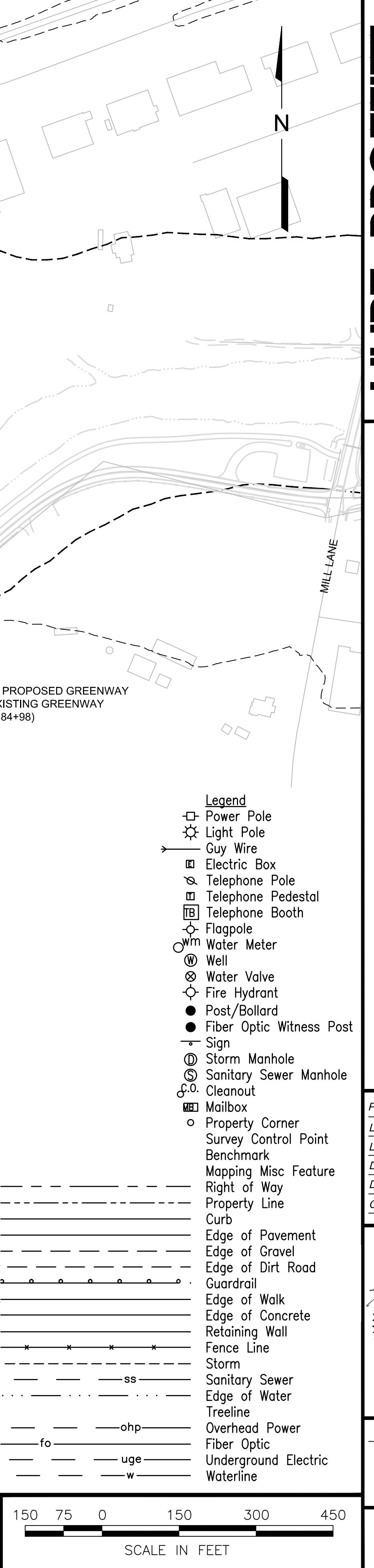
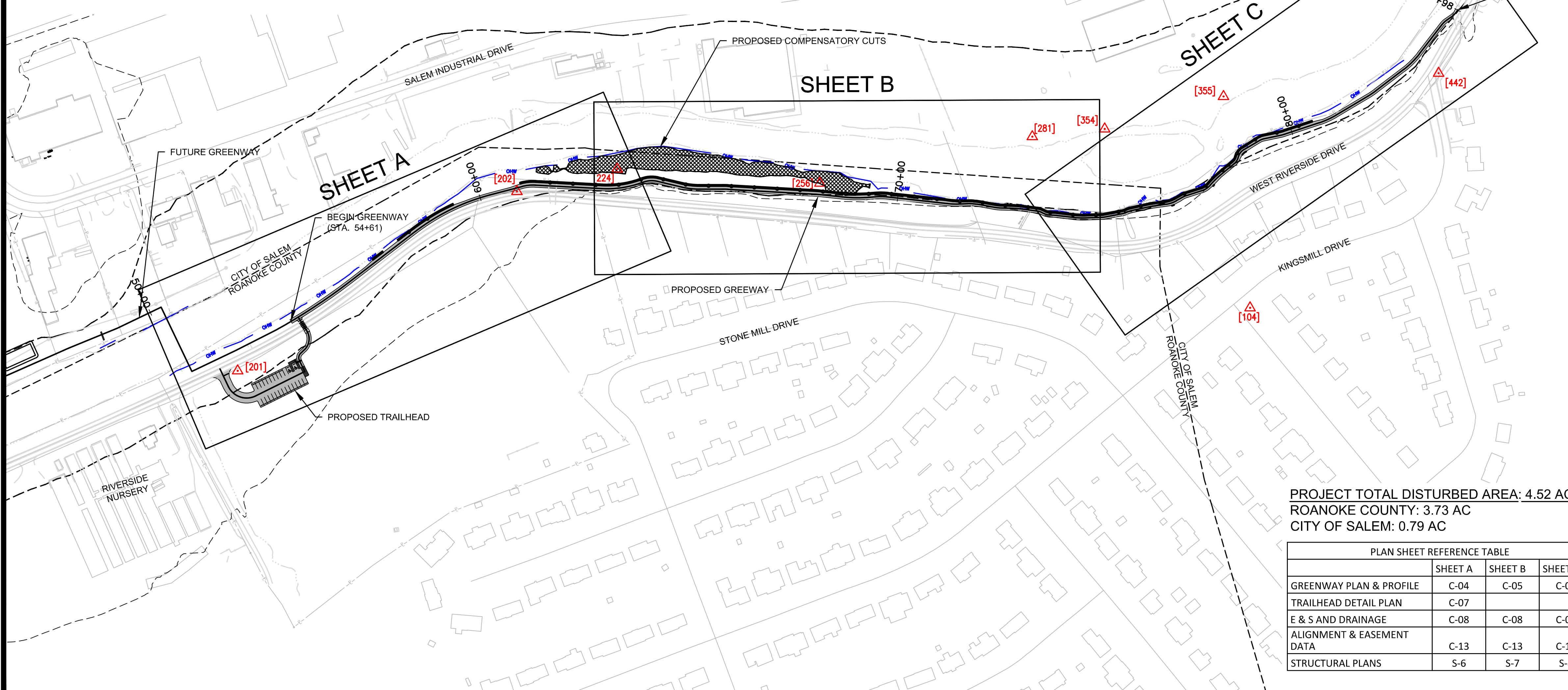
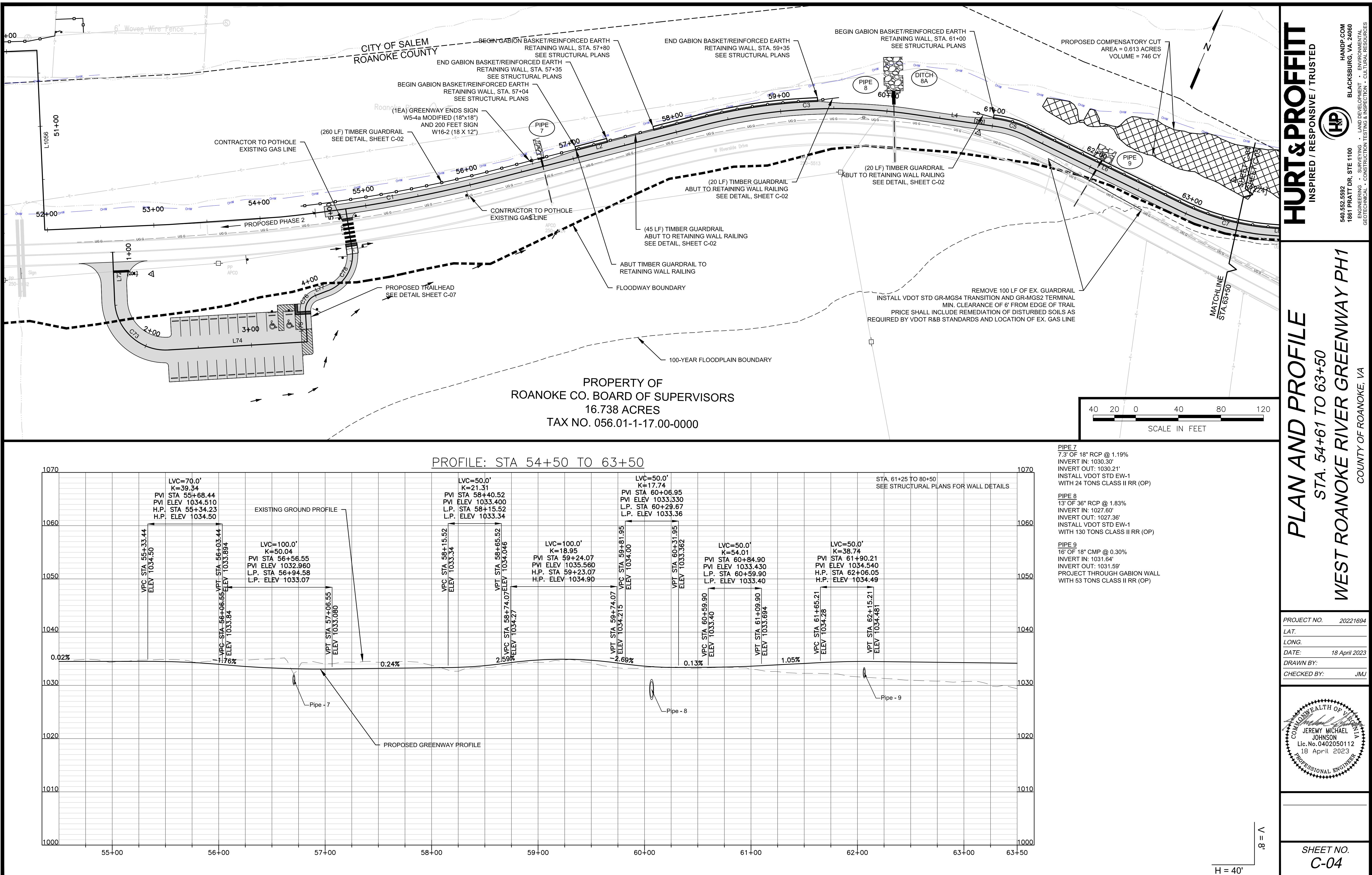
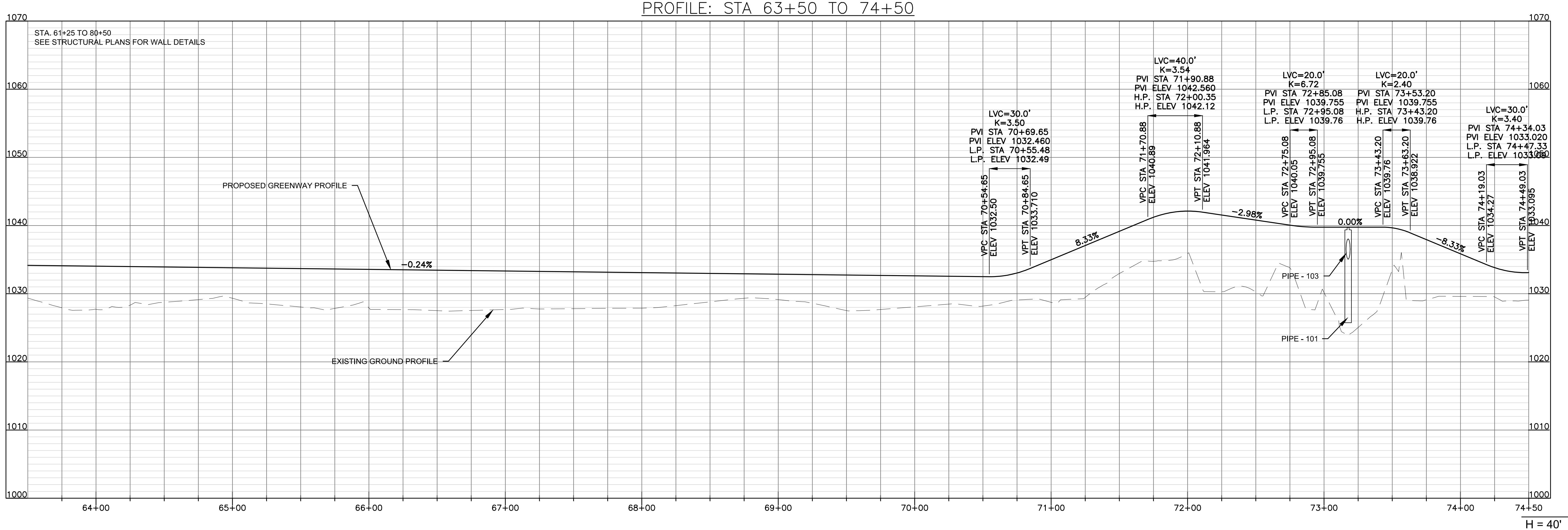
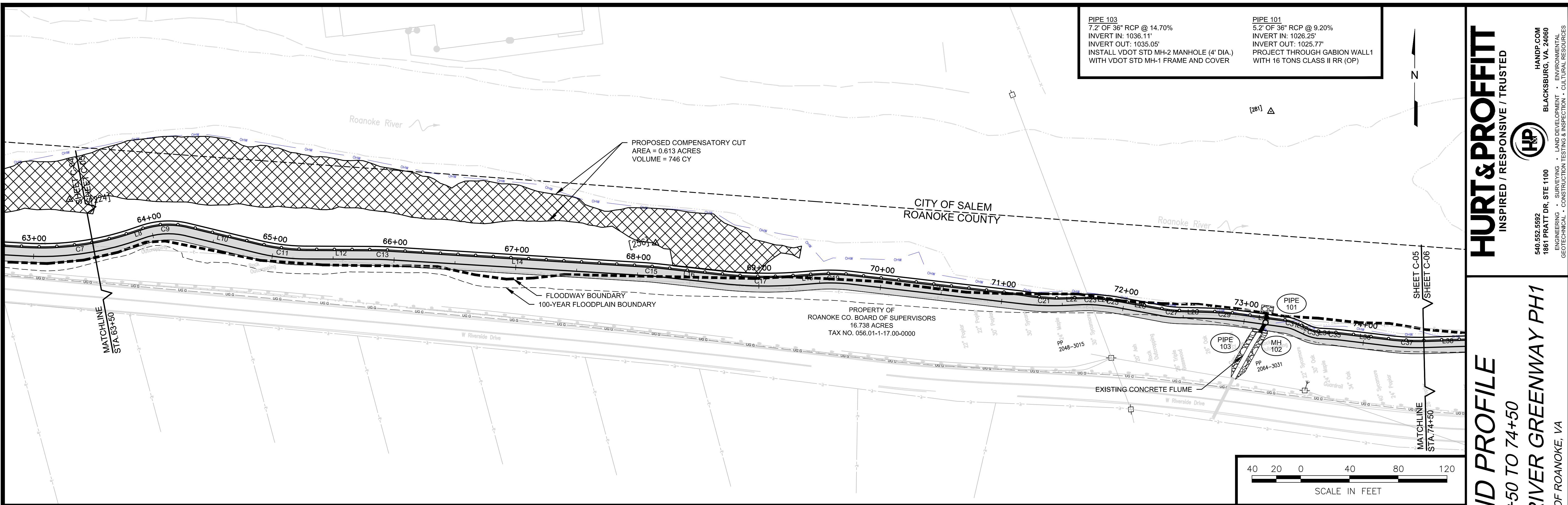


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3	3629134.194	11017118.070	1041.02	TRAVROD SET
4	3629388.541	11017781.065	1039.44	TRAVROD SET
5	3632227.054	11023401.185	1031.05	TRAVROD SET
6	3632156.429	11024118.713	1030.86	TRAVROD SET
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102	3632445.110	11023775.882	1033.90	PP 7
103	3630679.658	11024470.123	1027.39	PP 8
104	3629955.470	11021130.826	1089.40	PP 6
105	3628334.773	11018374.115	1172.61	PP 4
106	3628931.668	11015306.732	1051.79	PP 1
107	3628926.700	11014674.769	1049.33	PP 9
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202	3630231.682	11019390.950	1034.74	TRAVNAIL
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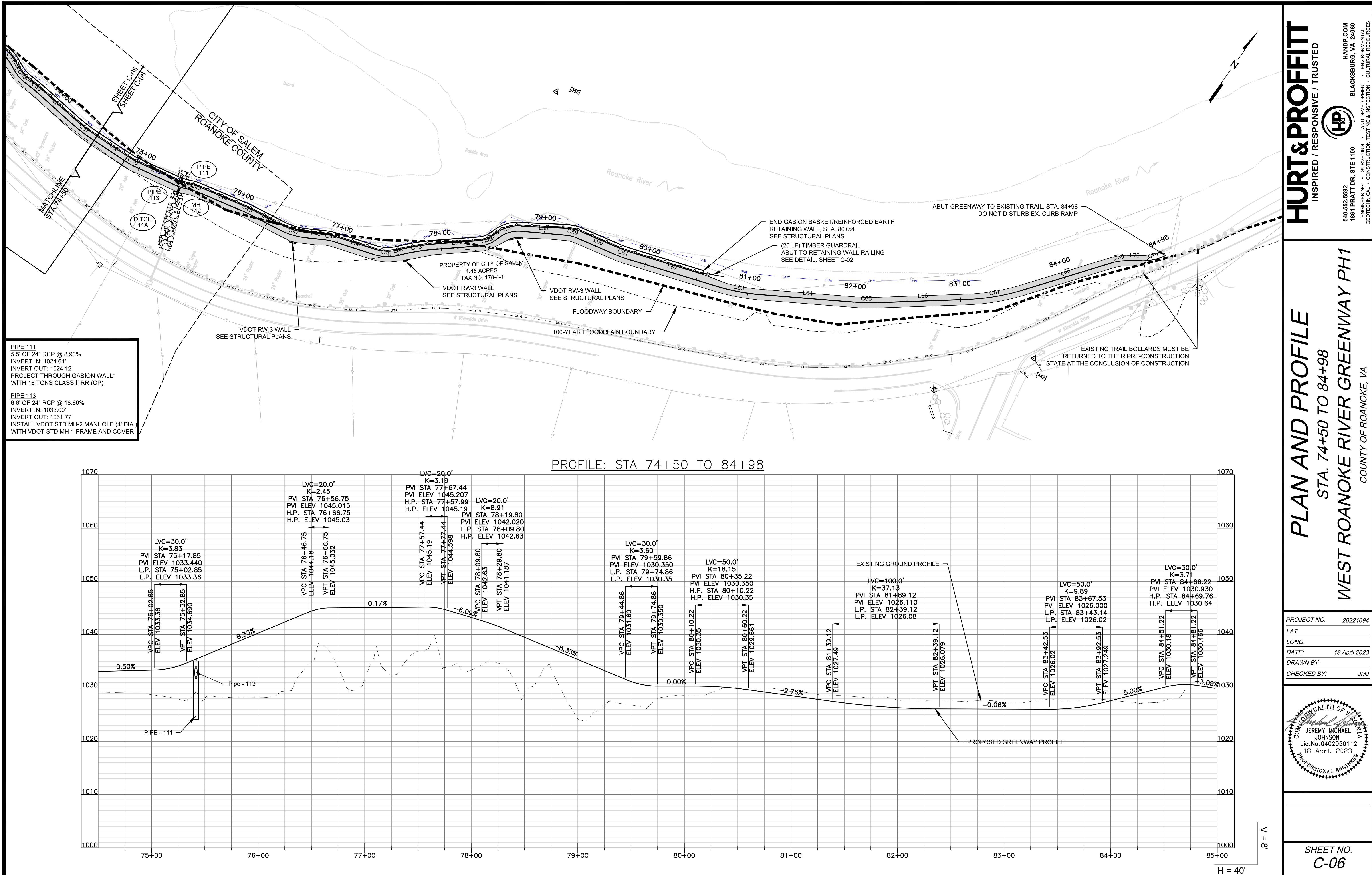
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Vertical Datum: NAVD88				
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Combined Factor: 0.9998986				
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354	3630380.207	11020785.772	1024.53	TRAVNAIL
355	3630457.235	11021067.815	1023.44	TRAVNAIL
442	3630512.387	11021578.177	1038.53	PK NAIL SET
449	3630972.425	11021819.519	1029.64	PK NAIL SET
450	3631248.174	11022459.018	1023.13	PK NAIL SET
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452	3631885.632	11023155.567	1021.73	TRAVNAIL
453	3632217.021	11023166.526	1027.91	TRAVNAIL
454	3628397.696	11016069.439	1046.63	TRAVNAIL
455	3628917.430	11015980.722	1049.97	TRAVNAIL
466	3628791.153	11016352.642	1045.40	TRAVNAIL
467	3628944.006	11016760.662	1043.07	TRAVNAIL
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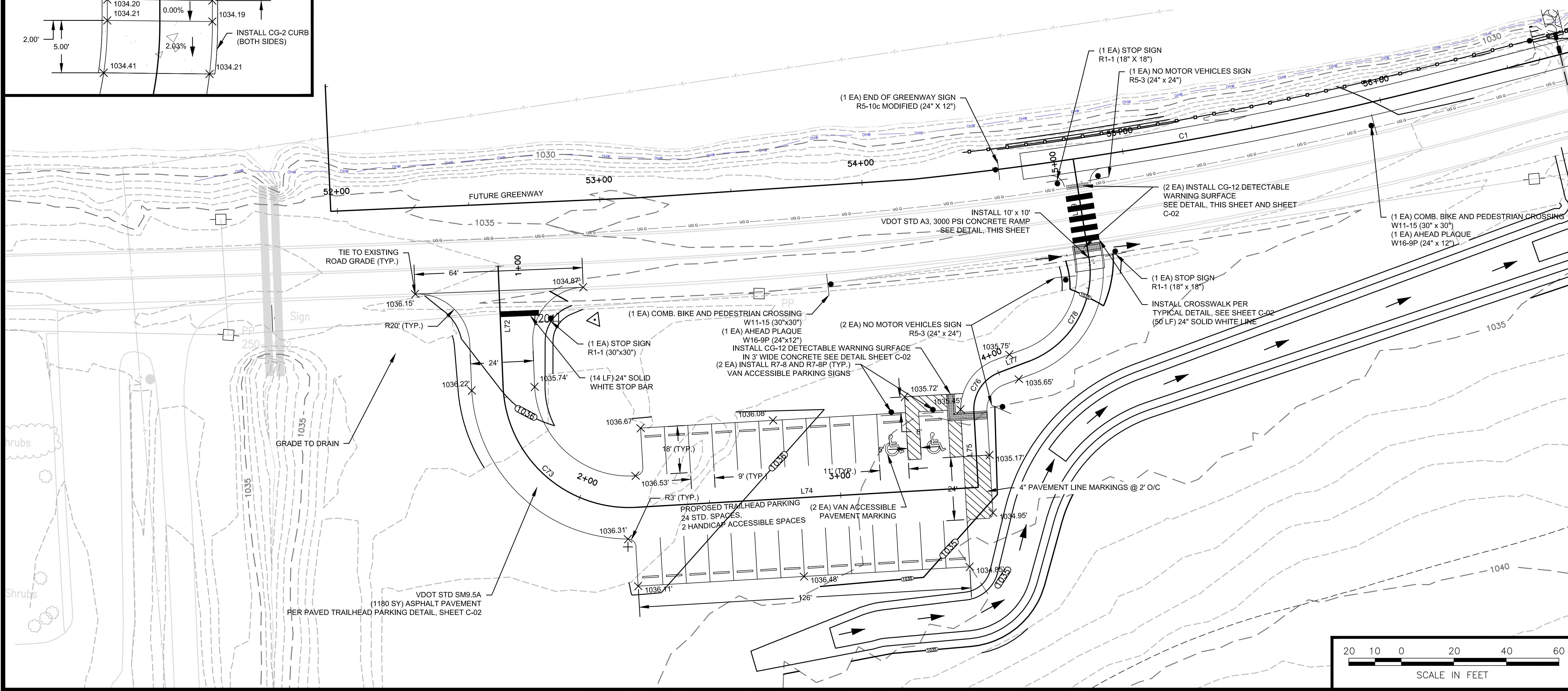
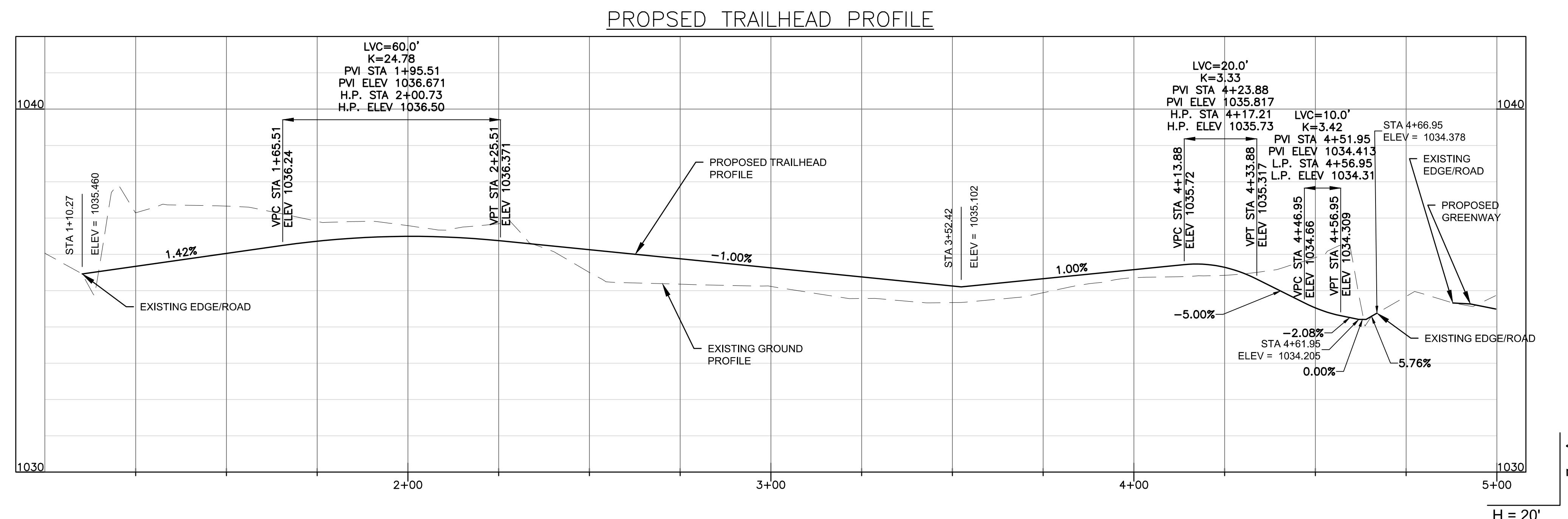
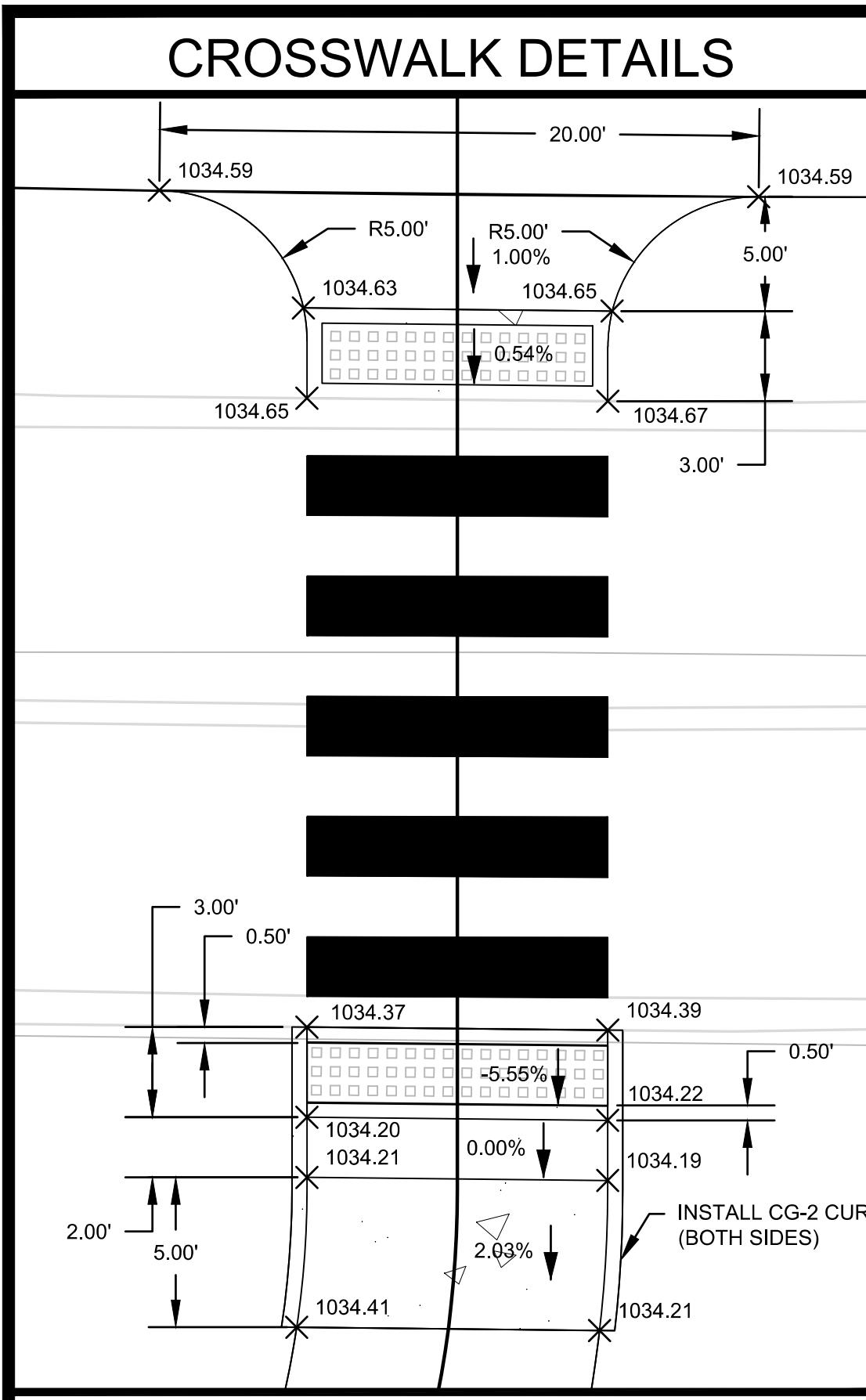






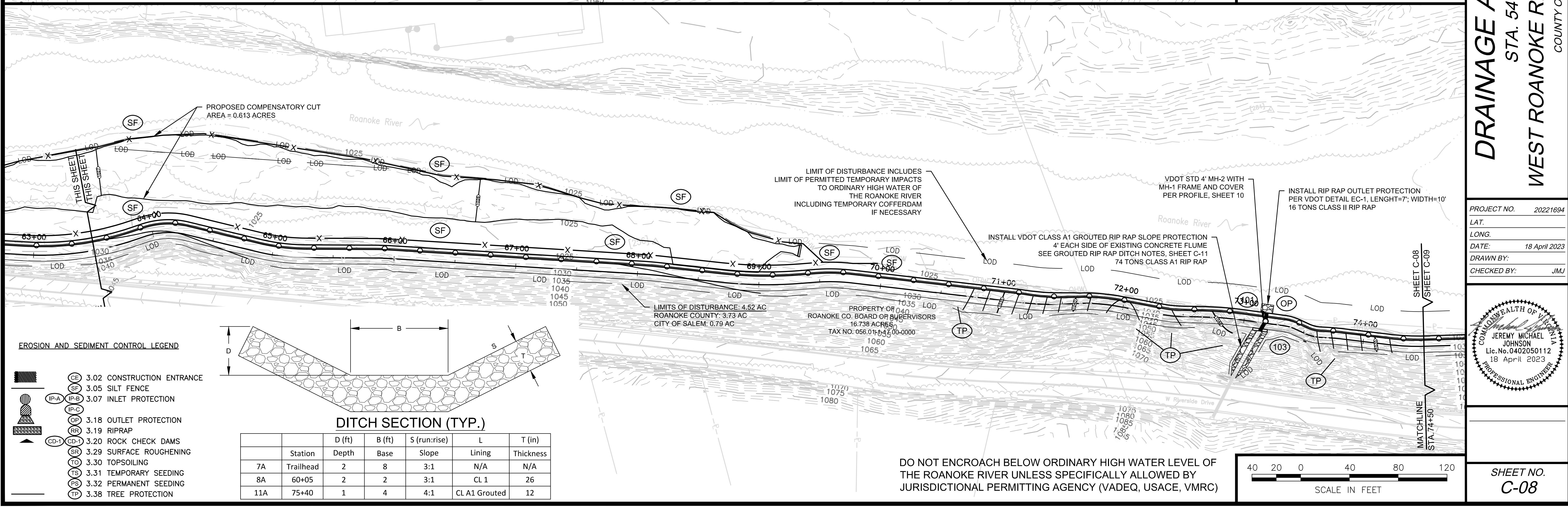
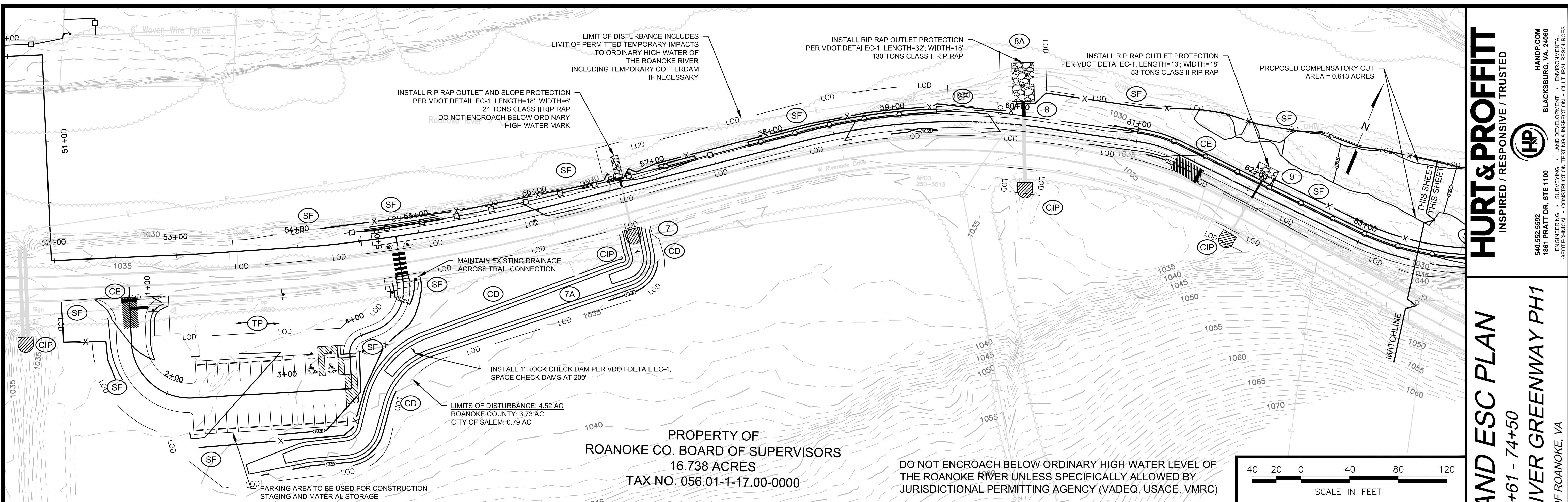
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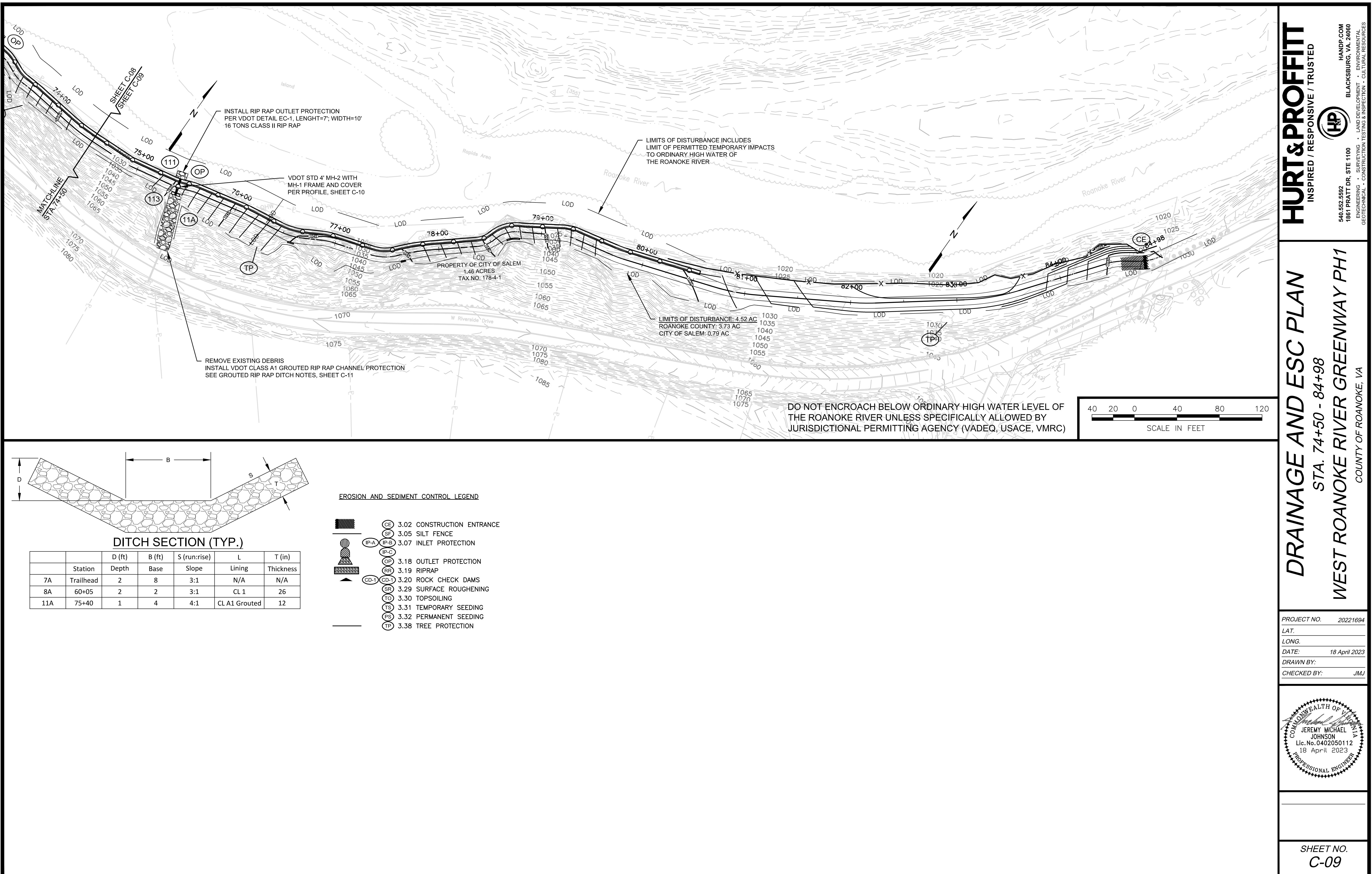




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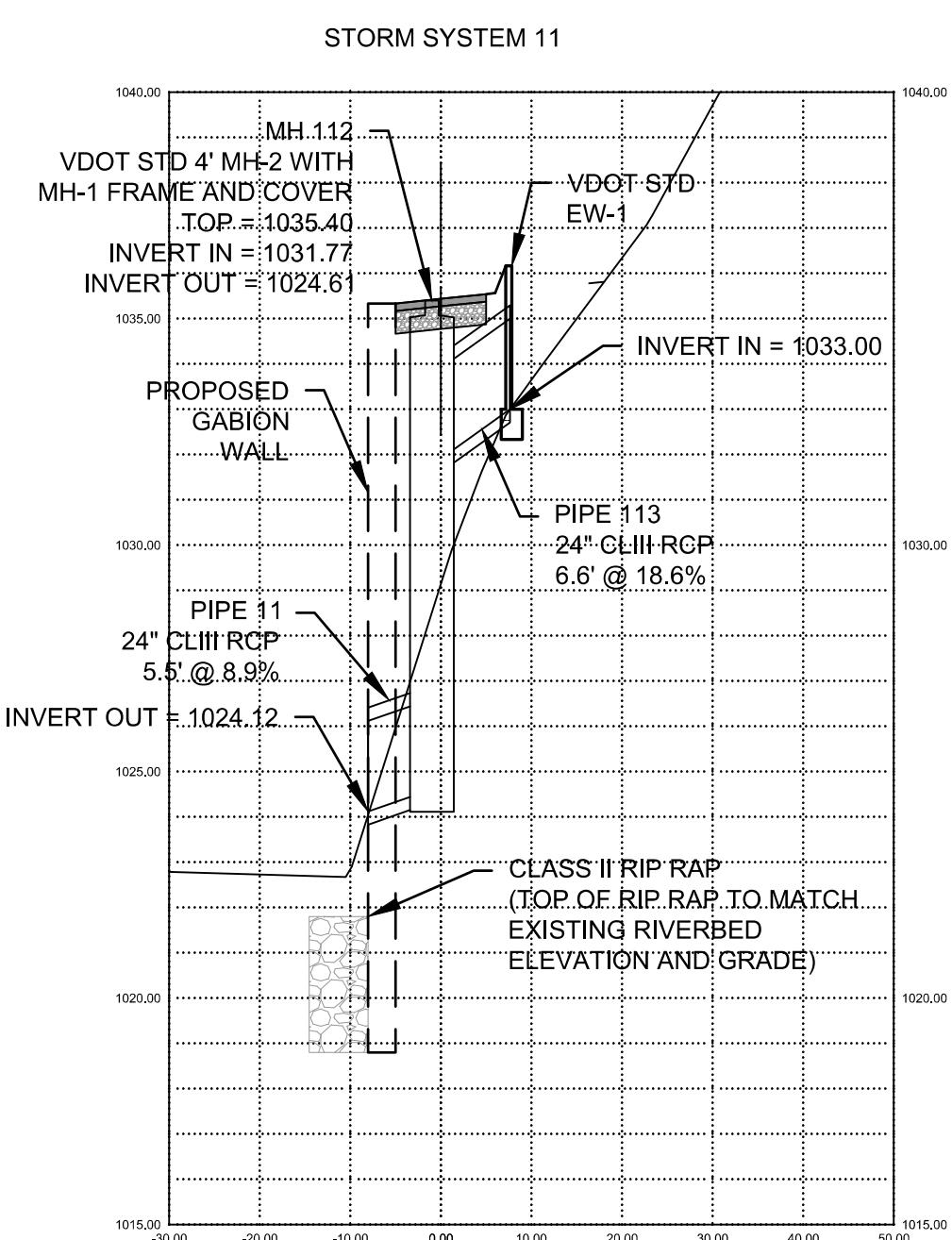
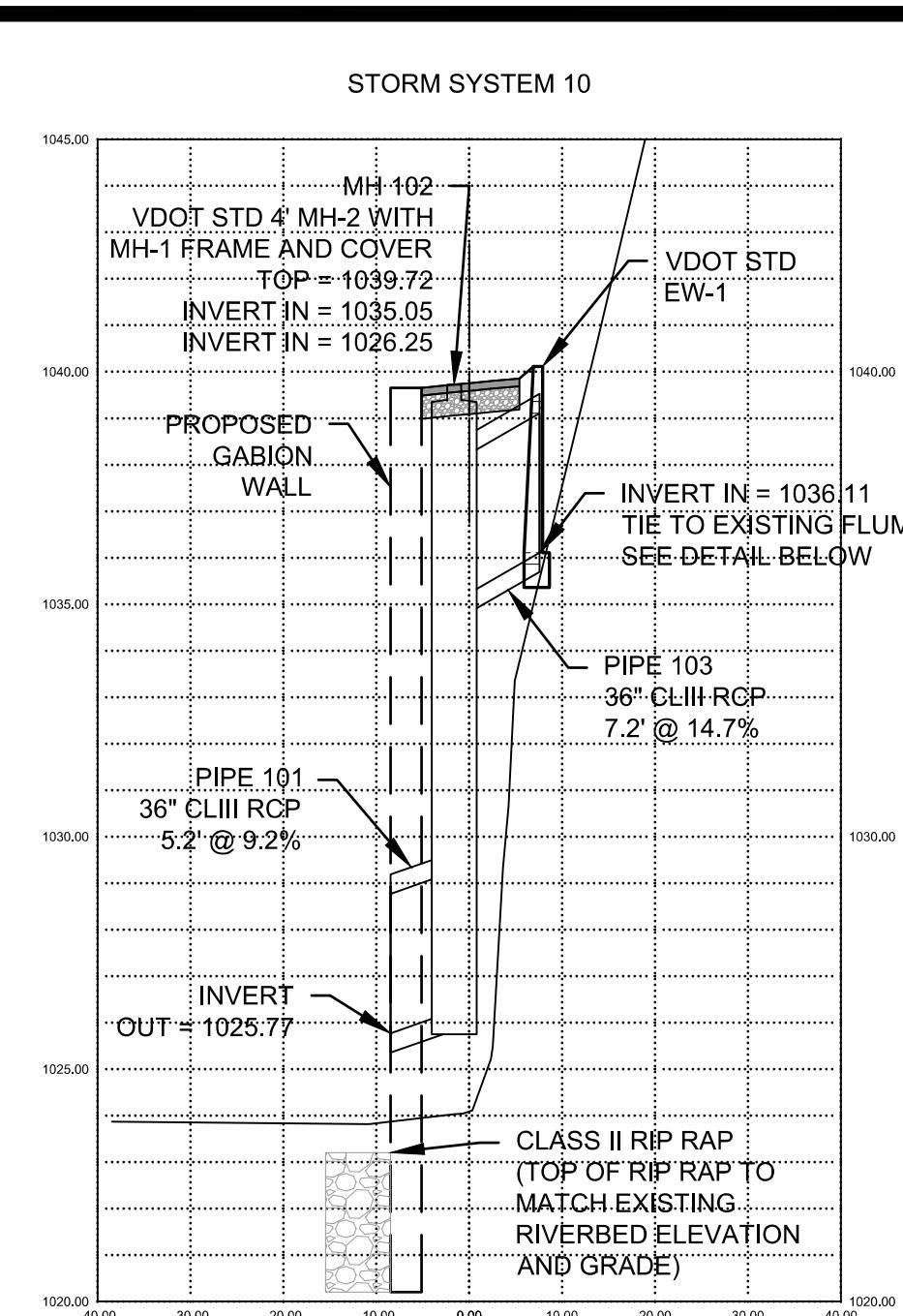
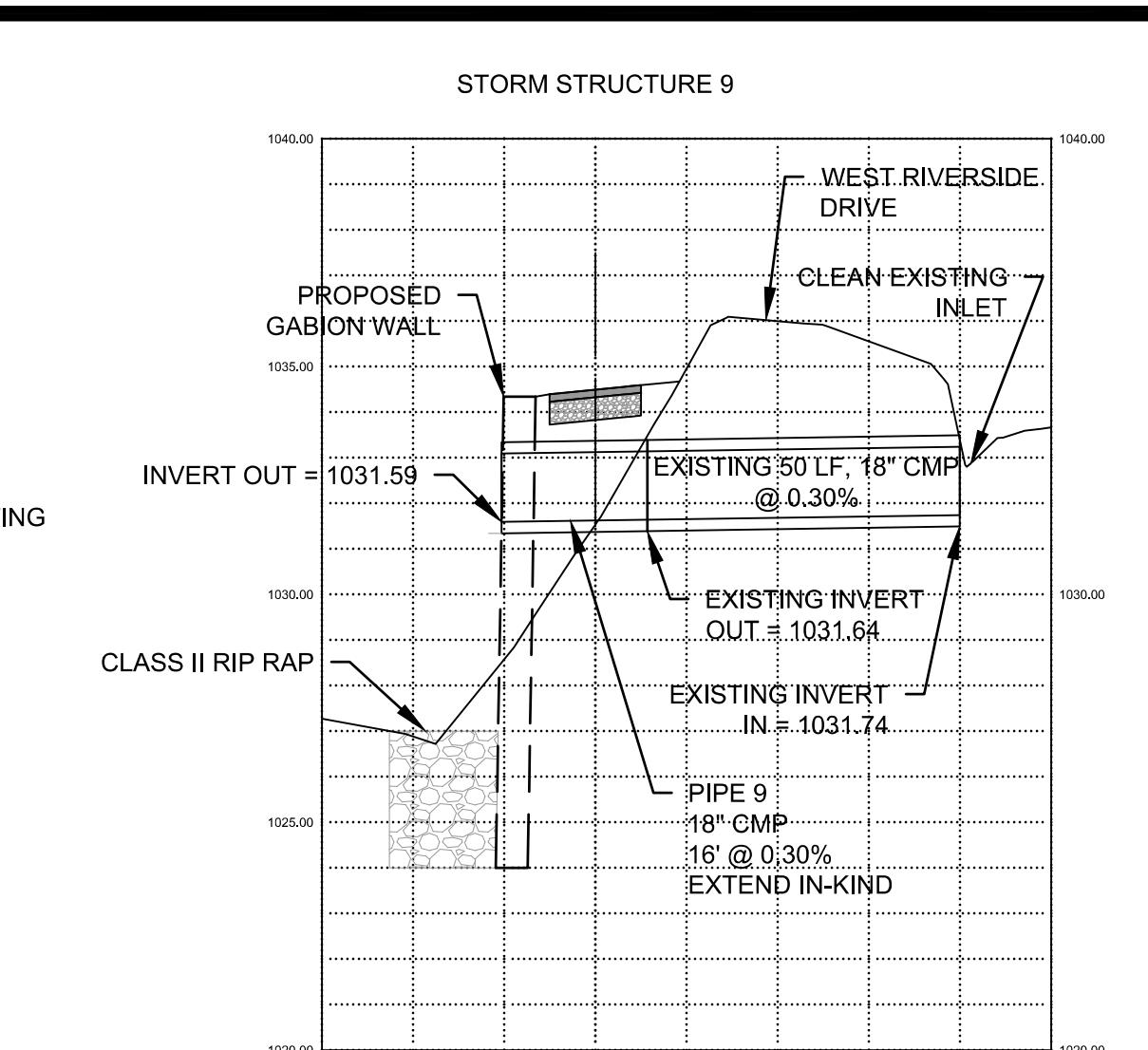
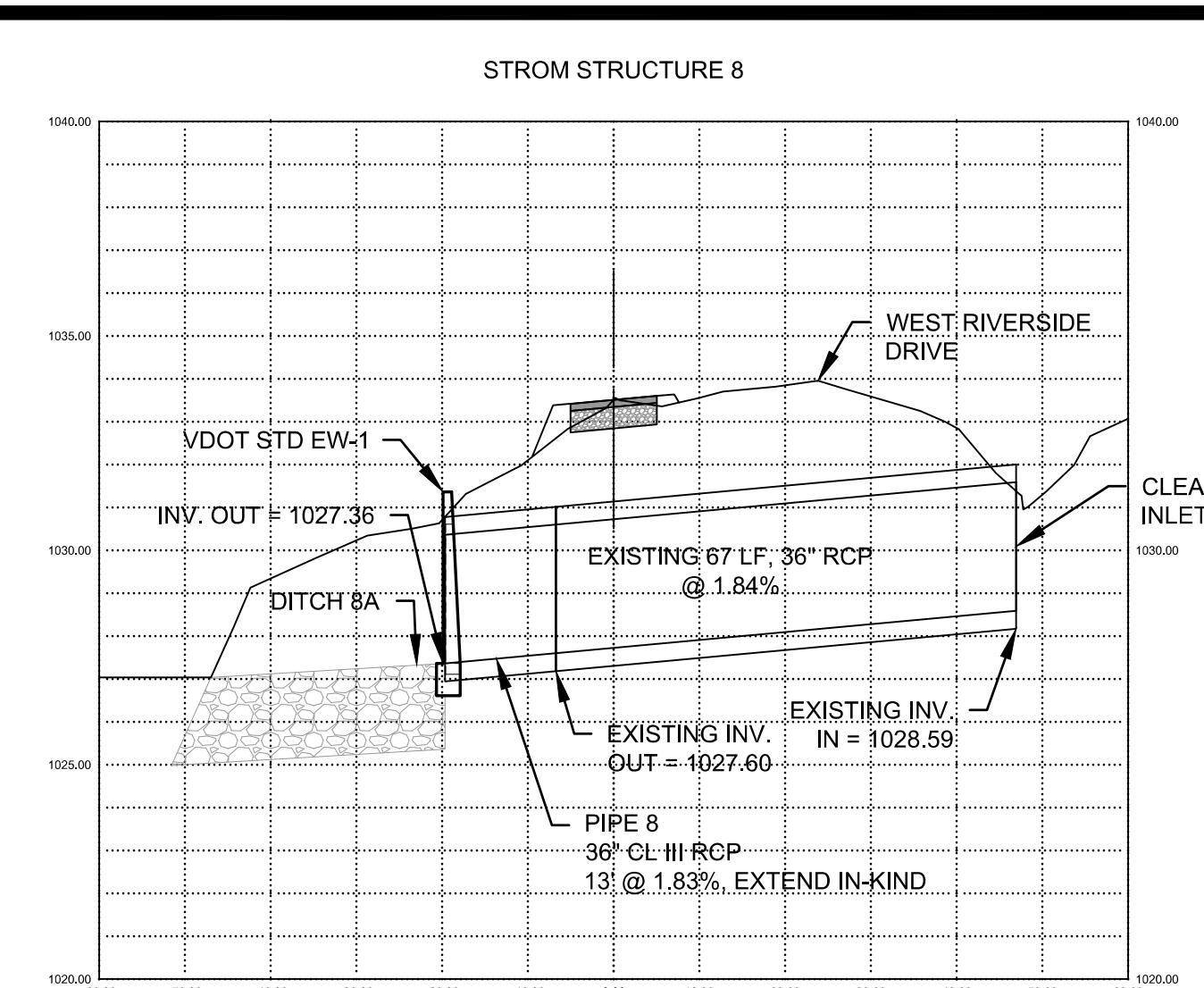
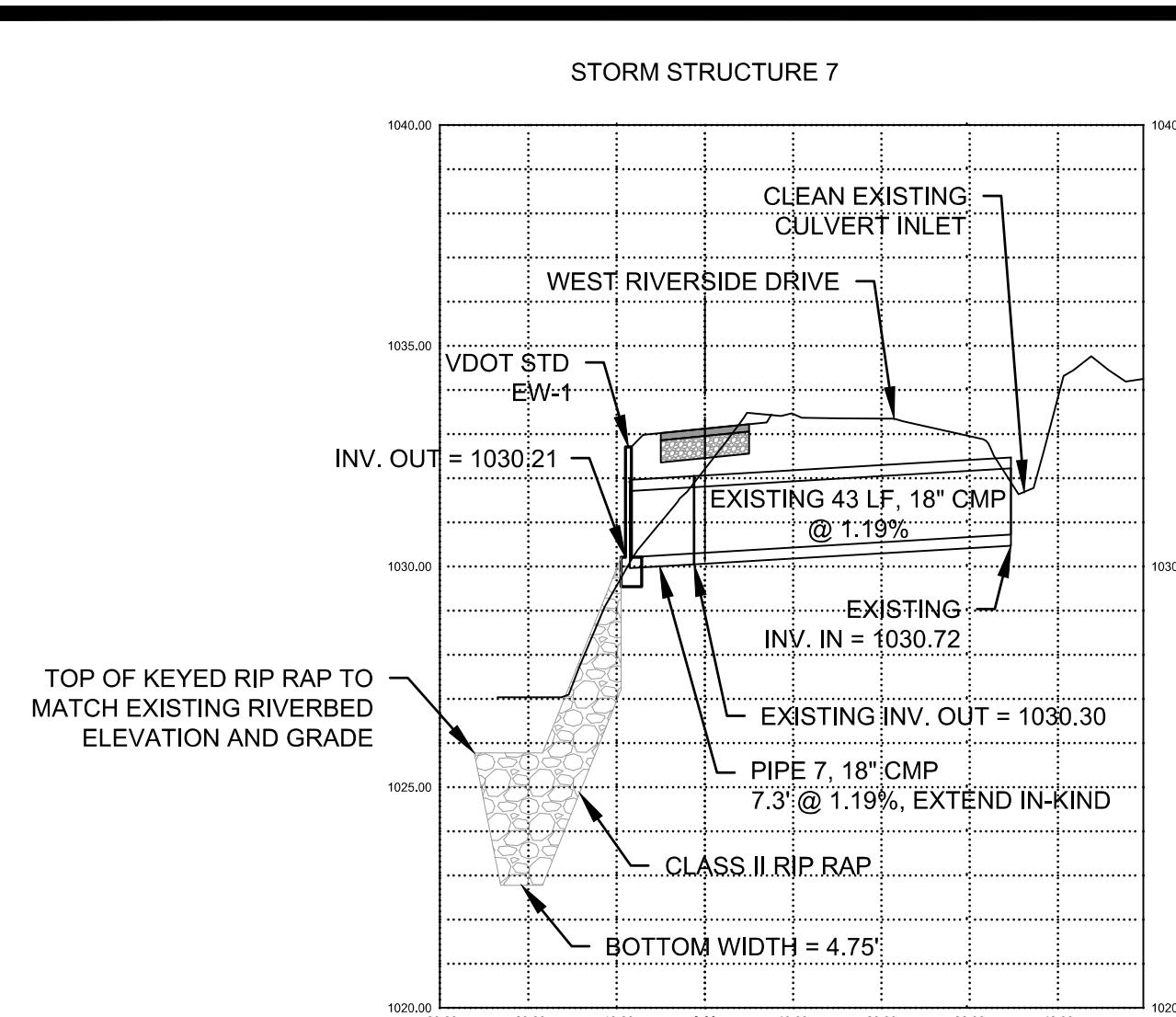
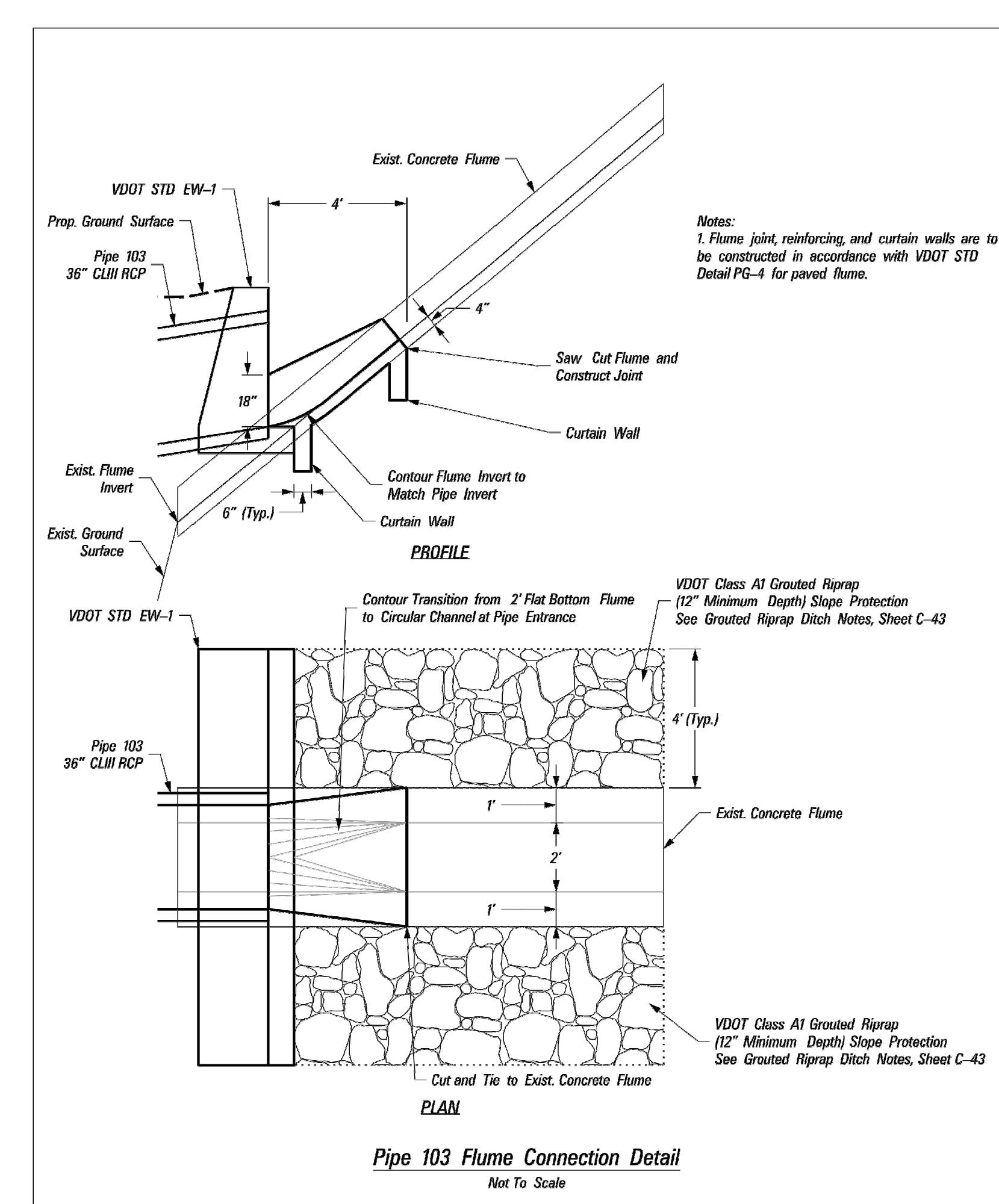
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COUNTY OF ROANOKE, VA
WEST ROANOKE RIVER GREENWAY PH1

