Reconstructing the Elevations of the Alexandria Canal

44AX04, 44AX28, 44AX55, 44AX84, 44AX99, 44AX232

Alexandria, Virginia

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Alexandria Archaeology Publications
Number #144

Alexandria Archaeology
Office of Historic Alexandria
City of Alexandria, Virginia

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Introduction

This research addendum will establish the relative heights and absolute elevations for portions of the Alexandria Canal, especially those located in Old Town Alexandria where a series of four locks carries the canal down to the Potomac River. Two of these locks have been excavated archaeologically: Lock 1 (the Tide Lock) in several phases between 1979 and 1986 and Lock 4 (along with Pool/Basin 3) in 2024 and 2025 (Figure 1). The Turning Basin, located at the western end of Lock 4, was excavated in 2017. The site of Lock 2 was excavated in 1972; however, no canal features were identified during those excavations. Most of the canal has been registered as an archaeological site.

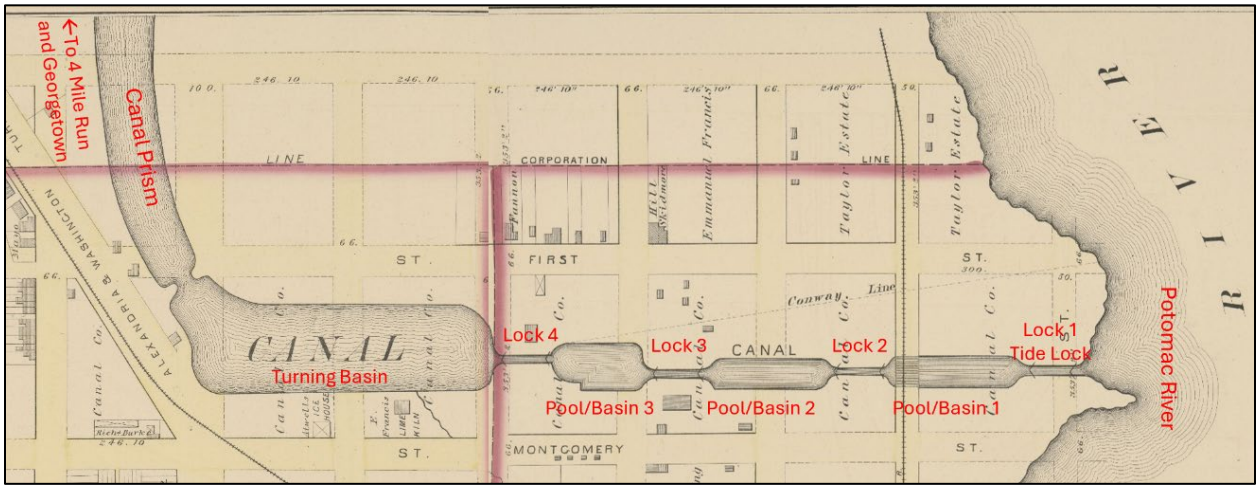

Figure 1. 1877 G.M. Hopkins City Atlas of Alexandria, Virginia, with canal features labeled.

Canal locks utilized the power of water and gravity to both lift and lower heavy loads, allowing canal-going vessels to safely navigate changes in elevation in ways that their river-based

counterparts could not. Because canal infrastructure required careful control of the flow of water, meticulous planning went into their construction and careful calculations needed to be made to ensure they would operate properly. By understanding the design principles and especially the measurements used to design the Alexandria Canal's descent to the Potomac River, we can estimate the theoretical elevation and position of the any part of the canal from a limited number of archaeological observations.

Background Research

In order to establish the relative and absolute elevations for the Alexandria Canal, the following research will pull from primary source material related to the construction of the Alexandria Canal and tie it to elevations recorded from archaeologically documented portions of the canal. Most of the primary source material relevant to this investigation is in the form of canal survey/construction notebooks kept by Engineer Maskell C. Ewing during the construction of the Alexandria Canal and is held by the National Park Service (NPS) by either Arlington House or the Chesapeake & Ohio Canal National Historical Park. While these collections are held by two different divisions of the NPS, the material appears to have originated from the same source collection (i.e. a gap in the construction notebooks held by the Arlington House division between March 1, 1845 and June 1845 is filled by a book in the same format held by the C&O division which covers the period between March 1, 1845 and April 30, 1845 [coverage for May 1845 has not been located]). Page numbers for materials referenced from these notebooks are not currently available and these items do not appear to have been systematically digitized or transcribed. Hahn and Kemp note that extracts of some of this material has been transcribed, but neither the Office of Historic Alexandria nor the Alexandria Library Special Collections has copies of these transcriptions beyond what is available in their 1992 publication (Hahn and Kemp 1992:72-76).

In their 1992 monograph *The Alexandria Canal: Its History & Preservation*, Thomas Swiftwater Hahn and Emory L. Kemp report a total change in elevation on the Alexandria Canal between the turning basin and the Potomac River of 38 feet (Hahn and Kemp 1992: 41). Prior to the excavations at the Tidelock in the late 1970s and early 1980s, they had already speculated this elevation change was divided equally between the four locks on the canal, for a change in elevation of 9.5 feet per lock. They cite a letter from Maskell Ewing to F. L. Smith dated December 7, 1846 (Bureau of Public Works File, Virginia State Library) giving the drop of each lock to be 9.5 feet. They further cite "Estimate for Lock No. 4" held by the National Park Service at Arlington House that shows the height of the breast wall (the wall at the west end of Lock 4, the top of which is the bottom of the turning basin and the bottom of which is the floor of Lock 4) to be 9.5 feet both in a cross section and in an inventory of stone to be cut (Figures 2 and 3). A separate list of the number of cut stone in Lock 4 from the "Estimate for Lock No. 4" includes the heights of each course of stone in the breast wall of Lock 4 (Figure 4). These measurements

add up to 114 inches high or exactly 9.5 feet. The 1980s excavations at the Tidelock largely confirmed these dimensions, at least at the Tidelock (see "Physical Description of the Tide Lock (Lift Lock No. 1) and Pool (Basin) No. 1", *The Industrial Archaeology of the Tide Lock and Pool No. 1 of the Alexandria Canal*, Thomas "Swift-Water" Hahn, pp.25-84, on file at Alexandria Archaeology).

