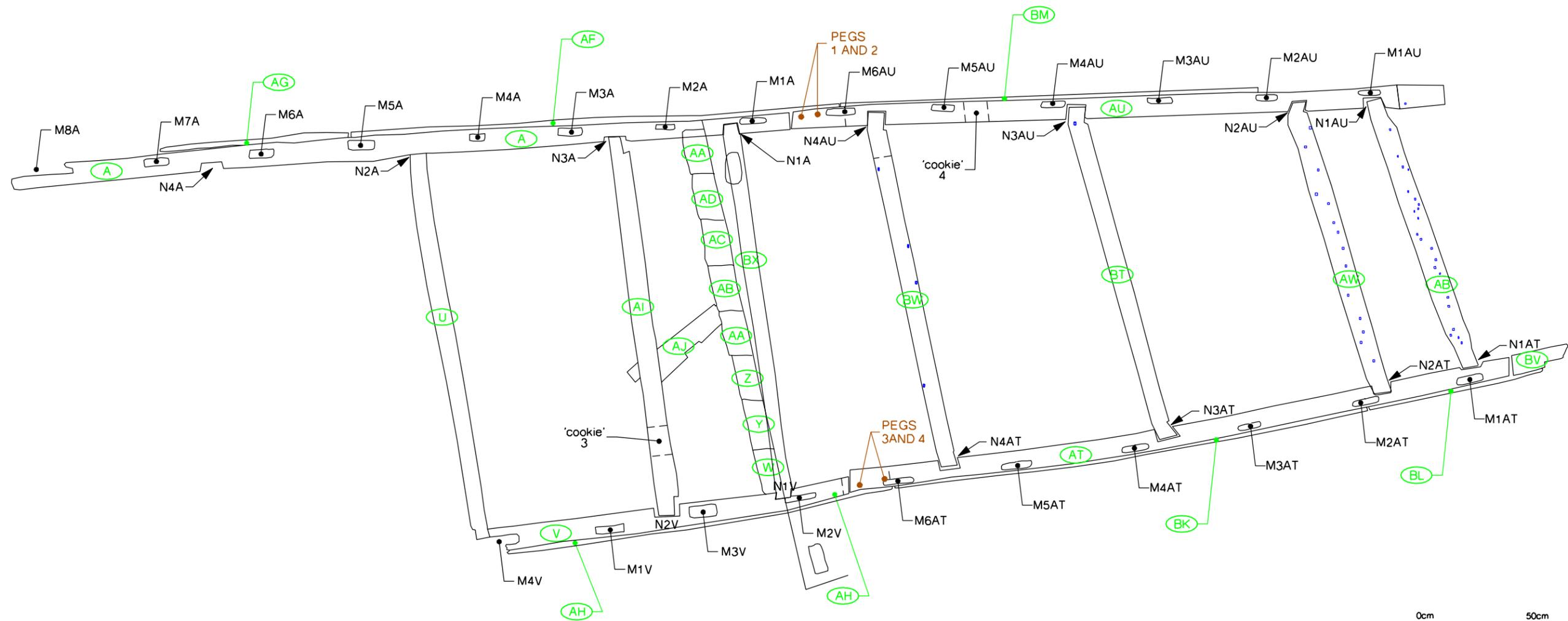
Photograph 26. East portion of plank platform after large timbers and clay/sand has been removed, facing south.



Photograph 27. West portion of crib frame after large timbers, clay/sand, and plank platform has been removed, facing south.



Photograph 28. East portion of crib frame after large timbers, clay/sand, and plank platform has been removed, facing south.



0cm 50cm



LEGEND:
 • CUT NAIL
 ○ ELEMENT IDENTIFICATION

DELAWARE DEPARTMENT OF TRANSPORTATION	
BRIDGE 918 ON S.R. 30 AT REYNOLDS POND SUSSEX COUNTY	
PLAN VIEW CRIB FRAME	
FIGURE - 12	SKELLY AND LOY, INC. CONSULTANTS IN ENVIRONMENT - ENERGY ENGINEERING - PLANNING

voids between the cross members filled with sand. The large timbers comprising the crib frame range in length from 2.9 to 4.6 m (9.5 to 15.0 ft); however, Wood Elements A, V, and BV are not complete since their lengths are broken at a mortise. With the exception of Wood Element BV, these timbers exhibit mortises along their lengths and were notched to receive the ends of the smaller cross members. The 25 mortises on the timbers (Mortises M1A, M2A, M3A, M4A, M5A, M6A, M7A, M8A, M1V, M2V, M3V, M4V, M1AT, M2AT, M3AT, M4AT, M5AT, M6AT, M1AU, M2AU, M3AU, M4AU, M5AU, M6AU, and M1BV) are rectangular in shape and range from 9.50 to 17.15 cm (3.75 to 6.75 in) in length, 4.45 to 6.99 cm (1.75 to 2.75 in) in width, and 5.08 to 7.62 cm (2.00 to 3.00 in) in depth. Clearly these mortises indicate that these timbers were originally meant to receive other wood elements, most likely upright supports for the penstock/wheel pit wall.