PROJECT NO. 20221694
LAT.
LONG.
DATE: 18 April 2023
DRAWN BY:
CHECKED BY: JMJ

COMMONWEALTH OF VIRGINIA
JEREMY MICHAEL JOHNSON
Lic. No. 0402050112
18 April 2023
PROFESSIONAL ENGINEER

SHEET NO.
C-10

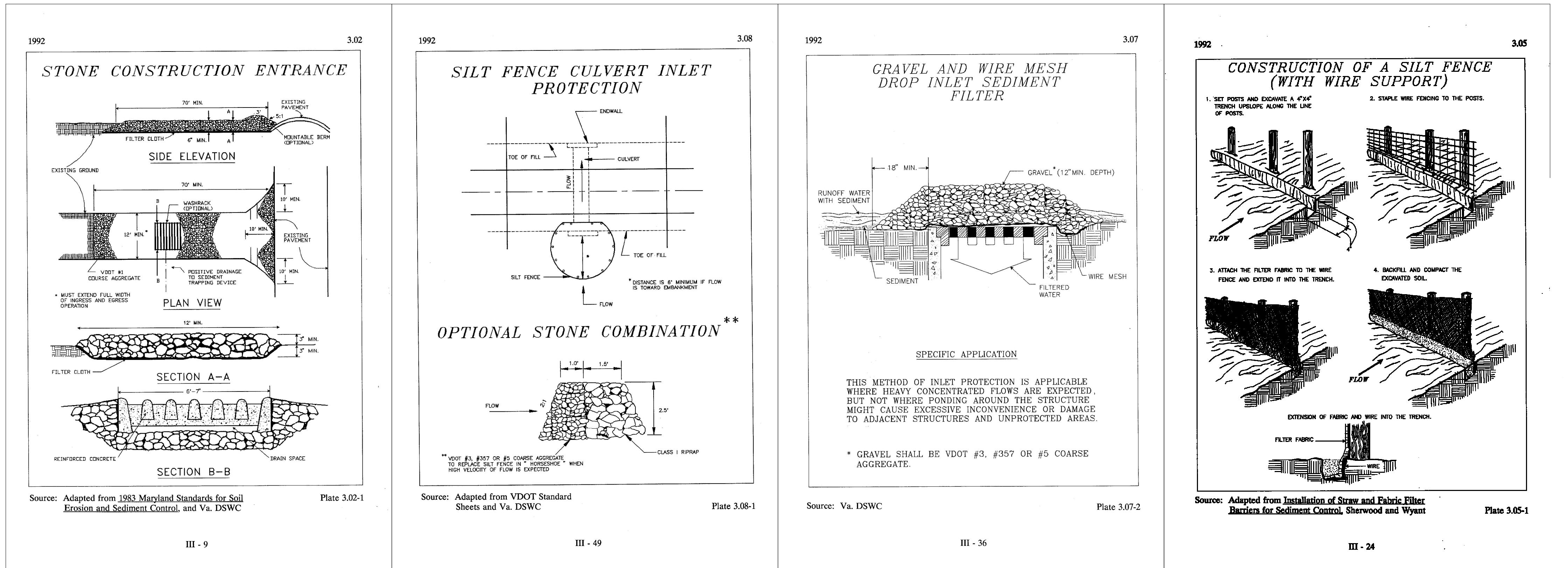




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<p>EROSION & SEDIMENT CONTROL NARRATIVE</p> <p>1. Project Area</p> <p>The project area runs generally parallel to the Roanoke River. It is bounded to the west by the proposed trailhead adjacent to 2306 W Riverside Dr and joins the end of an existing greenway between West Riverside Drive and the Roanoke River, near Kingsmill Lane. The proposed trailhead will be constructed on a parcel owned by Roanoke County on the south side of West Riverside Drive which will have parking for approximately 25 vehicles.</p> <p>The contractor shall be responsible for providing an approved erosion and sediment control plan for off-site borrow or waste areas.</p> <p>2. Critical Areas</p> <p>The proximity of the entire project area to the Roanoke River will require that particular attention is given to eliminating sediment laden runoff to the maximum extent practicable.</p> <p>Through the 'steep slope section,' between stations 70+00 and 80+50, a temporary cofferdam will be utilized, and silt fence will be installed wherever possible. To minimize the possibility of sediment runoff into the Roanoke River, the slope is not to be denuded until immediately before construction of the gabion basket retaining wall is to begin; however, tree cutting will commence as soon as permitting through U.S. Fish and Wildlife Service (USFWS) allows.</p> <p>3. Erosion and Sediment Control Measures</p> <p>The construction phase erosion and sediment controls shall be designed to retain sediment on site to the maximum extent practicable. All control measures must be properly selected, installed, and maintained in accordance with the manufacturers' specifications and good engineering practices. If periodic inspections or other information indicates a control has been installed inappropriately, or incorrectly, the permittee must replace or modify the control for site suitability. If sediment escapes the construction site, offsite accumulations of sediment must be removed at a frequency sufficient to minimize offsite impacts (e.g. fugitive sediment in street could be washed into storm sewers by the next rain and/or pose a safety hazard to users of public streets). Sediment must be removed from sediment traps or sedimentation ponds when design capacity has been reduced by 50%. Litter, construction debris, and construction chemicals exposed to storm water shall be prevented from becoming a pollutant source for storm water discharges (e.g., screening outfalls, picked up daily).</p> <p>The following measures will be used to control erosion and sediment-laden runoff on this project. See Appendix A for locations of specific erosion control measures which have been incorporated into the design plans. The Contractor shall be responsible for installation of appropriate soil stabilization measures as required by the construction sequencing.</p> <p>1. Safety Fence: will prevent the public from entering the construction site. (VESCH Standard and Spec. 3.01)</p> <p>2. Construction Entrance: will be used to reduce mud/sediment tracking onto public roads. (VESCH Standard and Spec. 3.02). If mud or sediment is transported onto a paved road surface, the road shall be cleaned thoroughly at the end of each day. Sediment and mud shall be removed from the roads by shoveling or sweeping and transported to a sediment control disposal area. Street washing shall be allowed only after sediment and mud are removed in this manner.</p> <p>3. Silt Fence: will be used to intercept and detain small amounts of sediment from disturbed areas during construction operations and to prevent sediment from leaving the site. (VESCH Standard and Spec. 3.05)</p> <p>4. Culvert Inlet Protection: will prevent sediment from entering, accumulating in and being transferred by a culvert and associated drainage system prior to permanent stabilization of a disturbed project area. (VESCH Standard and Spec. 3.08)</p> <p>5. Stormwater Conveyance Channel: will provide for the conveyance of concentrated surface runoff water to a receiving channel or system without damage from erosion. (VESCH Standard and Spec. 3.17)</p> <p>6. Outlet Protection: will prevent scour at stormwater outlets, protect the outlet structure, and minimize the potential for downstream erosion by reducing the velocity and energy of concentrated stormwater flows. (VESCH Standard and Spec. 3.18)</p> <p>7. Ripprap: will protect the soil from the erosive forces of concentrated runoff and slow the velocity of concentrated runoff while enhancing the potential for infiltration and stabilizing slopes with seepage problems and/or non-cohesive soils. (VESCH Standard and Spec. 3.19)</p> <p>8. Surface Roughening (All Denuded Surfaces): will aid in establishment of vegetative cover with seed, reduce runoff velocity, and increase infiltration, while reducing erosion and providing for sediment trapping. (VESCH Standard and Spec. 3.29)</p> <p>9. Topsoiling (All New Fill): will provide a suitable growth medium for final site stabilization with vegetation. (VESCH Standard and Spec. 3.30)</p> <p>10. Temporary Seeding (As Required): Permanent or temporary soil stabilization shall be applied to denuded areas within seven days after final grade is reached on any portion of the site. Temporary soil stabilization shall be applied within seven days to denuded areas that may not be at final grade but will remain dormant (undisturbed) for longer than 30 days. (VESCH Standard and Spec. 3.31)</p> <p>11. Permanent Seeding (All Denuded Surfaces): will be used to establish vegetative cover and to reduce silt runoff for any areas not paved or roofed. Permanent stabilization shall be applied to areas that are to be left dormant for more than one year. (VESCH Standard and Spec. 3.32)</p> <p>12. Mulching (All Denuded Surfaces): will prevent erosion by protecting the soil surface from raindrop impact and reducing the velocity of overland flow. Will also foster the growth of vegetation by increasing available moisture and providing insulation against extreme heat and cold. (VESCH Standard and Spec. 3.35)</p> <p>13. Soil Stabilization Blankets & Matting (As Required): will aid in controlling erosion on critical areas by providing a microclimate, which protects young vegetation and promotes its establishment. (VESCH Standard and Spec. 3.36)</p> <p>14. Tree Preservation & Protection: will ensure the survival of desirable trees where they will be effective for erosion and sediment control, watershed protection, landscape beautification, dust and pollution control, noise reduction, shade, and other environmental benefits while the land is being converted from forest to urban-type use. (VESCH Standard and Spec. 3.38)</p> <p>15. Dust Control (As Required): will prevent surface and air movement of dust from exposed soil surfaces and reduce the presence of airborne substances which may present health hazards, traffic safety problems, or harm animal or plant life. (VESCH Standard and Spec. 3.39)</p> <p>4. Stabilization Practices</p> <p>No specific schedule other than those guidelines given in the Erosion and Sediment Control Measures descriptions of the vegetative practices (given above) will be used for temporary and permanent seeding measures. Ripprap for areas requiring outlet protection shall be placed within two days after the outlet structures are functional.</p> <p>See Section 8.11, SWPPP Support Documents for Record of Grading Activities, a log to be used by the contractor to document all major grading activities, any cessation, temporary or permanent, of construction activity, and when stabilization measures are implemented. This record shall be kept throughout the duration of the project. The permittee shall ensure that these records are updated, maintained, and become a permanent part of this overall plan.</p> <p>Construction will be sequenced so that grading operations can begin and end as quickly as possible. Stabilization measures shall be implemented on disturbed areas as soon as practicable. Embankment walls, upon reaching final grade, must be immediately seeded and fertilized to ensure proper stabilization. Permanent seeding shall be installed within 7 days of reaching final grade. Denuded areas which are not at final grade but which will remain dormant for more than 30 days shall be temporarily seeded. Areas that are not to be disturbed must be clearly marked by flags, signs, etc.</p> <p>After the construction is completed, the site will be permanently stabilized in accordance with VESCH Standard and Specification 3.32, unless otherwise noted in the plans.</p> <p>5. Maintenance</p> <p>All erosion and sediment control structures and systems shall be maintained, inspected, and repaired as needed to ensure continued performance of their intended function. In general, all erosion and sediment control measures shall be checked at least every 14 days and after each rain event over 0.5 inches of precipitation. The following items shall be checked in particular:</p> <p>1. The construction entrances shall be checked to ensure that the stone does not become clogged with mud.</p> <p>2. The seeded areas shall be checked every 2 days to ensure that a good stand of grass is maintained. Grassed areas should be fertilized and reseeded as needed.</p> <p>3. Silt fence shall be checked for undermining or deterioration (of the fabric) and cleaned when sediment levels have reached half of the silt fence height.</p> <p>4. Sediment traps shall be cleaned out when sediment has accumulated to one-half of the design wet-storage volume and filter stone shall be removed and cleaned or replaced if it becomes choked with sediment.</p> <p>5. Inlet and outlet protection areas around culverts, temporary slope drains, and drop inlets shall be checked for buildup of sediment. If significant clogging is found (the capacity of the structure has been reduced by half), they will either be cleaned out or replaced.</p> <p>Specific requirements related to inspection and maintenance of each erosion control measure are discussed in the VESCH Standards and Specifications. The contractor shall be responsible for maintenance of all erosion control measures to the satisfaction of local review authorities, as well as the installation of additional measures as needed to ensure that sediment-laden runoff does not leave the site.</p> <p>6. Inspection</p> <p>Disturbed areas of the construction site that have not been finally stabilized, areas used for storage of materials that are exposed to precipitation, structural control measures, and locations where vehicles enter or exit the site shall be inspected at least once every 14 calendar days and within 48 hours of the end of a storm event that is 0.5 inches or greater. In those areas that have been finalized, temporary stabilized, or runoff is unlikely due to winter conditions, inspections shall take place at least once a month.</p> <p>Disturbed areas and areas used for storage of materials that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. ESC measures shall be checked to see they are operating correctly. At accessible discharge points, inspection shall take place to ensure these control measures are effective at preventing significant impacts to receiving waters. Nearby downstream locations shall be inspected if discharge points are inaccessible. Sites of vehicle entrance or exit shall be inspected for evidence of offsite sediment tracking.</p> <p>If existing control measures or Best Management Practices (BMPs) require modification or additional measures, such changes shall be made within 7 calendar days of the inspection or before the next anticipated storm event, as implementation is practicable.</p> <p>Include inspection reports of all stormwater and erosion & sediment control measures along with any required actions as a result of the inspection in the stormwater management plan. The report shall include the name and qualification of the inspector, dates of inspection, major observations and actions taken in response to inspections. Major observations include: the location of discharge of sediment or pollutant from the site, locations of BMPs that need to be maintained, locations of BMPs that failed to operate or proved inadequate, and locations where additional BMPs are needed that didn't exist at the time of inspection. These reports shall include incidents of noncompliance. If the report does not include any noncompliance incidents, the report shall contain a certification that the facility is in compliance with the stormwater pollution prevention plan and permit.</p> <p>7. Other Pollutant Controls</p> <p>Materials, Garbage, Debris</p> <p>No solid materials, including building materials, garbage, and debris shall be discharged to surface waters of the State. The permittee shall ensure that these items are not left in a location where they could be transported by stormwater runoff off the site.</p> <p>Expected Construction and Waste Materials</p> <p>Construction and waste materials that could potentially be stored on site include topsoil, fill dirt, excavated material, storm drainage and utility piping, timber and block building materials, fertilizer for seeding operations, stone to be placed on gravel areas, stone for riprap, fuel and silt fence material.</p> <p>Any stockpiles of topsoil, excavated material or fill dirt that are needed shall be surrounded on the downslope side by silt fence. Fertilizer must be kept in watertight containers, preferably in portable storage units and out from exposure to the weather, during storage on site. Care must be taken to minimize spillage of fertilizer if mixing operations are required to prepare the fertilizer for application.</p> <p>If overnight storage of fuel is required, the fuel storage container must be equipped with a fueling mechanism disable device. To minimize the effect of any potential spills, maintain all on-site fueling operations as far away from surrounding wetlands, surface waters and drainage facilities as is practical. Daily inspections of the fuel storage container must be implemented to detect the presence of leaks. The fueling operator shall have a safe fill, shutdown, and transfer procedure in place to minimize spillage during fueling activities. The operator must maintain a fully equipped spill kit on site at all times with the stored fuel. The kit must at least include absorbent mats or material to cleanup any spilled fuel. For any fuel spill on site equal to or exceeding 25 gallons, immediately create an appropriately sized berm around the area of spillage to minimize surface movement of the fuel. Contact local hazmat authorities, the ENGINEER, and the regional DEQ office in Roanoke as quickly as possible to report the spill and seek further assistance with spill cleanup.</p> <p>Construction materials which could be carried offsite by stormwater (plastics, paper, timber, etc.) shall be picked up daily and placed in appropriate waste disposal containers.</p> <p>8. Non-Stormwater Discharges</p> <p>No non-storm water discharges other than those permitted by the VPDES general permit for Stormwater Discharge from Construction Activities are anticipated during this project.</p> <p>9. Minimum Standards (MS-19)</p> <p>All applicable Virginia Erosion and Sediment Control Regulations and Minimum Standards shall be adhered to during all phases of construction. If plan details and specifications are more stringent, then they shall supersede the Minimum Standards. The Minimum Standards include, but are not limited to the following:</p> <p>1. STABILIZATION OF DENUDED AREAS:</p> <p>Permanent or temporary soil stabilization shall be applied to bare areas within seven days after final grade is reached on any portion of the site. Temporary soil stabilization shall be applied within seven days to denuded areas that may not be at final grade, but will remain dormant or undisturbed for longer than 14 days. Permanent stabilization shall be applied at areas that are to be left dormant for more than 1 year.</p> <p>Applicable: The Contractor shall establish permanent within seven days after final grade. If Contractor elects to rough grade areas of the trail or postpone permanent seeding until other sections of the greenway are complete which will remain dormant or undisturbed for more than 30 days then temporary seeding shall be applied at the Contractor's expense.</p> <p>2. STABILIZATION OF SOIL STOCKPILES:</p> <p>During construction of the project, soil stockpiles shall be stabilized or protected with sediment trapping measures. The project is responsible for temporary protection and permanent stabilization of all soil stockpiles on site as well as soil intentionally transported from the project site.</p> <p>Applicable: Due to limited space, existing easements, and floodplain limits, stockpiling off site may be required. With approved property owner agreements obtained by the contractor, stockpiles will be allowed offsite. The Contractor shall provide the required E&S permit and temporary and permanent stabilization measures for areas offsite and ensure that site stockpiles include appropriate stabilization measures.</p> <p>3. PERMANENT VEGETATIVE COVER</p> <p>A permanent vegetative cover shall be established on denuded areas not otherwise permanently stabilized. Permanent vegetation shall not be considered established until a ground cover is achieved that, in the opinion of the local authority (Roanoke County), is uniform and mature enough to survive to inhibit erosion.</p> <p>Applicable: The Contractor must seed and mulch all denuded areas per the project specifications. Over-seeding may be required at the Contractor's expense until an adequate ground cover is achieved as determined by Roanoke County. ESC measures shall not be removed until approved by the County. Areas of rutting shall be filled in and reseeded at the Contractor's expense.</p> <p>4. TIMING & STABILIZATION OF SILT TRAPPING MEASURES:</p> <p>Sediment basins and traps, perimeter dikes, sediment barriers and other measures intended to trap sediment shall be constructed as a first step in any land disturbing activity and shall be made functional before upslope land disturbance takes place.</p> <p>Applicable: The Contractor shall install construction entrances, perimeter silt fence, and inlet protection on existing structures as denoted on the plans prior to any land disturbance. Once proposed storm pipes are installed, culvert inlet and outlet protection shall be installed immediately after installation.</p> <p>5. STABILIZATION OF EARTHEN STRUCTURES:</p> <p>Stabilization measures shall be applied to earthen structures such as dams, dikes and diversions immediately after installation.</p> <p>Not Applicable: Dams, dikes, and diversions are not proposed.</p> <p>6. SEDIMENT TRAPS AND BASINS:</p> <p>A sediment basin shall control surface runoff from disturbed areas that is comprised of flow from drainage areas greater than or equal to three acres. The sediment basin shall be designed and constructed to accommodate the anticipated sediment loading for the land disturbing activity. The outfall device or system device shall take into account the total drainage area flowing through the disturbed area to be served by the basin.</p> <p>Not Applicable: No sediment traps or basins are proposed since concentrated drainage crosses the trail perpendicularly and there is minor land disturbance per outfall.</p> <p>7. CUT AND FILL SLOPES:</p> <p>Cut and fill slopes shall be designed and constructed in a manner that will minimize erosion. Slopes that are found to be eroding excessively within one year of permanent stabilization shall be provided with additional slope stabilizing measures until the problem is corrected.</p> <p>Applicable: Prior to final acceptance, there shall be no evidence of excessive erosion and the cut/fill slopes shall be stabilized with permanent stabilization acceptable to Roanoke County and/or the City of Salem. In the event that excessive erosion is present within one year after project acceptance, the Contractor shall be responsible for remediation.</p> <p>8. CONCENTRATED RUN-OFF DOWN CUT OR FILL SLOPES:</p> <p>Concentrated runoff shall not flow down cut or fill slopes unless contained within an adequate temporary or permanent channel, flume, or slope drain structure.</p> <p>Applicable: Concentrated runoff is designed to flow down cut or fill slopes with existing or newly constructed ditches with riprap lining. In the event, concentrated runoff is present prior to culvert and ditch installation, the Contractor shall provide temporary ditches or slope drains to accommodate the concentrated runoff to prevent erosion on cut and fill slopes.</p> <p>9. WATER SEEPs FROM A SLOPE FACE:</p> <p>Whenever water seeps from a slope face, adequate drainage or other protection shall be provided.</p> <p>Not Applicable: Based on site investigation, there are no existing water seeps within the project corridor. In the event water seeps are discovered, the Contractor shall notify the Engineer and Roanoke County and adequate drainage or other protection shall be provided.</p> <p>10. STORM SEWER INLET PROTECTION:</p> <p>All storm sewer inlets that are made operable during construction shall be protected so that sediment-laden water cannot enter the conveyance system without first being filtered or otherwise treated to remove sediment.</p> <p>Applicable: The Contractor shall protect the existing storm sewer system with inlet protection as shown on the plans. Inlets to proposed storm sewer must also be protected by inlet protection as shown on the plans. The Contractor shall protect proposed culverts from sediment laden water with culvert inlet protection as shown on the plans. All inlet protection shall be maintained until final completion.</p> <p>11. STABILIZATION OF OUTLETS:</p> <p>Before newly constructed stormwater conveyance channels are made operational, adequate outlet protection and any required temporary or permanent channel lining shall be installed in both the conveyance channel and receiving channel.</p> <p>Applicable: Concentrated runoff crossing perpendicular to the greenway requires a culvert and a riprap lined outlet ditch. In order to comply with this standard, the Contractor will be required to construct, reconstruct, and outlet ditch from the end of the culvert and install temporary or permanent channel lining prior to the installation of the culvert. If construction activity allows the installation of the culvert and outlet ditch protection within the same day, then this will be an acceptable approach.</p> <p>12. WORK IN LIVE WATERCOURSES:</p> <p>When work in a live watercourse is performed, precautions shall be taken to minimize encroachment, control sediment transport and stabilize the area to the greatest extent possible during construction. Non-erodible material shall be used for the construction of causeways and cofferdams. Earthfill fill may be used for these structures if armored by non-erodible cover materials.</p> <p>Applicable: Gabion basket retaining wall is proposed to encroach on the ordinary high water of the Roanoke River. Environmental permitting has accounted for use of a cofferdam in the watercourse to aid in wall construction. These measures are to be removed fully and completely from the Roanoke River at the conclusion of construction.</p> <p>13. CROSSING A LIVE WATERCOURSE:</p> <p>When a live watercourse must be crossed by construction vehicles more than twice in any six month period, a temporary stream crossing constructed of non-erodible materials shall be provided.</p> <p>Not Applicable: No stream crossing are proposed.</p> <p>14. APPLICABLE REGULATIONS:</p> <p>All applicable federal, state and local regulations pertaining to working in or crossing live watercourses shall be met.</p> <p>Applicable: Utilization of cofferdams and a work bridge are proposed as part of the project. There shall be strict E&S adherence to protect sediment from entering the Roanoke River which flows adjacent to the greenway construction.</p> <p>15. STABILIZATION OF BED AND BANKS</p> <p>The bed and banks of a watercourse shall be stabilized immediately after work in the watercourse is completed.</p> <p>Applicable: All materials used in construction of cofferdams and causeways, including, but not limited to rip rap and other construction debris, shall be removed from the river following construction and every effort will be taken to prevent sediment from entering the Roanoke River.</p> <p>16. UNDERGROUND UTILITIES:</p> <p>Underground utilities shall be installed in accordance with the following standards in addition to other criteria:</p> <p>a. No more than 500 linear feet of trench may be opened at one time.</p> <p>b. Excavated material shall be placed on the uphill side of trenches.</p> <p>c. Effluent for dewatering operations shall be filtered or passed through approved sediment trapping device, or both, and discharged in a manner that does not adversely affect flowing streams or offsite property.</p> <p>d. Material used for backfilling trenches shall be properly compacted in order to minimize erosion and promote stabilization.</p> <p>e. Re-stabilization shall be accomplished in accordance with these regulations.</p> <p>f. Applicable safety regulations shall be complied with.</p> <p>Applicable: Storm sewer pipe shall be installed per these requirements for trenching. Additionally, adjustment of sanitary sewer manhole elevations is to be completed in accordance with these requirements for excavation safety and stabilization.</p> <p>17. CONSTRUCTION ACCESS ROUTES:</p> <p>Where construction vehicle access routes intersect paved public roads, provisions shall be made to minimize the transport of sediment by vehicular tracking onto paved surfaces. Where sediment is transported onto a public road surface, the road shall be cleaned thoroughly at the end of each day. Sediment shall be removed by shoveling or sweeping and transported to a sediment control disposal area. Street washing shall be allowed only after sediment is removed in this manner. This provision shall apply to individual lots as well as to larger land disturbing activities.</p> <p>Applicable: The Contractor shall install and maintain the construction entrance as shown on the plans. In the event another construction access to the site is obtained by the Contractor, a construction entrance shall be installed and maintained at the Contractor's expense. When no longer utilized, the construction entrances shall be removed and the areas restored prior to final acceptance.</p> <p>18. TEMPORARY E&S CONTROL MEASURE REMOVAL:</p> <p>All temporary erosion and sediment control measures shall be removed within 30 days after final site stabilization or after temporary measures are no longer needed, unless otherwise authorized by the local program authority. Trapped sediment and the disturbed soil areas resulting from the disposition of temporary measures shall be permanently stabilized to prevent further erosion and sediment.</p> <p>Applicable: After the site is stabilized and approved by Roanoke County, silt fence, inlet protection, construction entrances, and other temporary E&S measures shall be removed within 30 days. The areas of removal shall be smoothly graded, seeded, and mulched. Any remaining buildup of sediment shall be removed from the site by the Contractor.</p> <p>19. ADEQUACY OF RECEIVING CHANNELS:</p> <p>Properties and waterways downstream from the development site shall be protected from sediment deposition, erosion, and damage, due to increases in volume, velocity and peak flow rates of stormwater runoff for the stated frequency storm of 24-hour duration in accordance with the following standards and criteria:</p> <p>a. Concentrated stormwater runoff leaving a development site shall be discharged into an adequate natural or man-made receiving channel, pipe, or storm sewer system. For those sites where runoff is discharged into a pipe or pipe system, downstream stability analysis at the outfall of the pipe or pipe system shall be performed.</p> <p>b. Adequacy of all channels and pipes shall be verified in the following manner:</p> <p>1. The applicant shall demonstrate that the total drainage areas to the point of analysis within the channel is one hundred times greater than the contributing drainage area of the project in question; or</p> <p>2. Each of the following:</p> <p>a. Natural channels shall be analyzed by the use of a two-year storm to verify that stormwater will not overtop channel banks nor cause erosion of channel bed or banks; and</p> <p>b. All previously constructed man-made channels shall be analyzed by the use of a ten-year storm to verify that stormwater will not overtop its banks and by the use of a two-year storm to demonstrate that stormwater will not cause erosion of channel bed or banks; and</p> <p>c. Pipes and storm sewer systems shall be analyzed by the use of a ten-year storm to verify that stormwater will be contained within the pipe or system.</p> <p>d. If natural receiving channels or previously constructed man-made channels or pipes are not adequate, the applicant shall:</p> <p>1. Improve the channel to a condition where a ten-year storm will not overtop the banks and a two-year storm will not cause erosion to the channel bed or banks; or</p> <p>2. Improve the pipe or pipe system to a condition where the ten-year storm is contained within the appurtenances; or</p> <p>3. Develop a site design that will not cause the pre-development peak runoff rate from a two-year storm to increase when runoff outfalls onto a natural channel or will not cause the pre-development peak runoff rate from a ten-year storm to increase when runoff outfalls onto a man-made channel; or</p> <p>4. Provide a combination of channel improvement, stormwater detention or other measures which is satisfactory to the plan-approving authority to prevent downstream erosion.</p> <p>d. The applicant shall provide evidence of permission to make the improvements.</p> <p>e. All hydraulic analyses shall be based in the existing watershed characteristics and the ultimate development of the subject project.</p> <p>f. If the applicant chooses an option that includes stormwater detention, he shall obtain approval from the locality of a plan for maintenance of the detention facilities. The plan shall set forth the maintenance of the facility and the person responsible for performing the maintenance.</p> <p>g. Outfall from a detention facility shall be discharged to a receiving channel, and energy dissipaters shall be placed at the outfall of all detention facilities as necessary to provide a stabilized transition from the facility to the receiving channel.</p> <p>h. All on-site channels must be verified to be adequate.</p> <p>i. Increased Volumes of sheet flows that may cause erosion or sedimentation on adjacent properties shall be diverted to a stable outlet, adequate channel, pipe or system, or to a detention facility.</p> <p>j. In applying these stormwater runoff criteria, individual lots or parcels in a residential, commercial, or industrial development shall not be considered to be separate development projects. Instead, the development, as a whole, shall be considered to be a single development project. Hydrologic parameters that reflect the ultimate development condition shall be used in all engineering calculations.</p> <p>k. All measures used to protect properties and waterways shall be employed in a manner which minimizes impacts on the physical, chemical, and biological integrity of rivers, streams, and other waters of the state.</p> <p>Applicable: Each outfall has been analyzed and found to be adequate. The receiving channel is the Roanoke River which has a drainage area of more than 100 times the project site. There is no runoff from the post development condition that is collected in an existing or proposed storm sewer system.</p> <p>IN RECOGNITION THAT OVER 50% OF THE PROJECT DISTURBED AREA IS LOCATED WITHIN ROANOKE COUNTY; ROANOKE COUNTY AND THE CITY OF SALEM HAVE EXECUTED A MEMORANDUM OF UNDERSTANDING THAT AUTHORIZES ROANOKE COUNTY TO ACT AS THE PERMITTING AUTHORITY FOR THE EROSION CONTROL PROGRAM AND THE VIRGINIA STORMWATER MANAGEMENT PROGRAM FOR THE ENTIRE PROJECT, INCLUDING THOSE AREAS THAT ARE WITHIN THE CITY OF SALEM.</p> <p>GENERAL CONSTRUCTION SEQUENCE:</p> <p>1. IDENTIFY LIMITS OF PERMITTED DISTURBANCE.</p> <p>2. INSTALL EROSION AND SEDIMENT CONTROL MEASURES.</p> <p>2.1. APPROVED EROSION AND SEDIMENT CONTROL MEASURES INSTALLED BELOW OHW OR WITHIN THE ROANOKE RIVER SHALL BE INSTALLED PRIOR TO THE START OF THE TIME OF YEAR RESTRICTIONS AND BE MAINTAINED UNTIL THE RESTRICTIONS END. CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLIANCE WITH ALL VMRC PERMIT REQUIREMENTS.</p> <p>3. BEGIN LAND DISTURBANCE ACTIVITIES.</p> <p>4. PERFORM ONGOING INSPECTION AND MAINTENANCE OF EROSION AND SEDIMENT CONTROL MEASURES AND INSTALL TEMPORARY MEASURES AS NEEDED. FOLLOWING RAIN EVENTS, CONTRACTOR SHALL DETERMINE BEHIND COFFER DAMS PER VESCH AND VMRC PERMIT.</p> <p>5. INSTALL PERMANENT STABILIZATION FOR DENUDED AREAS.</p> <p>6. FOLLOWING FINAL APPROVAL OF WORK AND STABILIZED AREAS, REMOVE EROSION AND SEDIMENT CONTROL MEASURES AND PROVIDE SEEDING FOR AREAS DISTURBED DURING REMOVAL.</p> <p>ENVIRONMENTAL RESTRICTIONS:</p> <p>7. TREE CLEARING MAY ONLY OCCUR FROM NOVEMBER 15 TO MARCH 14 DUE TO TRICLORED BAT.</p> <p>8. WORK WITHIN THE ROANOKE RIVER IS ONLY PERMITTED FROM JULY 1 TO MARCH 14 DUE</p>	
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PROJECT NO.	20221694
LAT.	
LONG.	
DATE:	18 April 2023
DRAWN BY:	JMJ
CHECKED BY:	



Source: Adapted from 1983 Maryland Standards for Soil Erosion and Sediment Control, and Va. DSWC

Plate 3.02-1

Source: Adapted from VDOT Standard Sheets and Va. DSWC

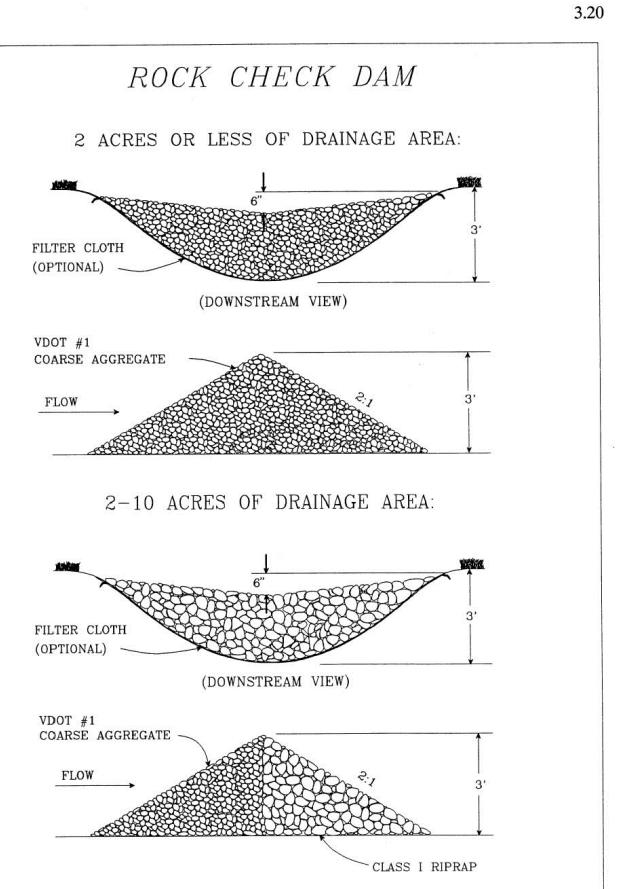
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Source: Va. DSWC

Plate 3.07-2

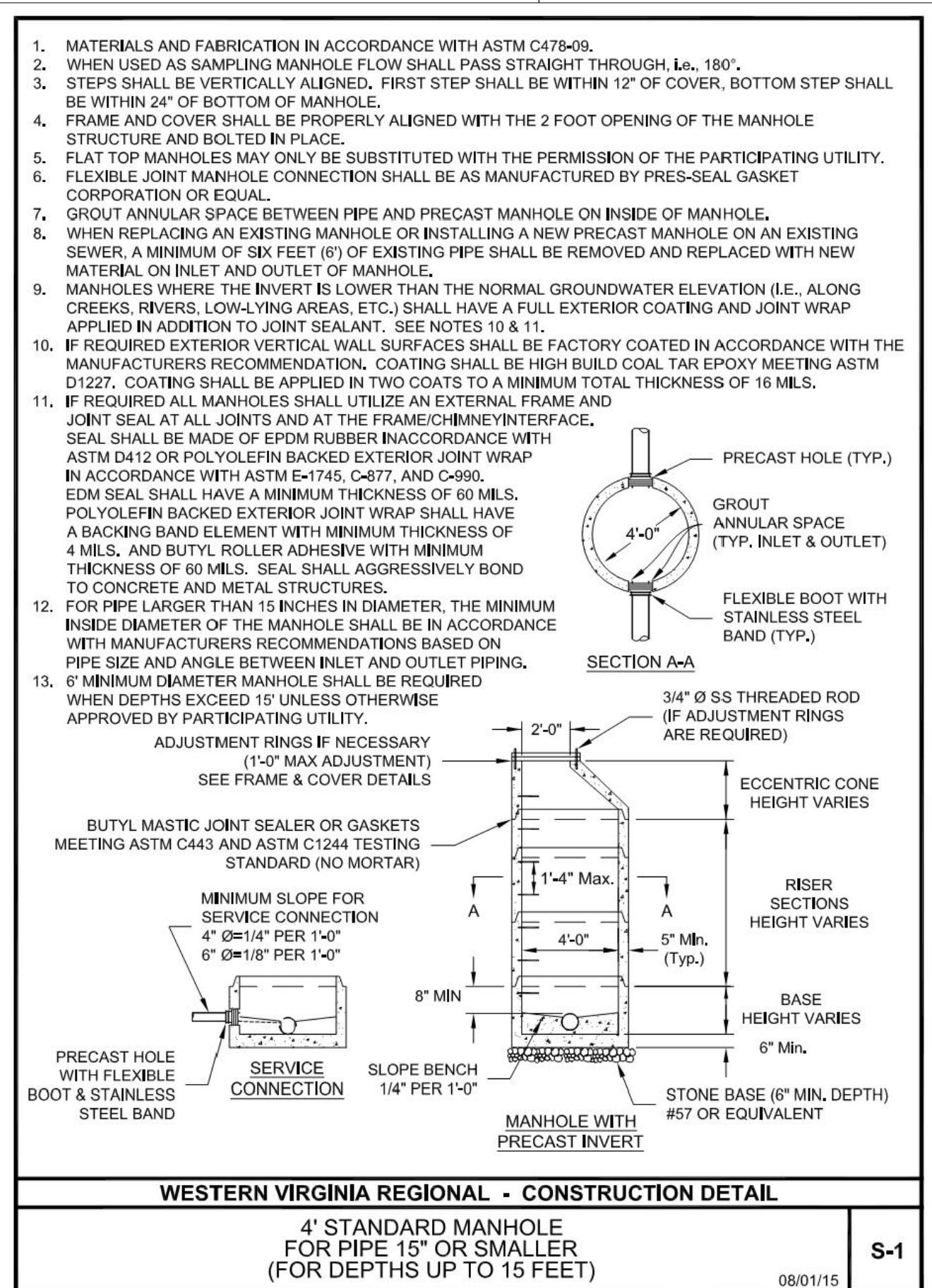
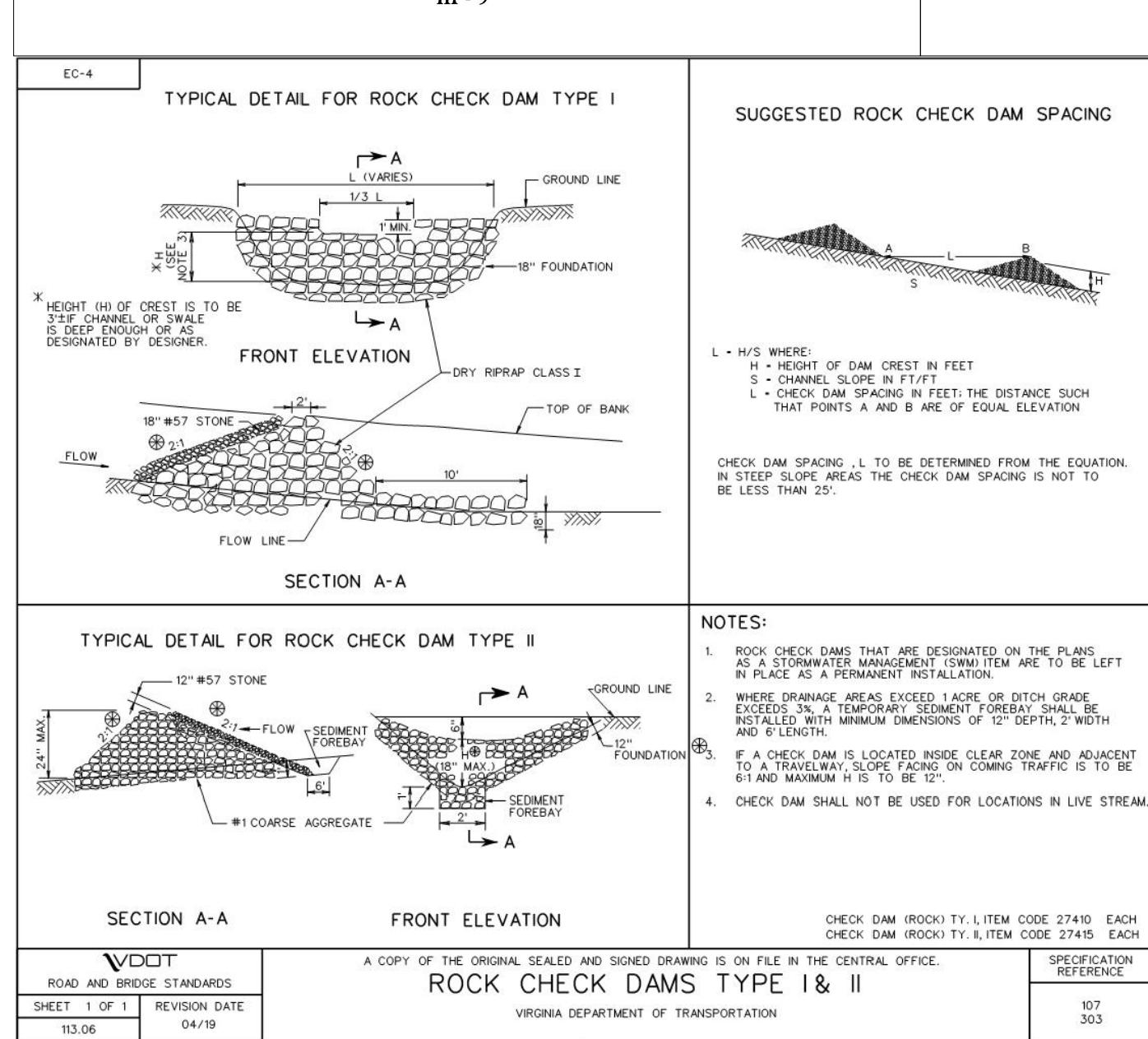
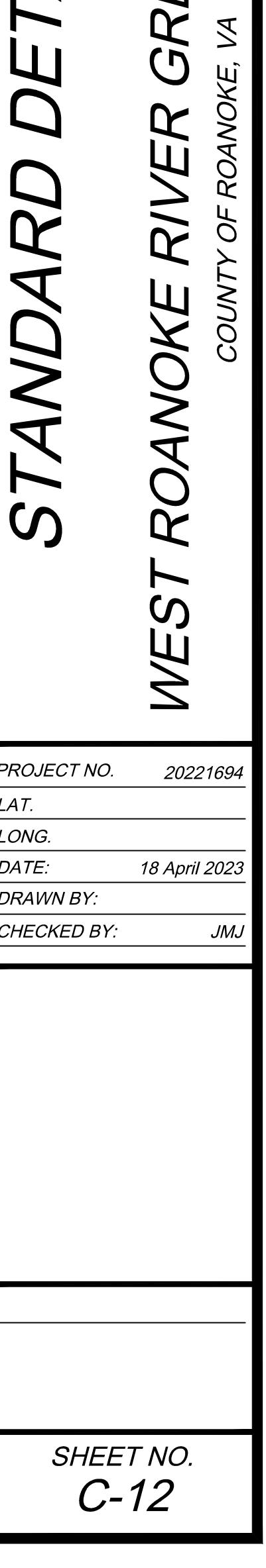
Source: Adapted from Installation of Straw and Fabric Filter Barriers for Sediment Control, Sherwood and Wyant

