BASELINE MONITORING DOCUMENT AND AS-BUILT BASELINE REPORT

Final

CANDY CREEK MITIGATION SITE
Guilford County, NC
NCDEQ Contract 5794
DMS ID No. 96315

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PREPARED FOR:

NC Department of Environment Quality
Division of Mitigation Services
1652 Mail Service Center
Raleigh, NC 27699-1652

PREPARED BY:

1430 South Mint Street, Suite 104
Charlotte, NC 28203
Phone: 704.332.7754
Fax: 704.332.3306

EXECUTIVE SUMMARY

Wildlands Engineering (Wildlands) implemented a full delivery project at the Candy Creek Mitigation Site (Site) for the North Carolina Division of Mitigation Services (DMS) to restore, enhance, and preserve a total of 19,583 linear feet (LF) of perennial and intermittent streams, in Guilford County, NC. The Site is expected to generate 15,507 stream mitigation units (SMUs) through the restoration, enhancement, and preservation of Candy Creek and nine unnamed tributaries (Table 1).

The Site is located northeast of the Town of Brown Summit within the DMS targeted local watershed for the Cape Fear River Basin Hydrologic Unit Code (HUC) 03030002010020 and NCDWR Subbasin 03-06-01 (Figure 1) and is being submitted for mitigation credit in the Cape Fear River Basin HUC 03030002. The Site is located within the Haw River Headwaters Watershed, which is part of DMS' Cape Fear River Basin Restoration Priorities (RBRP). While Candy Creek is not mentioned specifically, this document identifies a restoration goal for all streams within HUC 03030002 of reducing sediment and nutrient pollution to downstream Jordan Lake. The Haw River watershed was also identified in the 2005 NC Wildlife Resources Commission's Wildlife Action Plan as a priority area for freshwater habitat conservation and restoration to protect rare and endemic aquatic fauna and enhance species diversity. No rare and endemic aquatic species have been documented onsite or are proposed for re-establishment onsite as part of the project. The Wildlife Action Plan calls for "support of conservation and restoration of streams and riparian zones in priority areas (acquisition, easements, and buffer)." Restoration at the Site directly and indirectly addressed these goals by excluding cattle from the stream, creating stable stream banks, restoring a riparian corridor, and placing land historically used for agriculture under permanent conservation easement. A conservation easement was recorded on 61.74 acres to protect the restored riparian corridor in perpetuity.

The project goals established in the mitigation plan (Wildlands, 2016) were to provide ecological enhancement and mitigate site water quality stressors that will benefit the receiving waters in the Cape Fear River Basin. This will primarily be achieved by creating functional and stable stream channels, increasing and improving the interaction of stream hydrology within the riparian zone, and improving floodplain habitat and ecological function. This will also be achieved by restoring a Piedmont Bottomland Forest community as described by Schafale and Weakley (1990) along the stream reaches within open pastures. Completed with careful consideration of goals and objectives that were described in the RBRP and to address stressors identified in the LWP, the following project goals were established:

- Reduce in-stream water quality stressors resulting in enhanced habitat and water quality in riffles and pools.
- Construct stream channels that are laterally and vertically stable resulting in a network of streams capable of supporting hydrologic, biologic, and water quality functions.
- Improve on-site habitat by diversifying and stabilizing the stream channel form; installing habitat features such as undercut logs, brush toe, wood and stone based riffles; and by establishing native stream bank vegetation and shading where none exists.
- Exclude cattle from project streams resulting in greater treatment and reduction of overland flow and landscape derived pollutants including fecal coliform, nitrogen, and phosphorus.
- Increase and improve stream hydrology connectivity with riparian floodplains resulting in temporary water storage and recharge of wetlands and floodplain pools during high flows; increased groundwater connectivity within floodplains and wetlands; promotion of nutrient and carbon exchange between streams and floodplains, and reduced shear stress on channels during larger flow events.

- Restore and enhance native floodplain forest resulting in improved riparian habitat, reduced competition from non-native species, stream shading and reduced thermal loading, woody debris inputs for adjacent streams, and flood flow velocity reductions within the floodplain allowing for pollutant and sediment deposition.
- Permanently protect the Site ensuring that development and agricultural uses do not impact or reduce the watershed benefits provided by the project.

Site construction occurred between July 2016 and March 2017. The as-built surveys were completed between October 2016 and March 2017. Planting and baseline vegetation data collection occurred in March 2017. Minimal adjustments were made during construction and specific changes are detailed in Section 5.1. Baseline (MY0) profiles and cross section dimensions closely match the design parameters. Cross section widths and pool depths occasionally exceed design parameters within a normal range of variability for natural streams. Due to field conditions and construction adjustments, there are several sections where the buffer width ended up less than 50'. The buffers widths in most of these sections are between 45' and 50'. The total length of these sections is approximately 3.1% of the total project length. The Site has been built as designed and is expected to meet the upcoming monitoring year's success criteria.

CANDY CREEK MITIGATION SITE

Baseline Monitoring Document and As-Built Baseline Report

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APPENDICES

Section 1: PROJECT GOALS, BACKGROUND, AND ATTRIBUTES

1.1 Project Location and Setting

The Site is located in northeast Guilford County approximately 15 miles northeast of the City of Greensboro off of Old Reidsville Road and Hopkins Road (Figure 1). Conservation easements were recorded on a total of 61.74 acres and includes portions of 14 parcels owned by 11 landowners (Table 2).

The Site is located in the Cape Fear River Basin; eight-digit Cataloging Unit (CU) 03030002 and within the DMS targeted watershed for the Cape Fear River Basin 14-digit Hydrologic Unit Code (HUC) 03030002010020 (Figure 1). The Site is being submitted for mitigation credit in the Cape Fear River Basin HUC 03030002.

Located in the Inner Piedmont Belt of the Piedmont Physiographic Province (USGS, 1998), the project watershed is primarily comprised of agricultural and forested land. The drainage area for the Site is 937 acres. From Greensboro, NC, take US-29 North approximately 12 miles past the communities of Browns Summit and Monticello. The north end of the Site including Candy Creek Reach 3, Candy Creek Reach 4, UT1D, and UT1D may be accessed by Old Reidsville Rd (NC SR 2514). The south end of the Site including Candy Creek Reach 1, Candy Creek Reach 2, UT2, UT3, UT4, and UT5 can be accessed via Hopkins Rd (NC SR 2700).

Candy Creek and the unnamed tributaries (UT1C, UT1D, UT2, UT2A, UT2B, UT3, UT4, UT5, and UT5A) are located within the NC Division of Water Resources (NCDWR) subbasin 03-06-01. Candy Creek (NCDWR Index No. 16-5) has been classified as Water Supply V (WS-V) waters with a supplemental classification of Nutrient Sensitive Waters (NSW) which recognizes waters needing additional nutrient management. These waters are also protected for Class C uses such as secondary recreation, fishing, wildlife, fish and aquatic life propagation and survival, and agriculture. The Site is located within a Targeted Local Watershed (TLW) identified in DMS' 2009 Cape Fear River Basin Restoration Priorities (RBRP). The Site is also identified in the 2005 NC Wildlife Resources Commission's Wildlife Action Plan. No rare and endemic aquatic species have been documented onsite or are proposed for re-establishment onsite as part of the project.

Prior to construction activities, stream impairments included incised and over widened channels, bank erosion with areas of mass wasting, historic channelization, floodplain alteration, degraded in-stream habitat, and impoundments. Riparian impairments included clearing and livestock grazing. Table 5 in Appendix 1 and Tables 7a-f in Appendix 2 present the pre-restoration conditions in more detail.

1.2 Project Goals and Objectives

The overarching goals of the proposed stream mitigation project are to provide ecological enhancement and mitigate site water quality stressors that will benefit the receiving waters in the Cape Fear River Basin. The Site will treat almost all of the headwaters of Candy Creek and 47% of the entire 3.1-square mile Candy Creek watershed before flowing to the Haw River. A primary goal of the RBRP is to restore and maintain water quality as stated in the Jordan Lake Nutrient Management Strategy. The project goals established for the Site were completed with careful consideration of goals and objectives that were described in the RBRP and include the following:

- *Reduce in-stream water quality stressors.* Reconstruct stream channels with stable dimensions. Stabilize eroding stream banks. Add bank protection and in-stream structures to protect restored/enhanced streams.

- *Construct stream channels that are laterally and vertical stable.* Construct stream channels that will maintain a stable pattern and profile considering the hydrologic and sediment inputs to the system, the landscape setting, and the watershed conditions.
- *Improve on-site habitat.* Construct diverse and stable channel form with varied and self-sustainable stream bedform. Install habitat features such as undercut logs, brush toe, wood and stone-based riffles. Establish native stream bank vegetation and shading where none exists.
- *Exclude cattle from project streams.* Install fencing around the conservation easement adjacent to cattle pastures.
- *Increase and improve the interaction of stream hydrology within the riparian zone to in turn improve floodplain habitat and ecological function.* Reconstruct stream channels with appropriate bankfull dimensions and raise them to the proper depths relative to a functioning floodplain.
- *Restore and enhance native floodplain forest.* Plant native trees and understory species, and treat invasive species in the riparian zone.
- *Permanently protect the project Site from harmful uses.* Establish a conservation easement on the Site.

1.3 Project Structure, Restoration Type, and Approach

The final mitigation plan was submitted and accepted by DMS in March of 2016. Construction activities were completed in March 2017 by Land Mechanic Designs, Inc. Kee Mapping and Surveying, P.A. completed the as-built survey activities in March 2017. Planting was completed by Bruton Natural Systems, Inc. in March 2017. Minimal adjustments were made during construction and field adjustments made during construction are described in further detail in Section 5.1. Refer to Appendix 1 for detailed project activity, history, contact information, and watershed/site background information.

1.3.1 Project Structure

The project is expected to provide 15,507 SMUs. Refer to Figure 2 for the project component/asset map for the stream feature exhibits and Table 1 for the project component and mitigation credit information for the Site.

1.3.2 Restoration Type and Approach

The design streams were restored to the appropriate type based on the surrounding landscape, climate, and natural vegetation communities but also with thorough consideration to existing watershed conditions and trajectory. The project includes a combination of stream restoration, enhancement, and preservation. The specific stream restoration and enhancement activities are described below.

The stream restoration portion of this project included 13 reaches:

- *Candy Creek (Reaches 1 and 2)*: The start of Candy Creek Reach 1 is controlled by an existing culvert outfall at the upstream project limits. Candy Creek Reaches 1 and 2 were restored with the Priority 1 approach, connecting the proposed top of bank at approximately the existing floodplain elevation. There were two exceptions where some floodplain excavation was necessary to connect with existing channel grade constraints. The upper 500 feet of Candy Creek Reach 1 required approximately 6 to 18" of floodplain excavation to transition to a full Priority 1 approach approximately 500 feet downstream from the upstream project limits. Additionally, the lower 500 feet of Candy Creek Reach 2 required approximately 12 to 30" of floodplain excavation to transition to existing bedrock grade control upstream of the bridge at Hopkins Road.
- *Candy Creek (Reach 4)*: Dimension, pattern, and profile were restored in Candy Creek Reach 4 using a Priority 1 design approach. A new, offline, meandering channel was constructed in the right floodplain, occasionally tying back into the existing channel to maximize belt width while avoiding impacts to existing wetlands and trees located throughout the reach corridor. Several vernal pools were created along the left floodplain from unfilled portions of the remnant channel in order to create floodplain diversity and reduce site impacts that would be necessary to haul in extra fill material. The reach transitioned to a step-pool morphology within the downstream 731 LF of channel as the valley narrows and steepens, eventually stepping down to a Priority 2 channel to match the existing bed elevation at the downstream project limits.
- UT1C: UT1C began at a headwater impoundment which was drained to restore the natural valley and associated stream reach. The restoration approach included a Priority 1 B/C type stream to dissipate flows vertically through the narrow, wooded valley. The Priority I restoration activities tied into an existing, stable stream channel prior to the confluence with Candy Creek.
- *UT1D*: Similar to UT1C, the design approach for UT1D was a Priority 1 stream restoration involving the restoration of the valley via excavation through an old pond bed and breached dam embankment. UT1D begins upstream as a low gradient, meandering, C type stream constructed through a portion of the old pond bed and existing valley before transitioning to a B type step-pool channel until its confluence with Candy Reach 3.

- *UT2 (Reach 1 - Restoration)*: Restoration transitions from a Priority 2 at the upstream end to Priority 1 as the stream approached an old cattle pond. Restoration activities within the pond bed area resemble a Priority 2 approach, with wide floodplain benches and terrace slopes tying into natural ground. A permanent culvert crossing was installed on this reach to allow free access for cattle crossing. The internal crossing is fenced to exclude cattle from the easement.
- *UT3*: The upstream extent of UT3 is in stable condition and is included as a preservation reach. The lower portion of UT3 was severely degraded prior to the confluence with Candy Creek. Restoration activities tied to the existing stable channel on the upstream end and realigned the lower portion through the center of a wide forested valley to the confluence with Candy Creek Reach 1C. The Priority I design restored the natural sinuosity and reconnected the stream and floodplain. Structures were incorporated into the design to provide a stable and improved bedform and enhanced aquatic habitat.
- *UT4*: This stream reach was deeply incised prior to restoration activities. A Priority 2 approach was utilized to tie in the restored channel with the existing upstream elevation. While the existing channel is heavily incised at the tie in location, a bedrock feature exists to ensure a stable connection. UT4 was realigned to the center of the existing valley and a bench was cut for the Priority 2 channel. The remainder of UT4 was restored by implementing Priority 1 restoration. Structures were added to increase bedform diversity and increase available aquatic habitat. Areas of the old abandoned channel were utilized to create vernal pools on the floodplain, which will provide open water habitat and floodplain storage.
- *UT5*: Restoration for UT5 began at the confluence of UT5 and UT5A preservation reach. The overall sinuosity of UT5 was decreased slightly as the existing stream had created tight radius bends in the existing pattern resulting in erosion and mass wasting. The restored dimension of the channel reconnected UT5 to the floodplain and provides relief for channel banks during high flow events. Areas previously manipulated for farm crossings and/or abandoned impoundments were restored to a natural valley condition with an adequate bench created for floodplain flow. Similar to UT4, areas of old abandoned channel were used to create open water habitat and floodplain storage.

The project also included stream enhancement on five reaches classified as either enhancement I (EI) or enhancement II (EII).

- *Candy Creek Reach 3*: An EI approach was utilized between Hopkins Road and the confluence of UT1D, with EII through the remainder of the downstream corridor until Candy Creek Reach 4. EI activities included minor realignment of channel pattern by straightening a few tight meander bends and excavating bankfull benches to improve the expansion of flow between Hopkins Road and the UT1D confluence. Channel profile was adjusted with the installation of constructed riffles, jhook vanes, and a cross vane. EII measures included the sporadic placement of in-stream structures for bank protection, grade control, and to help raise the channel bed slightly to lessen incision throughout the reach. Bankfull benches were created in selected areas where the channel dimension was constricted to afford a wider channel width and limited floodplain access. In multiple locations, short sections of manmade levy were excavated to remove historic flood protection and re-connect bankfull flows to the wider floodplain.
- *UT2 (Reach 1 - Enhancement)*: The bedform along UT2 Reach 1A was considered functional, in spite of mass bank failure and deep incision. In order to retain the bedform, an EI approach was utilized to excavate a floodplain bench along both banks allowing for floodplain access and

stabilized terrace slopes. A few structures and constructed riffles were installed to supplement bedform and habitat.

- *UT2 (Reach 2)*: The banks along UT2 Reach 2 were fairly stable and the channel pattern was well developed. An EI approach was incorporated to raise the channel while retaining the existing pattern. Additionally, a floodplain bench was excavated to allow for floodplain access. In-stream log sills and constructed riffles were used to raise the bed elevation through the reach which promoted large, deep pools between structures, which will benefit habitat.
- *UT2A*: The EI approach for UT2A consisted of excavating a floodplain bench along both banks, stabilizing the two existing headcuts, and adding riffles and pools for habitat. The excavated bench addressed the channel incision and entrenchment while laying the terrace slopes back to a flatter, more stable slope. A log step pool series was installed to arrest the migrating headcuts and achieve a more consistent channel slope. Habitat was enhanced by introducing riffles and pools through log structures.
- *UT2B*: Th EII approach retained the pattern of the existing channel while addressing discrete occurrences of vertical or stressed banks and provided habitat through riffle and pool structures. One short section (approximately 50 LF) of channel was realigned to repair a blowout caused by cattle access. The steeper intermittent upstream section was stabilized using a log step pool system that spreads the drop out and dissipates energy in the pools.

Design parameters were developed for restoration reaches based on the design bankfull discharge, dimensionless ratios from the reference reach data, and professional judgment of the designers. The restoration reaches were designed to be similar to type C/E or B type streams according to the Rosgen classification system (Rosgen, 1996). Type C/E streams are meandering streams with well developed floodplains and average gradients of 2% or less. C/E streams occur within a wide range of valley types and were appropriate for Candy Creek Reaches 1 – 4, UT2 Reach 2, UT3, UT4, and UT5. Type B streams occur within headwater and 2nd order streams in steeper, more confined valley settings and have narrow floodplains with average gradients typically steeper than 2%. Construction of B-type step-pool channels were implemented for UT1C, UT1D, UT2 Reach 1, and UT2A.

The morphologic design parameters are shown in Appendix 2, Tables 7a-f for the restoration reaches and fall within the ranges specified. The specific values for the design parameters were selected based on designer experience and judgment and were verified with morphologic data form reference reach data sets.

1.4 Project History, Contacts, and Attribute Data

The Site was restored by Wildlands through a full delivery contract with DMS. Tables 3, 4, and 5 in Appendix 1 provide detailed information regarding the Project Activity and Reporting History, Project Contacts, and Project Information and Attributes.

Section 2: PERFORMANCE STANDARDS

The performance criteria for the Site follows approved performance criteria presented in the Candy Creek Mitigation Plan (Wildlands, 2016). Annual monitoring and semi-annual site visits will be conducted to assess the condition of the finished project. The stream reaches were assigned specific performance criteria components for stream morphology, hydrology, and vegetation. Performance criteria will be evaluated throughout the seven year post-construction monitoring. If all performance criteria have been successfully met and two bankfull events have occurred during separate years, Wildlands may propose to terminate stream and/or vegetation monitoring after year five pending little to no prevalent invasive species issues. An outline of the performance criteria components follows.

2.1 Stream

2.1.1 Dimension

Riffle cross sections on the restoration and enhancement (EI) reaches should be stable and should show little change in bankfull area, maximum depth ratio, and width-to-depth ratio. Per DMS guidance, bank height ratios shall not exceed 1.2 and entrenchment ratios shall be at least 2.2 for restored channels to be considered stable. All riffle cross sections should fall within the parameters defined for channels of the appropriate stream type. If any changes do occur, these changes will be evaluated to assess whether the stream channel is showing signs of instability. Indicators of instability include trends in vertical incision or bank erosion. Changes in the channel that indicate a movement toward stability or enhanced habitat include a decrease in the width-to-depth ratio in meandering channels or an increase in pool depth. Remedial action would not be taken if channel changes indicate a movement toward stability.

2.1.2 Pattern and Profile

Annual longitudinal profile surveys will not be conducted during the seven year monitoring period unless other indicators during the annual monitoring indicate a trend toward vertical and lateral instability. If a longitudinal profile is deemed necessary, monitoring will follow standards as described in the 2003 USACE and NCDWR Stream Mitigation Guidance for the necessary reaches. A longitudinal profile was conducted as part of the as-built survey to provide a baseline for comparison should it become necessary to perform longitudinal profile surveys later during monitoring and to insure accordance with design plans.

2.1.3 Substrate

Substrate materials in the restoration and enhancement (EI) reaches should indicate a progression towards or the maintenance of coarser materials in the riffle features and smaller particles in the pool features.

2.1.4 Photo Documentation

Photographs should illustrate the Site's vegetation and morphological stability on an annual basis. Cross section photos should demonstrate no excessive erosion or degradation of the banks. Longitudinal photos should indicate the absence of persistent bars within the channel or vertical incision. Grade control structures should remain stable. Deposition of sediment on the bank side of vane arms is preferable. Maintenance of scour pools on the channel side of vane arms is expected.

2.1.5 Hydrologic Events

Two bankfull flow events must be documented on the restoration and enhancement (EI) reaches within the seven-year monitoring period. These two bankfull events must occur in separate years. Stream

monitoring will continue until success criteria in the form of two bankfull events in separate years have been documented. Bankfull events will be documented using pressure transducers, manual crest gages, photographs, and visual assessments such as debris lines.

Consistent flow must be documented in the intermittent stream (UT1D) at the Site. Under normal circumstances stream flow must be documented to occur every year for at least 30 consecutive days during the seven year monitoring period. Stream flow must also be documented to occur intermittently in all months other than July through September of each monitoring year. Flow will be documented in UT1D using a pressure transducer established within the thalweg of the channel.

2.2 Vegetation

The final vegetative success criteria will be the survival of 210 planted stems per acre in the planted riparian corridor at the end of the required monitoring period (MY7). The interim measure of vegetative success for the Site will be the survival of at least 320 planted stems per acre at the end of the third monitoring year and at least 260 stems per acre at the end of the fifth year of monitoring. If this performance standard is met by MY5 and stem density is trending towards success (i.e., vigor), monitoring of vegetation on the Site may be terminated provided written approval is provided by the USACE in consultation with the NC Interagency Review Team. The extent of invasive species coverage will also be monitored and controlled as necessary throughout the required monitoring period.

2.3 Schedule and Reporting

Monitoring reports will be prepared in the fall of each year during the monitoring period and submitted to DMS. Based on the DMS Monitoring Report Template (Version 1.5, 6/8/12), the monitoring reports will include the following:

- Project background which includes project objectives, project structure, restoration type and approach, location and setting, history and background;
- Assessment of the stability of the stream based on the cross sections and visual assessments;
- Stream hydrological data and attainment of bankfull and flow attainment;
- Photographs showing views of the restored Site taken from fixed point stations;
- Vegetative data as described above including the identification of any invasion by undesirable plant species; and
- Maintenance issues and recommended remediation measures will be detailed and documented.

Section 3: MONITORING PLAN

Monitoring will consist of collecting morphological, hydrological, and vegetative data to assess the project success based on the restoration goals and objectives on an annual basis or until success criteria is met. The success of the project will be assessed using measurements of the stream channel's dimension, substrate composition, permanent photographs, surface water hydrology, and vegetation. Any areas with identified high priority problems, such as streambank instability, aggradation/degradation, or lack of vegetation establishment will be evaluated on a case-by-case basis. The problem areas will be visually noted and remedial actions will be discussed with DMS staff to determine a plan of action. Refer to Table 6 in Appendix 1 for monitoring component summary.

3.1 Stream

Geomorphic assessments follow guidelines outlined in the Stream Channel Reference Sites: An Illustrated Guide to Field Techniques (Harrelson et al., 1994), methodologies utilized in the Rosgen stream assessment and classification documents (Rosgen, 1994 and 1996), and in the Stream Restoration: A Natural Channel Design Handbook (Doll et al, 2003). Refer to Figures 3.0 – 3.7 in Appendix 1 for monitoring locations discussed below.

3.1.1 Dimension

In order to monitor the channel dimension, 48 permanent cross sections were installed per DMS guidance along the stream restoration and enhancement I reaches. Each cross section is permanently marked with rebar installed in concrete and marked with PVC pipes. Cross section surveys include points measured at all breaks in slope, including top of bank, bankfull, edge of water, and thalweg. If bank erosion is observed within permanent cross sections during the monitoring period, an array of bank pins will be installed in the permanent cross section where erosion is occurring for reaches with bankfull widths large enough to warrant bank pin monitoring. Bank pins will be installed on the outside bend of the cross section in at least three locations (one in upper third of the pool, one at the permanent cross section, and one in the lower third of the pool). Bank pins will be monitored by measuring exposed rebar and maintaining pins flush to bank to capture bank erosion progression. Cross section and bank pin surveys (if applicable) will be conducted in monitoring years one (MY1), two (MY2), three (MY3), five (MY5), and seven (MY7). Photographs will be taken annually of the cross sections looking upstream and downstream.

3.1.2 Pattern and Profile

Longitudinal profile surveys will not be conducted during the seven year monitoring period unless other indicators during the annual monitoring indicate a trend toward vertical and lateral instability. If a longitudinal profile is deemed necessary, monitoring will follow standards as described in the 2003 USACE and NCDWR Stream Mitigation Guidance for the necessary reaches. Stream pattern and profile will be assessed visually as described below in Section 3.1.6.

3.1.3 Substrate

A reach-wide pebble count will be performed in each restoration and enhancement level I reach for classification purposes. A pebble count will be performed at each surveyed riffle to characterize the pavement. Substrate sampling will occur in MY1, MY2, MY3, MY5, and MY7.

3.1.4 Photo Reference Points

A total of 85 permanent photograph reference points were established along the stream reaches after construction. Permanent markers were established so that the same locations and view directions on

the Site are photographed each year. Longitudinal stream photographs will be taken looking upstream and downstream once a year to visually document stability. Cross sectional photos will be taken at each permanent cross section looking upstream and downstream. Representative digital photos of each permanent photo point will be taken on the same day the stream assessments are conducted. The photographer will make every effort to consistently maintain the same area in each photo over time.

3.1.5 Hydrology Documentation

Bankfull events will be documented using crest gages, pressure transducers, photographs, and visual assessments such as debris lines. Eight hydrology monitoring stations with crest gages and pressure transducers were installed (Candy Creek Reach 2B, Candy Creek Reach 4A, UT1C, UT2 Reach 1, UT2A, UT3, UT4, and UT5). The gages were installed within a surveyed riffle cross section of the restored channels. The gages will be checked at each site visit to determine if a bankfull event has occurred. Photographs will be used to document the occurrence of debris lines and sediment deposition. Baseflow within the intermittent stream (UT1D) will be documented with a pressure transducer automated stream gage installed at the thalweg elevation of the channel. The pressure transducer data will be plotted and included in the annual monitoring reports.

3.1.6 Visual Assessment

Visual assessments will be performed along all stream areas on a semi-annual basis during the seven year monitoring period. Problem areas will be noted such as channel instability (i.e. lateral and/or vertical instability, in-stream structure failure/instability and/or piping, headcuts), vegetated health (i.e. low stem density, vegetation mortality, invasive species or encroachment), beaver activity, or livestock access. Areas of concern will be mapped, photographed, and described through a written description in the annual report. Problem areas will be re-evaluated during each subsequent visual assessment. Should remedial actions be required, recommendations will be provided in the annual monitoring report.

3.2 Vegetation

Planted woody vegetation will be monitored in accordance with the guidelines and procedures developed by the Carolina Vegetation Survey Level 2 Protocol (Lee et al., 2006) to monitor and assess the planted woody vegetation. A total of 37 standard 10 meter by 10 meter vegetation plots and three non-standard 5 meter by 20 meter plots were established within the project easement area. Refer to Figure 3.0 – 3.7 in Appendix 1 for the vegetation monitoring locations.

Vegetation plots were randomly established within the planted areas to capture the heterogeneity of the designed vegetative communities. The vegetation plot corners have been marked and are recoverable either through field identification or with the use of a GPS unit. Reference photographs at the origin (southwest corner) looking diagonally across the plot to the opposite corner were taken during the baseline monitoring in March 2017. Subsequent annual assessments following baseline survey will capture the same reference photograph locations. Species composition, density and survival rates will be evaluated on an annual basis by plot and for the entire Site. Individual plot data will be provided and will include height, density, vigor, damage (if any), and percent survival. Planted woody stems will be marked annually as needed based off a known origin so they can be found in succeeding monitoring years. Mortality will be determined from the difference between the baseline year's living planted stems and the current year's living planted stems.

Section 4: MAINTENANCE AND CONTINGENCY PLAN

Wildlands will perform maintenance as needed on the mitigation project. A physical inspection of the Site shall be conducted a minimum of once per year throughout the post-construction monitoring period until performance standards are met. These site visits may identify components and features that require routine maintenance. Routine maintenance should be expected most often in the first two years following construction and may include one or more of the following components.

4.1 Stream

Stream problem areas will be mapped and included in the Current Condition Plan View (CCPV) as part of the annual stream assessment. Stream problems areas may include bank erosion, structure failure, beaver dams, aggradation/degradation, etc. Routine channel maintenance and repair activities may include chinking of in-stream structures to prevent piping, securing loose coir matting, and supplemental installations of live stakes and other target vegetation along the channel. Areas where storm water runoff flows into the channel may also require maintenance to prevent bank failures and head-cutting.

4.2 Vegetation

Vegetation shall be maintained to ensure the health and vigor of the targeted community. Vegetative problem areas will be mapped and included in the CCPV as part of the annual vegetation assessment. Vegetation problems areas may include planted vegetation not meeting success criteria, persistent invasive species, barren areas with little to no herbaceous cover, or grass suffocation/crowding of planted stems. Routine vegetation maintenance and repair activities may include supplemental planting, pruning, mulching, and fertilizing. Exotic invasive plant species shall be controlled by mechanical and/or chemical methods. Any vegetation control requiring herbicide application will be performed in accordance with NC Department of Agriculture (NCDA) rules and regulations.

4.3 Site Boundary

Site boundary issues will be mapped and included in the CCPV as part of the annual visual assessment. Site boundaries shall be identified in the field to ensure clear distinction between the Site and adjacent properties. Boundaries may be identified by fence, marker, bollard, post, tree-blazing, or other means as allowed by site conditions and/or conservation easement. Boundary markers disturbed, damaged, or destroyed will be repaired and/or replaced on an as needed basis.

Section 5: AS-BUILT CONDITION (BASELINE)

Site construction occurred between July 2016 and March 2017. The as-built surveys were completed between October 2016 and March 2017. The survey included developing an as-built topographic surface, locating the channel boundaries, structures, and cross sections. For comparison purposes, during the baseline assessments, reaches were divided into assessment reaches in the same way that they were established for design parameters.

5.1 Record Drawings

A sealed half-size record drawing is located in Appendix 4 that includes redlines for any significant field adjustments made during construction that were different from the design plans. Minor adjustments made during construction were primarily associated with instream habitat improvement, erosion prevention measures and availability of onsite materials. Specific changes are detailed below:

5.1.1 Candy Creek

- Station 100+00 to Station 100+20 alignment shifted to facilitate proper tie in at upstream extent;
- Station 105+33 to Station 105+47 constructed riffle added;
- Station 105+46 to 105+74 sod mat replaced with brush toe to provide additional habitat;
- Station 107+37 boulder sill added to stabilize bed form;
- Station 108+21 to 108+41 brush toe not installed;
- Station 108+80 to 109+10 lunker log installed versus sod mat to provide additional habitat;
- Station 109+81 to 110+09 lunker log not installed to save existing trees;
- Station 110+41 to 110+53 brush toe reduced;
- Station 111+02 log sill not installed;
- Station 111+05 to 111+31 lunker log added to provide bank protection and habitat;
- Station 112+81 to 113+21 brush toe not installed;
- Station 113+96 to 114+21 sod mat replaced with brush toe to provide additional habitat;
- Station 114+18 log vane not installed;
- Station 119+90 to 120+44 brush toe not installed;
- Station 123+91 to 124+28 sod mat replaced with brush toe to provide additional habitat;
- Station 124+86 to 124+96 log vane shifted upstream;
- Station 125+90 to Station 126+10 log vane shifted downstream;
- Station 127+11 to 127+43 sod mat replaced with brush toe to provide additional habitat;
- Station 127+91 to 128+22 root wads replaced with brush toe;
- Station 128+31 to 128+93 brush toe not installed;
- Station 128+93 to 129+20 sod mat not installed;
- Station 132+38 log sill added to insure downstream grade control at stream crossing;
- Station 134+76 to 135+13 root wads replaced with brush toe;

- Station 138+23 to 138+40 log vane not installed to save existing trees;
- Station 138+89 log sill added;
- Station 138+89 to 139+14 brush toe not installed to save existing trees;
- Station 140+82 to 141+17 root wads replaced with brush toe;
- Station 141+52 to 141+90 sod mat not installed;
- Station 149+06 to 149+23 boulder toe not installed to save existing trees;
- Station 149+07 to 149+31 constructed riffle extended;
- Station 149+23 to 149+41 j-hook not installed;
- Station 154+59 to 154+90 boulder toe not installed to save existing trees;
- Station 155+30 to 155+42 constructed riffle length reduced due to existing crossing;
- Station 155+50 to 155+88 cross vane shifted;
- Station 155+80 to 156+25 brush toe logs not installed to save existing trees;
- Station 156+78 to 157+13 constructed riffle added;
- Station 157+71 to 157+97 brush toe not installed;
- Station 158+86 to 159+37 brush toe extended;
- Station 160+47 to 160+73 brush toe log not installed;
- Station 162+38 to 162+92 brush toe logs not installed;
- Station 163+28 to 163+47 brush toe not installed to save existing trees;
- Station 163+80 to 164+14 brush toe logs not installed;
- Station 164+15 to 164+39 lunker logs not installed to save existing trees;
- Station 164+39 to 165+28 brush toe not installed;
- Station 167+47 to 167+65 log vane replaced with rock vane;
- Station 167+94 to 168+37 brush toe replaced with boulder toe;
- Station 168+30 to 168+44 brush toe logs not installed;
- Station 169+08 to 169+29 log vane replaced with rock vane;
- Station 169+31 to 169+41 boulder toe not installed;
- Station 176+68 to 176+73 root wads not installed;
- Station 182+25 to 182+66 brush toe reduced;
- Station 185+78 to 186+41 brush toe not installed;
- Station 186+71 to 187+44 brush toe reduced;
- Station 188+12 to 188+31 brush toe not installed;
- Station 192+46 to 192+83 brush toe added;
- Station 193+55 to 193+81 brush toe reduced;
- Station 196+88 cross vane replaced with j-hook;
- Station 198+80 log sill added;
- Station 198+80 to 199+22 brush toe added;

- Station 199+41 to 199+75 boulder toe added;
- Station 201+97 to 202+58 sod mat replaced with brush toe to provide additional habitat;
- Station 204+92 to 205+23 boulder toe added;
- Station 205+46 to 205+62 brush toe not installed;
- Station 205+62 log sill replaced with boulder sill; and
- Station 205+65 root wad not installed.

5.1.2 UT1C

- Station 200+17 to 200+24 boulder toe not installed;
- Station 200+55 boulder sill replaced with log sill;
- Station 201+22 to 201+28 boulder toe not installed;
- Station 202+05 log vane not installed;
- Station 204+38 log vane not installed;
- Station 204+81 j-hook not installed;
- Station 205+00 log vane not installed;
- Station 205+12 log vane not installed;
- Station 205+36 to 205+42 brush toe not installed;
- Station 207+18 log vane not installed;
- Station 207+26 log vane not installed;
- Station 207+30 log sill added; and
- Station 207+32 j-hook not installed.

5.1.3 UT1D

- Station 250+02 to 250+54 field base alignment adjustment to facilitate proper tie in at upstream extent;
- Station 250+02 to 250+54 rock sills replaced with log sills;
- Station 250+59 to 250+92 constructed riffle lengths reduced;
- Station 251+32 boulder sill not installed;
- Station 251+91 to 252+10 constructed riffle lengths reduced;
- Station 252+10 to 252+21 brush toe not installed;
- Station 252+43 to 252+68 constructed riffle lengths reduced;
- Station 252+50 to 252+60 brush toe not installed;
- Station 252+71 to 252+93 log sill not installed;
- Station 252+85 to 253+00 boulder toes not installed;
- Station 253+12 boulder sill not installed;
- Station 253+16 to 253+42 constructed riffle lengths reduced;
- Station 253+21 log sill added;
- Station 253+30 log sill added;

- Station 253+46 to 253+60 boulder toes not installed; and
- Station 253+48 log sill replaced with boulder sill.

5.1.4 UT2

- Station 303+46 to 303+68 brush toe not installed;
- Station 305+33 to 305+53 structures not installed due to bedrock;
- Station 305+76 cross vane replaced with log sill;
- Station 306+32 log sill replaced with boulder sill;
- Station 306+59 log sill replaced with boulder sill;
- Station 306+89 cross vane replaced with boulder sill;
- Station 308+50 log sill replaced with boulder sill;
- Station 308+60 log sill not installed;
- Station 308+70 log sill replaced with boulder sill;
- Station 308+92 log sill replaced with boulder sill;
- Station 309+40 log sill replaced with boulder sill;
- Station 309+47 log sill replaced with boulder sill;
- Station 309+66 to 309+75 constructed riffle length reduced;
- Station 309+76 log sill replaced with boulder sill;
- Station 309+86 log sill replaced with boulder sill;
- Station 310+14 log sill replaced with boulder sill;
- Station 310+26 log sill replaced with boulder sill;
- Station 310+58 log sill not installed;
- Station 310+92 log sill replaced with boulder sill;
- Station 311+02 log sill replaced with boulder sill;
- Station 311+14 log sill replaced with boulder sill;
- Station 312+62 to 312+48 constructed riffle added;
- Station 313+91 log sill added; and
- Station 314+13 log sill removed.

5.1.5 UT2B

- Station 270+29 boulder sill added;
- Station 270+56 to 270+65 log sills added;
- Station 271+62 to 272+05 sod matting not installed to save existing trees;
- Station 272+80 to 273+09 sod matting not installed to save existing trees; and
- Station 273+45 to 273+73 sod matting not installed to save existing trees.

5.1.6 UT3

- Station 411+56 rock sill replaced with log sill;
- Station 413+42 to 413+94 log sills replaced with rock sills due to bedrock; and
- Station 414+00 lunker log not installed to save existing trees.

5.1.7 UT4

- Station 507+90 lunker log not installed to save existing trees.

5.1.8 UT5

- Station 608+46 608+62 log sill replaced with brush toe.

5.2 Baseline Data Assessment

Baseline monitoring (MY0) was conducted between October 2016 and March 2017. The first annual monitoring assessment (MY1) will be completed in the fall of 2017. The Site will be monitored for a total of seven years, with the final monitoring activities to be conducted in 2023. The close-out for the Site will be conducted in 2024 given the success criteria is met. As part of the closeout process, DMS will evaluate the Site at the end of the fourth year monitoring period to determine whether or not the Site is eligible to closeout following MY5. If the Site is meeting success criteria, DMS will propose to the Interagency Review Team (IRT) to proceed with the closeout process. If the Site is not meeting success criteria, then an additional two years of monitoring will be conducted by Wildlands.

5.2.1 Morphological State of the Channel

Morphological data for the as-built profile was collected in October 2016 and March 2017. Refer to Appendix 2 for summary data tables, morphological plots, and stream photographs.

Profile

The baseline (MY0) profiles closely match the profile design parameters. On the design profiles, riffles were depicted as straight lines with consistent slopes. However, at some locations the as-built survey riffle profiles are not consistent in slope due minor variations during construction as well as natural scour and deposition within some shallow reaches. Additionally, maximum pool depths typically exceed design parameters and are expected to trend towards the design depths as a result of natural deposition over time. These variations in riffle slope and pool depths do not constitute a problem or indicate a need for remedial actions and will be assessed visually during the CCPV Site walks.

Dimension

The baseline (MY0) dimension numbers closely match the design parameters with minor variations in all reaches. These occasional variations are primarily due to a larger as-built bankfull width constructed on UT1C, UT1D, and UT2-Reach 2 as reflected in the cross sections. We expect that over time as vegetation is established, the channels may narrow more toward the design dimensions. This narrowing over time would not be seen as an indicator of instability in and of itself.

Pattern

The baseline (MY0) pattern metrics fell within acceptable ranges of the design parameters for all restoration and enhancement level I reaches. Pattern data will be evaluated if there are any indicators through the profile or dimension assessments that significant geomorphic adjustments have occurred.

Sediment Transport

As-built shear stresses and velocities are similar to design calculations and should reduce the risk of further erosion along the reaches. The as-built condition for each of these reaches indicates an overall

increase in substrate particle size (Table 7a-f). The substrate data for each constructed reach was compared to the design shear stress parameters from the mitigation plan to assess the potential for bed degradation. The shear stresses calculated for the constructed channels are within the allowable range, which indicates the channel is not at risk to trend toward channel degradation.