Wood Element AU, which is made of red oak, contains two white oak wood pegs (Pegs 1 and 2), which join Wood Element AU with Wood Element A *via* a lap joint. The pegs are located along the outside edge of the timber in line with the mortises. Wood Element AT also contains two wood pegs (Pegs 3 and 4) located in the same position as those on Wood Element AU. The pegs join Wood Element AT with Wood Element V *via* a lap joint. Wood Element AT is made of white oak while the two pegs are made of pine (Photograph 29). In addition to the mortises and pegs, the four timbers comprising the crib frame also exhibit notches into which the wooden cross members fit (Photograph 30). Woods represented in the crib frame cross members are oak (unknown type) and white oak. The cross members (Wood Elements U, AI, AV, AW, BT, BW, and BX) range in length from approximately 1.8 to 2.6 m (6.0 to 8.5 ft), and in width from approximately 7.6 to 15.2 cm (3.0 to 6.0 in). Several of the cross members are also cut to accommodate the notching in the timbers comprising the crib frame. Three of the cross members have cut nails driven into them. The cut nails are the result of the planking being nailed to cross members. One non-articulated piece of wood (Wood Element AJ) was found beneath the crib frame, specifically under Wood Element AI. The piece of wood is a plank and may have been used to shim the wood element above it, or it may represent general discard prior to the construction of the wood crib frame. The wood crib frame supports the plank floor.

Several pieces of planking (Wood Elements AF, AG, AH, BK, BL, and BM) clad the exterior surface of the crib frame timbers. The planks are laid horizontally, on their long edge. These planks are various lengths ranging from approximately 1.0 to 3.3 m



Photograph 29. Example of pegs from Wood Element AT.



Photograph 30. Example of notch and mortise in Wood Element AU.

(3.1 to 10.8 ft), and widths ranging from approximately 10.2 to 76.2 cm (4.0 to 30.0 in); however, they are all approximately 2.5 cm (1.0 in) thick. It is unclear what the specific purpose of these boards may have been; however, they may have been emplaced along the penstock/wheel pit walls as heartening boards designed to further retain unconsolidated soils and impede water leaks into the surrounding areas.

Additional pieces of wood (Wood Elements B, C, T, AN, AO, AP, AQ, AR, AS, BU, BY, BZ, CA, CB, CC, and CD) were found in fill near the wooden structure and were most likely originally part of the mill water power structures or building. These pieces of wood may have been discarded when the penstock was dismantled to construct the ca. 1925 concrete bridge/spillway. Some of these pieces of wood exhibit mortises, tenons, and shaping which clearly indicate that they were originally part of another structure prior to their discard in the fill surrounding the wooden structure. Wood Element AQ matches the other large timbers found in the upper course of the wooden structure in size and shape. The other pieces of wood are smaller beams or planks that exhibit wear and breakage. Photograph 31 shows all of the wood recovered from the wooded structure and surrounding fill laid out near the project area.

4.2.2 Brick Mill Foundation

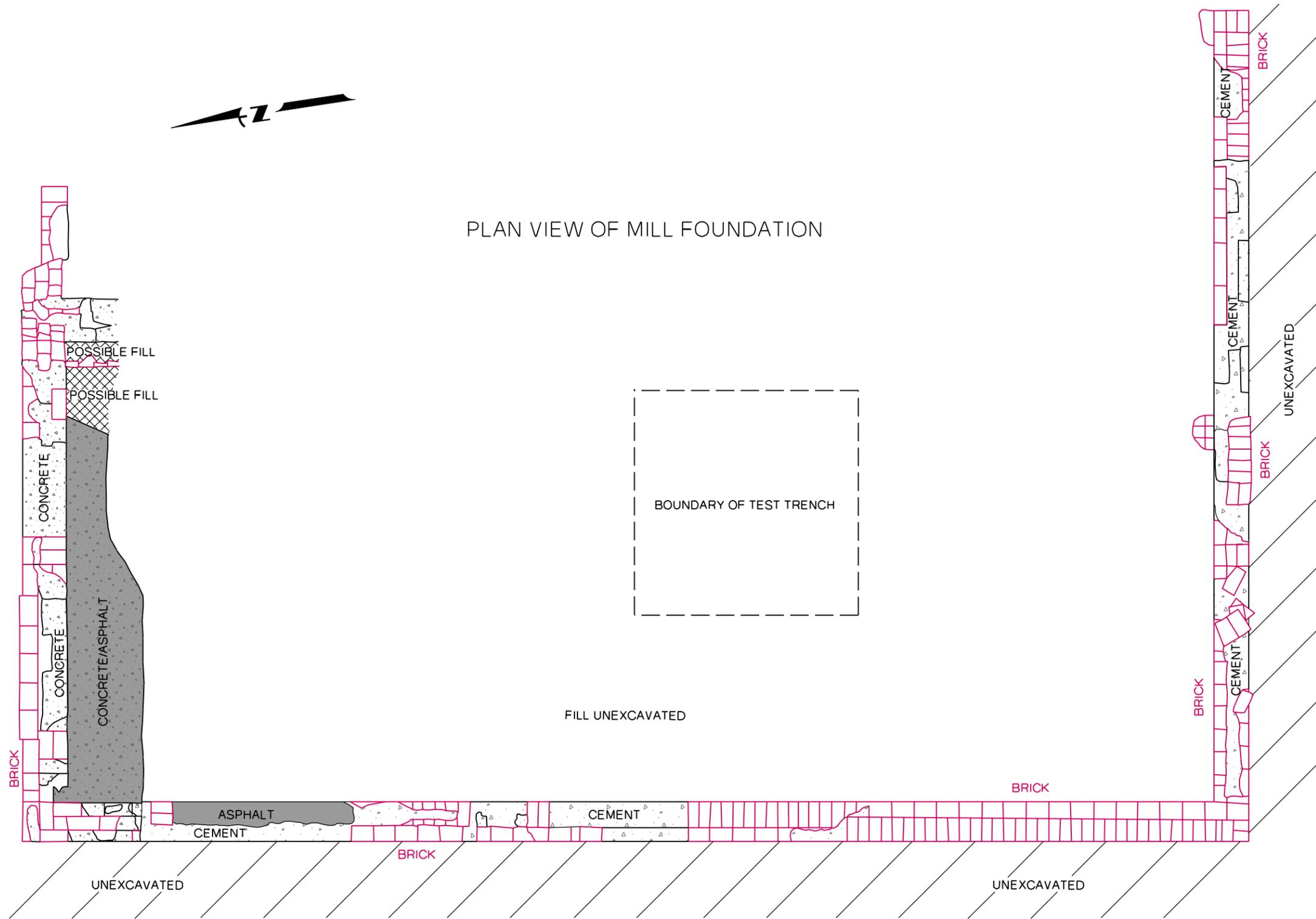
Three walls, including the north, south, and west walls of the mill foundation, were identified and partially excavated during the Bridge 918 project (Figure 13; Photographs 32, 33, 34, and 35). Remains of the east wall were not apparent during the excavations. The east wall by virtue of its location on the down-sloped side of the location would have been more exposed than the other three and may have been razed for safety concerns after the mill burned. The remaining three walls are constructed of red brick and mortar laid in American Common Bond pattern, which incorporates alternating courses of headers and stretchers with approximately five courses of stretchers separating the header courses (Figures 14 and 15). The thickness of the walls is the equivalent of a brick and a half with two bricks laid perpendicular to one another so that the header and stretcher courses are visibly opposite one another on the interior and exterior of the wall. No markings indicating the brick manufactory were detected on the bricks. The bricks measure 20.3 x 10.2 x 5.1 cm (8.0 x 4.0 x 2.0 in) in size and are referred to as straight, rectangular, or common.