Plate 3.05-1



Source: Va. DSWC

Plate 3.20-1



PERMANENT SEEDING MIXES

Compensatory cut area seeding

Mellow Marsh Farm MMF Wetland Seed Mix @ 25 lb/ac

Ernst Seeds OBL Wetland Mix ERNMX-131 @ 20 lb/ac

Roundstone Native Seed Southern Emergent Wetland Mix Mix# 158 @ 6 lb/ac PLS

Upland area seeding

Mellow Marsh Farm MMF Riparian Buffer Mix @ 25 lb/ac

Ernst Seeds Riparian Buffer Mix ERNMX-178 @ 20 lb/ac plus 30 lb/ac grain rye as cover crop

Roundstone Native Seed Southern Riparian Buffer Mix Mix#168 @ 11 lb/ac PLS

Around parking area and Trail shoulder area seeding (within 5' of trail)

Tall Fescue @ 128 lb/ac

Red Top Grass or Creeping Red Fescue @ 2 lb/ac

Seasonal Nurse Crop @20 lb/ac

1. Turfgrass varieties shall be approved by Virginia Crop Improvement Associates (VCA)

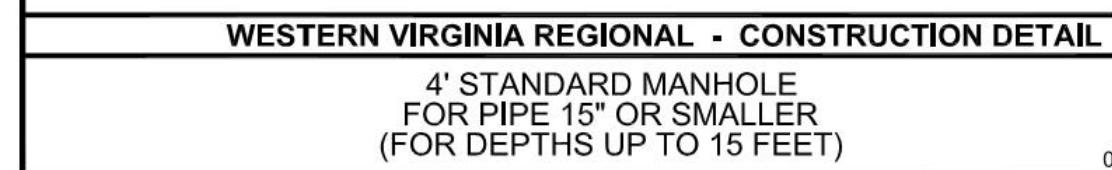
2. Use seasonal nurse crop in accordance with seeding dates as stated below:

March, April - May 15.....Annual Rye

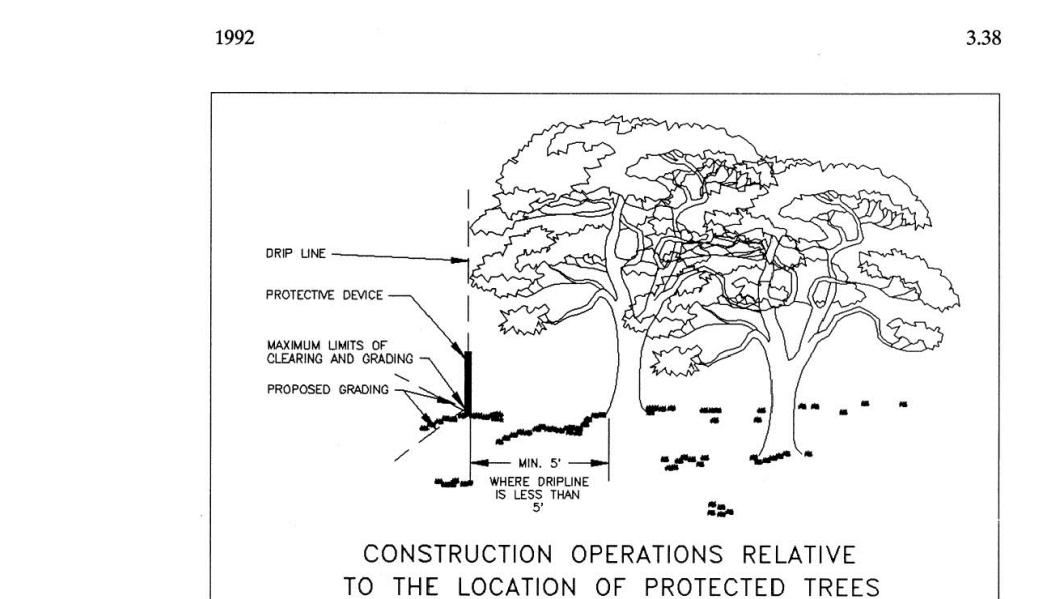
May 16 - August 15.....Foxtail Millet

August 16 - September, October.....Annual Rye

November - FebruaryWinter Rye

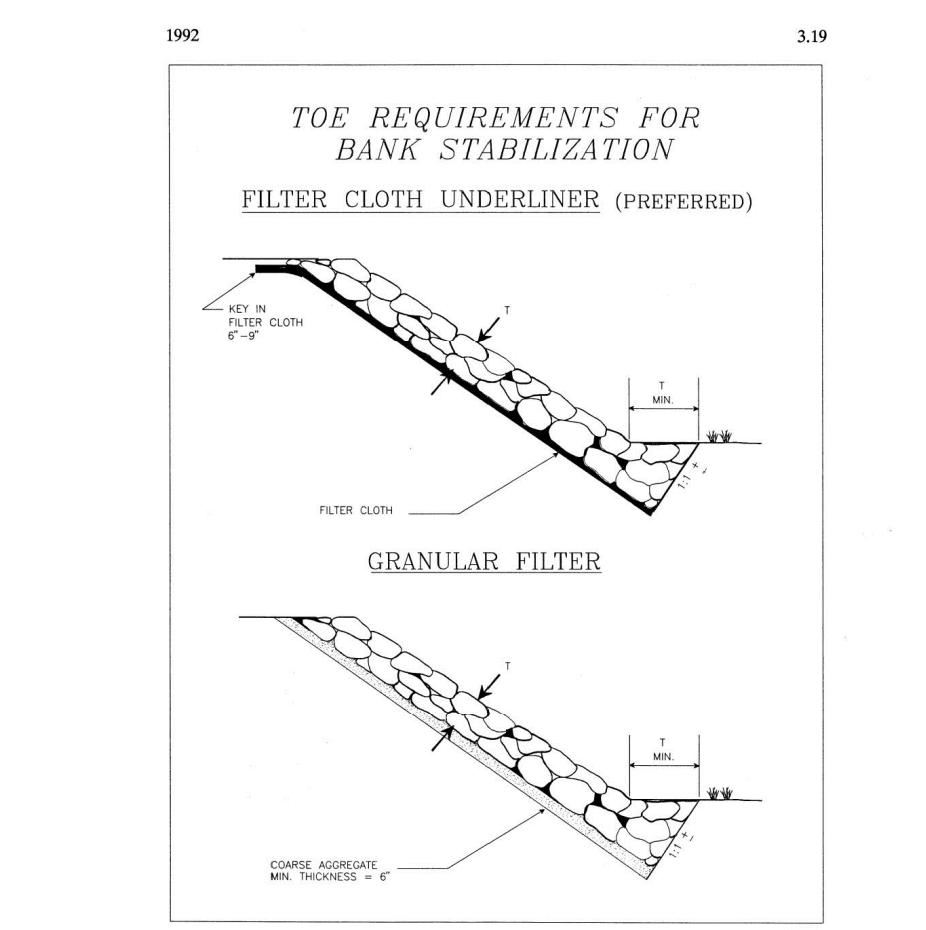


S-1



Source: Public Facilities Manual, Vol. III, Fairfax Co., Va., 1976

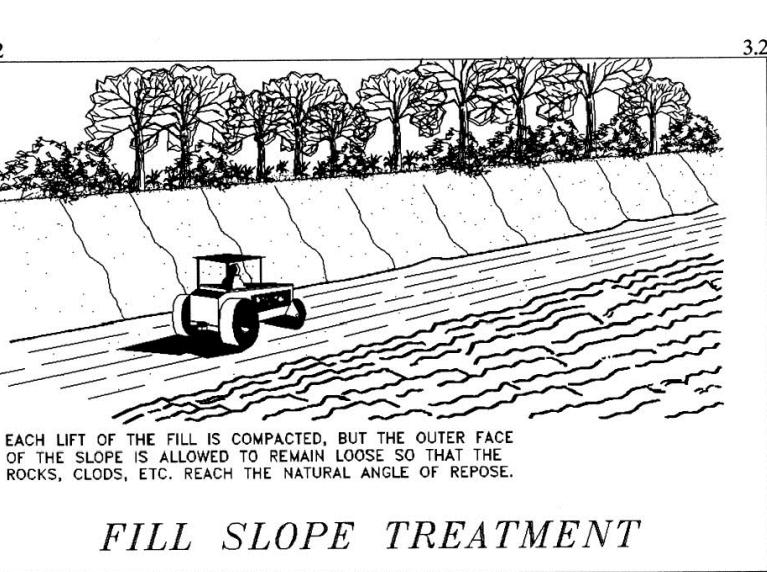
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Source: Va. DSWC

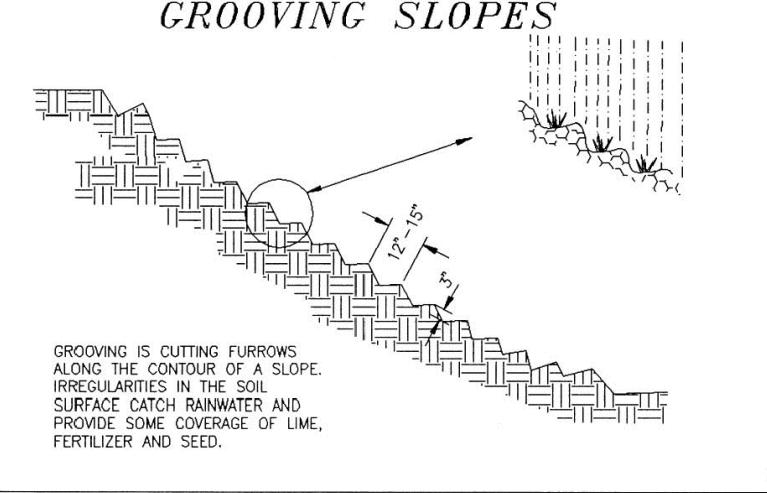
Plate 3.39-1

III-173



Source: USDA-SCS

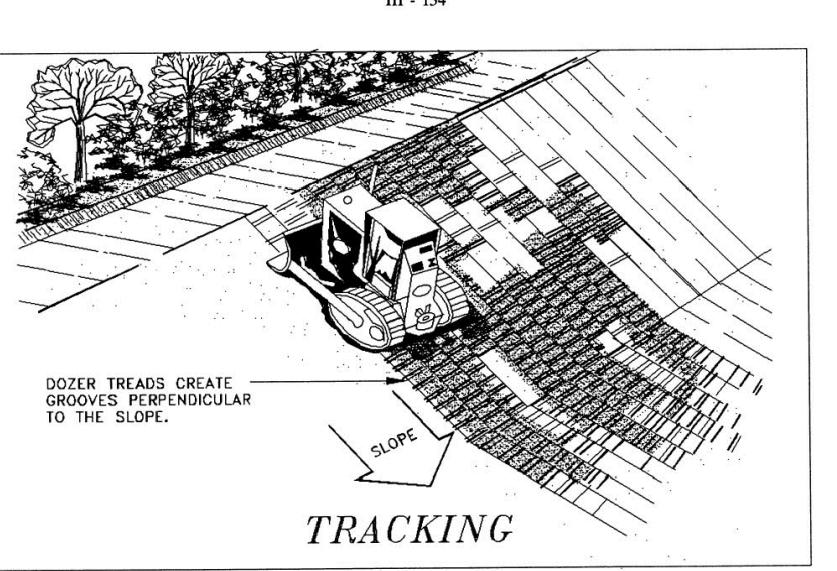
Plate 3.29-3



Source: Va. DSWC

Plate 3.29-2

III-173



Source: Michigan Soil Erosion and Sedimentation Guide

Plate 3.29-4

III-134

WEST ROANOKE RIVER GREENWAY PH1

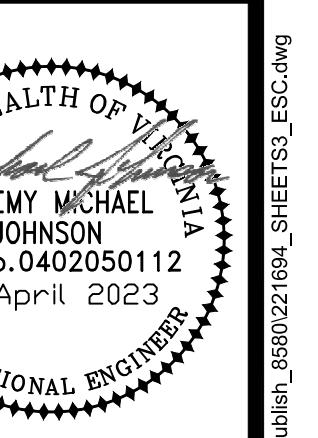
SHEET NO.
C-13

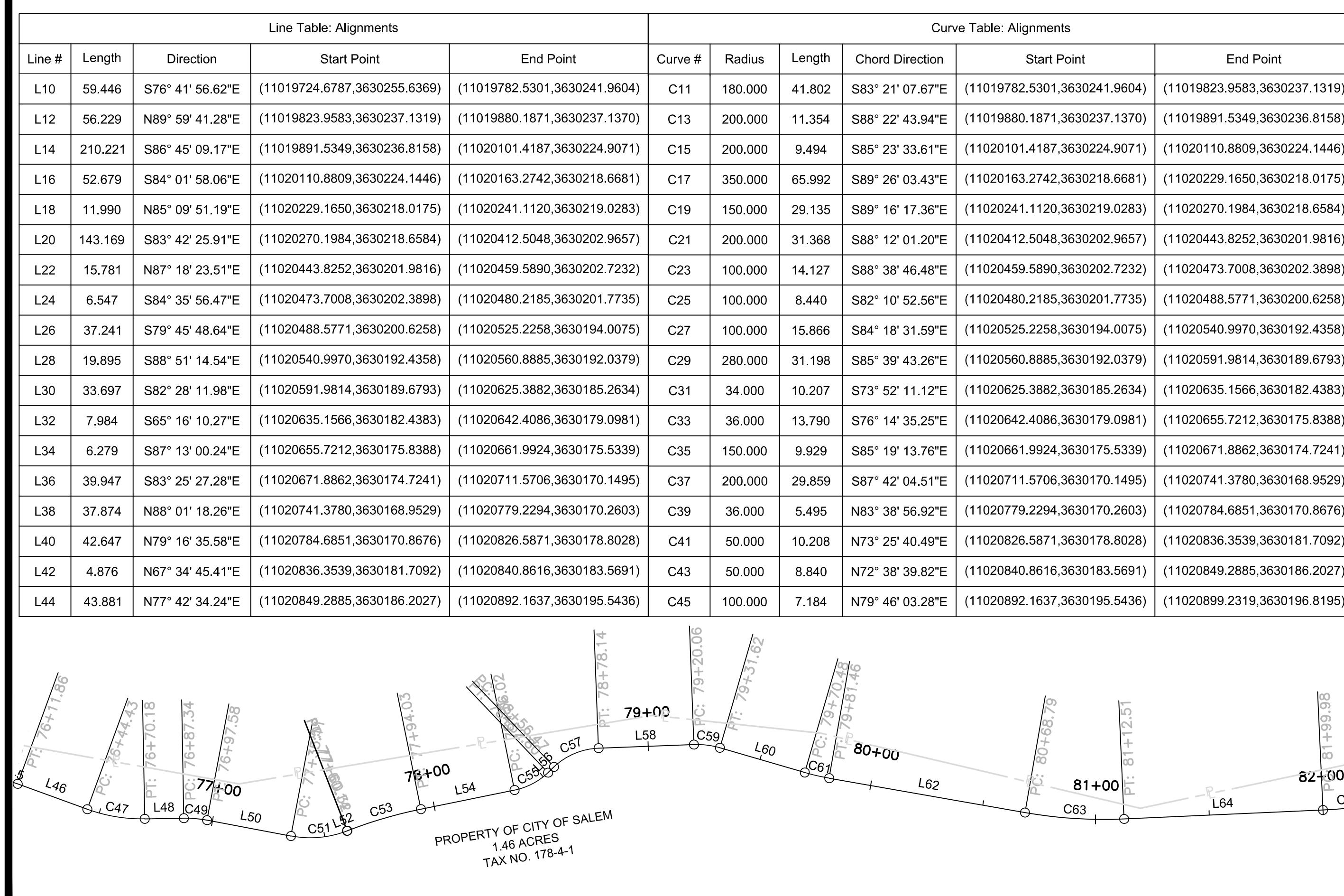
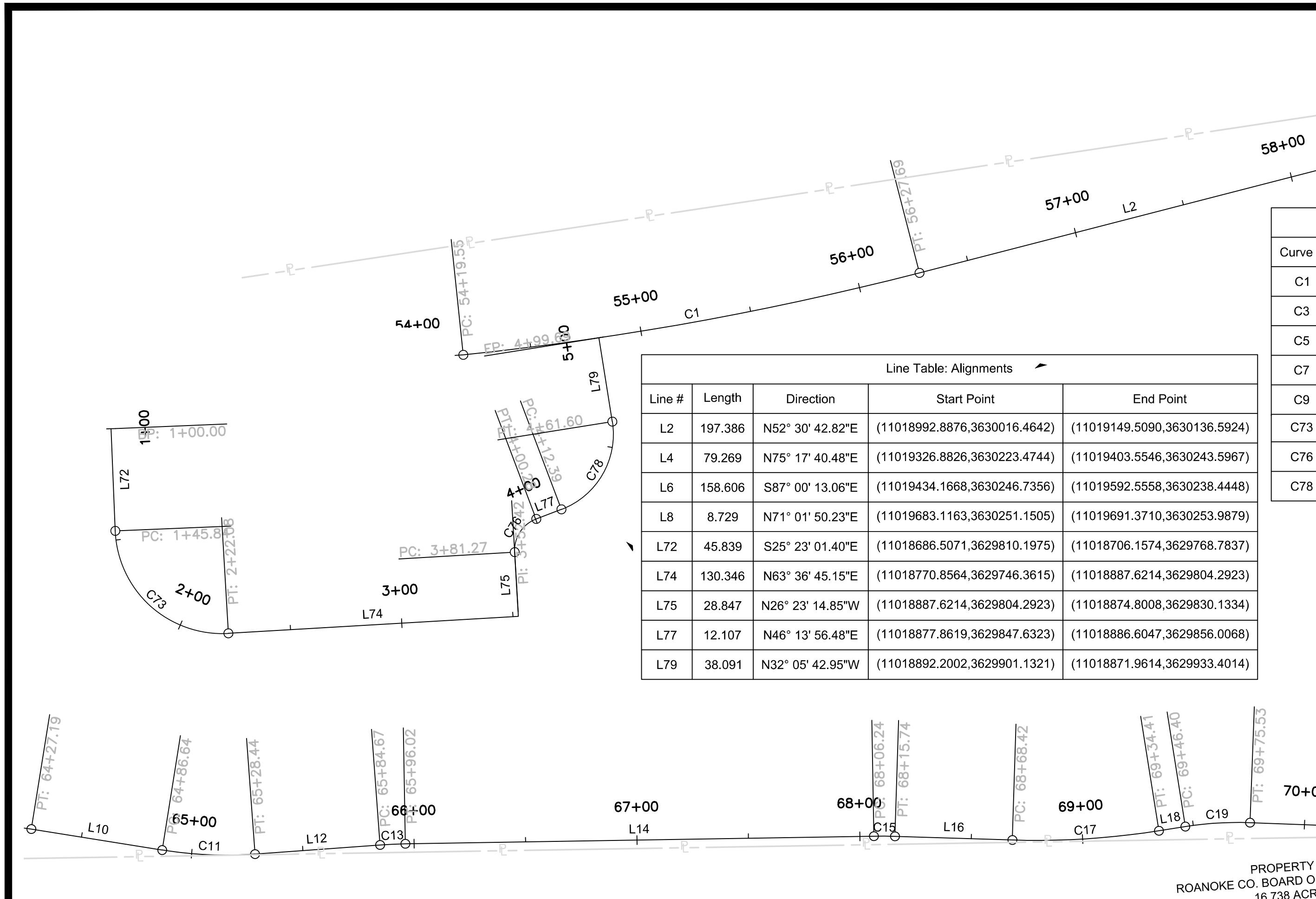
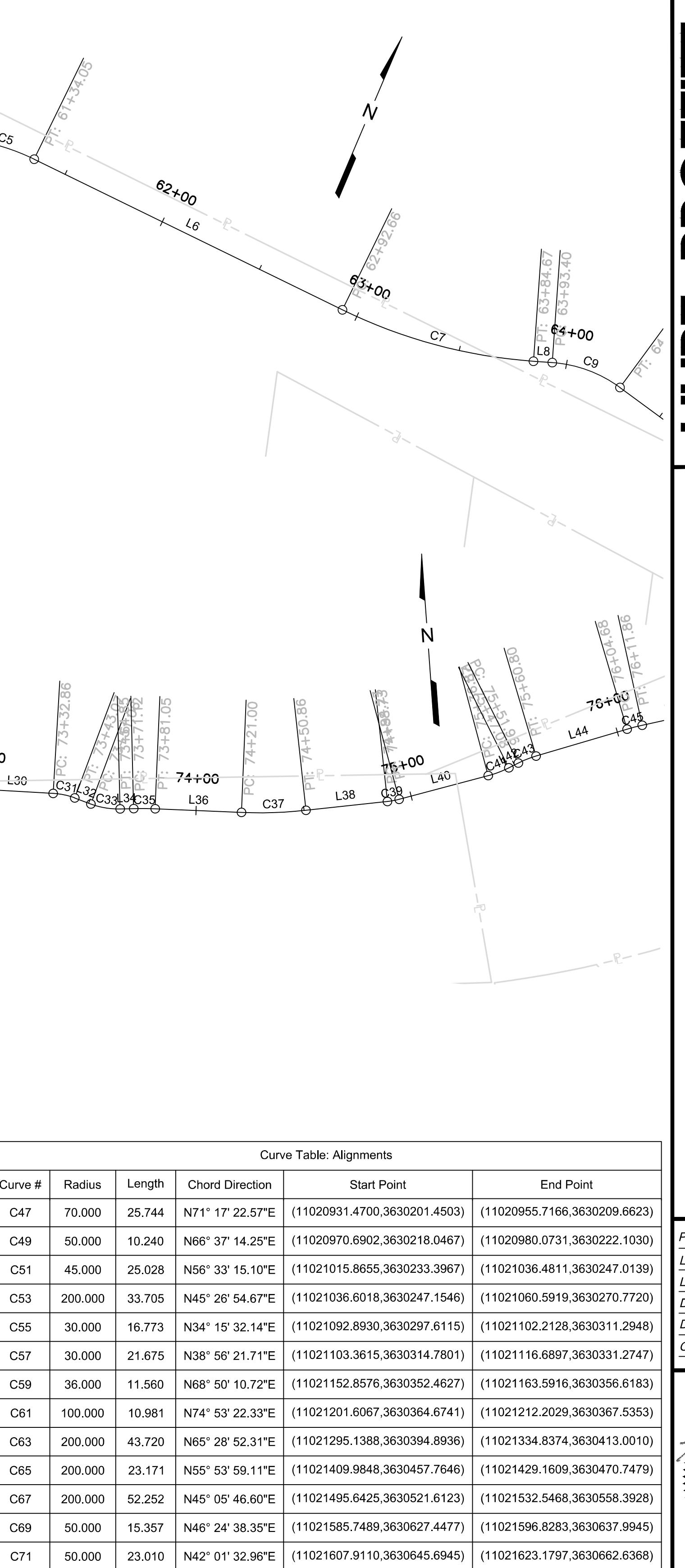
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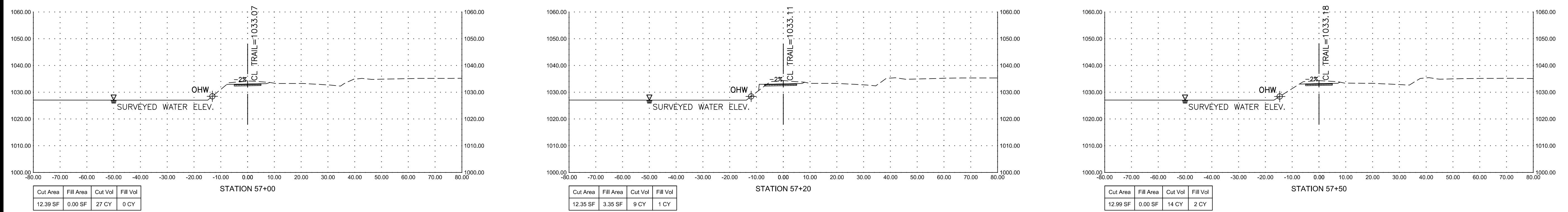
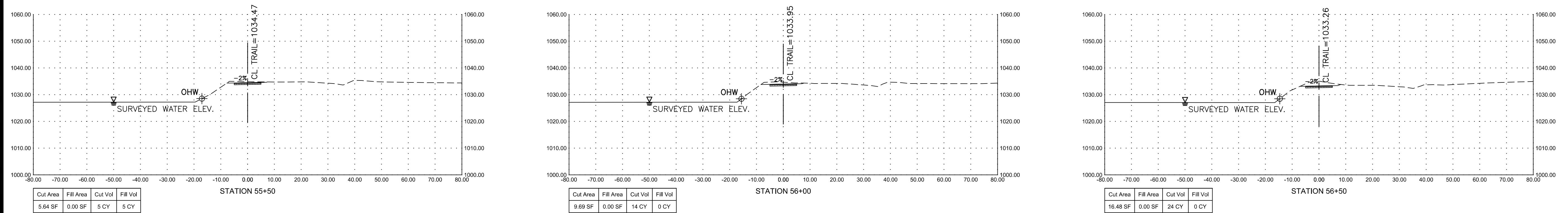
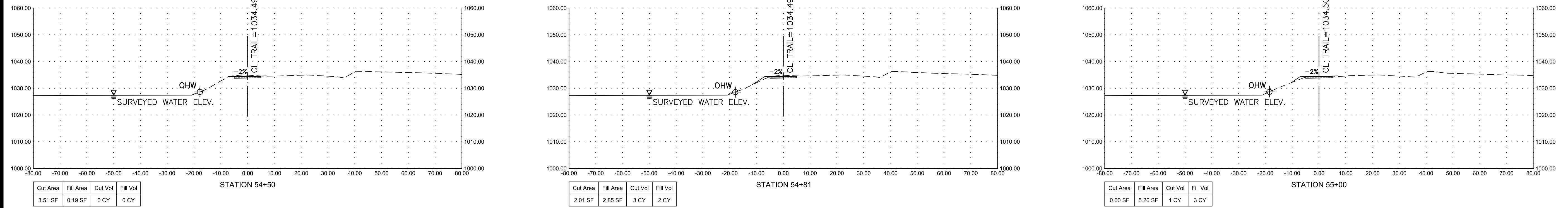
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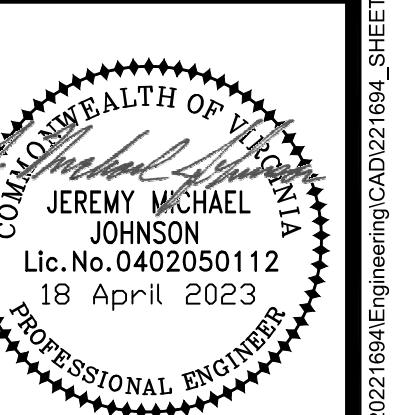
PROJECT NO. 20221694
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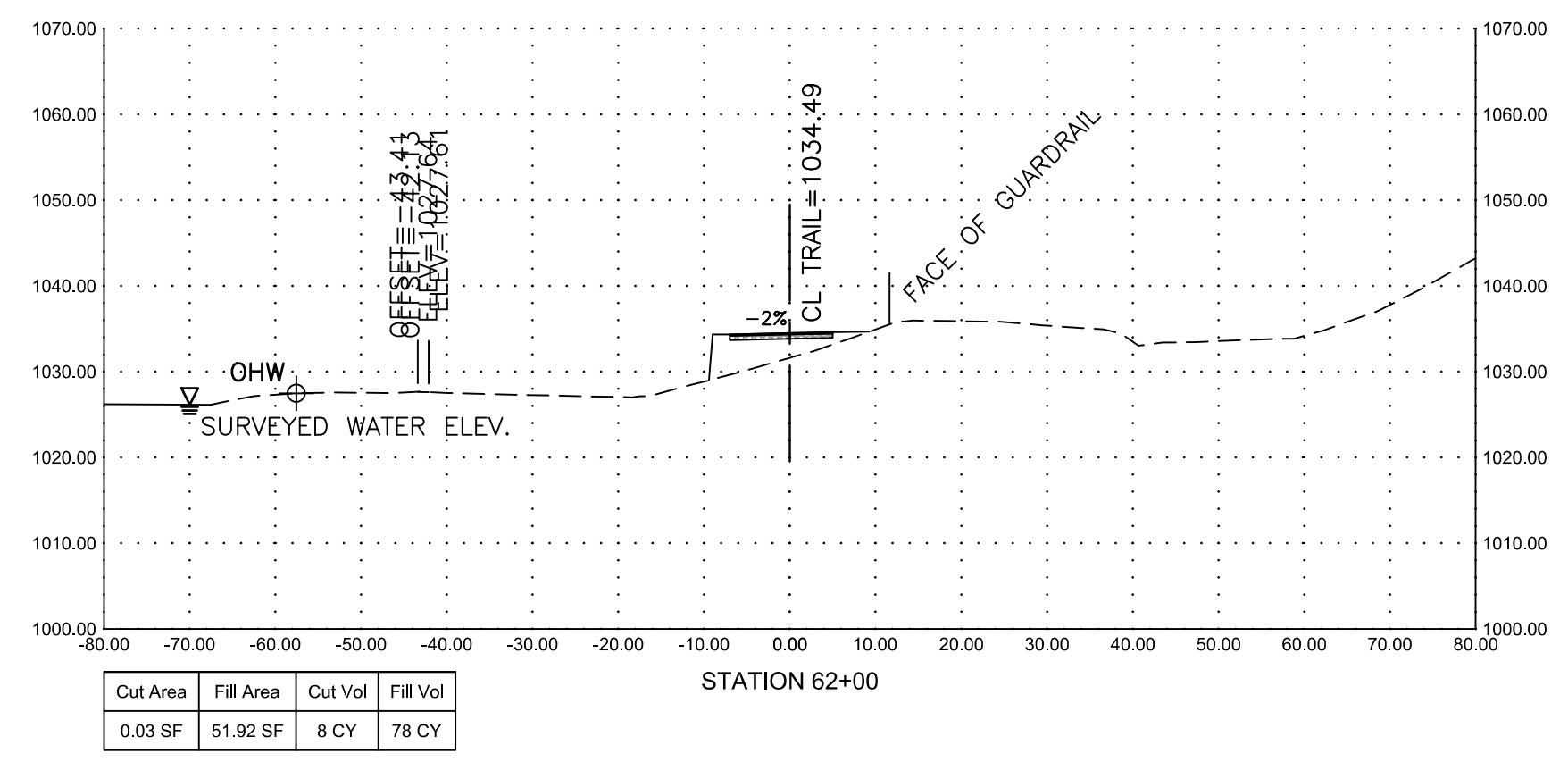
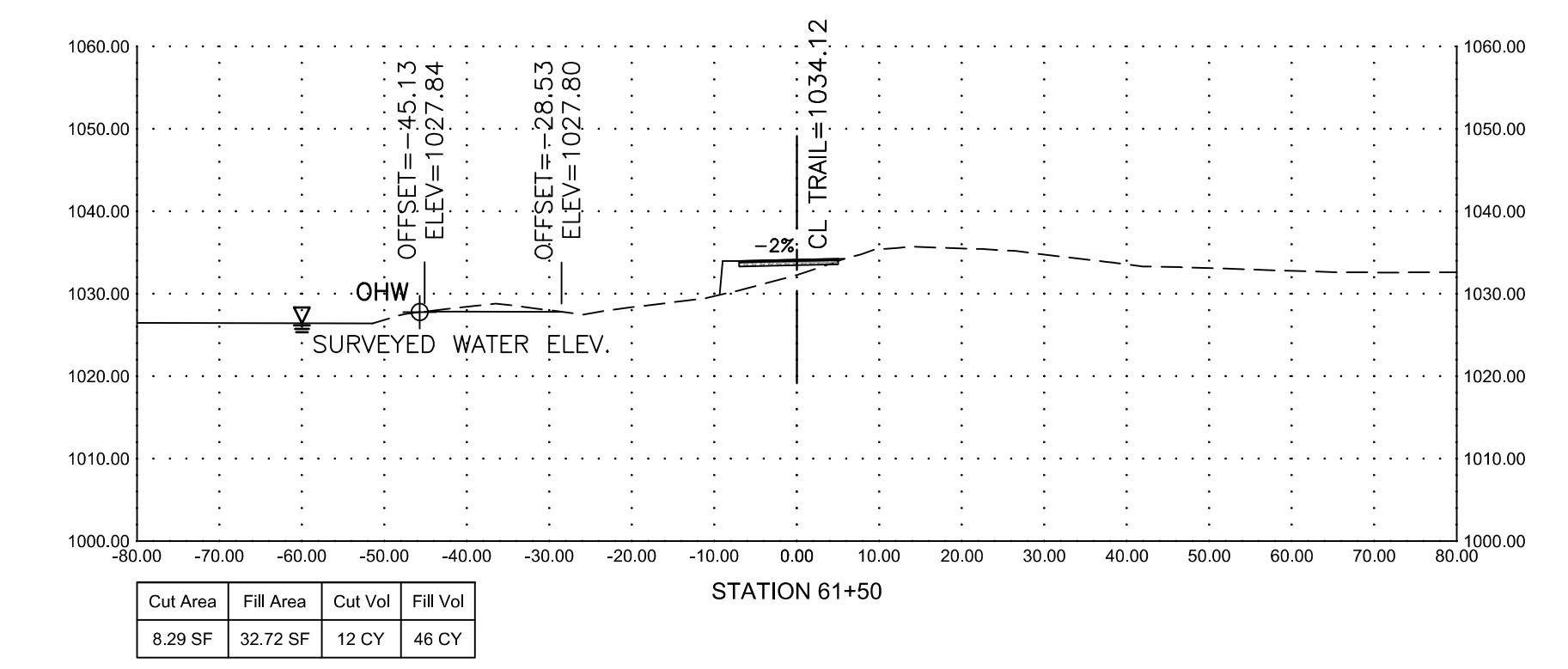
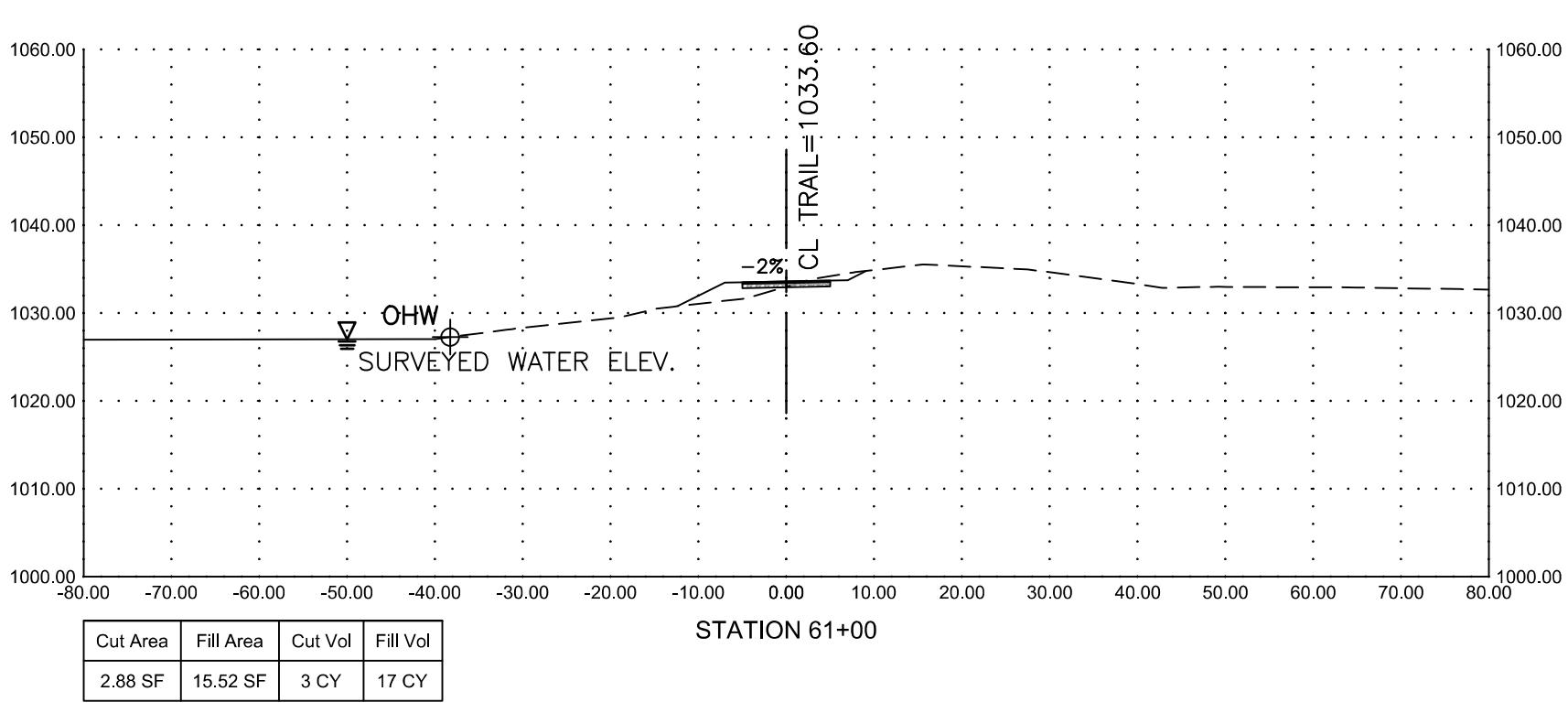
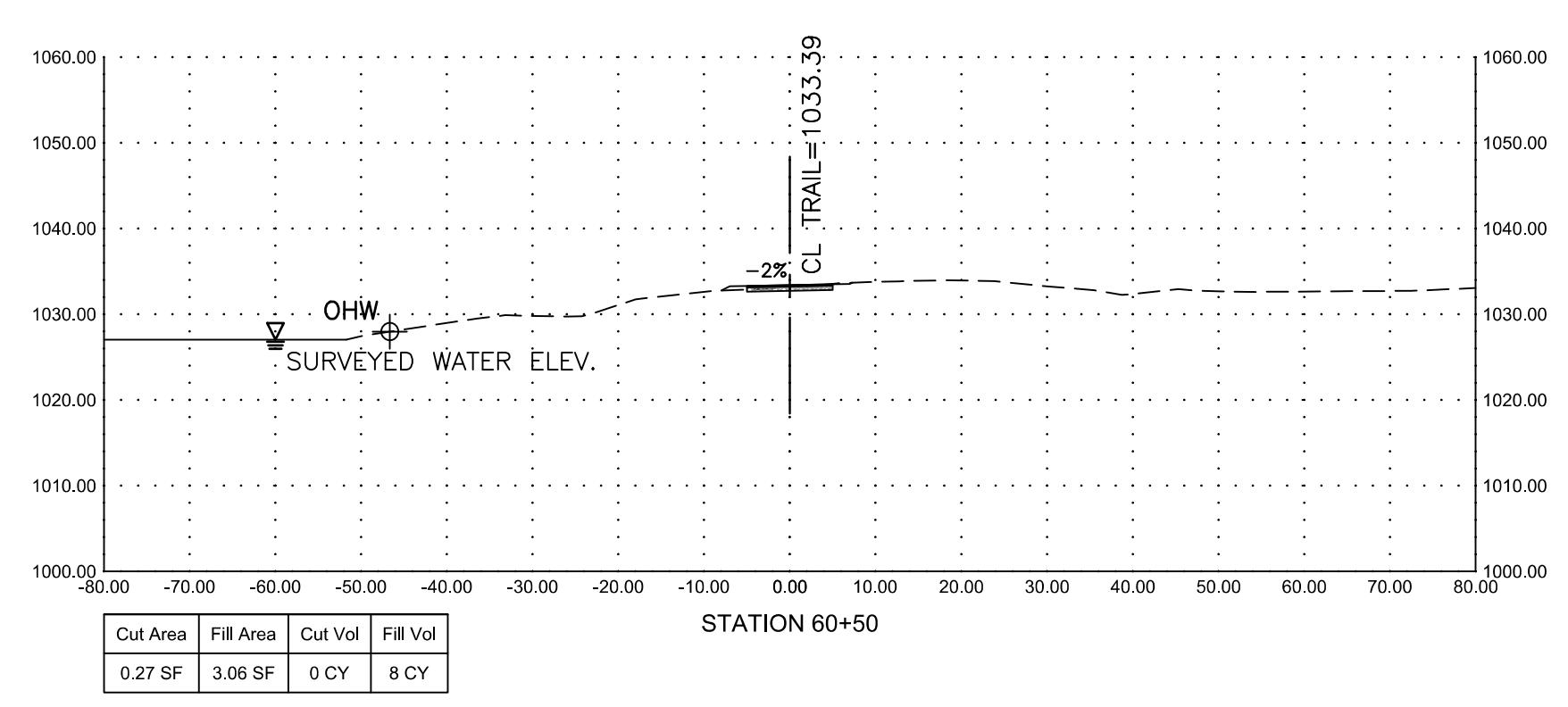
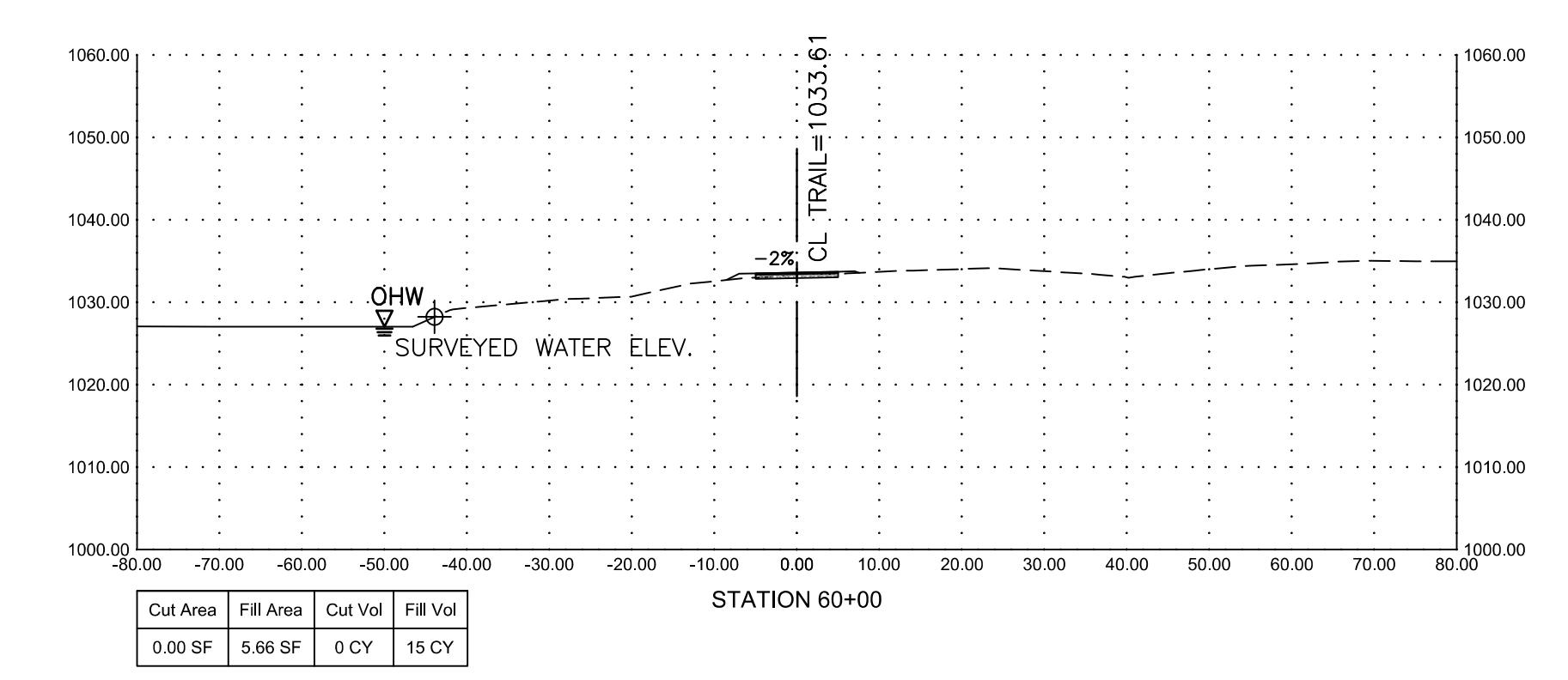
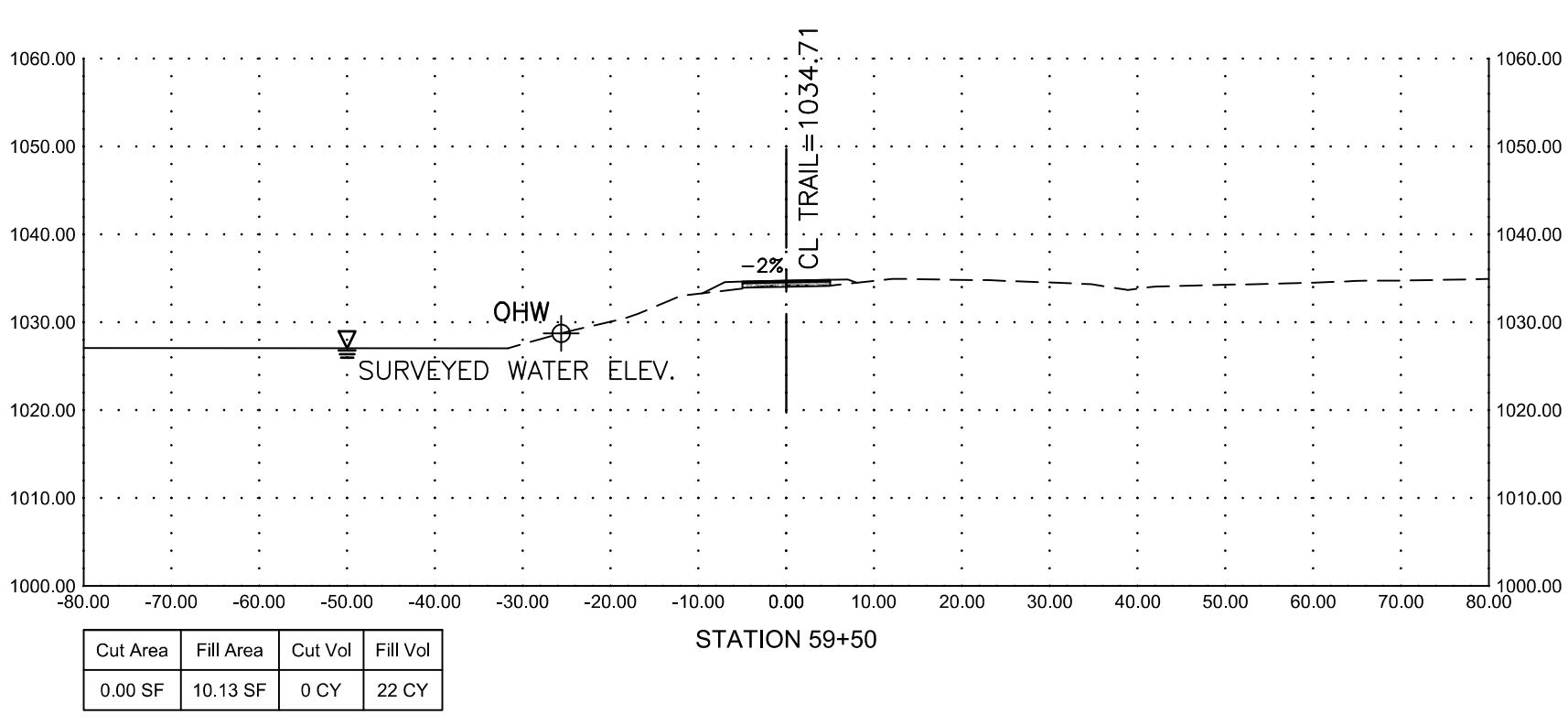
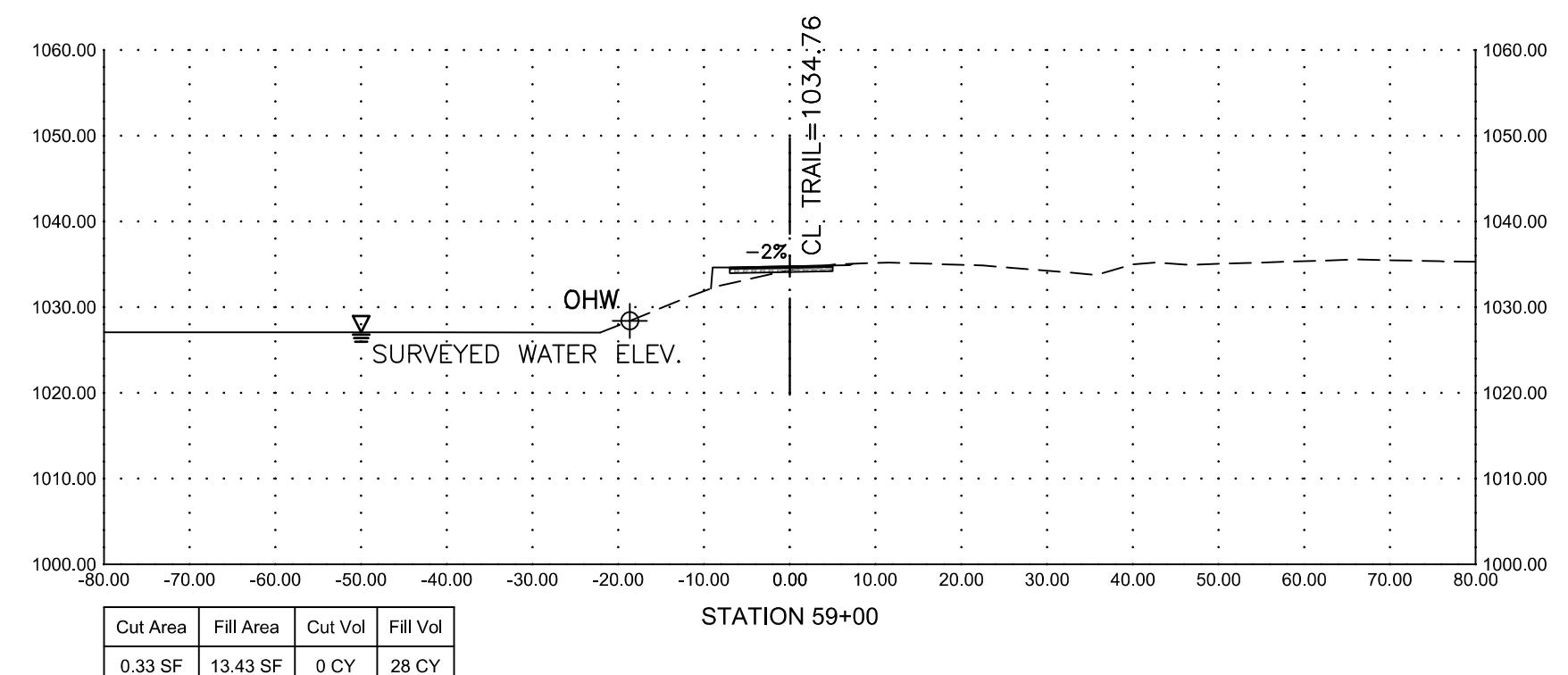
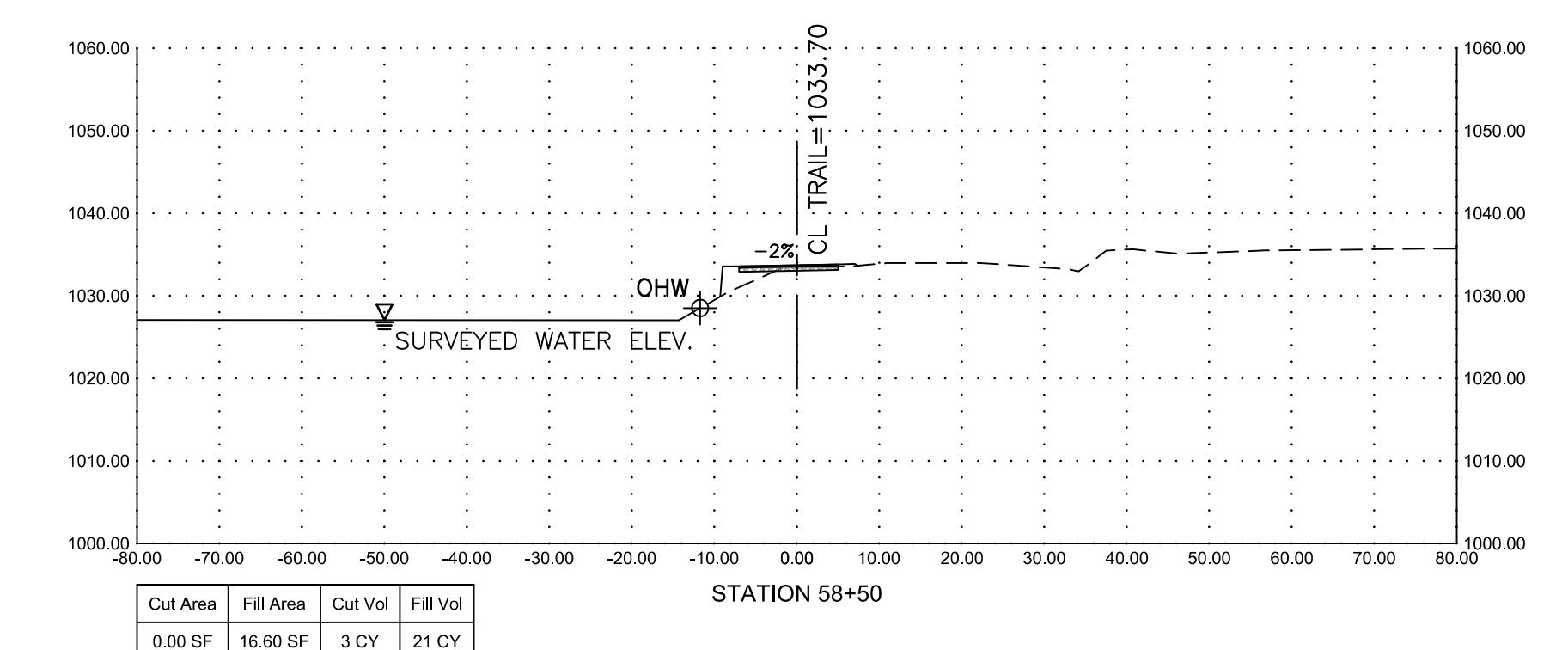
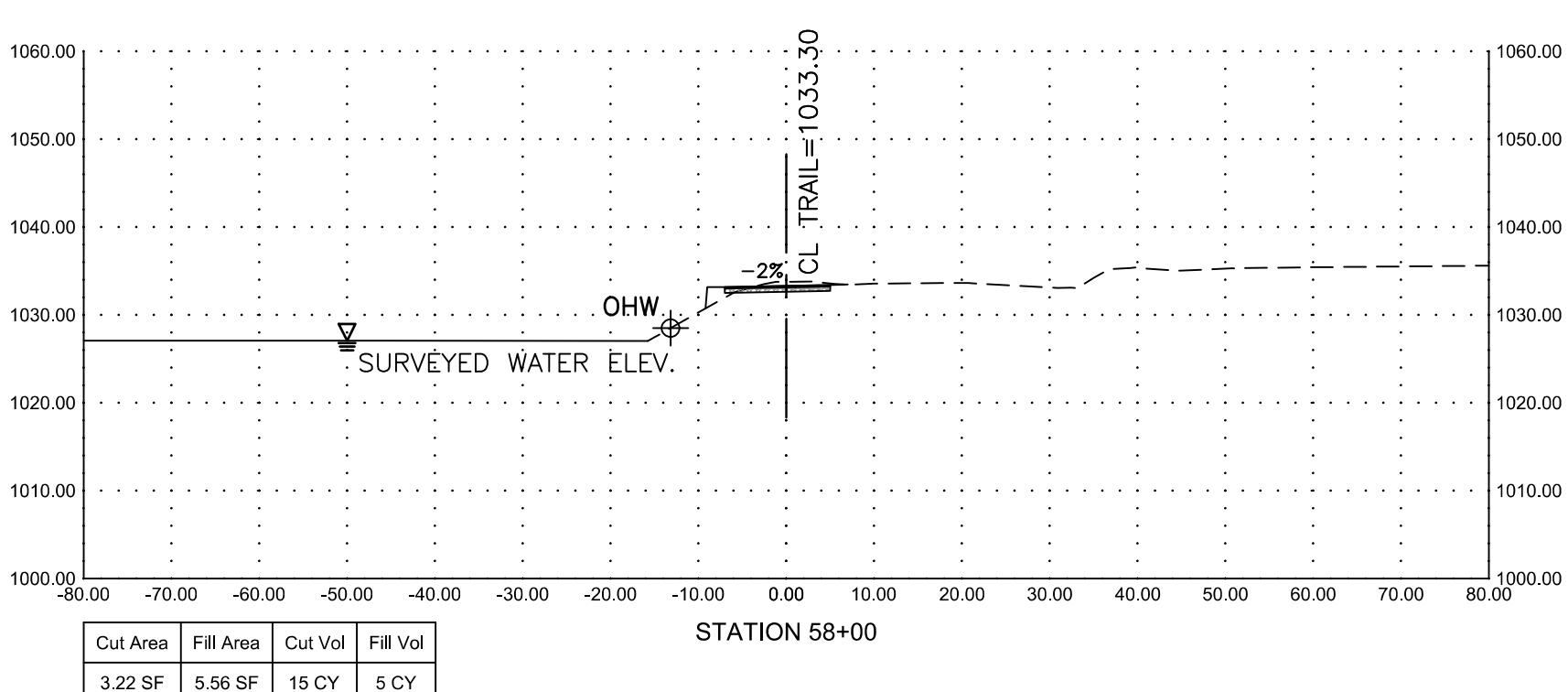