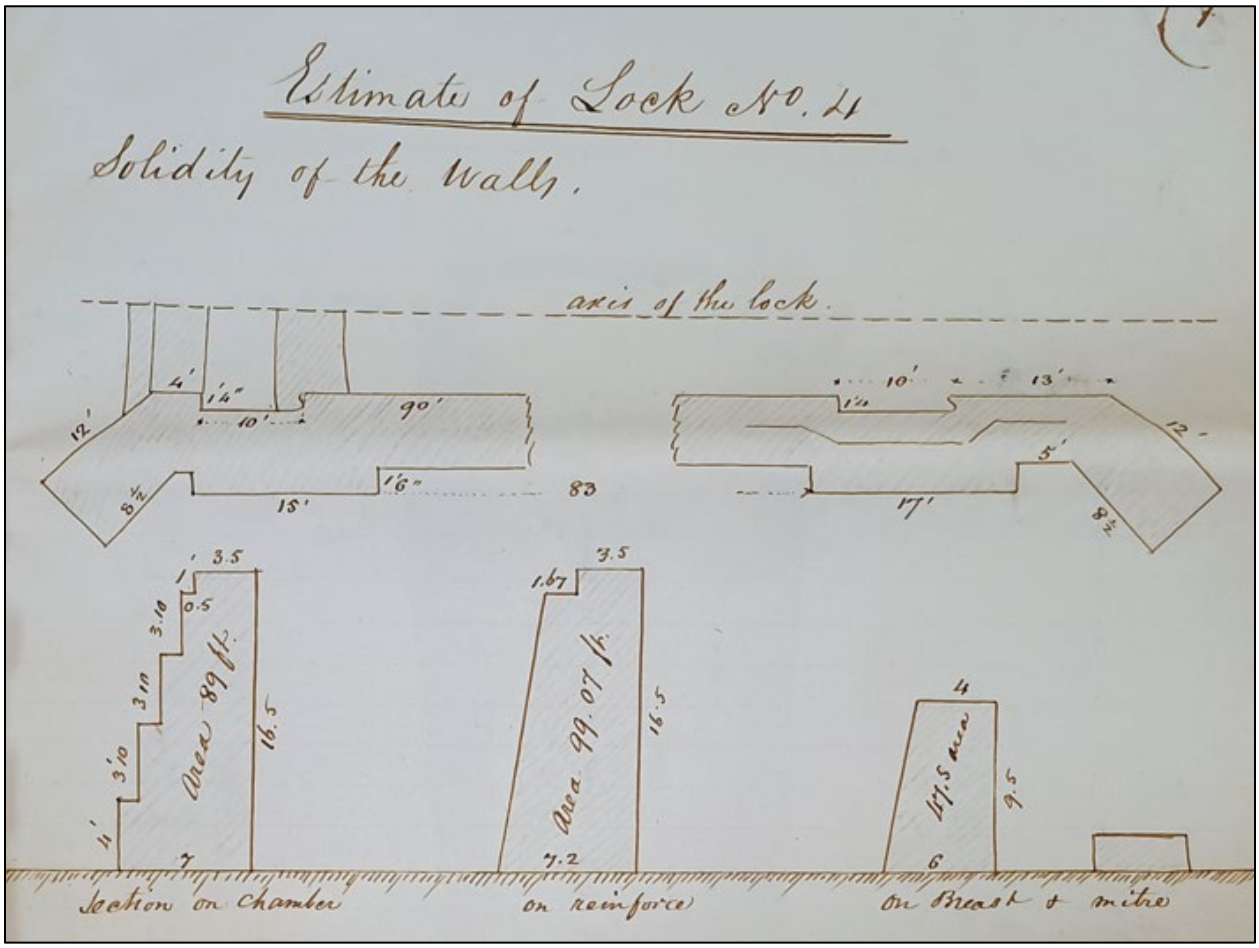

Figure 3. From "Estimate of Lock No. 4". National Park Service, Arlington House, Maskell Ewing, Accession Number ARHO-00468, Catalog # ARHO_2664.

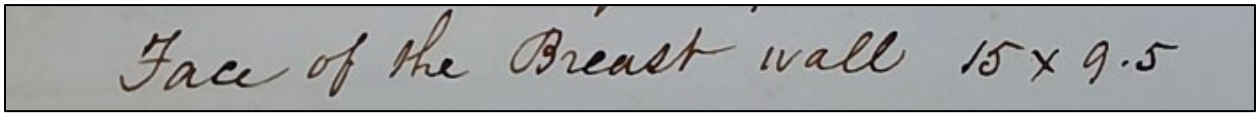

Figure 2. From "Estimate of Lock No. 4". National Park Service, Arlington House, Maskell Ewing, Accession Number ARHO-00468, Catalog # ARHO_2664.

A cursory search of Maskall C. Ewing's engineering notebooks held by the National Park Service reveals that he recorded benchmarked elevations of various parts of the canal during construction. Unfortunately, he used an arbitrary benchmark tied to an arbitrary elevation that cannot be easily tied to known, existing conditions. In several places in the notebooks, he

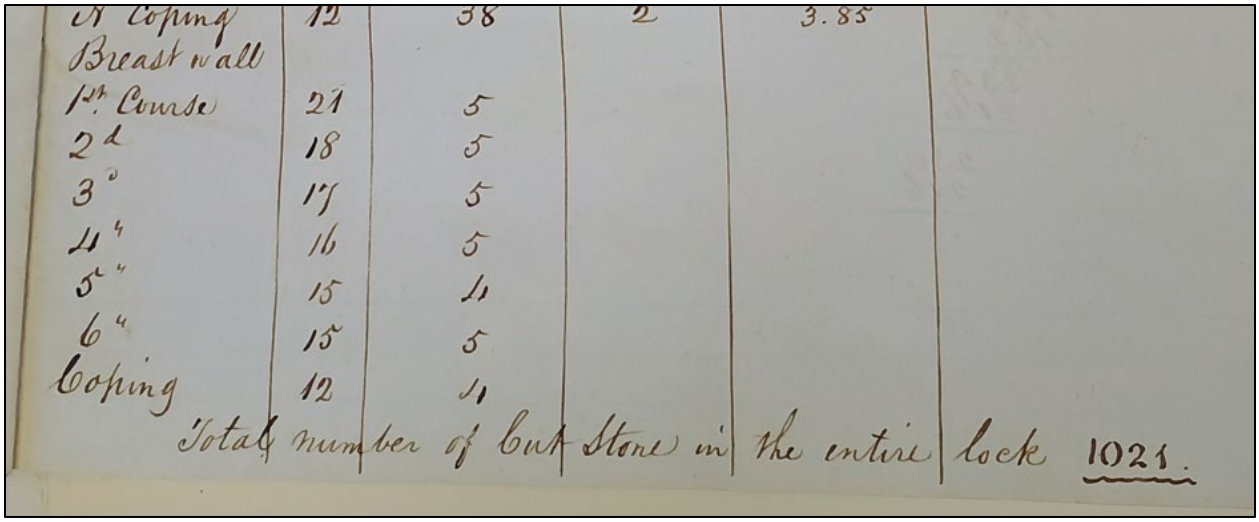

Figure 4. From "Estimate of Lock No. 4". National Park Service, Arlington House, Maskell Ewing, Accession Number ARHO-00468, Catalog # ARHO_2664.

reports elevations in relation to high and low tides, but because these measurements vary according to numerous factors (positions of the sun and moon, recent rainfall, long-term sea-level rise, etc.), these cannot be used to establish absolute elevations for these features (Figure 5). Ewing's 0.0' elevation benchmark appears to be set at the level of the bottom of the turning basin (z=0.0'), but it is not clear where exactly along the bottom of the turning basin this benchmark was established. In theory, the bottom of the turning basin should have been flat (or at least relatively flat). However, the relative changes in elevation he records are useful in trying to reconstruct the changes in elevation of the canal as it descended from the Turning Basin to the Potomac River.

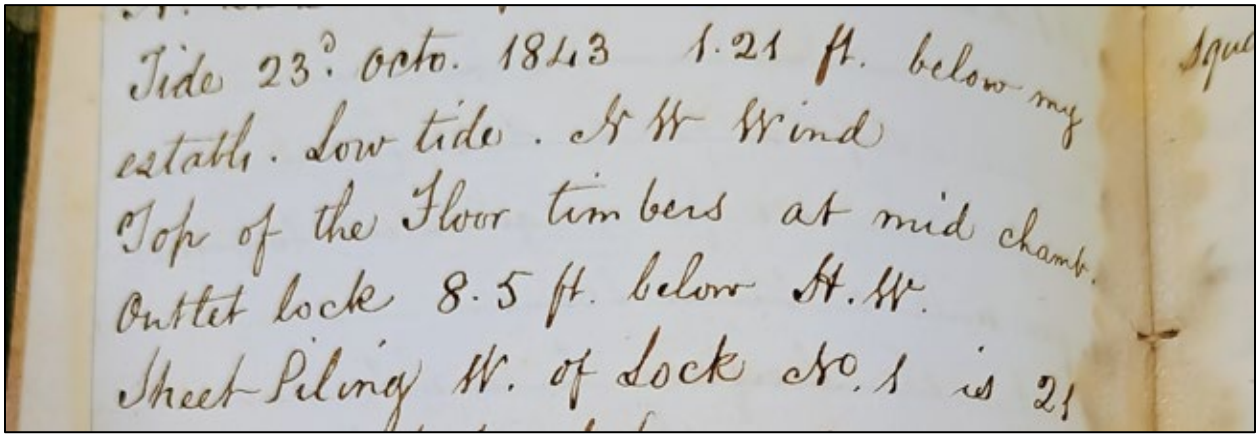

Figure 5. Excerpt from one of Ewing's Canal Notebooks. National Park Service, Arlington House, Maskell Ewing, Accession Number ARHO-00468, Catalog # ARHO_2662.

In the notebook dated November 1, 1843 through May 1, 1844, Ewing provides the following measurements for the bottoms of each pool as well as the tops of the corresponding banks that

lined their edges (the outlet pool has no corresponding bank because the final lock empties into the Potomac River) (Figure 6):

Bottom 1st Pool –9.5	Bank Lev. -2.5
Bottom 2nd Pool -19.0	Bank Lev. -12
Bottom 3rd Pool -28.5	Bank Lev. -21.5
Bottom Outlet Pool -38.0	

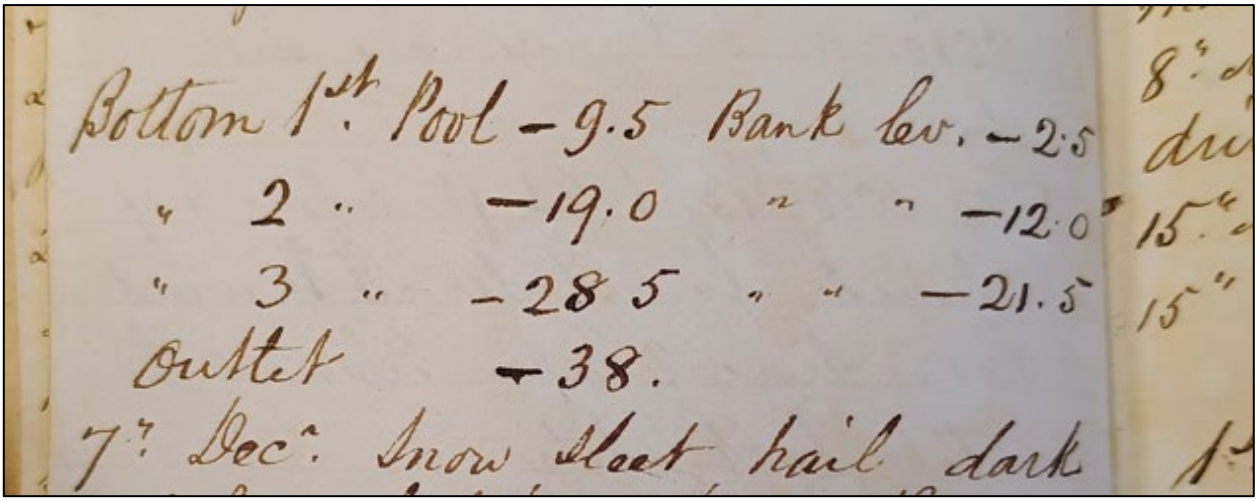

Figure 7. Excerpt from one of Ewing's Canal Notebooks. National Park Service, Arlington House, Maskell Ewing, Accession Number ARHO-00468, Catalog # ARHO_2659.