Photograph 31. All of the recovered wood laid out near the project area, facing north.



PLAN VIEW OF MILL FOUNDATION



DELAWARE DEPARTMENT OF TRANSPORTATION	
BRIDGE 918 ON S.R. 30 AT REYNOLDS POND SUSSEX COUNTY	
PLAN VIEW BRICK MILL FOUNDATION	
FIGURE - 13	SKELLY AND LOY, INC. CONSULTANTS IN ENVIRONMENT - ENERGY ENGINEERING - PLANNING



Photograph 32. Uncovering the north mill foundation wall, facing east-southeast.



Photograph 33. Excavated north mill foundation wall, facing south.

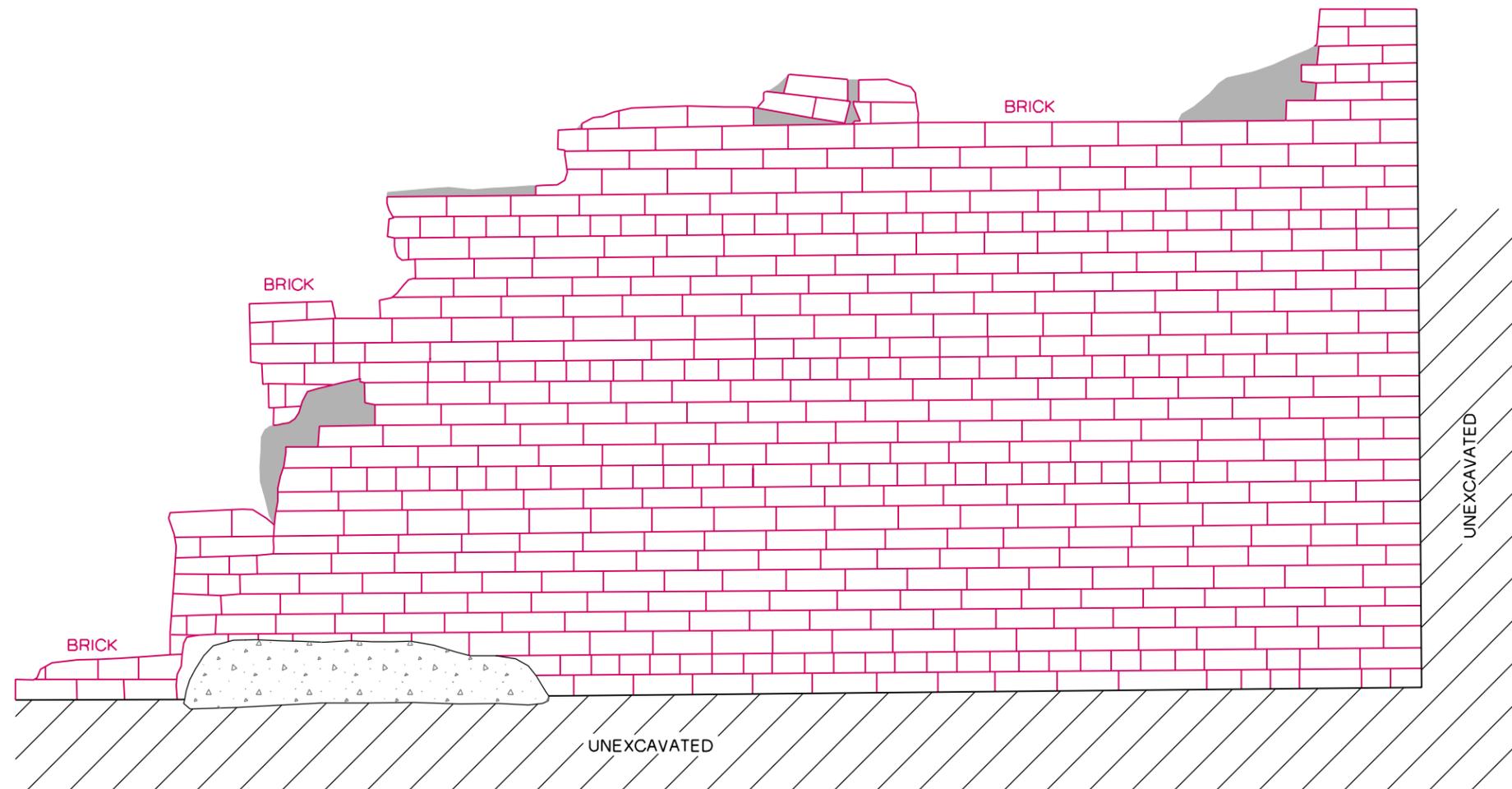