Bankfull Events

No bankfull events were recorded following completion of construction. Bankfull events will be documented and reported in subsequent annual monitoring reports.

5.2.2 Vegetation

The baseline (MY0) planted density is 610 stems/acre, which exceeds the interim measure of vegetative success of at least 320 planted stems per acre at the end of the third monitoring year. Summary data and photographs of each plot can be found in Appendix 3.

Section 6: REFERENCES

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Harrelson, Cheryl C; Rawlins, C.L.; Potyondy, John P. 1994. *Stream Channel Reference Sites: An Illustrated Guide to Field Technique.* Gen. Tech. Rep. RM-245. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 61 p.

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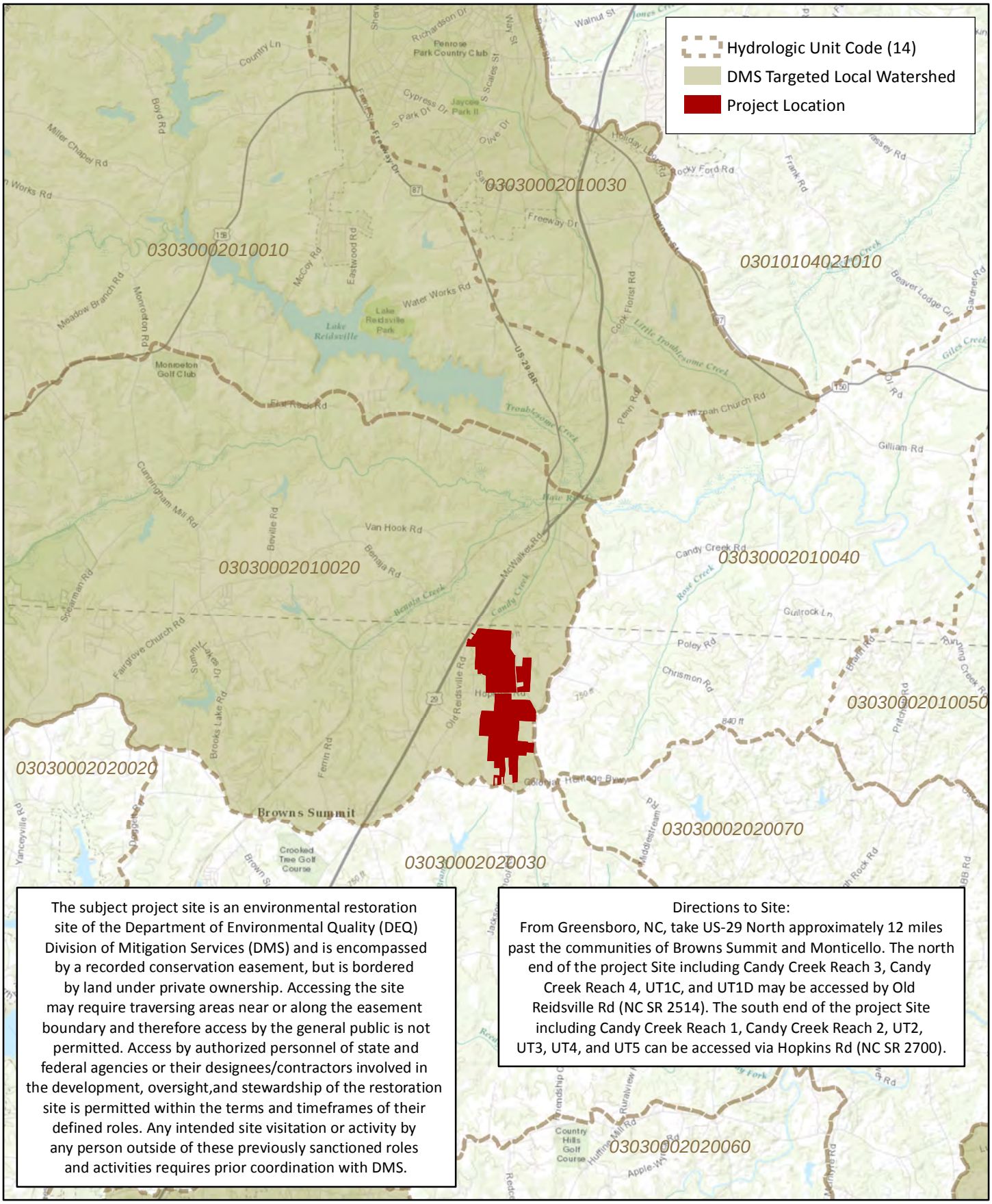
APPENDIX 1. General Figures and Tables



The subject project site is an environmental restoration site of the Department of Environmental Quality (DEQ) Division of Mitigation Services (DMS) and is encompassed by a recorded conservation easement, but is bordered by land under private ownership. Accessing the site may require traversing areas near or along the easement boundary and therefore access by the general public is not permitted. Access by authorized personnel of state and federal agencies or their designees/contractors involved in the development, oversight,and stewardship of the restoration site is permitted within the terms and timeframes of their defined roles. Any intended site visitation or activity by any person outside of these previously sanctioned roles and activities requires prior coordination with DMS.

Directions to Site:
From Greensboro, NC, take US-29 North approximately 12 miles past the communities of Browns Summit and Monticello. The north end of the project Site including Candy Creek Reach 3, Candy Creek Reach 4, UT1C, and UT1D may be accessed by Old Reidsville Rd (NC SR 2514). The south end of the project Site including Candy Creek Reach 1, Candy Creek Reach 2, UT2, UT3, UT4, and UT5 can be accessed via Hopkins Rd (NC SR 2700).

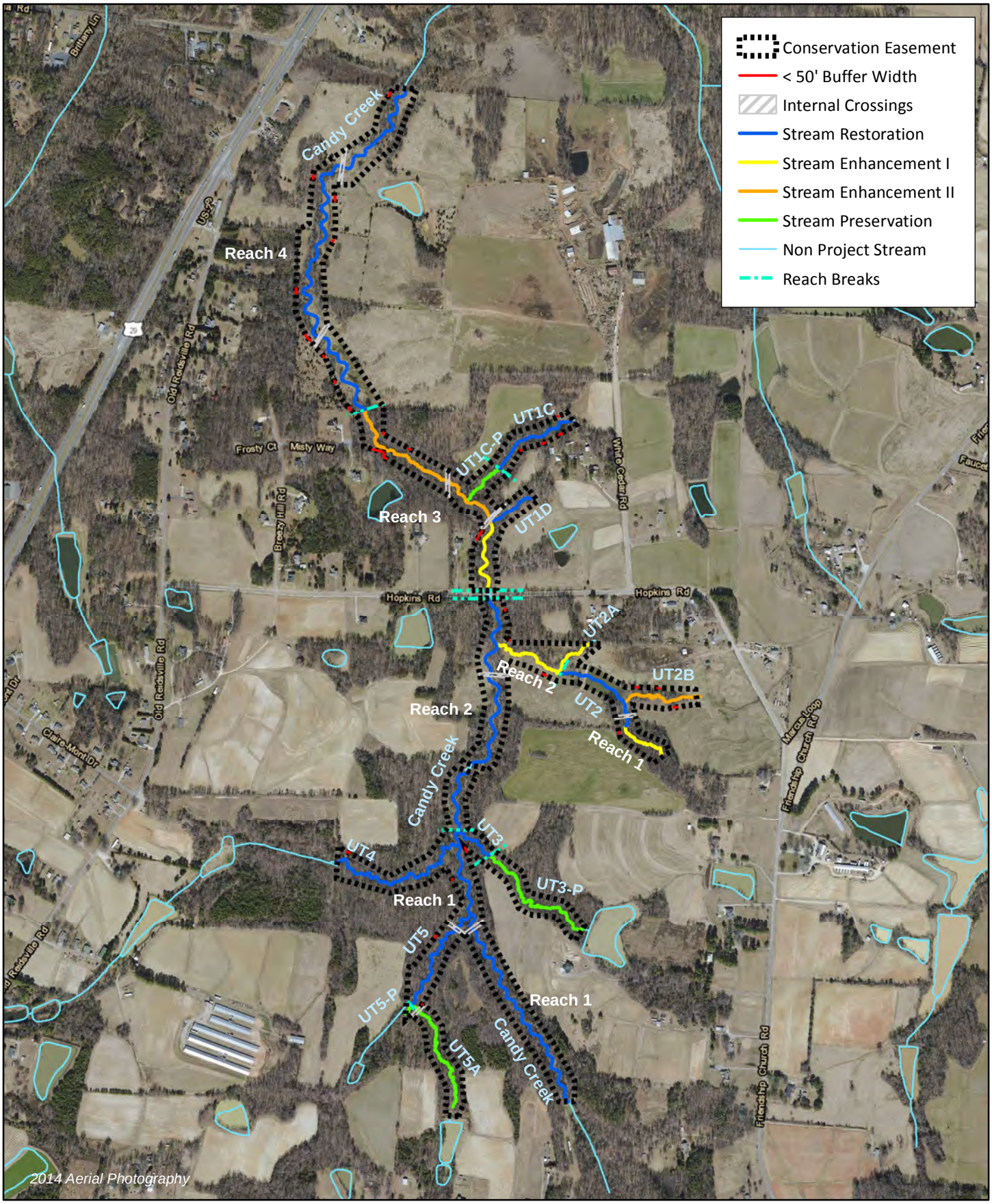
WILDLANDS ENGINEERING

0 1.5 Miles

N

Figure 1 Project Vicinity Map
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Guilford County, NC

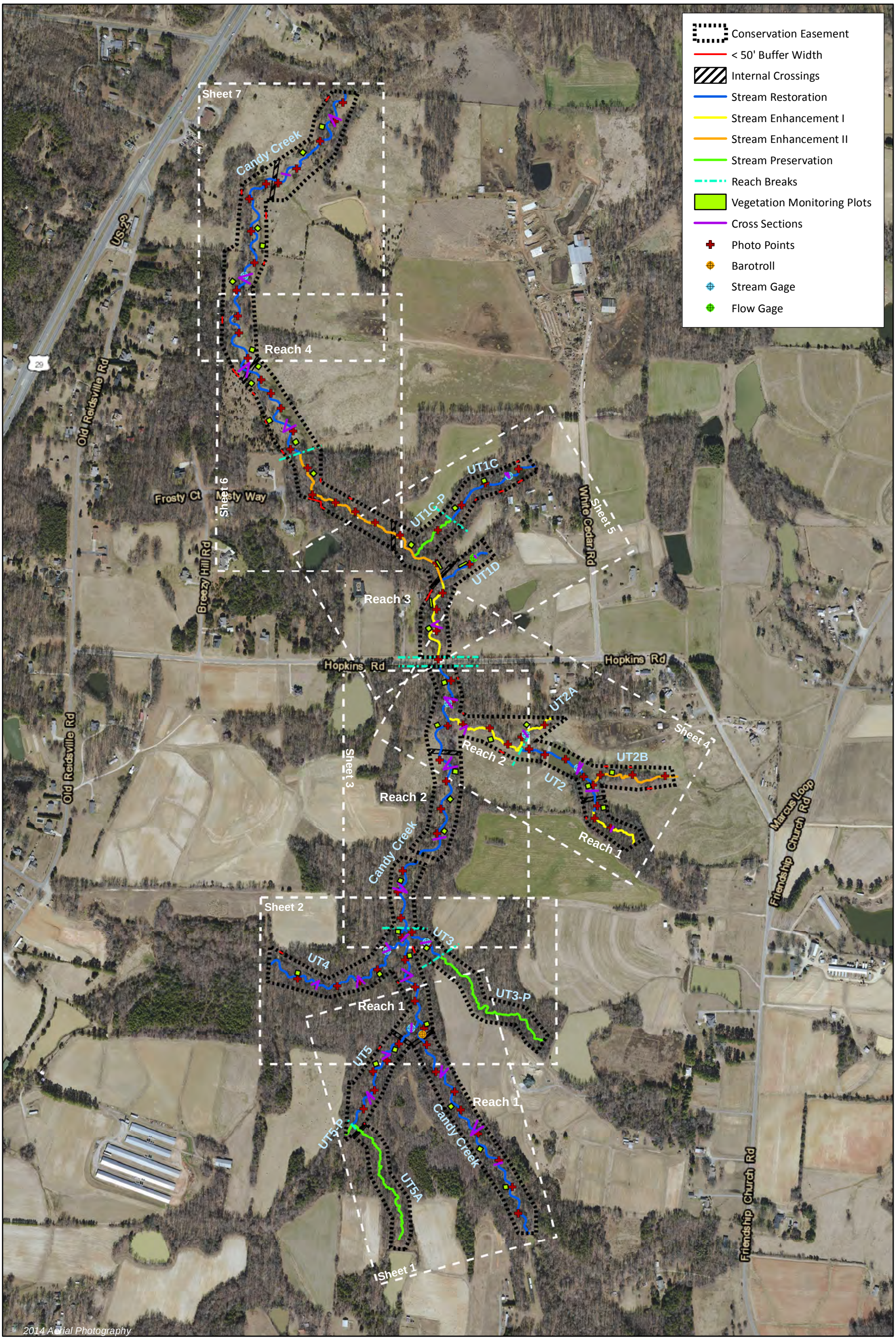


WILDLANDS ENGINEERING

0 1,000 Feet

N

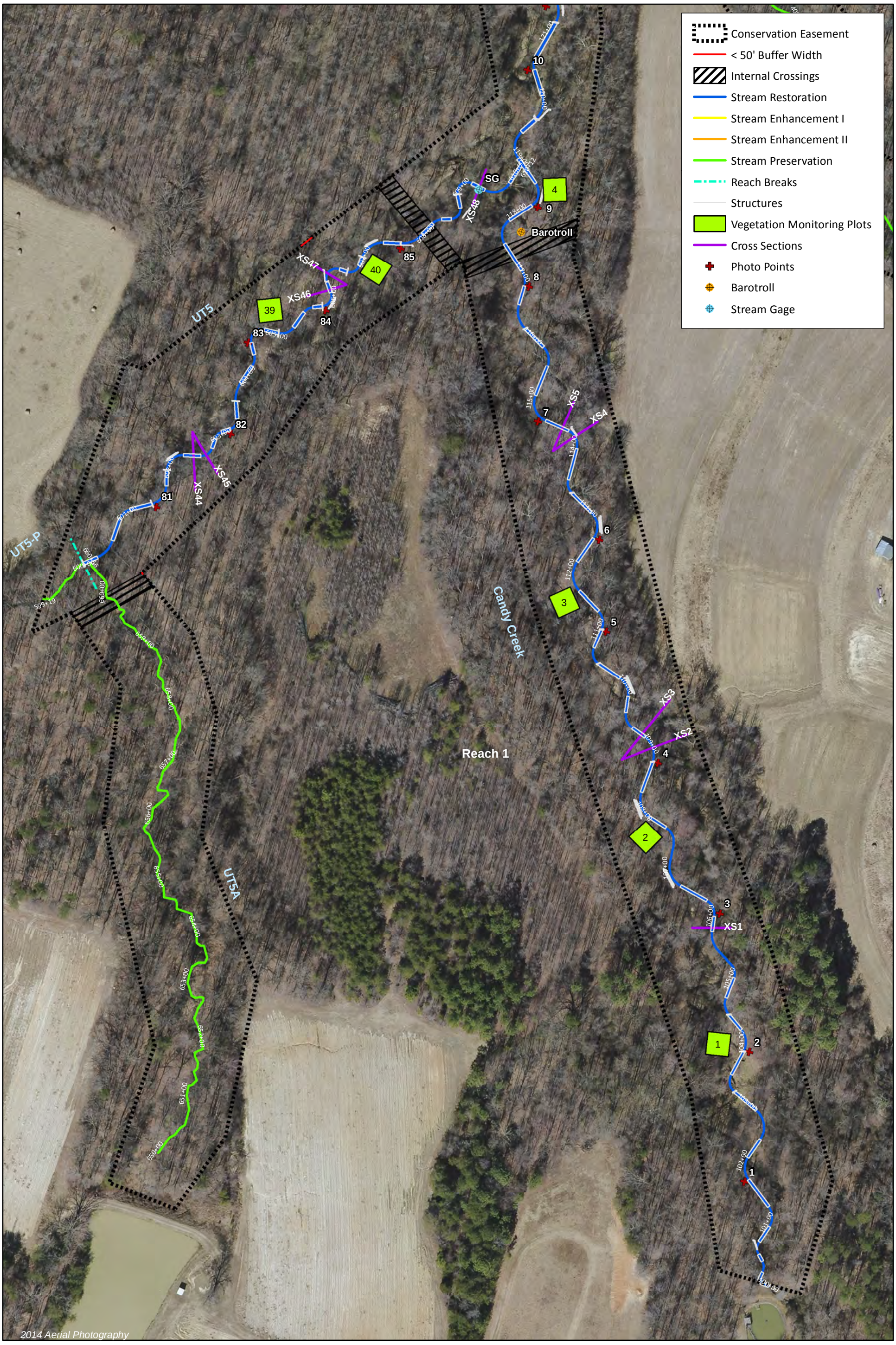
Figure 2 Project Component/Asset Map
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017
Guilford County, NC



WILDLANDS ENGINEERING

0 300 600 Feet

Figure 3.0 Monitoring Plan View (Key)
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017
Guilford County, NC



WILDLANDS ENGINEERING

0 125 250 Feet

Figure 3.1 Monitoring Plan View
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017
Guilford County, NC

WILDLANDS ENGINEERING

0 125 250 Feet

N

Figure 3.2 Monitoring Plan View
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Guilford County, NC

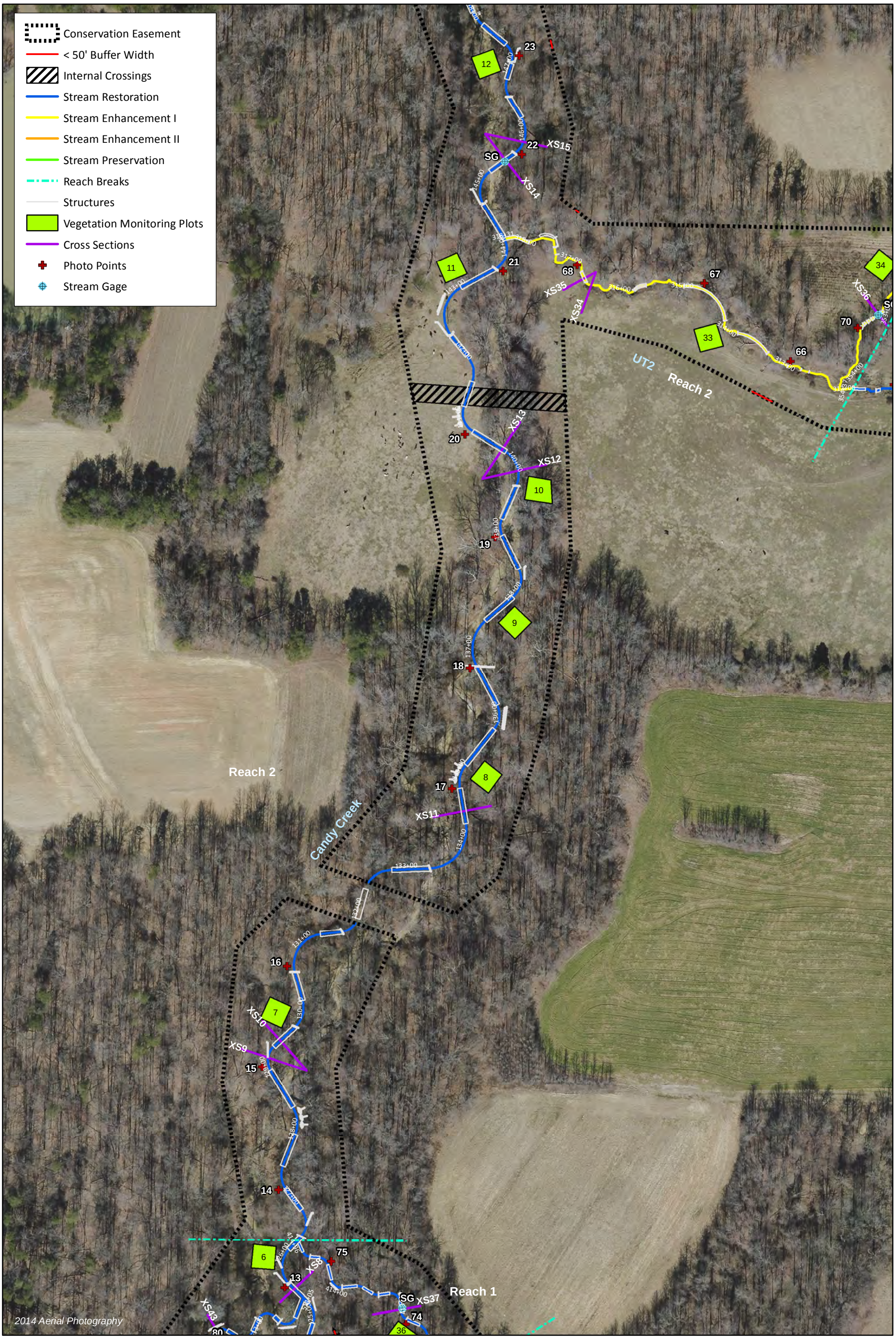


Figure 3.3 Monitoring Plan View
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Guilford County, NC

0 125 250 Feet

Figure 3.4 Monitoring Plan View
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017
Guilford County, NC

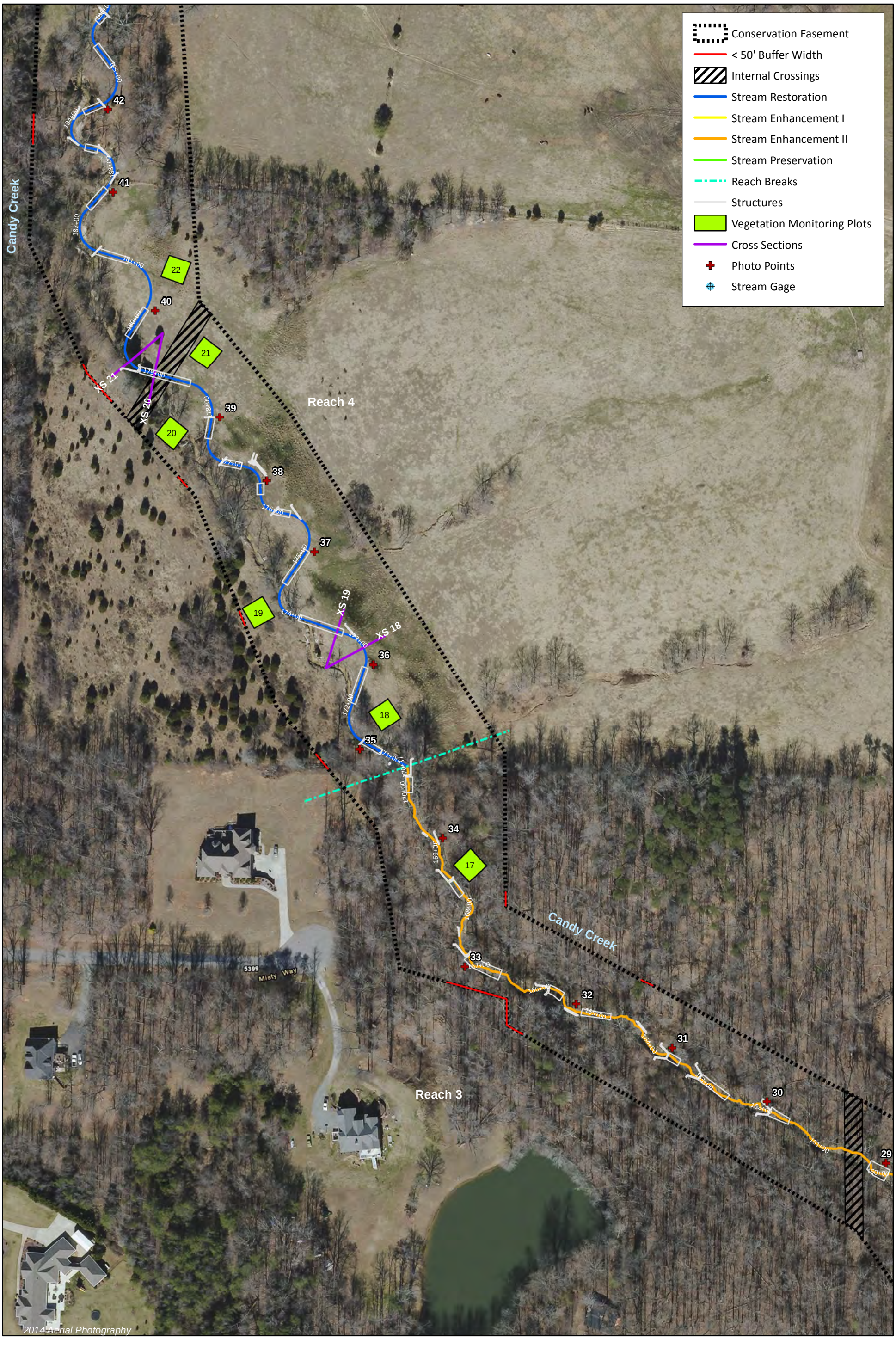
Candy Creek
Reach 3
UT1C
UT1C-P
UT1D
Flow Gage
XS 17
XS 16
XS 27
XS 28
XS 29
SG
Hopkins Rd
5299
©2014 Aerial Photography

Conservation Easement
< 50' Buffer Width
Internal Crossings
Stream Restoration
Stream Enhancement I
Stream Enhancement II
Stream Preservation
Reach Breaks
Structures
Vegetation Monitoring Plots
Cross Sections
Photo Points
Stream Gage
Flow Gage

WILDLANDS ENGINEERING

0 125 250 Feet

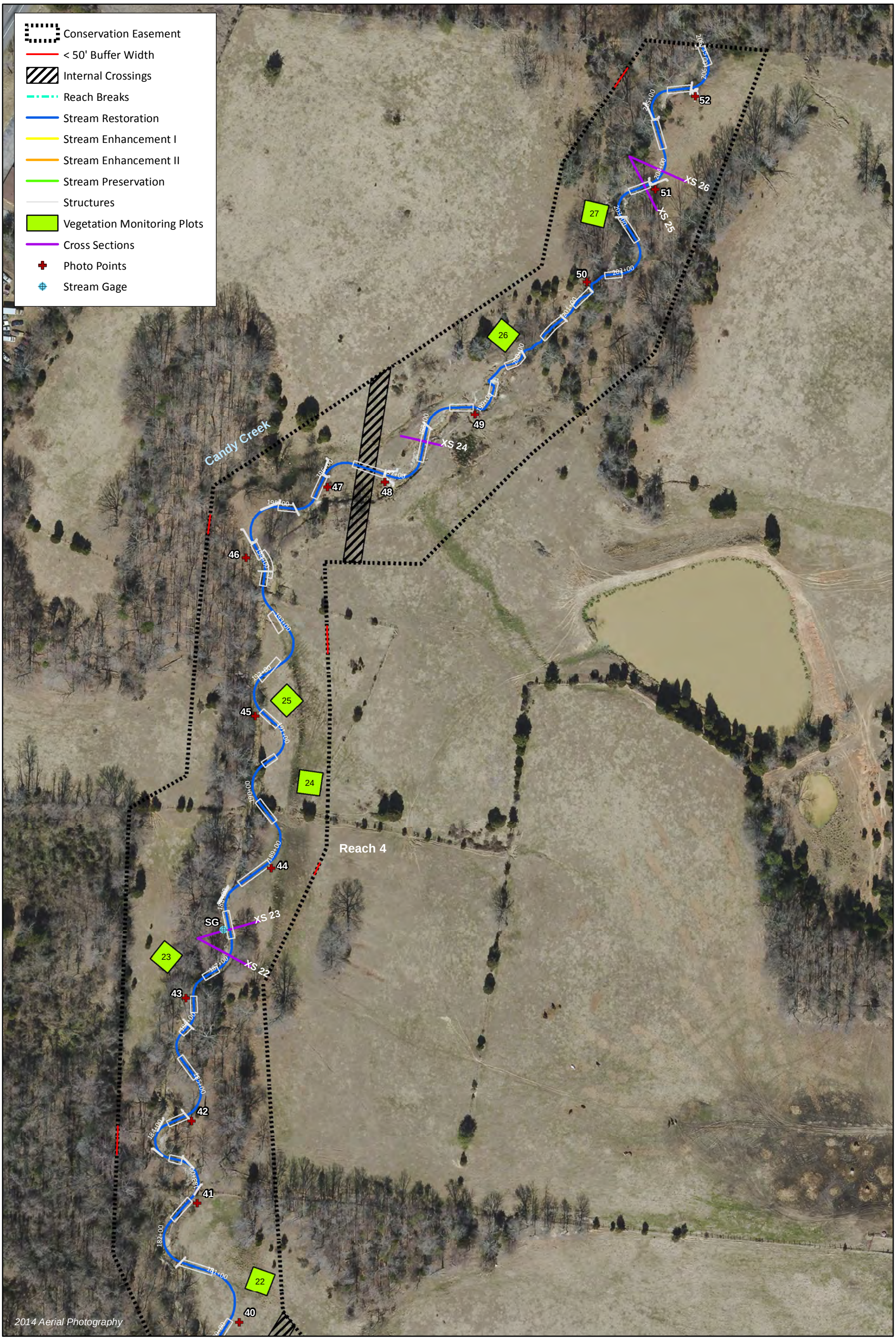
Figure 3.5 Monitoring Plan View
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017
Guilford County, NC



WILDLANDS ENGINEERING

0 125 250 Feet

Figure 3.6 Monitoring Plan View
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017
Guilford County, NC



WILDLANDS ENGINEERING

0 125 250 Feet

Figure 3.7 Monitoring Plan View
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017
Guilford County, NC

Table 1. Project Components and Mitigation Credits
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Mitigation Credits									
	Stream		Riparian Wetland		Non-Riparian Wetland		Buffer	Nitrogen Nutrient Offset	Phosphorous Nutrient Offset
Type	R	RE	R	RE	R	RE			
Totals	14,976	531	0	0	N/A	N/A	N/A	N/A	N/A

Project Components							
Reach ID	As-Built Stationing/ Location	Existing Footage/ Acreage	Approach	Restoration or Restoration Equivalent	Restoration Footage/ Acreage	Mitigation Ratio	Credits (SMU/WMU)
STREAMS							
Candy Creek Reach 1	100+08 - 117+19	2,885	P1	Restoration	1,711	1:1	1,711
	117+45 - 126+27		P1	Restoration	882	1:1	882
Candy Creek Reach 2	126+27 - 131+80	2,398	P1	Restoration	553	1:1	553
	132+40 - 141+17		P1	Restoration	877	1:1	877
	141+43 - 148+42		P1	Restoration	699	1:1	699
Candy Creek Reach 3	149+02 - 155+05	2,333	EI	Enhancement	603	1.5:1	402
	155+05 - 155+33		EII	Enhancement	28	2.5:1	11
	155+62 -160+35		EII	Enhancement	473	2.5:1	189
	160+62 - 170+37		EII	Enhancement	975	2.5:1	390
Candy Creek Reach 4	170+71 - 178+74	3,386	P1	Restoration	803	1:1	803
	179+00 - 196+47		P1	Restoration	1,747	1:1	1,747
	196+68 - 206+35		P1	Restoration	967	1:1	967
UT1C	200+12 - 207+40	551	P1	Restoration	728	1:1	728
UT1C - P	207+40 - 211+38	398	-	Preservation	398	5:1	80
UT1D	250+00 - 253+79	437	P1	Restoration	379	1:1	379
UT2 Reach 1	300+00 - 304+24	940	EI	Enhancement	424	1.5:1	283
	304+24 - 305+01		P1	Restoration	77	1:1	77
	305+26 - 311+88		P1	Restoration	662	1:1	662
UT2 Reach 2	311+88 - 318+31	746	EI	Enhancement	643	1.5:1	429
UT2A	350+84 - 354+37	376	EI	Enhancement	353	1.5:1	235
UT2B	270+28 - 276+85	702	EII	Enhancement	657	2.5:1	263
UT3 - P	400+00 - 411+50	1,150	-	Preservation	1,150	5:1	230
UT3	411+50 - 414+96	729	P1	Restoration	346	1:1	346
UT4	500+49 - 514+05	1,270	P1	Restoration	1,356	1:1	1,356
UT5-P	599+19 - 600+00	81	-	Preservation	81	5:1	16
UT5	600+00 - 607+91	1,297	P1	Restoration	791	1:1	791
	608+16 - 610+12			Restoration	196	1:1	196
UT5A	650+00 - 659+70	1,056	-	Preservation	970	5:1	194
	659+99 - 660+53		-	Preservation	54	5:1	11

Component Summation						
Restoration Level	Stream (LF)	Riparian Wetland (acres)		Non-Riparian Wetland (acres)	Buffer (square feet)	Upland (acres)
		Riverine	Non-Riverine			
Restoration	12,774	-	-	-	-	-
Enhancement		-	-	-	-	-
Enhancement I	2,023					
Enhancement II	2,133					
Preservation	2,653	-	-	-		

The linear feet associated with the stream crossings were excluded from the computations.

Table 2. Property Ownership and Conservation Easement Recording
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Landowner	Parcel Number	Deed Book and Page Number	Protected Acreage
Aniyikaiye, Bamidele and Barbara	0114329	7756/909	1.26
Bray, Nancy	0113973	7756/720	0.63
Carr, Darin W. and Tamela P.	0112709	7756/816	6.96
Chrismon, Bruce H. and Margie L.	0114364	7756/753	0.71
Chrismon, David Elmo	0112710	7756/651	8.42
Hopkins, Herbert Wallace and Marjorie	0112712	7756/738	3.75
Hopkins, Bryan D.	0112713	7756/855	6.66
Hopkins, Jefferson Todd and Mary Ann	0114284	7756/679	6.34
	0114313	7756/679	2.75
	0114300	7756/679	4.47
	0112711	7756/679	9.59
Hopkins, Joe W. and Lisa R.	0112718	7756/772	7.11
Thacker, Robert K.	0114363	7756/959	2.04
Wagoner, David G. Sr.	0113981	7756/879	1.05
		7756/893	

Table 3. Project Activity and Reporting History
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Activity or Report		Data Collection Complete	Completion or Scheduled Delivery
Mitigation Plan		November 2014	March 2016
Final Design - Construction Plans		July 2016	July 2016
Construction		July 2016 - March 2017	March 2017
Temporary S&E mix applied to entire project area [1]		July 2016 - March 2017	March 2017
Permanent seed mix applied to reach/segments		March 2017	March 2017
Bare root and live stake plantings for reach/segments		March 2017	March 2017
Baseline Monitoring Document (Year 0)	Stream Survey	October 2016 - March 2017	May 2017
	Vegetation Survey	March 2017	
Year 1 Monitoring	Stream Survey	2017	December 2017
	Vegetation Survey	2017	
Year 2 Monitoring	Stream Survey	2018	December 2018
	Vegetation Survey	2018	
Year 3 Monitoring	Stream Survey	2019	December 2019
	Vegetation Survey	2019	
Year 4 Monitoring	Stream Survey	2020	December 2020
	Vegetation Survey	2020	
Year 5 Monitoring	Stream Survey	2021	December 2021
	Vegetation Survey	2021	
Year 6 Monitoring	Stream Survey	2022	December 2022
	Vegetation Survey	2022	
Year 7 Monitoring	Stream Survey	2023	December 2023
	Vegetation Survey	2023	

[1]Seed and mulch is added as each section of construction is completed.