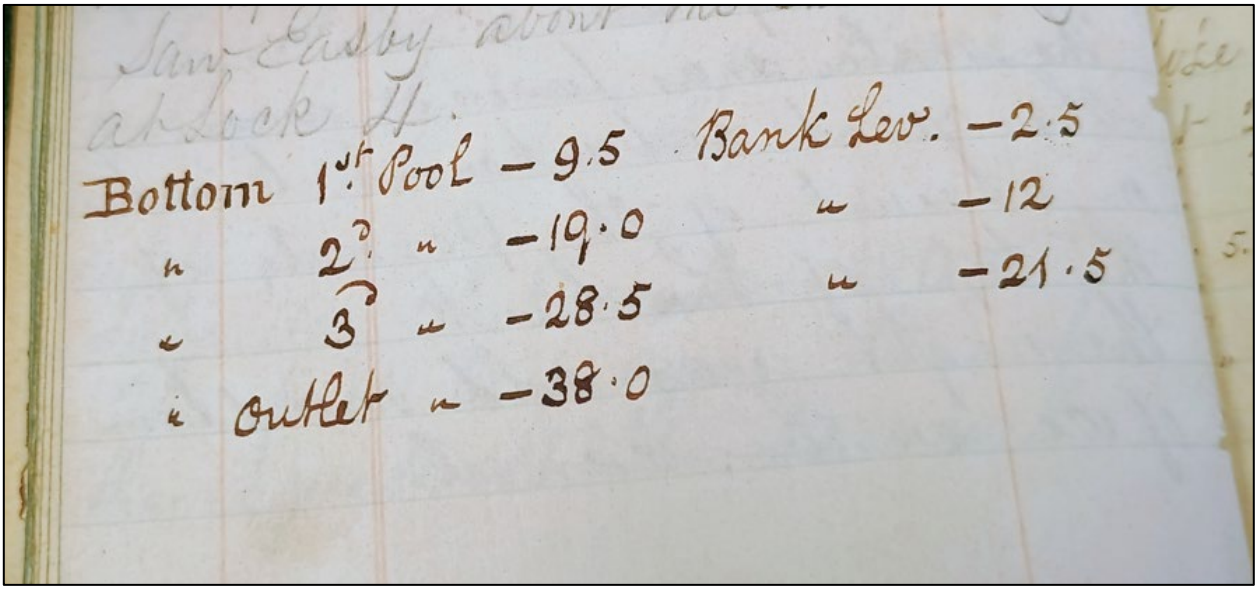

Figure 6. Excerpt from one of Ewing's Canal Notebooks. National Park Service, Arlington House, Maskell Ewing, Accession Number ARHO-00468, Catalog # ARHO_2658.

From the order, the increasingly lower measurements, and the inclusion of the Outlet pool at the end, it would appear that Ewing has numbered these from west to east. This numbering appears to be reversed from the numbering system used for the locks (with Lock 1 located at the river in the east and Lock 4 at the turning basin in the west). Care should be exercised to ensure that researchers understand which feature is being referenced. As noted by Ewing, each sequential pool as the canal descends to the river is exactly 9.5 feet below the one above it. Furthermore, each earthen bank or wall around the perimeter of each of these pools is also 9.5 feet below the one above it with each bank 7 feet above the corresponding pool bottom. Given these figures are all recorded as either 0 or 5 tenths of a foot where elsewhere measurements are precise to one thousandths of a foot and the early date of the notebook (more than a year before the completion of the canal), it is possible these are aspirational targets Ewing intended to hit and not necessarily the actual elevations of the finished canal. Ewing repeats these dimensions in the field book dated 1 May 1844-12 Aug 1844 (Figure 7).

In the notebook dated November 11, 1844 through March 1, 1845, Ewing provides benchmarks for the "SE recess corner of Lock 3" at -2.604' (that is, 2.604 feet below his datum) and the "SE recess corner Lock 4" at +6.784' (or 6.784 feet above his datum) (Figure 8). It's not exactly clear on which part of the lock Ewing's measurements were taken, (which part of the SE recess, likely the recess for the southern gate at the east end of the lock, or how high above the floor of the canal), but from the elevations established elsewhere along the canal, it would appear these were taken at or very near the top of the stone walls of each lock. Assuming Ewing measured the same part of the lock for both of these benchmarks, this gives a change in elevation between Lock 3 and Lock 4 of 9.388', or nearly all of the theoretical 9.5' in elevation required by the plans the elevations of the pools and banks noted above. Assuming the same change in elevation at all four locks, this would produce a total change in elevation of 37.552 feet, less than six inches different than the 38 feet approximated by Hahn and Kemp for the entire drop of the canal.

Ewing repeats these measurements in the June through December 31, 1845 notebook and includes an elevation of -12.394 for the SE recess cor. Lock 2" and -21.866 for the "SE recess cor. Lock 1" (Figure 9). This gives a change of elevation of 9.388 feet between Locks 4 and 3, 9.79 feet between Locks 3 and 2, and 9.472 between Locks 2 and 1 and a total overall change in elevation of 28.65 feet between Locks 4 and 1. This is one final step down east of Lock 1 (the Tidelock) into the river which Ewing benchmarked at -28.573' at high tide (6.707 feet down from Lock 1) and -32.073 at low tide (10.207 feet down from Lock 1), for a total change of elevation of 35.357 at high tide and 38.857 feet at low tide. Ewing