Photograph 34. Excavated west and south mill foundation walls, facing northeast.



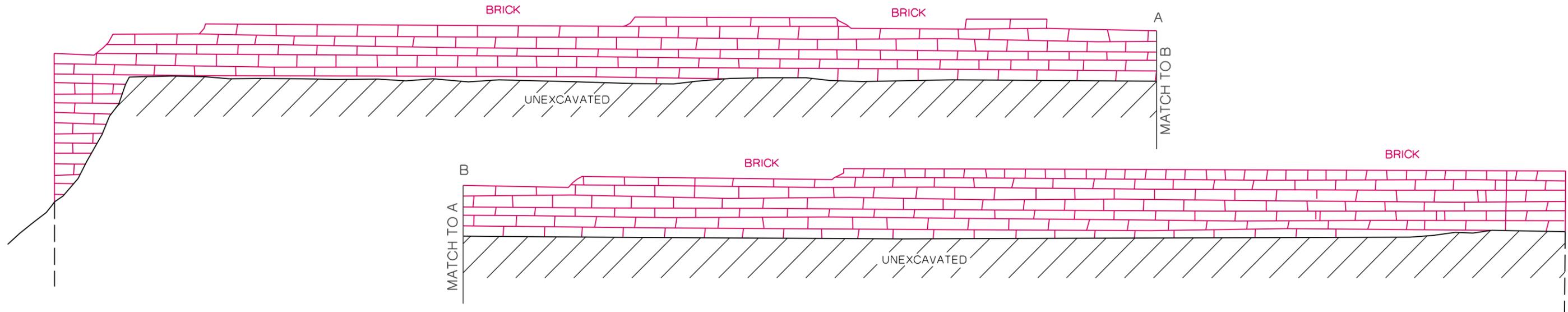
Photograph 35. Excavated north, west, and south mill foundation walls, facing southeast.

EXTERIOR PROFILE
NORTH WALL BRICK FOUNDATION

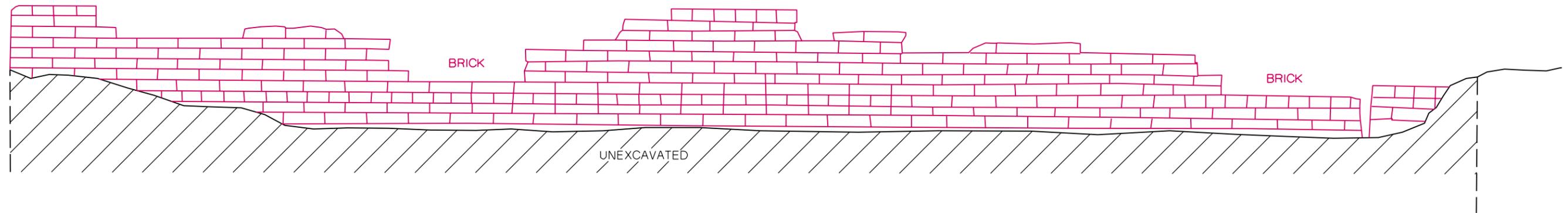


DELAWARE DEPARTMENT OF TRANSPORTATION	
BRIDGE 918 ON S.R. 30 AT REYNOLDS POND SUSSEX COUNTY	
NORTH WALL PROFILE BRICK MILL FOUNDATION	
FIGURE - 14	SKELLY AND LOY, INC. CONSULTANTS IN ENVIRONMENT - ENERGY ENGINEERING - PLANNING