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CROSS SECTIONS

STA. 58+00 TO 62+00
WEST ROANOKE RIVER GREENWAY PH1

COUNTY OF ROANOKE, VA



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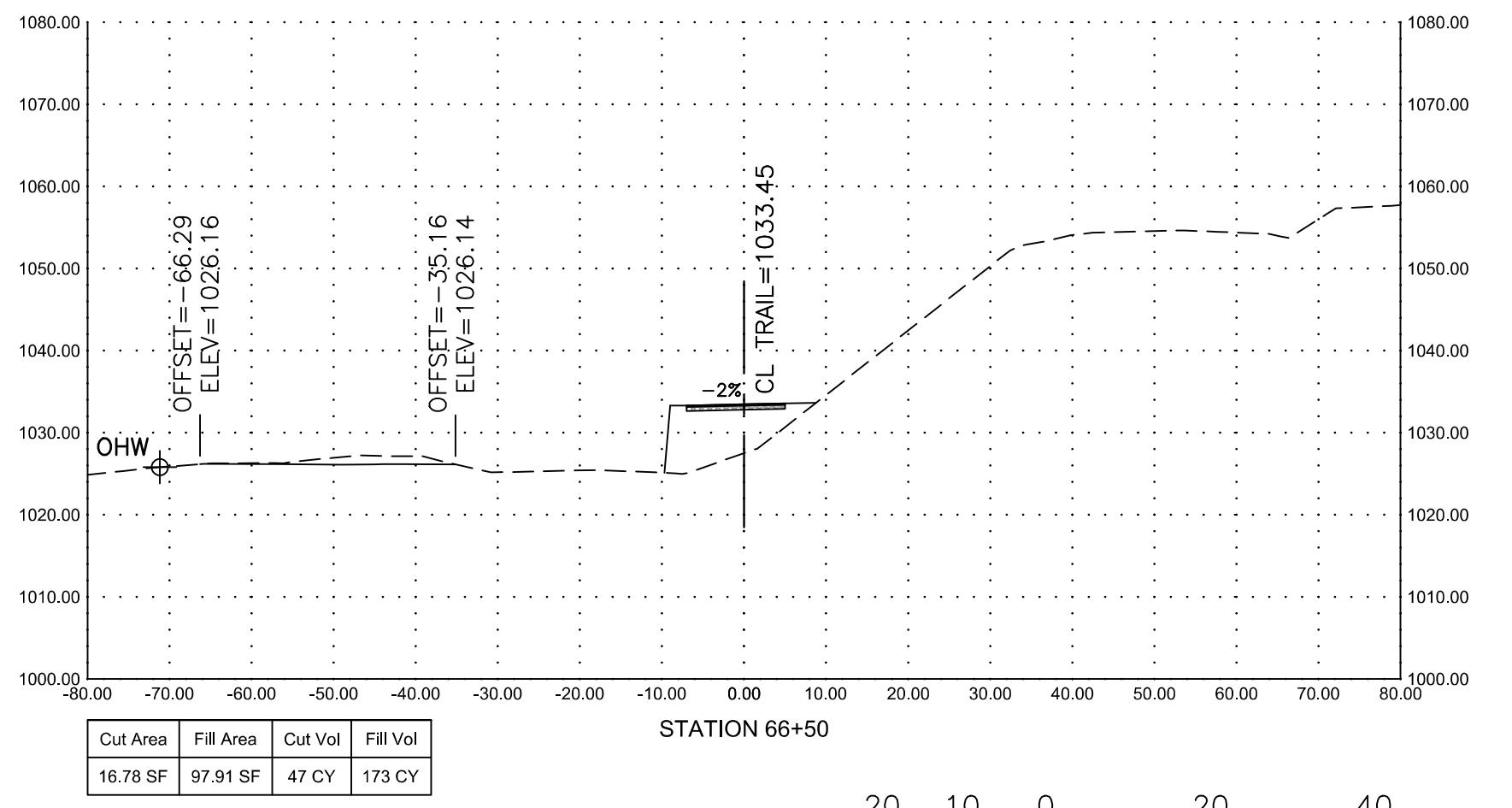
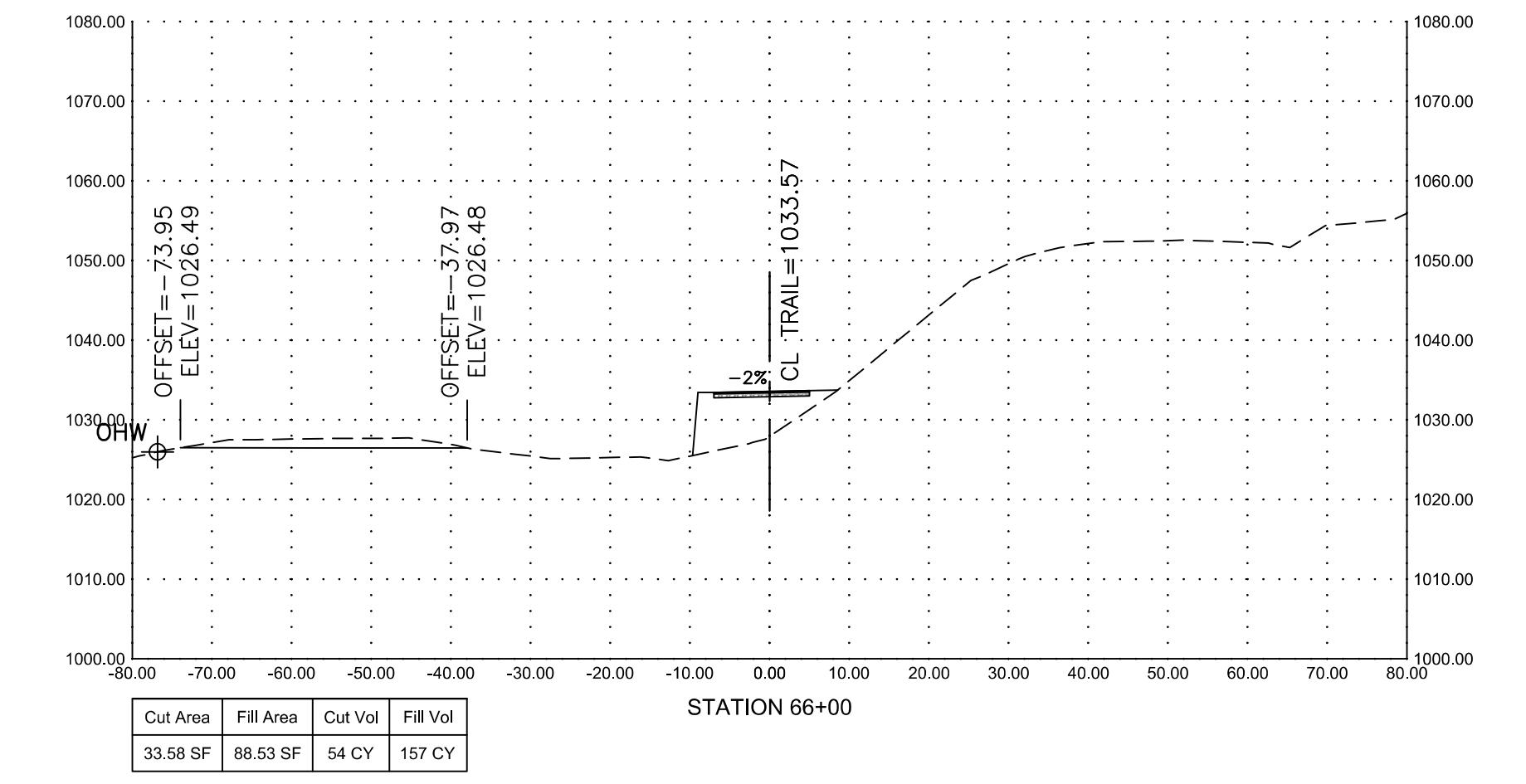
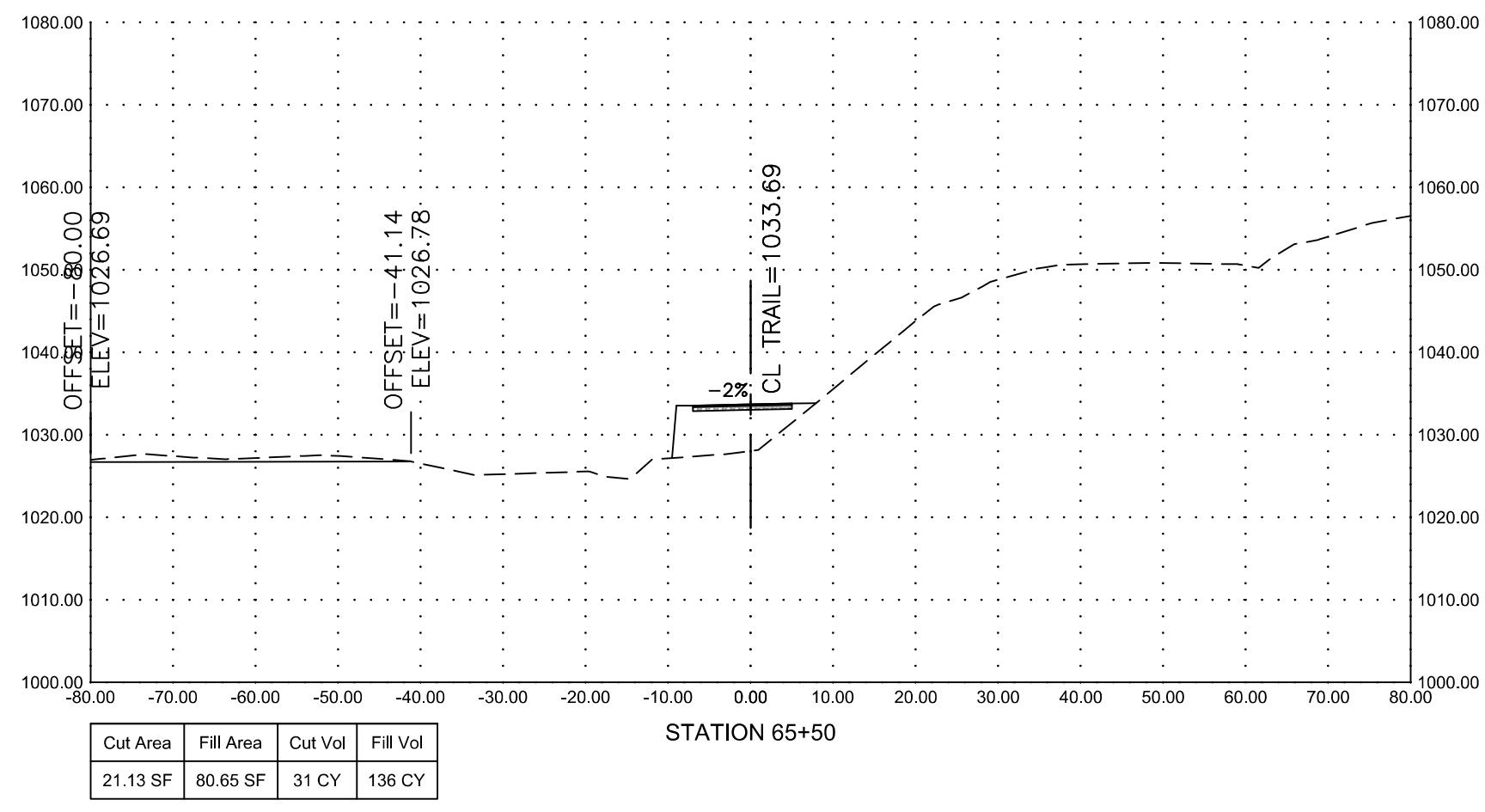
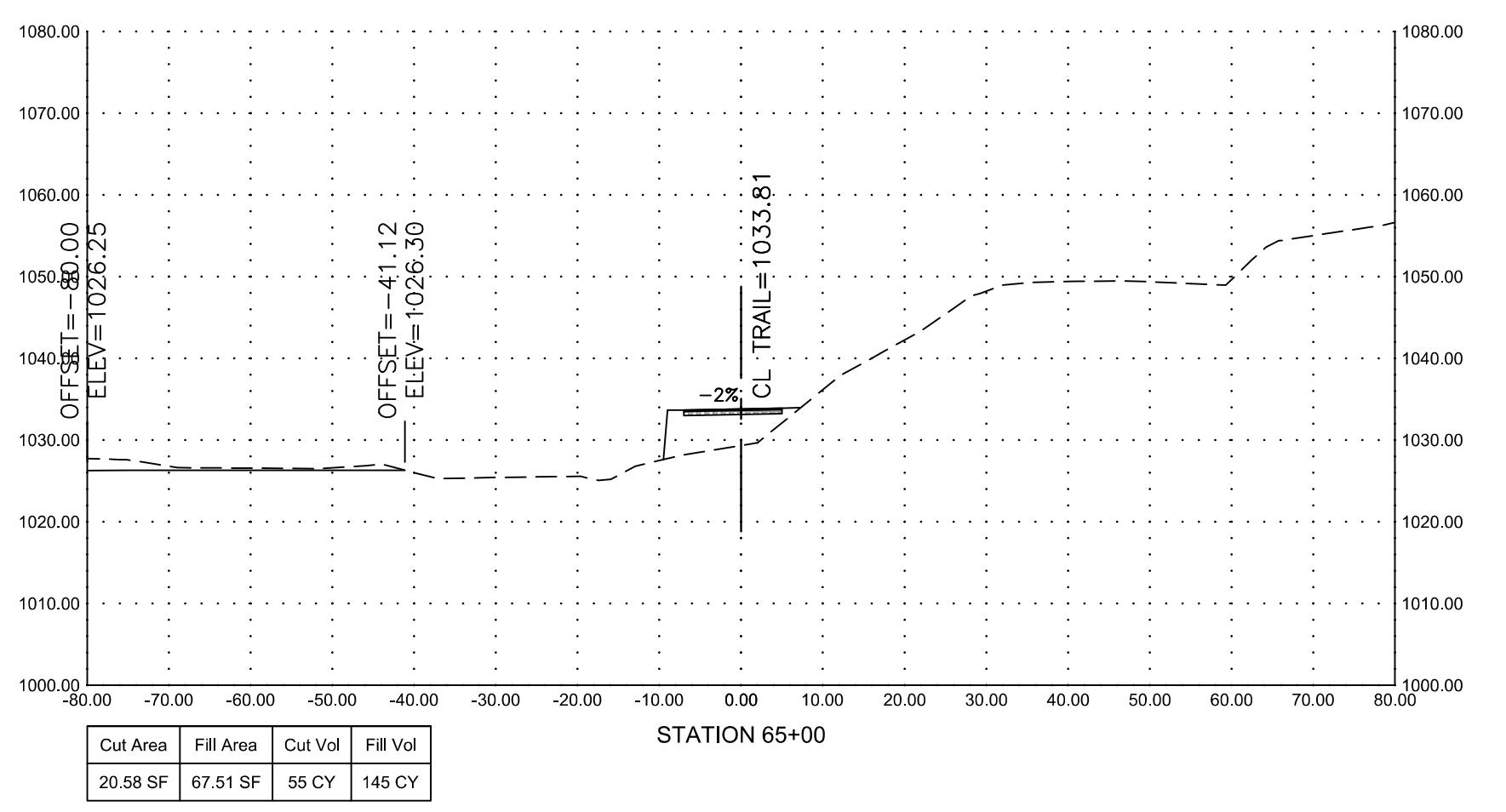
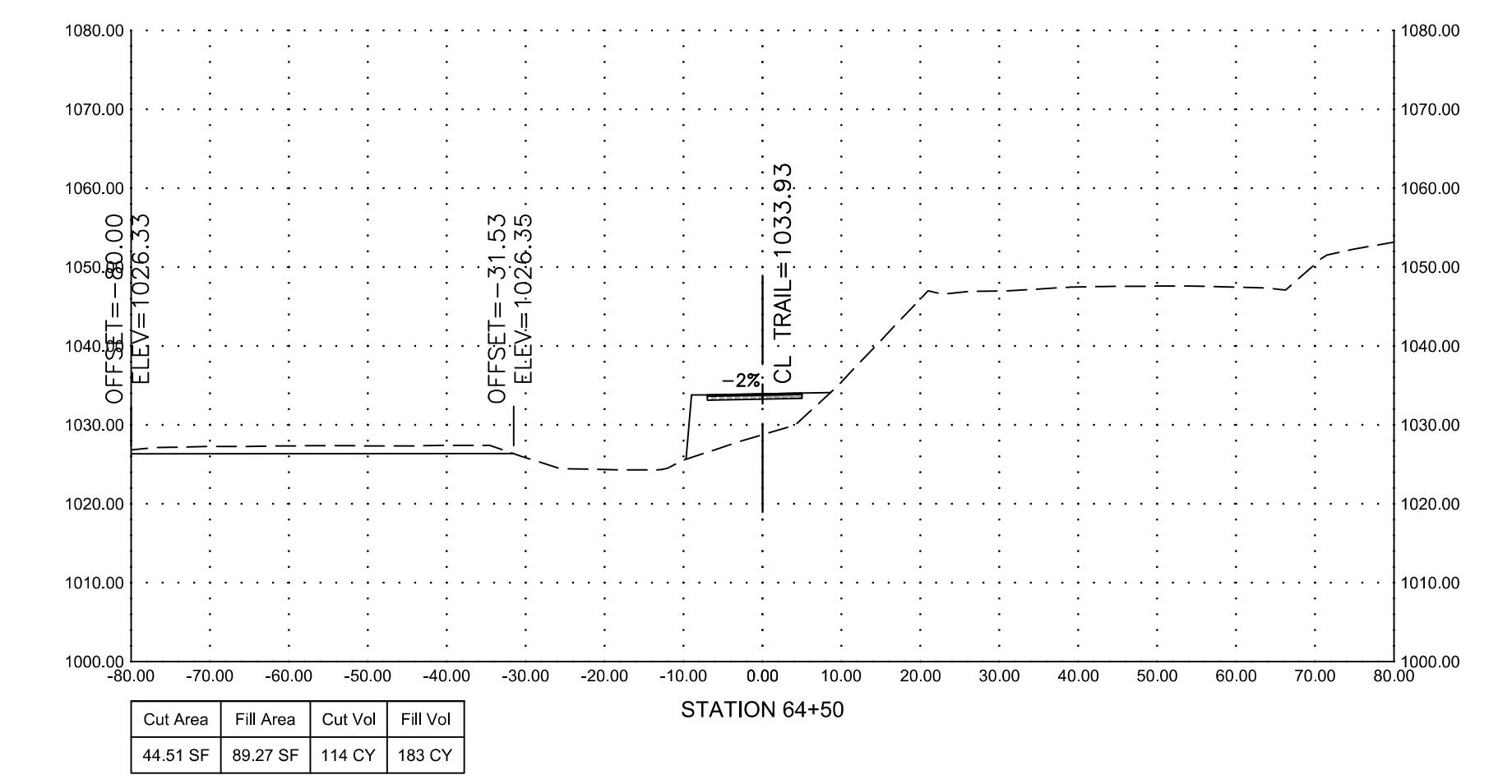
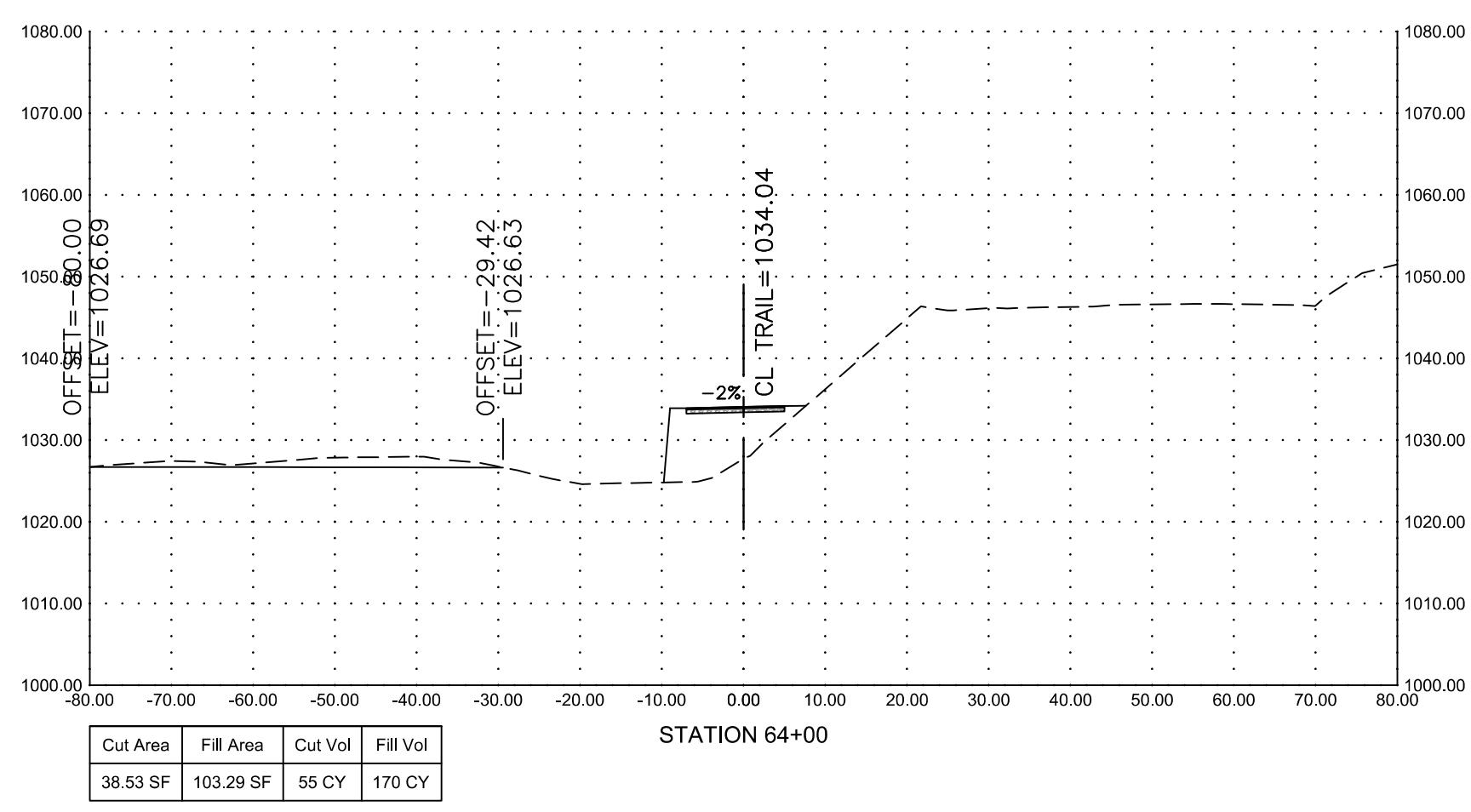
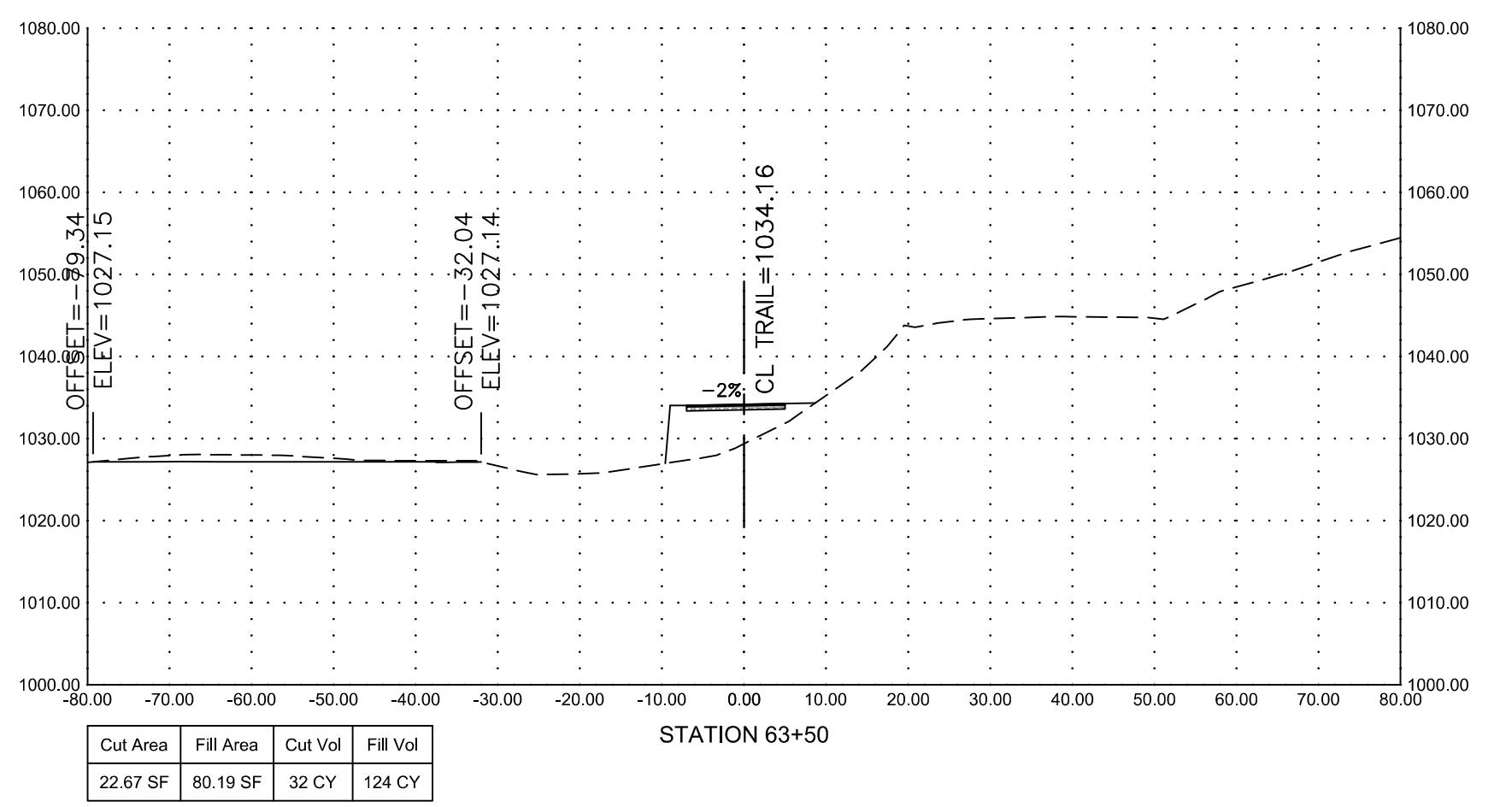
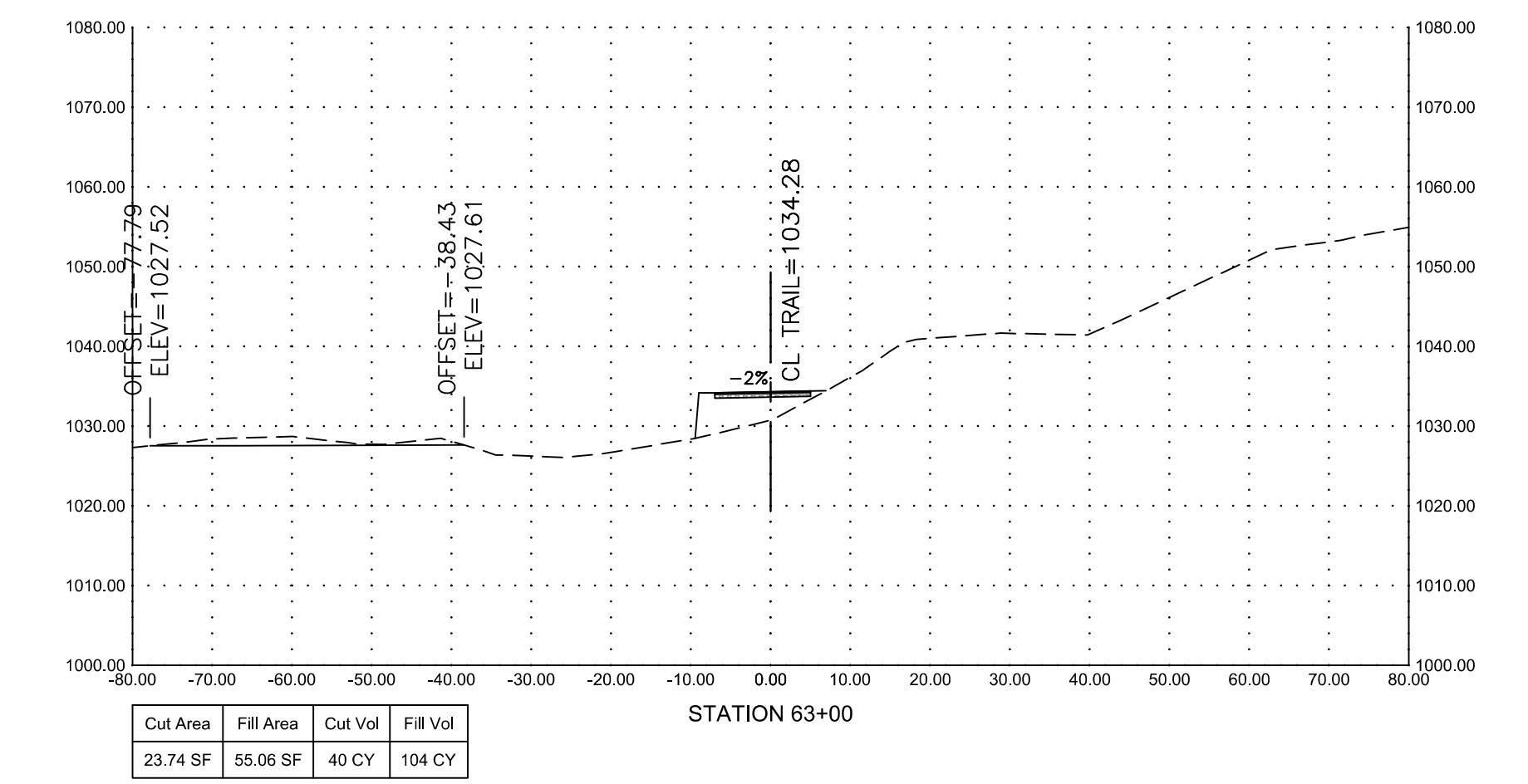
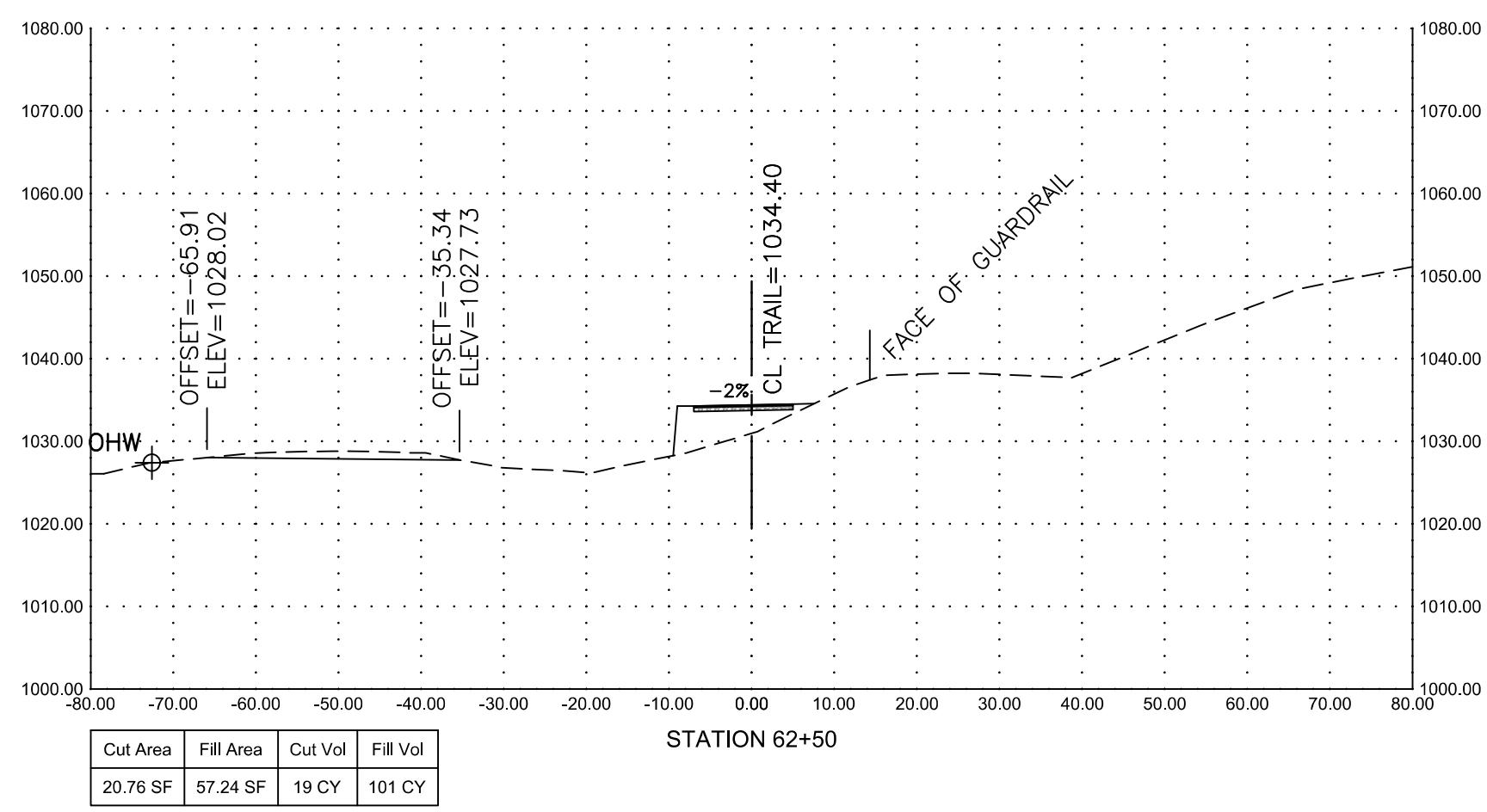
CROSS SECTIONS

STA. 62+50 TO 66+50
WEST ROANOKE RIVER GREENWAY PH1
COUNTY OF ROANOKE, VA

PROJECT NO.	20221694
LAT.	
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DATE:	18 April 2023
DRAWN BY:	TWH
CHECKED BY:	JMJ