Archaeological Investigations

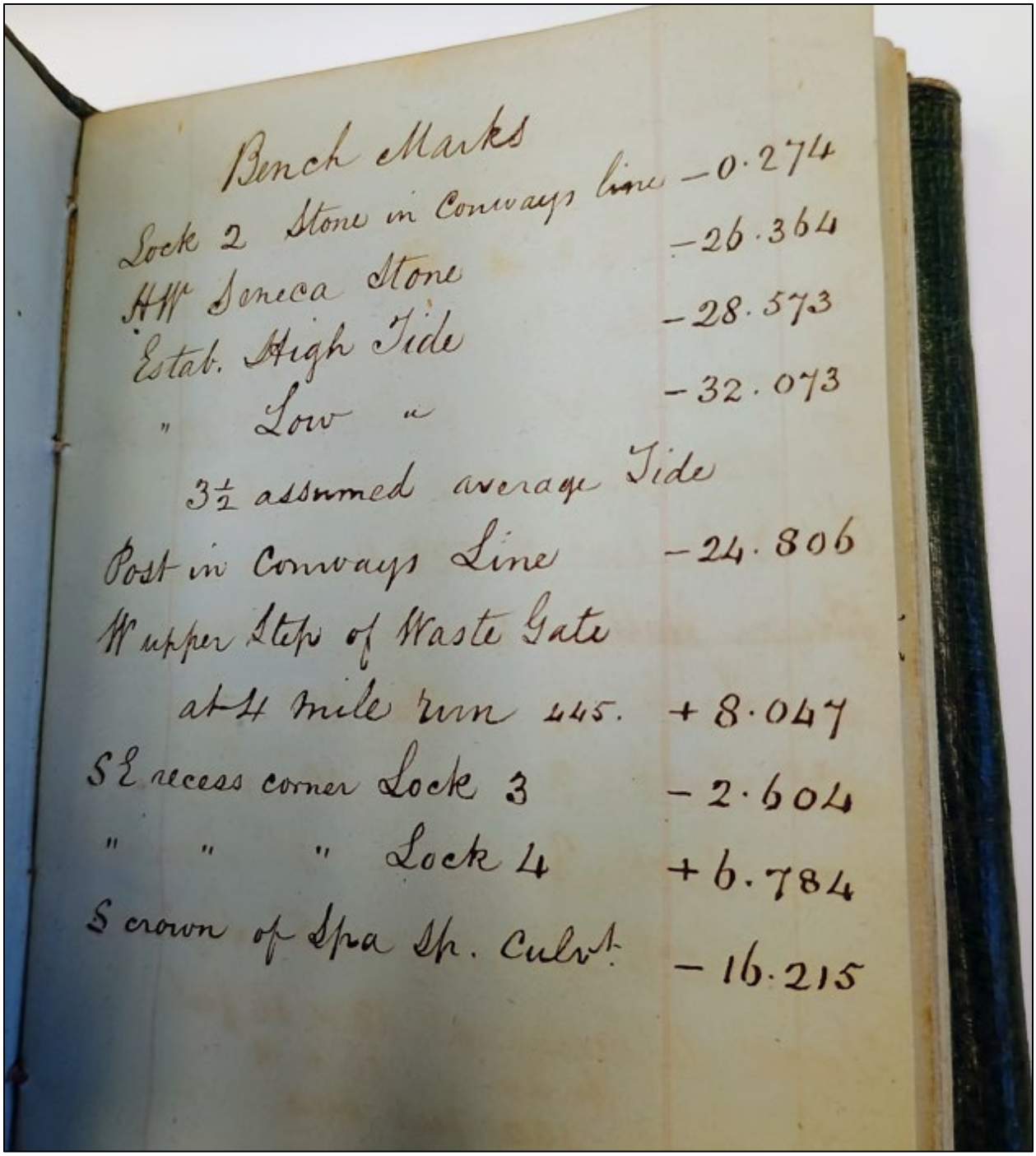

Figure 8. Excerpt from one of Ewing's Canal Notebooks. National Park Service, Arlington House, Maskell Ewing, Accession Number ARHO-00468, Catalog # ARHO_2661.

To these relative benchmarks recorded by Ewing, we can add archaeologically recovered elevation data in order to tie Ewings elevations to absolute measurements above sea level.

Portions of the Alexandria Canal have been encountered archaeologically (or at least documented historically) and subsequently registered with Virginia's Department of Historic

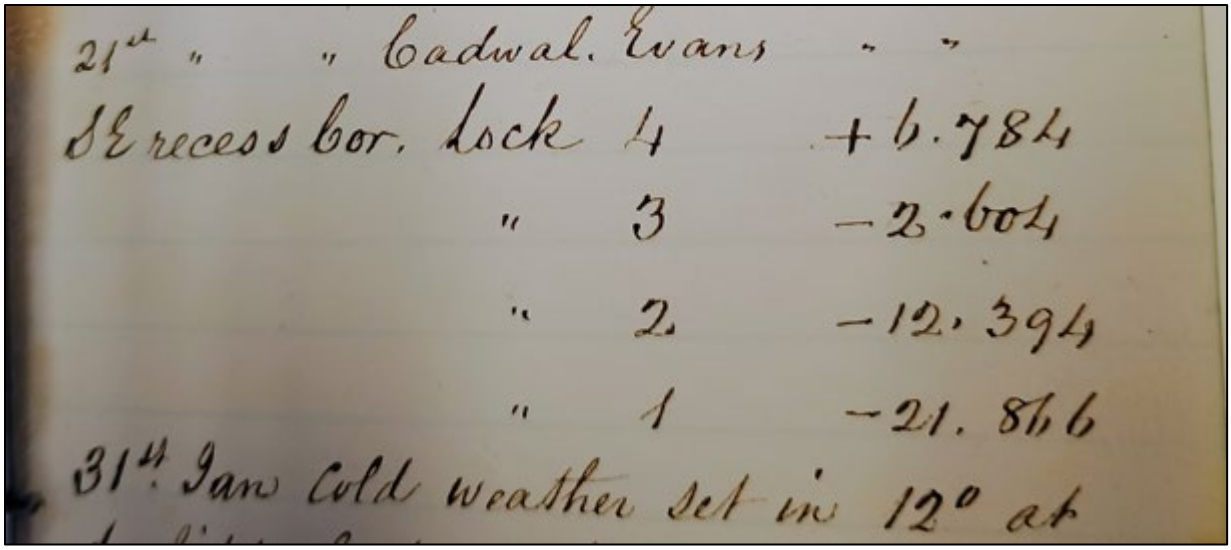

Figure 9. Excerpt from one of Ewing's Canal Notebooks. National Park Service, Arlington House, Maskell Ewing, Accession Number ARHO-00468, Catalog # ARHO_2662.

Resources (VDHR) as archaeological sites since the 1970s. These include 44AX04, 44AX28, 44AX55, 44AX84, 44AX99, and 44AX232. These six sites cover the length of the canal and its locks in the City of Alexandria and Arlington County, but the site of the Potomac Aqueduct between Georgetown, DC and Rosslyn, VA and the site of the coal wharves at the outlet of the canal in Alexandria (at the time of this writing, it is not clear to the author whether the site of the coal wharves falls within the boundary of Alexandria or the District of Columbia). In both cases, neither of these sites that fall within the Potomac River have been registered as archaeological sites.

44AX04 – Tidelock and Pool Number 1

44AX04 is located between N. Lee Street (formerly Water Street), Montgomery Street, First Street, and the Potomac River. It was excavated in phases between 1979 and 1986. Archaeologists encountered the mostly-intact remains of the Tidelock and elements of the first basin. These excavations are reported in *Industrial Archaeology of Tide Lock and Pool No. 1 of Alexandria Canal* (Hahn 1982a) and Hahn and Kemp (1992). For more on the background history of the canal, see *Maritime Historical Report for Alexandria canal Tide-Lock Project* (Hahn 1982b).

44AX28 - Canal Prism

44AX28 represents the approximately 6-mile-long length of the Alexandria Canal from where it crosses the Potomac River via the aqueduct at Rosslyn to where it turns east and descends back to the river around Montgomery Street in Alexandria. As designed, this section of the canal was built along a very gradual slope (Ewing records 1.5-inch drop per mile or 9 inches overall from the aqueduct) and contained no lift locks. This includes the portion of the canal located in what

is now Arlington County (where it is still registered with an AX site designation despite being in Arlington County). Archaeological work has been conducted to determine if portions of the canal prism still exist (most notably in the vicinity of Potomac Yard; see for example Adams 1996 or Mullen and Barse 2012), but extensive ground disturbance in these areas seem to have destroyed these remnants of the canal. The boundaries of 44AX28 were provided from historic maps and not archaeological testing.

44AX55 – Four Mile Run Aqueduct

44AX55 is the site of the aqueduct that carried the canal over Four Mile Run. This site was not investigated archaeologically but documented and registered based on historical evidence. A photograph by Civil War photographer Andrew J. Russell may show the aqueduct of the Four Mile Run and is held by the Huntington Library (Figure 10). The handwritten caption on this image reads "Tunnel, C&O Canal, Alexandria & Washington RR". The C&O Canal ran from Cumberland, MD to Georgetown, DC while the Alexandria & Washington Railroad ran from Alexandria to the south end of the Long Bridge and did not intersect each other whereas the Alexandria Canal and the Alexandria & Washington Railroad did at Four Mile Run. As such, it is likely the author of the caption has misidentified this section of the Alexandria Canal as an extension of the C&O Canal. In this case, Four Mile Run is in the foreground and passes under the low, double stone arches, the railroad is behind it passing through the tall arch, and the canal aqueduct is at the top of the image, spanning both the body of water and the railroad. Comparing the configuration of these features in the photograph to Civil War-era maps of the area, it would appear this photograph is taken from the vicinity of modern-day Four Mile Run Park at the end of Commonwealth Avenue, looking east.

Figure 10. Tunnel, C&O [Alexandria] Canal, Alexandria & Washington RR. Andrew J. Russell. Huntington Library, photCL 301 (35), https://hdl.huntington.org/digital/collection/p16003coll6/id/292/rec/1.

44AX84 – Lock 2 and Pools 1 and 2

44AX84 is located on the southern half of the block bounded by N. Lee, Montgomery, N. Fairfax, and First Streets. Salvage work was conducted here in 1972 prior to the construction of a hotel. Rescue archaeologist Richard Muzzrole encountered the remains of the Old Dominion Glass Factory, but apparently not Lock 2 of the canal or the associated basins on either end which once stood on this block (or if he did, there is no documentation of it; see "Alexandria Glass Factory Ruins Unearthed", *Washington Sunday Star and Daily News*, August 27, 1972, B-6). No formal report describing these excavations was produced and the extant records include a handful of site photographs of the excavations and glass factory features uncovered there, photographs and notes of the glass-blowing tools found, and a site registration form that does not note if canal features were found. The depth and extent of these excavations is not clear, nor does the scant documentation of these excavations make clear the below-ground footprint of the glass factory. Photographs of the glass factory from Wedderburn's *Historic Alexandria, Va., Souvenir Virginia Tercentennial* booklet and one from photographer Lewis Wickes Hine ("Some of the youngsters on day shift (next week on night shift) at Old Dominion Glass Co., Alexandria, Va ", https://www.loc.gov/pictures/item/2018676574/) do not conclusively show ground disturbance by the glass factory. Photos of the archaeological site show the encountered

Figure 11. Glass factory features found at 44AX84. AX84_FR_1 and and AX84_FR_6. Courtesy of Alexandria Archaeology.