Table 4. Project Contact Table
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Designer Aaron Earley, PE	**Wildlands Engineering, Inc.** 1430 South Mint Street, Suite 104 Charlotte, NC 28203 704.332.7754
Construction Contractor	**Land Mechanic Designs, Inc.** 126 Circle G Lane Willow Spring, NC 27592
Planting Contractor	**Bruton Natural Systems, Inc** P.O. Box 1197 Fremont, NC 27830
Seeding Contractor	**Land Mechanic Designs, Inc.** 126 Circle G Lane Willow Spring, NC 27592
Seed Mix Sources	**Green Resource, LLC**
Nursery Stock Suppliers **Bare Roots** **Live Stakes**	 **Dykes and Son Nursery** **Bruton Natural Systems, Inc & Foggy Mountain Nursery**
Monitoring Performers	**Wildlands Engineering, Inc.**
Monitoring, POC	Jason Lorch 919.413.12141, ext. 107

Table 5. Project Information and Attributes

Candy Creek Mitigation Site

DMS Project No. 96315

Monitoring Year 0 - 2017

Project Information	
Project Name	Candy Creek Mitigation Site
County	Guilford County
Project Area (acres)	61.74
Project Coordinates (latitude and longitude)	Upstream Project Limits – 36°13'27.27"N, 79°39'37.79"W
	Downstream Project Limits – 36°14'39.74"N, 79°39'50.46"W

Project Watershed Summary Information	
Physiographic Province	Inner Piedmont Belt of the Piedmont Physiographic Province
River Basin	Cape Fear
USGS Hydrologic Unit 8-digit	03030002
USGS Hydrologic Unit 14-digit	03030002010020
DWR Sub-basin	03-06-01
Project Drainiage Area (acres)	937
Project Drainage Area Percentage of Impervious Area	1%
CGIA Land Use Classification	66% – Agriculture/Managed Herbaceous; 29% – Forested/Scrubland, 5% - Developed

Reach Summary Information				
Parameters	**Candy Creek Reach 1**	**Candy Creek Reach 2**	**Candy Creek Reach 3**	**Candy Creek Reach 4**
Length of Reach (linear feet) - Post-Restoration	2,593	2,129	2,079	3,517
Drainage Area (acres)	560	694	809	937
NCDWR Stream Identification Score	40.5	40.5	45.0	45.0
NCDWR Water Quality Classification	WS-V (NSW)			
Morphological Desription (stream type)	G4c	F5	G4c	G4c
Evolutionary trend (Simon's Model) - Pre- Restoration	IV	IV	IV	III/IV
Underlying mapped soils	Clifford Sandy Clay Loam, Codorus Loam, Nathalie Sandy Loam, Poplar Forest Gravelly Sandy Loam			
Drainage class	Well Drained to Somewhat Poorly Drained			
Soil hydric status	Codorus Loam - Hydric			
Slope	---			
FEMA classification	N/A			
Native vegetation community	Piedmont Bottomland Forest			
Percent composition exotic invasive vegetation -Post-Restoration	0%			

Parameters	**UT1C**	**UT1D**	**UT2**	**UT2A**	**UT2B**	**UT3**	**UT4**	**UT5**	**UT5A**
Length of Reach (linear feet) - Post-Restoration	1,126	379	1,806	353	657	1,496	1,356	1,068	1,024
Drainage Area (acres)	28	6	63	15	24	79	190	137	45
NCDWR Stream Identification Score	35.0	27.5	34.5	31.5	31.5	36.5	37.5	31.5	33.5
NCDWR Water Quality Classification	C								
Morphological Desription (stream type)	E5b	C5	F5	G5	B5c	G4	G4	F4	N/A
Evolutionary trend (Simon's Model) - Pre- Restoration	III	II/III	III/V	III	III	IV	IV	IV	N/A
Underlying mapped soils	Casville Sandy Loam, Codorus Loam, Nathalie Sandy Loam								
Drainage class	Well Drained to Somewhat Poorly Drained								
Soil hydric status	Codorus Loam - Hydric								
Slope	---								
FEMA classification	N/A								
Native vegetation community	Piedmont Bottomland Forest								
Percent composition exotic invasive vegetation -Post-Restoration	0%								

Regulatory Considerations			
Regulation	**Applicable?**	**Resolved?**	**Supporting Documentation**
Waters of the United States - Section 404	Yes	Yes	USACE Nationwide Permit No.27 (Action ID# SAW-2015-01209) and DWR 401 Water Quality Certification (letter from DWR dated 5/13/2015).
Waters of the United States - Section 401	Yes	Yes	
Division of Land Quality (Dam Safety)	No	N/A	N/A
Endangered Species Act	Yes	Yes	Candy Creek Mitigation Plan; Wildlands determined "no effect" on Guilford County listed endangered species. USFWS responded on April 4, 2014 and stated the "proposed action is not likely to adversely affect any federally listed endangered or threatened species, their formally designated critical habitat or species currently proposed for listing under the Act".
Historic Preservation Act	Yes	Yes	No historic resources were found to be impacted (letter from SHPO dated 3/24/2014).
Coastal Zone Management Act (CZMA)/Coastal Area Management Act (CAMA)	No	N/A	N/A
FEMA Floodplain Compliance	No	N/A	N/A
Essential Fisheries Habitat	No	N/A	N/A

Table 6 Monitoring Component Summary
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Parameter	Monitoring Feature	Quantity / Length by Reach								Frequency
		Candy Creek Reach 1 (100+08 - 118+91)	Candy Creek Reach 1 (118+91 - 125+27)	Candy Creek Reach 1 (125+27 - 126+27)	Candy Creek Reach 2 (126+27 - 143+06)	Candy Creek Reach 2 (143+06 - 148+42)	Candy Creek Reach 3 (149+02 - 155+05)	Candy Creek Reach 4 (170+71 - 196+50)	Candy Creek Reach 4 (196+50 - 206+35)	
Dimension	Riffle Cross Sections	3	1	1	3	1	1	3	2	Years 1, 2, 3, 5, and 7
	Pool Cross Section	2	1	N/A	2	1	1	3	1	
Pattern	Pattern	N/A								N/A
Profile	Longitudinal Profile	N/A								N/A
Substrate	Reach Wide (RW) / Riffle (RF) 100 Pebble Count	1 RW / 3 RF	1 RW / 1 RF	1 RW / 1 RF	1 RW / 3 RF	1 RW / 1 RF	1 RW / 1 RF	1 RW / 3 RF	1 RW / 2 RF	Years 1, 2, 3, 5, and 7
Hydrology	Stream Gage (SG) / Flow Gage (FG)	1 SG					1 SG			Quarterly
Vegetation	Vegetation Plots	4	1	1	4	2	5	8	2	Years 1, 2, 3, 5, and 7
Visual Assessment	All Streams	Entire Reach								Semi-Annual
Exotic and Nuisance Vegetation										Annual
Project Boundary										Annual
Reference Photos	Photos	9	3	1	7	3	11	12	6	Annual

Parameter	Monitoring Feature	Quantity / Length by Reach									Frequency
		UT1C	UT1D	UT2 Reach 1	UT2 Reach 2	UT2A	UT2B	UT3	UT4	UT5	
Dimension	Riffle Cross Sections	1	1	3	1	1	N/A	1	3	3	Years 1, 2, 3, 5, and 7
	Pool Cross Section	1	N/A	1	1	N/A	N/A	N/A	3	2	
Pattern	Pattern	N/A									N/A
Profile	Longitudinal Profile	N/A									N/A
Substrate	Reach Wide (RW) / Riffle (RF) 100 Pebble Count	1 RW / 1 RF	1 RW / 1 RF	1 RW / 3 RF	1 RW / 1 RF	1 RW / 1 RF	N/A	1 RW / 1 RF	1 RW / 3 RF	1 RW / 3 RF	Years 1, 2, 3, 5, and 7
Hydrology	Stream Gage (SG) / Flow Gage (FG)	1 SG	1 FG	1 SG		1 SG	N/A	1 SG	1 SG	1 SG	Quarterly
Vegetation	Vegetation Plots	2	1	2	1	1	1	1	2	2	Years 1, 2, 3, 5, and 7
Visual Assessment	All Streams	Entire Reach									Semi-Annual
Exotic and Nuisance Vegetation											Annual
Project Boundary											Annual
Reference Photos	Photos	4	1	8	3	2	3	2	5	5	Annual

APPENDIX 2. Morphological Summary Data and Plots

Table 7a. Baseline Stream Data Summary

Candy Creek Mitigation Site

DMS Project No. 96315

Monitoring Year 0 - 2017

Candy Creek Reach 1

		Pre-Restoration Condition		Reference Reach Data								Design						As-Built/Baseline					
Parameter	**Gage**	**Candy Creek Reach 1**		**Collins Creek**		**Long Branch**		**UT to Rocky Creek**		**Spencer Creek Reach 2**		**Candy Creek Reach 1 (100+08 - 118+91)**		**Candy Creek Reach 1 (118+91 - 125+27)**		**Candy Creek Reach 1 (125+27 - 126+27)**		**Candy Creek Reach 1 (100+08 - 118+91)**		**Candy Creek Reach 1 (118+91 - 125+27)**		**Candy Creek Reach 1 (125+27 - 126+27)**	
		Min	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**
Dimension and Substrate - Shallow																							
Bankfull Width (ft)	N/A	8.7	9.4	11.9	20.1	14.8	18.6	12.2		10.7	11.2	10.6		13.6		16.8		11.9	12.8	16.1		17.0	
Floodprone Width (ft)		11	16	60		>50		72		60	>114	23	53	30	68	37	84	53	97	164		292	
Bankfull Mean Depth		1.3	1.4	1.6	2.7	1.3	2.1	1.3		1.6	1.8	0.8		1.0		1.2		0.5	0.7	0.9		1.2	
Bankfull Max Depth		1.7	1.8	3.3	4.2	1.9	2.9	1.8		2.1	2.6	1.2		1.5		1.8		1.0	1.2	1.8		2.3	
Bankfull Cross-sectional Area (ft^2)		12.1	12.3	32.9		25.0	34.6	16.3		17.8	19.7	8.2		13.2		19.9		7.1	9.3	13.9		20.3	
Width/Depth Ratio		6.2	7.2	4.4	12.1	7.9	13.8	9.1		5.8	7.1	13.7		14.0		14.2		18.4	25.3	18.6		14.3	
Entrenchment Ratio		1.2	1.7	2.0	3.0	>3.4		6.0		5.5	>10.2	2.2	5.0	2.2	5.0	2.2	5.0	4.4	8.1	10.2		17.1	
Bank Height Ratio		3.8	3.9	1.0	1.1	1.2	1.5	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0	
D50 (mm)		2.4																0.9		2.8		14.6	
Riffle Length (ft)	N/A			---		---		---		---		---		---		---		11	55	7	59	17	29
Riffle Slope (ft/ft)		0.007	0.031	0.003	0.008	0.012	0.013	0.061	0.089	0.013		0.005	0.078	0.007	0.047	0.007	0.023	0.002	0.055	0.006	0.017	0.007	0.017
Pool Length (ft)				---		---		---		---		---		---		---		18	70	19	57	52	
Pool Max Depth (ft)		2.1		2.4		2.2		2.2		3.3		0.9	2.4	1.2	3.0	1.4	3.7	2.1	3.0	3.3		3.2	
Pool Spacing (ft)		20	57	32	80	50	105	26	81	71		23	85	30	106	37	118	23	102	53	110	N/A	
Pool Volume (ft^3)																							
Pattern																							
Channel Beltwidth (ft)	N/A	N/A		---		60		---		38	41	28	94	39	121	50	150	19	47	25	58	54	
Radius of Curvature (ft)		N/A		---		16	87	---		11	15	16	34	20	44	25	54	17	38	22	44	40	
Rc:Bankfull Width (ft/ft)		N/A		---		1.1	4.7	---		1.3	1.4	1.5	3.2	1.5	3.2	1.5	3.2	1.6	3.0	1.4	2.6	2.4	
Meander Length (ft)		N/A		---		---		---		---		53	148	68	190	84	235	32	92	65	110	160	
Meander Width Ratio		N/A		---		---		---		---		5.0	14.0	5	14.0	5.0	14.0	3.1	6.4	3.6	6.2	3.2	
Substrate, Bed and Transport Parameters																							
Ri%/Ru%/P%/G%/S%	N/A																						
SC%/Sa%/G%/C%/B%/Be%																							
d16/d35/d50/d84/d95/d100		0.57/1.4/2.4/15.3/26/45		---		---		---		0.6/3.0/8.8/42.0/90/---								SC/0.35/0.9/62/114/512		SC/0.34/2.8/72/168/256		0.15/0.9/15/83/129/256	
Reach Shear Stress (Competency) lb/ft^2		0.73										0.45		0.45		0.45		0.35	0.43	0.40		0.63	
Max part size (mm) mobilized at bankfull																							
Stream Power (Capacity) W/m^2												---		---		---		---		---		---	
Additional Reach Parameters																							
Drainage Area (SM)	N/A	0.88		1.68		1.49		1.10		0.96		0.22		0.24		0.88		0.22		0.24		0.88	
Watershed Impervious Cover Estimate (%)		1%		---		---		---		---		1%		1%		1%		1%		1%		1%	
Rosgen Classification		G4c		E4		C/E4		E4b		E4		C/E		C/E		C/E		C4					
Bankfull Velocity (fps)		5.3	5.4	3.9		3.6	4.0	5.5		4.9	5.4	3.0		3.3		3.2		2.6	3.4	3.0		3.2	
Bankfull Discharge (cfs)		65		115	150	101	124	85		97		24		42		65		24		42		65	
Q-NFF regression (2-yr)		---																					
Q-USGS extrapolation (1.2-yr)		---																					
Q-Mannings		---																					
Valley Length (ft)		2,268		---		---		---		---		1,615		550		88		1,615		550		88	
Channel Thalweg Length (ft)		2,887		---		---		---		---		1,894		636		100		1,883		636		100	
Sinuosity		1.27		---		1.30		1.10		2.30		1.17		1.16		1.14		1.17		1.16		1.14	
Water Surface Slope $(ft/ft)^2$		---		---		---		---		---		0.004	0.021	0.006	0.012	0.006		0.010		0.008		0.009	
Bankfull Slope (ft/ft)		---		---		---		---		---		0.012		0.009		0.005		0.010		0.009		0.008	

SC: Silt/Clay <0.062 mm diameter particles

(---): Data was not provided

N/A: Not Applicable

Table 7b. Baseline Stream Data Summary
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Candy Creek Reaches 2 and 3

		Pre-Restoration Condition				Reference Reach Data		Design						As-Built/Baseline					
Parameter	**Gage**	**Candy Creek Reach 2**		**Candy Creek Reach 3**		**See Table 7a**		**Candy Creek Reach 2 (126+27 - 143+06)**		**Candy Creek Reach 2 (143+06 - 148+02)**		**Candy Creek Reach 3 (149+02 - 155+05)**		**Candy Creek Reach 2 (126+27 - 143+06)**		**Candy Creek Reach 2 (143+06 - 148+02)**		**Candy Creek Reach 3 (149+02 - 155+05)**	
		Min	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**
Dimension and Substrate - Riffle																			
Bankfull Width (ft)	N/A	18.2	19.4	15.3	17.6	See Table 7a		17.5		17.0		20.0		16.1	19.5	16.3		19.2	
Floodprone Width (ft)		27	99+	24	60			39	88	37	85	44	100	154	254	164		57	
Bankfull Mean Depth		1.2	1.5	1.6	1.7			1.2		1.2		1.4		1.0	1.2	1.2		1.5	
Bankfull Max Depth		1.8	2.4	2.2	2.4			1.9		1.9		2.1		1.9	2.1	1.8		2.3	
Bankfull Cross-sectional Area (ft^2)		23.4	27.9	25.8	27.6			21.8		20.9		28.0		16.2	23.3	20.8		28.2	
Width/Depth Ratio		11.9	16.2	9.1	11.2			14.0		13.8		14.3		13.3	16.3	13.5		13.1	
Entrenchment Ratio		1.4	3.2+	1.4	3.9			2.2	5.0	2.2	5.0	2.2	5.0	9.5	15.8	9.8		3.0	
Bank Height Ratio		1.3	2.4	1.8	2.3			1.0		1.0		1.0		1.0		1.0		1.0	
D50 (mm)		0.8		N/A										0.4		0.5		1.0	
Riffle Length (ft)	N/A					See Table 7a		---		---		---		24	63	14	60	10	61
Riffle Slope (ft/ft)		0.005	0.010	N/A				0.004	0.035	0.011	0.035	0.006	0.013	0.001	0.019	0.001	0.019	0.001	0.035
Pool Length (ft)								---		---		---		23	101	23	58	22	53
Pool Max Depth (ft)		2.7		N/A				1.5	3.9	1.5	3.8	2.1	4.2	3.3	3.5	3.9		3.5	
Pool Spacing (ft)		16	68	N/A				39	124	37	119	40	130	59	146	55	136	49	97
Pool Volume (ft^3)																			
Pattern																			
Channel Beltwidth (ft)	N/A	N/A		N/A		See Table 7a		48	156	38	151	N/A		31	72	23	68	N/A	
Radius of Curvature (ft)		N/A		N/A				26	56	26	54	N/A		20	107	27	42	N/A	
Rc:Bankfull Width (ft/ft)		N/A		N/A				1.5	3.2	1.5	3.2	N/A		1.1	4.5	1.3	1.9	N/A	
Meander Length (ft)		N/A		N/A				88	245	85	238	N/A		81	171	54	121	N/A	
Meander Width Ratio		N/A		N/A				2.2	8.9	2.2	8.9	N/A		1.4	3.0	1.1	3.0	N/A	
Substrate, Bed and Transport Parameters																			
Ri%/Ru%/P%/G%/S%	N/A					See Table 7a													
SC%/Sa%/G%/C%/B%/Be%																			
d16/d35/d50/d84/d95/d100		SC/0.3/0.8/9.1/13.9/23		N/A										SC/0.17/0.4/93/146/256		SC/0.21/0.5/72/117/362		SC/0.27/1.0/113/148/256	
Reach Shear Stress (Competency) lb/ft^2		0.42		N/A				0.50		0.50		N/A		0.40	0.48	0.59		N/A	
Max part size (mm) mobilized at bankfull																			
Stream Power (Capacity) W/m^2								---		---		---		---		---		---	
Additional Reach Parameters																			
Drainage Area (SM)	N/A	1.08		1.26		See Table 7a		0.93		1.08		1.26		0.93		1.08		1.26	
Watershed Impervious Cover Estimate (%)		1%		1%				1%		1%		1%		1%		1%		1%	
Rosgen Classification		F5		G4c				C/E		C/E		C/E		C5		C5		C5	
Bankfull Velocity (fps)		3.6	4.3	3.4	3.6			3.5		4.0		3.2		3.2	4.6	4.1		3.3	
Bankfull Discharge (cfs)		85		93				75		85		93		75		85		93	
Q-NFF regression (2-yr)		---		---															
Q-USGS extrapolation (1.2-yr)		---		---															
Q-Mannings		---		---															
Valley Length (ft)		1,387		551				1,363		426		511		1,363		426		490	
Channel Thalweg Length (ft)		1,780		671				1,679		536		628		1,679		536		603	
Sinuosity		1.28		1.22				1.23		1.26		1.23		1.23		1.26		1.23	
Water Surface Slope $(ft/ft)^2$		---		---				0.004	0.009	0.009		0.004	0.005	0.007		0.008		0.004	
Bankfull Slope (ft/ft)		---		---				0.006		0.018		0.007		0.007		0.009		0.005	

SC: Silt/Clay <0.062 mm diameter particles
(---): Data was not provided
N/A: Not Applicable

Table 7c. Baseline Stream Data Summary

Candy Creek Mitigation Site

DMS Project No. 96315

Monitoring Year 0 - 2017

Candy Creek Reach 4

		Pre-Restoration Condition		Reference Reach Data		Design				As-Built/Baseline			
Parameter	**Gage**	**Candy Creek Reach 4**		**See Table 7a**		**Candy Creek Reach 4 (170+71 - 196+50)**		**Candy Creek Reach 4 (196+50 - 206+35)**		**Candy Creek Reach 4 (170+71 - 196+50)**		**Candy Creek Reach 4 (196+50 - 206+35)**	
		Min	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**
Dimension and Substrate - Riffle													
Bankfull Width (ft)	N/A	11.4	14.1	See Table 7a		22.0		20.0		19.1	24.9	21.7	23.2
Floodprone Width (ft)		17	21			77	176	70	120	158	222	132	155
Bankfull Mean Depth		1.5	1.8			1.5		1.4		1.4	1.5	1.4	1.5
Bankfull Max Depth		1.8	2.1			2.2		2.0		2.1	2.9	2.5	2.9
Bankfull Cross-sectional Area (ft^2)		20.4	21.5			32.1		27.2		26.9	38.1	31.6	32.8
Width/Depth Ratio		6.4	9.2			15.1		14.7		13.6	16.3	12.2	16.2
Entrenchment Ratio		1.5	1.5			3.5	8.0	3.5	6.0	7.1	11.6	6.1	6.7
Bank Height Ratio		1.9	2.3			1.0		1.0		1.0		1.0	
D50 (mm)		2.2								0.4		0.6	
Riffle Length (ft)	N/A			See Table 7a		---		---		14	74	15	53
Riffle Slope (ft/ft)		N/A				0.006	0.020	0.011	0.039	0.003	0.022	0.004	0.025
Pool Length (ft)						---		---		20	125	22	71
Pool Max Depth (ft)		2.8				2.9	4.4	2.7	4.1	4.5	4.6	4.1	
Pool Spacing (ft)		N/A				88	154	26	132	40	145	52	111
Pool Volume (ft^3)													
Pattern													
Channel Beltwidth (ft)	N/A	N/A		See Table 7a		66	154	30	100	66	154	30	100
Radius of Curvature (ft)		N/A				25	55	25	50	25	55	25	50
Rc:Bankfull Width (ft/ft)		N/A				1.2	2.5	1.3	2.5	1.2	2.5	1.3	2.5
Meander Length (ft)		N/A				84	220	80	220	84	220	80	220
Meander Width Ratio		N/A				3.0	7.0	1.5	5.0	3.0	7.0	1.5	5.0
Substrate, Bed and Transport Parameters													
Ri%/Ru%/P%/G%/S%	N/A			See Table 7a									
SC%/Sa%/G%/C%/B%/Be%													
d16/d35/d50/d84/d95/d100		0.3/0.7/2.2/14/28/256								SC/0.15/0.4/64/180/256		0.09/0.26/0.6/49/111/180	
Reach Shear Stress (Competency) lb/ft^2		0.69				0.46		0.46		0.40	0.44	0.85	0.83
Max part size (mm) mobilized at bankfull													
Stream Power (Capacity) W/m^2						---		---		---		---	
Additional Reach Parameters													
Drainage Area (SM)	N/A	1.46		See Table 7a		1.40		1.46		1.40		1.46	
Watershed Impervious Cover Estimate (%)		1%				1%		1%		1%		1%	
Rosgen Classification		G4c				C/E		C/E		C5		C5	
Bankfull Velocity (fps)		4.9	5.2			3.3		4.0		3.3		3.2	3.3
Bankfull Discharge (cfs)		105				---		105		---		105	
Q-NFF regression (2-yr)		---											
Q-USGS extrapolation (1.2-yr)		---											
Q-Mannings		---											
Valley Length (ft)		2,847				1,976		744		1,981		745	
Channel Thalweg Length (ft)		3,359				2,575		983		2,579		985	
Sinuosity		1.18				1.30		1.32		1.30		1.32	
Water Surface Slope ($ft/ft)^2$		---				0.004	0.008	0.009	0.013	0.005		0.010	
Bankfull Slope (ft/ft)		---				0.005		0.012		0.005		0.008	

SC: Silt/Clay <0.062 mm diameter particles

(---): Data was not provided

N/A: Not Applicable

Table 7d. Baseline Stream Data Summary

Candy Creek Mitigation Site

DMS Project No. 96315

Monitoring Year 0 - 2017

UT1C and UT1D

		Pre-Restoration Condition				Reference Reach Data								Design				As-Built/Baseline			
Parameter	**Gage**	**UT1C**		**UT1D**		**UT to Varnals Creek**		**Spencer Creek Reach 3**		**Agony Acres UT1 Reach 3**		**UT to Richland Creek**		**UT1C**		**UT1D**		**UT1C**		**UT1D**	
		Min	**Max**			**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**
Dimension and Substrate - Shallow																					
Bankfull Width (ft)	N/A	8.7		6.4		9.3	10.5	6.3	9.3	9.1	10.4	8.8	10.4	5.8		3.7		7.8		7.6	
Floodprone Width (ft)		12		34		20	64	14	125	36+		28	31	13	29	8	18	28		15	
Bankfull Mean Depth		1.3		0.6		1.1	1.2	0.8	1.0	1.0	1.2	0.8	0.9	0.4		0.2		0.5		0.5	
Bankfull Max Depth		1.7		1.0		1.5	1.7	1.0	1.2	1.8		1.1	1.3	0.5		0.3		0.9		0.8	
Bankfull Cross-sectional Area (ft^2)		7.2		3.7		10.3	12.3	6.6	8.7	10.7	11.3	7.8	8.5	2.1		0.8		4.0		3.8	
Width/Depth Ratio		4.5		11.2		8.1	9.3	7.9	9.3	7.3	10.1	10.0	12.8	16.0		16.1		15.0		15.4	
Entrenchment Ratio		2.1		5.3		1.9	6.1	1.7	4.3	>3.9		2.5	4.0	2.2	5.0	2.2	5.0	3.6		2.0	
Bank Height Ratio		3.8		1.2		0.9	1.0	1.0		1.0		1.4	2.1	1.0		1.0		1.0		1.0	
D50 (mm)		0.3		0.3														12.8		31.2	
Riffle Length (ft)	N/A					---		---		---		---		---		---		3	43	4	62
Riffle Slope (ft/ft)		N/A		N/A		0.024	0.057	0.018	0.034	N/A		0.021	0.045	0.030	0.050	0.006	0.112	0.003	0.082	0.002	0.085
Pool Length (ft)						---		---		---		---		---		---		5.0	20.0	4.0	15.0
Pool Max Depth (ft)		N/A		N/A		2.5	2.6	1.2	1.8	2.5		N/A		0.7	1.3	0.5	0.8	1.7		1.1	
Pool Spacing (ft)		N/A		N/A		8	82	9	46	N/A		N/A		8	29	5	26	6	51	6	33
Pool Volume (ft^3)																					
Pattern																					
Channel Beltwidth (ft)	N/A	N/A		N/A		15	45	10	50	21	93	N/A		N/A		N/A		N/A		N/A	
Radius of Curvature (ft)		N/A		N/A		8	47	12	85	14	60	N/A		N/A		N/A		N/A		N/A	
Rc:Bankfull Width (ft/ft)		N/A		N/A		0.6	3.2	1.9	9.1	1.5	5.8	N/A		N/A		N/A		N/A		N/A	
Meander Length (ft)		N/A		N/A		---		53	178	---		N/A		N/A		N/A		N/A		N/A	
Meander Width Ratio		N/A		N/A		1.0	3.0	1.6	5.4	2.3	8.9	N/A		N/A		N/A		N/A		N/A	
Substrate, Bed and Transport Parameters																					
Ri%/Ru%/P%/G%/S%	N/A																				
SC%/Sa%/G%/C%/B%/Be%																					
d16/d35/d50/d84/d95/d100		SC/SC/0.3/9.4/30/90		SC/0.1/0.3/2.9/5.2/16		---		1.9/8.9/11/64/128/---		---		---						SC/0.39/12.8/82/117/180		0.3/6.1/31/57/78/128	
Reach Shear Stress (Competency) lb/ft^2		2.70		0.39										0.31		0.50		0.84		1.48	
Max part size (mm) mobilized at bankfull																					
Stream Power (Capacity) W/m^2														---		---		---		---	
Additional Reach Parameters																					
Drainage Area (SM)	N/A	0.04		0.01		0.41		0.37		0.30		0.28		0.04		0.01		0.04		0.01	
Watershed Impervious Cover Estimate (%)		1%		<1%		---		---		---		---		1%		<1%		1%		<1%	
Rosgen Classification		E5b		C5		B		E4		E4		C4/E4		B/C		B/C		B/C		B/C	
Bankfull Velocity (fps)		0.8		0.5		4.4	5.2	5	5.6	2.2	2.4	3.5	4.1	2.5		3.0		1.5		0.5	
Bankfull Discharge (cfs)		6		2		54		35		25		29	32	6		2		6		2	
Q-NFF regression (2-yr)		---		---																	
Q-USGS extrapolation (1.2-yr)		---		---																	
Q-Mannings		---		---																	
Valley Length (ft)		688		378		---		---		---		---		684		370		672		363	
Channel Thalweg Length (ft)		728		436		---		---		---		---		740		385		728		379	
Sinuosity		1.06		1.15		1.20		1.00	1.30	1.35		1.00		1.08		1.04		1.08		1.04	
Water Surface Slope $(ft/ft)^2$		---		---		---		---		---		---		0.028		0.006	0.075	0.028		0.051	
Bankfull Slope (ft/ft)		---		---		---		---		---		---		0.040		0.052		0.028		0.045	

SC: Silt/Clay <0.062 mm diameter particles

(---): Data was not provided

N/A: Not Applicable

Table 7e. Baseline Stream Data Summary
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

UT2 and UT2A

		Pre-Restoration Condition						Reference Reach Data		Design						As-Built/Baseline					
Parameter	**Gage**	**UT2 - Reach 1**		**UT2 - Reach 2**		**UT2A**		**See Table 7d**		**UT2 - Reach 1**		**UT2 - Reach 2**		**UT2A**		**UT2 - Reach 1**		**UT2 - Reach 2**		**UT2A**	
		Min	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**
Dimension and Substrate - Shallow																					
Bankfull Width (ft)		3.1	6.7	5.2		2.8				6.4		7.5		4.6		4.8	7.5	7.8		7.0	
Floodprone Width (ft)		4	9	7		9				19	82	16	28	10	18	22	88	60		31	
Bankfull Mean Depth		0.4	0.8	0.6		0.4				0.4		0.5		0.3		0.3	0.9	0.5		0.6	
Bankfull Max Depth		0.8	1.0	0.9		0.6				0.6		0.8		0.4		0.4	1.5	0.8		1.0	
Bankfull Cross-sectional Area (ft^2)	N/A	2.4	3.0	3.3		1.2		See Table 7d		2.7		3.9		1.3		1.2	6.8	4.1		4.1	
Width/Depth Ratio		4.0	14.9	8.3		6.6				15.1		14.4		16.3		8.3	18.5	14.9		11.9	
Entrenchment Ratio		1.1	1.3	1.4		3.1				3.0	12.8	2.1	3.7	2.2	3.9	2.9	11.3	7.7		4.4	
Bank Height Ratio		4.3	4.9	3.8		5.7				1.0		1.0		1.0		1.0		1.0		1.0	
D50 (mm)		0.1		N/A		N/A										34.6		4.5		2.5	
Riffle Length (ft)										---		---		---		4	68	7	80	3	102
Riffle Slope (ft/ft)		0.003	0.110	N/A		N/A				0.011	0.070	0.017	0.032	0.035	0.065	0.004	0.063	0.001	0.055	0.019	0.071
Pool Length (ft)	N/A							See Table 7d		---		---		---		4	18	11	62	4	12
Pool Max Depth (ft)		1.1		N/A		N/A				1.0	1.9	1.0	2.0	0.6	1.0	1.7		1.5		1.5	2.1
Pool Spacing (ft)		22	116	N/A		N/A				8	42	17	53	6	30	8	45	13	51	7	55
Pool Volume (ft^3)																					
Pattern																					
Channel Beltwidth (ft)		N/A		N/A		N/A				N/A		N/A		N/A		10	25	N/A		N/A	
Radius of Curvature (ft)		N/A		N/A		N/A				N/A		N/A		N/A		17	54	N/A		N/A	
Rc:Bankfull Width (ft/ft)	N/A	N/A		N/A		N/A		See Table 7d		N/A		N/A		N/A		3.7	9.2	N/A		N/A	
Meander Length (ft)		N/A		N/A		N/A				N/A		N/A		N/A		21	68	N/A		N/A	
Meander Width Ratio		N/A		N/A		N/A				N/A		N/A		N/A		2.2	5.6	N/A		N/A	
Substrate, Bed and Transport Parameters																					
Ri%/Ru%/P%/G%/S%																					
SC%/Sa%/G%/C%/B%/Be%																					
d16/d35/d50/d84/d95/d100	N/A	SC/SC/0.1/22.6 /36.7/90		N/A		N/A		See Table 7d								0.35/6.0/34.6/70/90/256		0.2/0.7/5/56/161/>2048		0.27/1.1/2.5/47/76/180	
Reach Shear Stress (Competency) lb/ft^2		1.80		N/A		N/A				0.95		---		---		0.31	1.05	0.45		1.32	
Max part size (mm) mobilized at bankfull																					
Stream Power (Capacity) W/m^2										---		---		---		---		---		---	
Additional Reach Parameters																					
Drainage Area (SM)		0.07		0.10		0.02				0.07		0.10		0.02		0.07		0.10		0.02	
Watershed Impervious Cover Estimate (%)		3%		3%		5%				3%		3%		5%		3%		3%		5%	
Rosgen Classification		F5		G5c		G5				B		C/E		B		C4		C5		C5	
Bankfull Velocity (fps)		3.0	3.7	3.6		3.5				3.1		3.1		2.3		1.3	7.5	2.9		1.0	
Bankfull Discharge (cfs)		9		12		4				9		12		4		9		12		4	
Q-NFF regression (2-yr)		---		---		---															
Q-USGS extrapolation (1.2-yr)	N/A	---		---		---		See Table 7d													
Q-Mannings		---		---		---															
Valley Length (ft)		1,105		595		341				1,168		591		340		1,168		591		358	
Channel Thalweg Length (ft)		1,279		731		376				1,208		645		349		1,208		643		366	
Sinuosity		1.16		1.23		1.10				1.03		1.09		1.02		1.03		1.09		1.02	
Water Surface Slope $(ft/ft)^2$		---		---		---				0.010	0.035	0.014	0.016	0.032	0.036	0.021	0.031	0.015		0.039	
Bankfull Slope (ft/ft)		---		---		---				0.038		0.019		0.038		0.023	0.032	0.014		0.040	

SC: Silt/Clay <0.062 mm diameter particles
(---): Data was not provided
N/A: Not Applicable

Table 7f. Baseline Stream Data Summary
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

UT3, UT4, and UT5

		PRE-RESTORATION CONDITION						REFERENCE REACH DATA		DESIGN						AS-BUILT/BASELINE					
Parameter	Gage	UT3		UT4		UT5		See Table 7d		UT3		UT4		UT5		UT3		UT4		UT5	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Dimension and Substrate - Shallow																					
Bankfull Width (ft)	N/A	5.8		8.5		9.5		See Table 7d		7.8		11.0		9.8		8.8		11.5	15.1	7.9	9.9
Floodprone Width (ft)		8		11		10				17	100	24	135	22	100	77		98	288	83	229
Bankfull Mean Depth		0.7		0.8		0.7				0.6		0.9		0.8		0.6		0.9	1.1	0.6	1.2
Bankfull Max Depth		0.9		1.0		1.0				0.9		1.2		1.1		1.1		1.6	2.1	0.9	1.9
Bankfull Cross-sectional Area (ft^2)		3.9		7.2		6.7				4.8		9.4		7.5		5.5		11.0	15.2	6.0	9.1
Width/Depth Ratio		8.8		10.2		13.4				12.7		12.9		12.8		14.0		10.2	15.0	6.9	15.5
Entrenchment Ratio		1.3		1.2		1.1				2.2	12.8	2.2	12.3	2.2	10.2	8.8		6.5	25.0	8.5	28.8
Bank Height Ratio		5.4		6.2		5.6				1.0		1.0		1.0		1.0		1.0		1.0	
D50 (mm)		10.6		2.8		12.5										1.5		0.6		0.6	
Riffle Length (ft)	N/A							See Table 7d		---		---		---		8	20	8	69	11	28
Riffle Slope (ft/ft)		0.011	0.072	0.011	0.064	0.020	0.012			0.012	0.092	0.003	0.018	0.003	0.035	0.007	0.057	0.000	0.072	0.000	0.027
Pool Length (ft)										---		---		---		8	24	9	42	12	39
Pool Max Depth (ft)		1.1		1.4		1.2				1.1	2.1	1.7	2.6	1.5	2.4	1.1	2.7	2.3	2.9	1.9	
Pool Spacing (ft)		6	43	12	42	9	54			17	43	28	66	25	64	24	33	24	123	26	65
Pool Volume (ft^3)																					
Pattern																					
Channel Beltwidth (ft)	N/A	N/A		N/A		N/A		See Table 7d		6	16	10	28	9	64	7	19	10	45	10	39
Radius of Curvature (ft)		N/A		N/A		N/A				10	27	14	28	13	49	12	24	12	33	11	48
Rc:Bankfull Width (ft/ft)		N/A		N/A		N/A				1.3	3.5	1.3	2.5	1.3	5.0	1.1	2.1	1.1	2.1	0.8	3.6
Meander Length (ft)		N/A		N/A		N/A				41	101	39	105	54	127	28	76	31	72	34	71
Meander Width Ratio		N/A		N/A		N/A				0.8	2.0	0.9	2.5	0.9	6.5	0.8	1.7	0.7	2.7	0.9	2.2
Substrate, Bed and Transport Parameters																					
Ri%/Ru%/P%/G%/S%	N/A							See Table 7d													
SC%/Sa%/G%/C%/B%/Be%																					
d16/d35/d50/d84/d95/d100		SC/0.1/10.6/22.6/41/64		0.3/0.5/2.8/28.5/40.6/64		0.3/2.8/12.5/29.7/41/90										SC/0.36/1.5/81/111/180		SC/0.16/0.6/100/161/512		SC/SC/0.6/32/143/362	
Reach Shear Stress (Competency) lb/ft^2		0.93		0.55		1.90				0.81		0.61		0.28		0.88		0.30	0.32	0.27	0.32
Max part size (mm) mobilized at bankfull																					
Stream Power (Capacity) W/m^2										---		---		---		---		---		---	
Additional Reach Parameters																					
Drainage Area (SM)	N/A	0.12		0.30		0.21		See Table 7d		0.12		0.30		0.21		0.12		0.30		0.21	
Watershed Impervious Cover Estimate (%)		1%		0%		1%				1%		0%		1%		1%		0%		1%	
Rosgen Classification		G4		G4		F4				C/E		C/E		C/E		C5		C5/E5		C5/E5	
Bankfull Velocity (fps)		3.7		4.2		3.3				2.9		3.2		2.9		2.5		2.0	2.7	2.4	3.7
Bankfull Discharge (cfs)		14		30		22				14		30		22		14		30		22	
Q-NFF regression (2-yr)		---		---		---															
Q-USGS extrapolation (1.2-yr)		---		---		---															
Q-Mannings		---		---		---															
Valley Length (ft)		238		1,058		732				301		1,111		845		301		1,111		845	
Channel Thalweg Length (ft)		346		1,270		1,012				346		1,355		1,012		346		1,356		1,012	
Sinuosity		1.45		1.20		1.38				1.15		1.22		1.20		1.15		1.22		1.20	
Water Surface Slope $(ft/ft)^2$		---		---		---				0.011	0.032	0.003	0.012	0.002	0.010	0.024		0.006		0.006	
Bankfull Slope (ft/ft)		---		---		---				0.016	0.032	0.012		0.012		0.022		0.006		0.007	

SC: Silt/Clay <0.062 mm diameter particles
(---): Data was not provided
N/A: Not Applicable

Table 8a. Morphology and Hydraulic Summary (Dimensional Parameters - Cross Section)
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

	Cross Section 1, Candy Creek Reach 1 (Riffle)								Cross Section 2, Candy Creek Reach 1 (Pool)								Cross Section 3, Candy Creek Reach 1 (Riffle)								Cross Section 4, Candy Creek Reach 1 (Pool)								Cross Section 5, Candy Creek Reach 1 (Riffle)							
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
based on fixed bankfull elevation	765.9								763.4								763.0								757.4								757.1							
Bankfull Width (ft)	12.8								18.7								12.0								12.5								11.9							
Floodprone Width (ft)	71								---								71								---								53							
Bankfull Mean Depth (ft)	0.7								1.0								0.5								1.1								0.6							
Bankfull Max Depth (ft)	1.2								3.0								1.0								2.1								1.2							
Bankfull Cross Sectional Area (ft^2)	8.9								18.4								5.7								13.5								7.1							
Bankfull Width/Depth Ratio	18.4								19.0								25.3								11.6								19.9							
Bankfull Entrenchment Ratio	5.5								---								8.1								---								4.4							
Bankfull Bank Height Ratio	1.0								---								1.0								---								1.0							
	Cross Section 6, Candy Creek Reach 1 (Pool)								**Cross Section 7, Candy Creek Reach 1 (Riffle)**								**Cross Section 8, Candy Creek Reach 1 (Riffle)**								**Cross Section 9, Candy Creek Reach 2 (Pool)**								**Cross Section 10, Candy Creek Reach 2 (Riffle)**							
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
based on fixed bankfull elevation	749.3								748.9								747.3								745.6								745.0							
Bankfull Width (ft)	19.9								16.1								17.0								22.0								16.1							
Floodprone Width (ft)	---								164								292								---								254							
Bankfull Mean Depth (ft)	1.8								0.9								1.2								1.8								1.0							
Bankfull Max Depth (ft)	3.3								1.8								2.3								3.5								1.9							
Bankfull Cross Sectional Area (ft^2)	35.5								13.9								20.3								40.1								16.2							
Bankfull Width/Depth Ratio	11.2								18.6								14.3								12.0								16.0							
Bankfull Entrenchment Ratio	---								10.2								17.1								---								15.8							
Bankfull Bank Height Ratio	---								1.0								1.0								---								1.0							
	Cross Section 11, Candy Creek Reach 2 (Riffle)								**Cross Section 12, Candy Creek Reach 2 (Pool)**								**Cross Section 13, Candy Creek Reach 2 (Riffle)**								**Cross Section 14, Candy Creek Reach 2 (Riffle)**								**Cross Section 15, Candy Creek Reach 2 (Pool)**							
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
based on fixed bankfull elevation	741.1								737.4								737.0								733.1								733.2							
Bankfull Width (ft)	16.3								23.6								19.5								16.7								23.9							
Floodprone Width (ft)	154								---								221								164								---							
Bankfull Mean Depth (ft)	1.2								1.9								1.2								1.2								1.9							
Bankfull Max Depth (ft)	1.9								3.3								2.1								1.8								3.9							
Bankfull Cross Sectional Area (ft^2)	19.8								44.2								23.3								20.8								46.3							
Bankfull Width/Depth Ratio	13.3								12.6								16.3								13.5								12.3							
Bankfull Entrenchment Ratio	9.5								---								11.3								9.8								---							
Bankfull Bank Height Ratio	1.0								---								1.0								1.0								---							

Table 8b. Morphology and Hydraulic Summary (Dimensional Parameters - Cross Section)