COMMONWEALTH OF VIRGINIA
JEREMY MICHAEL JOHNSON
Lic. No. 0402050112
18 April 2023
PROFESSIONAL ENGINEER

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CROSS SECTIONS

STA. 67+00 TO 69+50

WEST ROANOKE RIVER GREENWAY PH1

COUNTY OF ROANOKE, VA

PROJECT NO. 2022194

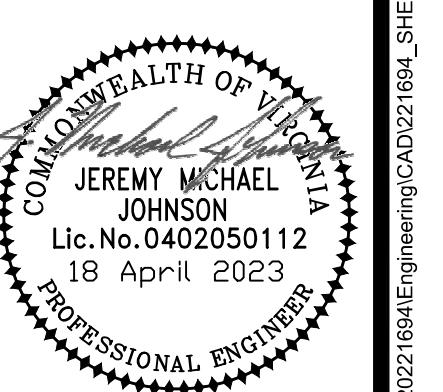
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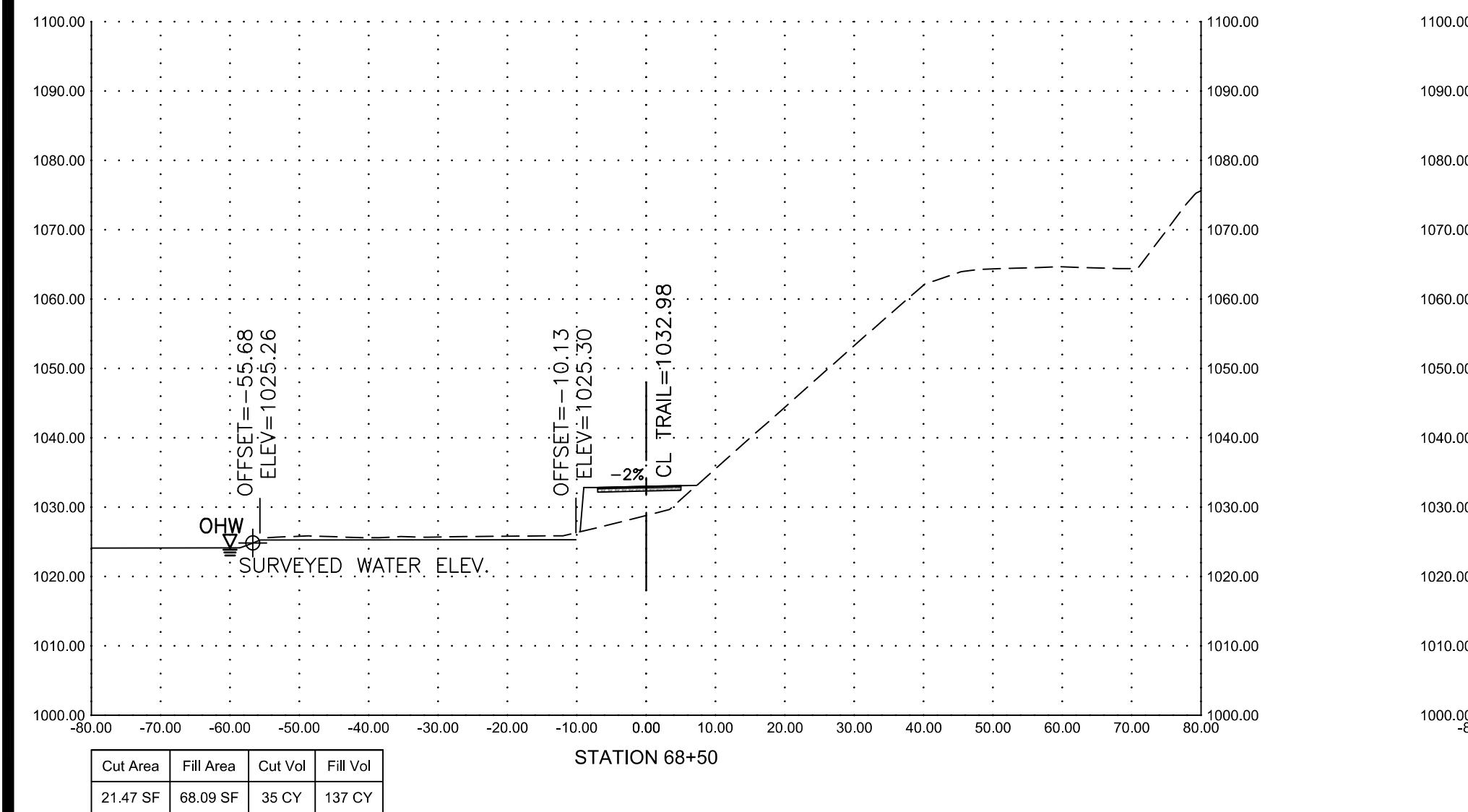
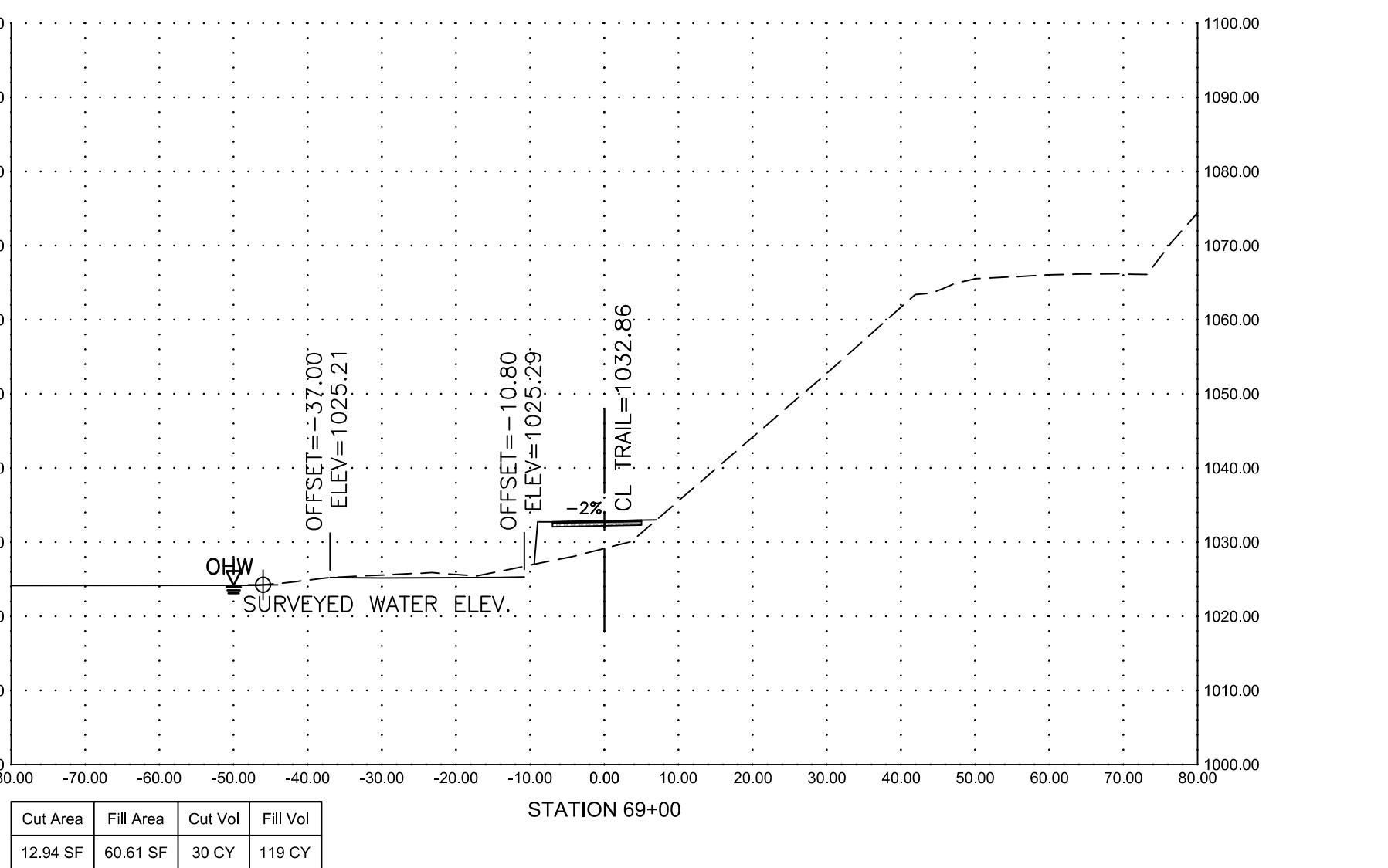
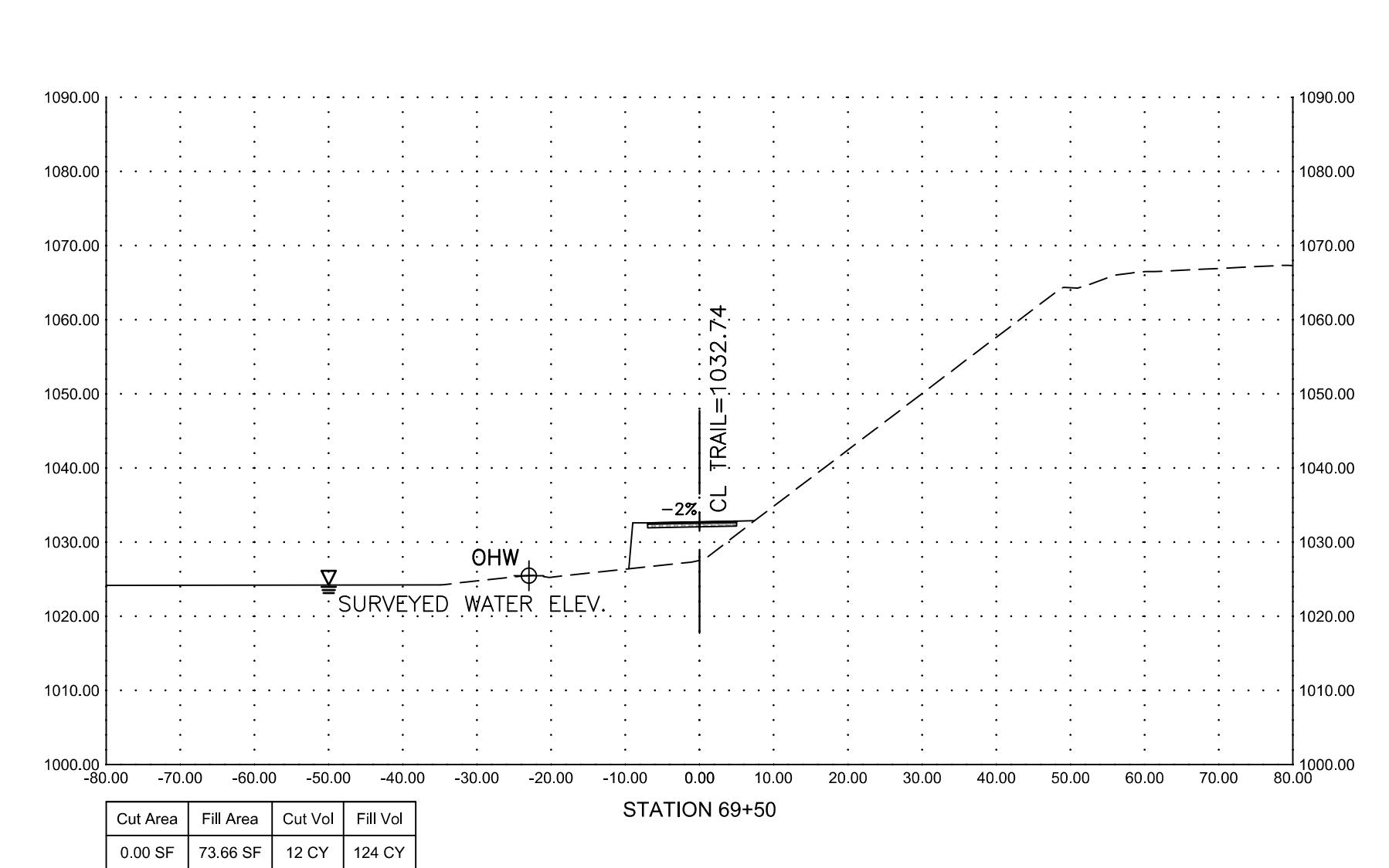
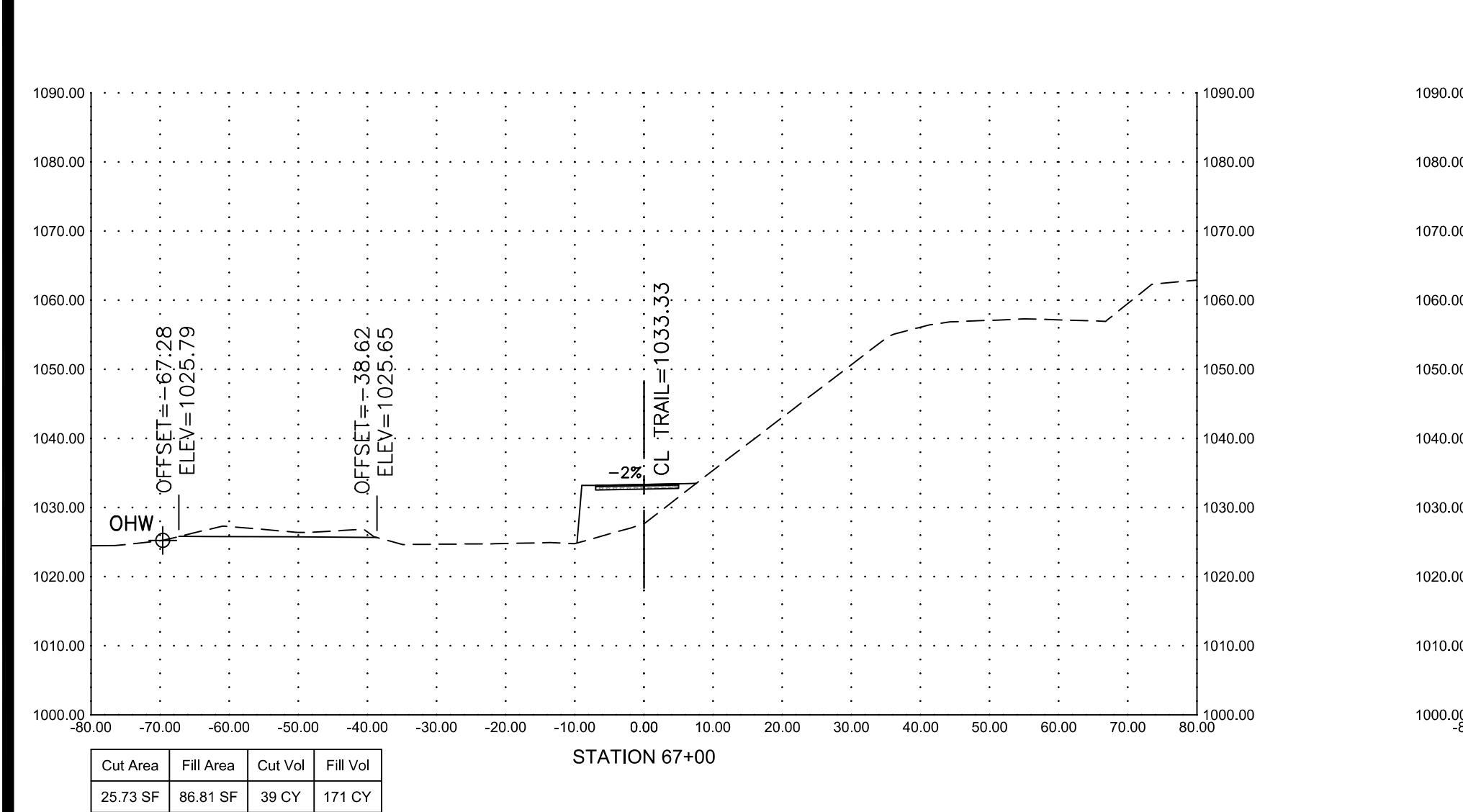
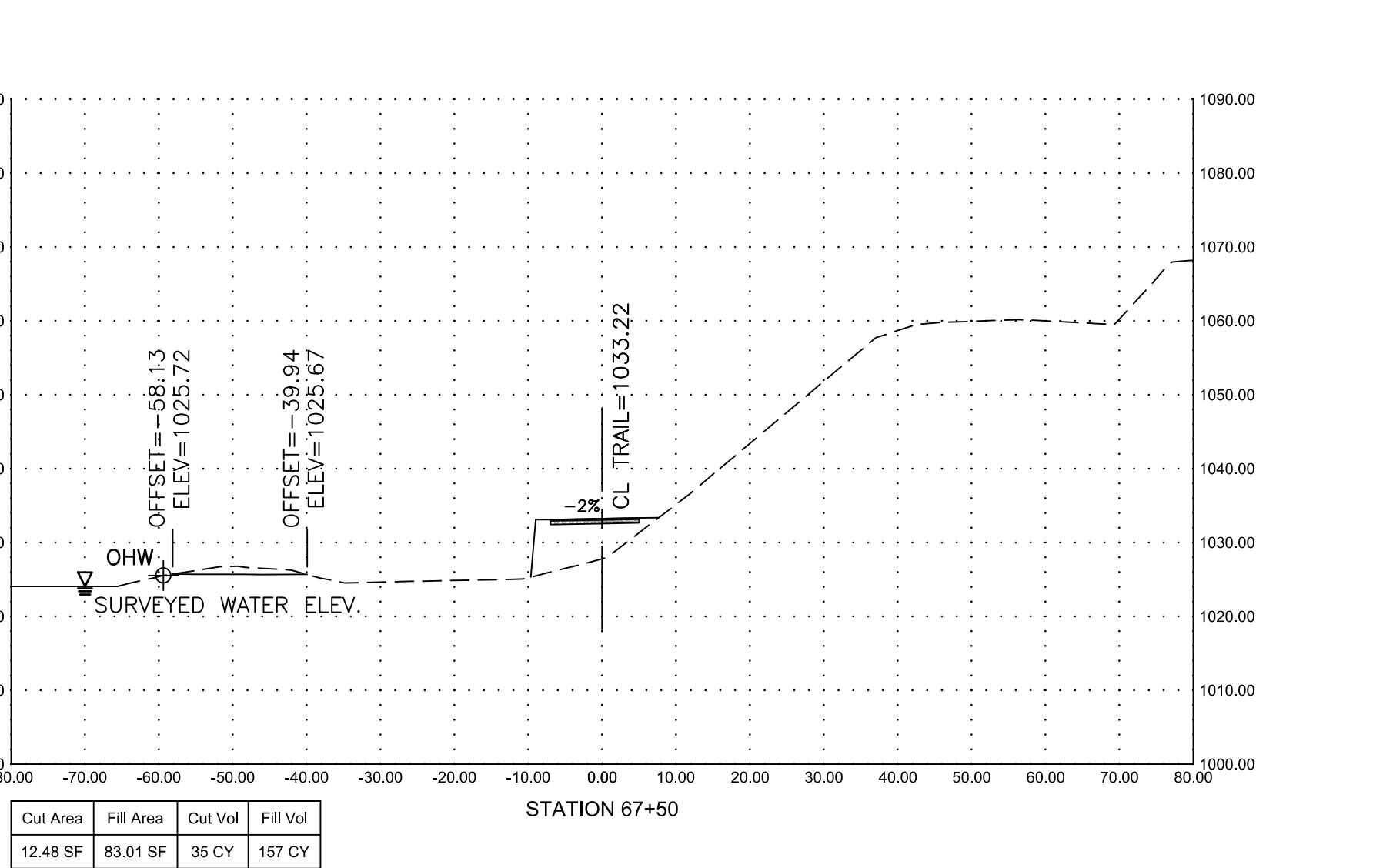
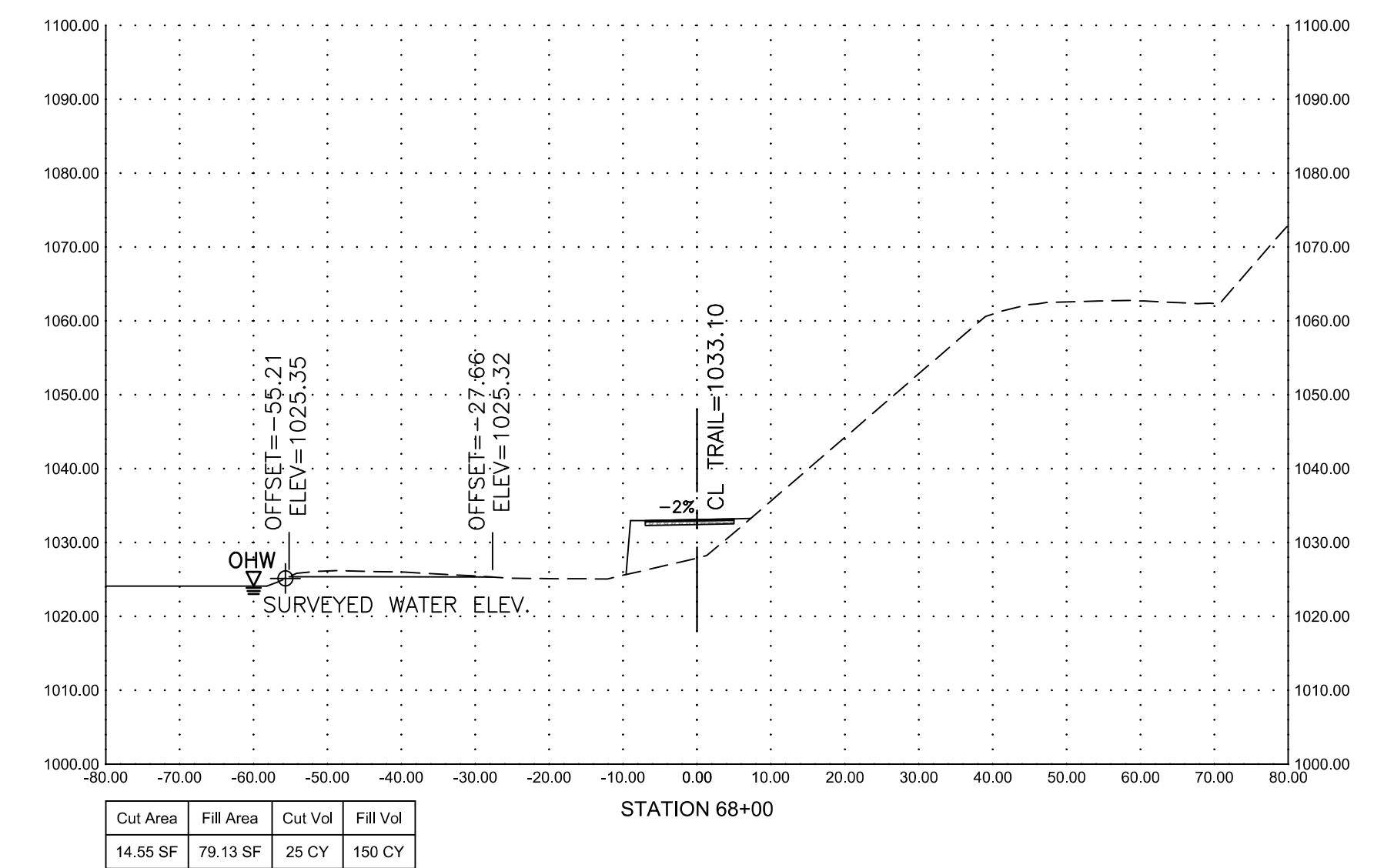
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CROSS SECTIONS

STA. 70+00 TO 72+50

WEST ROANOKE RIVER GREENWAY PH1

COUNTY OF ROANOKE, VA

PROJECT NO. 20221694

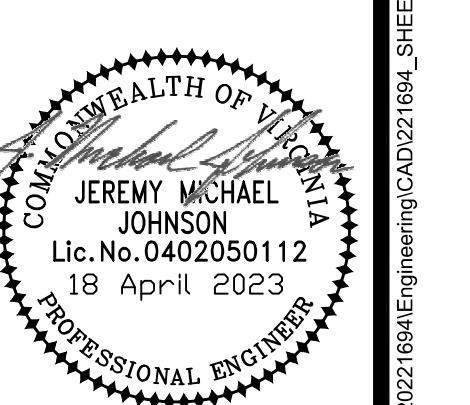
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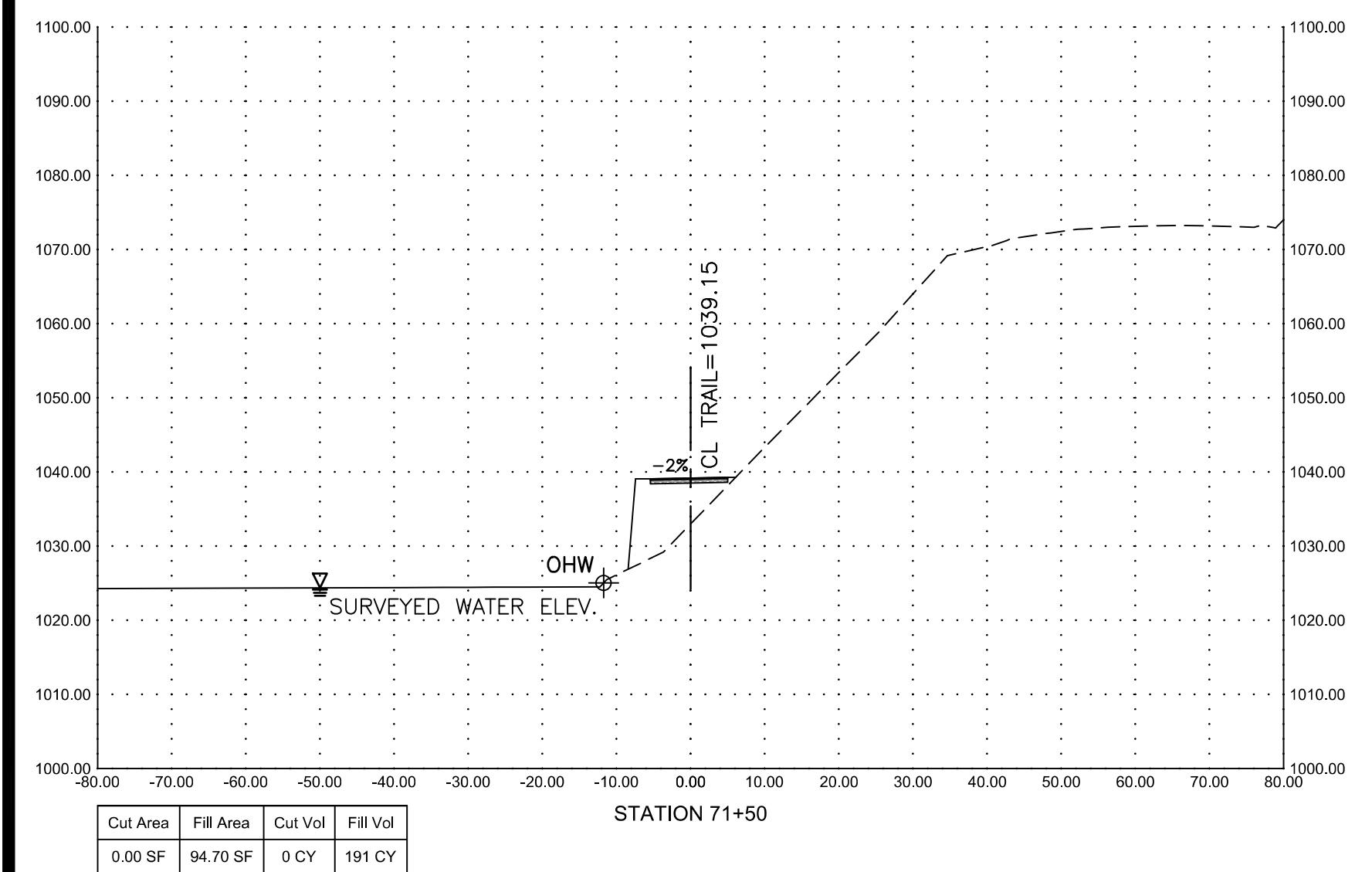
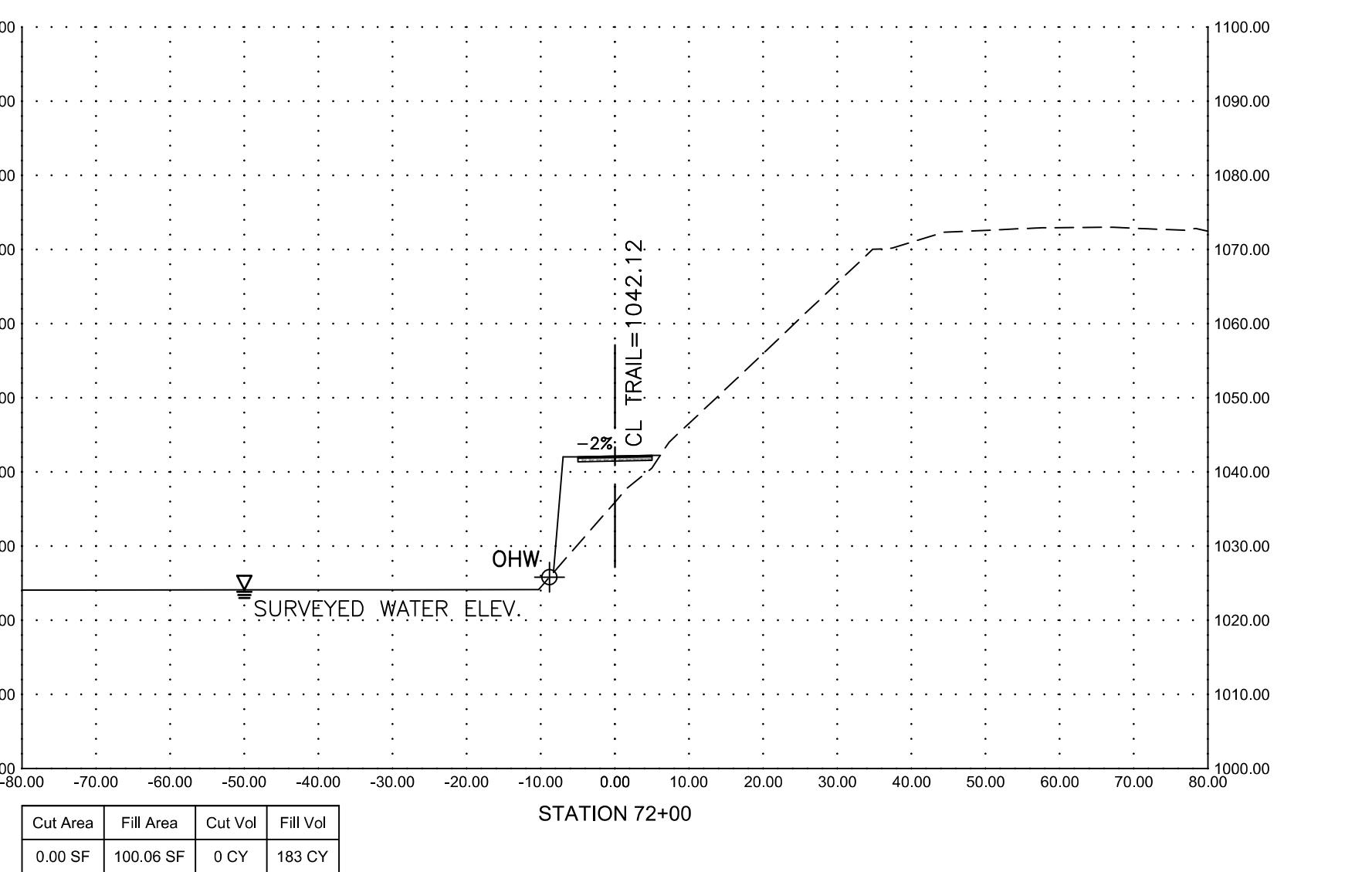
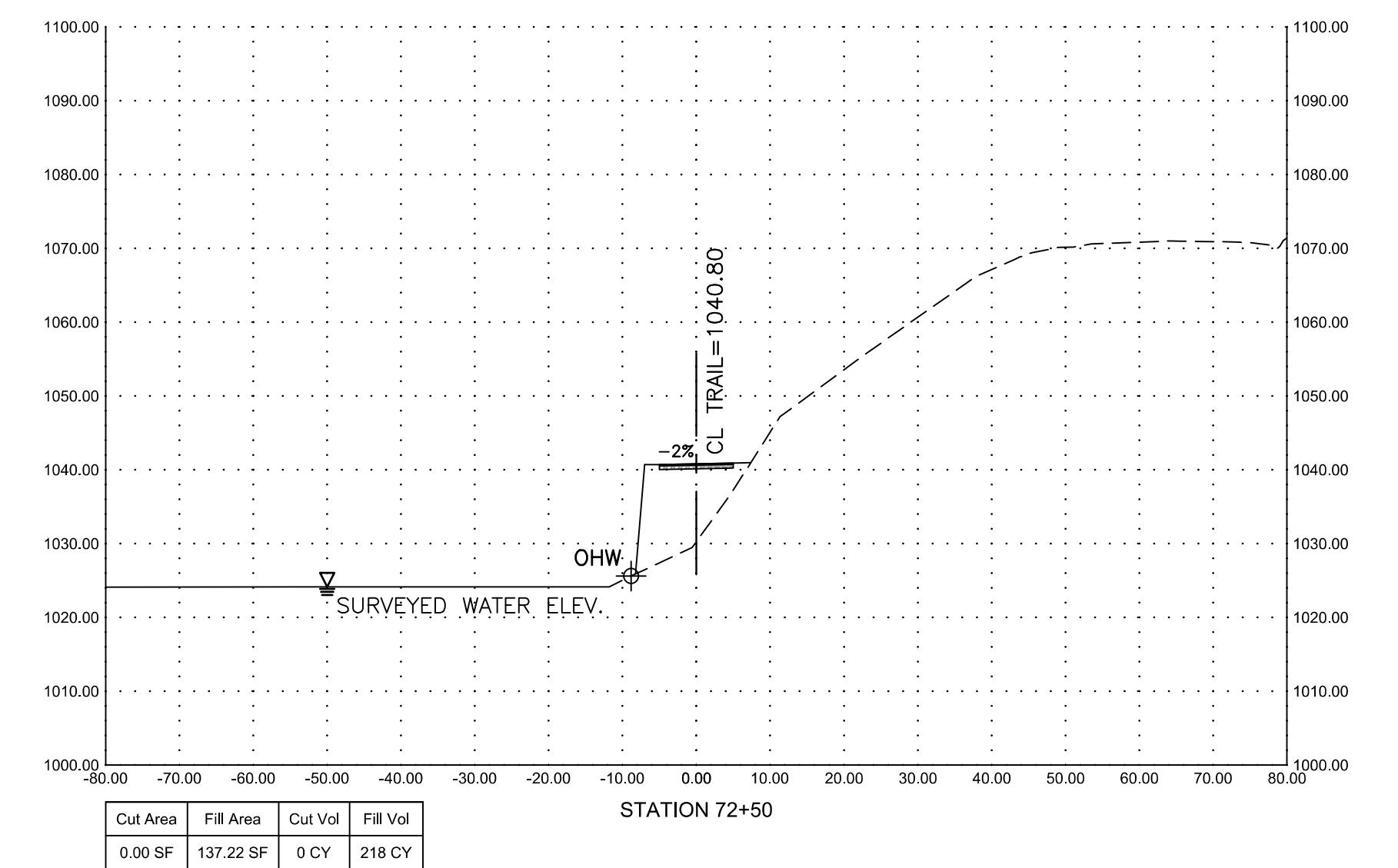
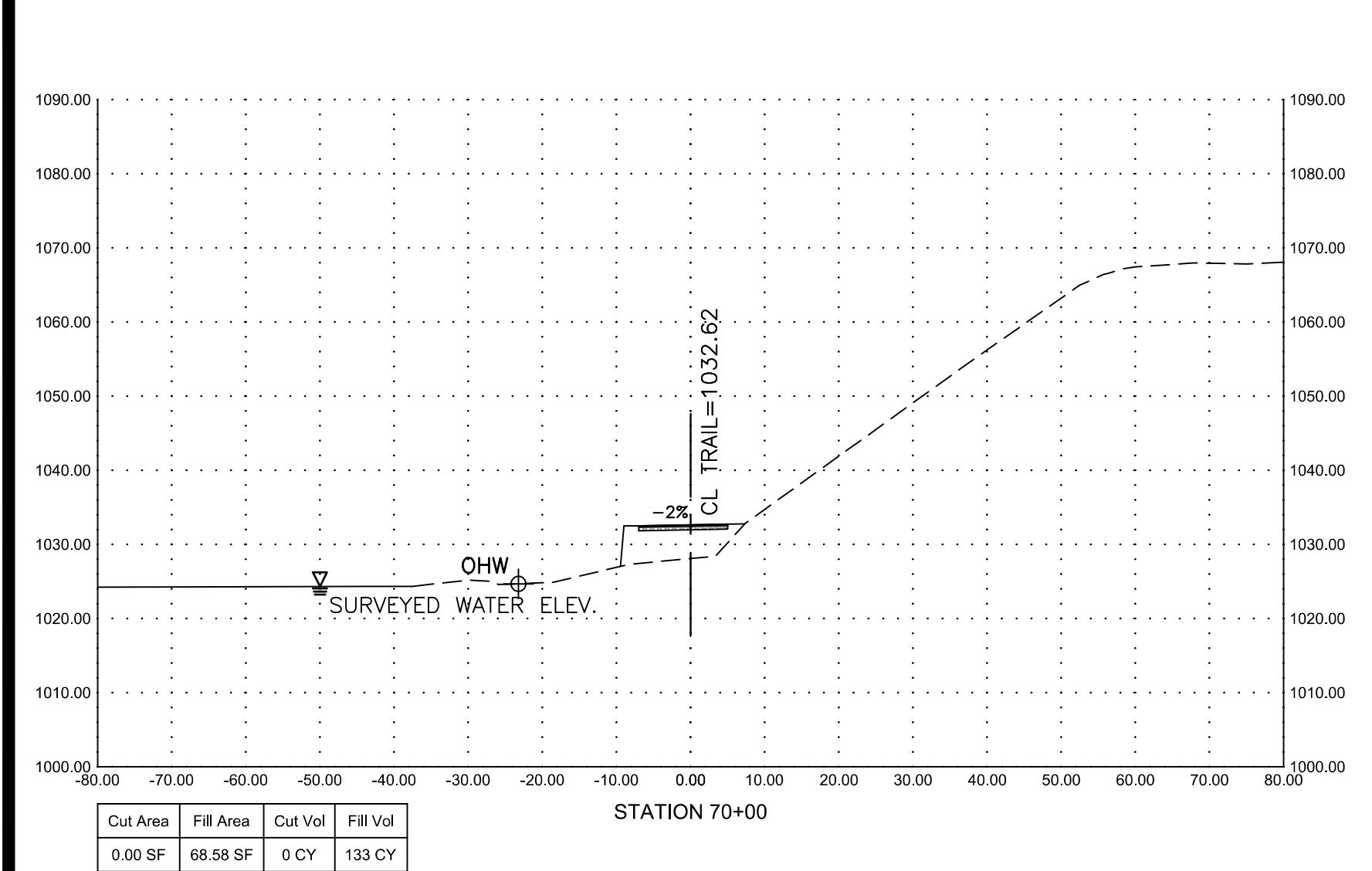
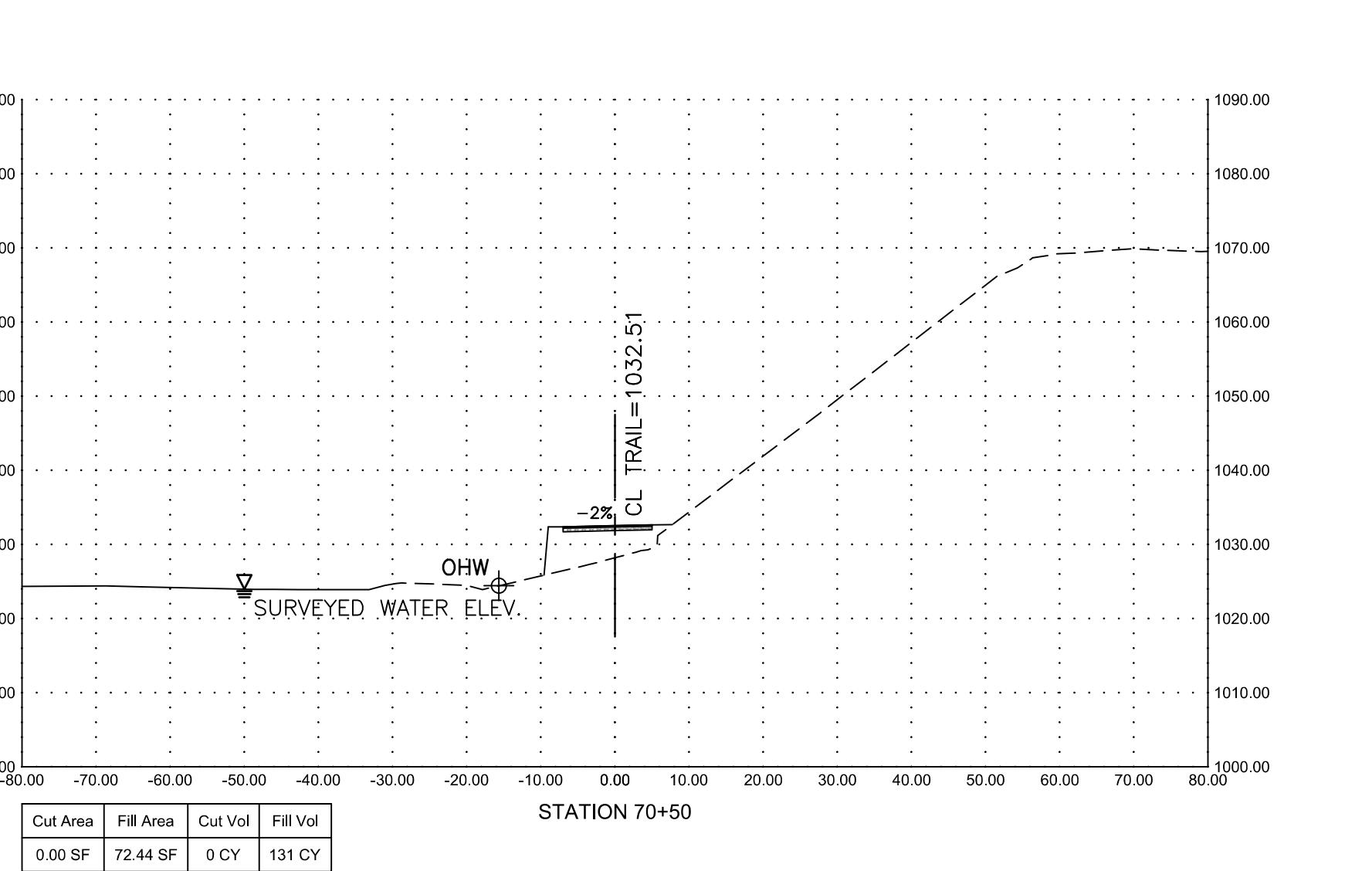
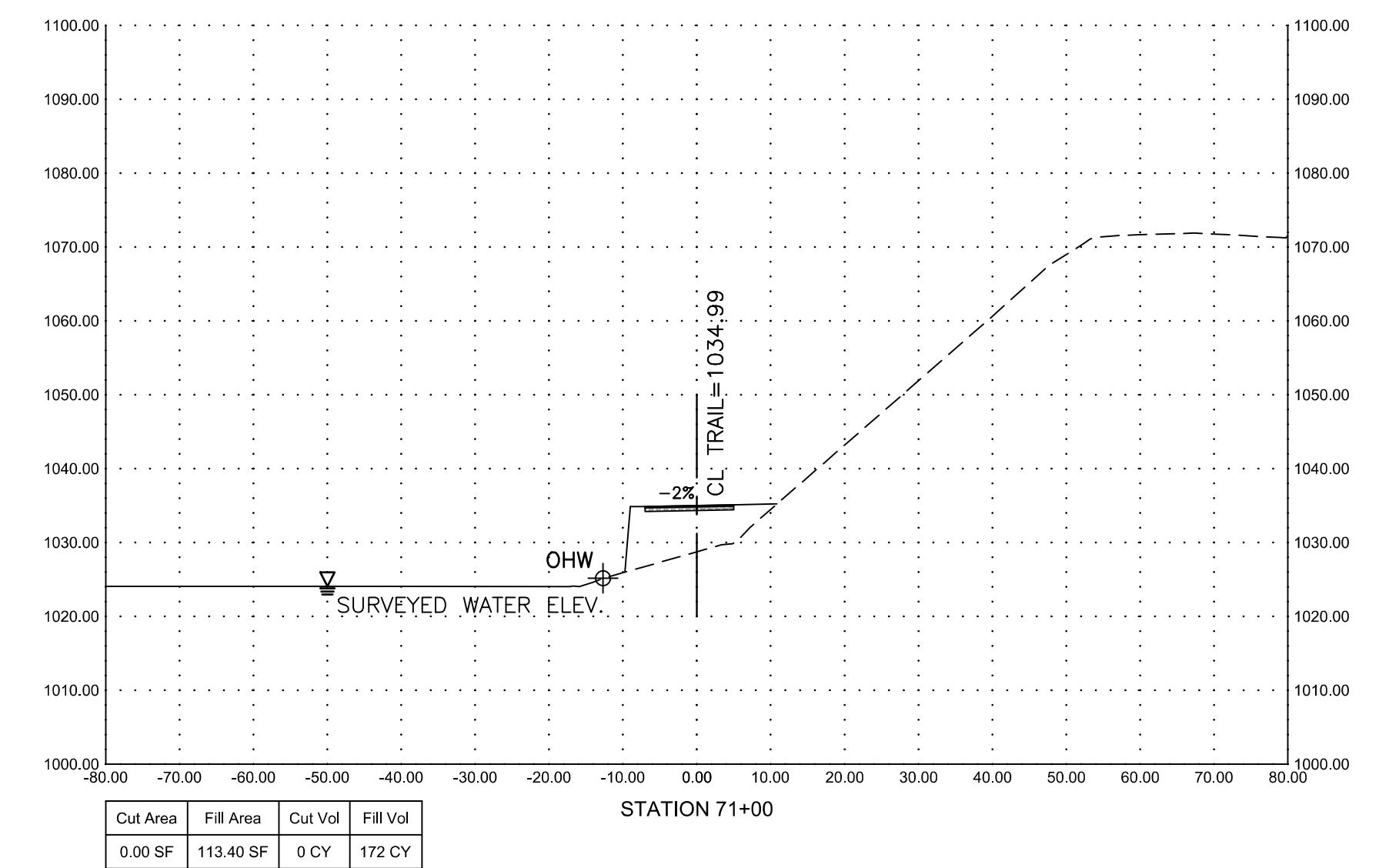
DRAWN BY: TWH

CHECKED BY: JMJ



SHEET NO.
C-18

20 10 0 20 40 60
SCALE IN FEET





540.552.5592
1861 PRATT DR, STE 1100

CROSS SECTIONS
STA. 73+00 TO 75+50
WEST ROANOKE RIVER GREENWAY PH1
COUNTY OF ROANOKE, VA

PROJECT NO. 20221694

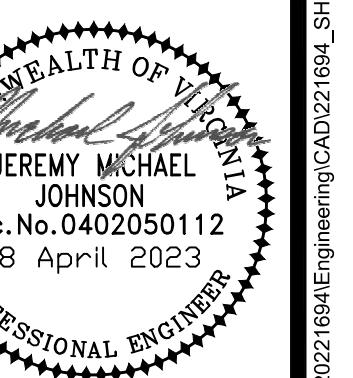
LAT.

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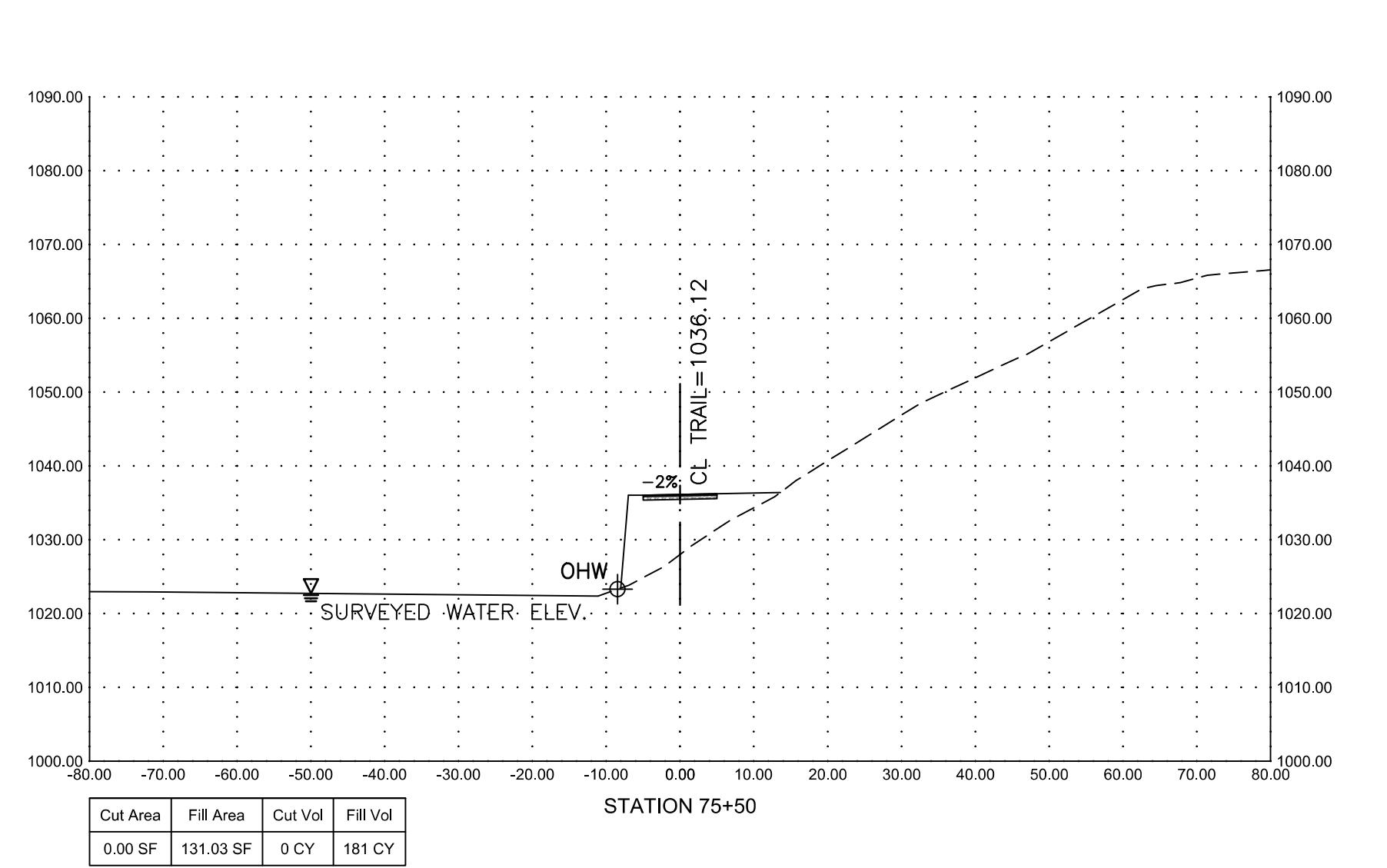
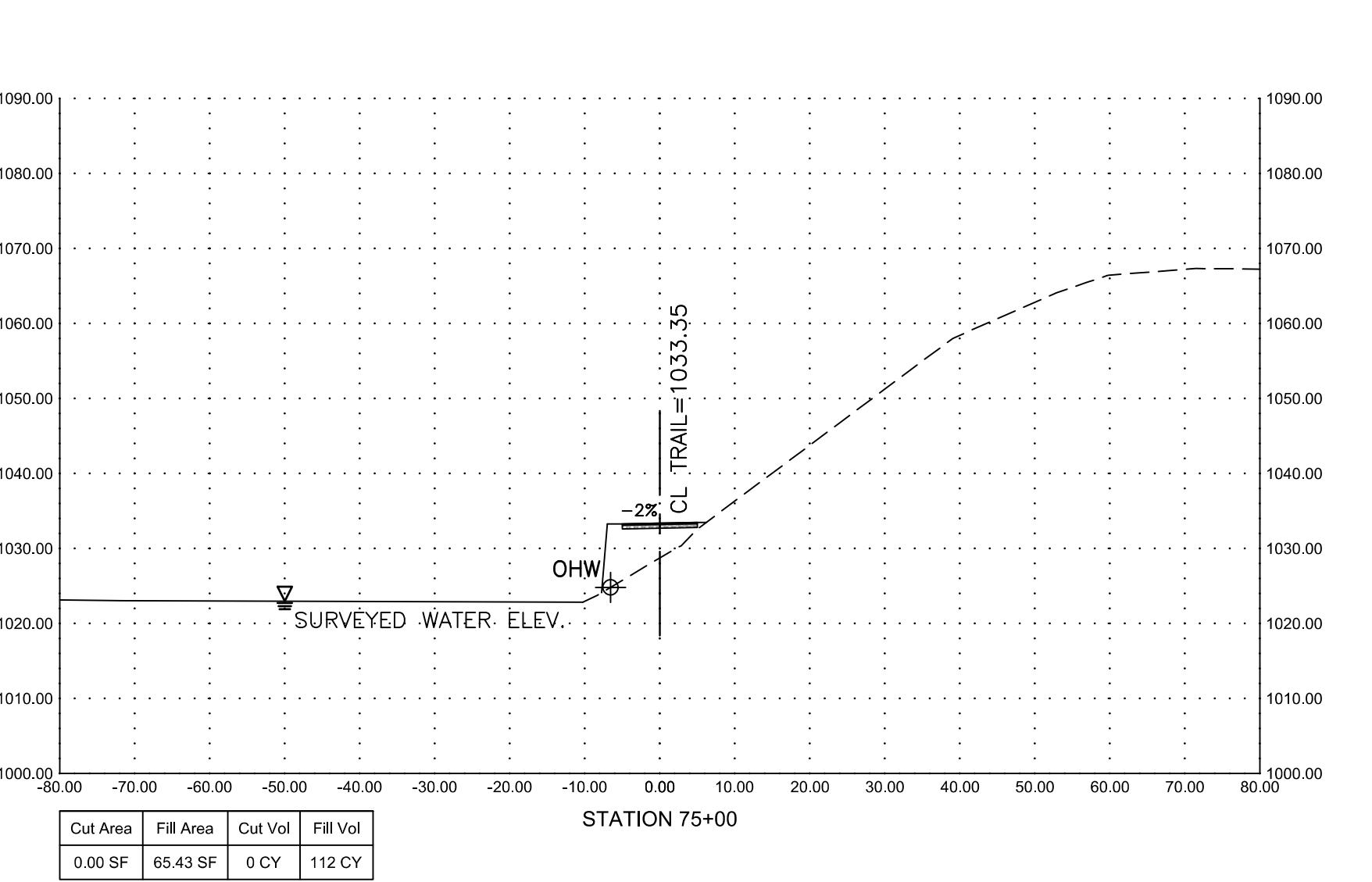
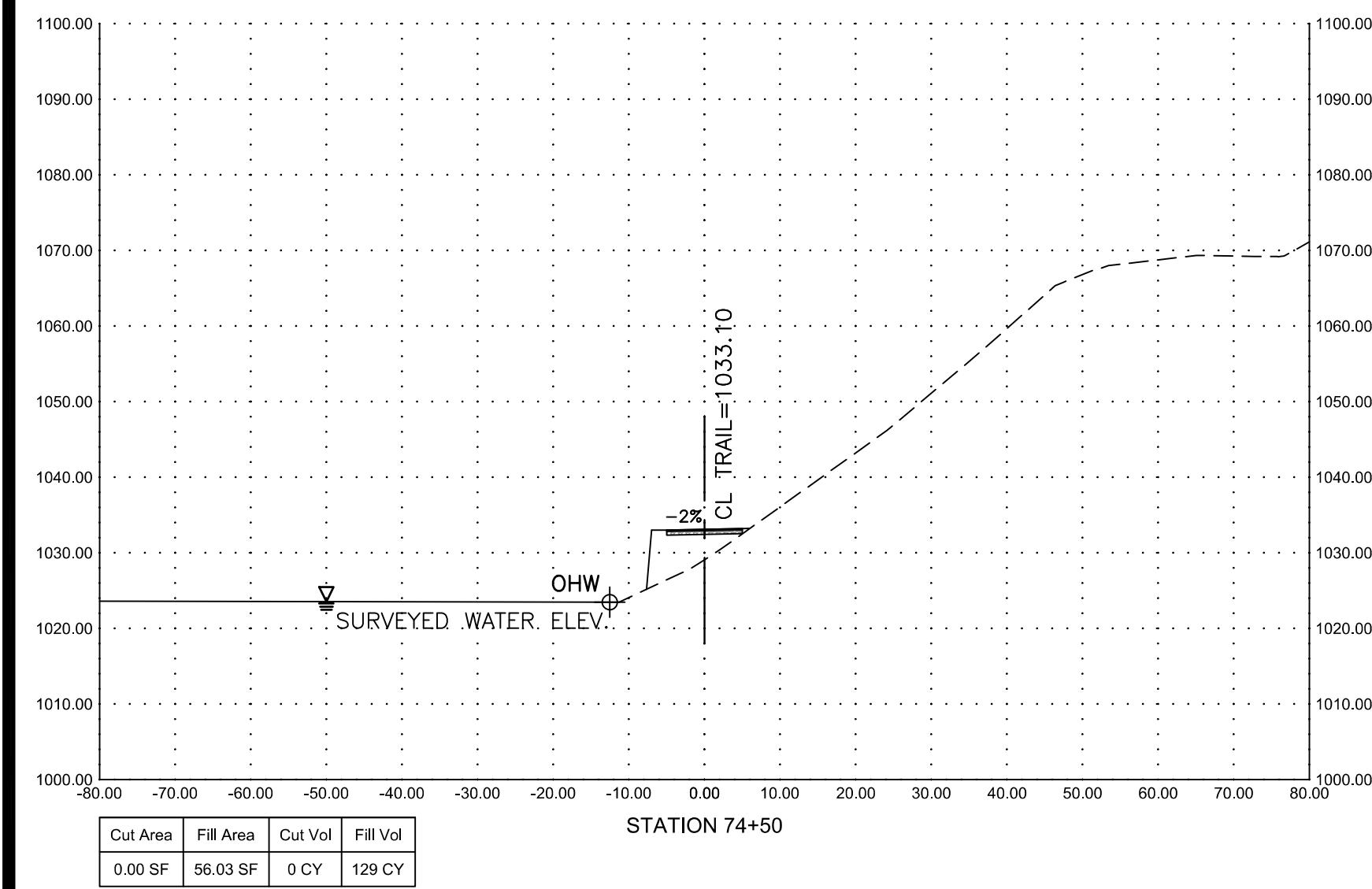
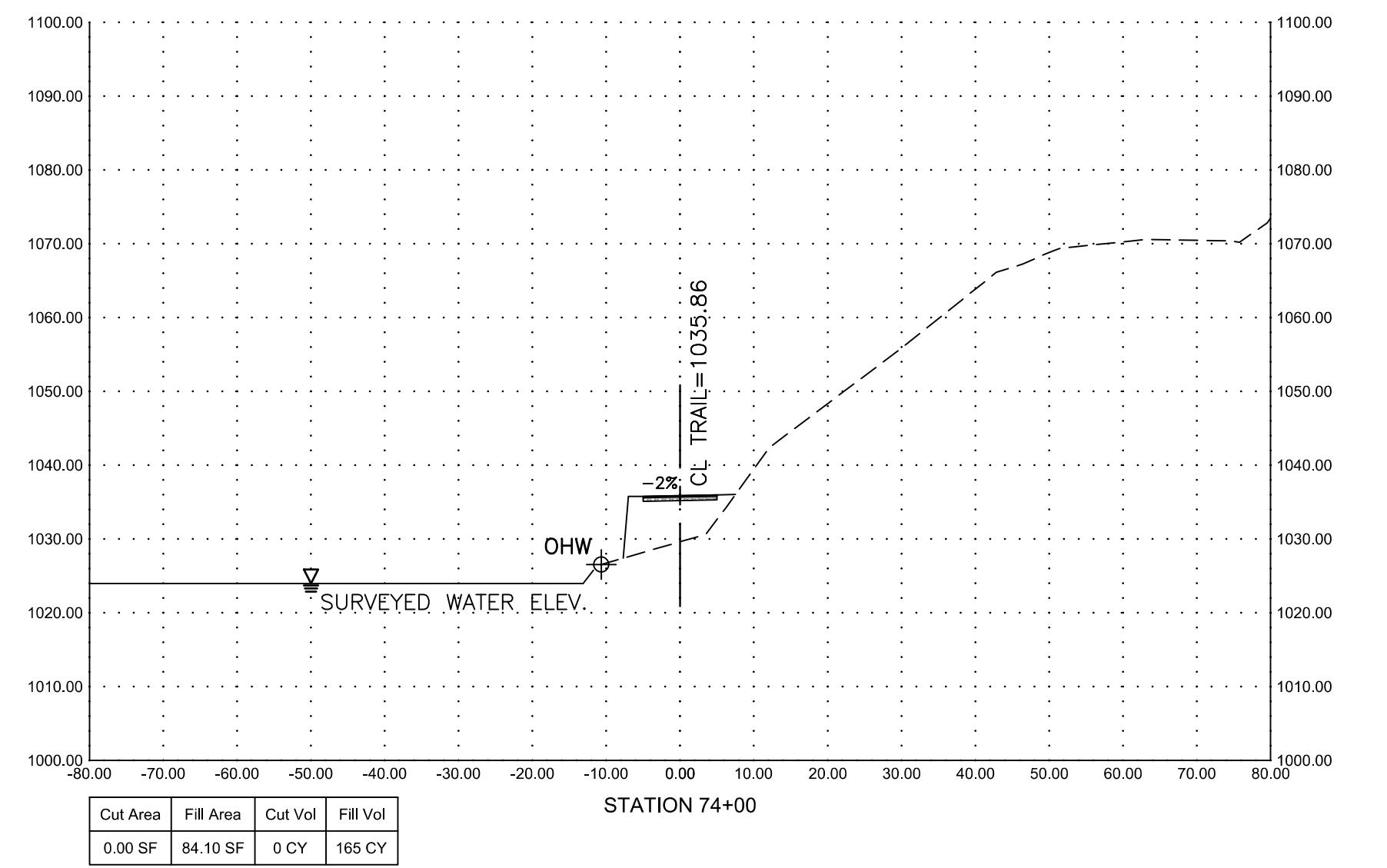
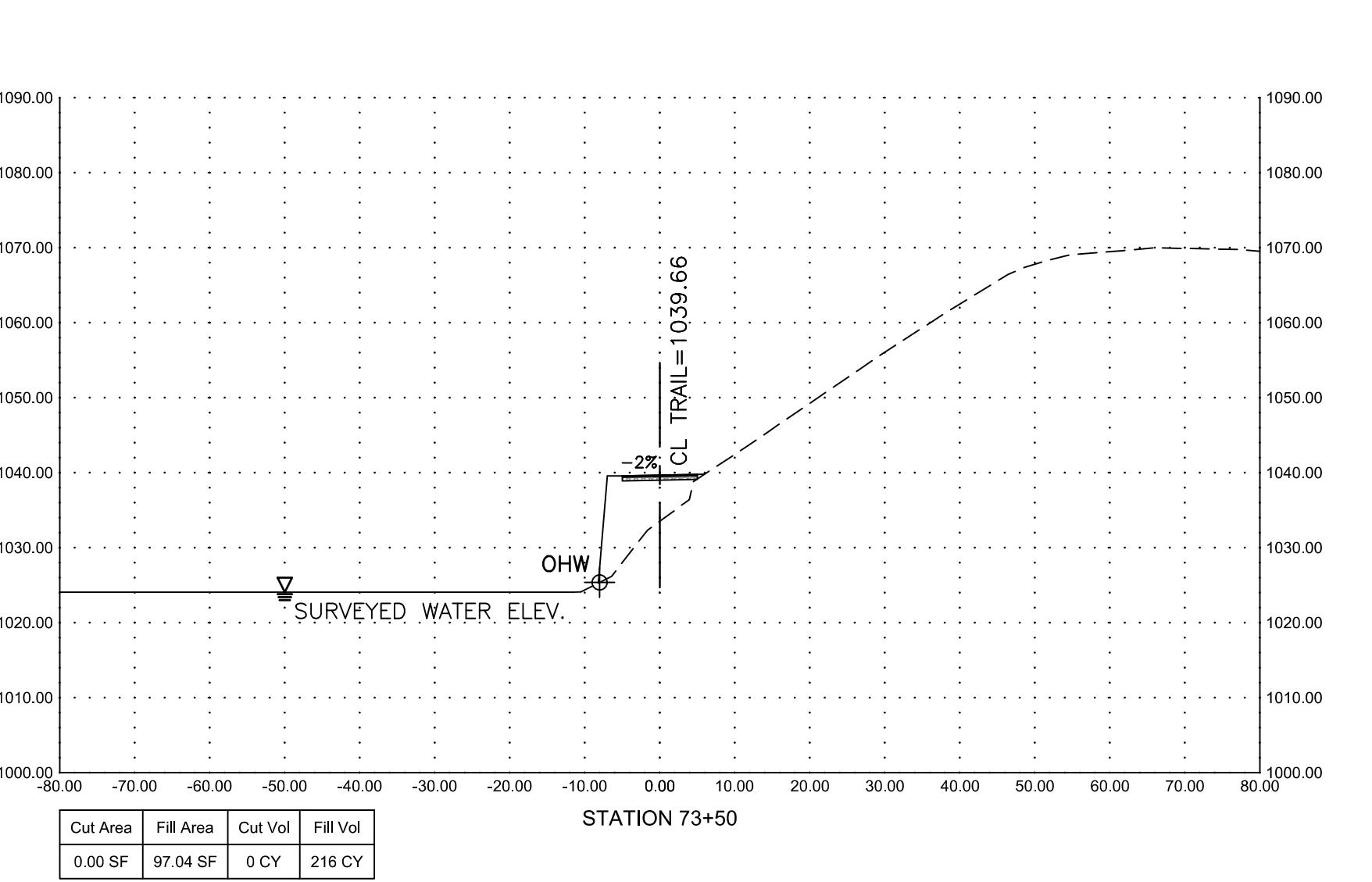
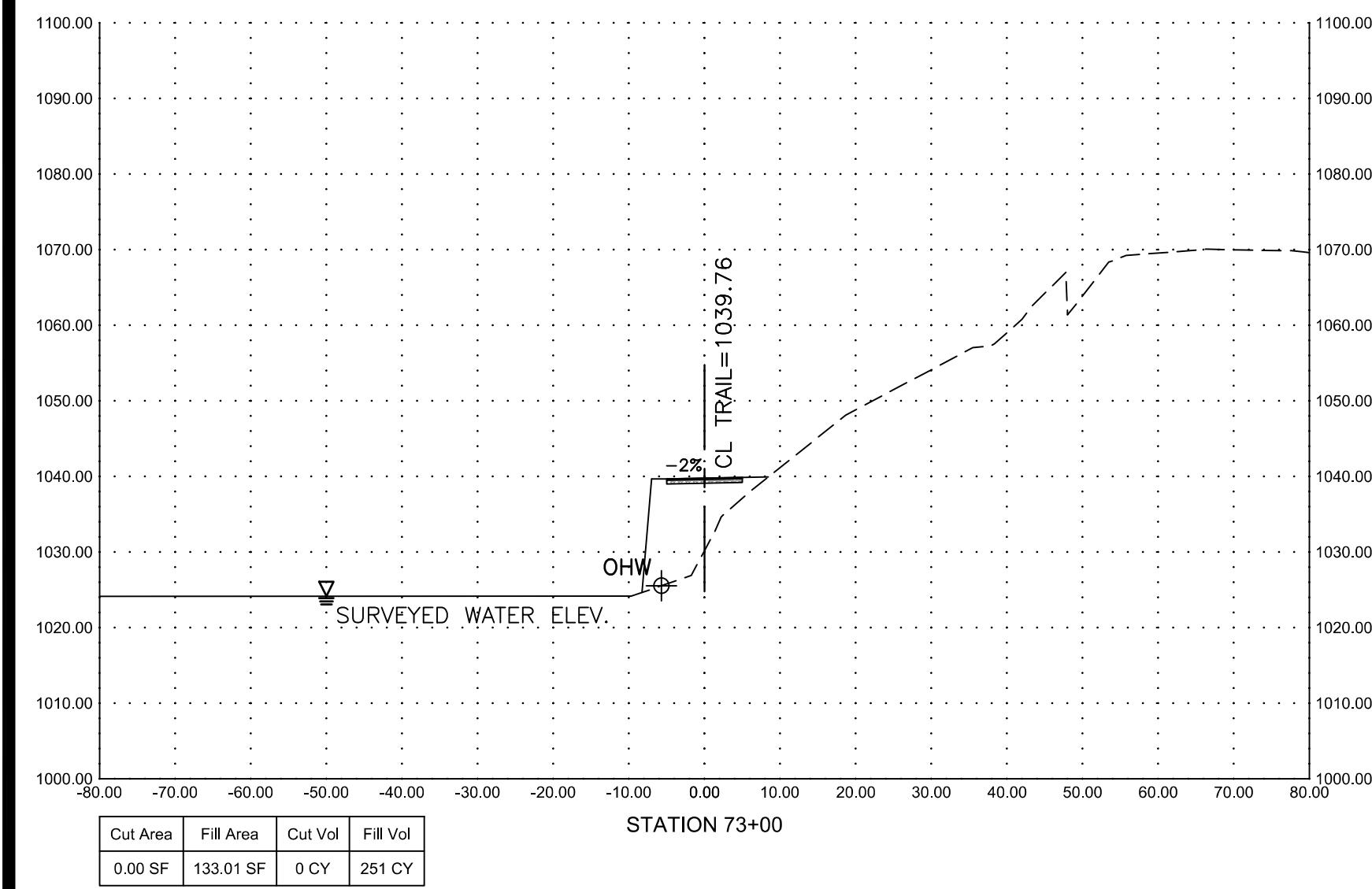
DATE: 18 April 2023