Figure 12. Site construction at 44AX84. AX84_SLS_1 and AX84_SLS_2 c.1972. Courtesy of Alexandria Archaeology.

glass factory features (Figure 11) as well as the general depth of the excavation and construction work (Figure 12).

The hotel that was built here appears to have been built at grade (although the hotel is no longer standing and this has not been confirmed) and the buildings that replaced this hotel also appear to be built at grade. As such, it is possible that both past and modern construction did not lead to extensive ground disturbance on this block and the remnants of Lock 2 may still exist under this site.

As will be established below, the canal infrastructure on this block should theoretically be located between approximately 11 feet (in the west along Fairfax Street) and 25 feet (in the east along Lee Street) below the modern ground surface. The previous ground disturbance on this block may not have gone that deep. That being said, several items appearing in the Alexandria Gazette around the turn of the 20th Century report the City was experimenting with repurposing canal stones for use as flooring, bulkheads, curbstones, and other street work and may have deconstructed some or all of this and other locks around this time (Figures 13, 14, 15, and 16). Excavations at Lock 4 revealed only the bottom three courses of dressed stone on the north side of the lock and only part of one course on the south side of the lock survived into the present. The rest had been removed at some point in the past. Furthermore, earlier phases of construction related to the glass factory or oil storage and undocumented ground disturbance related to those structures could have impacted the canal. Excavations at Lock 4 showed the way construction crews built the 1980s office building up right up to the canal remains and removed them when they were in the way. Any additional ground disturbance at 44AX84 should consider the possibility that Lock 2 and its associated basins still remain (at least partially) undisturbed under that block.

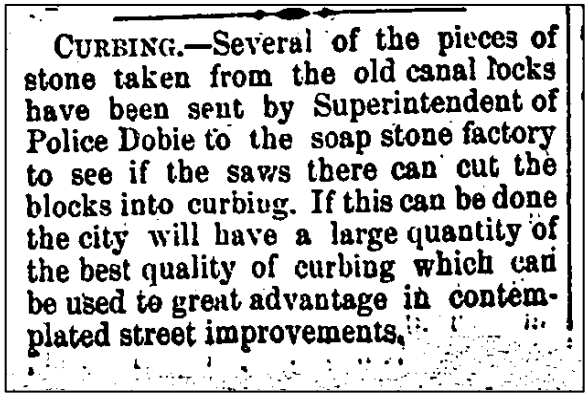
CURBING.—Several of the pieces of stone taken from the old canal locks have been sent by Superintendent of Police Dobie to the soap stone factory to see if the saws there can cut the blocks into curbing. If this can be done the city will have a large quantity of the best quality of curbing which can be used to great advantage in contemplated street improvements.

Figure 13. Alexandria Gazette, April 4, 1895, p.4.

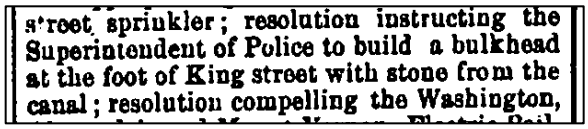
street sprinkler; resolution instructing the Superintendent of Police to build a bulkhead at the foot of King street with stone from the canal; resolution compelling the Washington,

Figure 16. Alexandria Gazette, April 10, 1895, p.3.

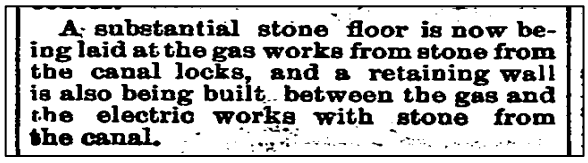
A substantial stone floor is now being laid at the gas works from stone from the canal locks, and a retaining wall is also being built between the gas and the electric works with stone from the canal.

Figure 15. Alexandria Gazette, August 3, 1895, p.4.

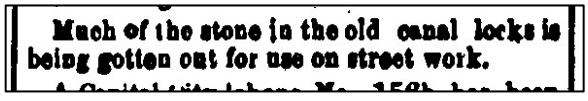
Much of the stone in the old canal locks is being gotten out for use on street work.

Figure 14. Alexandria Gazette, May 31, 1901, p.4.

44AX99 – Canal Locks and Basins

The site number 44AX99 was originally used to denote the Turning Basin within the block bounded by N. Washington, N. St. Asaph, Montgomery, and First Streets, but the geometry registered with DHR shows it as the canal below the Turning Basin (Locks 1 through 4 and Pools 1 through 3). The site was registered based on historical documentation, namely the depiction on several historical maps.

In 2024-2025, archaeologists from Wetlands Studies and Solutions, Inc., a Davey company (WSSI) found, excavated, and recorded the remains of Lock 4 and Basin/Pool 3 at 901 N. Pitt Street (recorded as a part of 44AX99, report in progress). The documentation of these two features included terrestrial laser scanning, which recorded the bottom of Lock 4 and Pool 3 at an elevation of between 19.15 and 19.3 feet above sea level (Figure 17). The western portion of the pool consisted of flat stone pavers; the tops of some of these stones reached as high as 19.6 feet above sea level, but the bottoms of these two features are functionally at the same level. As will be discussed below, from the benchmarks and measurements recorded in Ewing's engineering notebooks and WSSI's observation of the floor of Lock 4 at approximately 19.2' asl,

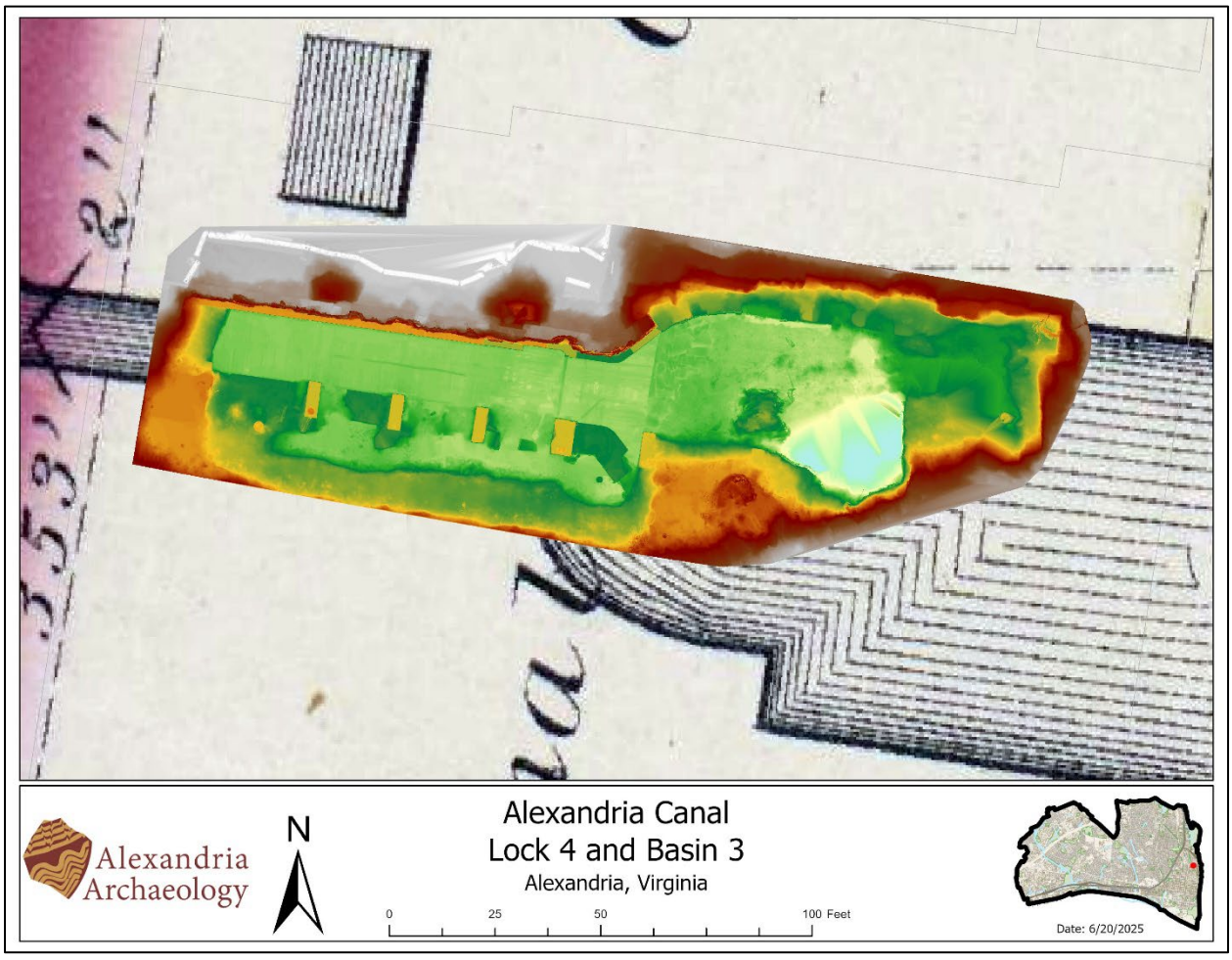

Figure 17. Laser scan of Lock 4 and Basin 3, 44AX99, WSSI.

the theoretical elevations for the rest of the canal can be extrapolated and used to guide and interpret archaeological investigations on these sites.