EXTERIOR PROFILE WEST WALL BRICK MILL FOUNDATION



EXTERIOR PROFILE SOUTH WALL BRICK MILL FOUNDATION



DELAWARE DEPARTMENT OF TRANSPORTATION	
BRIDGE 918 ON S.R. 30 AT REYNOLDS POND SUSSEX COUNTY	
WEST AND SOUTH PROFILES BRICK MILL FOUNDATION	
FIGURE - 15	SKELLY AND LOY, INC. CONSULTANTS IN ENVIRONMENT - ENERGY ENGINEERING - PLANNING

The north wall was the first wall identified during the excavations. Upper portions of all three walls are missing; therefore, the original height of the brick foundation cannot be determined. However, based on the height of the fully excavated north wall, it had to have been in excess of 2.1 m (7.0 ft). The west wall is the only wall that is complete in its length. The west wall is 11.3 m (37.0 ft) long; therefore, the mill foundation would have measured 11.3 m (37.0 ft) north to south. The length of the portion of the north wall that remains is 4.7 m (15.4 ft) while the portion of the south wall that remains is 7.4 m (24.3 ft) long. Based on these remains, the mill foundation would have measured in excess of 7.3 m (24.0 ft) east to west. The measurements of the brick mill foundation indicate that the building would have been large enough to accommodate the mill operation and are in keeping with known mill sizes in the area.

Mr. Issacs stated that when the mill burned in the 1970s, it burned with such extreme heat that the mill wheels were reduced to powder. After the fire, Mr. Issacs ceded the property to the state, which then filled the foundation cavity. Therefore, the fill within the mill foundation was emplaced there in the 1970s or shortly thereafter. The source of the fill is unknown.

4.3 Artifacts and Artifact Samples

A total of 87 artifacts/artifact samples, including wood samples, metal, glass, ceramic, brick, and a brick foundation wall sample, were retained for analysis and curation. They represent two major functional categories: architectural and domestic. The majority of the architectural remains are likely associated with the mill structures. With the exception of two millstone fragments, no artifacts directly related to the use of the mill, such as mill equipment, were identified during the excavations. Complete artifact provenience and analysis catalogs are included in Appendix F.

4.3.1 Wood Samples

Twenty wood samples, some with multiple construction elements, were taken from various larger pieces of wood in the wooded structure (Photograph 36). Due to the size and quantity of the identified wood remains, a sampling strategy was developed so that some of the wood could be analyzed and permanently curated. The sampling strategy included samples, which contained diagnostic construction features such as



Photograph 36. Wood samples laid out in laboratory.

mortise and tenons or pegs, as well as various potential species. All types (e.g., planks, beams, pegs) and sizes of the wood were sampled (Photographs 37, 38, 39, 40, 41, and 42).

Taxonomic identification of the wood samples was completed. The results included the identification of four wood type groups: oak (unidentified), white oak, yellow/hard pine, and red oak. All of the wood types identified in the wood sample assemblage would have been available locally from the Coastal Plain forests of Delaware and were historically useful for building construction. A complete analysis of the wood samples is included as Appendix G.

4.3.2 Millstone Fragments

Two millstone fragments were recovered outside of and south of the south mill foundation wall during the Bridge 918 project excavations (Figure 16; Photographs 43, 44, 45, and 46). The two fragments do not refit and most likely are from two different millstones. In addition to the major break creating the fragment, both millstone fragments exhibit some additional breakage or spalling.

Millstone Fragment #1 appears to be almost one-half of a complete millstone and exhibits six complete master furrows, 19 furrows, and seven whole or partial harps. Half of the eye where the shaft would be fitted is also present in the center of the stone. The diameter of Millstone Fragment #1 appears to have been approximately 1.2 m (4.0 ft), while the thickness is approximately 12.7 cm (5.0 in). Millstone Fragment #2 appears to be about one-quarter of a millstone. It exhibits portions of four master furrows, 14 furrows, and five harps. The stone has been broken so that none of the eye remains on the fragment. Based on the arc of the millstone fragment, it is estimated that the diameter of the stone would have been approximately 1.4 m (4.5 ft). The thickness of the fragment is approximately 14.0 cm (5.5 in). Based on the apparent difference in diameter of the two stones, it is unlikely that they were used together as a runner and bed stone.

4.3.3 Metal

A total of 94 metal specimens were identified and recovered from the Reynolds Mill (7S-C-99) excavations. All of the metal specimens were recovered from mixed



Photograph 37. Wood samples.



Photograph 38. Wood samples.



Photograph 39. Wood samples.



Photograph 40. Wood samples.