DRAWN BY: TWH

CHECKED BY: JMJ



SHEET NO.
C-19



20 10 0 20 40 60
SCALE IN FEET



540.552.5592
1861 PRATT DR, STE 1100

CROSS SECTIONS
STA. 76+00 TO 77+64
WEST ROANOKE RIVER GREENWAY PH1
COUNTY OF ROANOKE, VA

Apr 18, 2023 - 11:49pm \data001\Projects\2022\20221654\Engineering\CD221654_3Sheets_X_Sections.dwg

PROJECT NO. 20221694

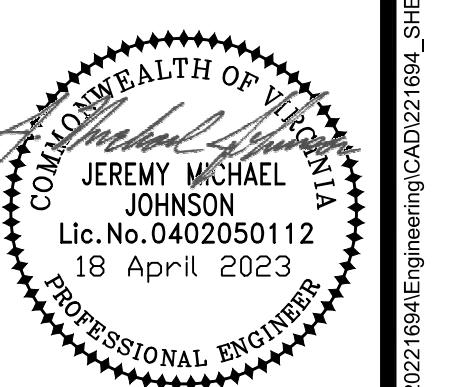
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DATE: 18 April 2023

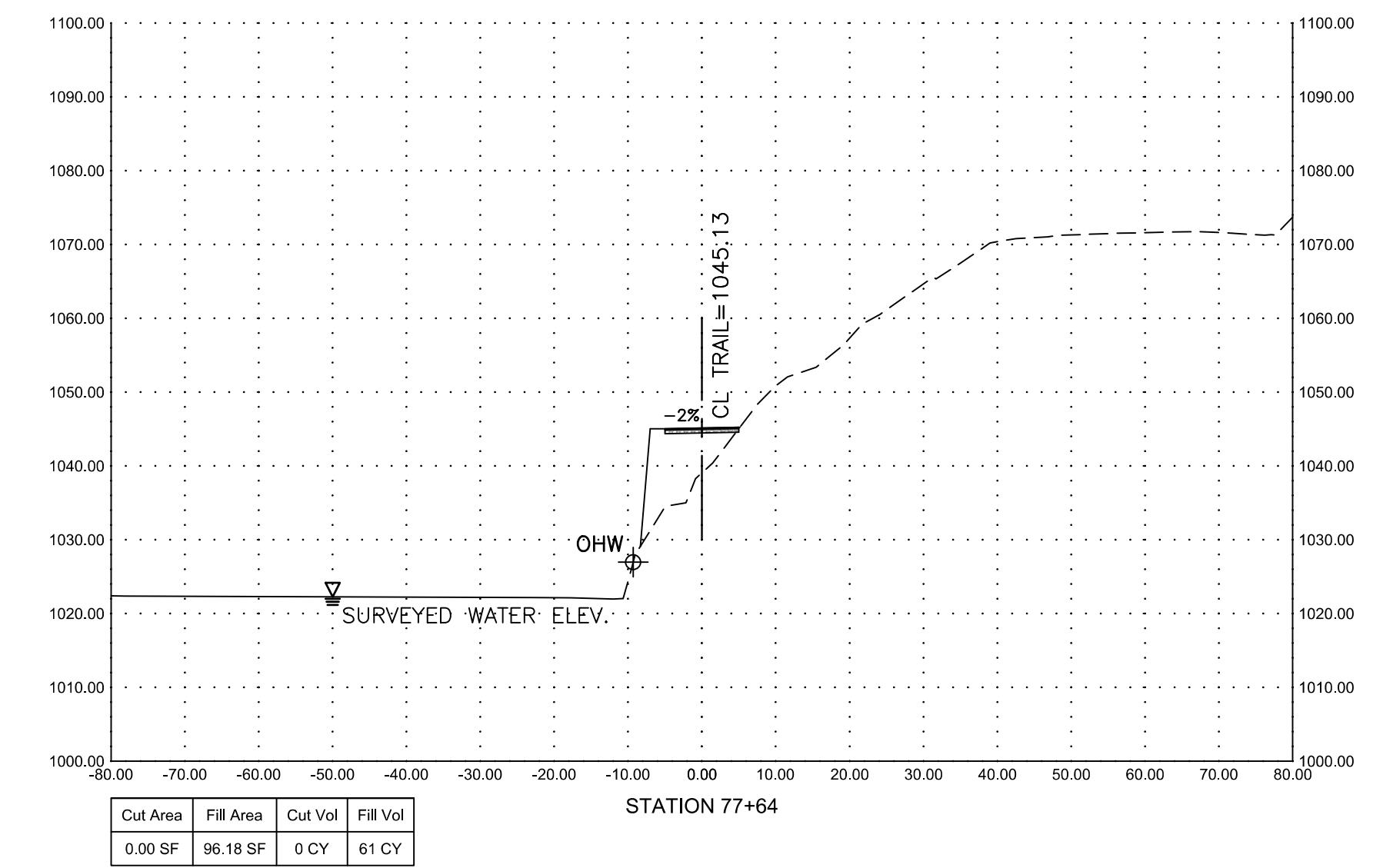
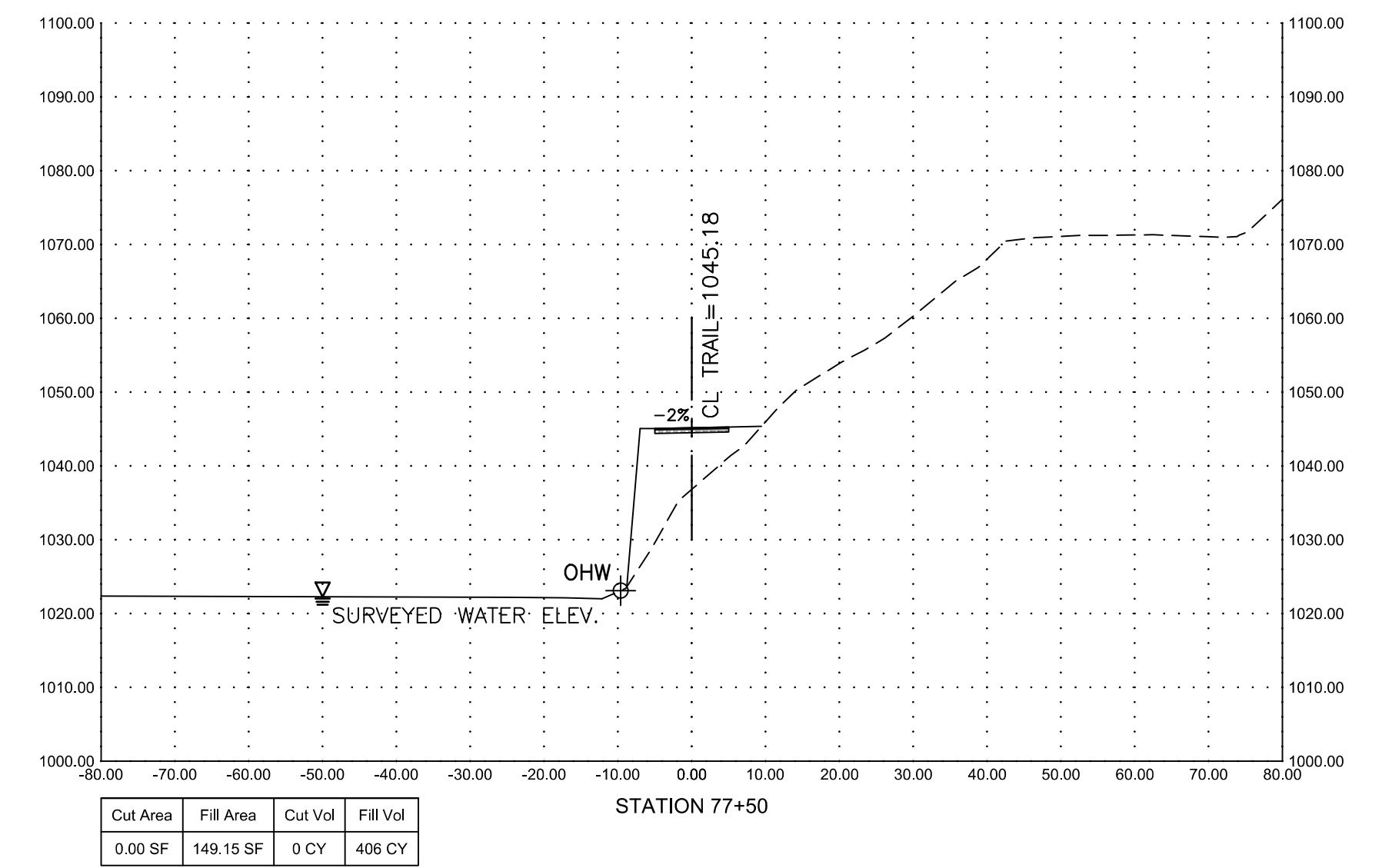
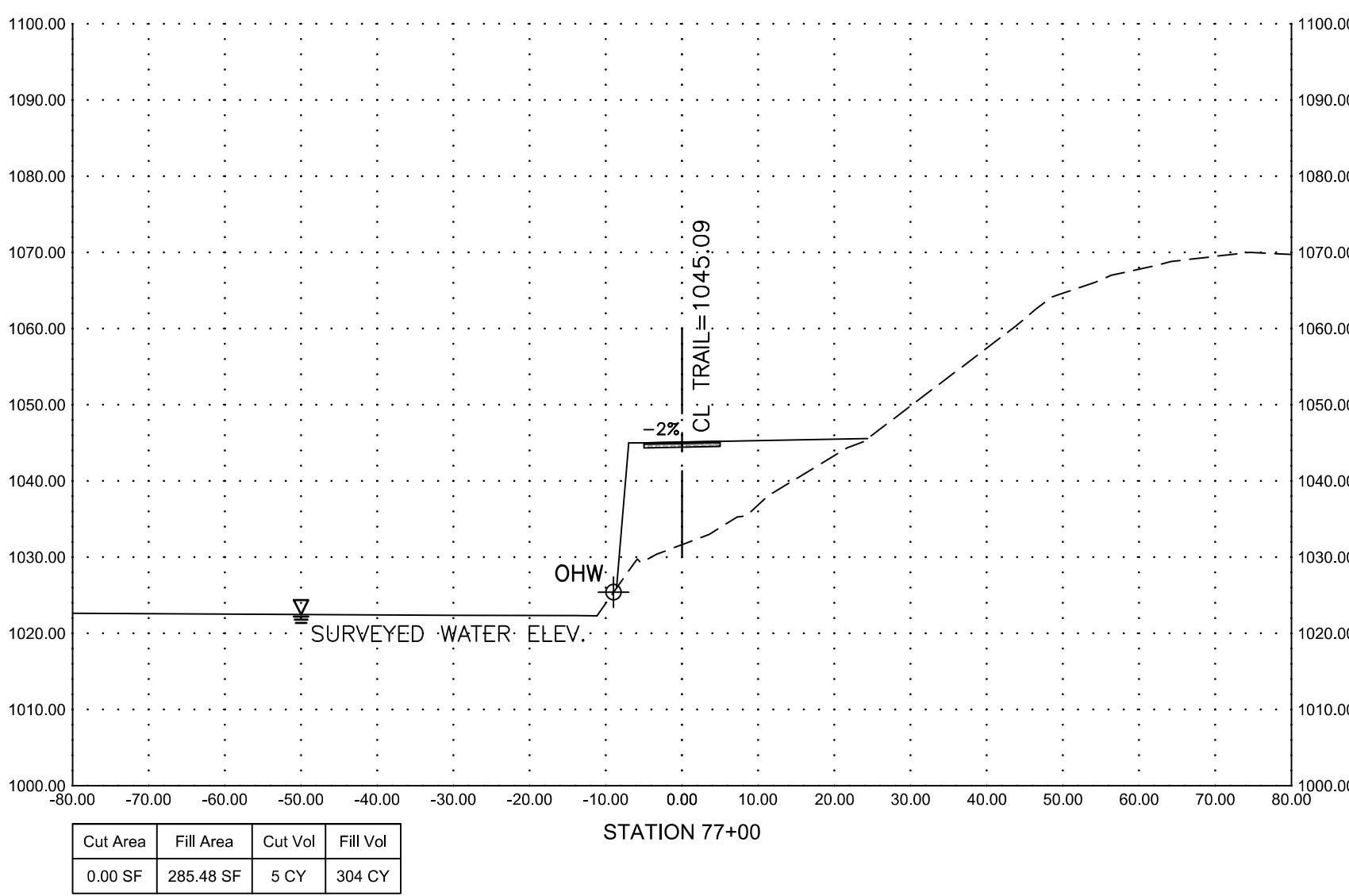
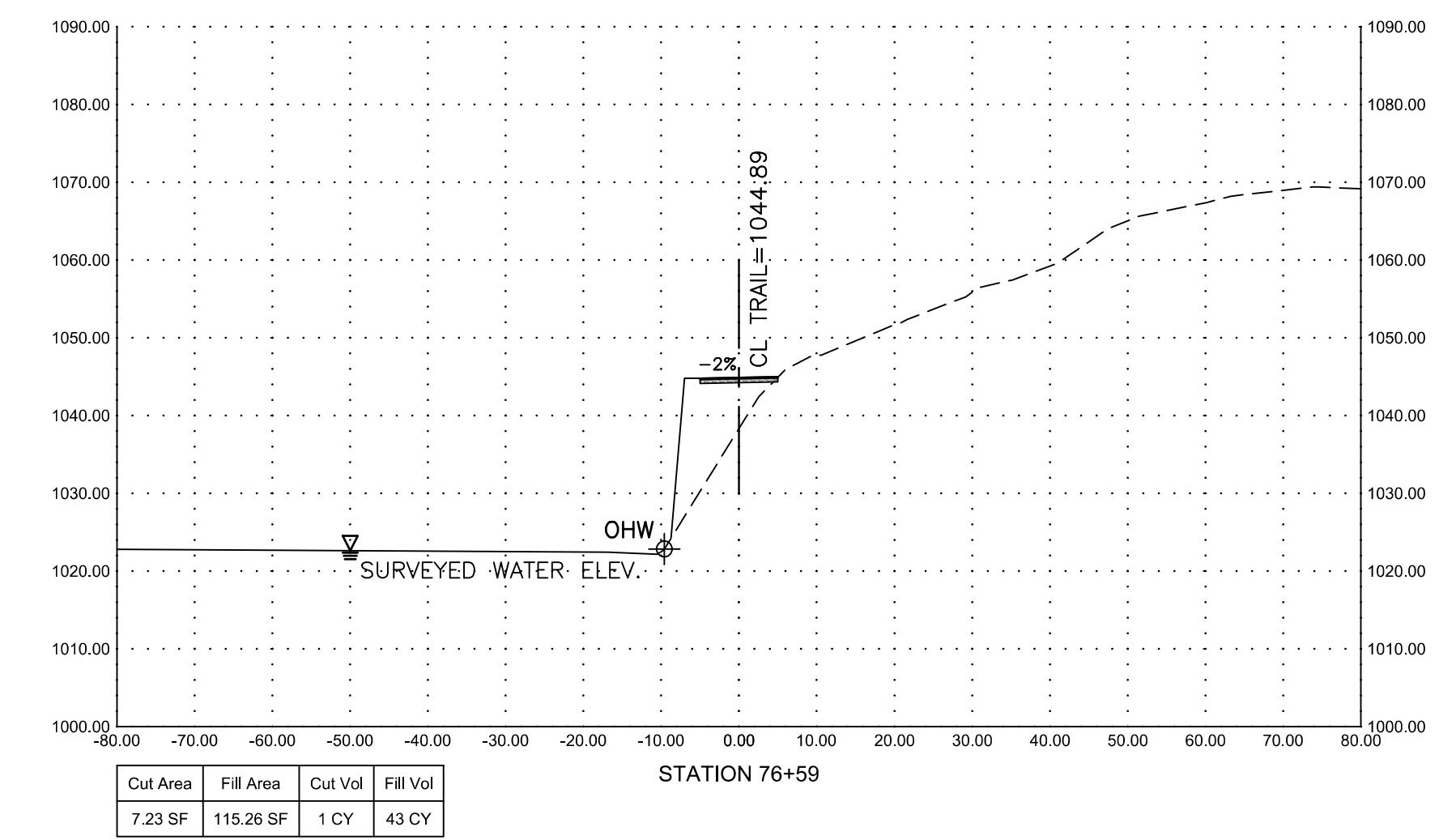
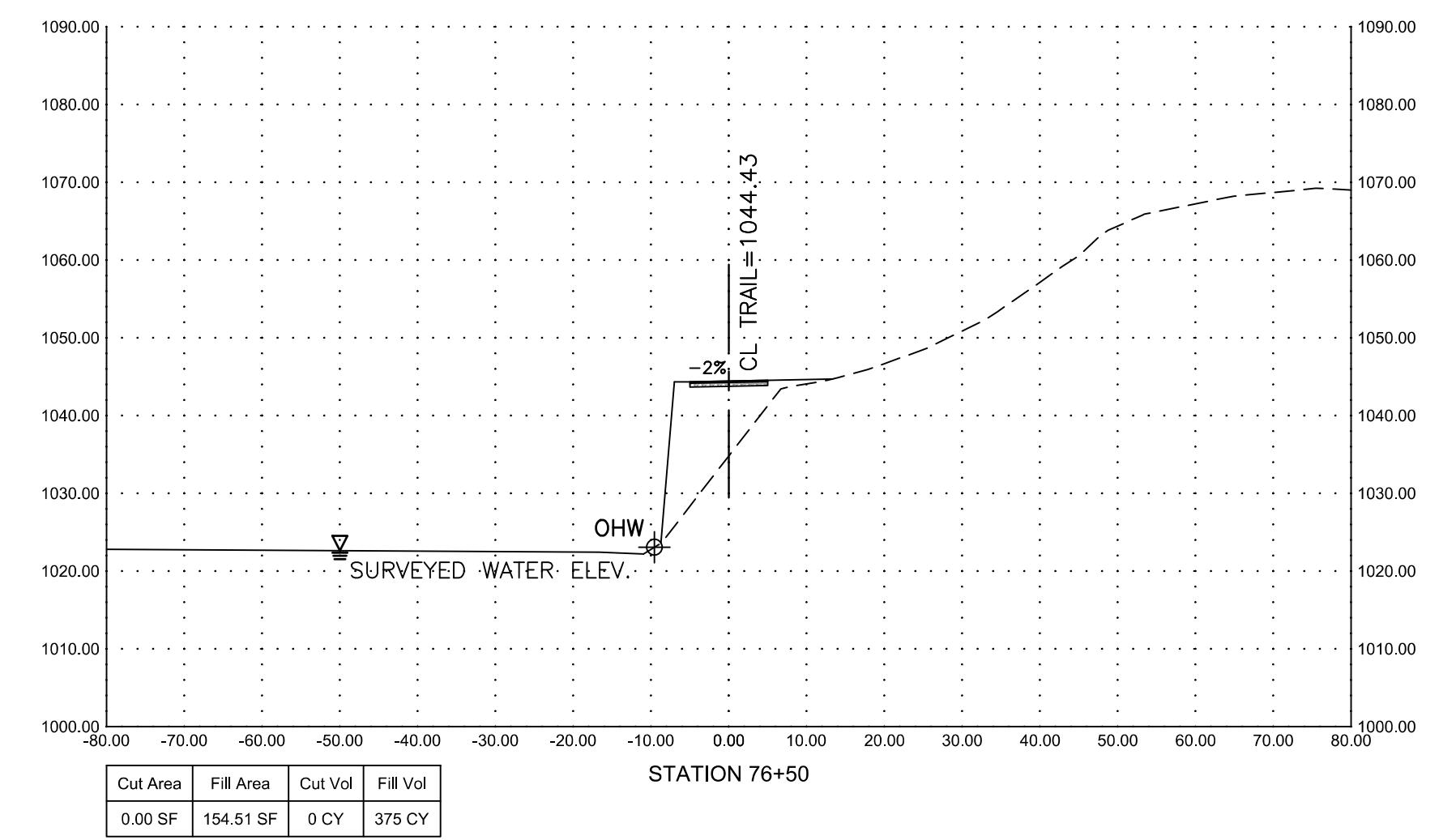
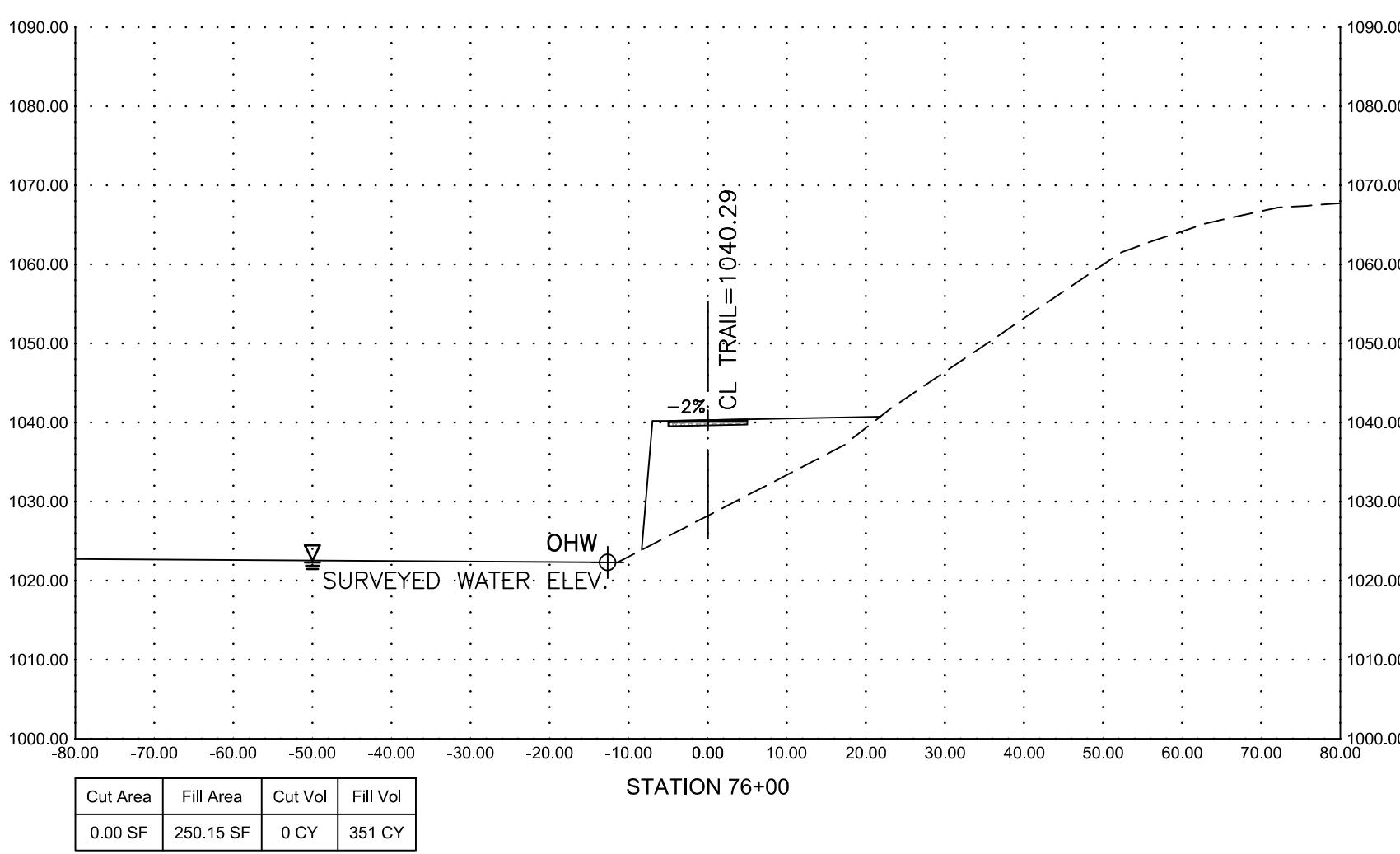
DRAWN BY: TWH

CHECKED BY: JMJ



SHEET NO.
C-20

20 10 0 20 40 60
SCALE IN FEET





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GEOTECHNICAL • CONSTRUCTION TESTING • INSPECTION • CULTURAL RESOURCES

CROSS SECTIONS

STA. 78+00 TO 80+00

WEST ROANOKE RIVER GREENWAY PH1

COUNTY OF ROANOKE, VA

PROJECT NO.

20221694

LAT.

LONG.

DATE:

18 April 2023

DRAWN BY:

TWH

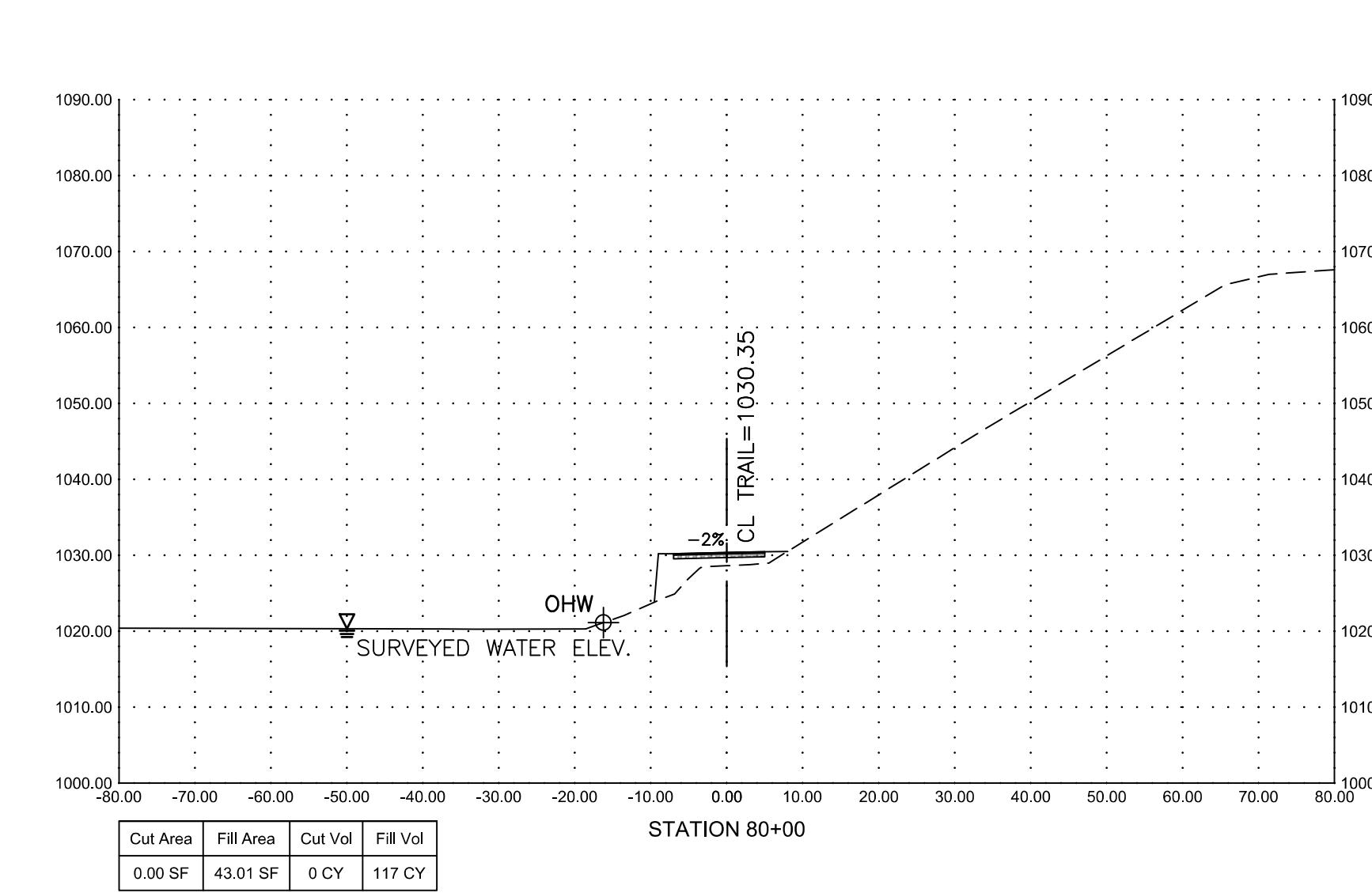
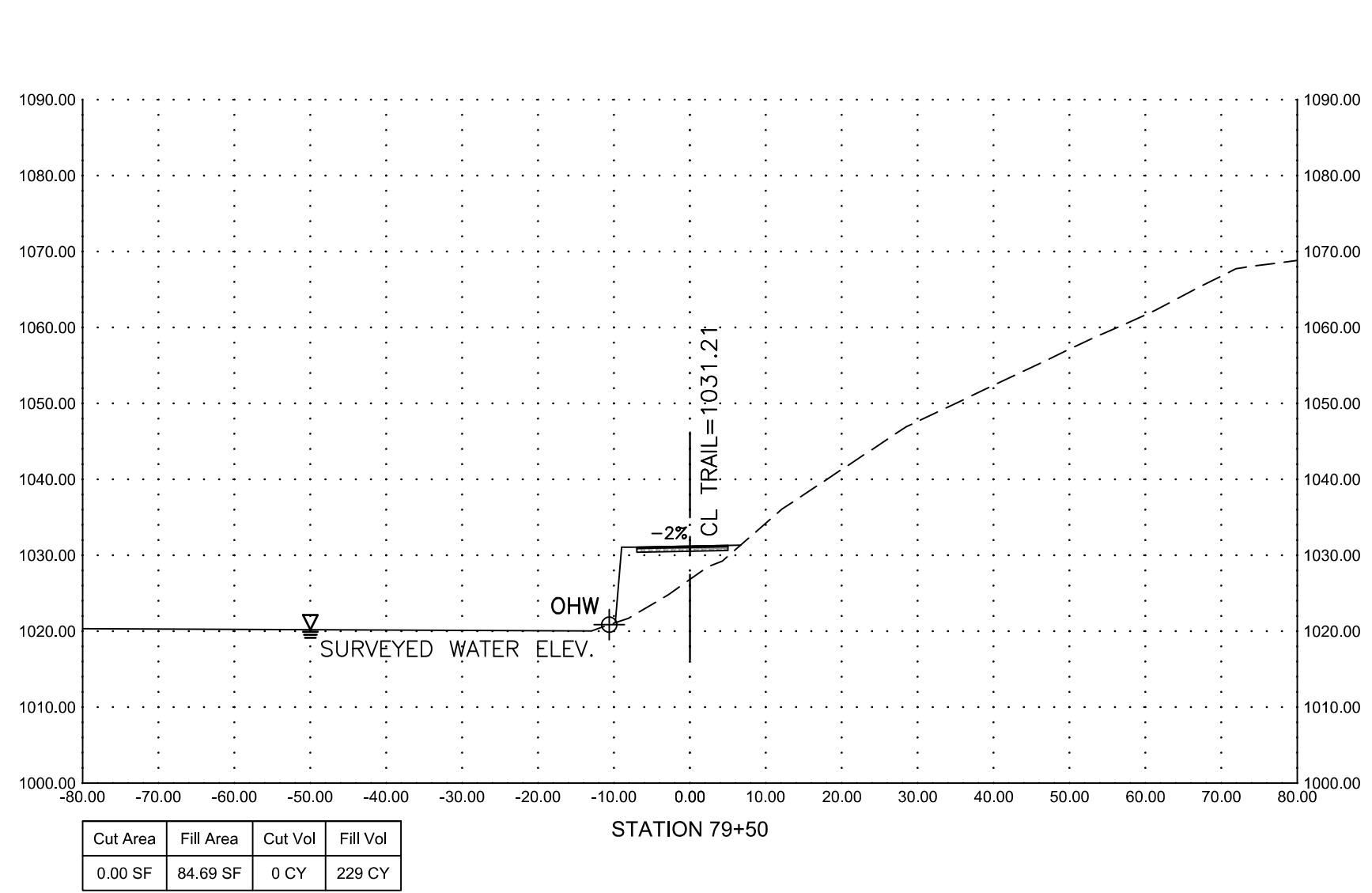
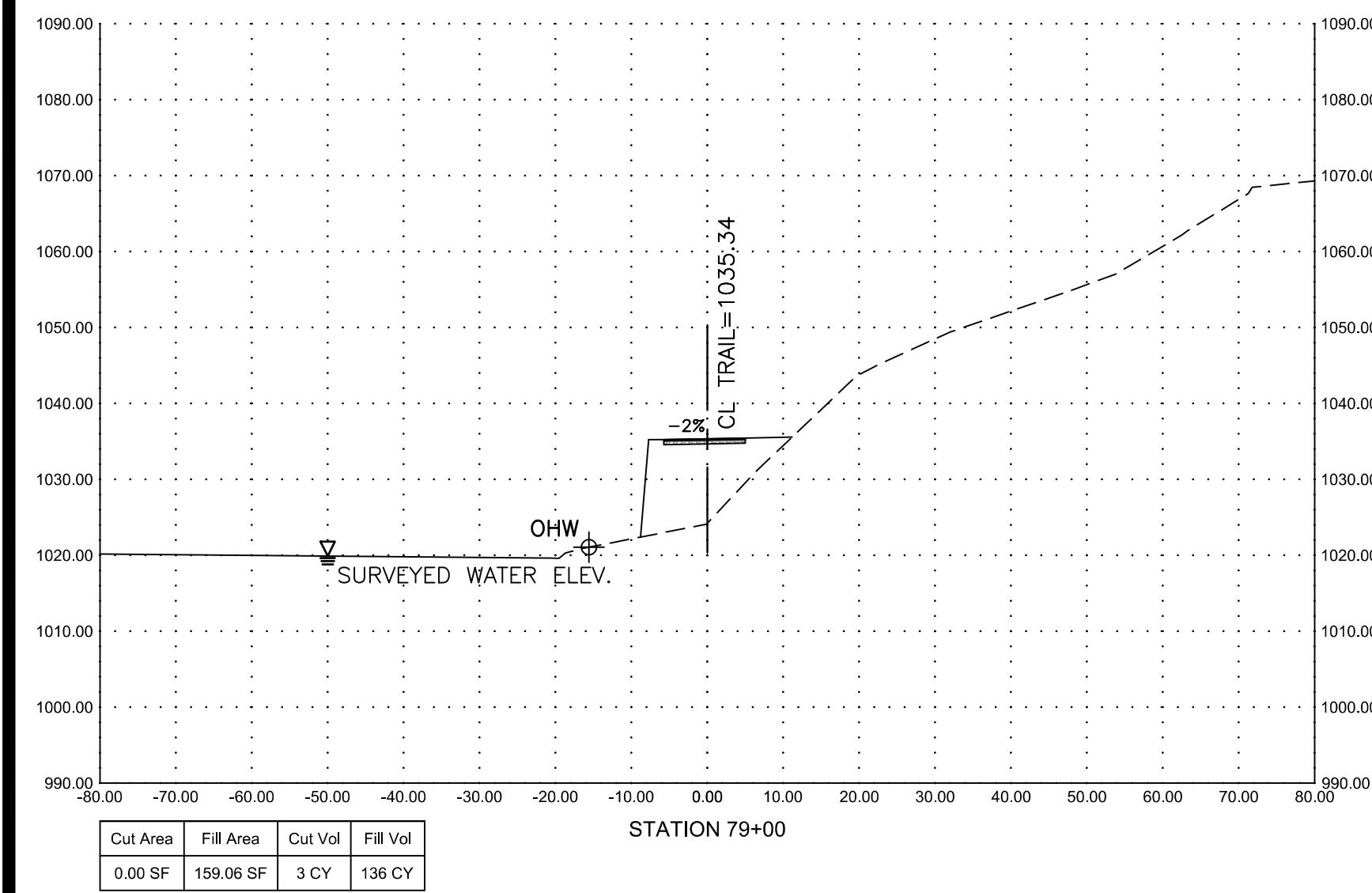
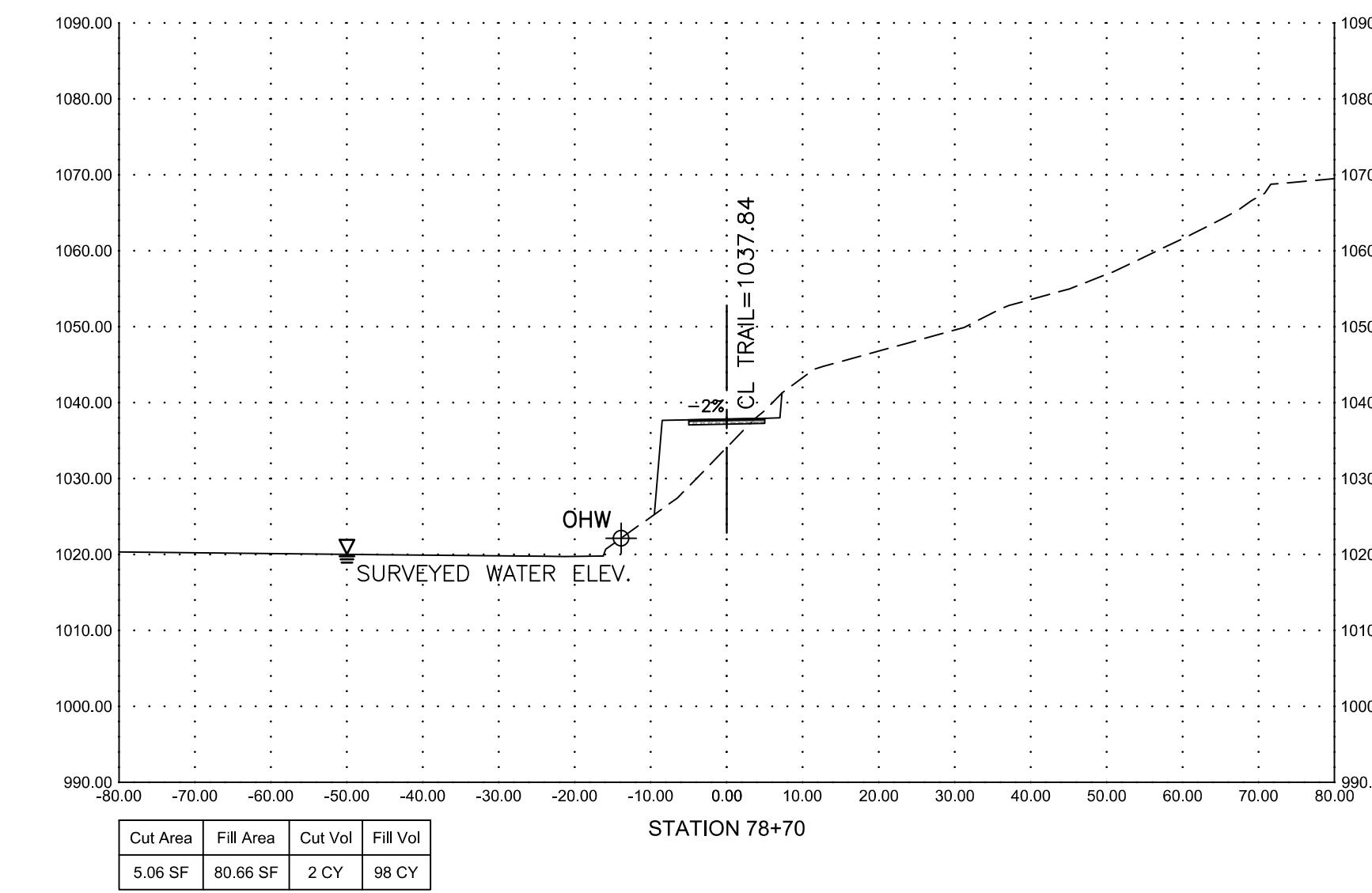
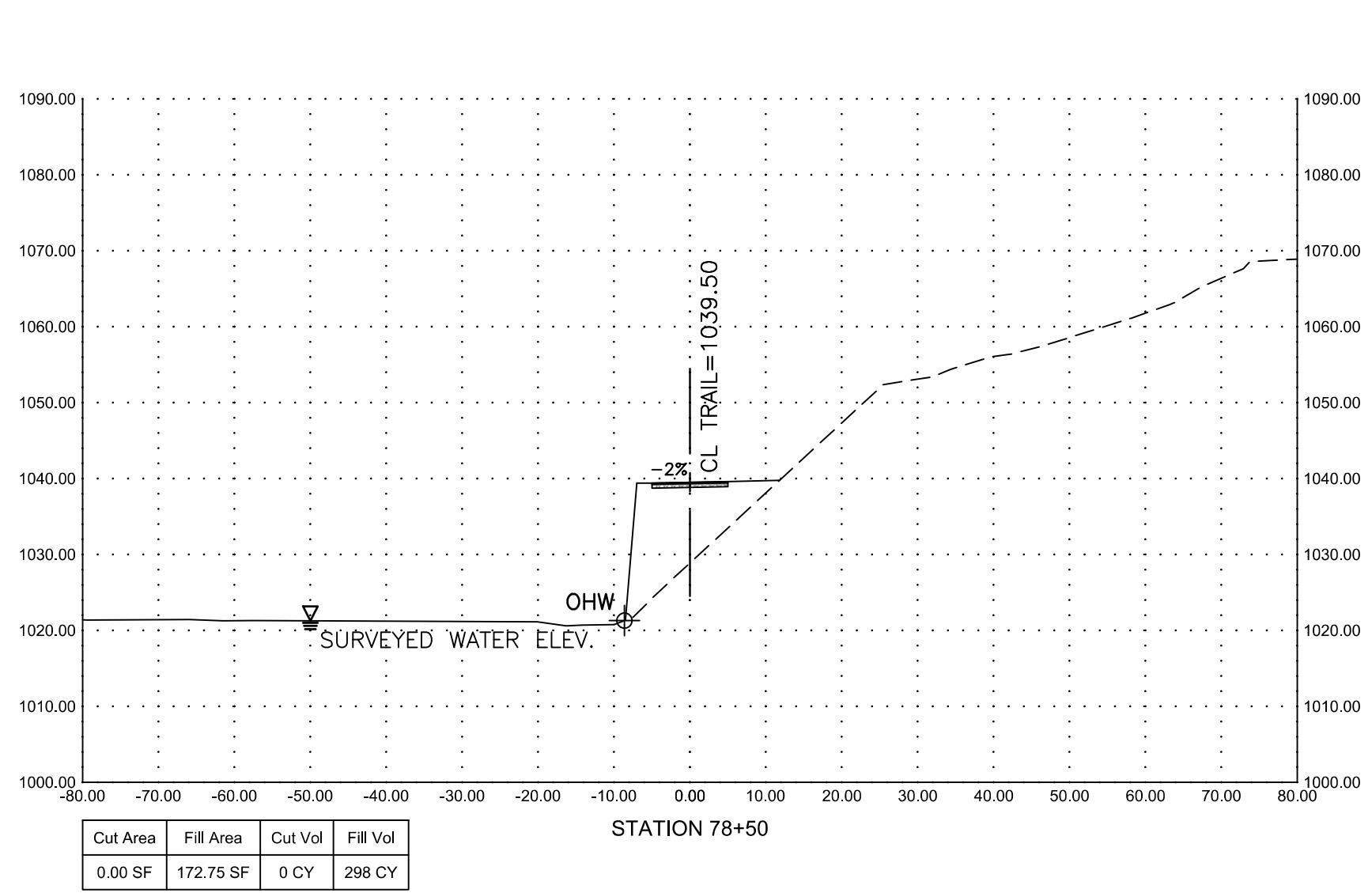
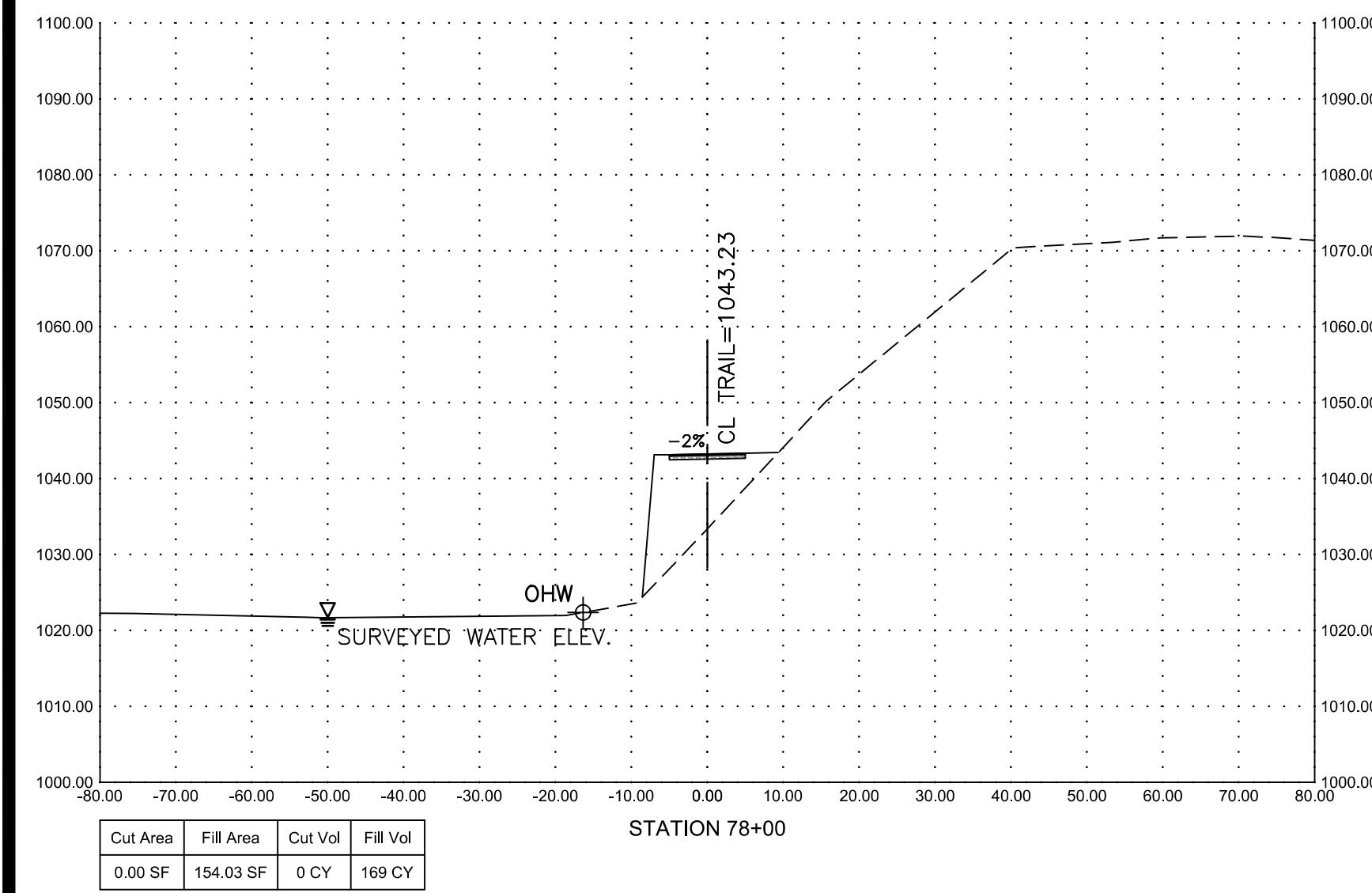
CHECKED BY:

JMJ



JEREMY MICHAEL JOHNSON
Lic. No. 0402050112
18 April 2023

SHEET NO.
C-21



20 10 0 20 40 60
SCALE IN FEET

HURT & PROFFITT

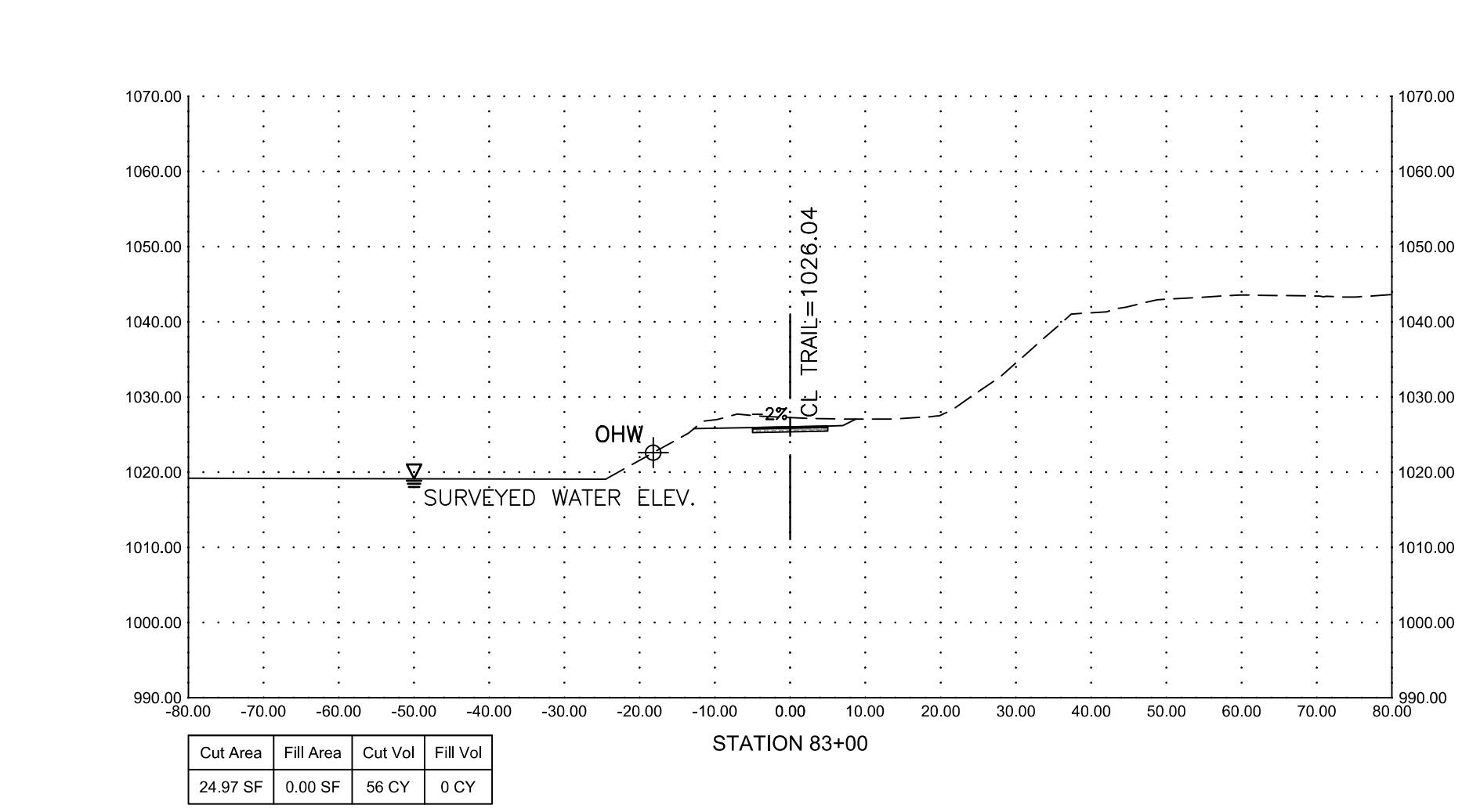
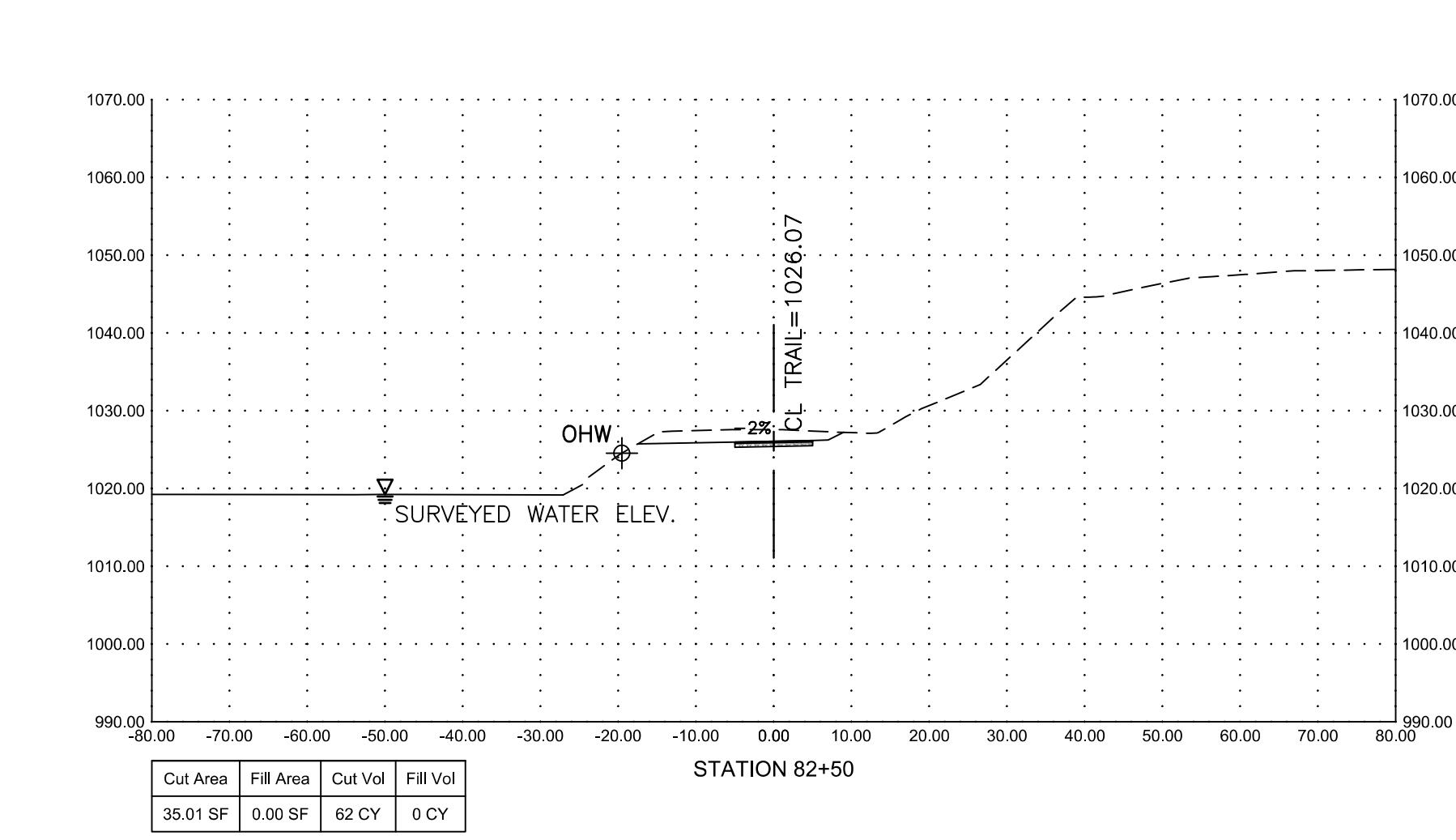
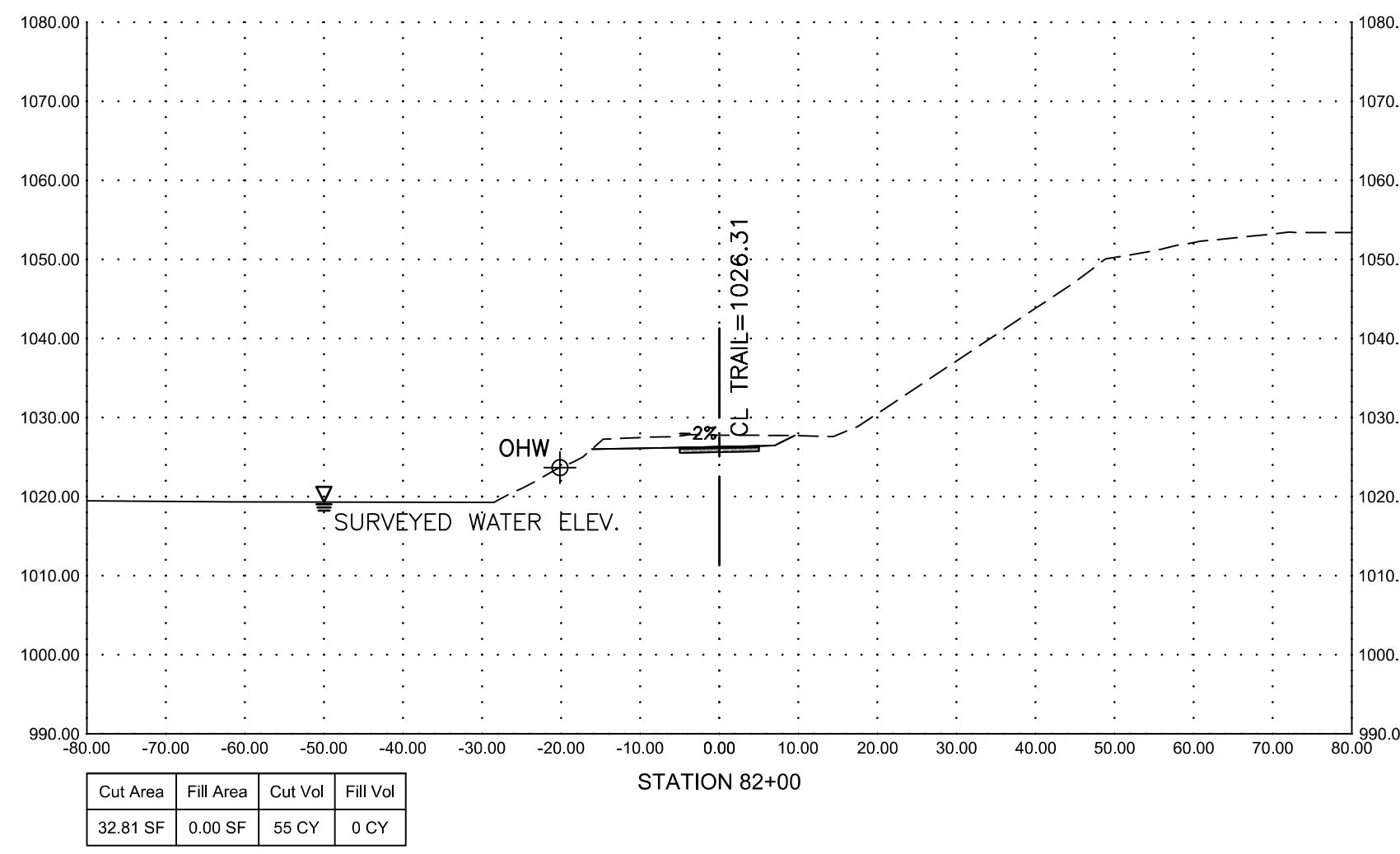
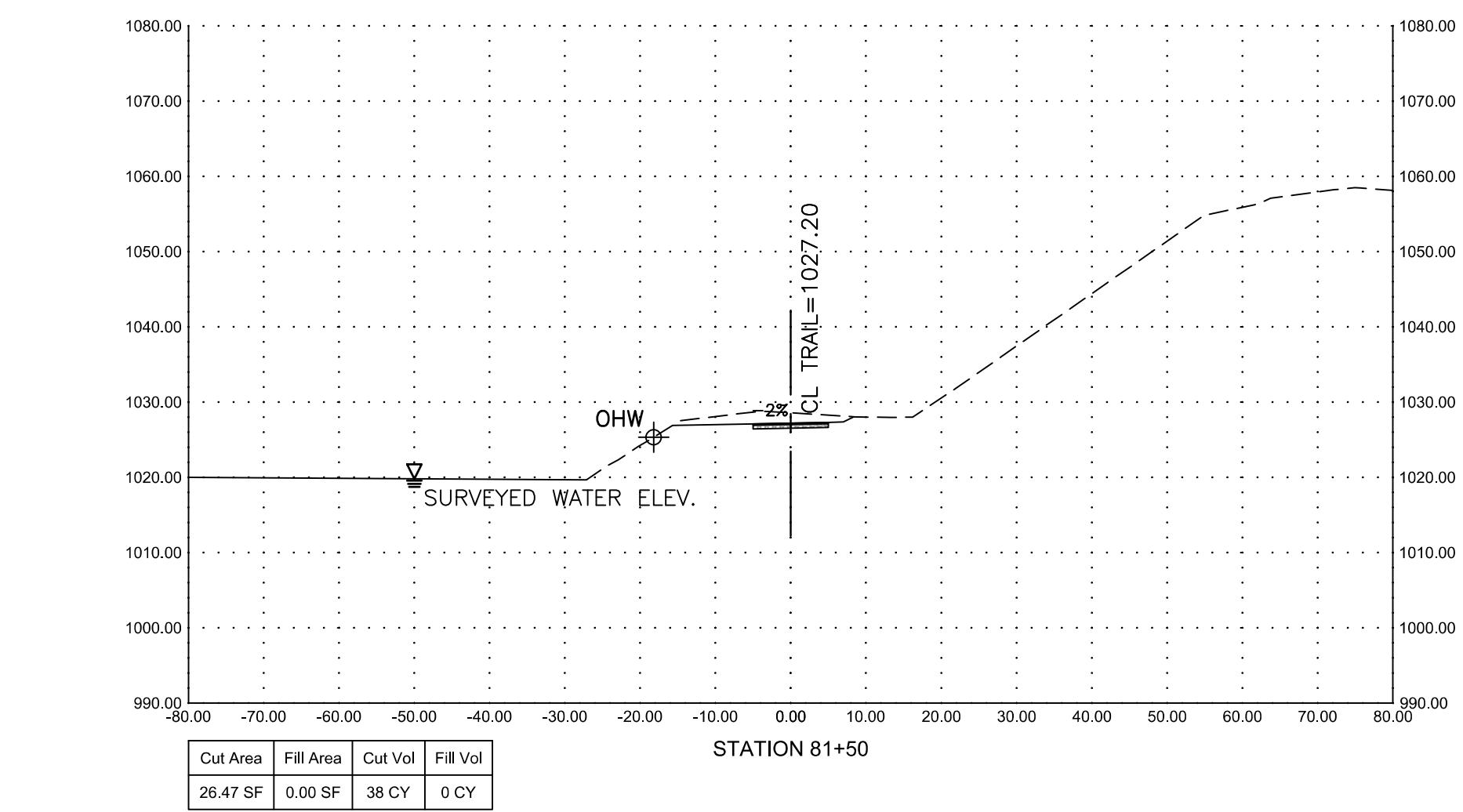
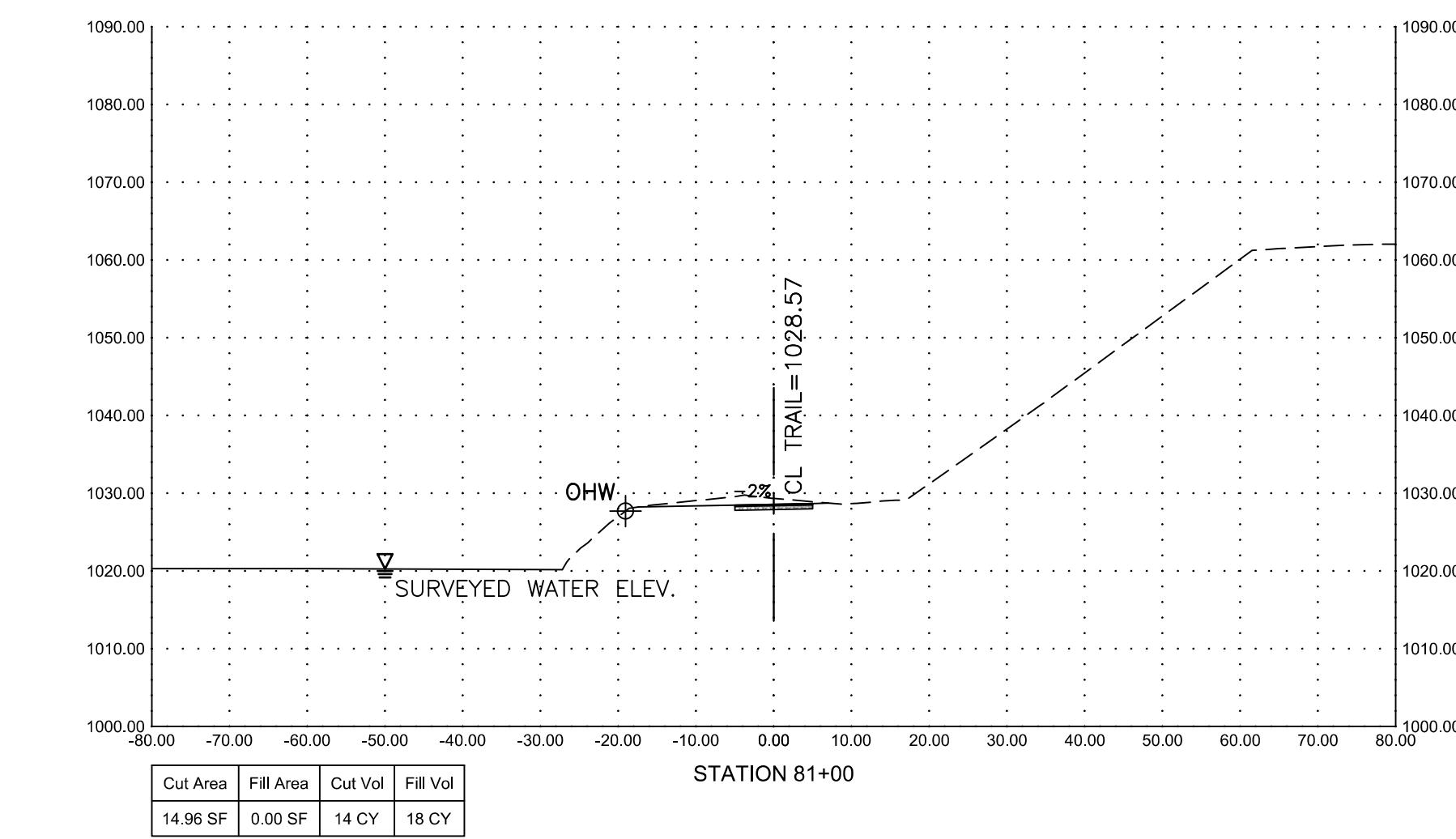
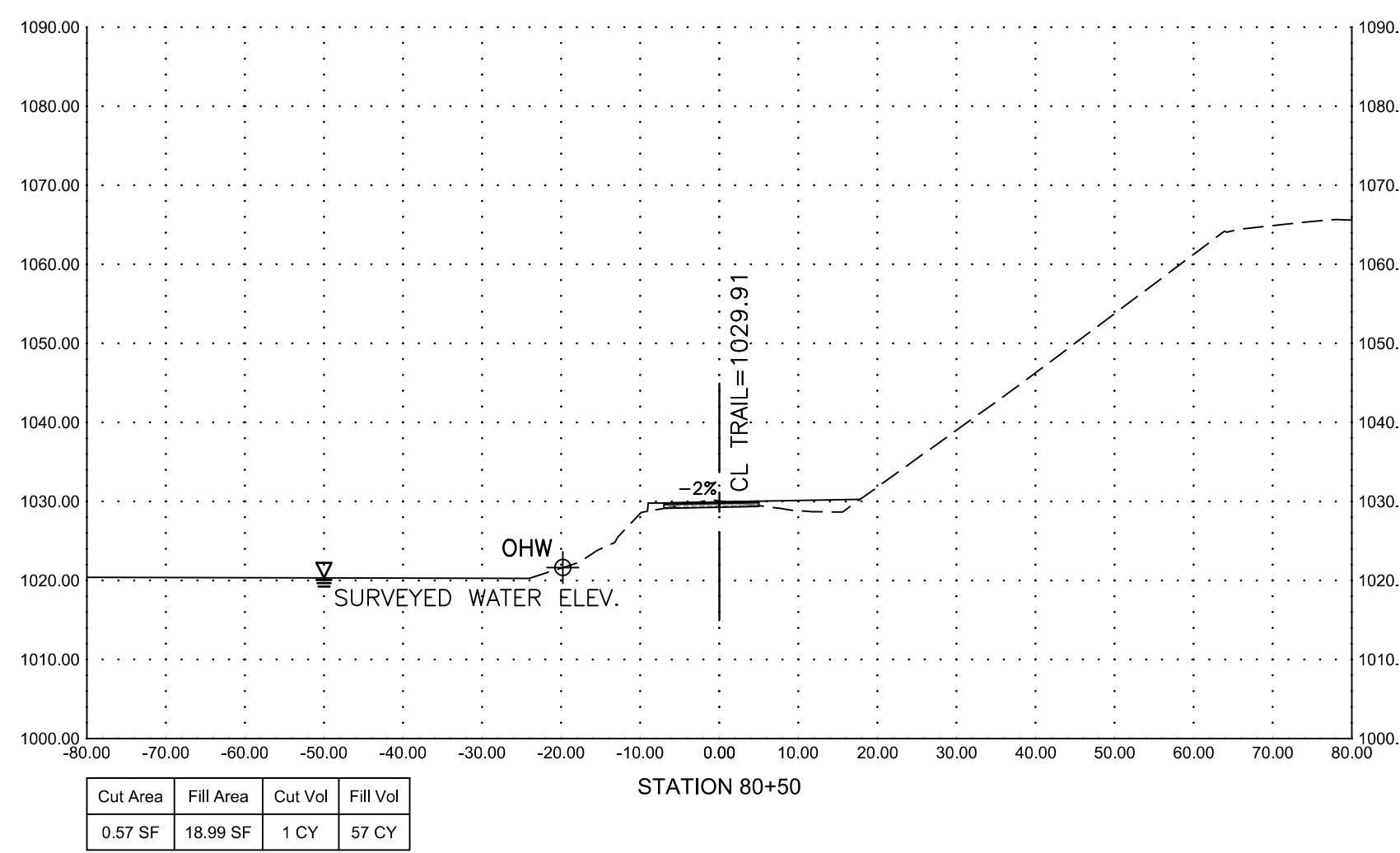
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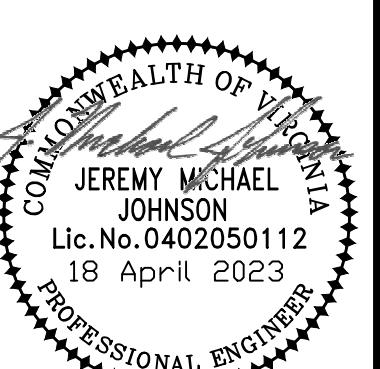
540.552.5592
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BLACKSBURG, VA, 24060
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CROSS SECTIONS

STA. 80+50 TO 83+00
WEST ROANOKE RIVER GREENWAY PH1
COUNTY OF ROANOKE, VA



PROJECT NO. 20221694
LAT.
LONG.
DATE: 18 April 2023
DRAWN BY: TWH
CHECKED BY: JMJ



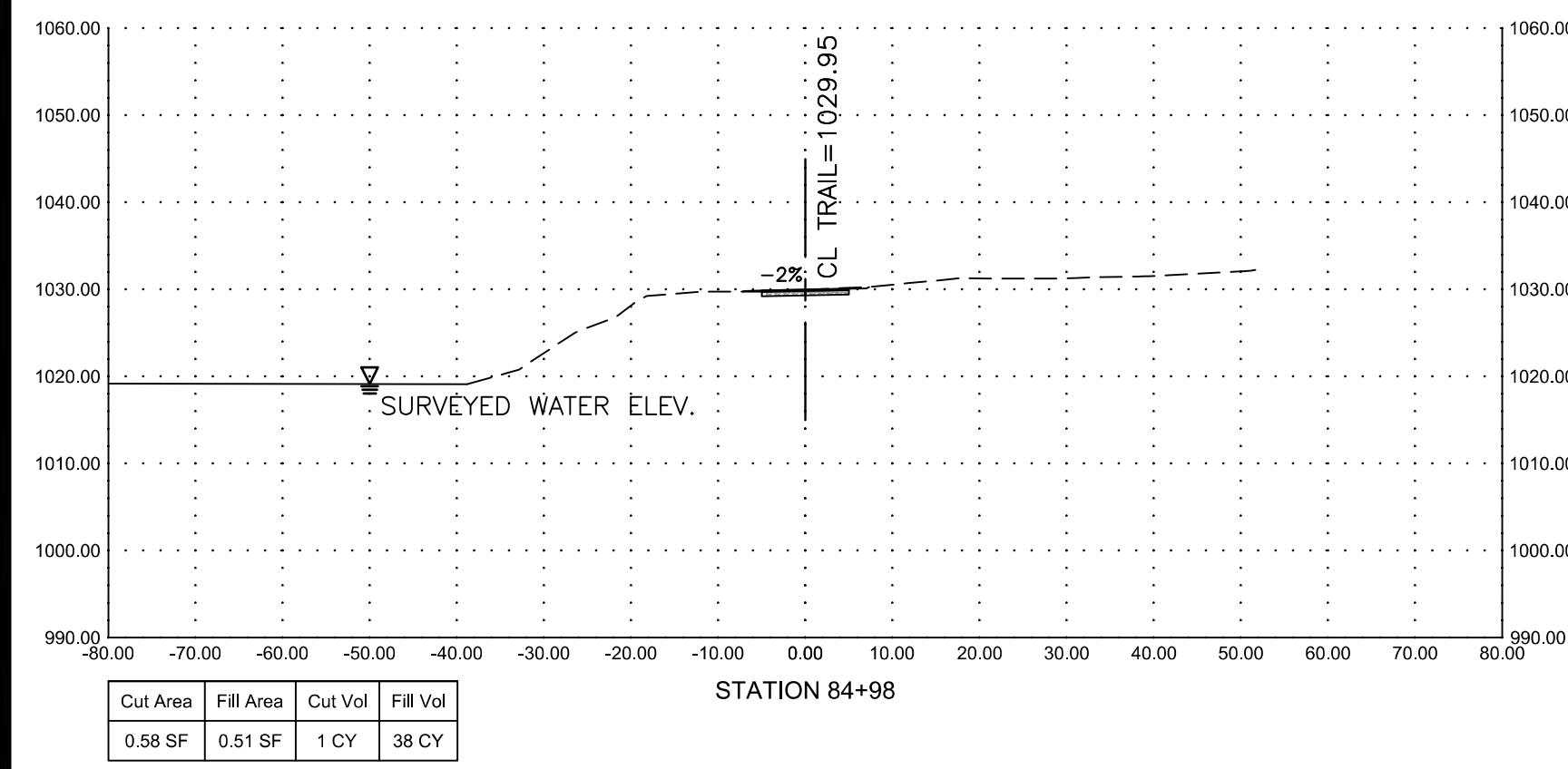
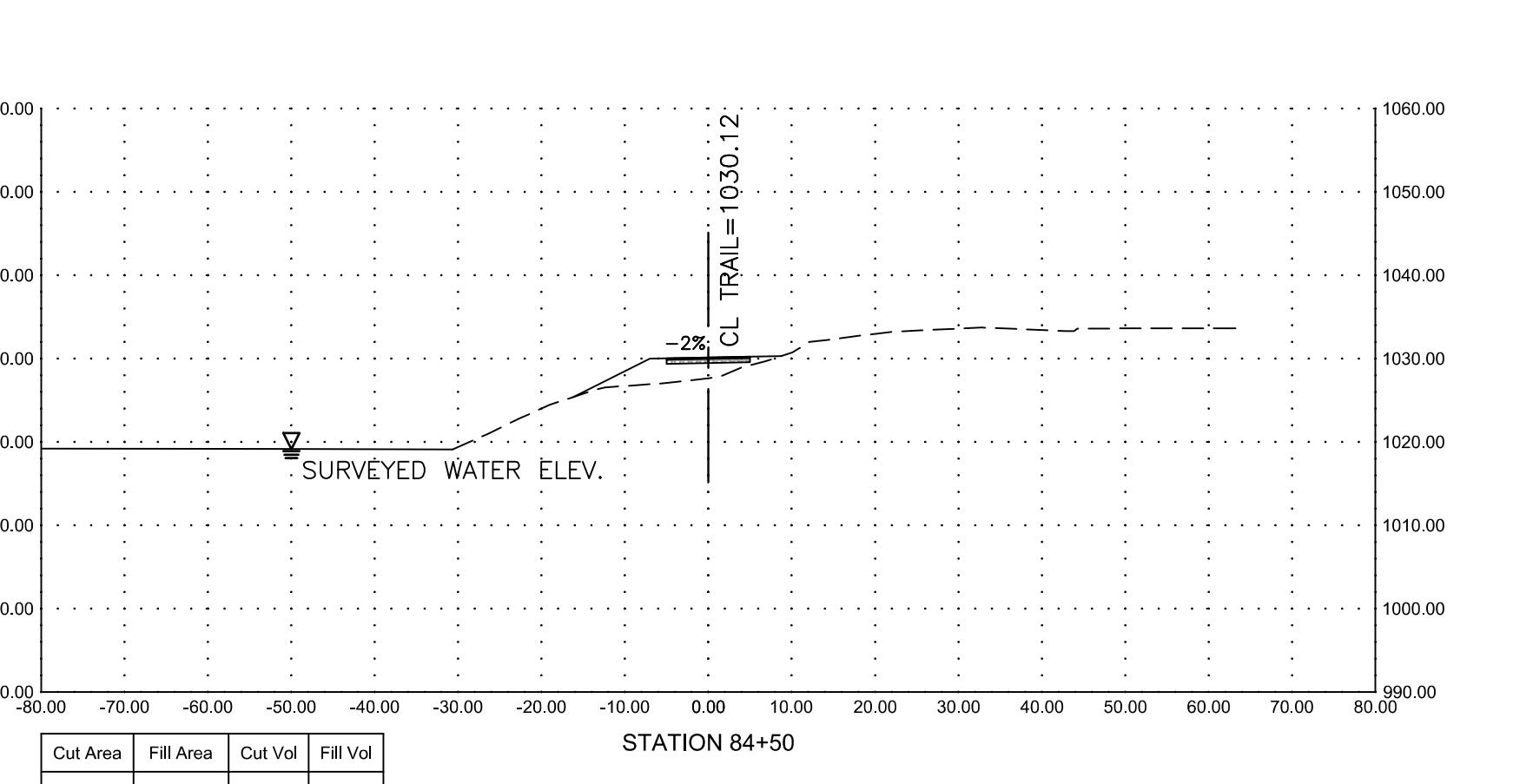
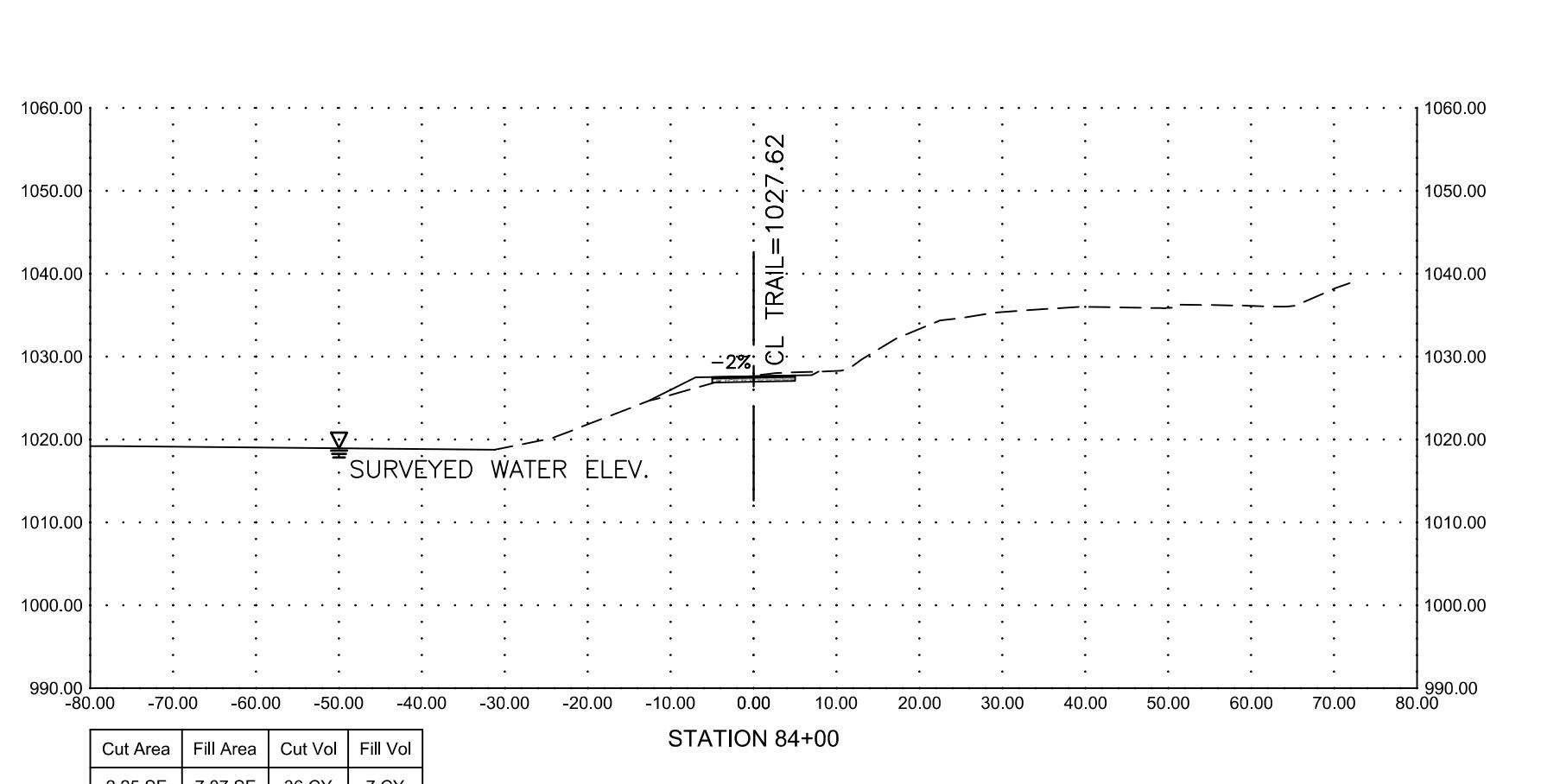
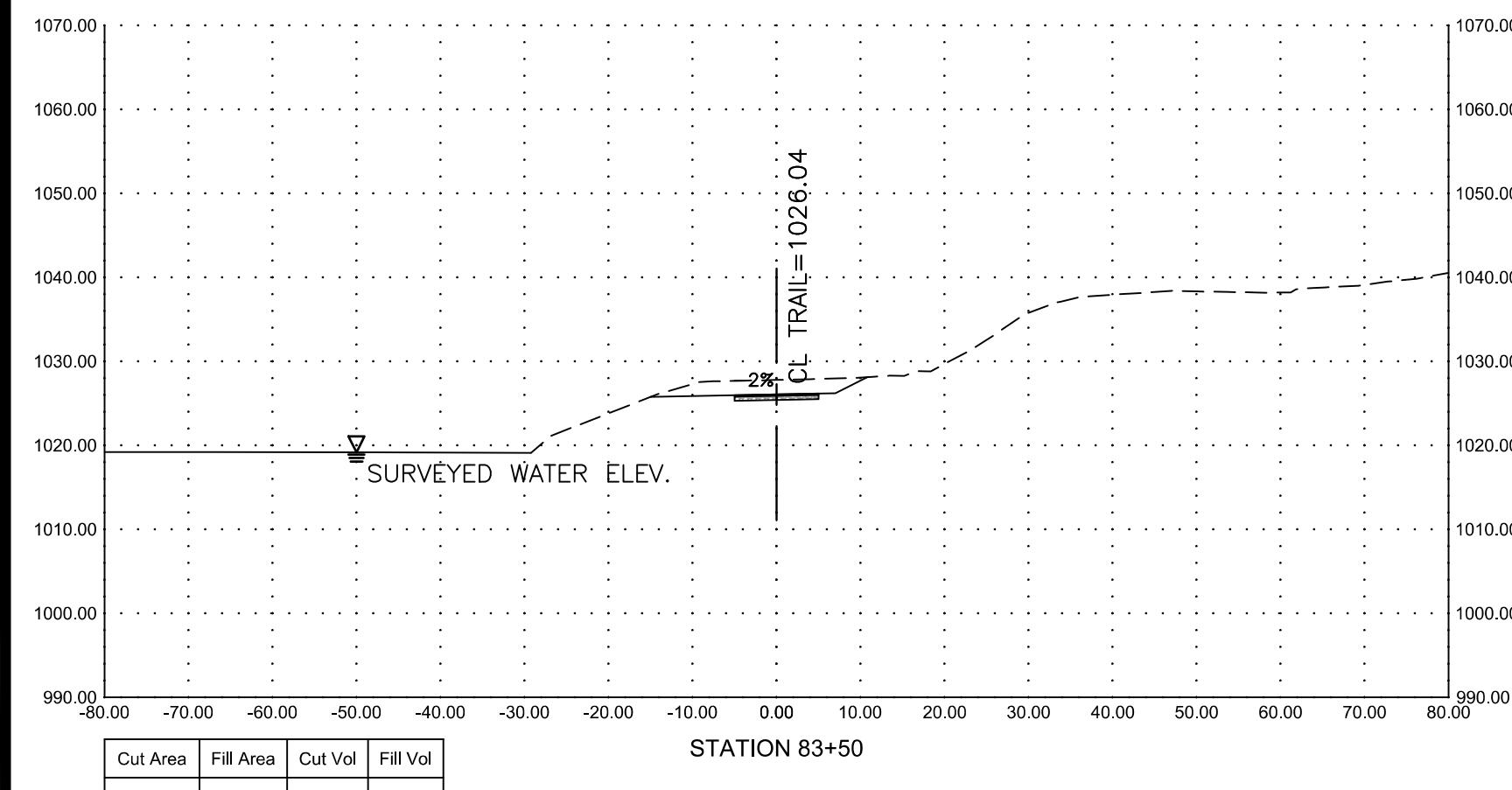
20 10 0 20 40 60
SCALE IN FEET

SHEET NO.
C-22



HURT & PROFFIT

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SCALE IN FEET

GENERAL NOTES:

Any misuse of electronic files, including scanned signatures is illegal. Violators will be prosecuted to the full extent of the applicable laws.

Specifications:

Construction: Virginia Department of Transportation Road and Bridge Specifications, 2020 and 2022 supplement.

Design: AASHTO LRFD Bridge Design Specifications, 7th Edition, 2014; and VDOT Modifications.

All information on existing conditions is obtained from best available sources. The actual as-built construction may possibly differ from what is assumed in the contract documents. The Contractor shall verify all existing conditions noted on the contract documents, and shall notify the Engineer in writing of any discrepancies between the existing conditions and the contract documents.

The Contractor shall request in writing and highlight on the shop drawings any proposed changes in the materials, details, etc. indicated on the drawings or specifications. Any changes must be approved by the Engineer in writing.

The design, adequacy, and safety of erection bracing, shoring, temporary supports, etc. is the sole responsibility of the Contractor.

The location of the utilities, including underground utilities, is indicated on the drawings in so far as their existence and location were known at the time of preparation of the drawings. However, nothing in these contract documents shall be construed as a guarantee that such utilities are in the location indicated or that they actually exist, or that such utilities are not within the area of operations. The Contractor shall make necessary investigations to determine the existence and location of such utilities. The Contractor shall pay for any damage to and for maintenance of protection of existing utilities and structures including water service and sewer laterals.

B.M.: Iron Rod set south of Parkside Drive, just east of the entrance to the Greenway Trail parking lot in Green Hill Park (see map below).
3628342.18 N, 11015706.29 E, El. 1046.10

BACKFILL NOTES:

See Sheets S-5 through S-8 for information on the Mechanically Stabilized Earth (MSE) Retaining Structures.

SHEET LIST

NO.	SHEET TITLE
S-1	STRUCTURES COVER SHEET
S-2	ESTIMATED QUANTITIES
S-3	GEOLGY SHEET NO. 1
S-4	GEOLGY SHEET NO. 2
S-5	MSE RETAINING WALL STRUCTURE (GABION FACED) - DOWNSTREAM OF FUTURE BRIDGE NO. 2
S-6	MSE RETAINING STRUCTURE PROFILES, 2 WALLS
S-7	MSE RETAINING STRUCTURE PROFILE BTW STA. 61+00 & 80+54
S-8	RW-3 WALL PROFILES (3) AND TYP. PEDESTRIAN RAILING DETAIL



Date	



Date: 01/15/23

Issue Date: 01/15/23

Drawn By: DKA

Designed By: MLF

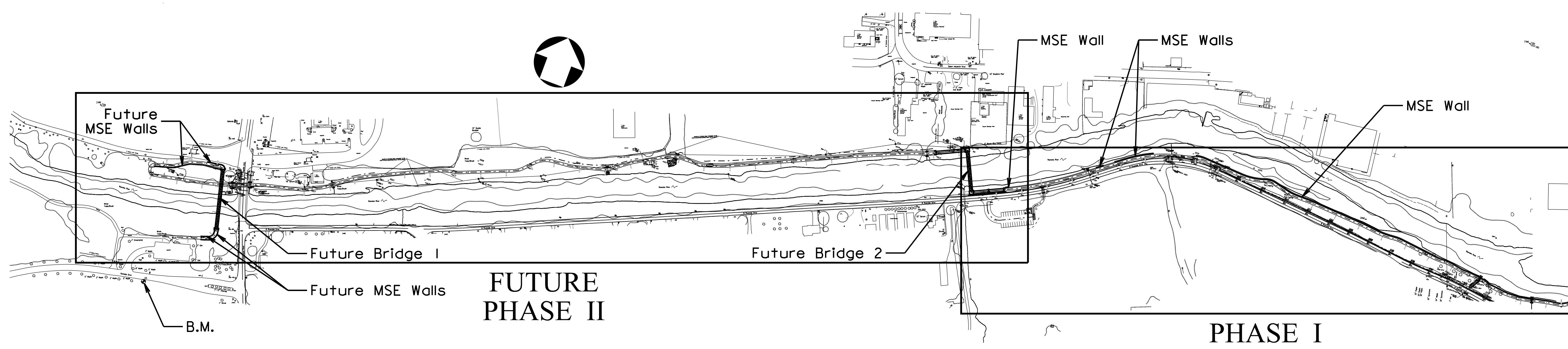
Checked By: SAC

Date: 01/15/23

WEST ROANOKE RIVER GREENWAY - PHASE I
STRUCTURES COVER SHEET
ROANOKE COUNTY, VA AND CITY OF SALEM, VA

Vertical Scale: N/A
Horizontal Scale: N/A
Commission Number: 3435A
Sheet No.:

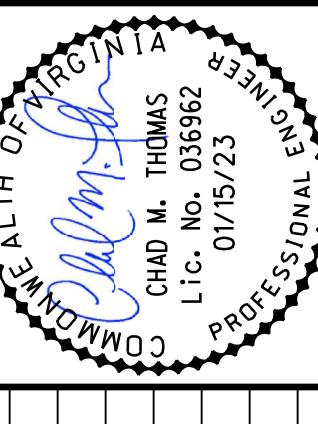
S-1



ESTIMATED QUANTITIES - RETAINING STRUCTURES ONLY						
	NS - MSE Retaining Structure (Gabion Faced) SF	Retaining Wall RW-3 CY	Handrail HR-1 Type III Modified LF	Retaining Wall Excav. CY 	Dry Riprap Class II 38" TON	Misc. Concrete CY
Left (Sta. 57+04 to 57+35)	275	—	32	—	22	—
Left (Sta. 57+80 to 59+35)	1,575	—	163	—	108	—
Left (Sta. 61+00 to 80+54)	33,575	—	1,955	—	1,304	100
Right (Sta. 76+56 to 76+62)	—	2.0	—	6.0	—	—
Right (Sta. 77+62 to 77+67)	—	2.0	—	7.0	—	—
Right (Sta. 78+65 to 78+80)	—	8.0	—	23.0	—	—
Total	35,425	12.0	2,150	36.0	1,434	100

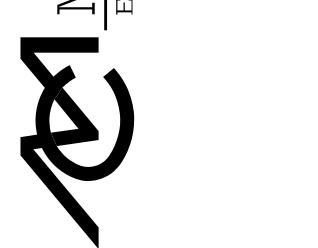
 Denotes items to be paid for on the basis of plan quantities in accordance with current Road and Bridge Specifications.

Note:
These estimated quantities reflect retaining structure quantities only. Incidental items for wall construction, including but not limited to mobilization, construction surveying, and erosion and sediment control, are required but not included on this sheet.