From the benchmarks recorded in Ewing's canal construction notebooks and the elevation of the bottom of Lock 4 observed by WSSI at 901 N. Pitt Street, the absolute and relative elevations of various elements of the canal can be summarized in the following graphic (Figure 18):

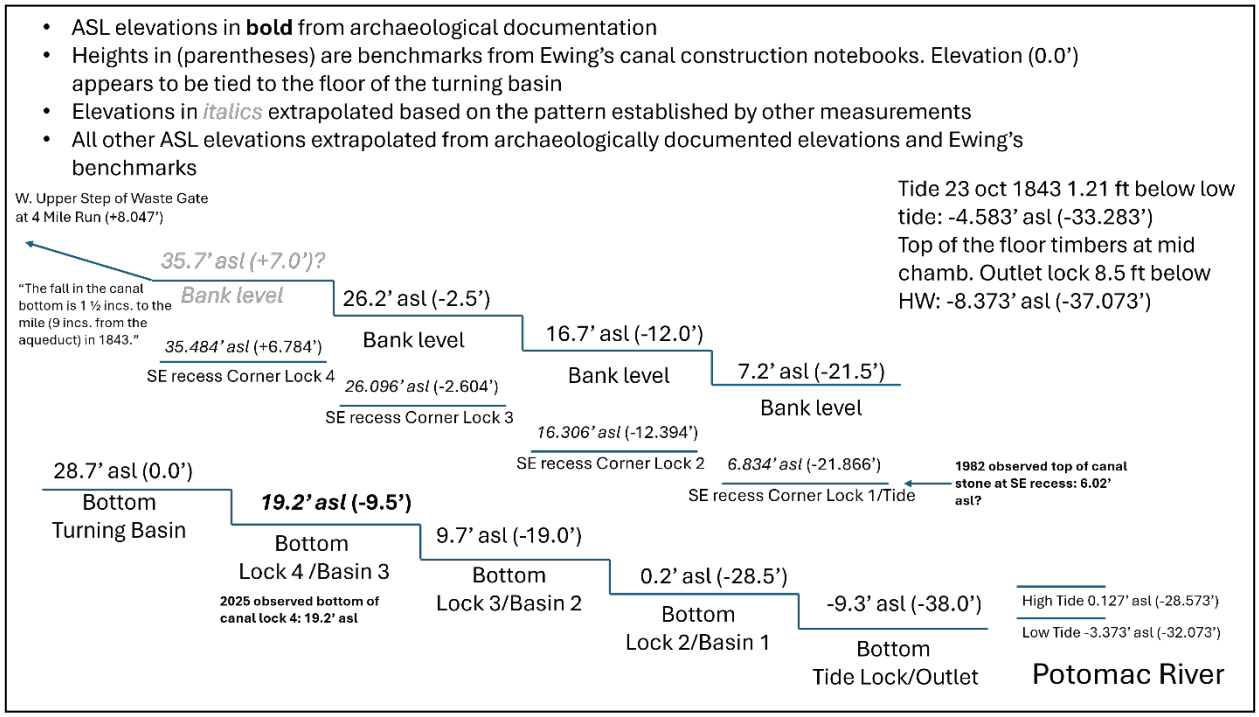

Figure 18. Absolute and relative elevations of various elements of the Alexandria Canal (not to scale).

The top stepped blue line represents the elevations of the top of the bank at the Turning Basin and Pools 3, 2, and 1 as they step down to the river. The middle set of observations are extrapolated from benchmarks provided by Ewing on the southeast recess corner of each lock. Presumably, these are measured at the same place on each lock and most likely along the top-most course of stone, but this is not clear from the documentation. The bottom stepped blue line represents the elevations of the prepared bottoms of the Turning Basin, Locks 4, 3, and 2, and the Tidelock. It also provides the bottoms of the pools between each of these locks. Ewing also recorded both high and low tide in relation to his established canal benchmarks and these can be converted using the same process to an absolute elevation measured in feet above sea level.

44AX232 – Turning Basin

In 2017, archaeologists from Goodwin & Associates excavated the 900 block of N. St. Asaph Street, which once contained portions of the Alexandria Canal Turning Basin. These excavations

revealed stratigraphy indicative of the north and south edges of the canal basin in Trench 1 and Trench 2 and the site was registered as 44AX232 (Figures 19, 20, 21, 22, and 23). These excavations are reported in *Archaeological Evaluation of the ABC-Giant Property, 500 First Street and 901 N. St. Asaph Street, Alexandria,* Virginia, Child, Kathleen M, Katie Kosack, and Shannon Baker, Goodwin & Associates, Inc., 2024, on file at Alexandria Archaeology. The annotated trench profiles below record the stratigraphy as recorded by Goodwin & Associates along with their interpretation for those layers. The interpretation of this stratigraphy can be informed by an understanding the elevations of the canal as described above.

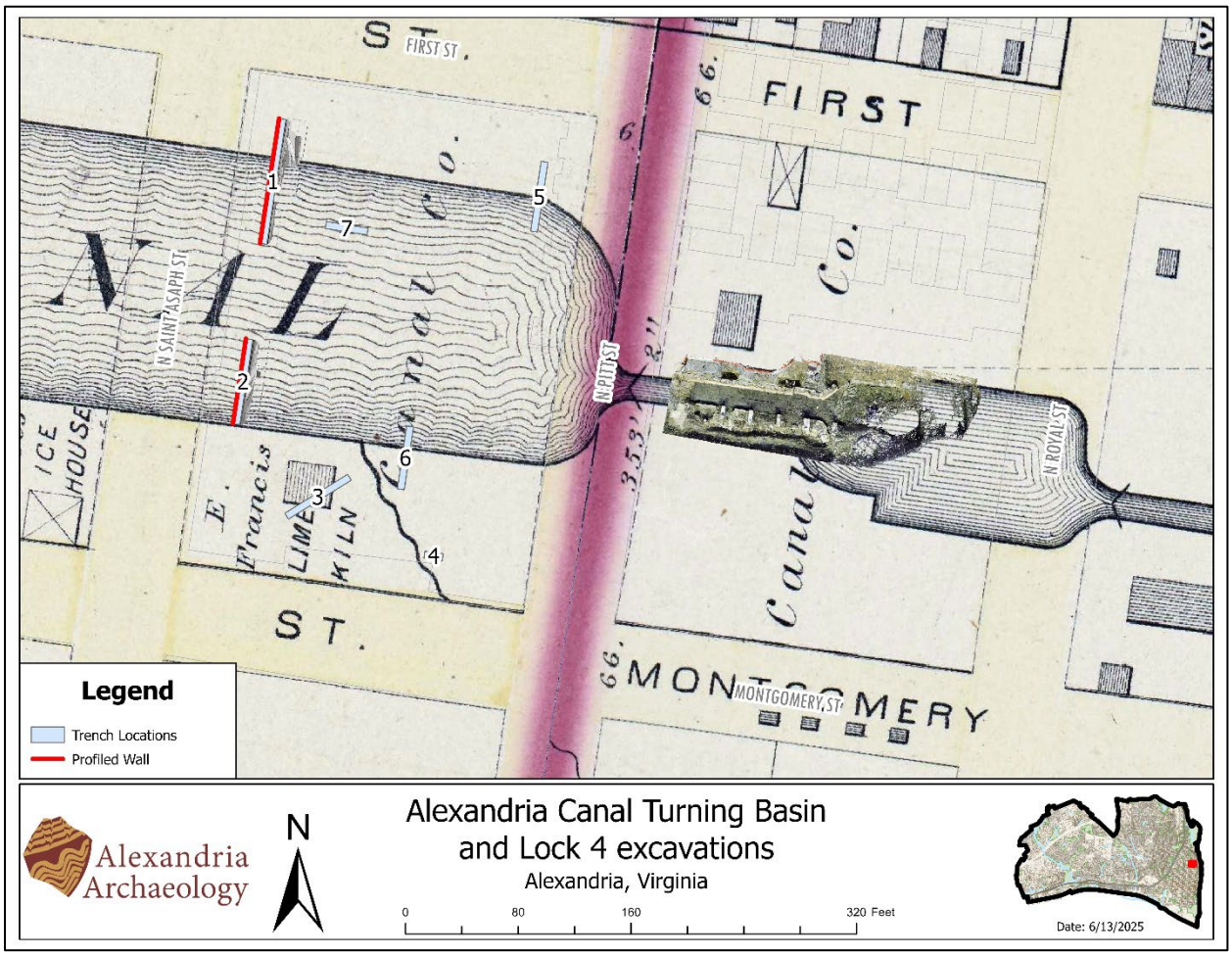

Figure 19. Archaeologically encountered elements of the Alexandria Canal, Turning Basin, Lock 4, and Pool/Basin 3. Numbers refer to archaeologically excavated trenches.