Candy Creek Mitigation Site

DMS Project No. 96315

Monitoring Year 0 - 2017

	Cross Section 16, Candy Creek Reach 3 (Pool)								Cross Section 17, Candy Creek Reach 3 (Riffle)								Cross Section 18, Candy Creek Reach 4 (Pool)								Cross Section 19, Candy Creek Reach 4 (Riffle)							
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
based on fixed bankfull elevation	729.2								729.1								720.6								720.5							
Bankfull Width (ft)	18.7								19.2								26.9								19.1							
Floodprone Width (ft)	---								57								---								222							
Bankfull Mean Depth (ft)	2.4								1.5								2.2								1.4							
Bankfull Max Depth (ft)	3.5								2.3								4.5								2.2							
Bankfull Cross Sectional Area (ft^2)	44.4								28.2								58.7								26.9							
Bankfull Width/Depth Ratio	7.8								13.1								12.3								13.6							
Bankfull Entrenchment Ratio	---								3.0								---								11.6							
Bankfull Bank Height Ratio	---								1.0								---								1.0							
	Cross Section 20, Candy Creek Reach 4 (Riffle)								**Cross Section 21, Candy Creek Reach 4 (Pool)**								**Cross Section 22, Candy Creek Reach 4 (Pool)**								**Cross Section 23, Candy Creek Reach 4 (Riffle)**							
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
based on fixed bankfull elevation	717.8								717.7								714.0								713.9							
Bankfull Width (ft)	22.4								29.3								23.6								24.9							
Floodprone Width (ft)	158								---								---								180							
Bankfull Mean Depth (ft)	1.4								2.4								2.2								1.5							
Bankfull Max Depth (ft)	2.1								4.6								4.6								2.9							
Bankfull Cross Sectional Area (ft^2)	31.0								70.1								51.1								38.1							
Bankfull Width/Depth Ratio	16.2								12.2								10.9								16.3							
Bankfull Entrenchment Ratio	7.1								---								---								7.2							
Bankfull Bank Height Ratio	1.0								---								---								1.0							
	Cross Section 24, Candy Creek Reach 4 (Riffle)								**Cross Section 25, Candy Creek Reach 4 (Riffle)**								**Cross Section 26, Candy Creek Reach 4 (Pool)**								**Cross Section 27, UT1C (Riffle)**							
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
based on fixed bankfull elevation	707.8								702.6								702.1								752.2							
Bankfull Width (ft)	23.2								21.7								23.6								7.8							
Floodprone Width (ft)	155								132								---								28							
Bankfull Mean Depth (ft)	1.4								1.5								2.2								0.5							
Bankfull Max Depth (ft)	2.9								2.5								4.1								0.9							
Bankfull Cross Sectional Area (ft^2)	31.6								32.8								51.3								4.0							
Bankfull Width/Depth Ratio	17.1								14.4								10.80								15.0							
Bankfull Entrenchment Ratio	6.7								6.1								---								3.6							
Bankfull Bank Height Ratio	1.0								1.0								---								1.0							
	Cross Section 28, UT1C (Pool)								**Cross Section 29, UT1D (Riffle)**								**Cross Section 30, UT2 Reach 1 (Riffle)**								**Cross Section 31, UT2 Reach 1 (Riffle)**							
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
based on fixed bankfull elevation	752.1								742.7								771.9								763.8							
Bankfull Width (ft)	6.4								7.6								7.5								4.8							
Floodprone Width (ft)	---								15								22.0								47.0							
Bankfull Mean Depth (ft)	0.9								0.5								0.9								0.3							
Bankfull Max Depth (ft)	1.7								0.8								1.5								0.4							
Bankfull Cross Sectional Area (ft^2)	5.4								3.8								6.8								1.2							
Bankfull Width/Depth Ratio	7.5								15.4								8.3								18.5							
Bankfull Entrenchment Ratio	---								2.0								2.9								9.8							
Bankfull Bank Height Ratio	---								1.0								1.0								1.0							

Table 8c. Morphology and Hydraulic Summary (Dimensional Parameters - Cross Section)
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

	Cross Section 32, UT2 Reach 1 (Pool)								Cross Section 33, UT2 Reach 1 (Riffle)								Cross Section 34, UT2 Reach 2 (Pool)								Cross Section 35, UT2 Reach 2 (Riffle)								Cross Section 36, UT2A (Riffle)							
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
based on fixed bankfull elevation	760.4								760.0								734.8								734.6								747.7							
Bankfull Width (ft)	10.1								7.8								10.2								7.8								7.0							
Floodprone Width (ft)	---								88								---								60								31							
Bankfull Mean Depth (ft)	0.6								0.5								0.8								0.5								0.6							
Bankfull Max Depth (ft)	1.7								0.8								1.5								0.8								1.0							
Bankfull Cross Sectional Area (ft^2)	6.2								3.5								7.9								4.1								4.1							
Bankfull Width/Depth Ratio	16.4								17.2								13.3								14.9								11.9							
Bankfull Entrenchment Ratio	---								11.3								---								---								4.4							
Bankfull Bank Height Ratio	---								1.0								---								1.0								1.0							

	Cross Section 37, UT3 Reach 2 (Riffle)								Cross Section 38, UT4 (Riffle)								Cross Section 39, UT4 (Pool)								Cross Section 40, UT4 (Pool)								Cross Section 41, UT4 (Riffle)							
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
based on fixed bankfull elevation	749.7								753.6								753.2								750.3								750.2							
Bankfull Width (ft)	8.8								15.1								14.1								14.5								11.8							
Floodprone Width (ft)	77								98								---								---								172							
Bankfull Mean Depth (ft)	0.6								1.0								1.3								1.3								0.9							
Bankfull Max Depth (ft)	1.1								2.1								2.3								2.3								1.6							
Bankfull Cross Sectional Area (ft^2)	5.5								15.2								17.8								18.5								11.0							
Bankfull Width/Depth Ratio	14.0								15.0								11.2								11.4								12.7							
Bankfull Entrenchment Ratio	8.8								6.5								---								---								14.6							
Bankfull Bank Height Ratio	1.0								1.0								---								---								1.0							

	Cross Section 42, UT4 (Riffle)								Cross Section 43, UT4 (Pool)								Cross Section 44, UT5 (Riffle)								Cross Section 45, UT5 (Pool)								Cross Section 46, UT5 (Riffle)							
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
based on fixed bankfull elevation	748.3								748.0								758.4								758.4								755.0							
Bankfull Width (ft)	11.5								16.9								9.7								10.6								9.9							
Floodprone Width (ft)	288								---								83								---								84							
Bankfull Mean Depth (ft)	1.1								1.2								0.6								0.9								0.7							
Bankfull Max Depth (ft)	1.8								2.9								0.9								1.9								1.0							
Bankfull Cross Sectional Area (ft^2)	13.0								20.2								6.0								9.8								6.8							
Bankfull Width/Depth Ratio	10.2								14.2								15.5								11.4								14.5							
Bankfull Entrenchment Ratio	25.0								---								8.6								---								8.5							
Bankfull Bank Height Ratio	1.0								---								1.0								---								1.0							

	Cross Section 47, UT5 (Pool)								Cross Section 48, UT5 (Riffle)							
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
based on fixed bankfull elevation	754.8								741.1							
Bankfull Width (ft)	13.1								7.9							
Floodprone Width (ft)	---								229							
Bankfull Mean Depth (ft)	1.1								1.2							
Bankfull Max Depth (ft)	1.9								1.9							
Bankfull Cross Sectional Area (ft^2)	14.7								9.1							
Bankfull Width/Depth Ratio	11.6								6.9							
Bankfull Entrenchment Ratio	---								28.8							
Bankfull Bank Height Ratio	---								1.0							

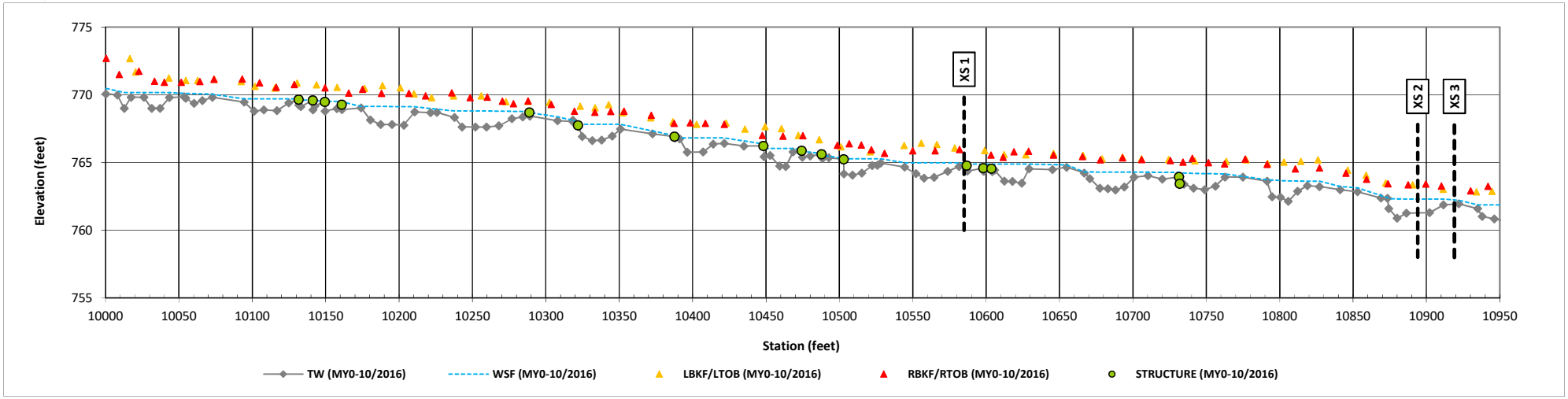
Longitudinal Profile Plots

Candy Creek Mitigation Site

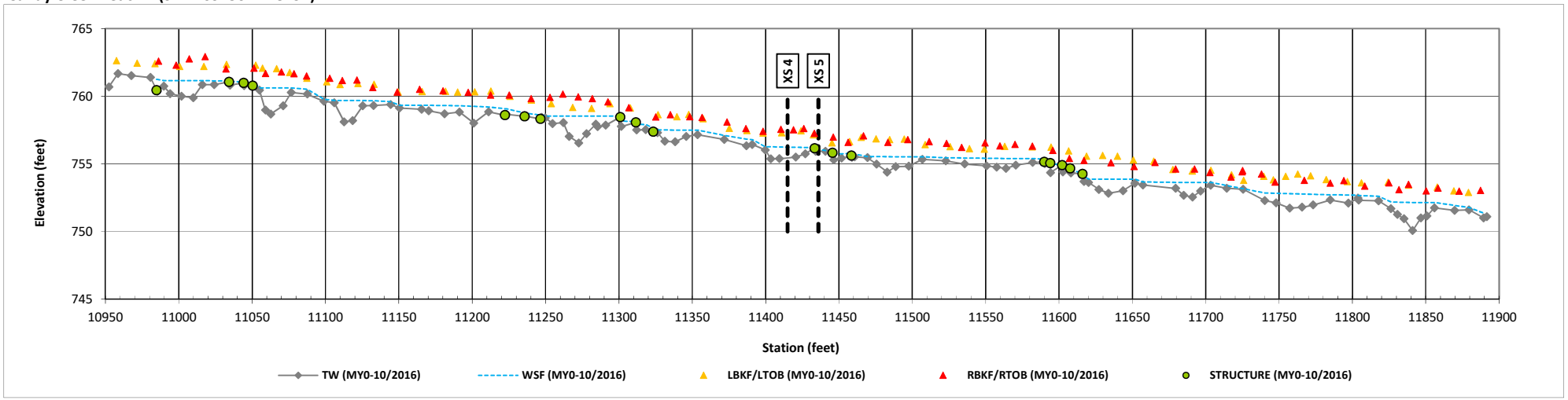
DMS Project No. 96315

Monitoring Year 0 - 2017

Candy Creek Reach 1 (STA 100+08 - 109+50)



Candy Creek Reach 1 (STA 109+50 - 118+91)



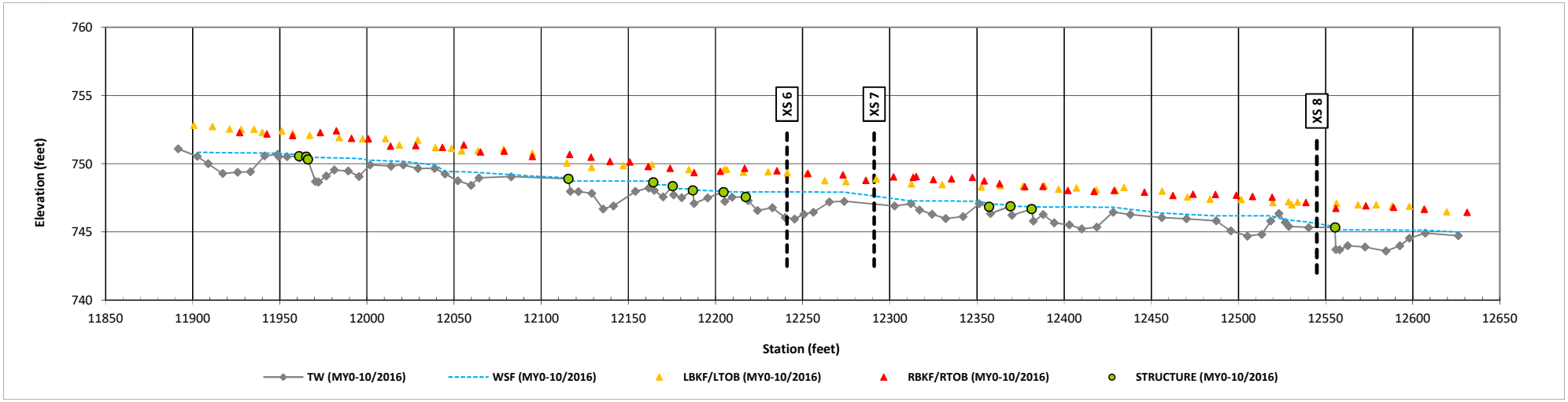
Longitudinal Profile Plots

Candy Creek Mitigation Site

DMS Project No. 96315

Monitoring Year 0 - 2017

Candy Creek Reach 1 (STA 118+91 - 126+27)



Longitudinal Profile Plots

Candy Creek Mitigation Site
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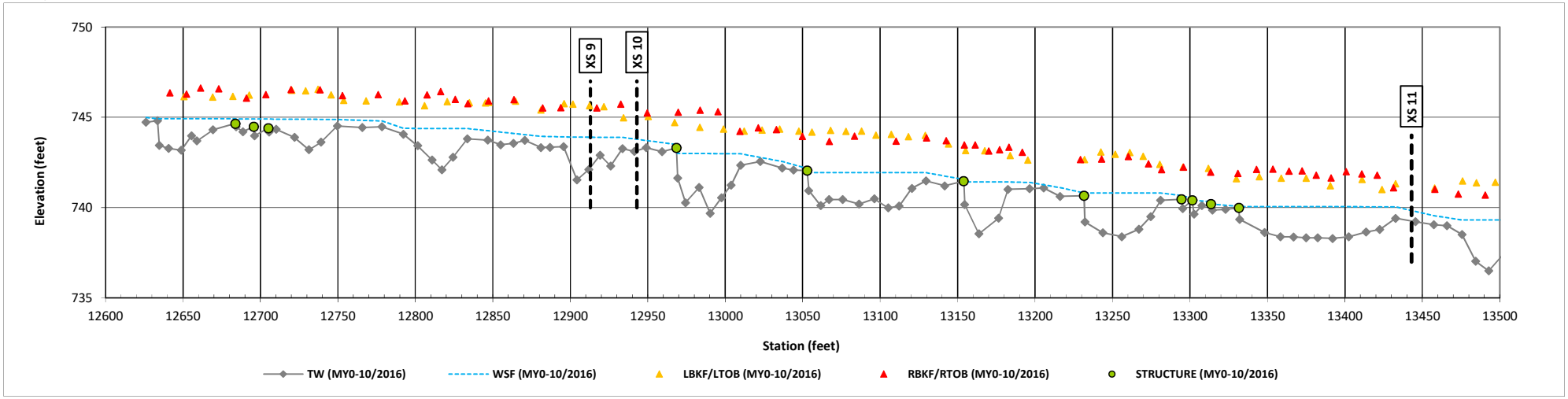
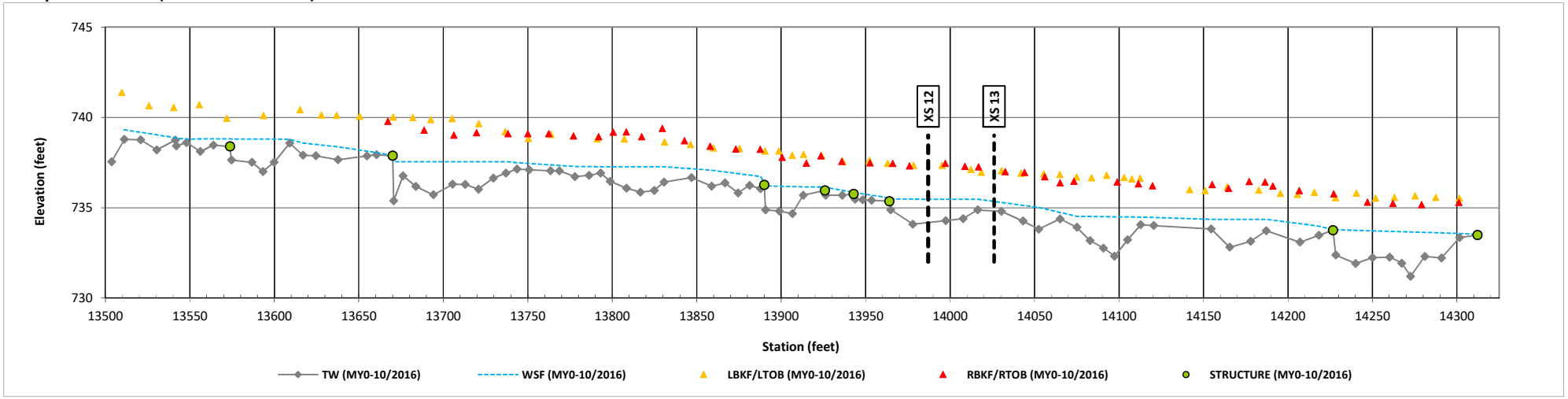
Monitoring Year 0 - 2017

Candy Creek Reach 2 (STA 126+27 - 135+00)



Candy Creek Reach 2 (STA 135+00 - 143+06)



Longitudinal Profile Plots

Candy Creek Mitigation Site
DMS Project No. 96315
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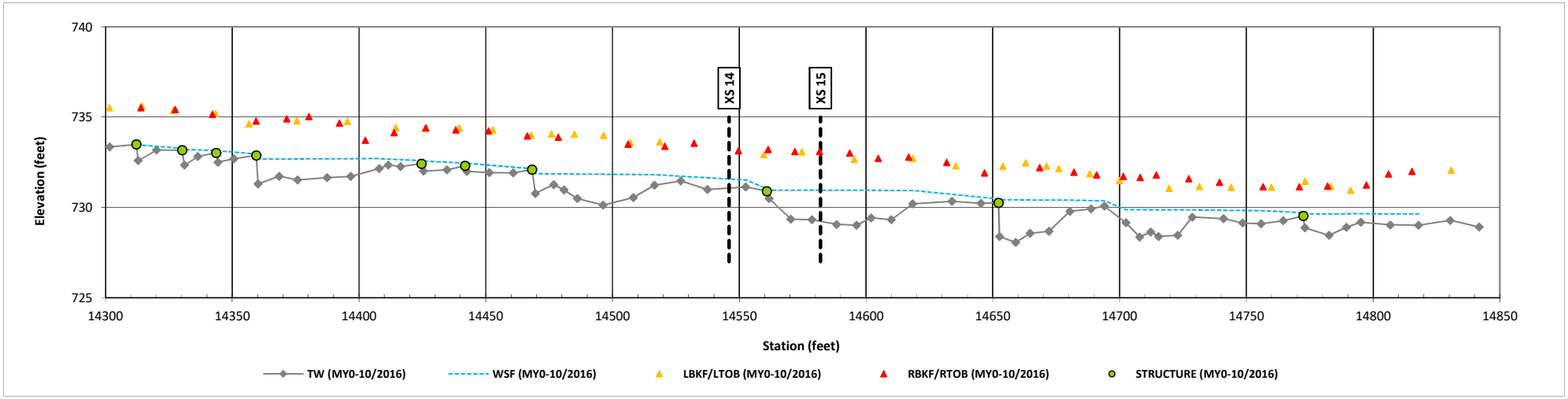
Candy Creek Reach 2 (STA 143+06 - 148+42)



Longitudinal Profile Plots

Candy Creek Mitigation Site
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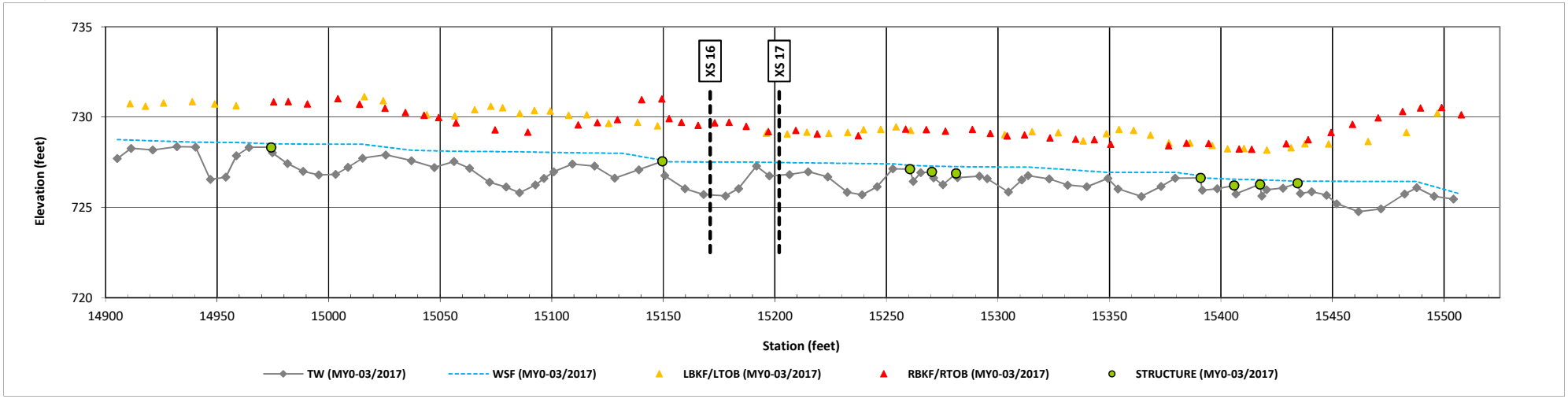
Candy Creek Reach 3 (STA 149+02 - 155+05)



Longitudinal Profile Plots

Candy Creek Mitigation Site

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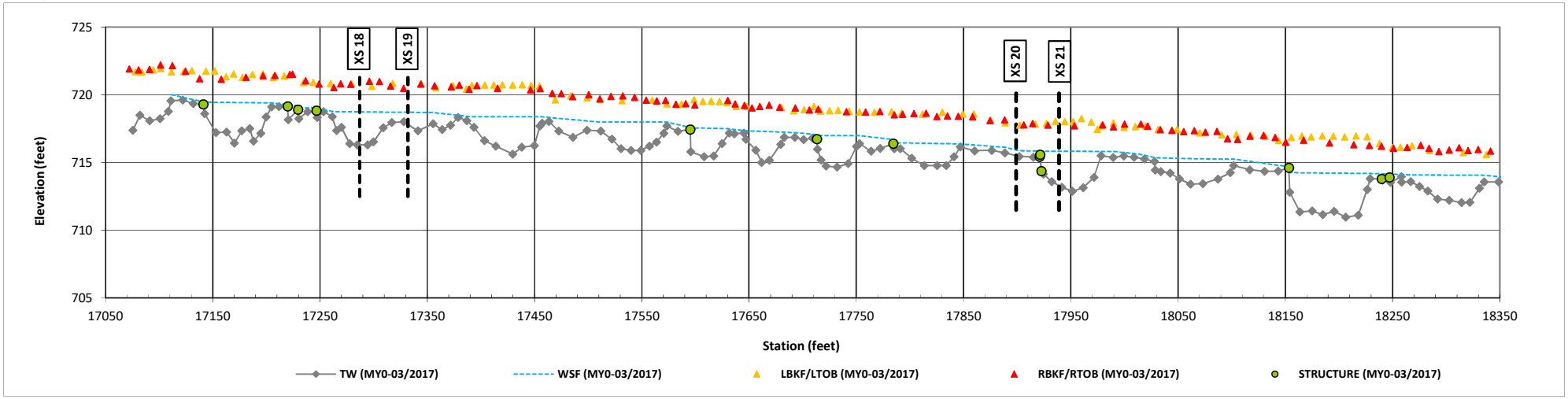
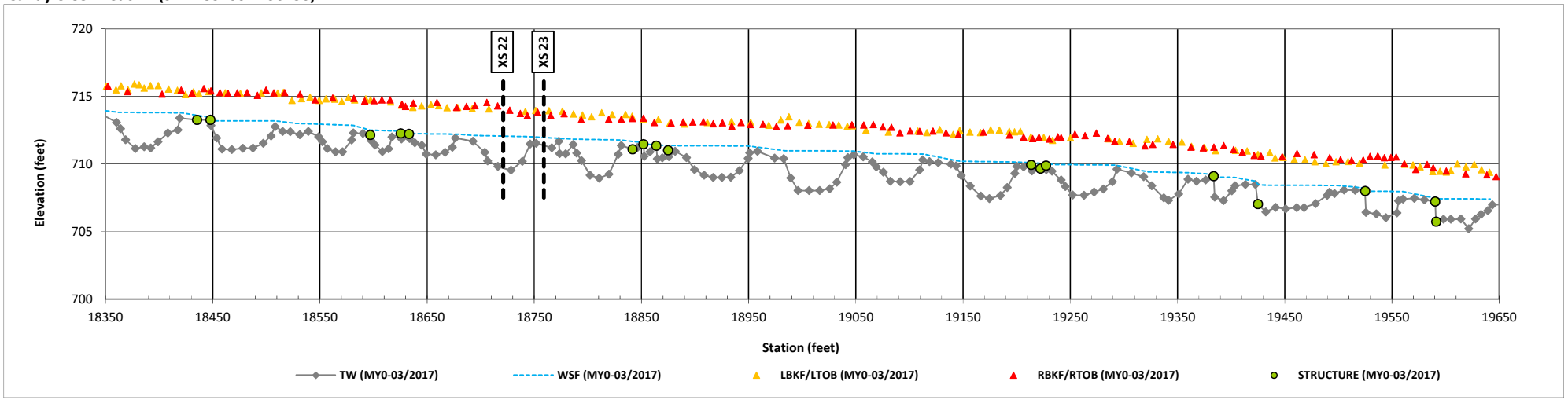
Candy Creek Reach 4 (STA 170+71 - 183+60)



Candy Creek Reach 4 (STA 183+60 - 196+50)



Longitudinal Profile Plots

Candy Creek Mitigation Site
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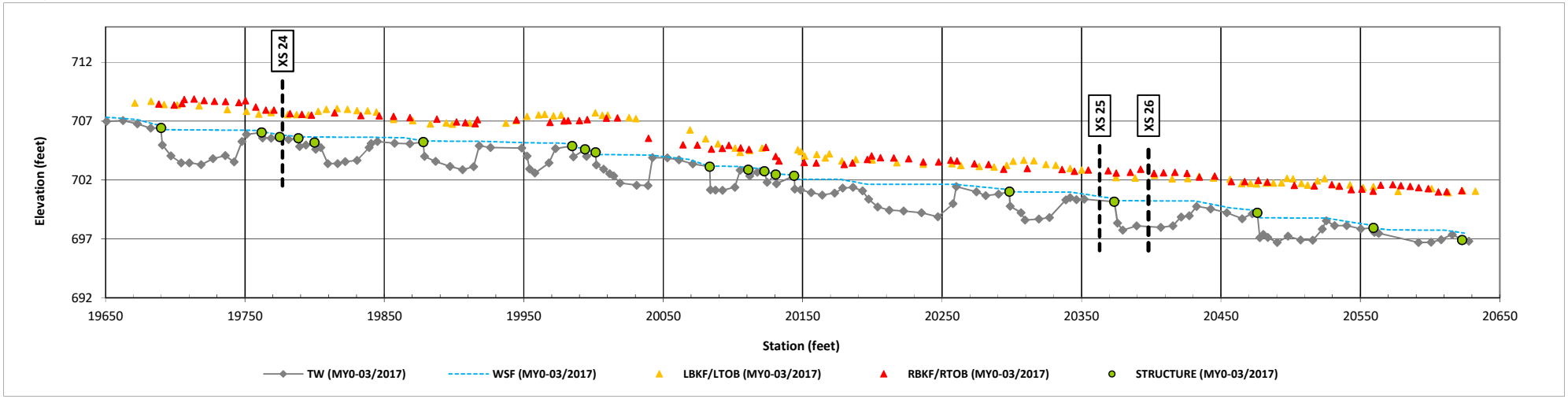
Candy Creek Reach 4 (STA 196+50 - 206+35)



Longitudinal Profile Plots

Candy Creek Mitigation Site
DMS Project No. 96315
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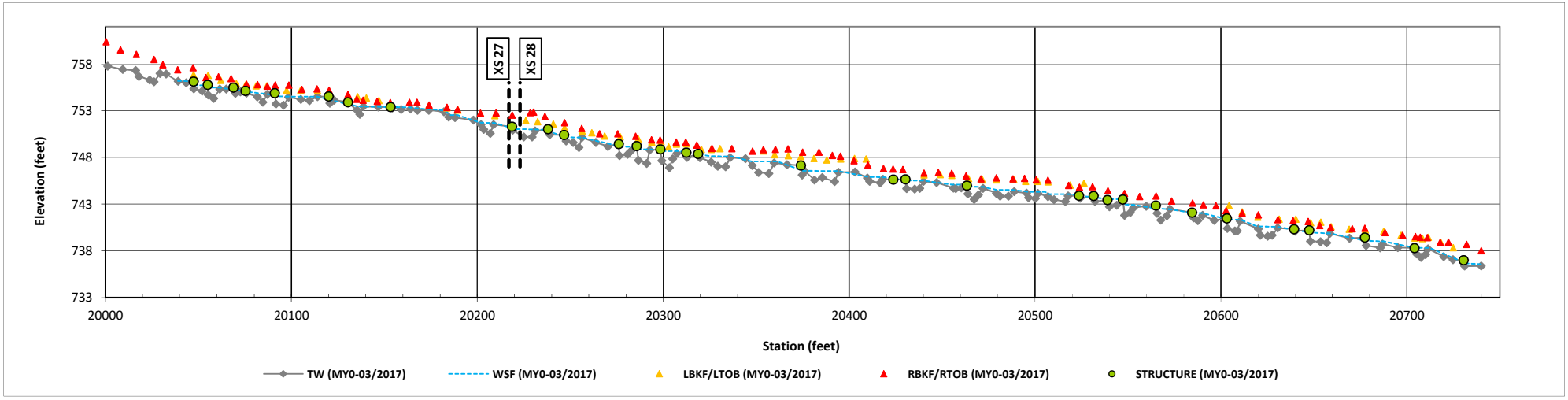
UT1C (STA 200+12 - 207+40)



Longitudinal Profile Plots

Candy Creek Mitigation Site
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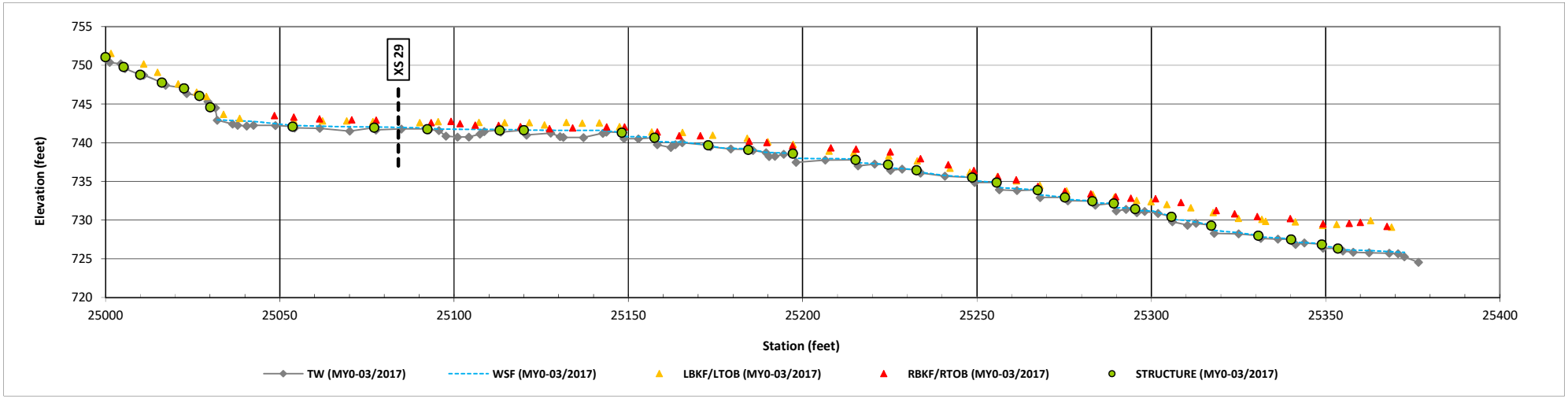
UT1D (STA 250+00 - 253+79)



Longitudinal Profile Plots

Candy Creek Mitigation Site
DMS Project No. 96315
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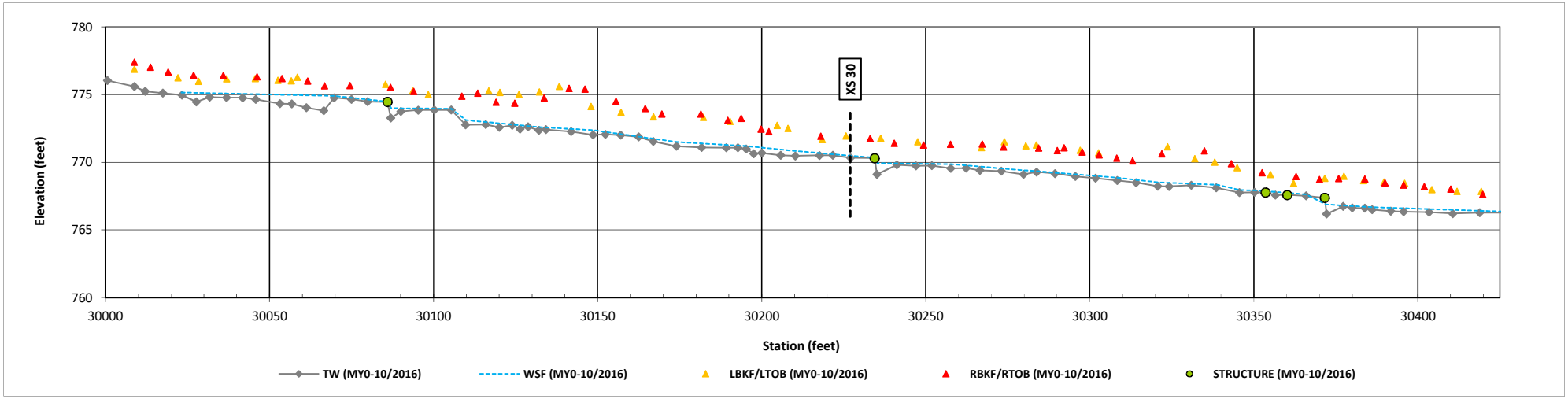
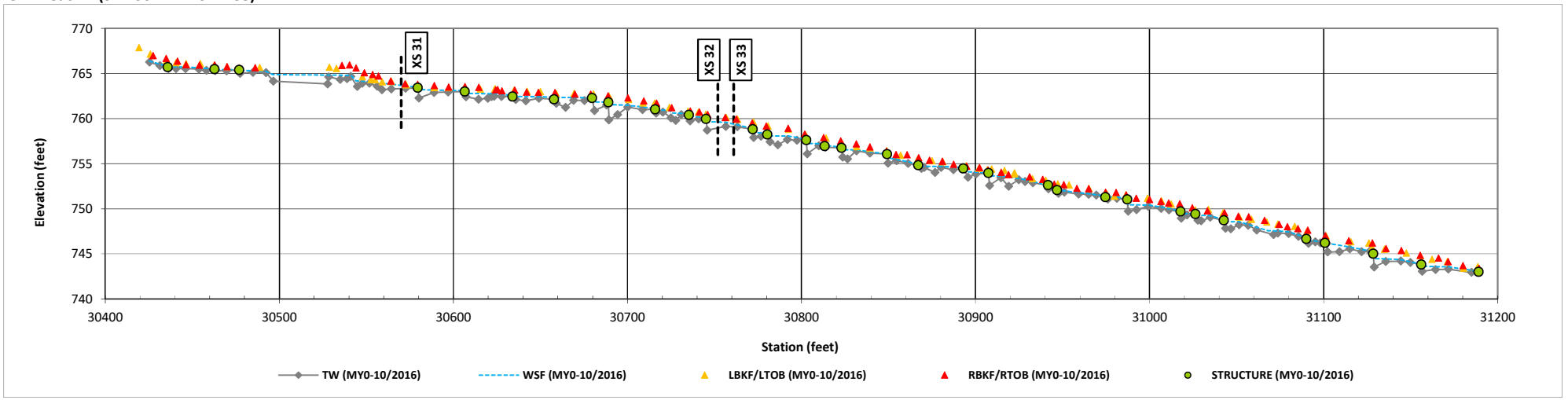
UT2 Reach 1 (STA 300+00 - 304+24)



UT2 Reach 1 (STA 304+24 - 311+88)



Longitudinal Profile Plots

Candy Creek Mitigation Site
DMS Project No. 96315
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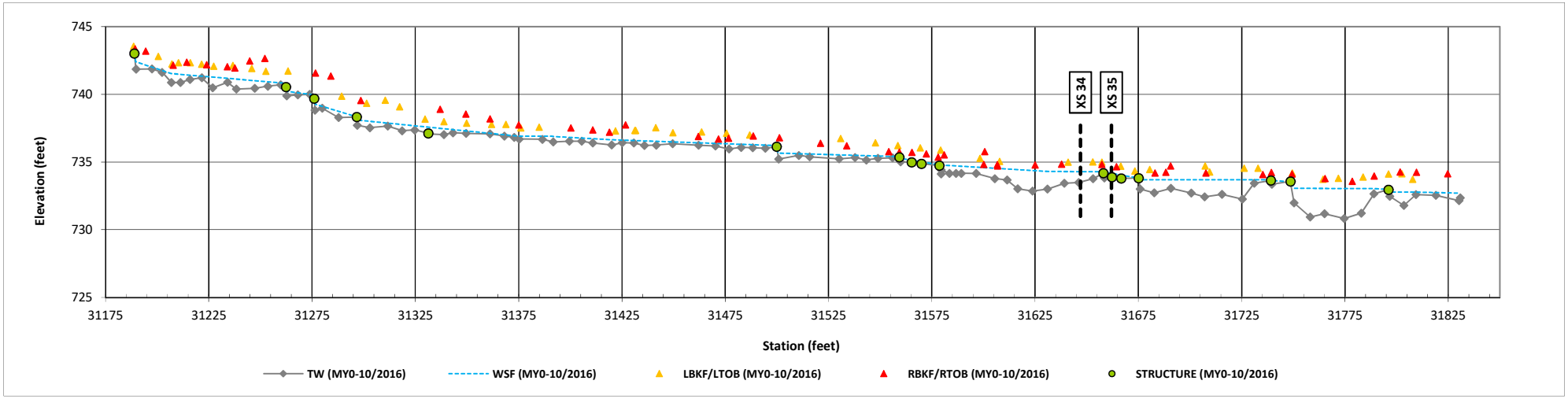
UT2 Reach 2 (STA 311+88 - 318+31)



Longitudinal Profile Plots

Candy Creek Mitigation Site
DMS Project No. 96315
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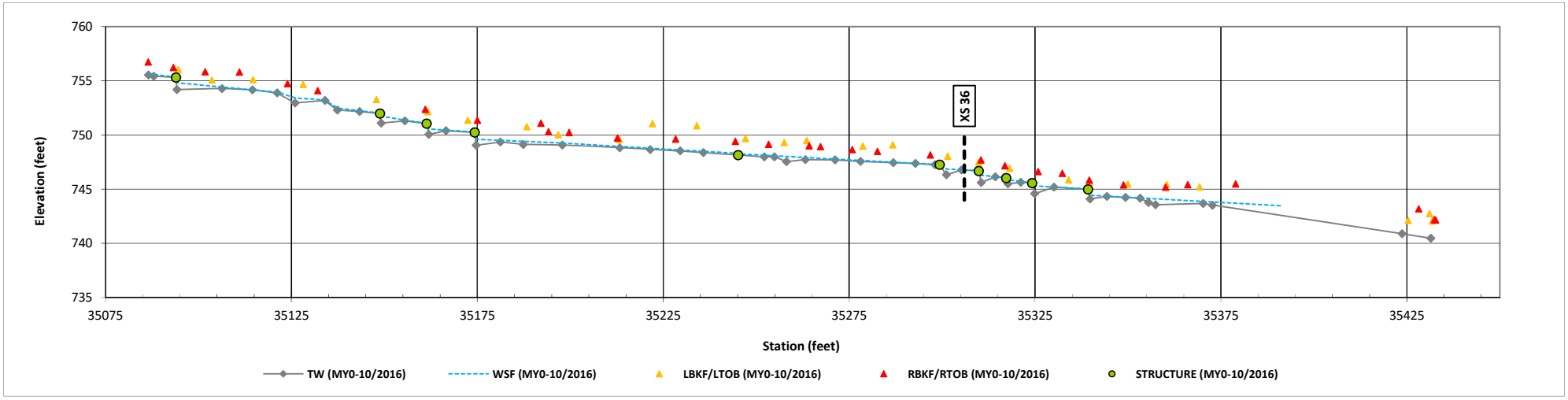
UT2A (STA 350+84 - 354+37)