Date	Revisions

Issue Date: 01/15/23	Revisions



Mattern & Craig

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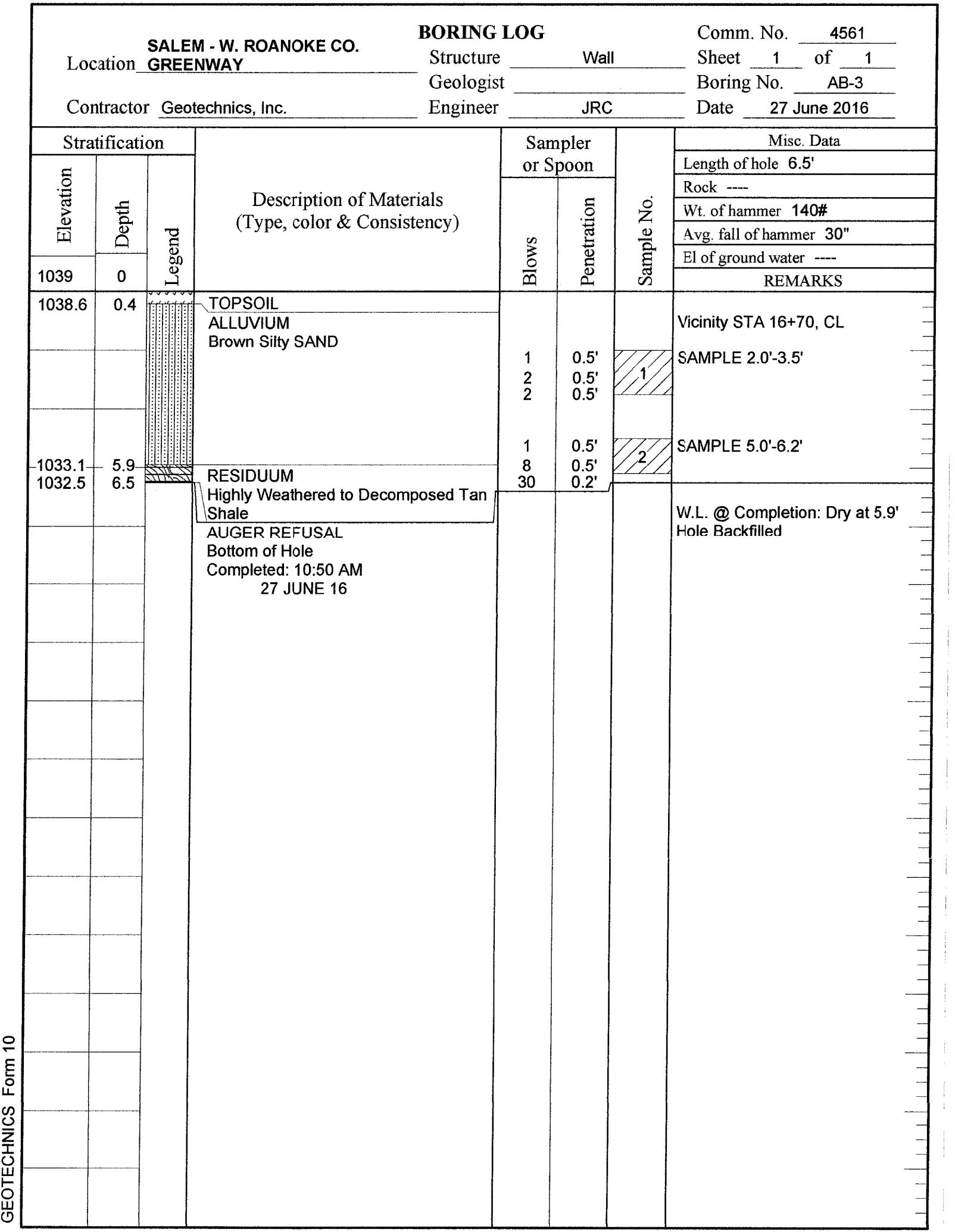
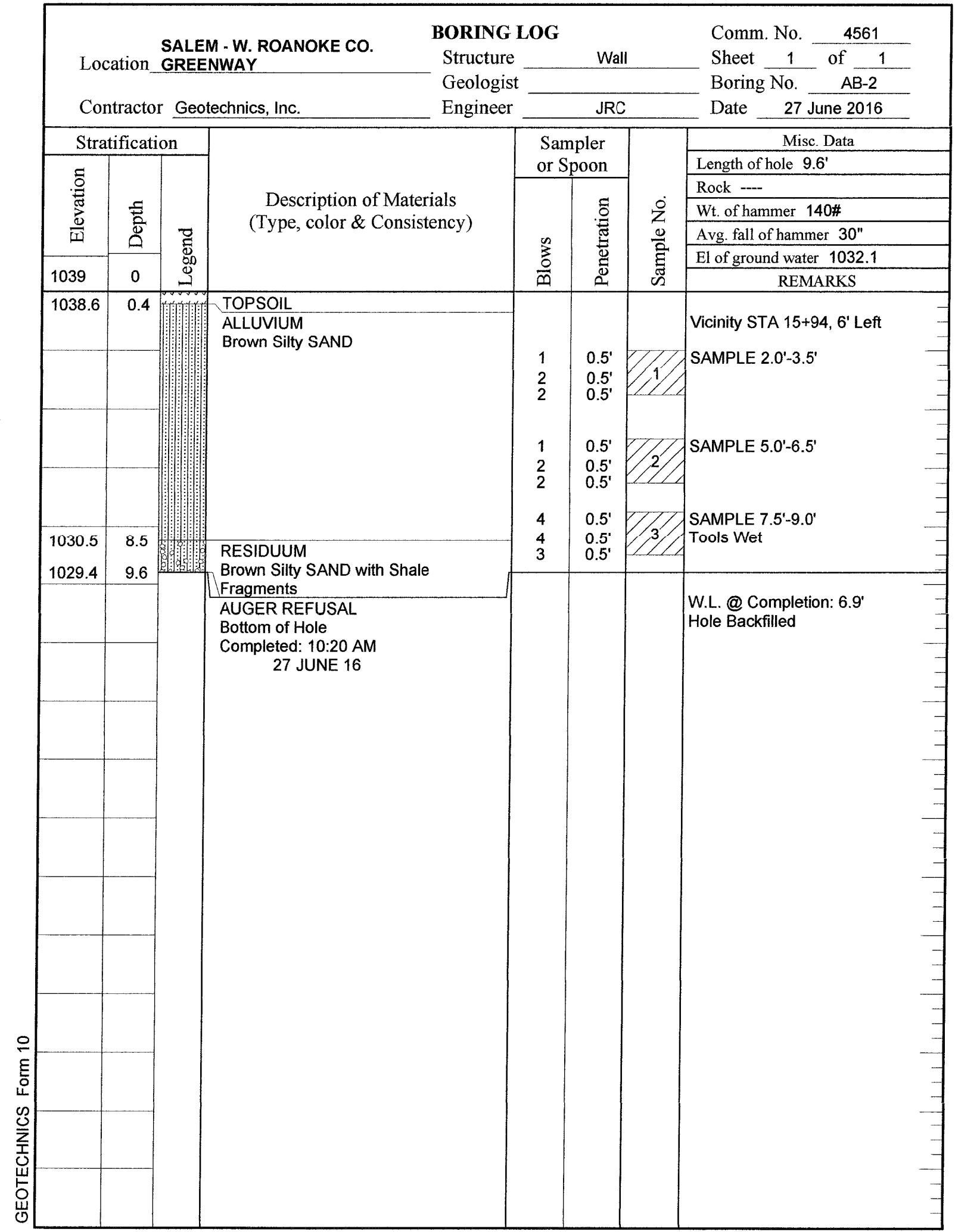
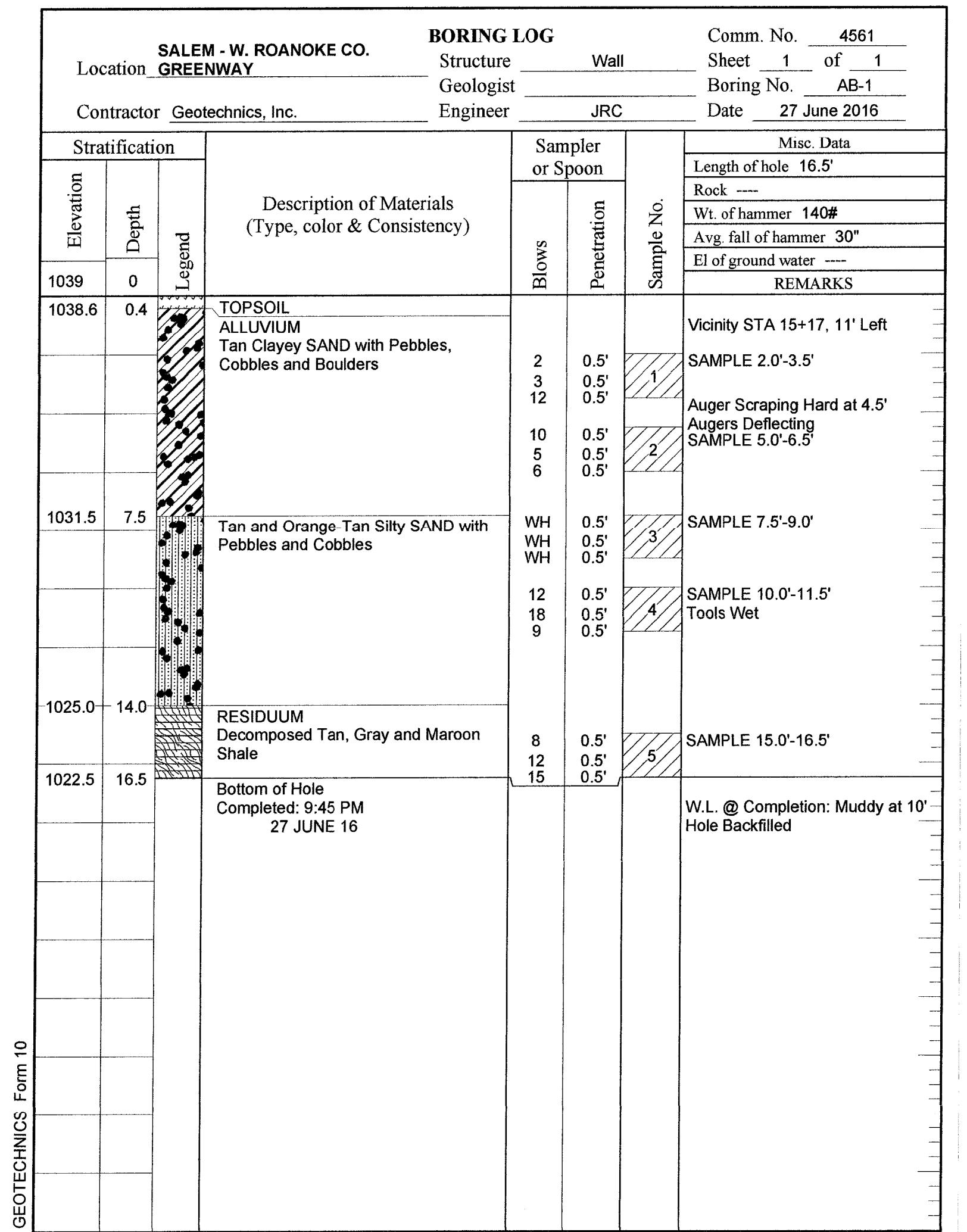
WEST ROANOKE RIVER GREENWAY - PHASE I
ESTIMATED QUANTITIES
ROANOKE COUNTY, VA AND CITY OF SALEM, VA

Vertical Scale: N/A

Horizontal Scale: N/A

Commission Number: 3435A

Sheet No.: S-2



WEST ROANOKE RIVER GREENWAY - PHASE I
ROANOKE COUNTY, VA AND CITY OF SALEM, VA

Geology Sheet NO. 1

Date: 01/15/23

Revisions: _____

Issue Date: 01/15/23

Drawn By: DKA

Designed By: MLF

Checked By: SAC

Date: 01/15/23



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Vertical Scale: N/A
Horizontal Scale: N/A
Commission Number: 3435A
Sheet No.: S-3

SUBSURFACE INFORMATION - Boring Logs

This subsurface information shown on the boring logs in these plans was obtained with reasonable care and recorded in good faith solely for use by the County of Roanoke and the City of Salem and in establishing design controls for the project. The County and City have no reason to suspect that such information is not reasonably accurate as an approximate indication of the subsurface conditions at the sites where the borings were taken. The County and City do not in any way warrant or guarantee that such data can be projected as indicative of conditions beyond the limits of the borings shown; and any such projections by bidders are purely interpretive and altogether speculative. Further, the County and City do not in any way guarantee, either expressly or by implication, the sufficiency of the information for bid purposes.

The boring logs are made available to bidders in order that they may have access to subsurface data identical to that which is possessed by the County and City, and are not intended as a substitute for personal investigation, interpretation and judgment by the bidders.

Location <u>SALEM - W. ROANOKE CO.</u> <u>GREENWAY</u>			BORING LOG			Comm. No. <u>4561</u>			
			Structure <u>Wall</u>	Geologist	Engineer	Sheet <u>1</u> of <u>1</u>			
Contractor <u>Geotechnics, Inc.</u>			JRC			Boring No. <u>AB-4</u>			
Stratification						Date <u>14 October 2015</u>			
Elevation	Depth	Legend	Description of Materials (Type, color & Consistency)			Sampler or Spoon	Misc. Data		
			Blows	Penetration	Sample No.				
1050	0		FILL Gray-Brown Clayey SAND with Crushed Stone Fragments			4 3 3	0.5' 0.5' 0.5'	1	Vicinity STA 15+17, 16' Right SAMPLE 2.0'-3.5'
1042.0	8.0		Brown Silty SAND with Pebbles, Cobbles and Boulders			1 2 2	0.5' 0.5' 0.5'	2	SAMPLE 5.0'-6.5'
1038.3	11.7		AUGER REFUSAL Bottom of Hole Completed: 1:45 PM 14 OCTOBER 15			2 6 12 12 14 16	0.5' 0.5' 0.5' 0.5' 0.5' 0.5'	3 4	SAMPLE 7.5'-9.0' SAMPLE 10.0'-11.5' Auger Scraping 10'-11.7'
									W.L. @ Completion: Dry Hole Backfilled

SUBSURFACE INFORMATION - Boring Logs

This subsurface information shown on the boring logs in these plans was obtained with reasonable care and recorded in good faith solely for use by the County of Roanoke and the City of Salem and in establishing design controls for the project. The County and City have no reason to suspect that such information is not reasonably accurate as an approximate indication of the subsurface conditions at the sites where the borings were taken. The County and City do not in any way warrant or guarantee that such data can be projected as indicative of conditions beyond the limits of the borings shown; and any such projections by bidders are purely interpretive and altogether speculative. Further, the County and City do not in any way guarantee, either expressly or by implication, the sufficiency of the information for bid purposes.

The boring logs are made available to bidders in order that they may have access to subsurface data identical to that which is possessed by the County and City, and are not intended as a substitute for personal investigation, interpretation and judgment by the bidders.

A circular state seal of Virginia. The outer ring contains the text "THE COMMONWEALTH OF VIRGINIA" at the top and "PROFESSIONAL ENGINEER" at the bottom. The inner circle features a large, stylized blue signature of the name "John M. [illegible]". Overlaid on the signature are the words "CHAD M. THOMAS", "Lic. No. 036962", and the date "01/15/23".

Mattern & Craig
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WEST ROANOKE RIVER GREENWAY - PHASE I
ECOLOGY SHEET NO. 2

W	G	R
Vertical Scale:		
	N/A	
Horizontal Scale:		
	N/A	
Commission Number:		
	3435A	
Sheet No.:		
	S-4	

MSE RETAINING STRUCTURE (GABION FACED) NOTES:

The minimum design life of the Mechanically Stabilized Earth (MSE) retaining structure shall be 75-years.

Based on the Geotechnical Report, the man-made fill and alluvium is variable, and some consolidation or settlement of the MSE retaining structure is expected to occur. Due to the coarse-grained nature of the man-made fill and alluvium, the settlement will occur quickly.

Based on the Geotechnical Report, since the MSE retaining structure shall bear on bedrock, an allowable bearing value not to exceed 6 TSF may be utilized for design.

The entire area of mechanically stabilized earth mass behind the MSE wall between the wall and excavation or existing grade shall be backfilled with coarse aggregate backfill material. The existing slopes to be backfilled shall be bench cut every 2 feet in elevation change, prior to placing backfill. The cost of all materials, labor, and equipment for excavation and coarse aggregate backfill in this area shall be included in the price bid for the MSE Retaining Structure.

The lateral limits of excavation are dependent on the depth at a particular location below the wall. Additional localized excavation may be required depending on the site conditions at the time of construction as determined by the Engineer in the field.

A geotextile fabric shall be used between the mechanically stabilized earth mass and the existing soils.

Provide drainage details such as perforated pipe underdrain and/or drainage blanket based upon field conditions.

MSE RETAINING STRUCTURE (GABION FACED) NOTES CONT'D:

All wall segments and other related elements shall be detailed on shop drawings.

See the Special Provision for Mechanically Stabilized Earth (MSE) retaining structure.

Dimensions may vary based on the design, the Contractor shall record the changes on the plans for the as-built records.

The MSE gabion basket facing shall bear on competent bedrock with a roughened surface which will provide a minimum friction coefficient as specified by the designer to resist sliding and provide adequate bearing capacity.

The bearing elevations are based on the best information available at the time of preparation of the drawings. The Contractor shall verify the existing conditions noted on the contract documents, and shall notify the Engineer in writing of any discrepancies between the existing conditions and the contract documents.

Shoring may be required during excavation. If shoring is required, the shoring shall be designed and sealed by a Professional Engineer with a current Professional Engineering License in the Commonwealth of Virginia.

Handrail shall be installed per manufacturer's requirements and location of posts shall be coordinated by the Contractor to maintain the minimum trail width.

Elevations denoting base of MSE gabion basket facing shown on the plans shall be considered approximate only. Excavation for MSE retaining structure shall terminate at competent bedrock. Foundations shall not be considered satisfactory until approved by the Engineer.

MSE RETAINING STRUCTURE (GABION FACED) NOTES CONT'D:

The Contractor shall explore foundations by rod soundings or drillings to determine, to the Engineer's satisfaction, the adequacy for the foundations to support the structure. In the event that competent bedrock is not reasonably accessible, a concrete sub-fooing may be installed as directed by the Engineer. If the Engineer recommends a sub-fooing be installed, it shall consist of Concrete Class B2 or Class A3.

Any required or recommended sub-fooing will be paid for at contract price per cubic yard for "Miscellaneous Concrete." The price shall include all labor and materials required for clearing and grubbing, excavating, dewatering, sheeting, shoring, bracing, placing of concrete, disposing of unsuitable or surplus material, and clearing the channel of obstructions caused by construction operations.

Miscellaneous Concrete shall be measured in cubic yard of concrete placed within the limits of vertical planes 18 inches outside of the base layer of the MSE Retaining Structure (Gabion Faced) to the depth of the sub-fooing. The depth of the sub-fooing shall be approved by the Engineer prior to placement of concrete.

CHAD M. THOMAS
LIC. NO. 036962
01/15/23
Professional Engineer

Date: _____
Revisions: _____
Issue Date: 01/15/23
Drawn By: DKA
Designed By: MLF
Checked By: SAC
Date: 01/15/23

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FAX (540) 345-1651

ONE WALL SECTION

WEST ROANOKE RIVER GREENWAY - PHASE I
MSE RETAIN. STRUCTURE (GABION FACED)
DOWNSTREAM OF FUTURE BRIDGE NO. 2

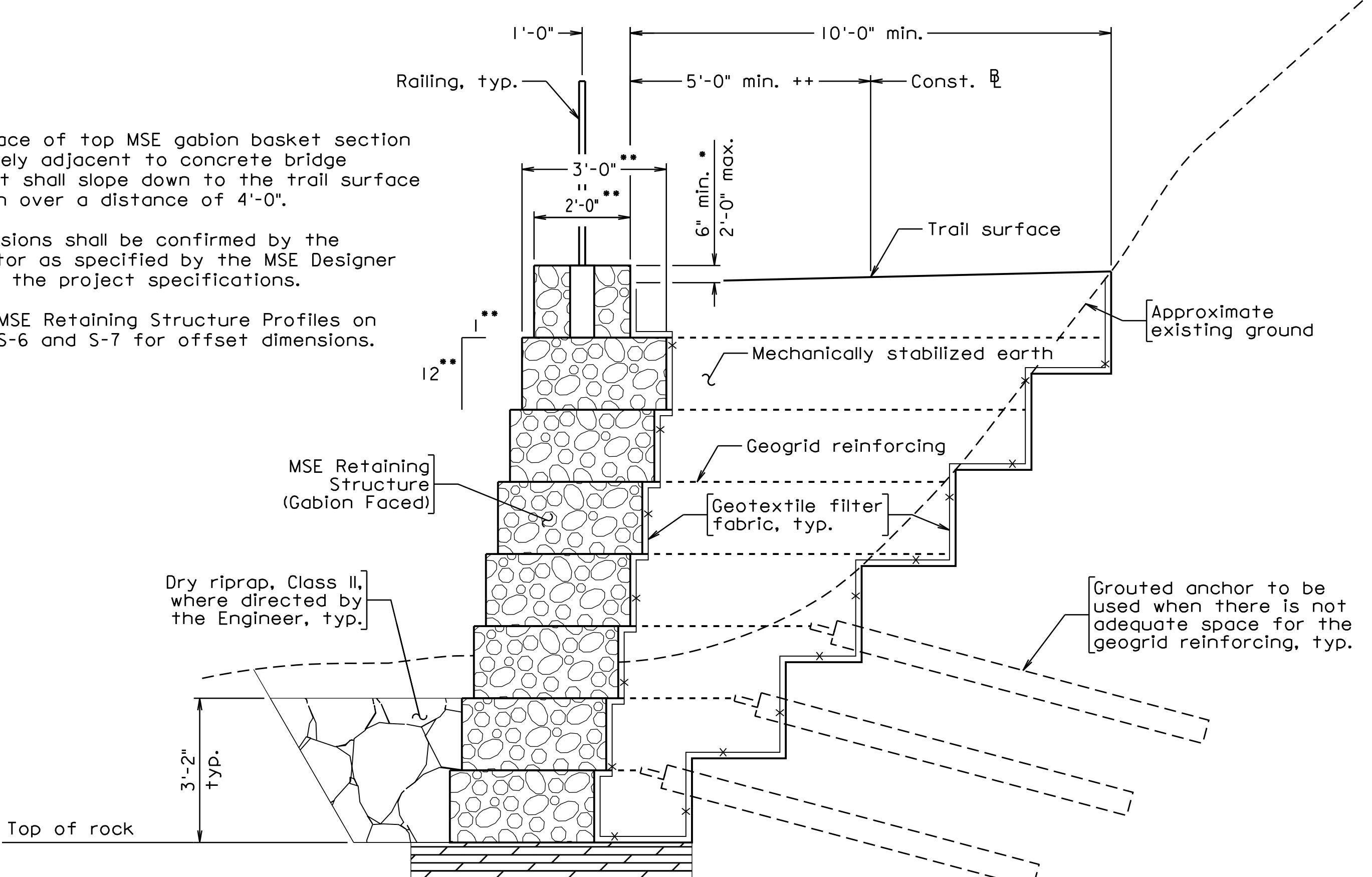
ROANOKE COUNTY, VA AND CITY OF SALEM, VA

Vertical Scale: N/A
Horizontal Scale: AS NOTED
Commission Number: 3435A
Sheet No.: S-5

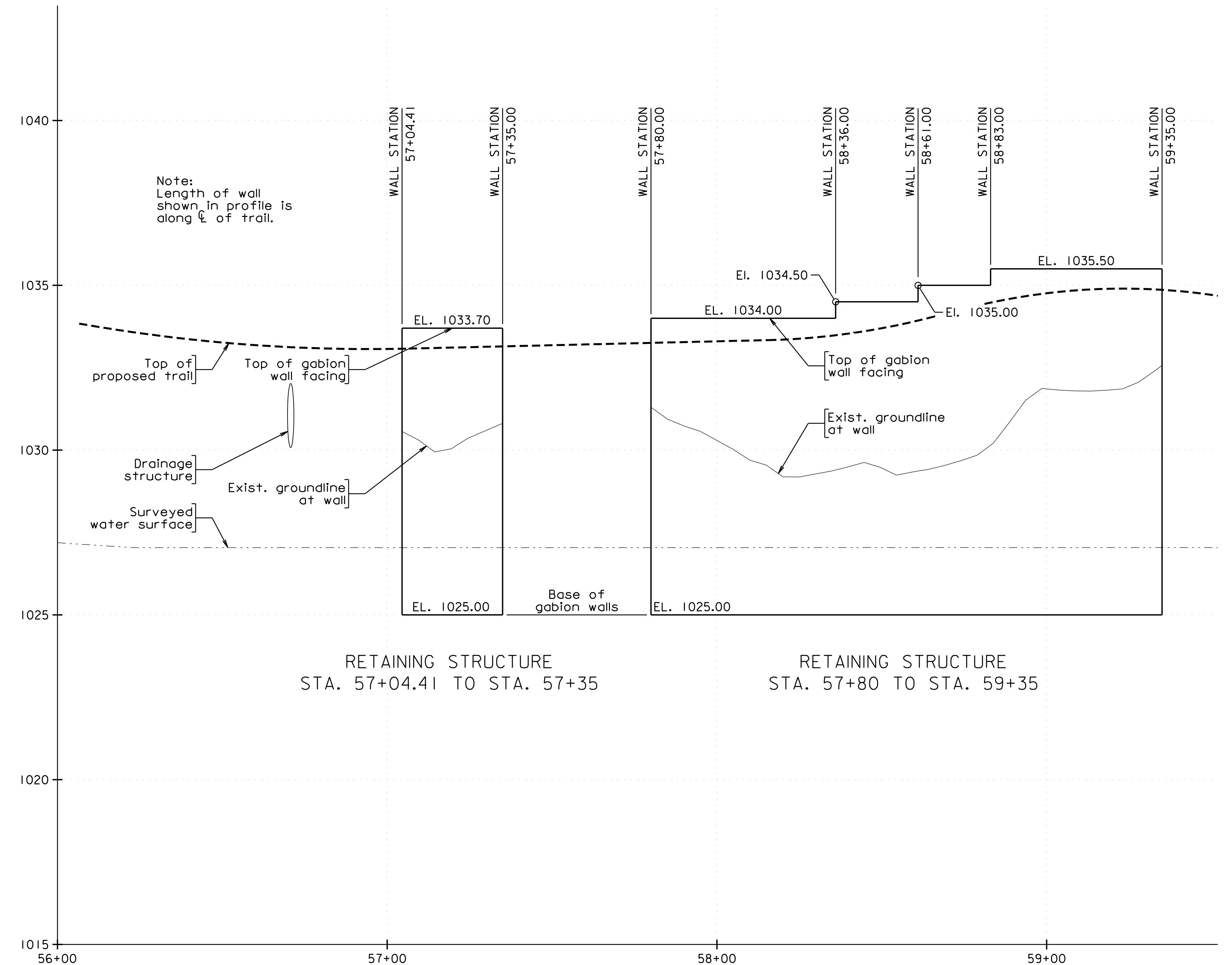
Scale: Not to Scale

MECHANICALLY STABILIZED EARTH (MSE)
RETAINING STRUCTURE (GABION FACED)
DOWNSTREAM OF BRIDGE NO. 2

S-5



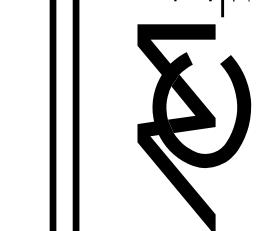
MECHANICALLY STABILIZED EARTH (MSE)
RETAINING STRUCTURE (GABION FACED)
DOWNSTREAM OF BRIDGE NO. 2

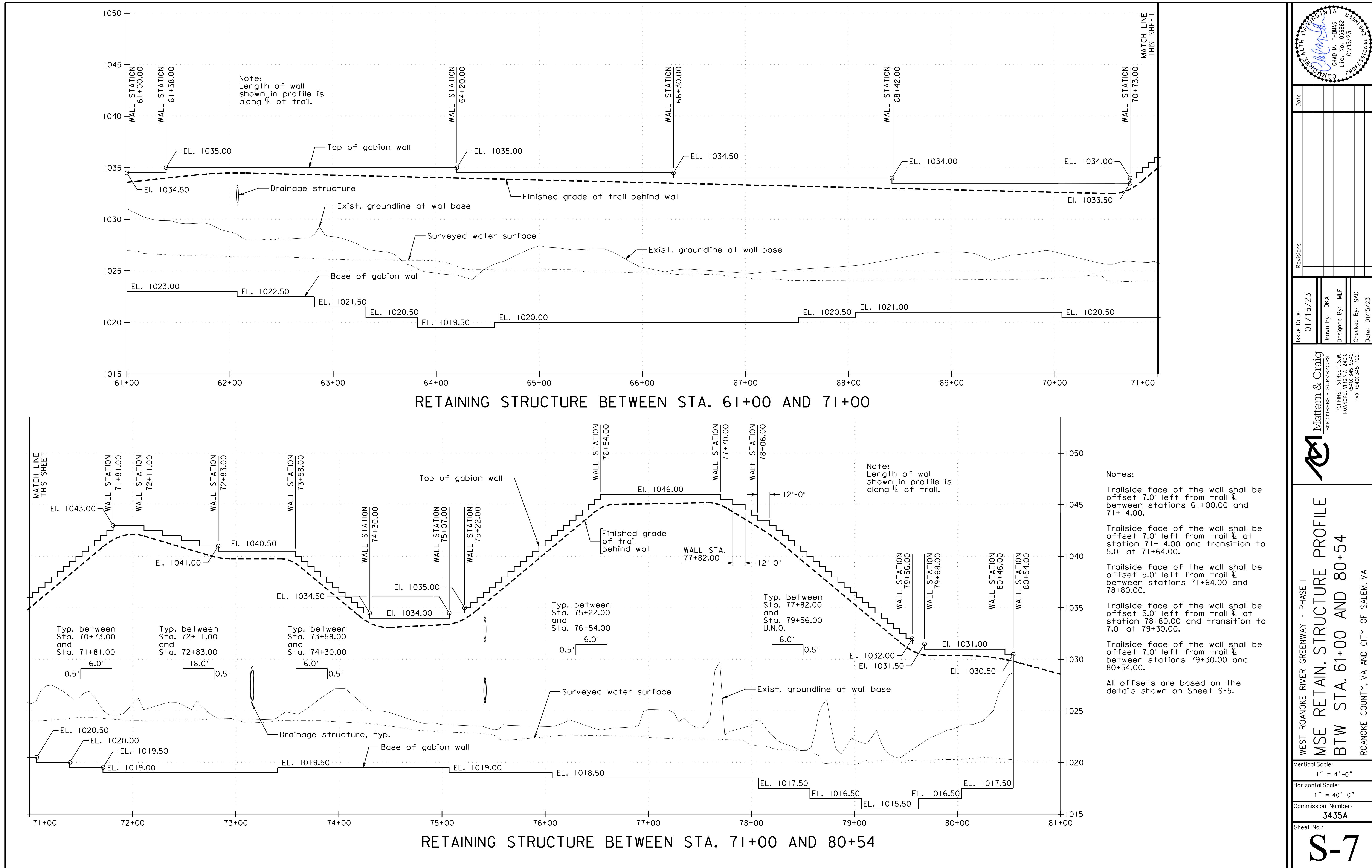


RETAINING STRUCTURES (2) BETWEEN STA. 57+04 AND STA. 59+35

Trailside face top of the wall shall be offset 7.0' left from trail C based on the detail shown on Sheet S-5

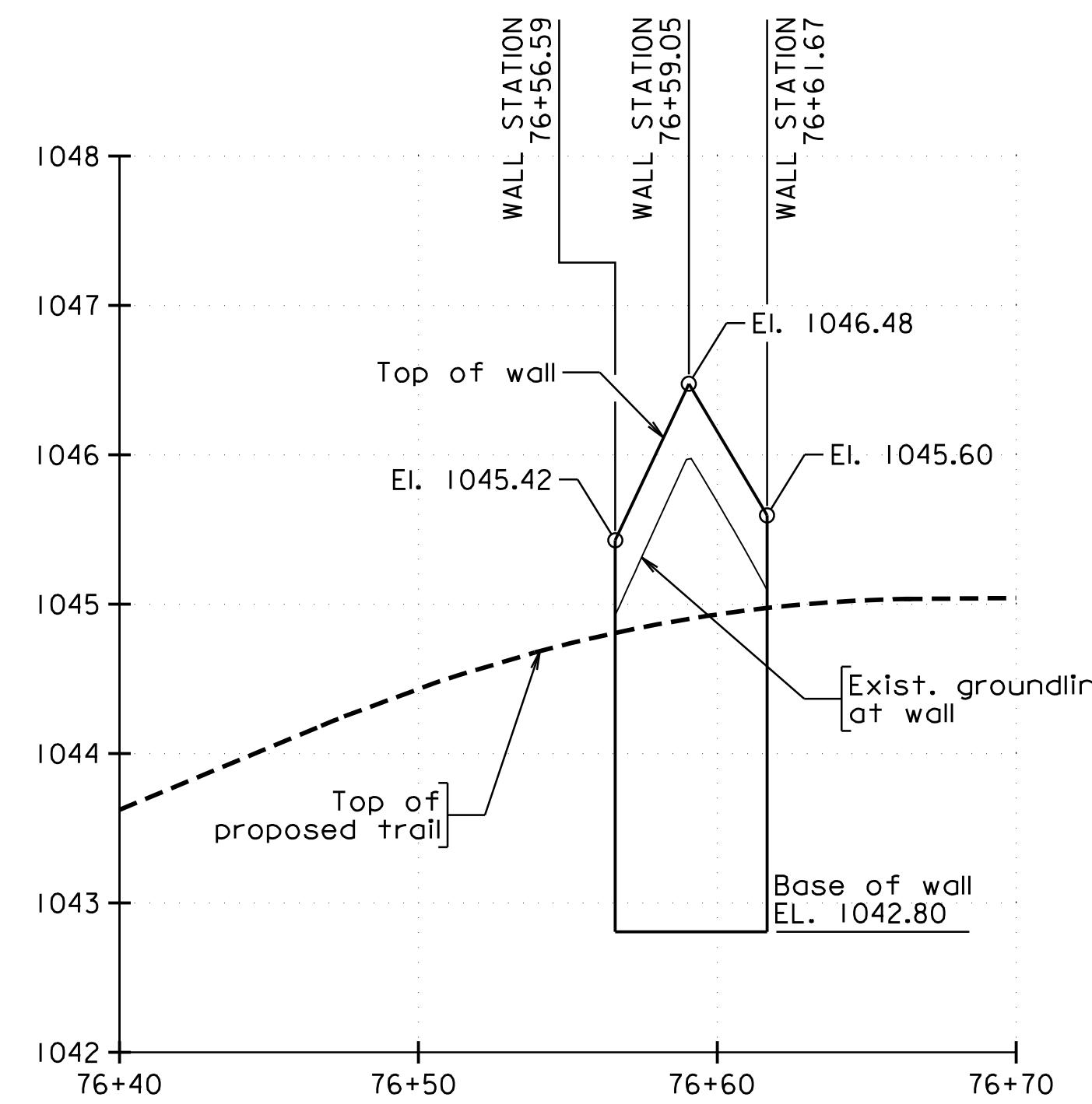
MECHANICALLY STABILIZED EARTH (MSE) RETAINING STRUCTURE PROFILES
WALLS (2) BETWEEN STA. 57+04 AND STA. 59+35

WEST ROANOKE RIVER GREENWAY - PHASE I	Issue Date: 01/15/23	Revisions	Date
MSE RETAIN. STRUCTURE PROFILES	Drawn By: DKA	Designed By: MLF	
2 WALLS	Checked By: SAC		
ROANOKE COUNTY, VA AND CITY OF SALEM, VA	Date: 01/15/23		
 <p>Mattern & Craig ENGINEERS • SURVEYORS 701 FIRST STREET, P.O. W. ROANOKE, VIRGINIA 24016 (540) 345-9342 FAX (540) 345-1651</p>			
Vertical Scale: 1" = 2'-0"	Horizontal Scale: 1" = 20'-0"	Commission Number: 3435A	Sheet No.: S-6
			



Notes:

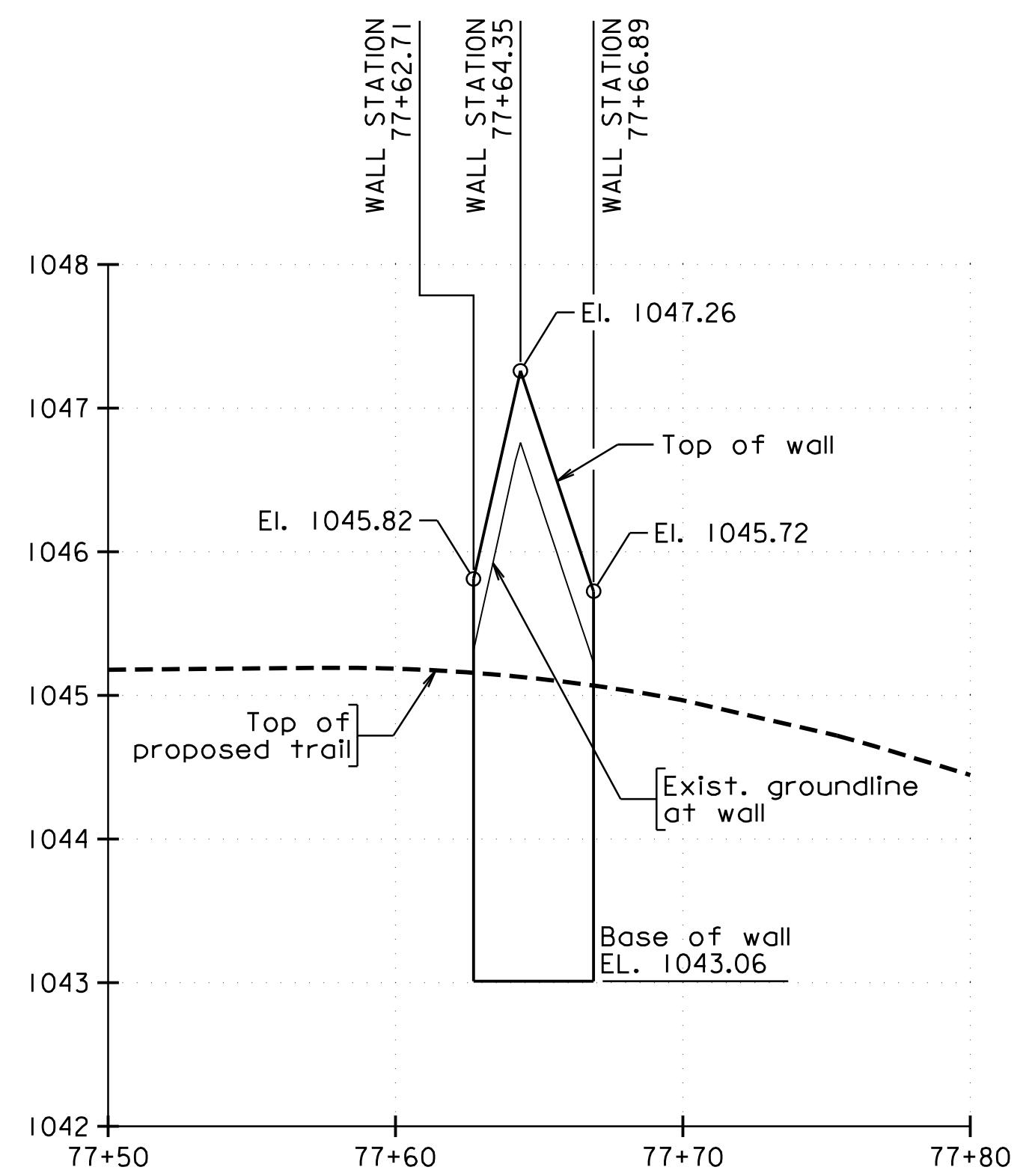
The retaining wall shall be constructed per VDOT Road and Bridge Standard RW-3, Concrete Gravity Retaining Walls Infinite Surcharge and Deck Surcharge - Loaded.



VDOT RW-3 WALL
BETWEEN STA. 76+56 AND STA. 76+62

Trailside face of wall is offset 5'-0" right from trail

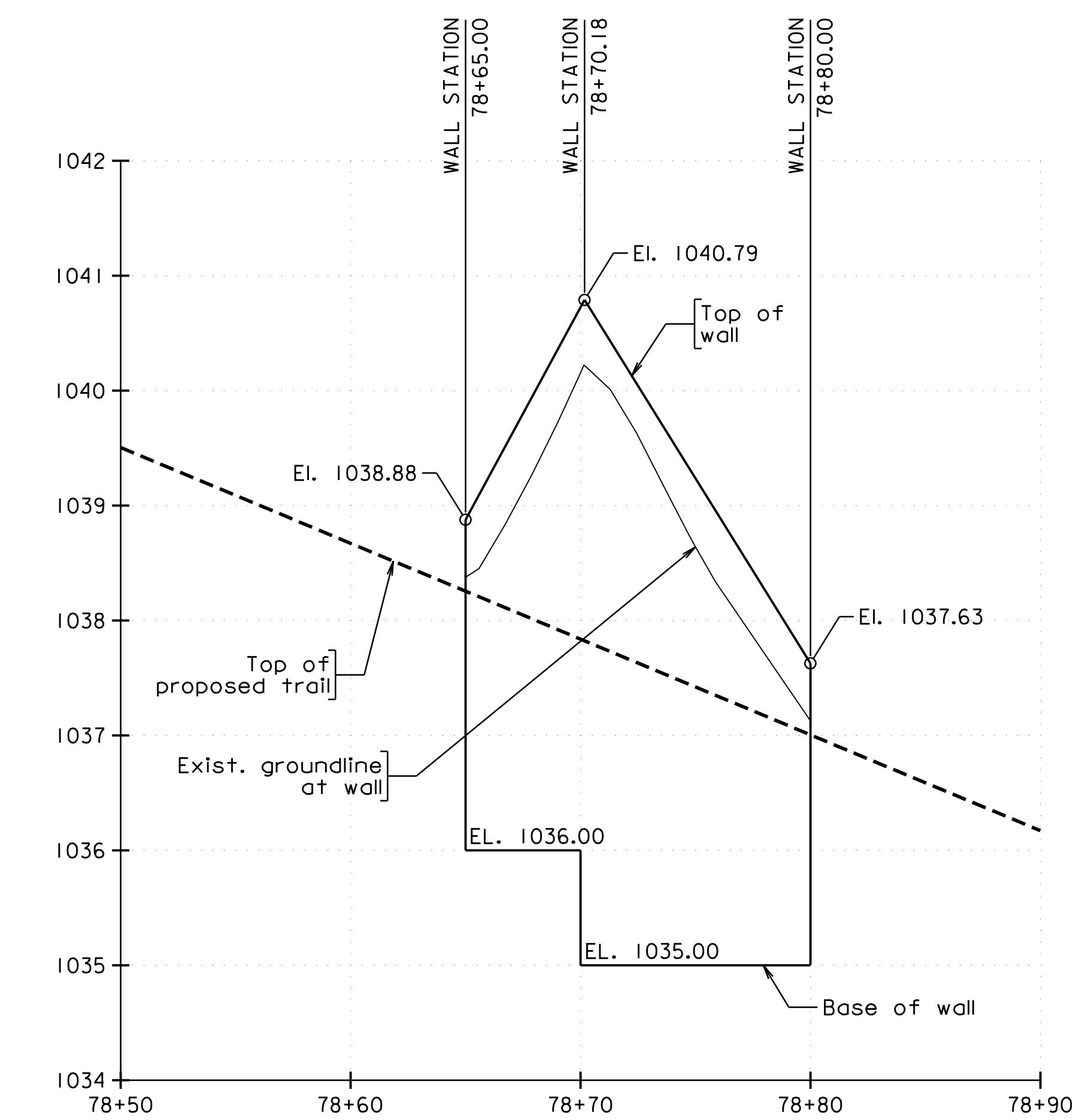
Vertical Scale: 1" = 1'-0"
Horizontal Scale: 1" = 5'-0"



VDOT RW-3 WALL
BETWEEN STA. 77+62 AND STA. 77+67

Trailside face of wall is offset 5'-0" right from trail

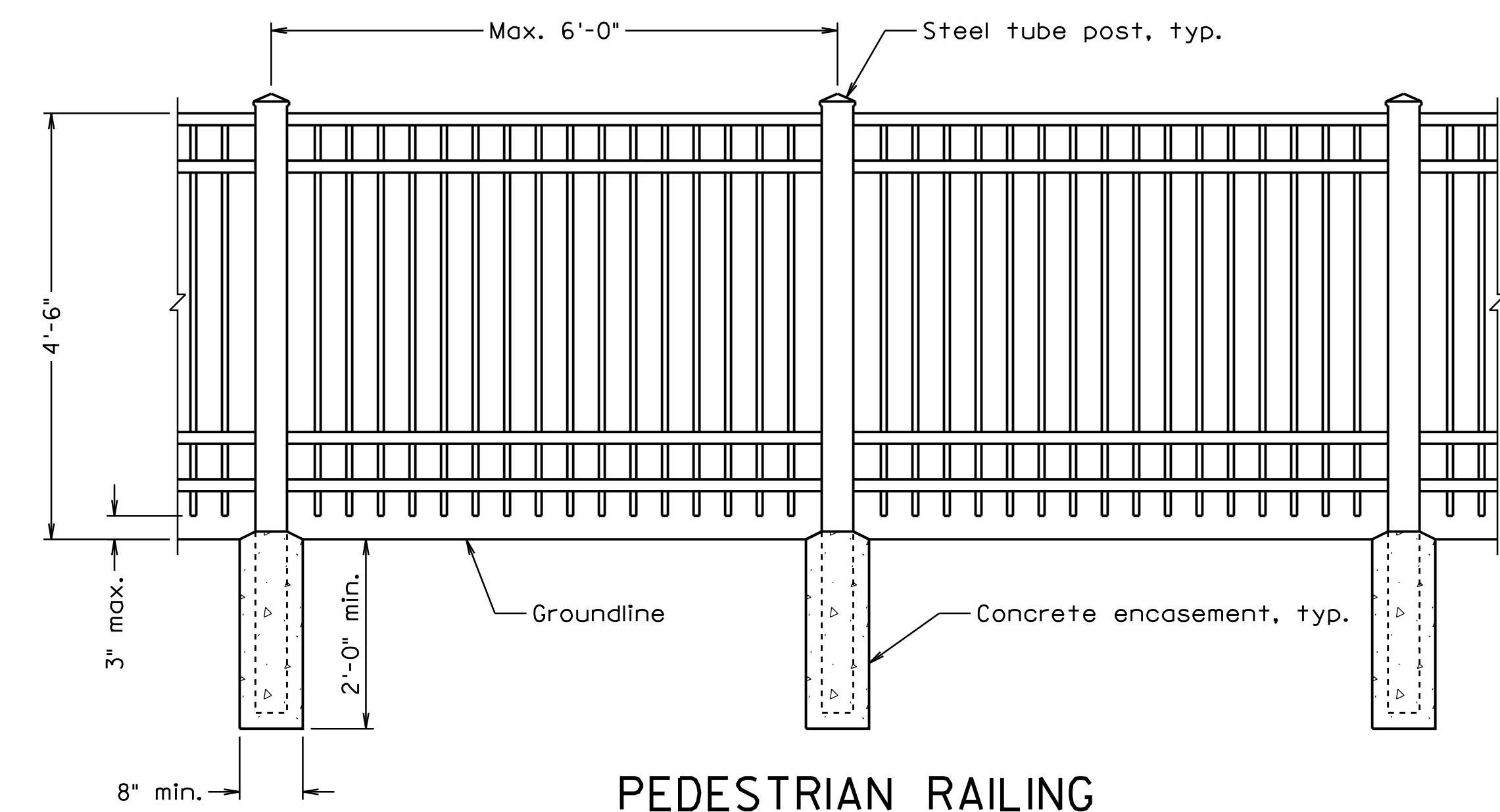
Vertical Scale: 1" = 1'-0"
Horizontal Scale: 1" = 5'-0"



VDOT RW-3 WALL
BETWEEN STA. 78+65 AND STA. 78+80

Trailside face of wall is offset 5'-0" right from trail

Vertical Scale: 1" = 1'-0"
Horizontal Scale: 1" = 5'-0"



PEDESTRIAN RAILING
(HR-I TYPE III BICYCLE RAILING - MODIFIED)

Railing Notes:

1. Railing shall meet the requirements for VDOT Standard HR-I Type III Bicycle Railing and will be paid for at the unit price bid for Handrail HR-I Type III Modified. The unit price bid shall include all items required to install the railing (including the foundations), the finish of the railing, and the items listed in the VDOT Road and Bridge Specifications.
2. Railing style and finish shall be approved by the Owner.
3. The Contractor shall submit drawings detailing all aspects of fabrication and installation of railing, including concrete encasement, and expansion joint location for approval by the Engineer prior to installation. Shop drawings shall be signed and sealed by a professional engineer, holding a valid license to practice engineering in the Commonwealth of Virginia.
4. All railing components and fasteners shall be galvanized in accordance with the current Road and Bridge Specifications, to achieve a uniform coating on all surfaces venting and drainage holes for galvanizing shall be included in the shop drawings.
5. All steel shall be hot dip galvanized. After galvanizing, all steel members shall be painted black with the following Tnemec paint system (or approved equal):
 - Surface Preparation: SSPC-SP7 abrasive sweep blast.
 - First Coat: Series N69 Black at 4.0-6.0 mils dft.
 - Second Coat: Series 73 Urethane Black at 2.0-3.0 mils dft.
 - Total Dry Film Thickness: 6.0-9.0 mils dft.
6. All fasteners shall be in accordance with ASTM A307, ASTM A563, and ASTM F844. All anchor bolts shall be in accordance with AASHTO M314, Grade 36.
7. Posts shall be mitered to match grade of trail.
8. Pedestrian railings shall match grade of trail.
9. All posts and pickets shall be set plumb.
10. Railings shall be grounded and effectively bonded. Grounding materials installation to be in accordance with STD FE-6.
11. Commercially available railing systems may be used in lieu of designing and fabricating the railing upon approval from the Owner. Documentation from the manufacturer verifying that the project requirements are met with the railing system shall be submitted with the installation drawings and approved by the Engineer in accordance with Notes 2 and 3.
12. Handrail to be in accordance with the latest edition of the Virginia Uniform Statewide Building Code.

WEST ROANOKE RIVER GREENWAY - PHASE I
RW-3 WALL PROFILES (3) AND
TYP. PEDESTRIAN RAILING DETAIL
ROANOKE COUNTY, VA AND CITY OF SALEM, VA

Vertical Scale: AS NOTED
Horizontal Scale: AS NOTED
Commission Number: 3435A
Sheet No.: S-8

CHAD M. THOMAS
LIC. NO. 036962
01/15/23
Professional Engineer
COMMERCIAL ENGINEERING
S-8