Unfortunately, absolute elevations of the trenches at 44AX232 were not recorded, but the archaeologists do provide relative measurements for each trench from the top of the parking lot surface. As recorded in a 2014 aerial LiDAR dataset that includes the site, the elevation of the parking lot surface at 901 N. St Asaph Street at the north end of trench 1 was 29.03 feet above sea level and at the south end 30.24 feet above sea level. The elevation of the parking lot

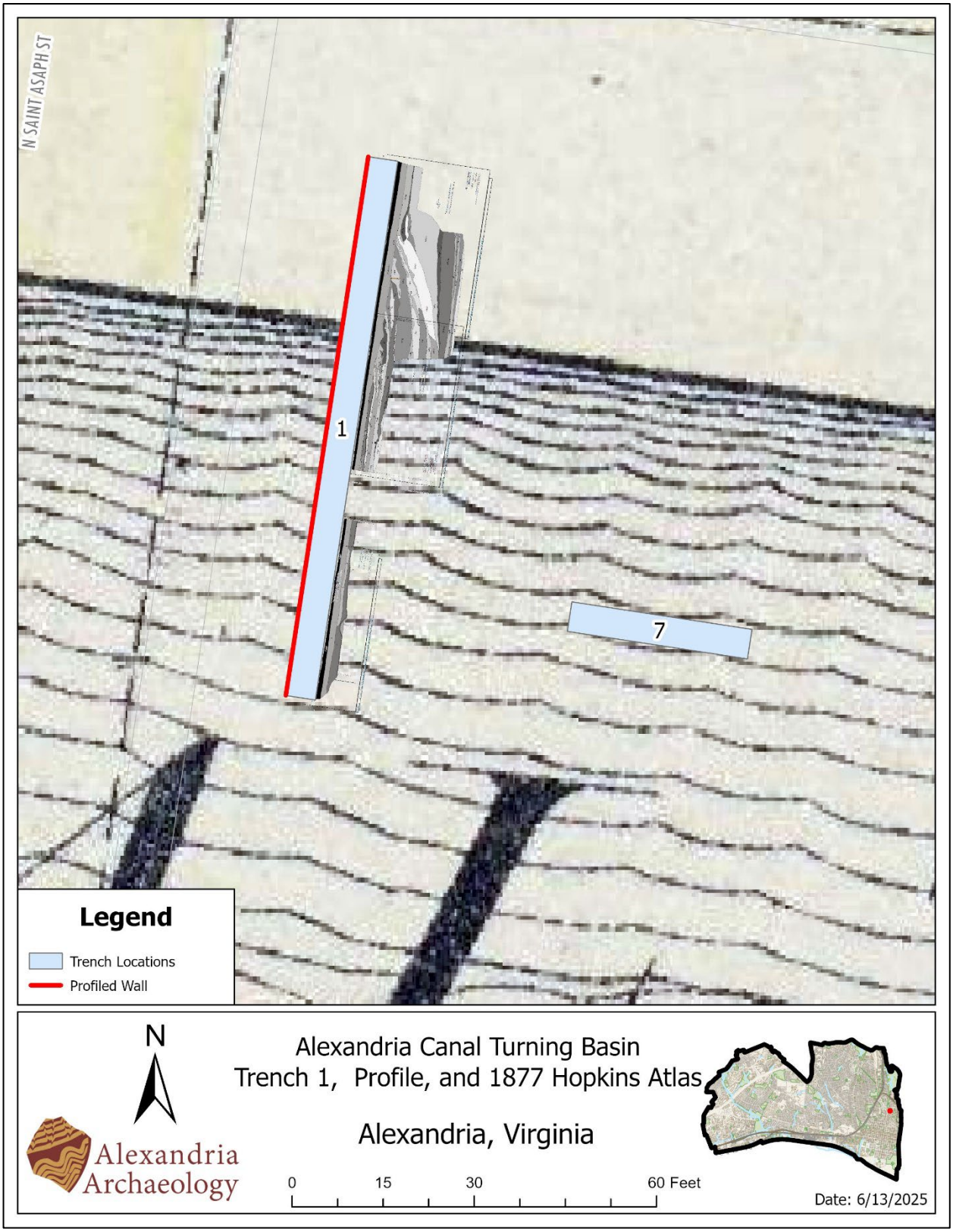

Figure 20. Trench 1 West Profile in relation to canal as mapped by G.M. Hopkins, City Atlas of Alexandria, VA, 1877.

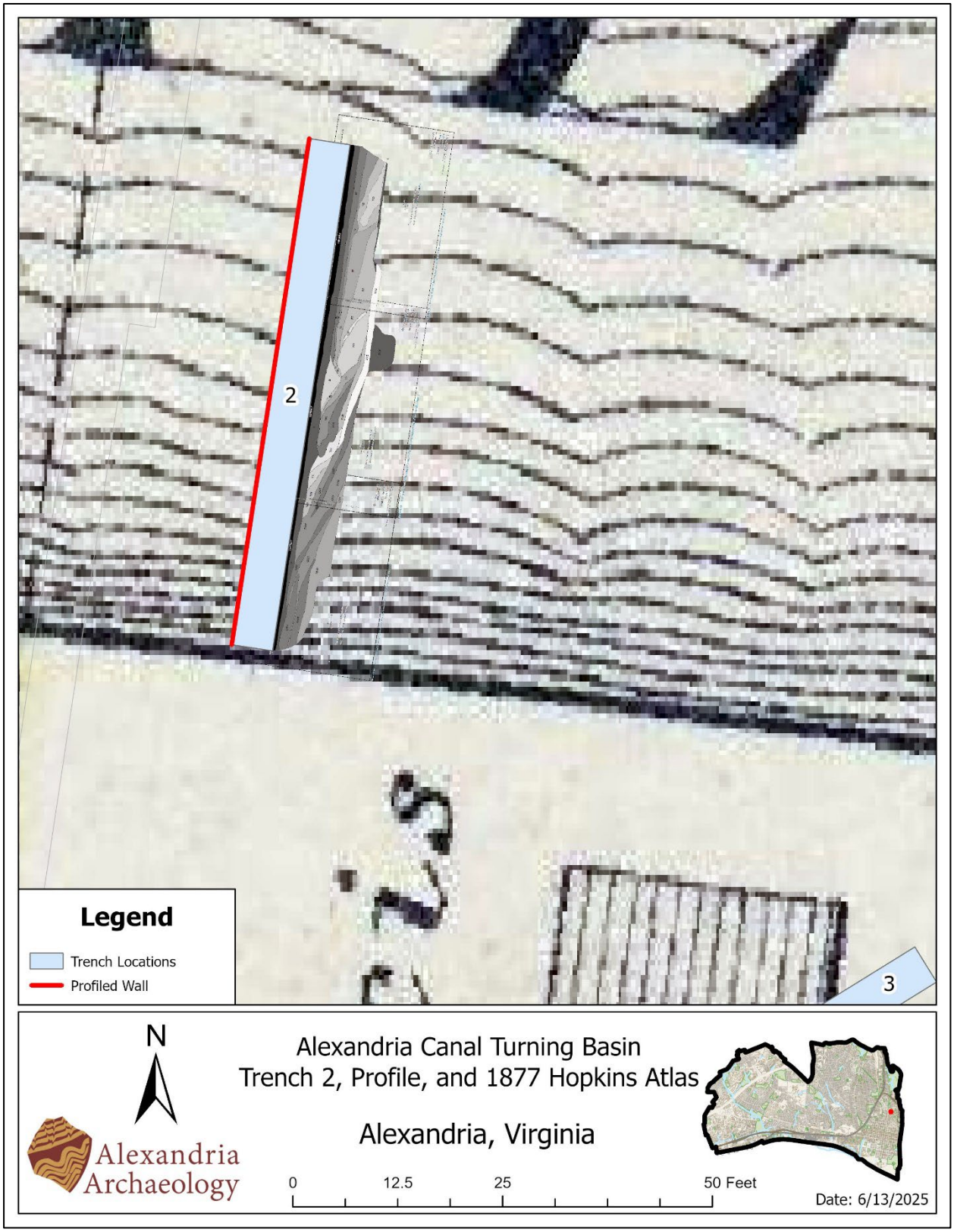

Figure 21. Trench 2 West Profile in relation to canal as mapped by G.M. Hopkins, City Atlas of Alexandria, VA, 1877.