Longitudinal Profile Plots

Candy Creek Mitigation Site
DMS Project No. 96315
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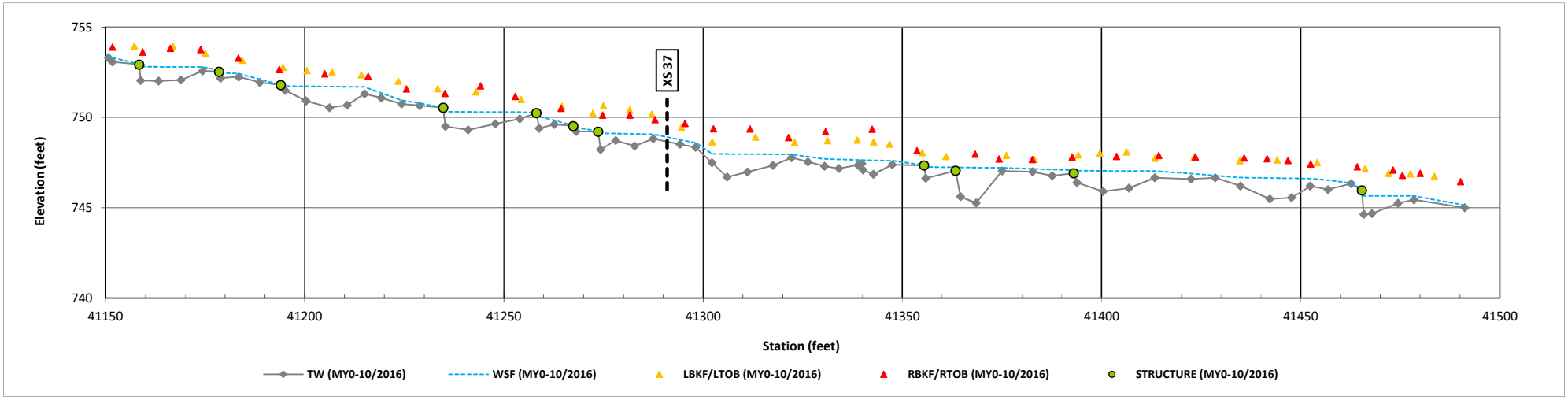
UT3 (STA 411+50 - 414+96)



Longitudinal Profile Plots

Candy Creek Mitigation Site
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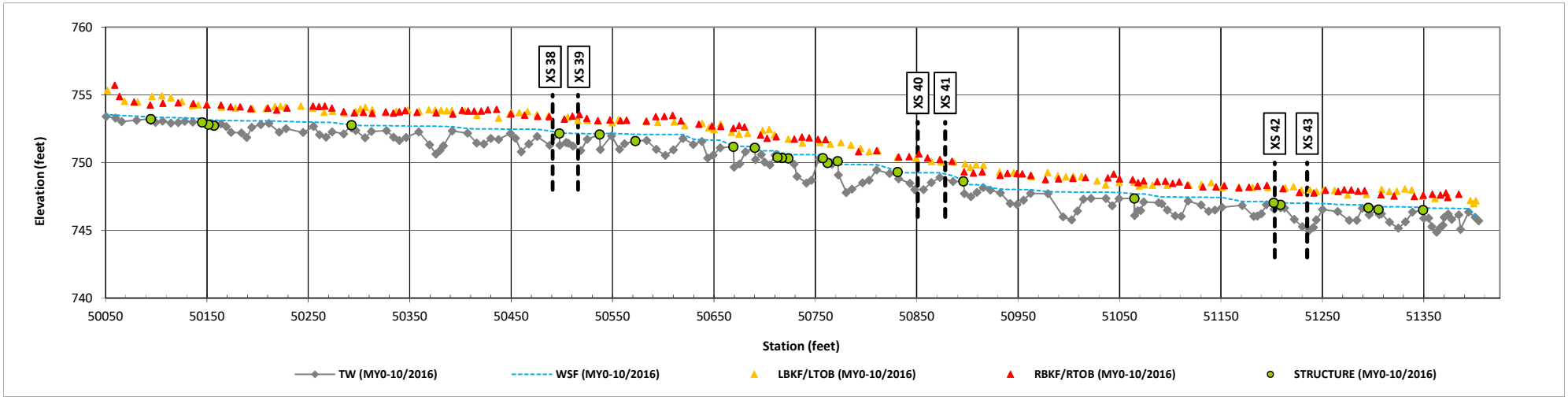
UT4 (STA 500+49 - 514+05)



Longitudinal Profile Plots

Candy Creek Mitigation Site
DMS Project No. 96315
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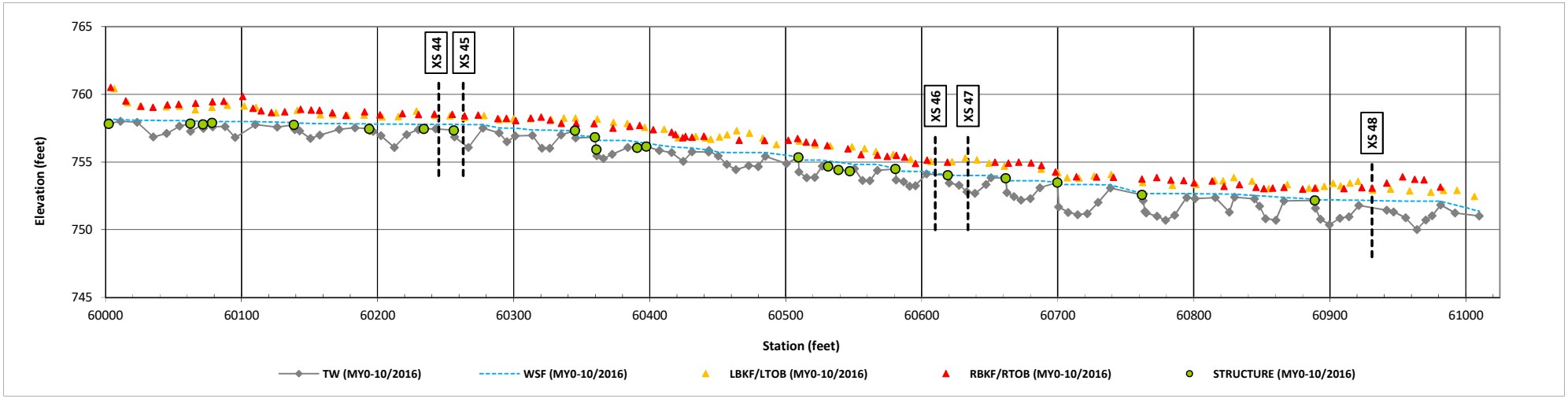
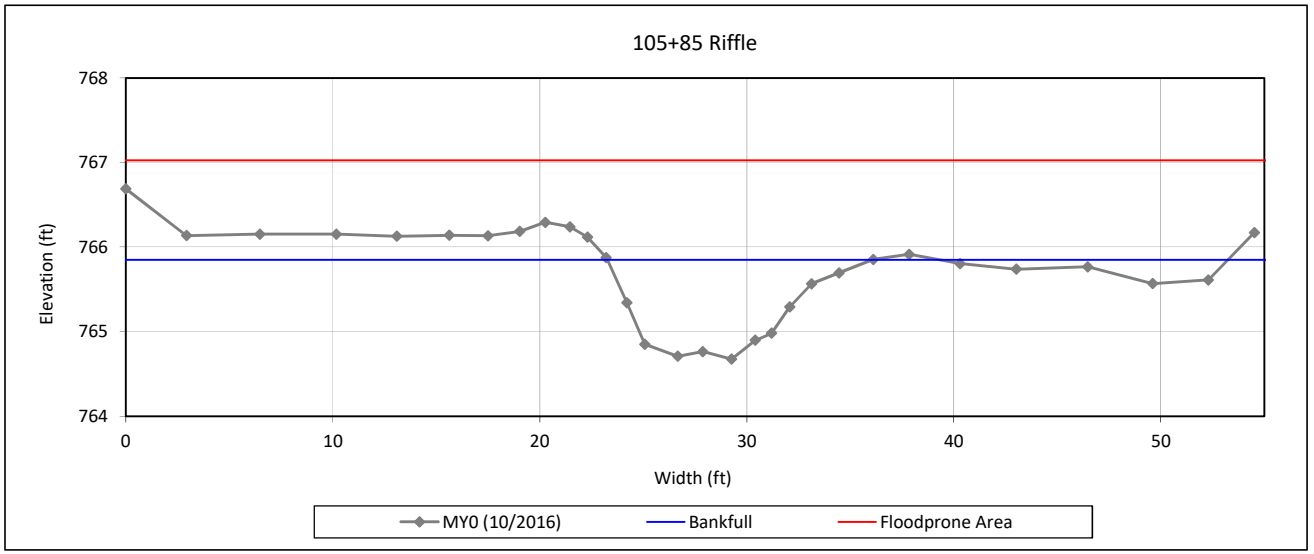
UT5 (STA 600+00 - 610+12)



Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 1 - Candy Creek Reach 1



Bankfull Dimensions	
8.9	x-section area (ft.sq.)
12.8	width (ft)
0.7	mean depth (ft)
1.2	max depth (ft)
13.2	wetted perimeter (ft)
0.7	hydraulic radius (ft)
18.4	width-depth ratio
71.0	W flood prone area (ft)
5.5	entrenchment ratio
1.0	low bank height ratio

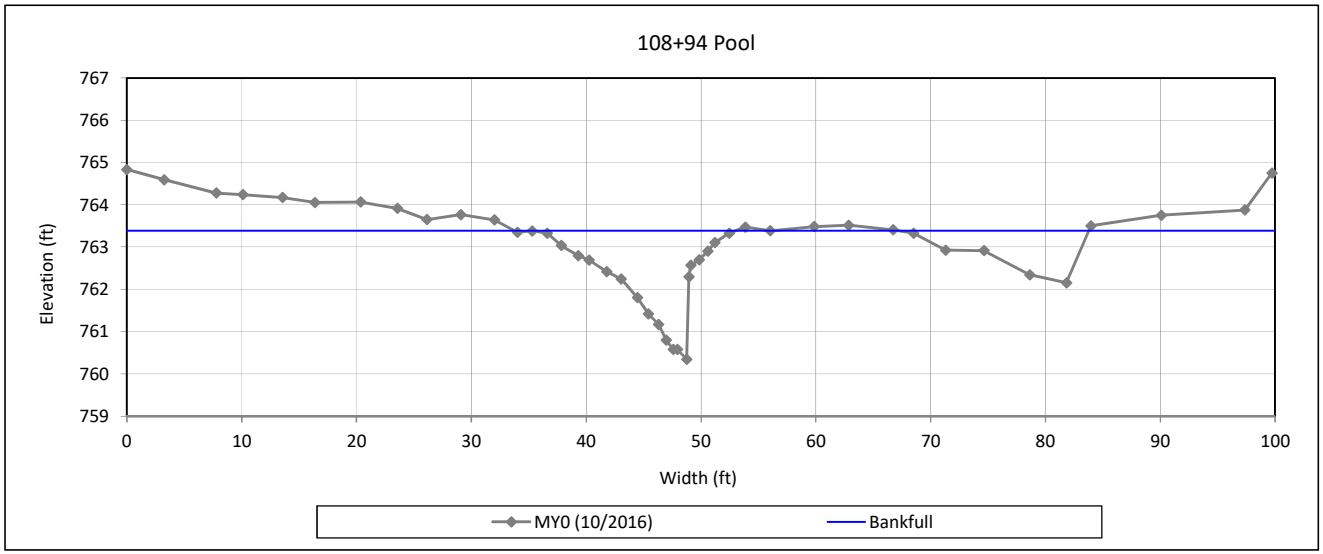
Survey Date: 10/2016
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 2 - Candy Creek Reach 1



Bankfull Dimensions	
18.4	x-section area (ft.sq.)
18.7	width (ft)
1.0	mean depth (ft)
3.0	max depth (ft)
21.2	wetted perimeter (ft)
0.9	hydraulic radius (ft)
19.0	width-depth ratio

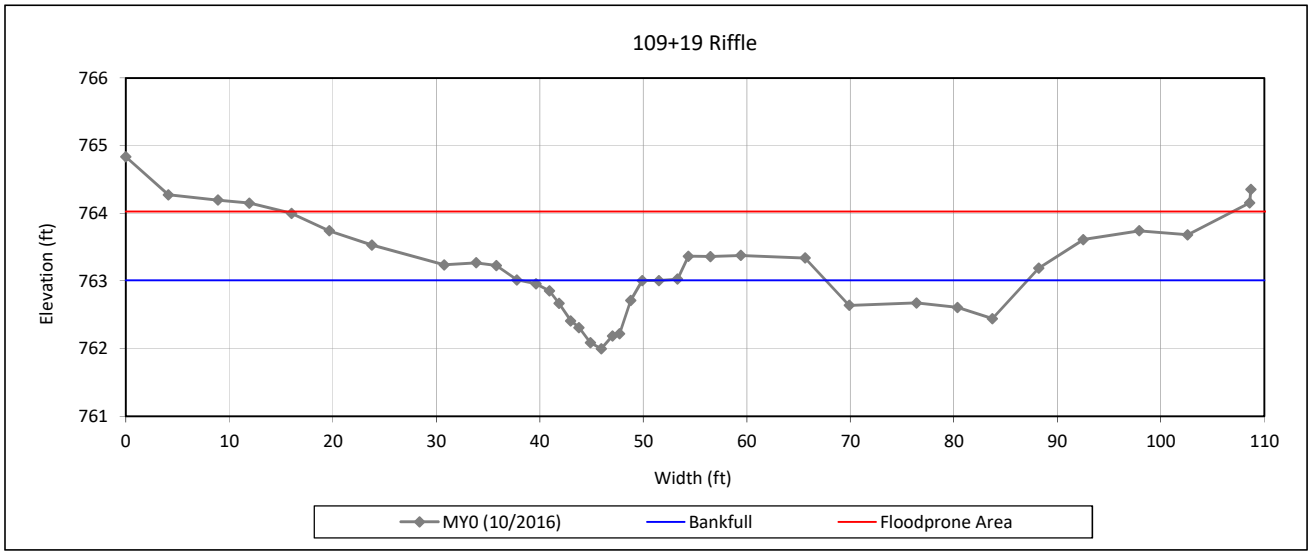
Survey Date: 10/2016
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 3 - Candy Creek Reach 1



Bankfull Dimensions	
5.7	x-section area (ft.sq.)
12.0	width (ft)
0.5	mean depth (ft)
1.0	max depth (ft)
12.2	wetted perimeter (ft)
0.5	hydraulic radius (ft)
25.3	width-depth ratio
97.0	W flood prone area (ft)
8.1	entrenchment ratio
1.0	low bank height ratio

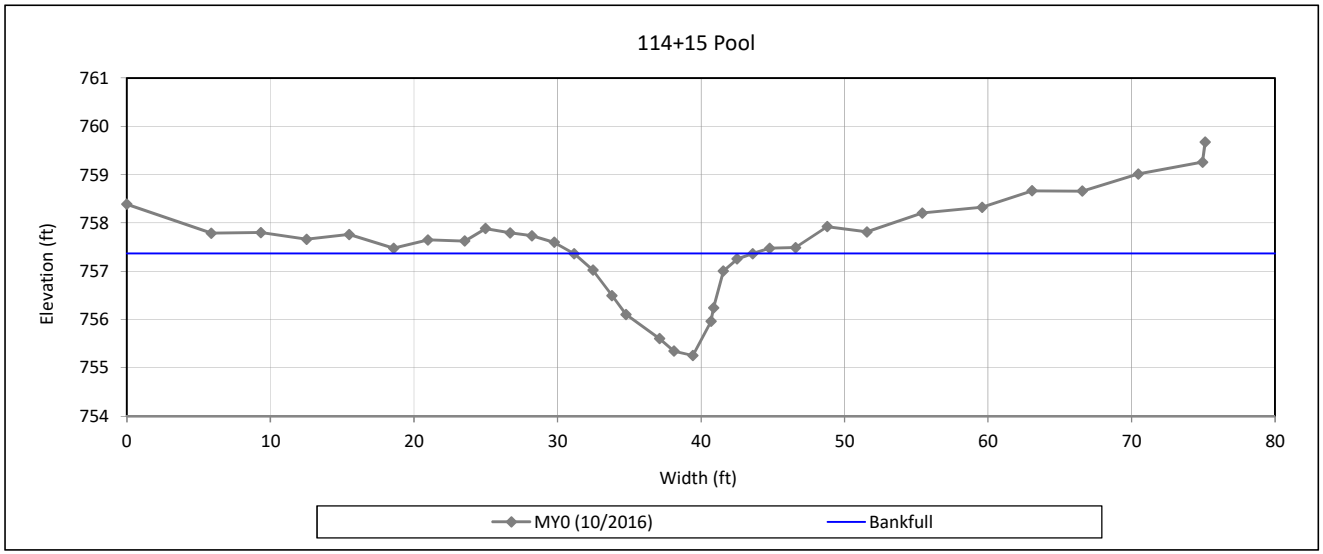
Survey Date: 10/2016
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 4 - Candy Creek Reach 1



Bankfull Dimensions	
13.5	x-section area (ft.sq.)
12.5	width (ft)
1.1	mean depth (ft)
2.1	max depth (ft)
13.6	wetted perimeter (ft)
1.0	hydraulic radius (ft)
11.6	width-depth ratio

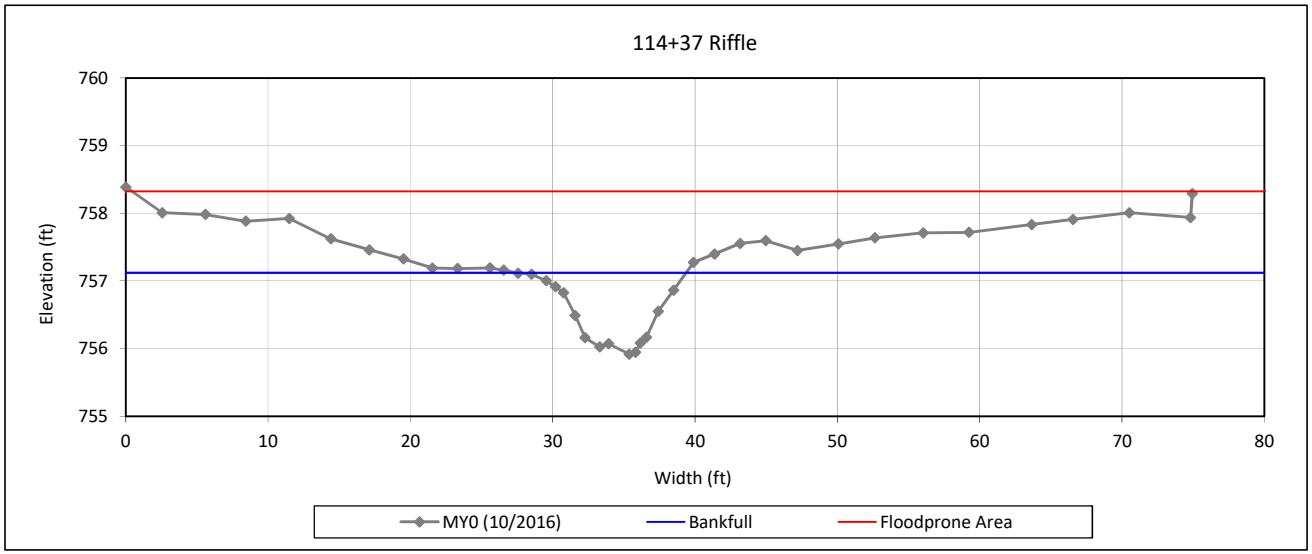
Survey Date: 10/2016
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 5 - Candy Creek Reach 1



Bankfull Dimensions	
7.1	x-section area (ft.sq.)
11.9	width (ft)
0.6	mean depth (ft)
1.2	max depth (ft)
12.3	wetted perimeter (ft)
0.6	hydraulic radius (ft)
19.9	width-depth ratio
53.0	W flood prone area (ft)
4.4	entrenchment ratio
1.0	low bank height ratio

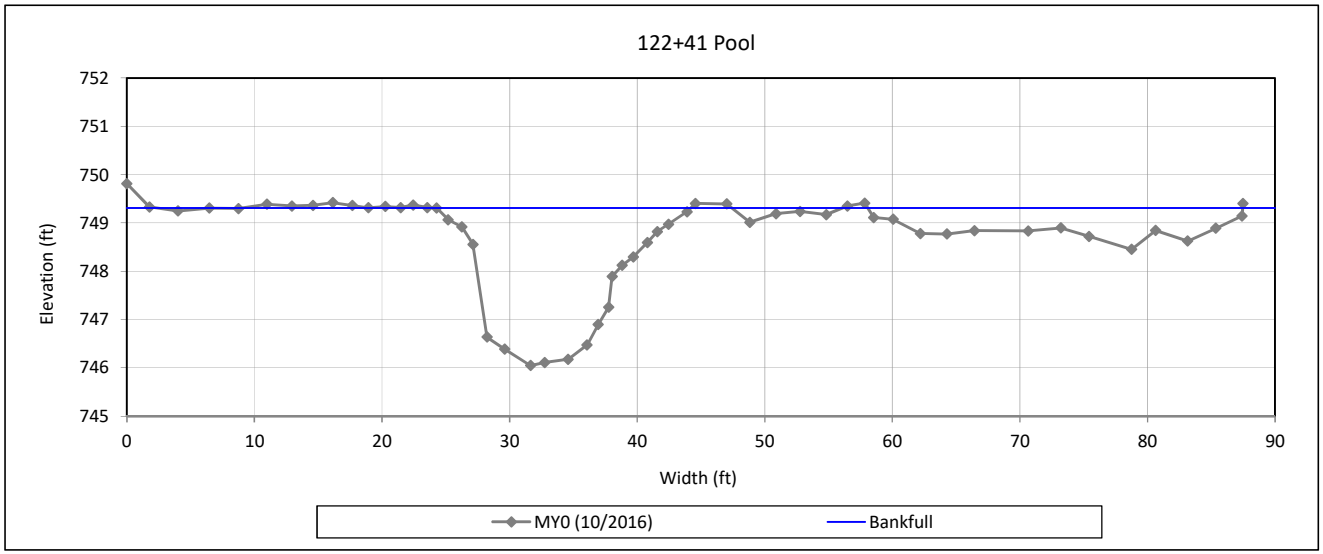
Survey Date: 10/2016
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 6 - Candy Creek Reach 1



Bankfull Dimensions	
35.5	x-section area (ft.sq.)
19.9	width (ft)
1.8	mean depth (ft)
3.3	max depth (ft)
22.0	wetted perimeter (ft)
1.6	hydraulic radius (ft)
11.2	width-depth ratio

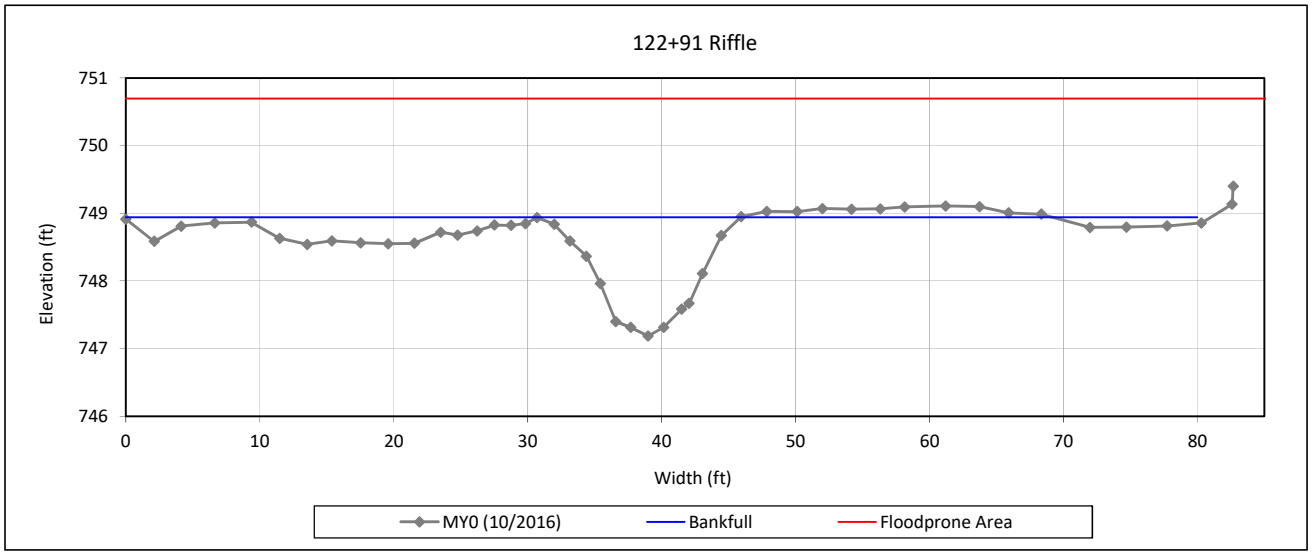
Survey Date: 10/2016
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 7 - Candy Creek Reach 1



Bankfull Dimensions	
13.9	x-section area (ft.sq.)
16.1	width (ft)
0.9	mean depth (ft)
1.8	max depth (ft)
16.6	wetted perimeter (ft)
0.8	hydraulic radius (ft)
18.6	width-depth ratio
164.0	W flood prone area (ft)
10.2	entrenchment ratio
1.0	low bank height ratio

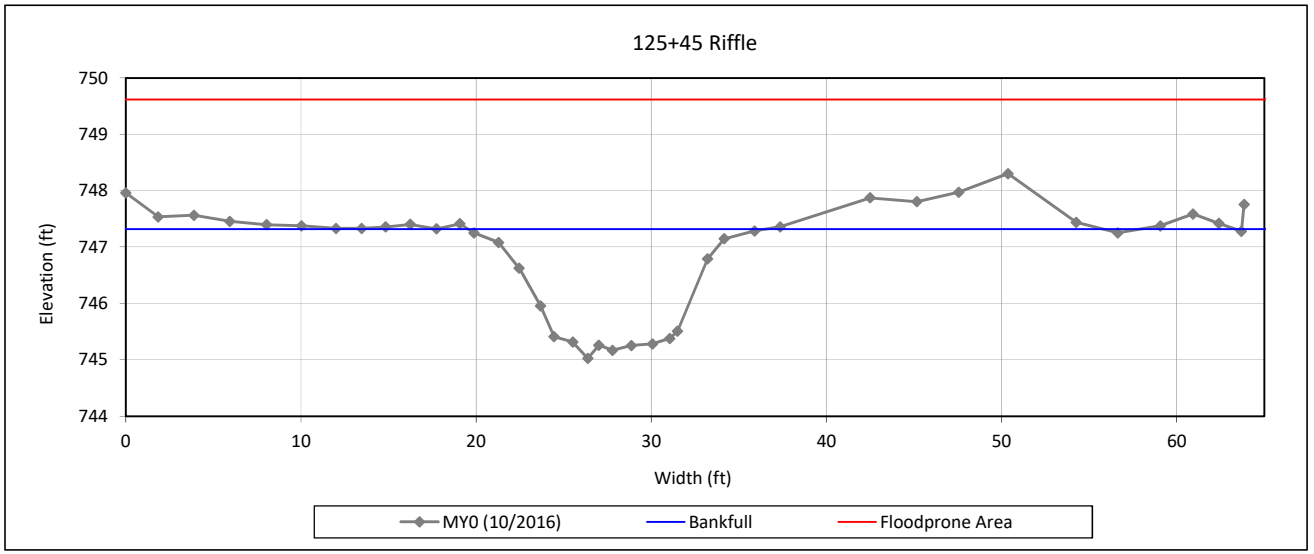
Survey Date: 10/2016
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 8 - Candy Creek Reach 1



Bankfull Dimensions	
20.3	x-section area (ft.sq.)
17.0	width (ft)
1.2	mean depth (ft)
2.3	max depth (ft)
18.1	wetted perimeter (ft)
1.1	hydraulic radius (ft)
14.3	width-depth ratio
292.0	W flood prone area (ft)
17.1	entrenchment ratio
1.0	low bank height ratio

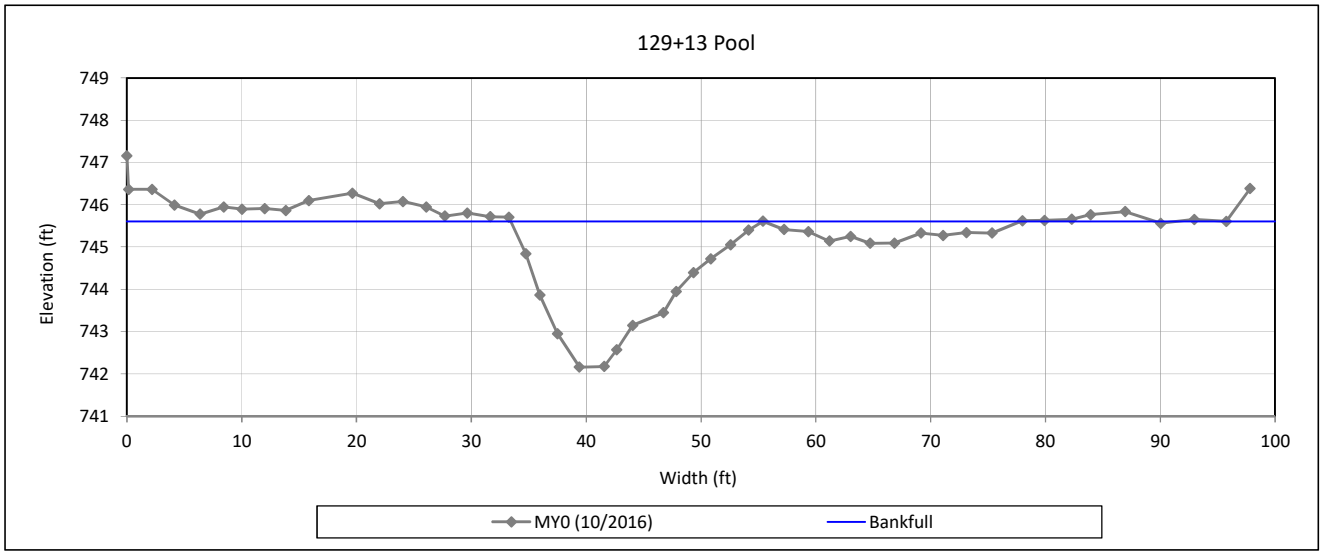
Survey Date: 10/2016
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 9 - Candy Creek Reach 2



Bankfull Dimensions	
40.1	x-section area (ft.sq.)
22.0	width (ft)
1.8	mean depth (ft)
3.5	max depth (ft)
23.4	wetted perimeter (ft)
1.7	hydraulic radius (ft)
12.0	width-depth ratio

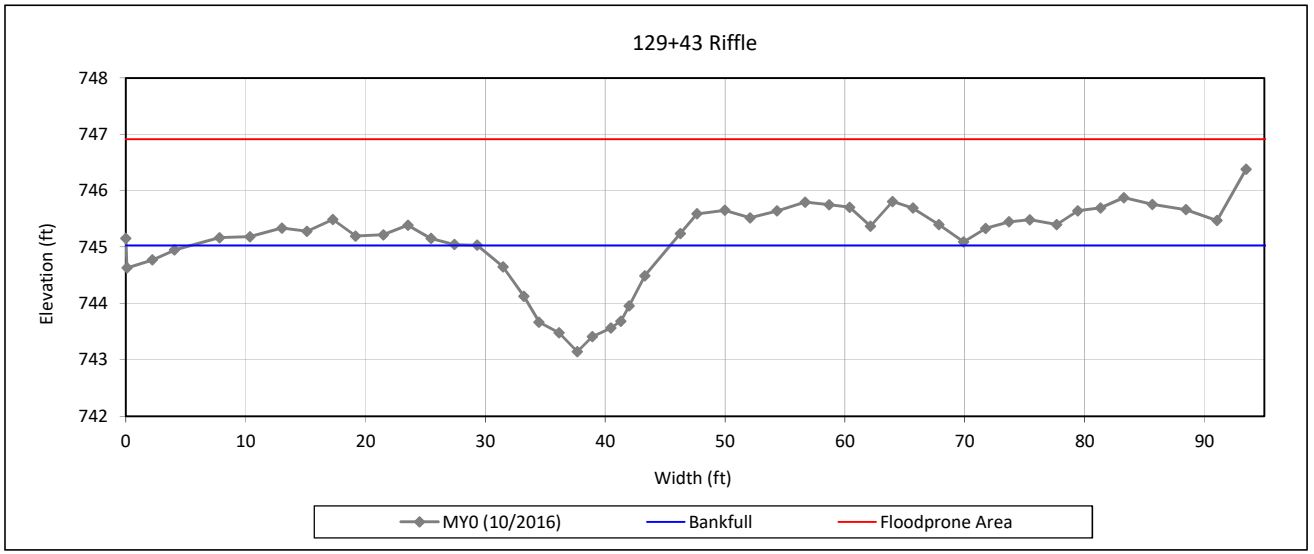
Survey Date: 10/2016
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 10 - Candy Creek Reach 2



Bankfull Dimensions	
16.2	x-section area (ft.sq.)
16.1	width (ft)
1.0	mean depth (ft)
1.9	max depth (ft)
16.6	wetted perimeter (ft)
1.0	hydraulic radius (ft)
16.0	width-depth ratio
254.0	W flood prone area (ft)
15.8	entrenchment ratio
1.0	low bank height ratio

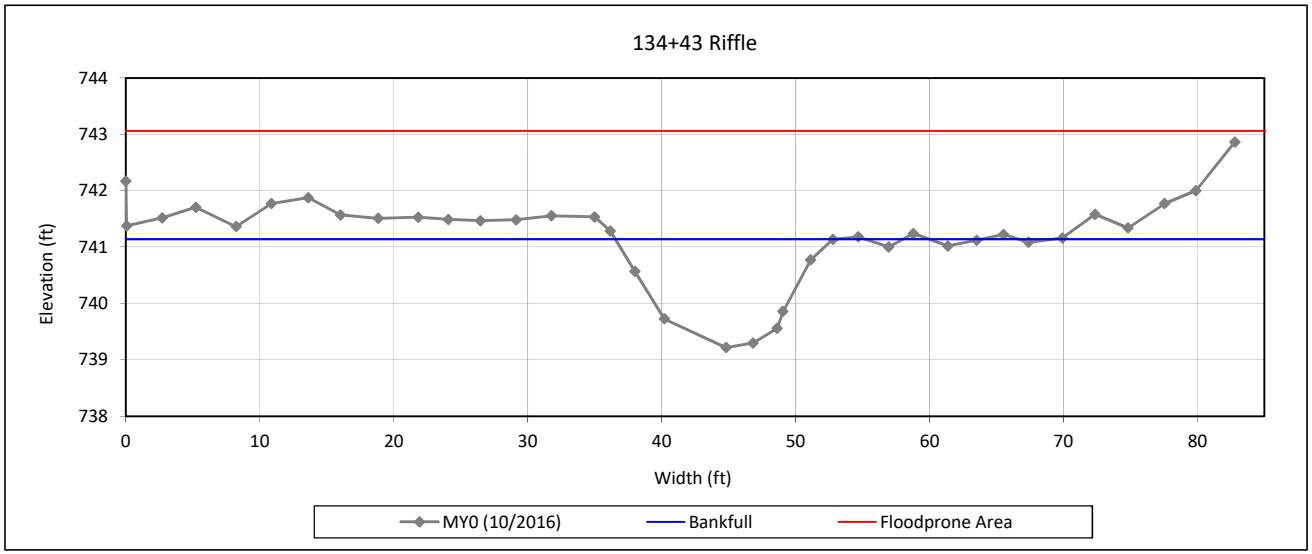
Survey Date: 10/2016
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 11 - Candy Creek Reach 2



Bankfull Dimensions	
19.8	x-section area (ft.sq.)
16.3	width (ft)
1.2	mean depth (ft)
1.9	max depth (ft)
16.9	wetted perimeter (ft)
1.2	hydraulic radius (ft)
13.3	width-depth ratio
154.0	W flood prone area (ft)
9.5	entrenchment ratio
1.0	low bank height ratio

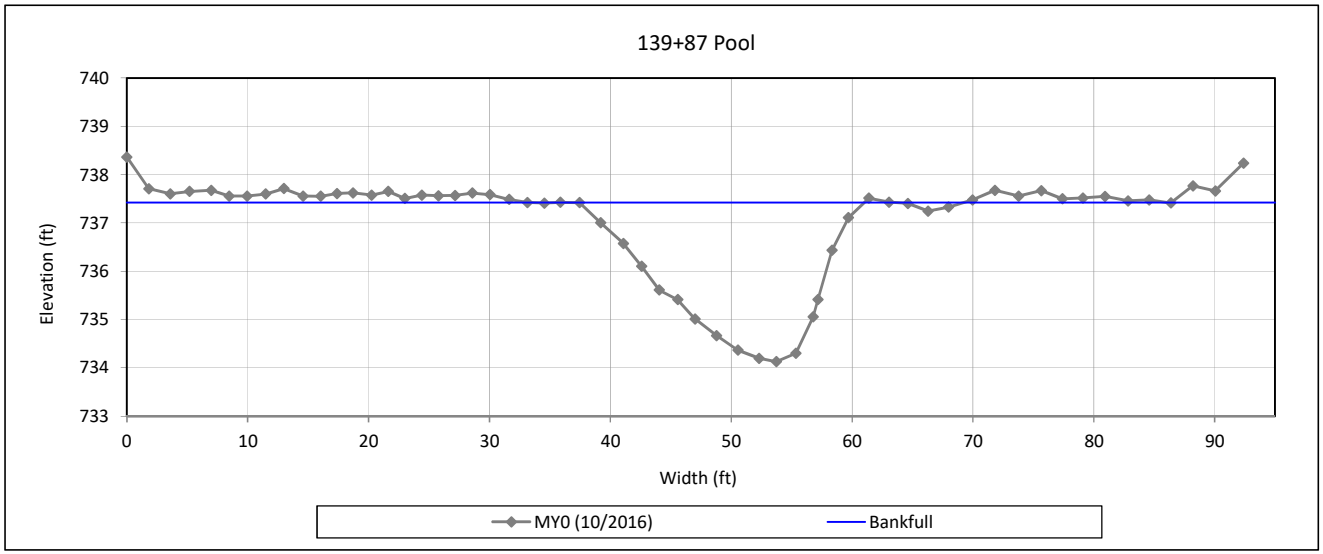
Survey Date: 10/2016
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 12 - Candy Creek Reach 2



Bankfull Dimensions	
44.2	x-section area (ft.sq.)
23.6	width (ft)
1.9	mean depth (ft)
3.3	max depth (ft)
24.9	wetted perimeter (ft)
1.8	hydraulic radius (ft)
12.6	width-depth ratio