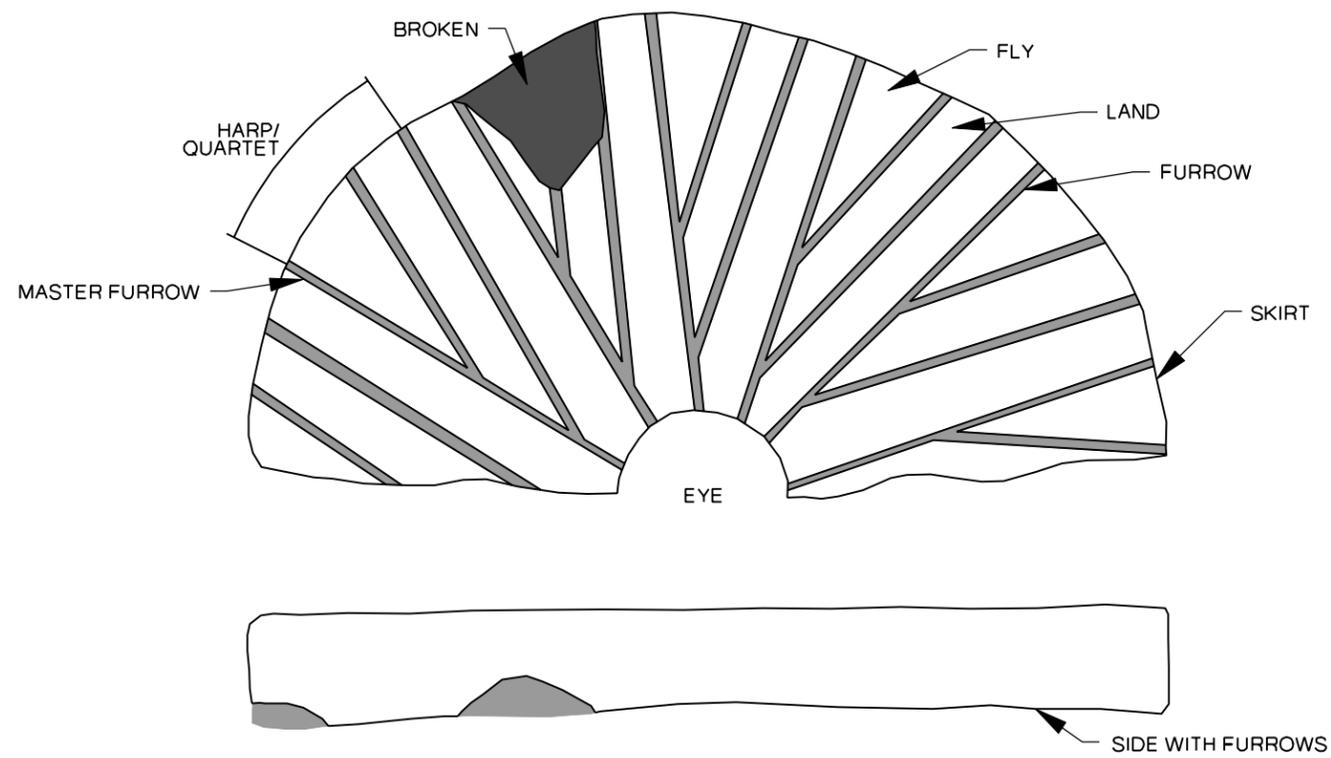


Photograph 41. Wood samples.



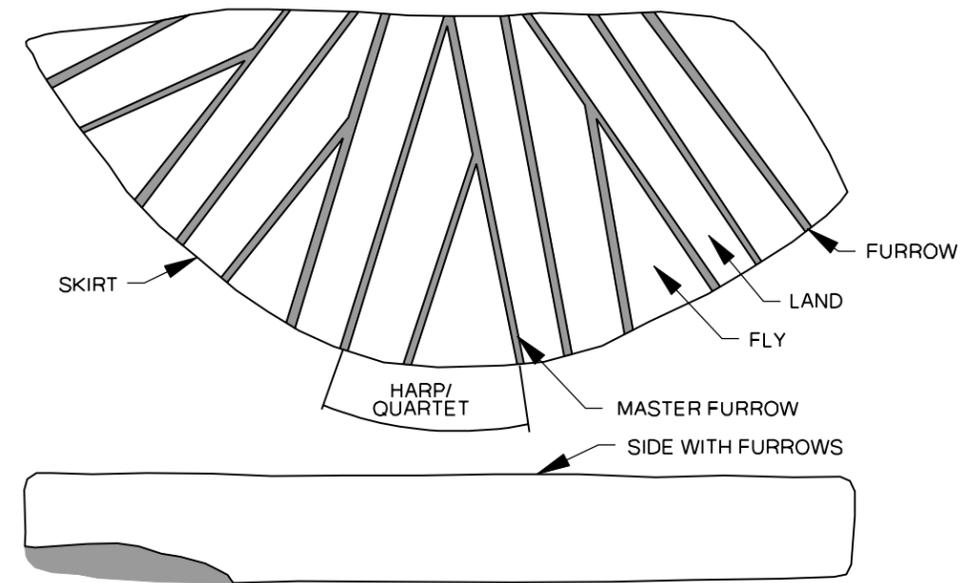
Photograph 42. Wood samples.

PLAN VIEW OF MILL STONE FRAGMENT #1



PROFILE OF MILL STONE FRAGMENT #1

PLAN VIEW OF MILL STONE FRAGMENT #2



PROFILE OF MILL STONE FRAGMENT #2



DELAWARE DEPARTMENT OF TRANSPORTATION	
BRIDGE 918 ON S.R. 30 AT REYNOLDS POND SUSSEX COUNTY	
PLAN VIEWS AND PROFILES MILLSTONE FRAGMENTS	
FIGURE - 16	SKELLY AND LOY, INC. CONSULTANTS IN ENVIRONMENT - ENERGY ENGINEERING - PLANNING



Photograph 43. Millstone #1.



Photograph 44. Millstone #1 reverse face.



Photograph 45. Millstone #1 skirt (on edge).