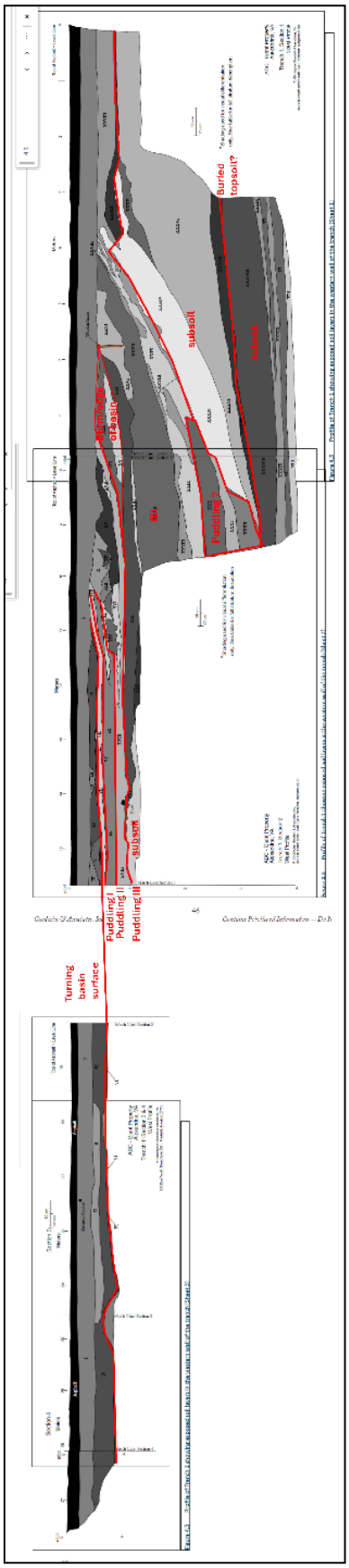

Figure 23. Trench 1 West Profile (north at top, south at bottom), excavated and recorded by Goodwin & Associates.

Figure 22. Trench 2 West Profile (north at top, south at bottom), excavated and recorded by Goodwin & Associates.

surface at the north end of trench 2 was 31.75 feet above sea level and at the south end 32.14 feet above sea level.

Therefore, in theory, the remains of the bottom of the Alexandria Canal Turning Basin should be encountered at the 901 N. St. Asaph St site at approximately 0.53 feet below the top of the north end of trench 1, 1.74 feet below top of the south end of trench 1, 3.25 feet below the top of the north end of trench 2, and 3.64 feet below top of the south end of trench 2.

The layers identified by Goodwin & Associates as being the surface at the bottom of the Turning Basin are Strat VI in Trench 1 and Strat X in Trench 2. These layers are at approximately the correct depths as the bottom of the Turning Basin as predicted by the above analysis of the canal elevations and are most likely the surface at the bottom of the Turning Basin.

The trench profiles from 901 N. St. Asaph Street (especially trenches 1 and 2) reveal multiple thin stratigraphic layers that dive toward the center of the canal, some of which are below the theoretical bottom of the canal. It should be noted here that the bottom of the canal (the interface between the bottom of the water in the canal and ground surface that water rests on is likely not the 'bottom' of human intervention to build the canal. Ewing's canal notebooks contain references to 'puddling' or clay put down to retain water and layers of timber and gravel under the locks to better support their weight. These observed layers below the supposed 'bottom' of the canal are likely engineered or cultural layers created or otherwise deposited during construction activities at the canal (c. 1843-1845), designed to prepare and shape the ground surface for subsequent construction activities and to help retain water in the canal.

Furthermore, it should also be noted that while observed canal-related stratigraphy appears to exist below the 'bottom' of the canal, there should be additional portions located at the top of the canal that appear to have been graded away at some point prior to the construction of this parking lot. Hahn and Kemp cite a letter from Ewing stating the depth of water along the length of the canal to be 4 feet (see same letter from Ewing to Smith in which Ewing provides the change in elevation at each lock, 1992:24). Therefore, there should be at least four feet between the bottom surface of the canal and the top of the water level, plus some additional height for the bank of the canal prism that prevents the water from spilling out. From the stratigraphy observed by Goodwin & Associates at 901 N. St Asaph St., it would appear that the top of the basin has been graded away.

Additional Canal Sites without site numbers

Further upstream, portions of the Aqueduct Bridge over the Potomac River still exist, including the abutment on the northern shore at Georgetown just west of the Francis Scott Key Bridge and a stone pier in the water close to the southern end of the former crossing. The construction of this section of the canal is extensively documented in a report by Captain William Turnbull

(Turnbull 1873). These features are not currently registered as an archaeological site in the District of Columbia.

Likewise, two F-shaped wharves or piers in the Potomac River at the outlet of the canal in Alexandria have not been registered as an archaeological site. In 1985, Donald Shomette reported that they were “still partially extant” after examining 1983 aerial photography (Shomette 414-5). At the time of this report, it is not clear if this location falls within the District of Columbia or the City of Alexandria. The boundary line provided by the City of Alexandria’s GIS Office follows the shoreline along this stretch of the river while the boundary line provided by the District of Columbia’s planning office is drawn approximately 350 feet out into the river. As drawn by both jurisdictions, this leaves the site of the canal wharves unclaimed by either jurisdiction. Therefore, additional research is required to determine which boundary line is correct and which jurisdiction is responsible for the management of this archaeological resource. Once this is done, the canal wharves should be registered as an archaeological site in the appropriate jurisdiction. In theory, the boundary between Second Street and Jones Point should follow the pierhead line, which would put the site of the canal wharves within Alexandria, Virginia (see Public Law 208, 59 Stat 552, Chapter 443, "To establish a boundary line between the District of Columbia and the Commonwealth of Virginia, and for other purposes", 1945, https://www.loc.gov/item/llsl-v59/, pp. 552-554).

One additional site that may be related to the Alexandria Canal can be mentioned here. The final fate of the Alexandria Canal barge fleet is not known; however, aerial photography from 1927 reveal between 20 and 30 long, narrow shapes lined up in a row along the main Four Mile Run channel, just west of where it ran under Commonwealth Avenue. It is not clear what these features represent, but it is

Figure 24. Detail from 1927 aerial imagery. Four Mile Run at Commonwealth Avenue. 1927 aerial imagery.

possible these are the remains of the canal fleet. The size of the barges on the Alexandria Canal was limited by the size of the locks, which meant canal barges could be up to 90' long by 15' wide. The majority of these features are across the City boundary in Arlington County, but the southern-most five or six are theoretically in Alexandria. Unfortunately, Four Mile Run was heavily channelized by the Army Corps of Engineers in the 1960s and the Arlington Water Pollution Control Plant now stands on this location (Figure 24). It does not seem likely that these features have survived into the present undisturbed, but it is possible at least several have escaped 20th Century impacts and still exist.

Conclusion and Recommendations

From these observations, it would appear likely that:

1) Goodwin & Associates encountered the former surface at the bottom of the Alexandria Canal Turning Basin (44AX232) between approximately half of a foot and three and a half feet below the surface in trenches 1 and 2;

2) Goodwin & Associates also encountered cultural layers related to the preparation and construction of the canal below these layers that represent the surface of the 'bottom' of the canal basin; and,

3) Prior to the construction of the parking lot that existed at the site in 2017, a significant amount of the top of the Turning Basin was graded away and destroyed.

In addition to these archaeological findings, the Ewing collection held by the National Park Service is a rich source of descriptive data about the design, construction, and early use of the canal. The construction notebooks consist of 11 books held at Arlington House (Accession ARHO-00468; Catalog #s ARHO 2653-2663) and two at CHOHA_1245 and CHOHA_1246). An additional volume containing surveys for the acquisition of lands for the Alexandria Canal (dated 1831) exists at the Library of Virginia (Accession Number 24665b, Volume 282). The remainder of the Ewing collection held by NPS consists financial statements, receipts, checks, accounts, and other items related to Ewing's work on the construction of the canal. Therefore, these archival items represent a good candidate for a digitization and transcription program to assist future researchers. Grant funding should be identified and secured to achieve this goal.

Primary Source Collections

Meskell Ewing Canal Construction Notebooks, National Park Service, Chesapeake & Ohio National Historical Park, CHOHA_1245 and CHOHA_1246

Ewing Alexandria Canal Collection, National Park Service, Arlington House, Accession # ARHO_00468.

Alexandria Canal Company Survey Book and Account of Tolls Collected, 1831-1853, Library of Virginia, Accession number 24665d, Barcode numbers 1112985 and 1112996.

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