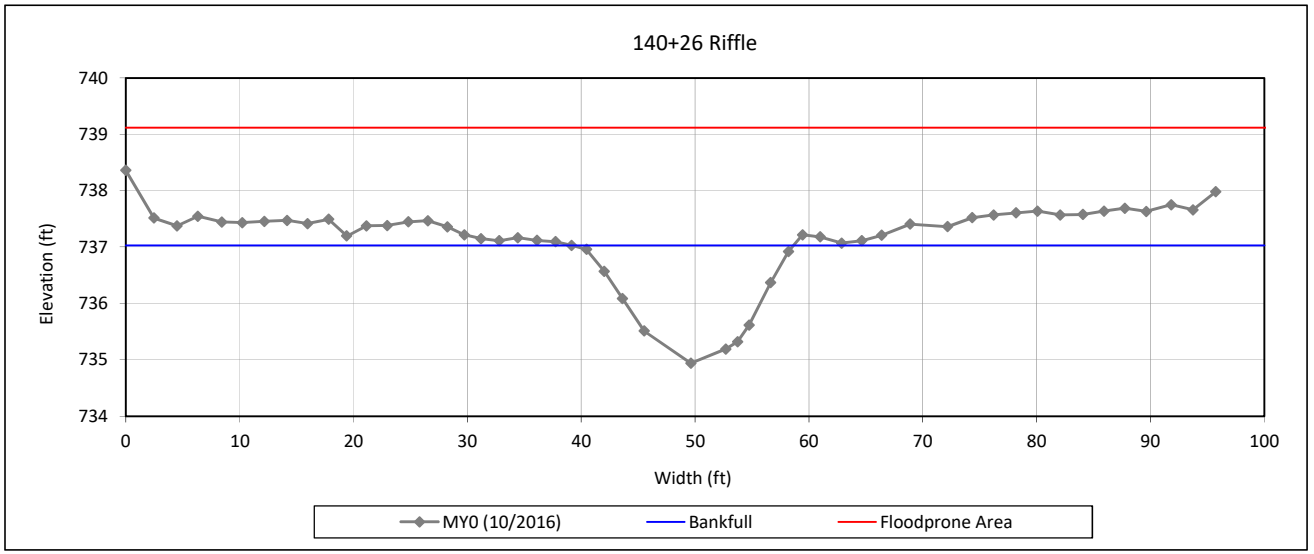
Survey Date: 10/2016
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 13 - Candy Creek Reach 2



Bankfull Dimensions	
23.3	x-section area (ft.sq.)
19.5	width (ft)
1.2	mean depth (ft)
2.1	max depth (ft)
20.1	wetted perimeter (ft)
1.2	hydraulic radius (ft)
16.3	width-depth ratio
221.0	W flood prone area (ft)
11.3	entrenchment ratio
1.0	low bank height ratio

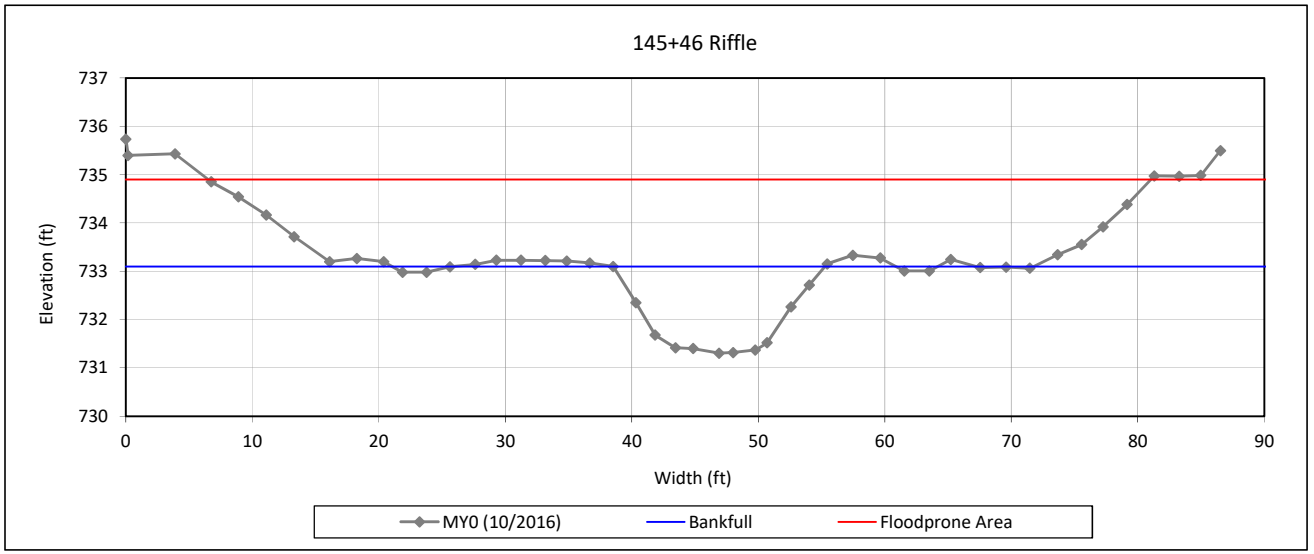
Survey Date: 10/2016
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 14 - Candy Creek Reach 2



Bankfull Dimensions	
20.8	x-section area (ft.sq.)
16.7	width (ft)
1.2	mean depth (ft)
1.8	max depth (ft)
17.3	wetted perimeter (ft)
1.2	hydraulic radius (ft)
13.5	width-depth ratio
164.0	W flood prone area (ft)
9.8	entrenchment ratio
1.0	low bank height ratio

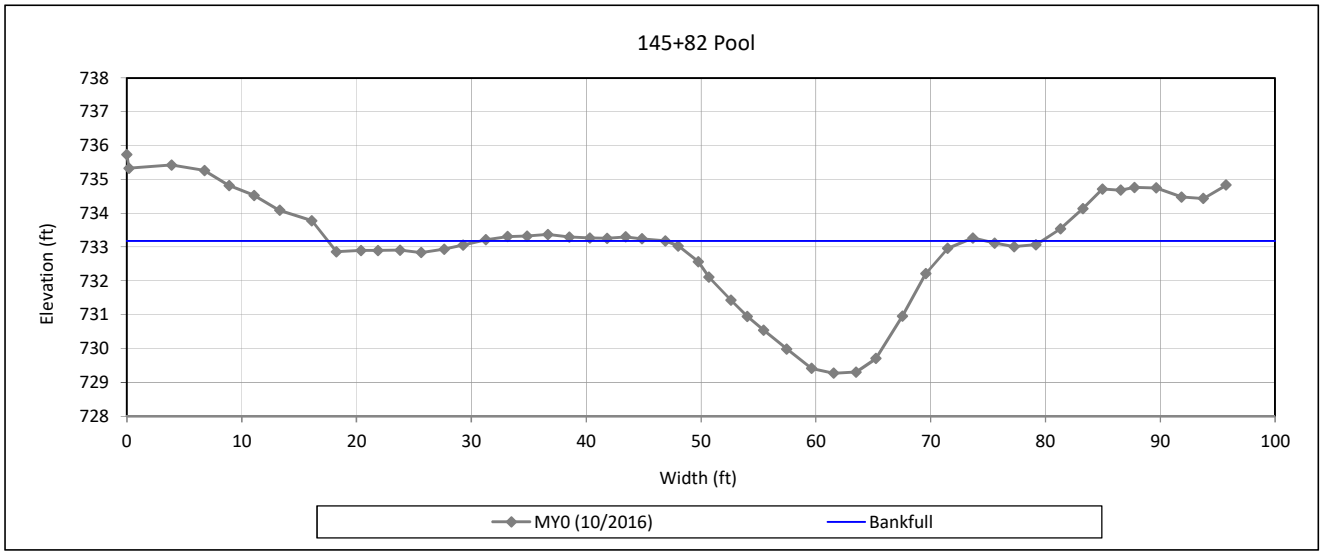
Survey Date: 10/2016
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 15 - Candy Creek Reach 2



Bankfull Dimensions	
56.4	x-section area (ft.sq.)
26.1	width (ft)
2.2	mean depth (ft)
3.9	max depth (ft)
27.6	wetted perimeter (ft)
2.0	hydraulic radius (ft)
12.1	width-depth ratio

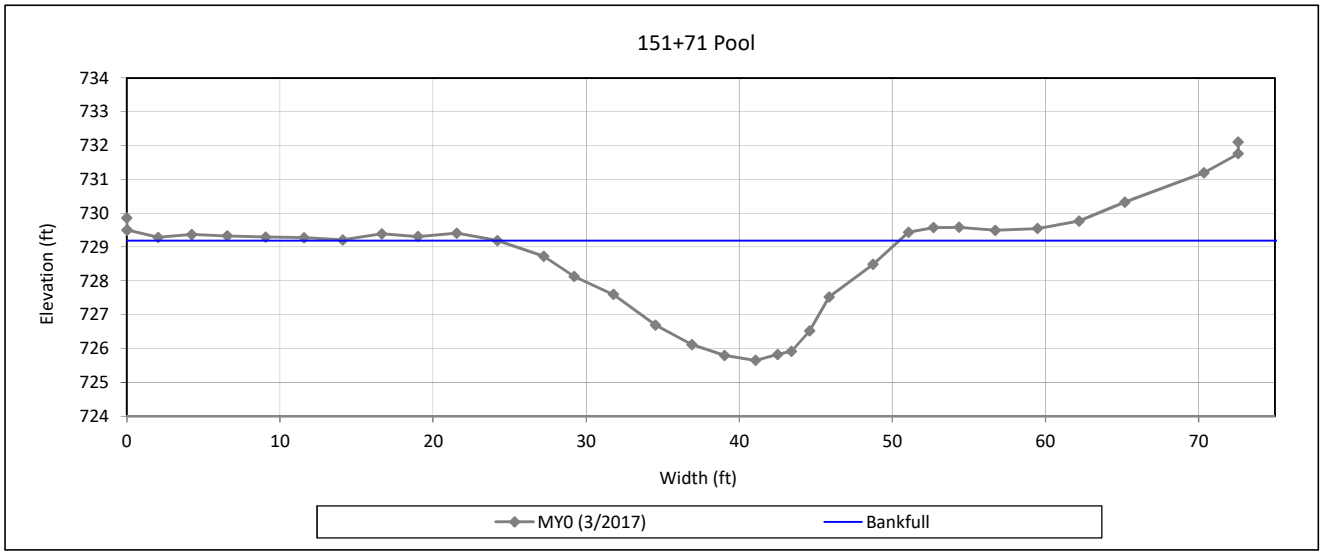
Survey Date: 10/2016
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 16 - Candy Creek Reach 3



Bankfull Dimensions	
44.4	x-section area (ft.sq.)
18.7	width (ft)
2.4	mean depth (ft)
3.5	max depth (ft)
19.7	wetted perimeter (ft)
2.3	hydraulic radius (ft)
7.8	width-depth ratio

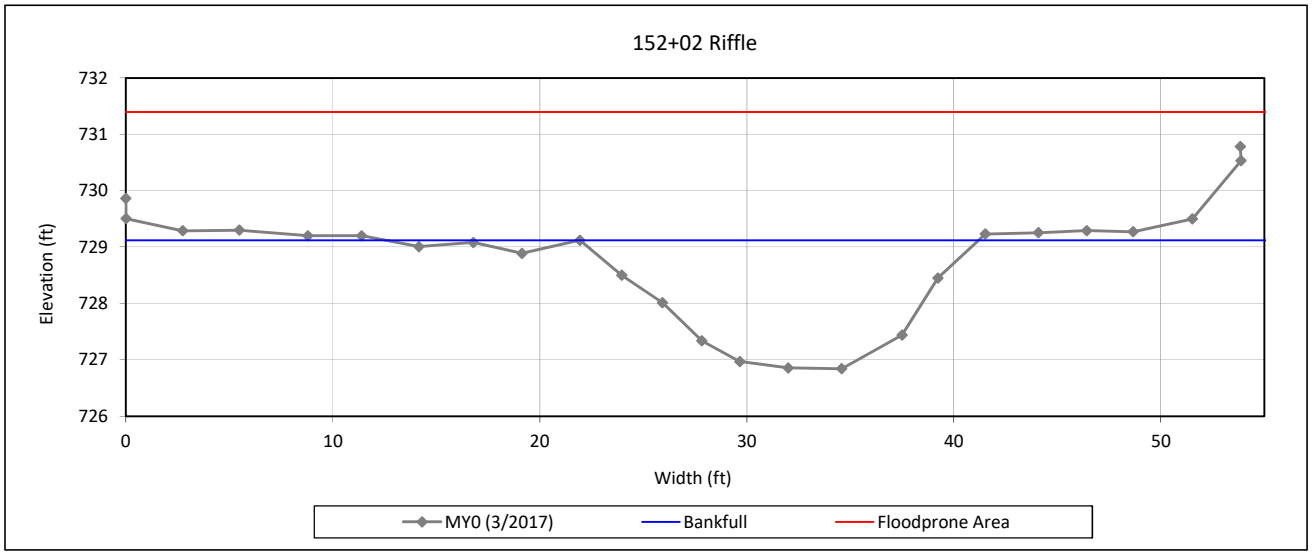
Survey Date: 3/2017
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 17 - Candy Creek Reach 3



Bankfull Dimensions	
28.2	x-section area (ft.sq.)
19.2	width (ft)
1.5	mean depth (ft)
2.3	max depth (ft)
20.0	wetted perimeter (ft)
1.4	hydraulic radius (ft)
13.1	width-depth ratio
57.0	W flood prone area (ft)
3.0	entrenchment ratio
1.0	low bank height ratio

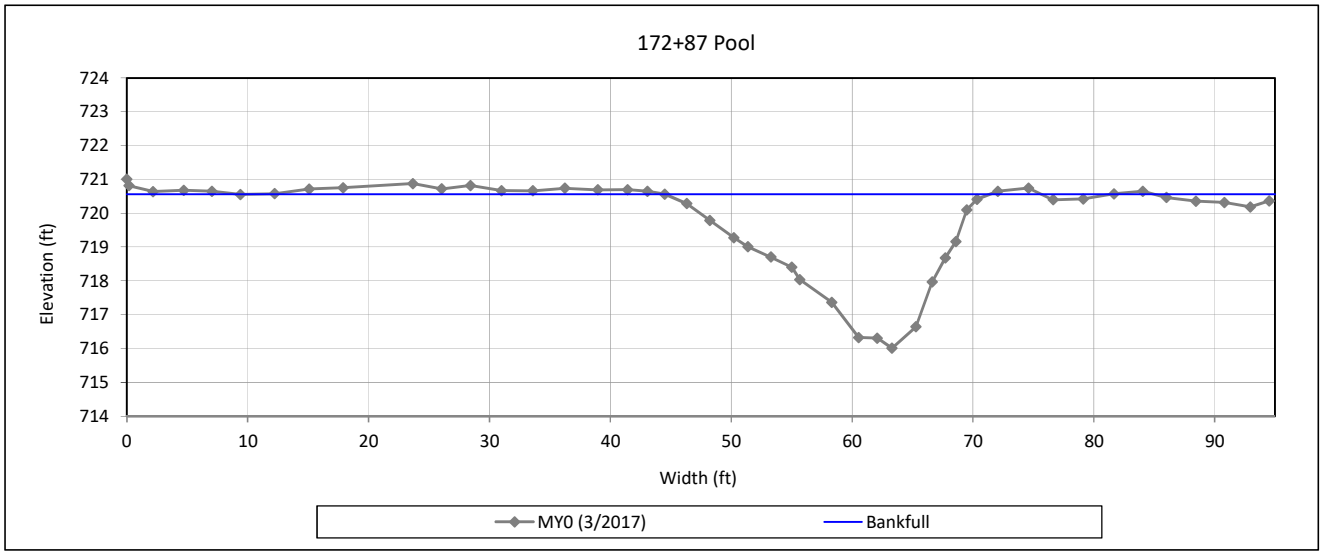
Survey Date: 3/2017
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 18 - Candy Creek Reach 4



Bankfull Dimensions	
58.7	x-section area (ft.sq.)
26.9	width (ft)
2.2	mean depth (ft)
4.5	max depth (ft)
29.0	wetted perimeter (ft)
2.0	hydraulic radius (ft)
12.3	width-depth ratio

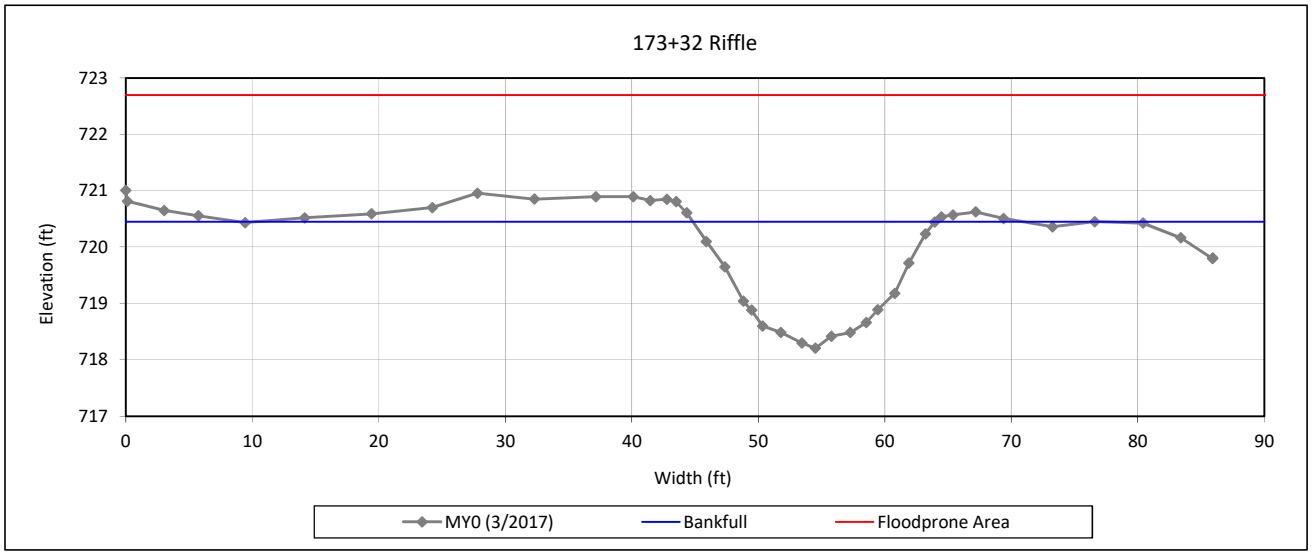
Survey Date: 3/2017
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 19 - Candy Creek Reach 4



Bankfull Dimensions	
26.9	x-section area (ft.sq.)
19.1	width (ft)
1.4	mean depth (ft)
2.2	max depth (ft)
19.8	wetted perimeter (ft)
1.4	hydraulic radius (ft)
13.6	width-depth ratio
222.0	W flood prone area (ft)
11.6	entrenchment ratio
1.0	low bank height ratio

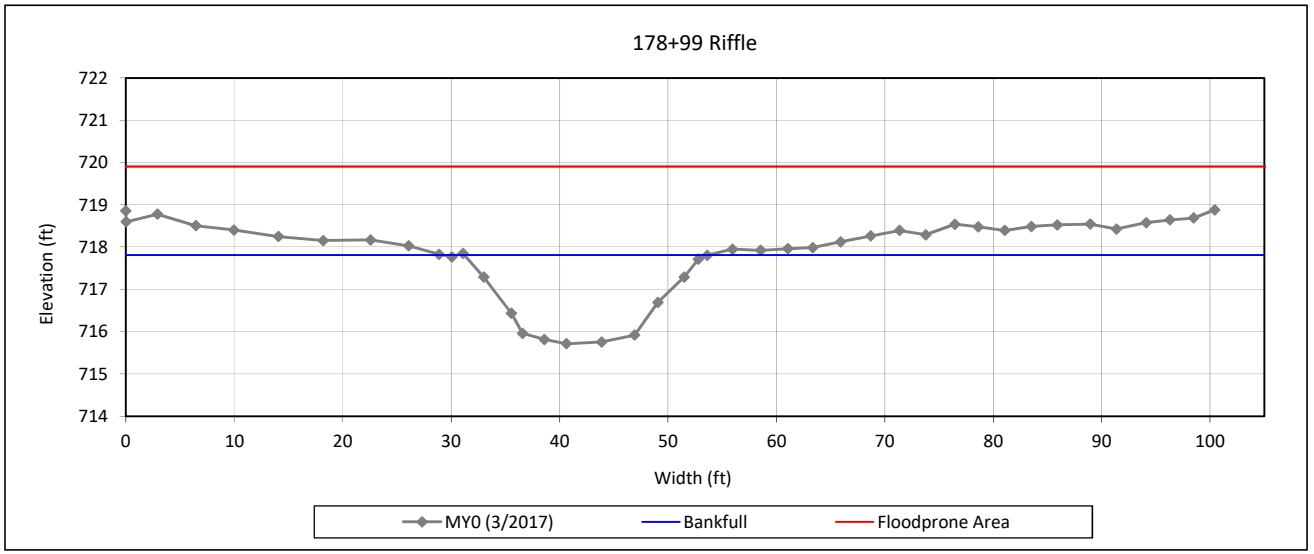
Survey Date: 3/2017
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 20 - Candy Creek Reach 4



Bankfull Dimensions	
31.0	x-section area (ft.sq.)
22.4	width (ft)
1.4	mean depth (ft)
2.1	max depth (ft)
23.0	wetted perimeter (ft)
1.3	hydraulic radius (ft)
16.2	width-depth ratio
158.0	W flood prone area (ft)
7.1	entrenchment ratio
1.0	low bank height ratio

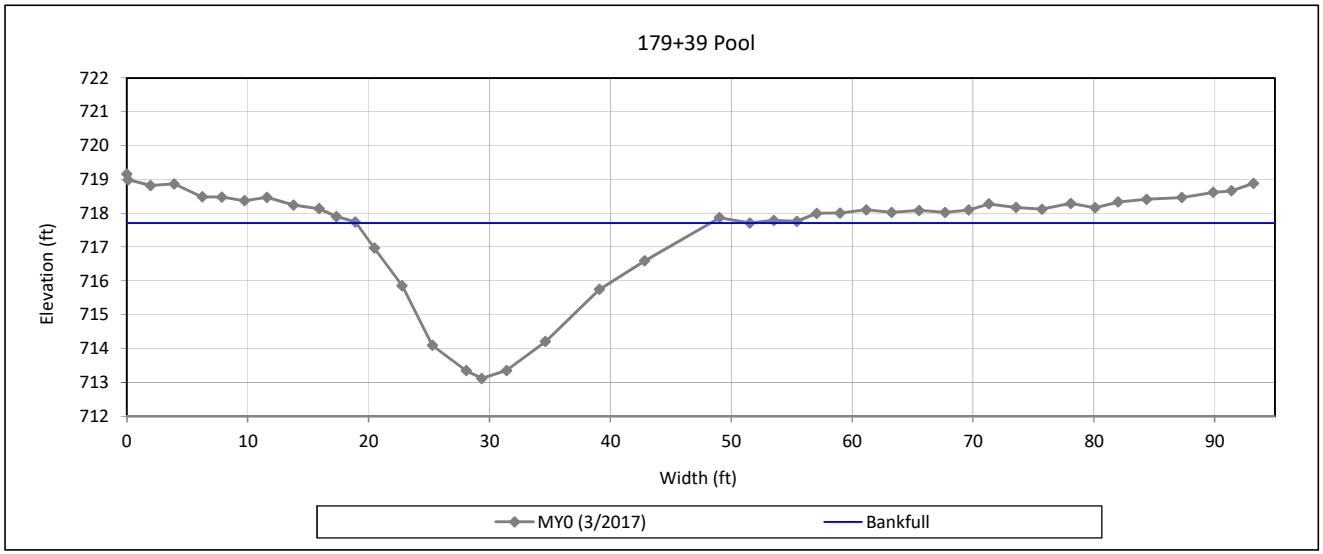
Survey Date: 3/2017
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 21 - Candy Creek Reach 4



Bankfull Dimensions	
70.1	x-section area (ft.sq.)
29.3	width (ft)
2.4	mean depth (ft)
4.6	max depth (ft)
31.0	wetted perimeter (ft)
2.3	hydraulic radius (ft)
12.2	width-depth ratio

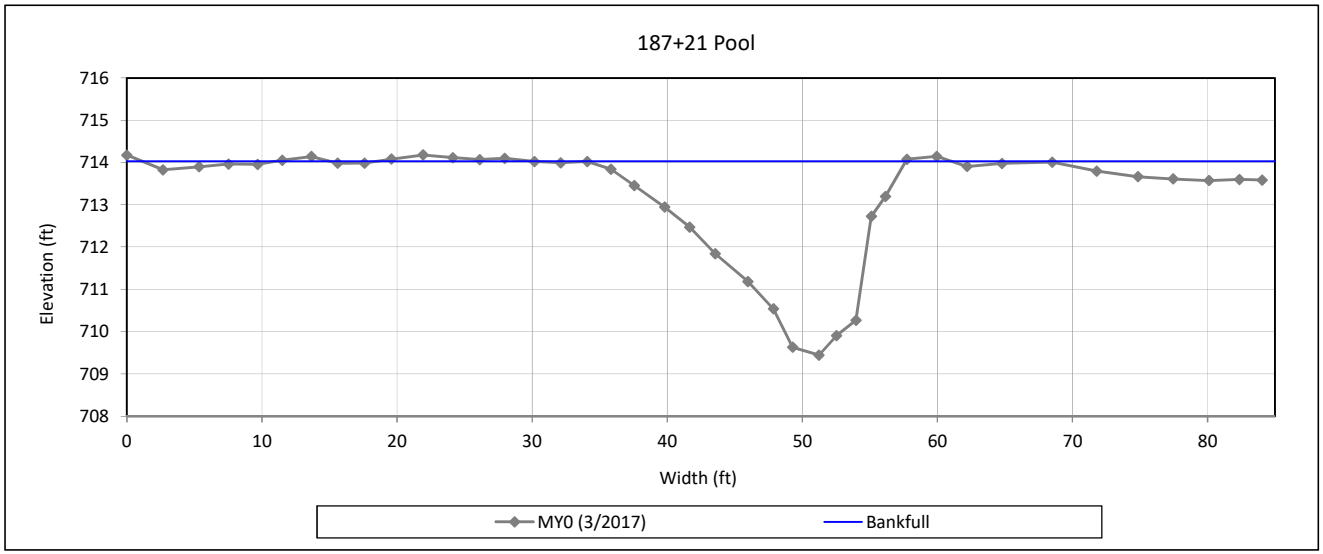
Survey Date: 3/2017
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 22 - Candy Creek Reach 4



Bankfull Dimensions	
51.1	x-section area (ft.sq.)
23.6	width (ft)
2.2	mean depth (ft)
4.6	max depth (ft)
26.3	wetted perimeter (ft)
1.9	hydraulic radius (ft)
10.9	width-depth ratio

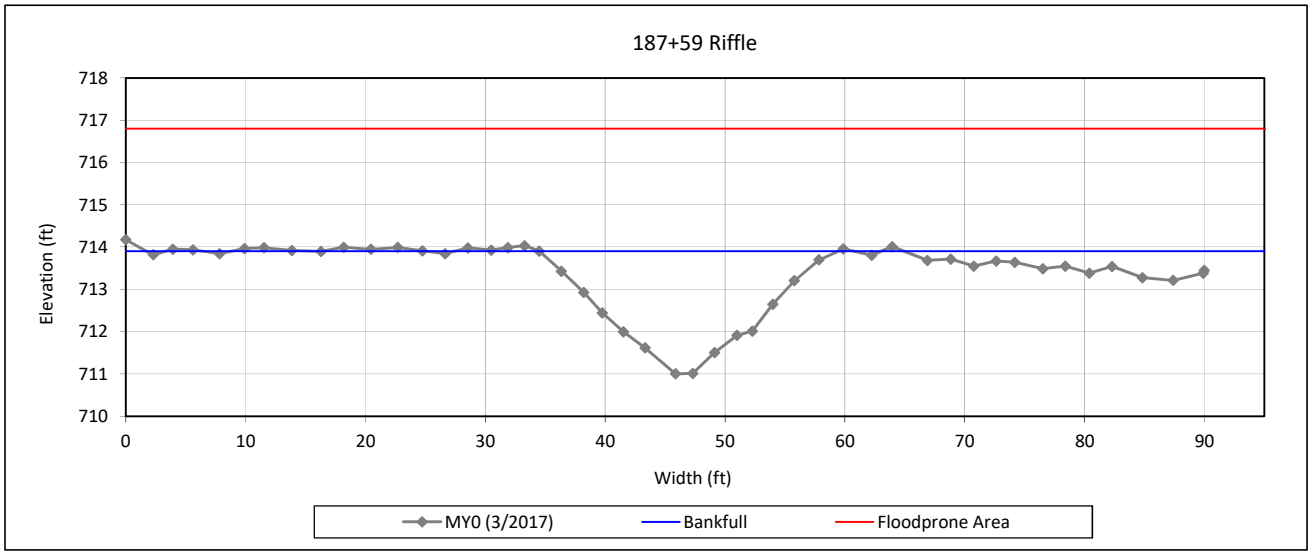
Survey Date: 3/2017
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 23 - Candy Creek Reach 4



Bankfull Dimensions	
38.1	x-section area (ft.sq.)
24.9	width (ft)
1.5	mean depth (ft)
2.9	max depth (ft)
25.7	wetted perimeter (ft)
1.5	hydraulic radius (ft)
16.3	width-depth ratio
180.0	W flood prone area (ft)
7.2	entrenchment ratio
1.0	low bank height ratio

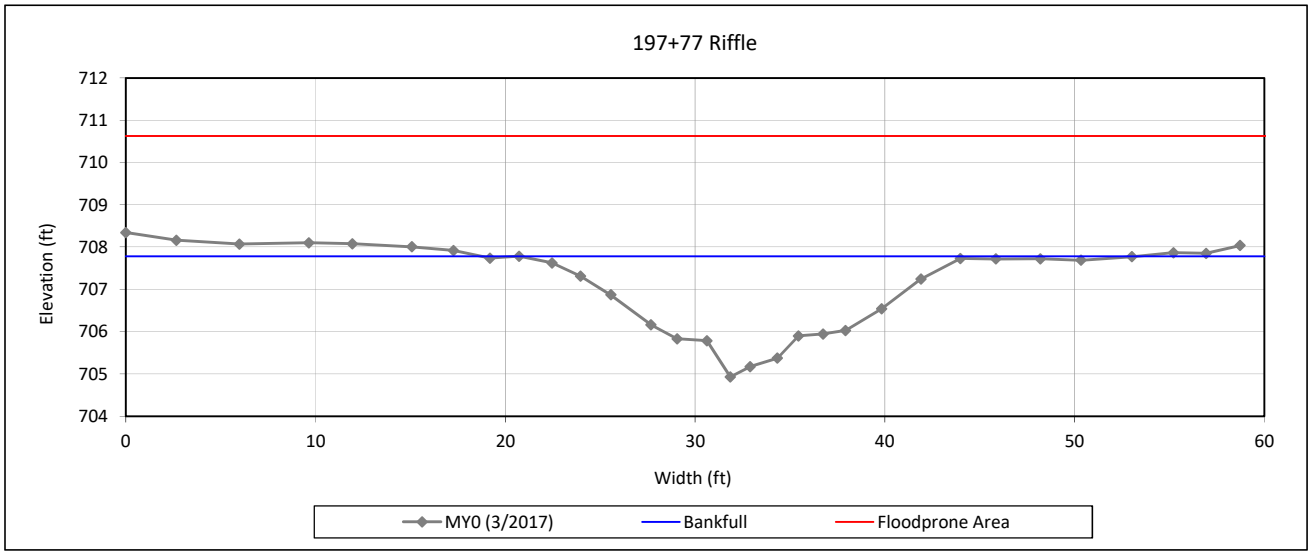
Survey Date: 3/2017
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 24 - Candy Creek Reach 4



Bankfull Dimensions	
31.6	x-section area (ft.sq.)
23.2	width (ft)
1.4	mean depth (ft)
2.9	max depth (ft)
24.2	wetted perimeter (ft)
1.3	hydraulic radius (ft)
17.1	width-depth ratio
155.0	W flood prone area (ft)
6.7	entrenchment ratio
1.0	low bank height ratio

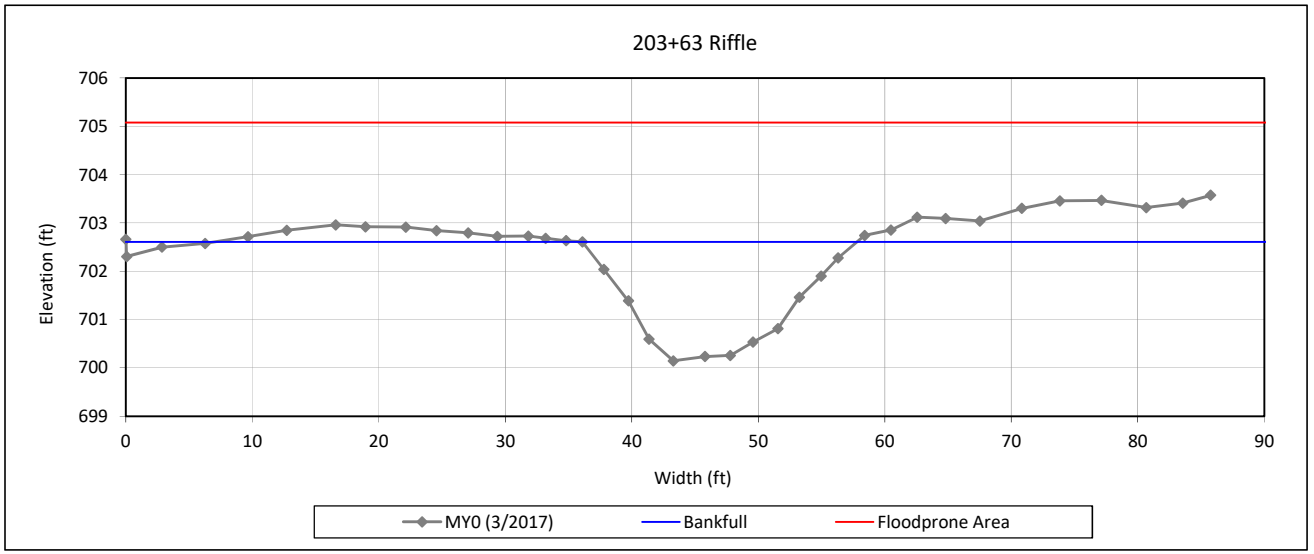
Survey Date: 3/2017
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 25 - Candy Creek Reach 4



Bankfull Dimensions	
32.8	x-section area (ft.sq.)
21.7	width (ft)
1.5	mean depth (ft)
2.5	max depth (ft)
22.5	wetted perimeter (ft)
1.5	hydraulic radius (ft)
14.4	width-depth ratio
132.0	W flood prone area (ft)
6.1	entrenchment ratio
1.0	low bank height ratio

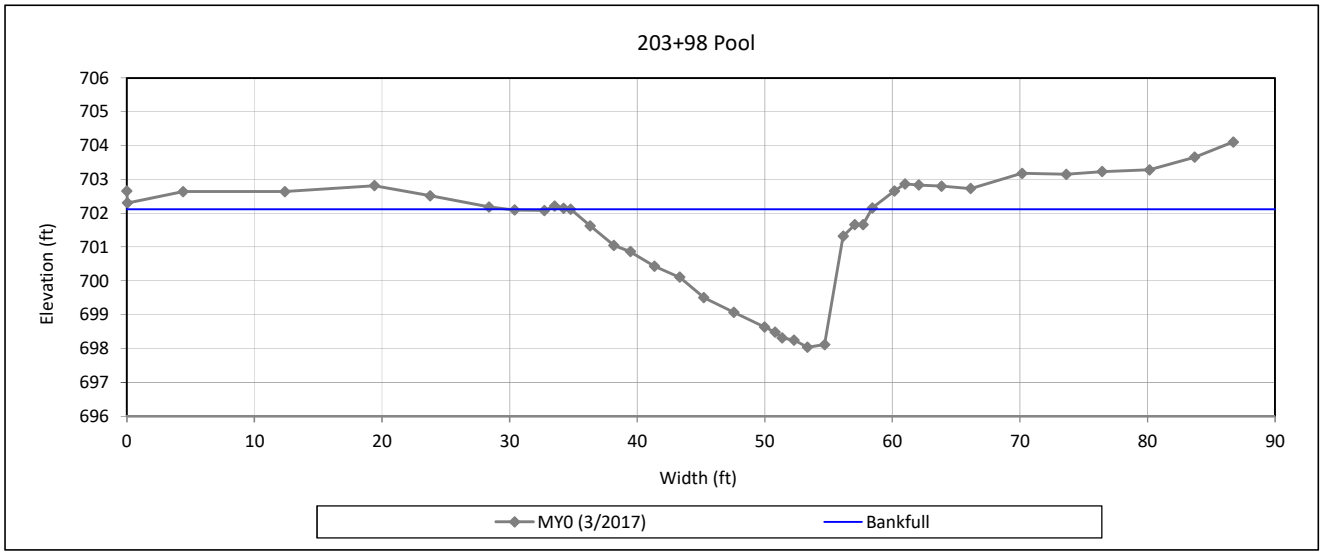
Survey Date: 3/2017
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 26 - Candy Creek Reach 4



Bankfull Dimensions	
51.3	x-section area (ft.sq.)
23.6	width (ft)
2.2	mean depth (ft)
4.1	max depth (ft)
26.4	wetted perimeter (ft)
1.9	hydraulic radius (ft)
10.8	width-depth ratio

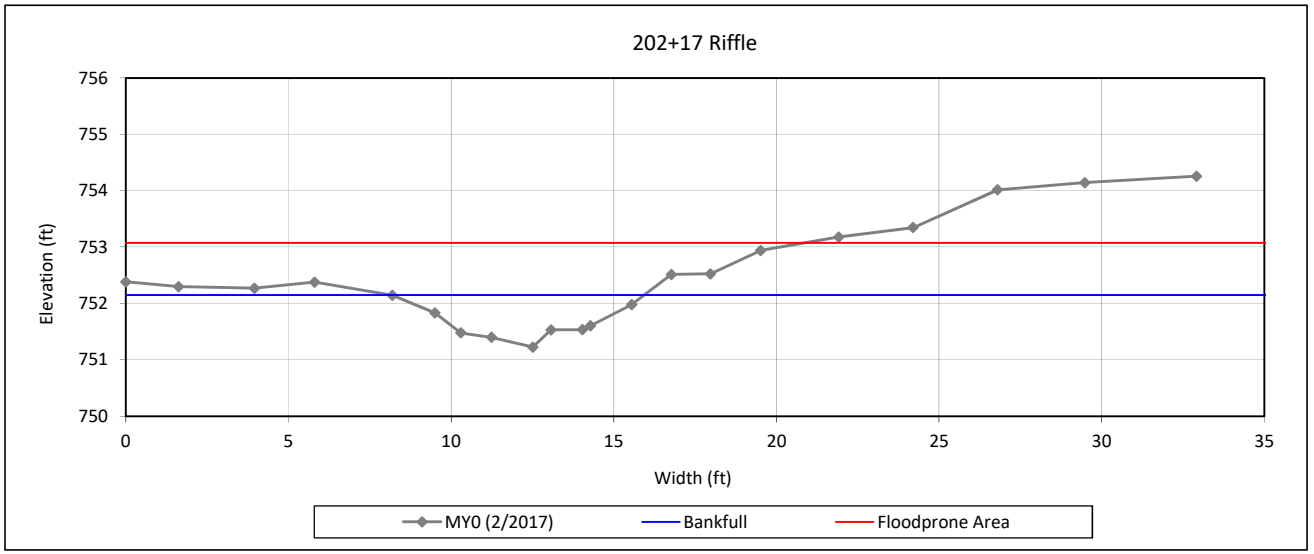
Survey Date: 3/2017
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 27 - UT1C



Bankfull Dimensions	
4.0	x-section area (ft.sq.)
7.8	width (ft)
0.5	mean depth (ft)
0.9	max depth (ft)
8.1	wetted perimeter (ft)
0.5	hydraulic radius (ft)
15.0	width-depth ratio
28.0	W flood prone area (ft)
3.6	entrenchment ratio
1.0	low bank height ratio