Photograph 46. Millstone #2.

context fill located outside of both the mill foundation remains and the wooden structure, or are nails associated with the wooden structure. The fill is associated with the backfilling of the bridge/culvert construction area when the ca. 1925 concrete bridge/culvert was installed. Sixty-eight cut/square nails or nail fragments, five wire nails or nail fragments, one horse/mule shoe, one padlock, one piece of strapping, one spike, one rod, and 16 pieces of unknown metal comprise the metal artifact assemblage. The complete nails range in size from 8d to 50d and are oxidized. A few of the nails are bent indicating that they were previously used. Most of the nails are square/cut nails most likely associated with the construction of the penstock/wheel pit or other mill related buildings. The wire nails are most likely associated with the ca. 1925 construction of the concrete bridge/spillway. The function of the metal rod and spike are not known. The padlock and horse/mule shoe may be associated with the mill operations; however, no direct association can be made.

4.3.4 Glass

A total of 15 pieces of glass were identified and recovered from the Reynolds Mill (7S-C-99) excavations. Specimens of both flat and container glass are represented in the glass artifact assemblage. All of the glass fragments were recovered from mixed context fill located outside of both the mill foundation remains and the wooden structure. The fill is associated with the backfilling of the ca. 1925 concrete bridge/culvert construction area when the ca. 1925 bridge/culvert was installed. Four complete or almost complete bottles, one unidentified piece of colorless container glass, one piece of colorless flat glass, and nine pieces of light green colored flat glass comprise the glass artifact assemblage.

The identifiable bottles represent Heinz, Nehi, and 7up brands (Photographs 47 and 48). The two soda bottles date from 1924 to 1955, and post 1937 (but most likely the 1960s), respectively. The incomplete Heinz bottle cannot be dated, but most likely represents a condiment bottle possibly for horseradish. The last bottle is a whiskey or spirits bottle manufactured at a Columbus, Ohio manufacturing plant, which operated from 1932 to 1948 (Photograph 49). The remaining fragment of container glass is not datable. Based on their overlapping date ranges, these bottles are most likely associated with historic period activities near the mill between 1935 and 1950.



Photograph 47. Heinz brand bottle.



Photograph 48. Nehi soda bottle.



Photograph 49. Whiskey or spirits bottle.

The flat glass specimens are representative of architecture/construction materials, but are not diagnostic with regard to temporal affiliation. They most likely represent window glass from nearby structures including the mill. The thickness of the fragments varies from 1.76 mm to 3.7 mm; therefore, the fragments most likely represent several different windows.

4.3.5 Ceramic

A total of three historic period ceramic fragments were identified and recovered from the Reynolds Mill (7S-C-99) excavations. All of the ceramics were recovered from mixed context fill located outside of both the mill foundation remains and the wooden structure. The fill is associated with the backfilling of the bridge/culvert construction area when the *ca.* 1925 concrete bridge/culvert was installed. One redware sherd; one stoneware sherd; and one whiteware sherd comprise the ceramic artifact assemblage.

Redwares and stonewares are the earliest ceramic types and were manufactured from local clays (Ramsay 1939:128). Localized production and lack of maker's marks make these types of wares difficult to date if they are not found in datable contexts or in association with other artifact types. Based on their small size, and lack of maker's marks and diagnostic characteristics, the redware and stoneware sherds are not datable. The recovered whiteware sherd exhibits underglaze painting of a floral motif. Due to the curvature of the sherd, it is most likely from a bowl or cup. Whitewares were first manufactured in the 1830s but were not commonly manufactured until the 1880s when consumer choice for the highly decorated white bodied ceramics made them preferable to other ceramic types (Ramsay 1939; Spargo 1938). Whiteware clays were not widely distributed; therefore, centers of whiteware production emerged with large scale manufacturing of this type of ceramic ware. Whitewares generally have a date range, which begins in the 1830s and continues to the present. Based on its small size, and lack of maker's marks and diagnostic characteristics, the whiteware sherd is not datable. Due to the lack of temporal associations, the recovered ceramics cannot be associated with a specific mill owner or use period, but rather are indicative of general domestic activities that might have taken place there historically.

4.3.6 Brick Fragments and Brick Foundation Wall Sample

A total of six red brick fragments were identified and recovered from the Reynolds Mill (7S-C-99) excavations. All of the brick fragments were recovered from mixed context fill located outside of both the mill foundation remains and the wooden structure. The fill is associated with the backfilling of the bridge/culvert construction area when the *ca.* 1925 bridge/culvert was installed. In addition, a small section (red brick and mortar) of the north wall of the brick mill foundation was retained for curation (Photograph 50). It is probable that the red brick fragments were originally part of the mill or other nearby buildings and were most likely inadvertently incorporated into the fill when the *ca.* 1925 concrete bridge/culvert was installed.

4.4 Summary

The mill seat known as the Reynolds Mill in Broadkilm Hundred, Sussex County was established in the 1790s by Major or Unice Clifton. From its earliest days through much of the nineteenth century, the Reynolds Mill seat hosted both a water-powered sawmill and gristmill. The supposed location of the sawmill was not within the project APE and no remains of the sawmill were identified during the Bridge 918 project research. Evidence of the waterpower system used at the gristmill was identified; however, it is not clear what period of mill operation the remains relate to. In 1811, the mill seat became the property of Nathan Reed, who may have been the only owner-operator of the mills during the nineteenth century. Reed lost the property in 1825, and in *ca.* 1830, it came into the ownership of the Reynolds family, who would give the mill seat its historic name. They owned the property for approximately 29 years.

The Reynolds family, like previous owners, leased both a sawmill and gristmill to tenants, with the sawmill being the more valuable operation for most of their ownership. The gristmill was a custom mill, meaning it ground corn for local farmers rather than for market. The mill was located on a 60 acre farm.

In 1859, the mill seat became the property of the Ponder family, local entrepreneurs and politicians from Milton. The Ponders invested in the gristmill and greatly increased its output. Evidence of any of these improvements was not forthcoming in the archaeological record possibly because they were tied to upgraded equipment, which has not been preserved, or to increased length of operation during the year, which would not show up in the archaeological record. Census records indicate the gristmill contained a single set of millstones, and at its



Photograph 50. Brick wall sample from north wall of brick mill foundation.

peak ca. 1860 it ground 3,200 bushels of corn and produced a similar amount of cornmeal valued at \$2,240. While two millstone fragments were recovered during the archaeological research, it is unclear with which period of operation they may have been associated. In addition, the stones are different sizes and thus indicate that they would have been used at different time periods. By 1870 the gristmill's operations were greatly reduced, and by 1880 it was apparently out of operation. It appears that James Ponder dismantled the original mill and replaced it with a new building in the late 1880s. Since excavations of the entire mill complex and surrounding areas were not part of the proposed Bridge 918 project, it is difficult to say if evidence of the earlier mill building could be found in the archaeological record. The sawmill on the property went out of operation ca. 1904.

Following James Ponder's death, the gristmill seems to have fallen into disrepair. Ponder's widow, Sallie, sold the gristmill and accompanying property in 1905 to William Chase, who apparently operated rather than leased the mill. In 1918, the gristmill came under the ownership of Frederick Jensen, who ran the mill until 1943; this period represents the last substantial operation of the mill. It would have been during Jensen's ownership/operation when the ca. 1925 concrete bridge/spillway was constructed at the site. Jensen ground both flour and corn meal. In 1943, John S. and Mary Isaacs purchased the gristmill and mill seat, as they assembled land holdings of approximately 9,000 acres in the vicinity. The Isaacs used the mill to make chicken feed; therefore, at least parts of the mill complex were operational during the period of 1943 to 1950. Following John Isaacs's death in 1950 the gristmill ceased operation. The gristmill sat vacant until the 1970s, when it was destroyed in an arson fire. Mr. Isaac then ceded the mill to the State of Delaware who in-filled the foundation.

Portions of the brick mill foundation and waterpower system were identified during the archaeological investigations at the Reynolds Mill (7S-C-99) site; however, no equipment directly related to the mill operations performed inside of the mill building was identified. In addition, the context and direct associations between the mill building foundation and the water power structure remains were not intact. The location of the mill building indicates that like many other Sussex County mills, it was built "into the dam" (Crane 1998:2). Based on historic documents, the mill foundation remains most likely represent the replacement mill constructed on the site by James Ponder in the late 1880s; however, without a description of the building and more complete remains, it is difficult to definitively state that. The preserved remnants of the waterpower system structure were identified under the ca. 1925 concrete bridge/spillway. The majority of the recovered artifacts are architectural materials, including nails, wood, and brick likely associated with the gristmill operations.

The architectural and artifactual remains identified at the Reynolds Mill (7S-C-99) site give little indication about the daily operations of the mill or how it evolved or operated in the community over its history. This may be in part due to the specific history of this particular mill as well as a function of preservation conditions and the limited scope of excavations. The preservation of remnants of the penstock and/or wheel pit under the ca. 1925 concrete bridge/spillway confirmed the suspicion that portions of the mill might be present in the project APE; however, the limited nature of the bridge project and therefore its APE, did not allow study of the mill complex as a whole. It is important to recognize that without studying the mill complex as a whole, it is difficult to properly identify, interpret, and/or evaluate the context and function of individual elements comprising the complex.

Despite a very complete listing of the mill's owners, many of whom were either leasing the mill or not operating it at all, there is a dearth of information about the tenant millers operating Reynolds Mill. This makes it difficult to trace the products, output, equipment, layout, and changes of the mill for any specific period as well as over time. There are few maps depicting the mill location, only one known photograph of the mill, and no drawings or descriptions of the mill's operations that were found in the historic documentary record. In addition, the mill building itself burned in the 1970s and the remaining foundation was in-filled. The location of the mill building foundation was mainly outside of the project APE, and, therefore, not subject to intensive study. Therefore, associations between the mill building and the wooden structure preserved under the ca. 1925 concrete bridge/spillway could not be ascertained. The installation of the ca. 1925 concrete bridge/spillway has also extensively affected the preservation of the remains at the site. It appears from the archaeological remains located under the bridge/spillway, that the installation of this structure disturbed, destroyed, and re-used portions of the historic, wooden mill-related water power structures.

What the archaeological excavation of the site did do was to confirm the existence of mill remains in an area where there was no above ground evidence of them, allow them to be documented in a timely and cost effective manner, and allow the resulting information to guide future roadway planning.