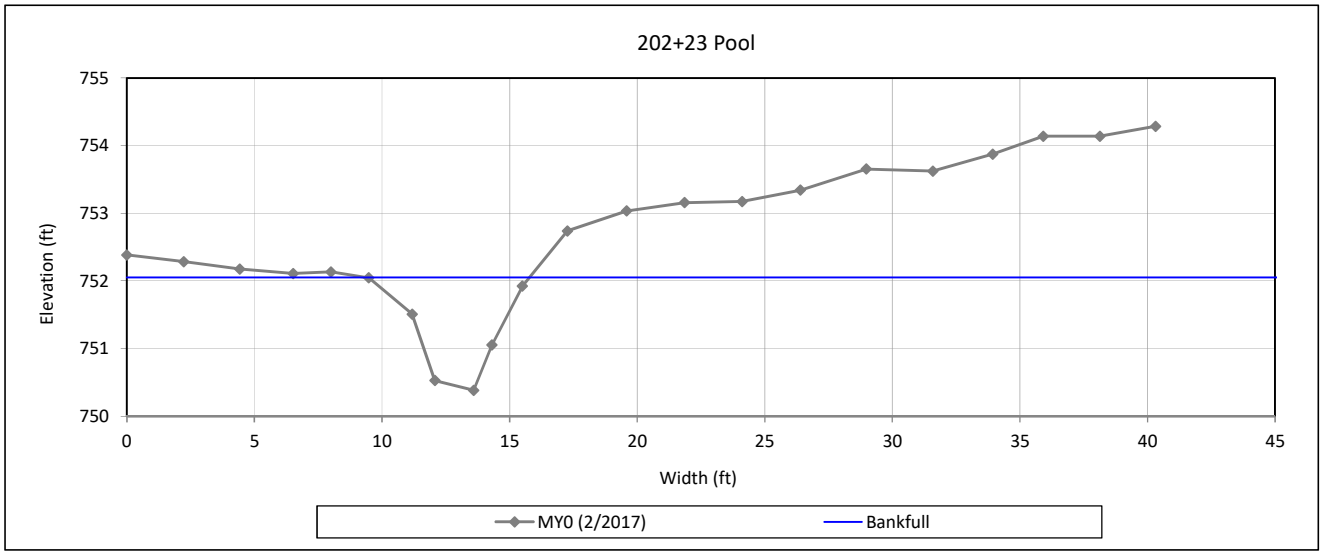
Survey Date: 3/2017
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 28 - UT1C



Bankfull Dimensions	
5.4	x-section area (ft.sq.)
6.4	width (ft)
0.9	mean depth (ft)
1.7	max depth (ft)
7.5	wetted perimeter (ft)
0.7	hydraulic radius (ft)
7.5	width-depth ratio

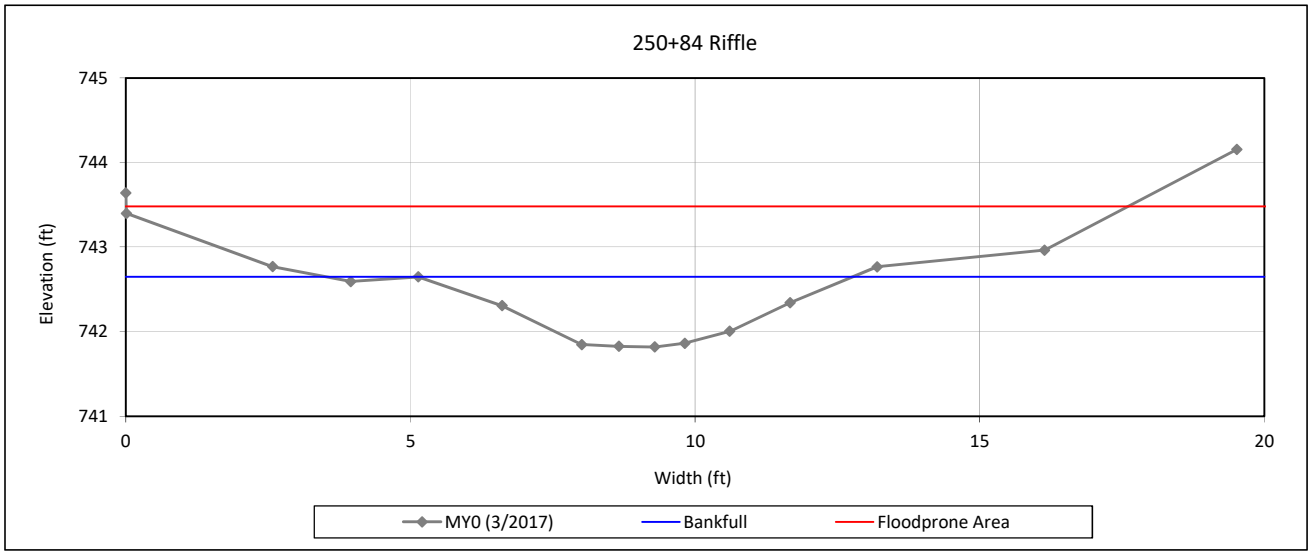
Survey Date: 3/2017
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 29 - UT1D



Bankfull Dimensions	
3.8	x-section area (ft.sq.)
7.6	width (ft)
0.5	mean depth (ft)
0.8	max depth (ft)
7.9	wetted perimeter (ft)
0.5	hydraulic radius (ft)
15.4	width-depth ratio
15.0	W flood prone area (ft)
2.0	entrenchment ratio
1.0	low bank height ratio

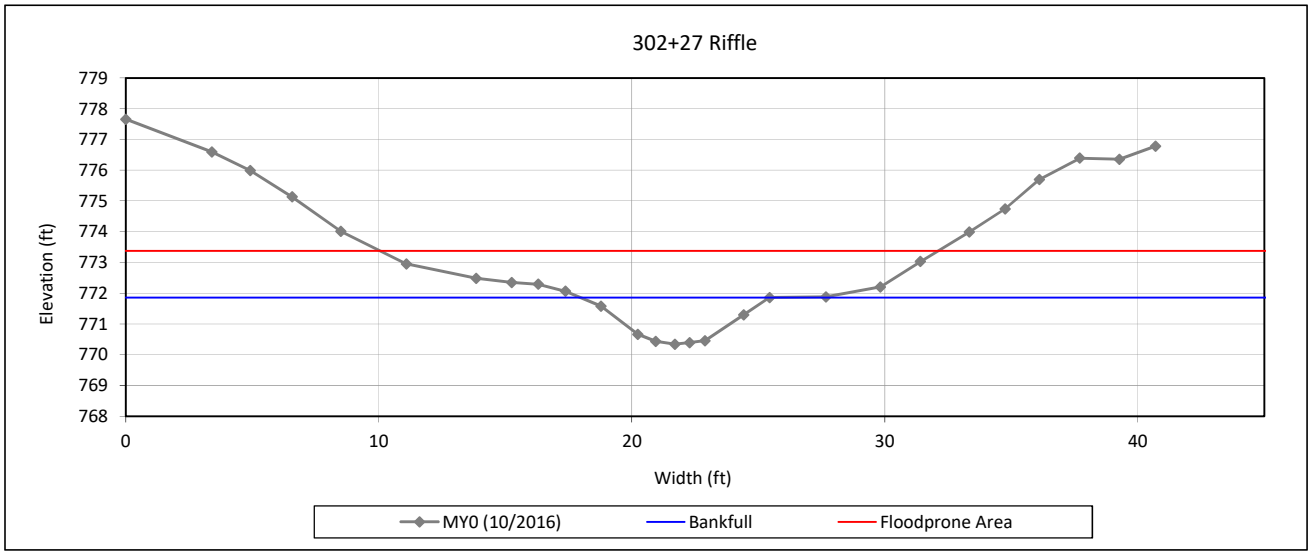
Survey Date: 3/2017
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 30 - UT2 Reach 1



Bankfull Dimensions	
6.8	x-section area (ft.sq.)
7.5	width (ft)
0.9	mean depth (ft)
1.5	max depth (ft)
8.2	wetted perimeter (ft)
0.8	hydraulic radius (ft)
8.3	width-depth ratio
22.0	W flood prone area (ft)
2.9	entrenchment ratio
1.0	low bank height ratio

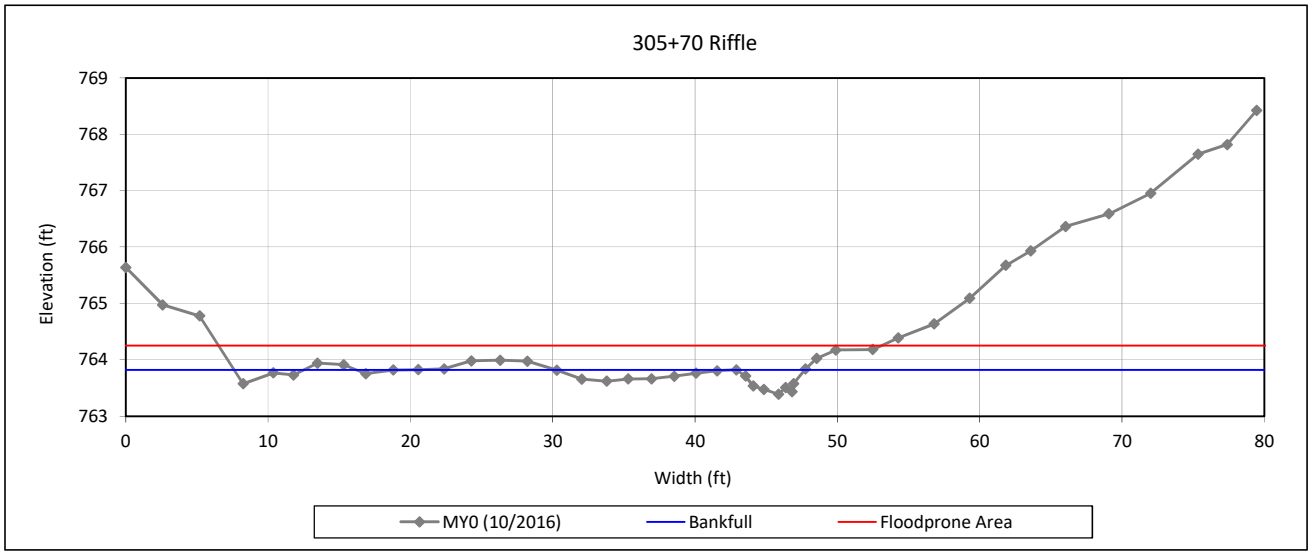
Survey Date: 10/2016
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 31 - UT2 Reach 1



Bankfull Dimensions	
1.2	x-section area (ft.sq.)
4.8	width (ft)
0.3	mean depth (ft)
0.4	max depth (ft)
5.0	wetted perimeter (ft)
0.3	hydraulic radius (ft)
18.5	width-depth ratio
47.0	W flood prone area (ft)
9.8	entrenchment ratio
1.0	low bank height ratio

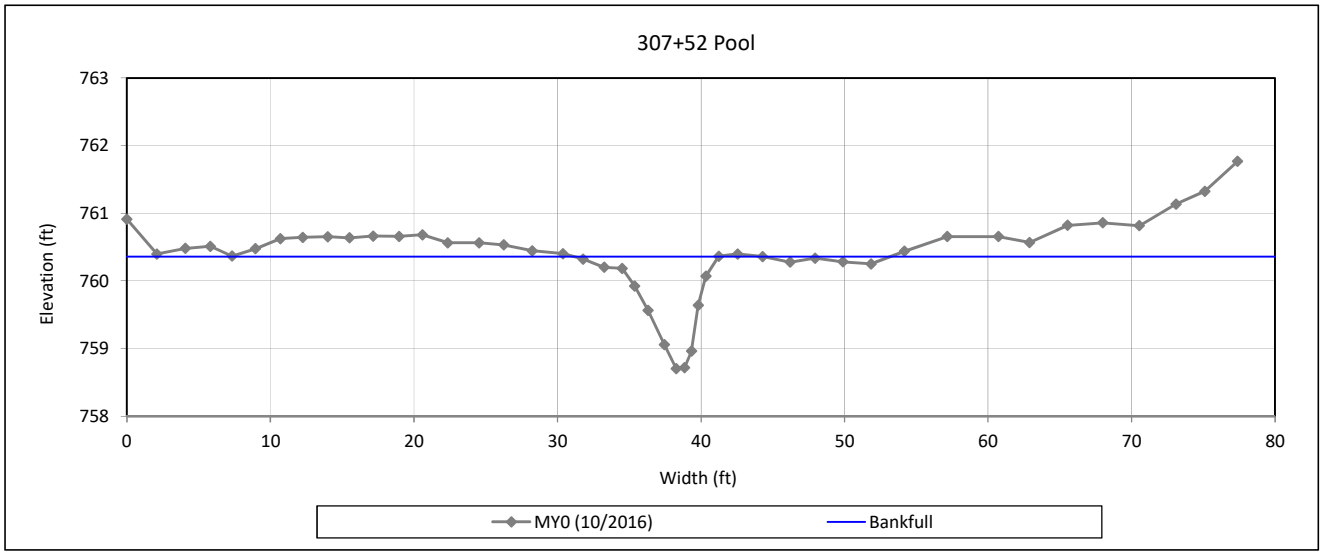
Survey Date: 10/2016
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 32 - UT2 Reach 1



Bankfull Dimensions	
6.2	x-section area (ft.sq.)
10.1	width (ft)
0.6	mean depth (ft)
1.7	max depth (ft)
11.0	wetted perimeter (ft)
0.6	hydraulic radius (ft)
16.4	width-depth ratio

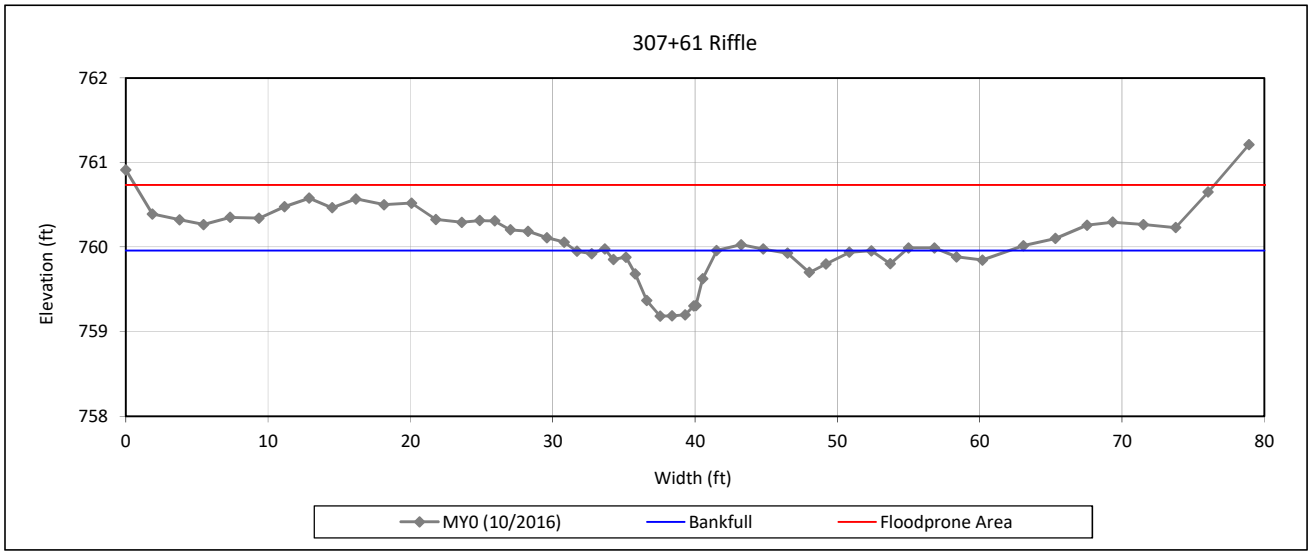
Survey Date: 10/2016
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 33 - UT2 Reach 1



Bankfull Dimensions	
3.5	x-section area (ft.sq.)
7.8	width (ft)
0.5	mean depth (ft)
0.8	max depth (ft)
8.0	wetted perimeter (ft)
0.4	hydraulic radius (ft)
17.2	width-depth ratio
88.0	W flood prone area (ft)
11.3	entrenchment ratio
1.0	low bank height ratio

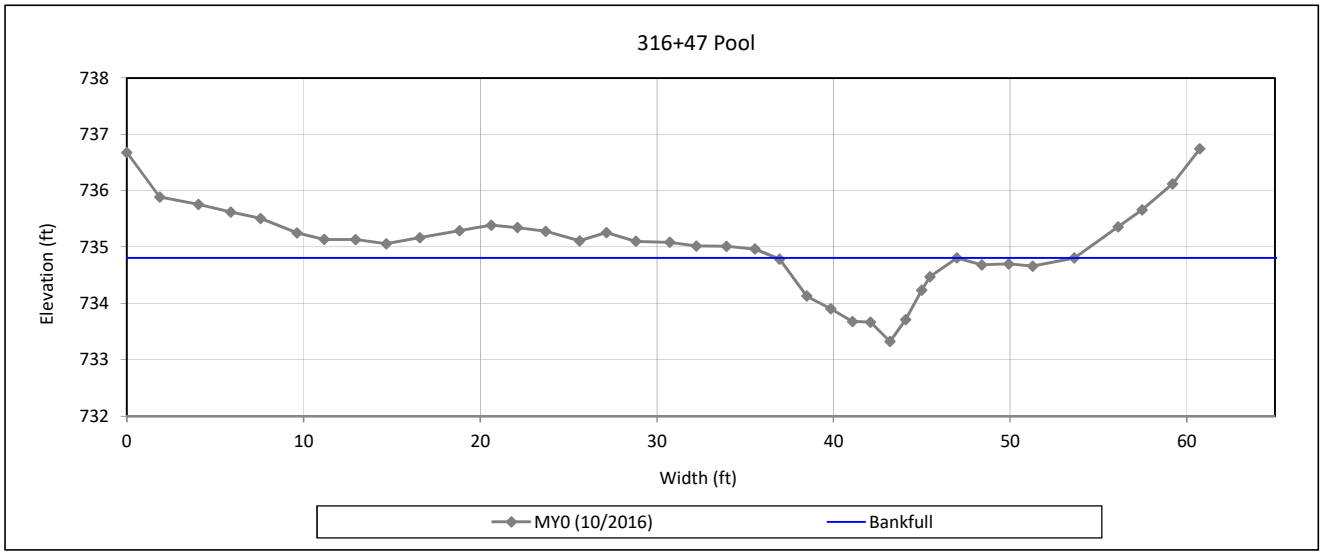
Survey Date: 10/2016
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 34 - UT2 Reach 2



Bankfull Dimensions	
7.9	x-section area (ft.sq.)
10.2	width (ft)
0.8	mean depth (ft)
1.5	max depth (ft)
10.8	wetted perimeter (ft)
0.7	hydraulic radius (ft)
13.3	width-depth ratio

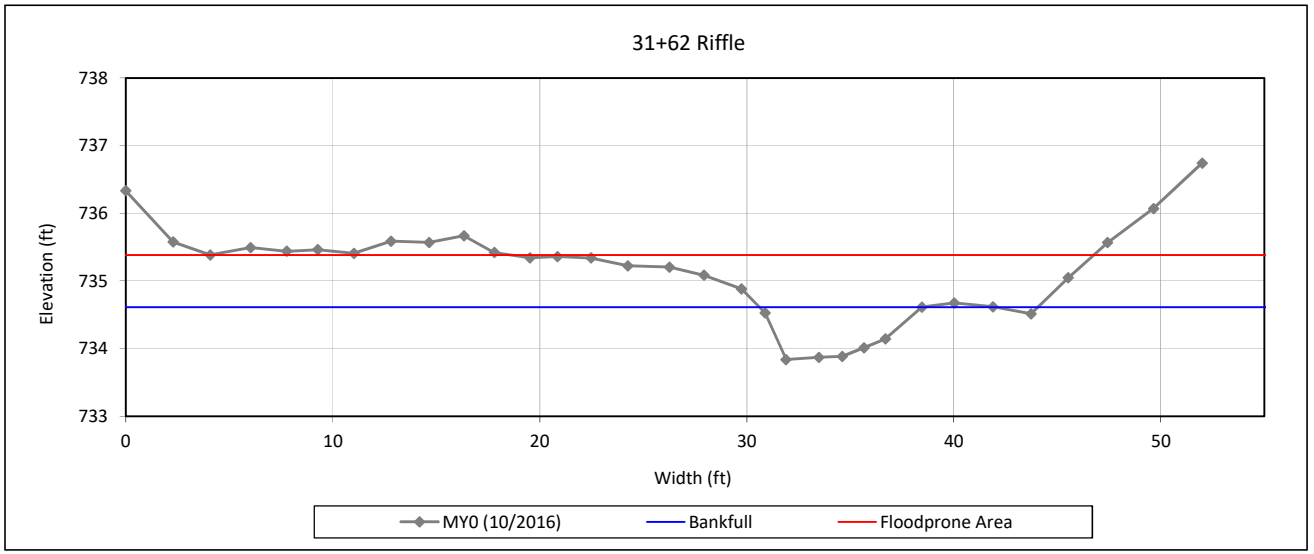
Survey Date: 10/2016
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 35 - UT2 Reach 2



Bankfull Dimensions	
4.1	x-section area (ft.sq.)
7.8	width (ft)
0.5	mean depth (ft)
0.8	max depth (ft)
8.1	wetted perimeter (ft)
0.5	hydraulic radius (ft)
14.9	width-depth ratio
60.0	W flood prone area (ft)
7.7	entrenchment ratio
1.0	low bank height ratio

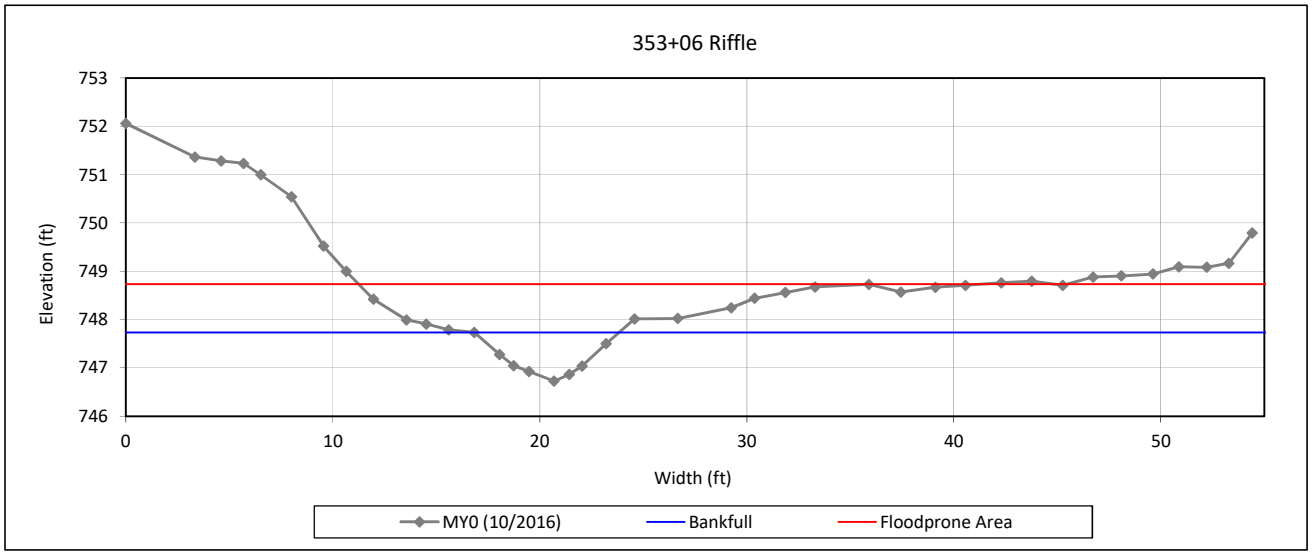
Survey Date: 10/2016
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 36 - UT2A



Bankfull Dimensions	
4.1	x-section area (ft.sq.)
7.0	width (ft)
0.6	mean depth (ft)
1.0	max depth (ft)
7.3	wetted perimeter (ft)
0.6	hydraulic radius (ft)
11.9	width-depth ratio
31.0	W flood prone area (ft)
4.4	entrenchment ratio
1.0	low bank height ratio

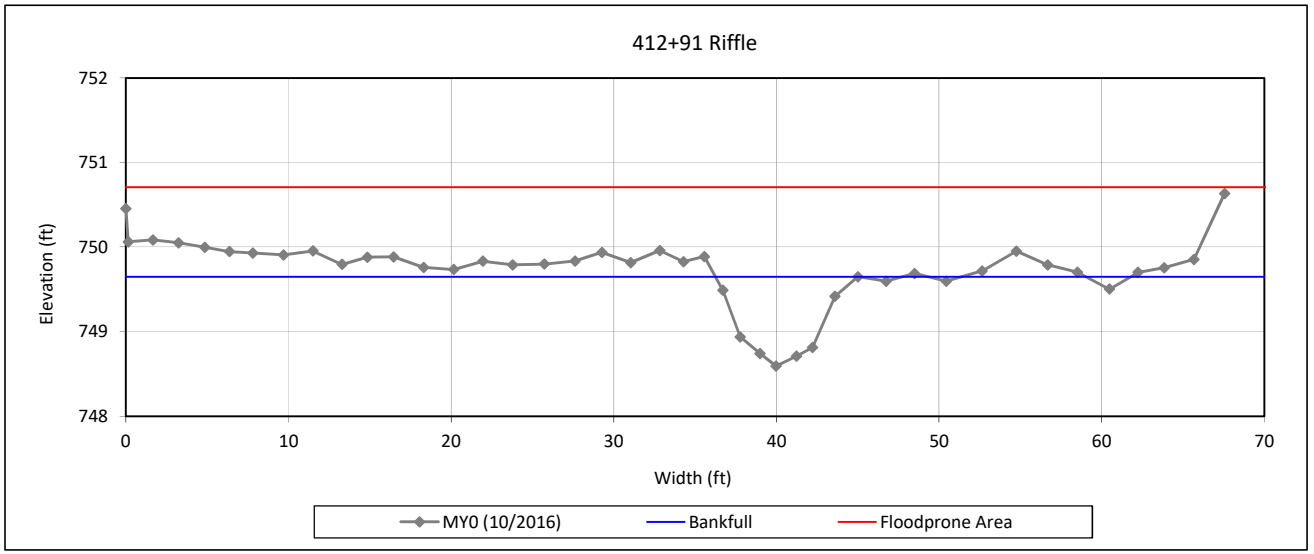
Survey Date: 10/2016
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 37 - UT3



Bankfull Dimensions	
5.5	x-section area (ft.sq.)
8.8	width (ft)
0.6	mean depth (ft)
1.1	max depth (ft)
9.1	wetted perimeter (ft)
0.6	hydraulic radius (ft)
14.0	width-depth ratio
77.0	W flood prone area (ft)
8.8	entrenchment ratio
1.0	low bank height ratio

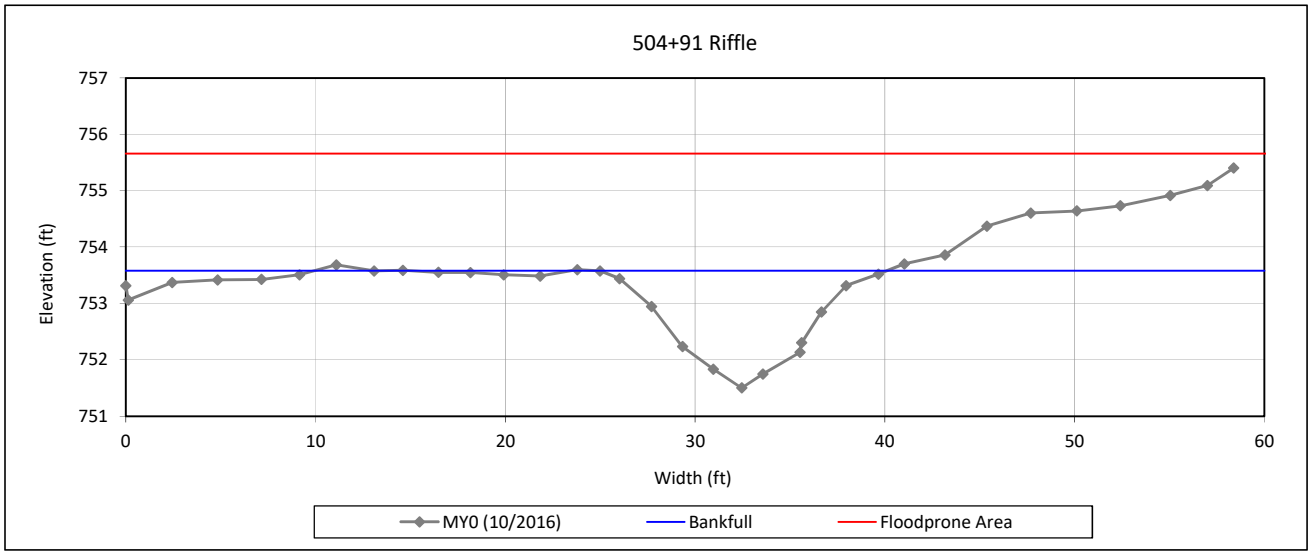
Survey Date: 10/2016
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 38 - UT4



Bankfull Dimensions	
15.2	x-section area (ft.sq.)
15.1	width (ft)
1.0	mean depth (ft)
2.1	max depth (ft)
15.8	wetted perimeter (ft)
1.0	hydraulic radius (ft)
15.0	width-depth ratio
98.0	W flood prone area (ft)
6.5	entrenchment ratio
1.0	low bank height ratio

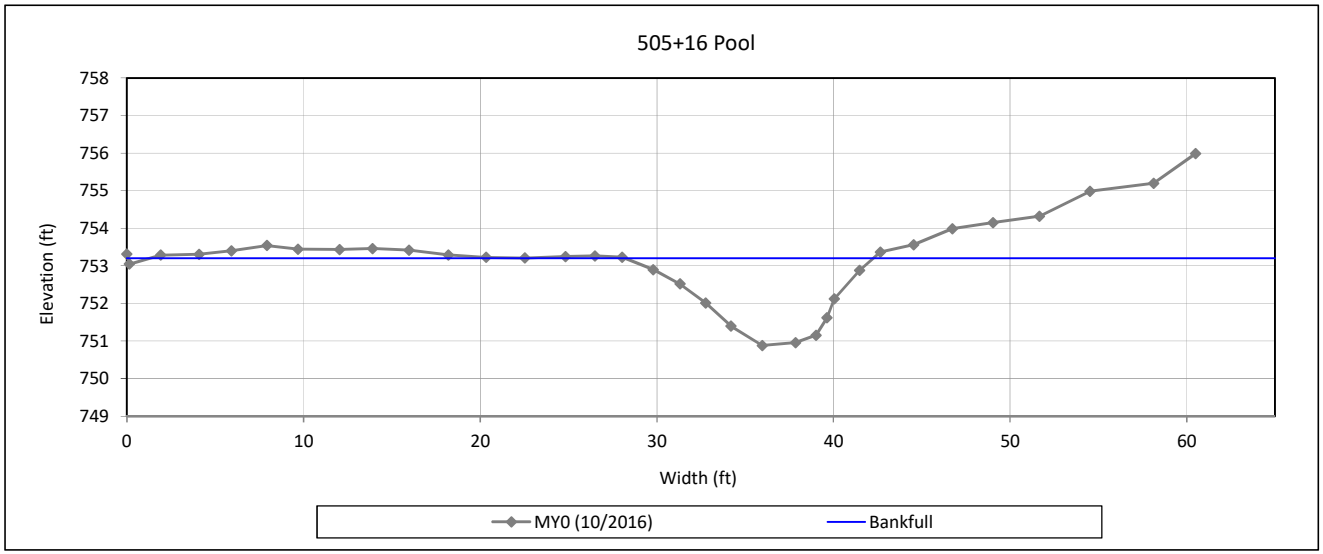
Survey Date: 10/2016
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 39 - UT4



Bankfull Dimensions	
17.8	x-section area (ft.sq.)
14.1	width (ft)
1.3	mean depth (ft)
2.3	max depth (ft)
15.1	wetted perimeter (ft)
1.2	hydraulic radius (ft)
11.2	width-depth ratio

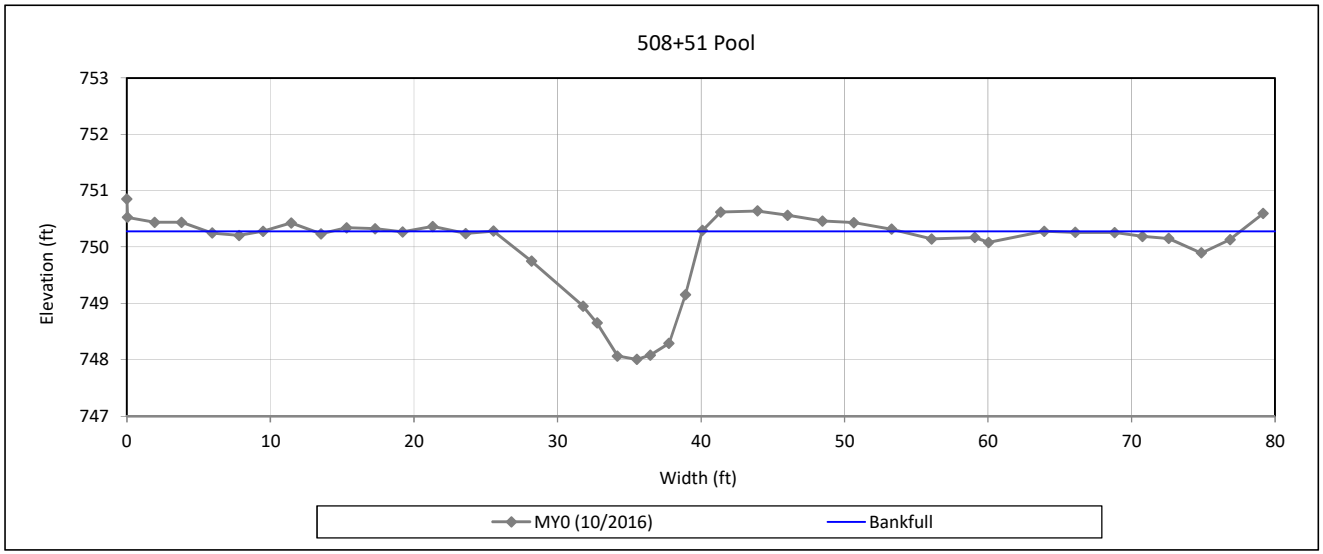
Survey Date: 10/2016
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 40 - UT4



Bankfull Dimensions	
18.5	x-section area (ft.sq.)
14.5	width (ft)
1.3	mean depth (ft)
2.3	max depth (ft)
15.6	wetted perimeter (ft)
1.2	hydraulic radius (ft)
11.4	width-depth ratio

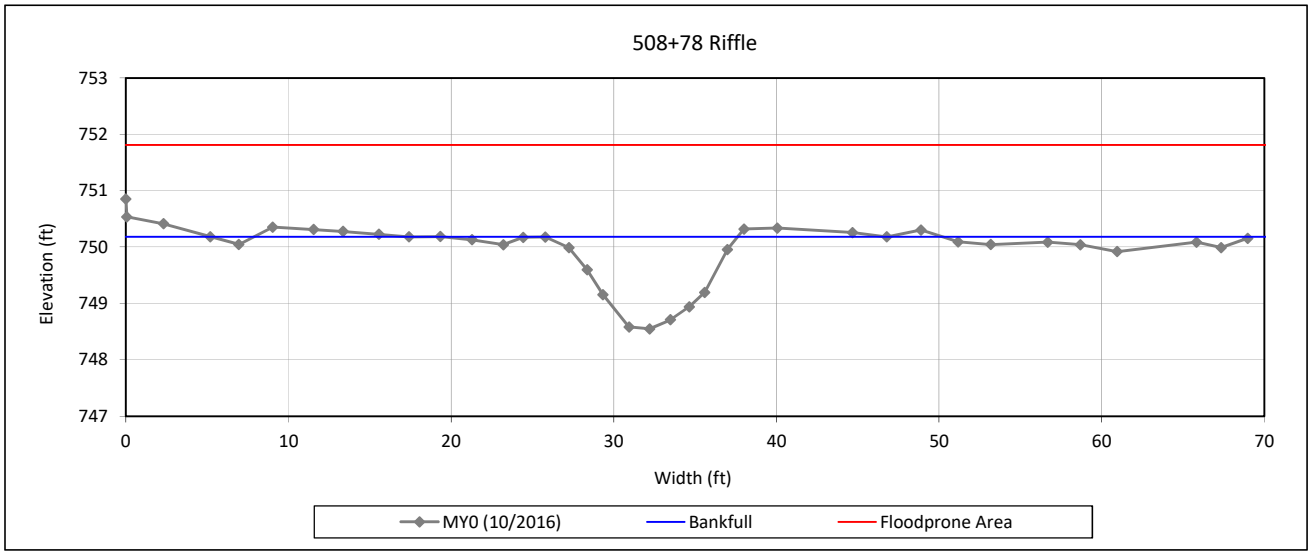
Survey Date: 10/2016
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 41 - UT4



Bankfull Dimensions	
11.0	x-section area (ft.sq.)
11.8	width (ft)
0.9	mean depth (ft)
1.6	max depth (ft)
12.4	wetted perimeter (ft)
0.9	hydraulic radius (ft)
12.7	width-depth ratio
172.0	W flood prone area (ft)
14.6	entrenchment ratio
1.0	low bank height ratio

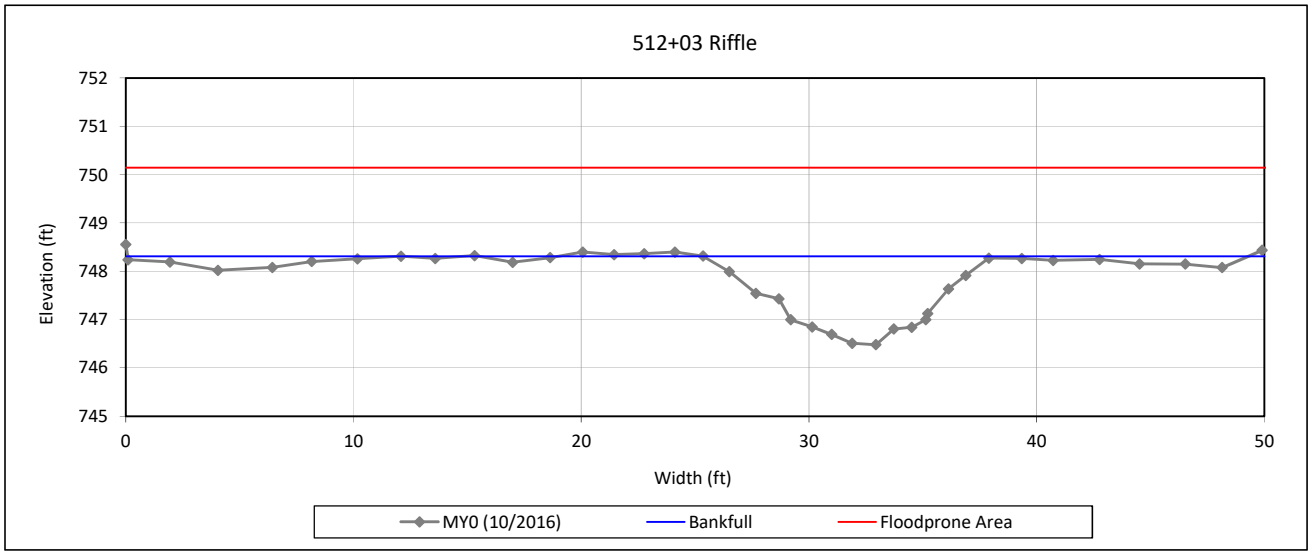
Survey Date: 10/2016
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 42 - UT4



Bankfull Dimensions	
13.0	x-section area (ft.sq.)
11.5	width (ft)
1.1	mean depth (ft)
1.8	max depth (ft)
12.2	wetted perimeter (ft)
1.1	hydraulic radius (ft)
10.2	width-depth ratio
288.0	W flood prone area (ft)
25.0	entrenchment ratio
1.0	low bank height ratio

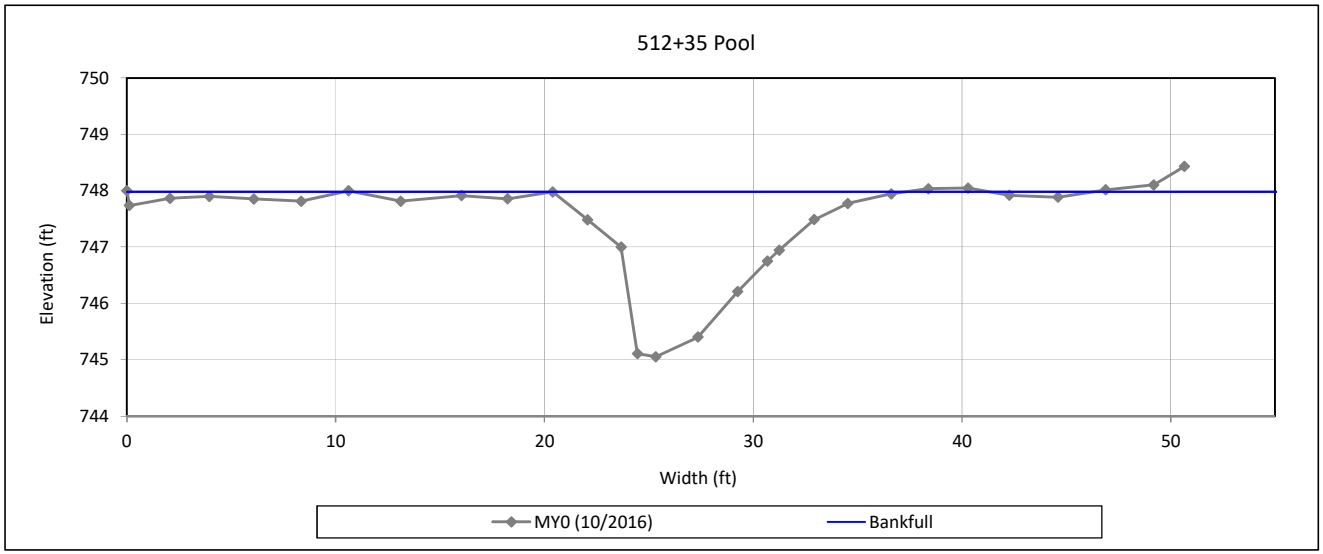
Survey Date: 10/2016
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 43 - UT4



Bankfull Dimensions	
20.2	x-section area (ft.sq.)
16.9	width (ft)
1.2	mean depth (ft)
2.9	max depth (ft)
18.8	wetted perimeter (ft)
1.1	hydraulic radius (ft)
14.2	width-depth ratio

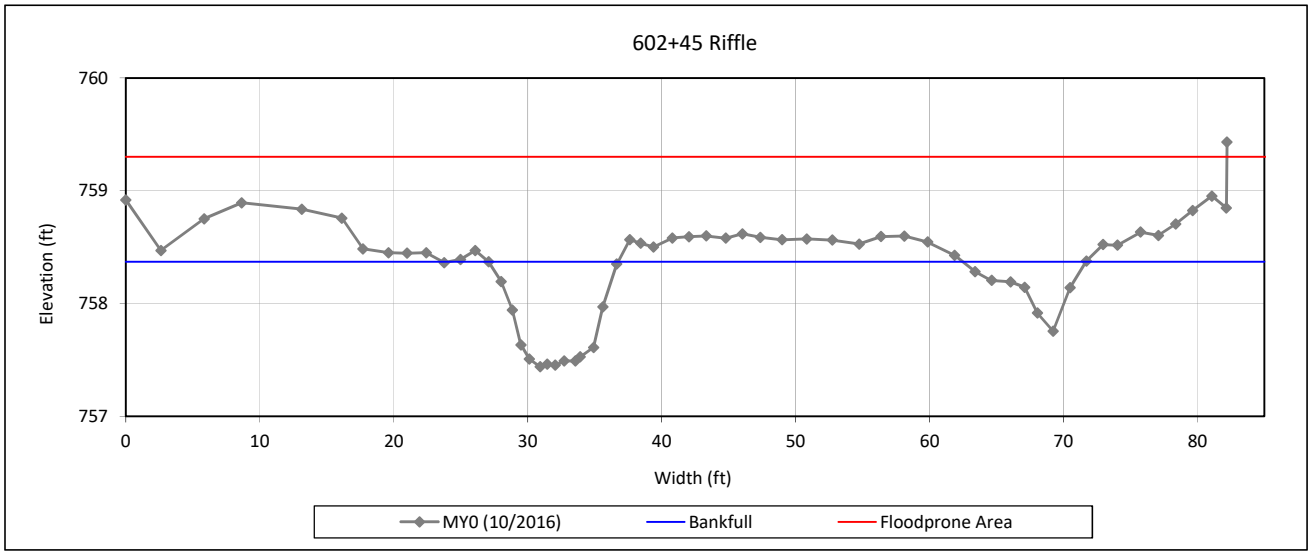
Survey Date: 10/2016
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 44 - UT5



Bankfull Dimensions	
6.0	x-section area (ft.sq.)
9.7	width (ft)
0.6	mean depth (ft)
0.9	max depth (ft)
10.0	wetted perimeter (ft)
0.6	hydraulic radius (ft)
15.5	width-depth ratio
83.0	W flood prone area (ft)
8.6	entrenchment ratio
1.0	low bank height ratio

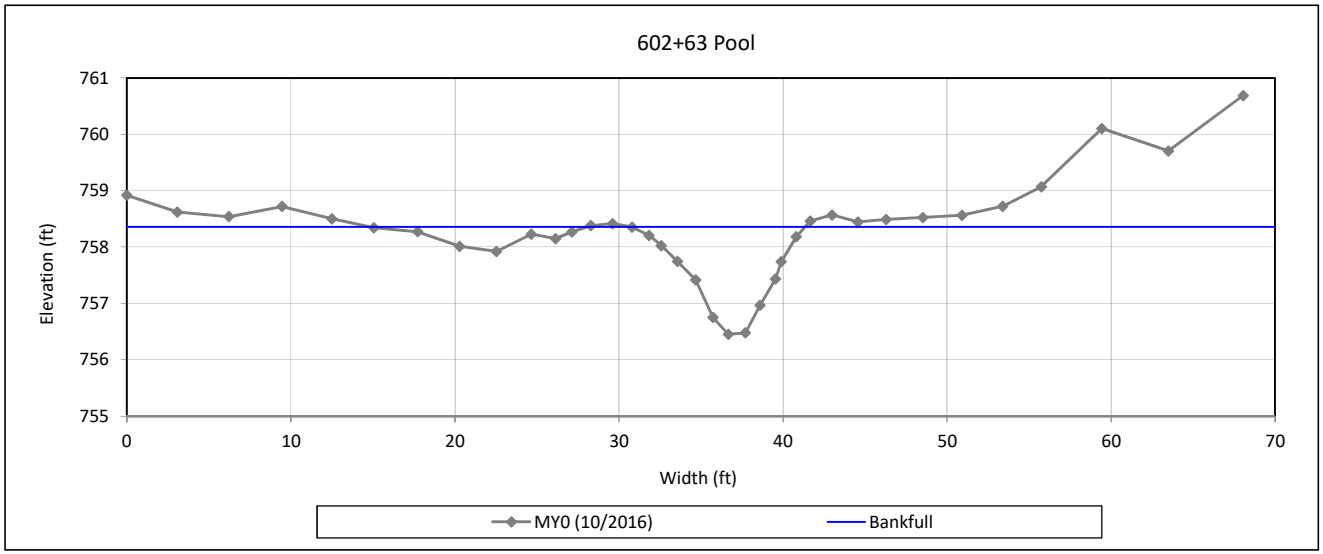
Survey Date: 10/2016
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 45 - UT5



Bankfull Dimensions	
9.8	x-section area (ft.sq.)
10.6	width (ft)
0.9	mean depth (ft)
1.9	max depth (ft)
11.4	wetted perimeter (ft)
0.9	hydraulic radius (ft)
11.4	width-depth ratio

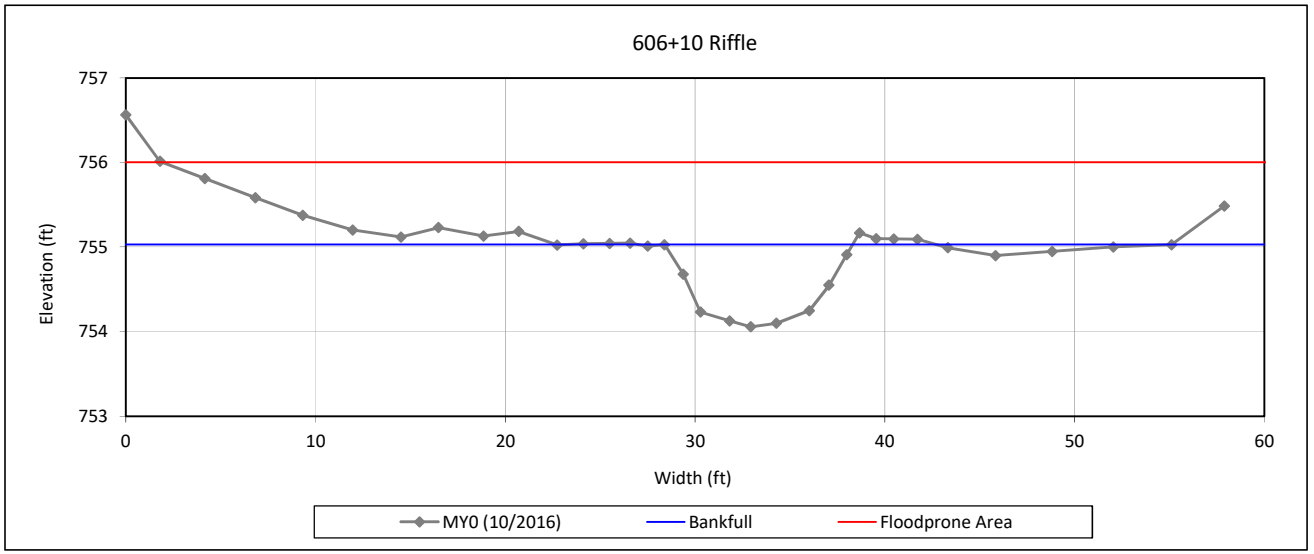
Survey Date: 10/2016
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 46 - UT5



Bankfull Dimensions	
6.8	x-section area (ft.sq.)
9.9	width (ft)
0.7	mean depth (ft)
1.0	max depth (ft)
10.2	wetted perimeter (ft)
0.7	hydraulic radius (ft)
14.5	width-depth ratio
84.0	W flood prone area (ft)
8.5	entrenchment ratio
1.0	low bank height ratio

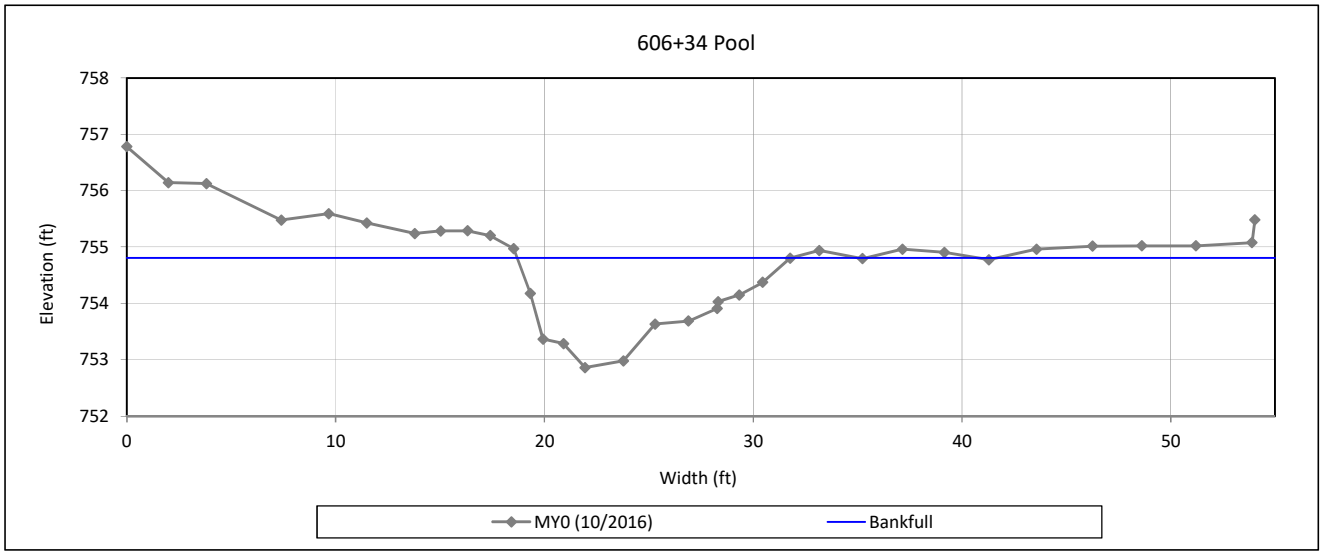
Survey Date: 10/2016
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 47 - UT5



Bankfull Dimensions	
14.7	x-section area (ft.sq.)
13.1	width (ft)
1.1	mean depth (ft)
1.9	max depth (ft)
14.2	wetted perimeter (ft)
1.0	hydraulic radius (ft)
11.6	width-depth ratio

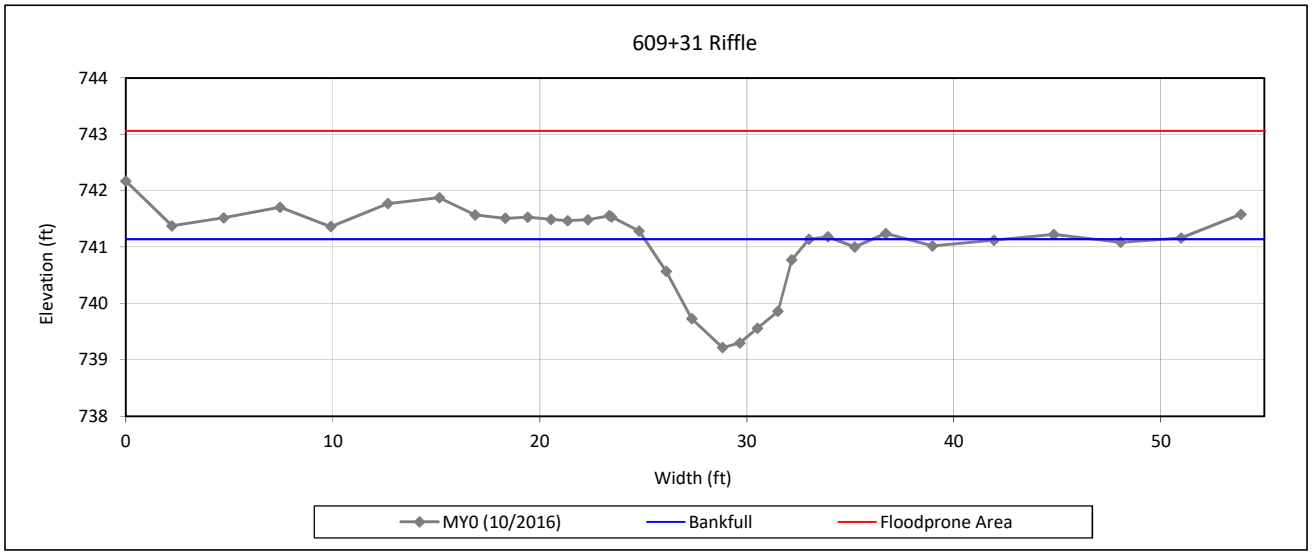
Survey Date: 10/2016
Field Crew: Kee Mapping & Surveying

View Downstream

Cross Section Plots

Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Cross Section 48 - UT5



Bankfull Dimensions	
9.1	x-section area (ft.sq.)
7.9	width (ft)
1.2	mean depth (ft)
1.9	max depth (ft)
9.1	wetted perimeter (ft)
1.0	hydraulic radius (ft)
6.9	width-depth ratio
229.0	W flood prone area (ft)
28.8	entrenchment ratio
1.0	low bank height ratio

Survey Date: 10/2016
Field Crew: Kee Mapping & Surveying

View Downstream

Reachwide and Cross Section Pebble Count Plots

Candy Creek Mitigation Site

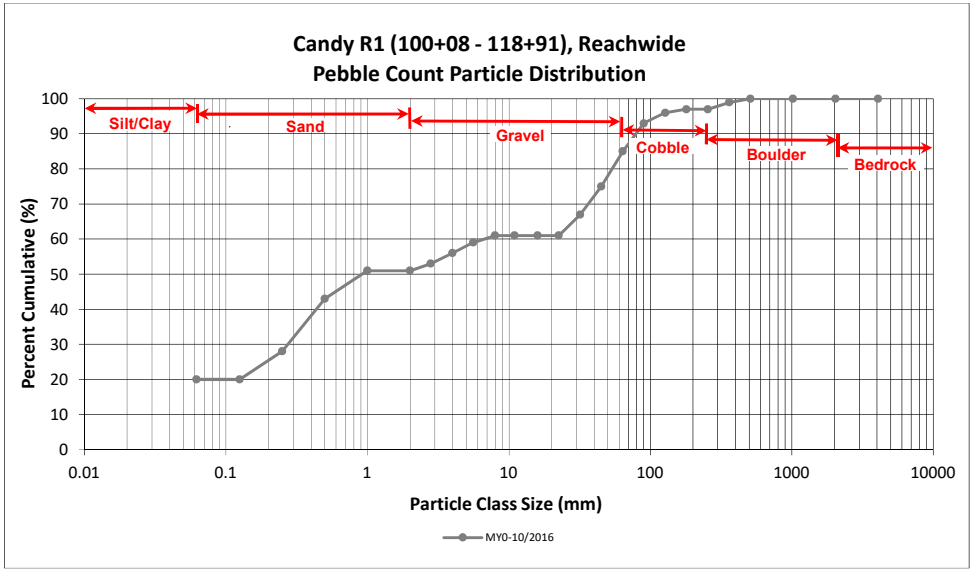
DMS Project No. 96315

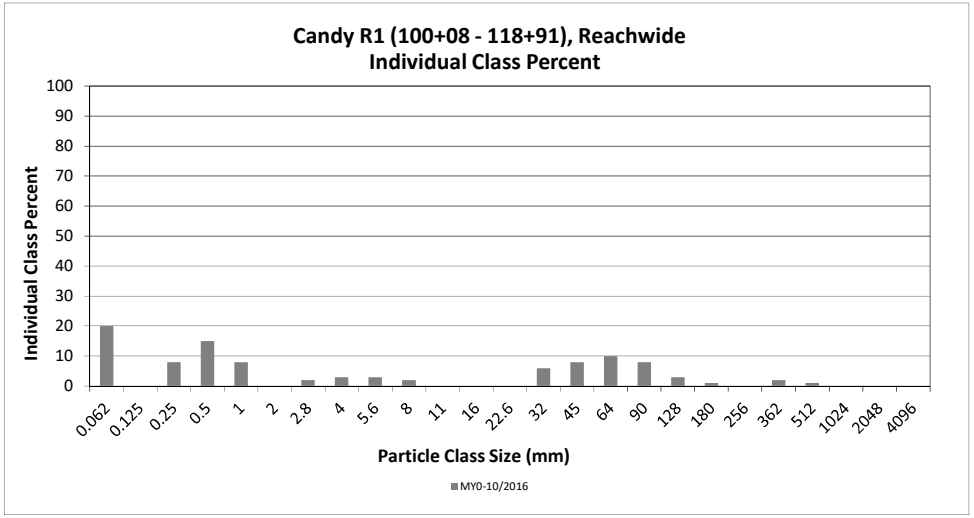
Monitoring Year 0 - 2017

Candy R1 (100+08 - 118+91), Reachwide

Particle Class		Diameter (mm)		Particle Count			Reach Summary	
		min	max	Riffle	Pool	Total	Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	3	17	20	20	20
SAND	Very fine	0.062	0.125					20
	Fine	0.125	0.250		8	8	8	28
	Medium	0.25	0.50	5	10	15	15	43
	Coarse	0.5	1.0		8	8	8	51
	Very Coarse	1.0	2.0					51
GRAVEL	Very Fine	2.0	2.8		2	2	2	53
	Very Fine	2.8	4.0	2	1	3	3	56
	Fine	4.0	5.6	2	1	3	3	59
	Fine	5.6	8.0	1	1	2	2	61
	Medium	8.0	11.0					61
	Medium	11.0	16.0					61
	Coarse	16.0	22.6					61
	Coarse	22.6	32	6		6	6	67
	Very Coarse	32	45	8		8	8	75
	Very Coarse	45	64	10		10	10	85
COBBLE	Small	64	90	8		8	8	93
	Small	90	128	3		3	3	96
	Large	128	180	1		1	1	97
	Large	180	256					97
BOULDER	Small	256	362		2	2	2	99
	Small	362	512	1		1	1	100
	Medium	512	1024					100
	Large/Very Large	1024	2048					100
BEDROCK	Bedrock	2048	>2048					100
			Total	**50**	**50**	**100**	**100**	**100**

Reachwide	
Channel materials (mm)	
D_{16} =	Silt/Clay
D_{35} =	0.35
D_{50} =	0.9
D_{84} =	61.8
D_{95} =	113.8
D_{100} =	512.0





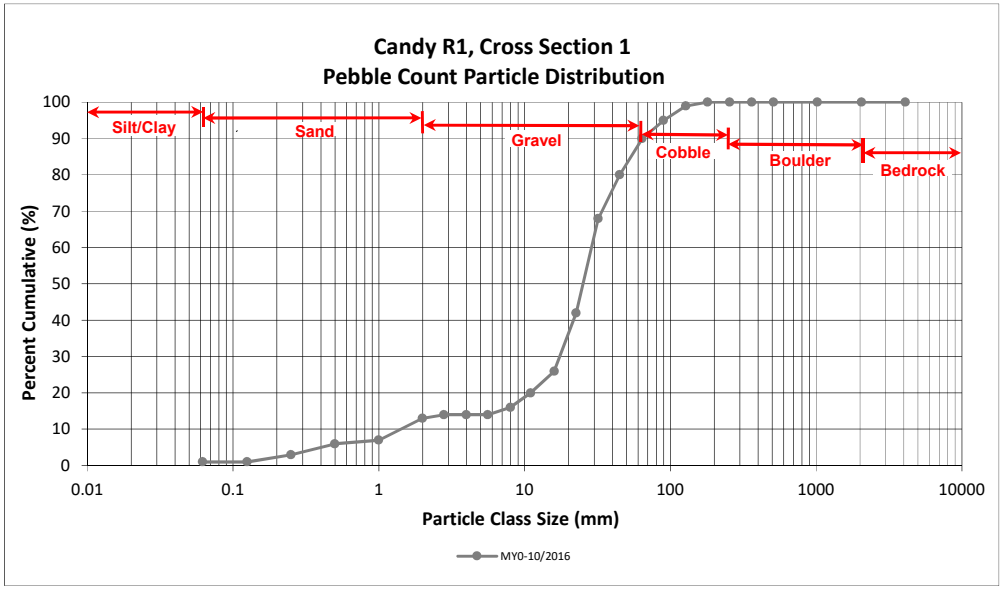
Reachwide and Cross Section Pebble Count Plots

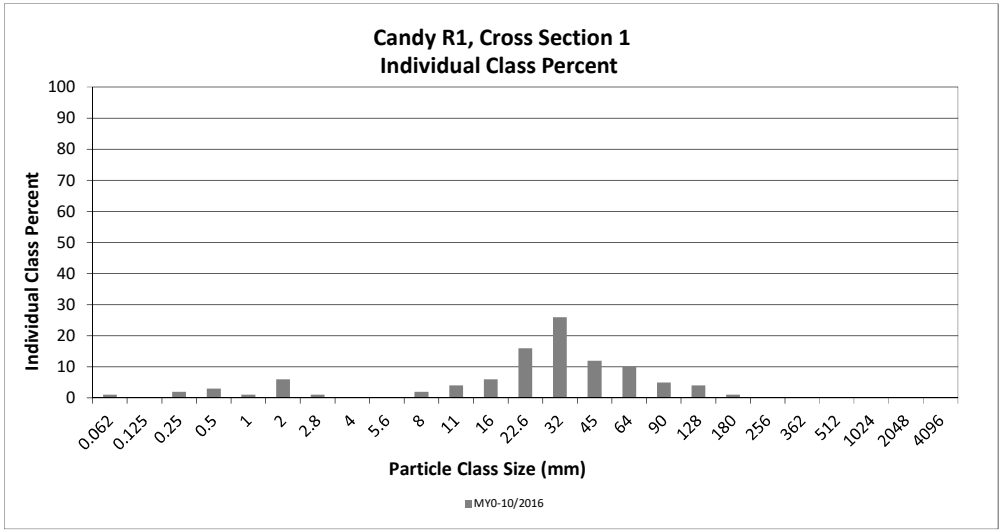
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Candy R1, Cross Section 1

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	1	1	1
SAND	Very fine	0.062	0.125			1
	Fine	0.125	0.250	2	2	3
	Medium	0.25	0.50	3	3	6
	Coarse	0.5	1.0	1	1	7
	Very Coarse	1.0	2.0	6	6	13
GRAVEL	Very Fine	2.0	2.8	1	1	14
	Very Fine	2.8	4.0			14
	Fine	4.0	5.6			14
	Fine	5.6	8.0	2	2	16
	Medium	8.0	11.0	4	4	20
	Medium	11.0	16.0	6	6	26
	Coarse	16.0	22.6	16	16	42
	Coarse	22.6	32	26	26	68
	Very Coarse	32	45	12	12	80
	Very Coarse	45	64	10	10	90
COBBLE	Small	64	90	5	5	95
	Small	90	128	4	4	99
	Large	128	180	1	1	100
	Large	180	256			100
BOULDER	Small	256	362			100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
			Total	**100**	**100**	**100**

Cross Section 1	
Channel materials (mm)	
D_{16} =	8.00
D_{35} =	19.43
D_{50} =	25.2
D_{84} =	51.8
D_{95} =	90.0
D_{100} =	180.0





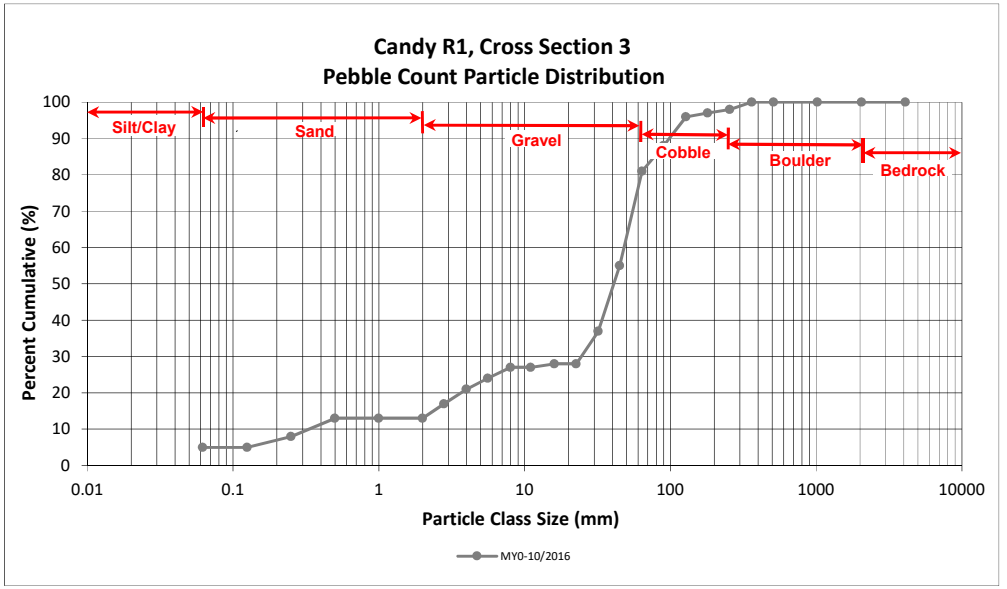
Reachwide and Cross Section Pebble Count Plots

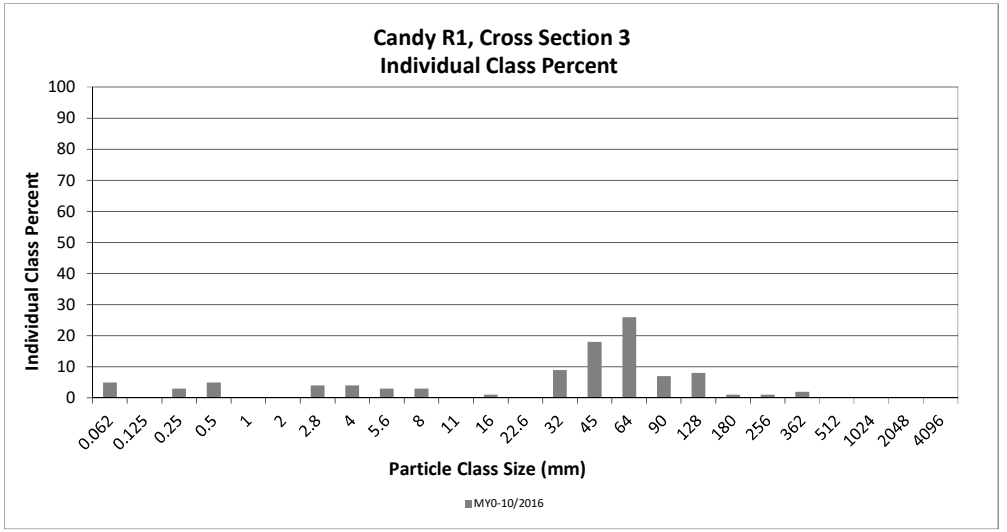
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Candy R1, Cross Section 3

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	5	5	5
SAND	Very fine	0.062	0.125			5
	Fine	0.125	0.250	3	3	8
	Medium	0.25	0.50	5	5	13
	Coarse	0.5	1.0			13
	Very Coarse	1.0	2.0			13
GRAVEL	Very Fine	2.0	2.8	4	4	17
	Very Fine	2.8	4.0	4	4	21
	Fine	4.0	5.6	3	3	24
	Fine	5.6	8.0	3	3	27
	Medium	8.0	11.0			27
	Medium	11.0	16.0	1	1	28
	Coarse	16.0	22.6			28
	Coarse	22.6	32	9	9	37
	Very Coarse	32	45	18	18	55
	Very Coarse	45	64	26	26	81
COBBLE	Small	64	90	7	7	88
	Small	90	128	8	8	96
	Large	128	180	1	1	97
	Large	180	256	1	1	98
BOULDER	Small	256	362	2	2	100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
			Total	**100**	**100**	**100**

Cross Section 3	
Channel materials (mm)	
D_{16} =	2.57
D_{35} =	29.62
D_{50} =	40.9
D_{84} =	74.1
D_{95} =	122.5
D_{100} =	362.0





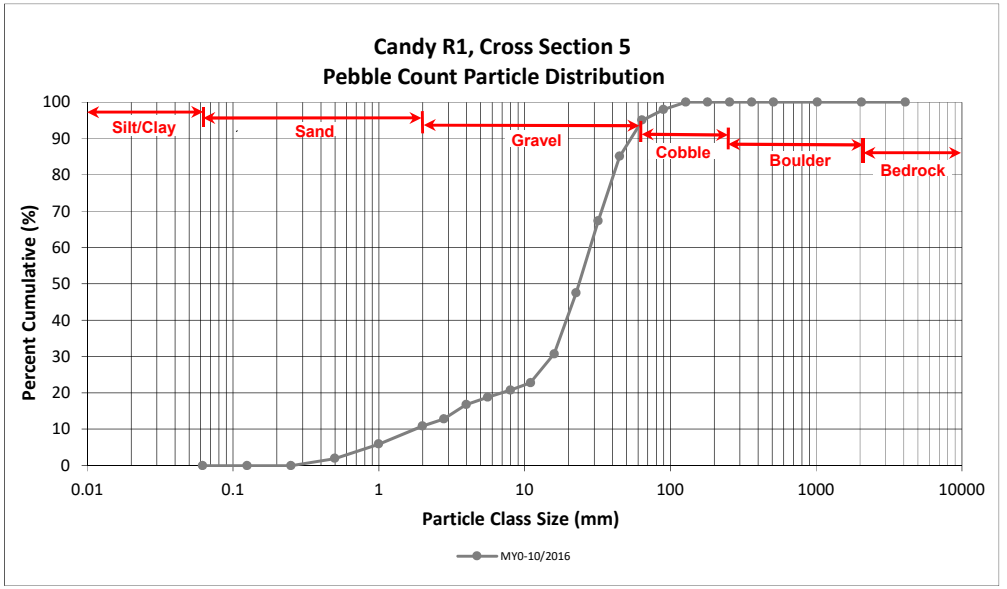
Reachwide and Cross Section Pebble Count Plots

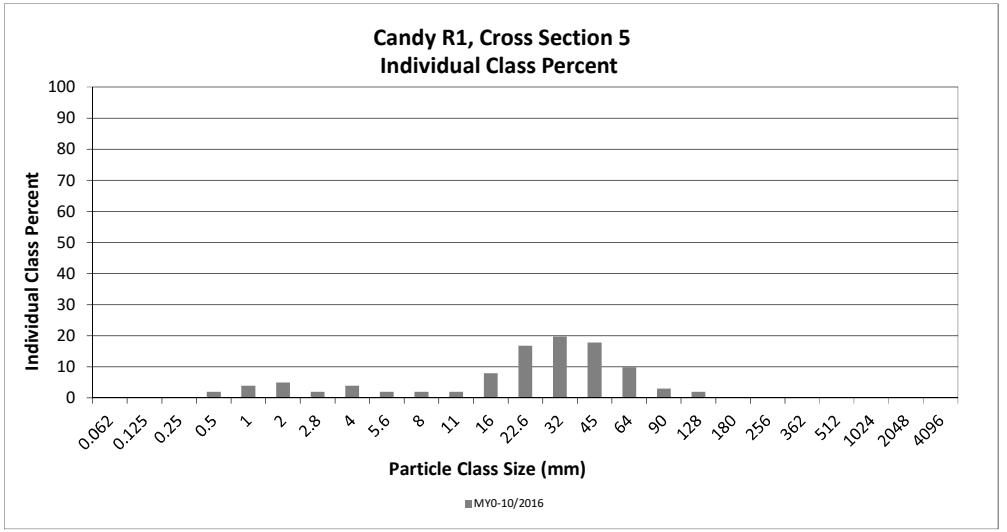
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Candy R1, Cross Section 5

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062			0
SAND	Very fine	0.062	0.125			0
	Fine	0.125	0.250			0
	Medium	0.25	0.50	2	2	2
	Coarse	0.5	1.0	4	4	6
	Very Coarse	1.0	2.0	5	5	11
GRAVEL	Very Fine	2.0	2.8	2	2	13
	Very Fine	2.8	4.0	4	4	17
	Fine	4.0	5.6	2	2	19
	Fine	5.6	8.0	2	2	21
	Medium	8.0	11.0	2	2	23
	Medium	11.0	16.0	8	8	31
	Coarse	16.0	22.6	17	17	48
	Coarse	22.6	32	20	20	67
	Very Coarse	32	45	18	18	85
	Very Coarse	45	64	10	10	95
COBBLE	Small	64	90	3	3	98
	Small	90	128	2	2	100
	Large	128	180			100
	Large	180	256			100
BOULDER	Small	256	362			100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
			Total	**101**	**100**	**100**

Cross Section 5	
Channel materials (mm)	
D_{16} =	3.71
D_{35} =	17.48
D_{50} =	23.6
D_{84} =	44.0
D_{95} =	63.9
D_{100} =	128.0





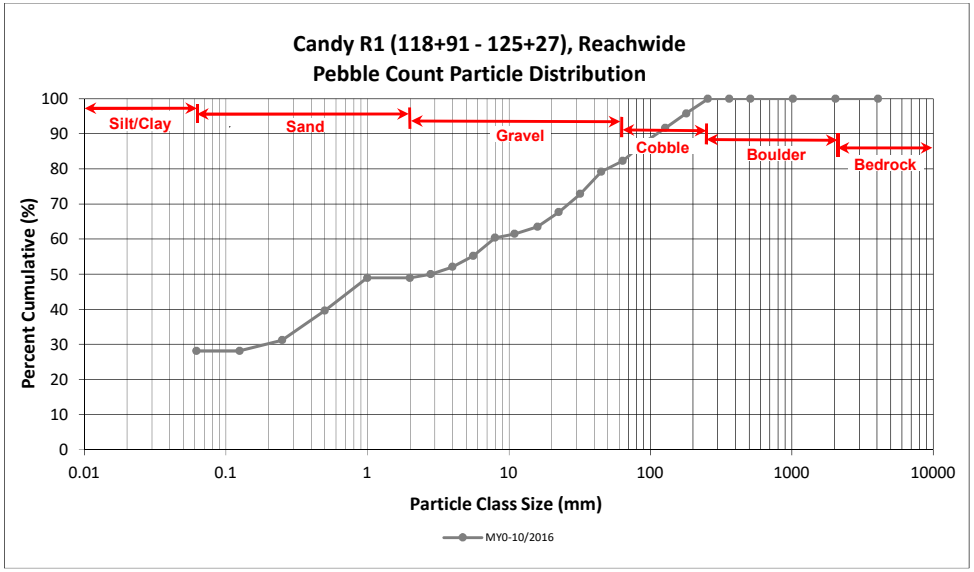
Reachwide and Cross Section Pebble Count Plots

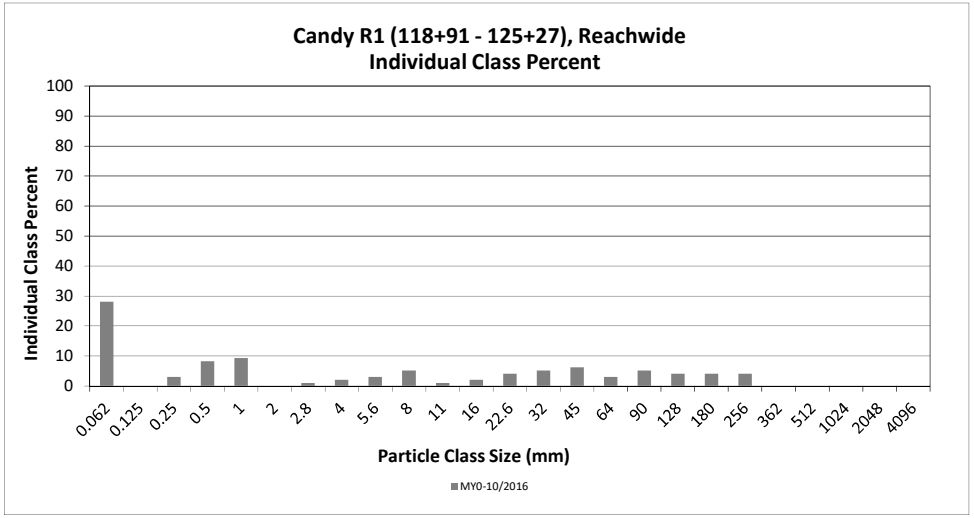
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Candy R1 (118+91 - 125+27), Reachwide

Particle Class		Diameter (mm)		Particle Count			Reach Summary	
		min	max	Riffle	Pool	Total	Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	4	23	27	28	28
SAND	Very fine	0.062	0.125					28
	Fine	0.125	0.250		3	3	3	31
	Medium	0.25	0.50	1	7	8	8	40
	Coarse	0.5	1.0	1	8	9	9	49
	Very Coarse	1.0	2.0					49
GRAVEL	Very Fine	2.0	2.8		1	1	1	50
	Very Fine	2.8	4.0	1	1	2	2	52
	Fine	4.0	5.6	2	1	3	3	55
	Fine	5.6	8.0	5		5	5	60
	Medium	8.0	11.0	1		1	1	61
	Medium	11.0	16.0	2		2	2	64
	Coarse	16.0	22.6	3	1	4	4	68
	Coarse	22.6	32	5		5	5	73
	Very Coarse	32	45	6		6	6	79
	Very Coarse	45	64	3		3	3	82
COBBLE	Small	64	90	4	1	5	5	88
	Small	90	128	4		4	4	92
	Large	128	180	4		4	4	96
	Large	180	256	4		4	4	100
BOULDER	Small	256	362					100
	Small	362	512					100
	Medium	512	1024					100
	Large/Very Large	1024	2048					100
BEDROCK	Bedrock	2048	>2048					100
			Total	**50**	**46**	**96**	**100**	**100**

Reachwide	
Channel materials (mm)	
D_{16} =	Silt/Clay
D_{35} =	0.34
D_{50} =	2.8
D_{84} =	71.6
D_{95} =	168.1
D_{100} =	256.0





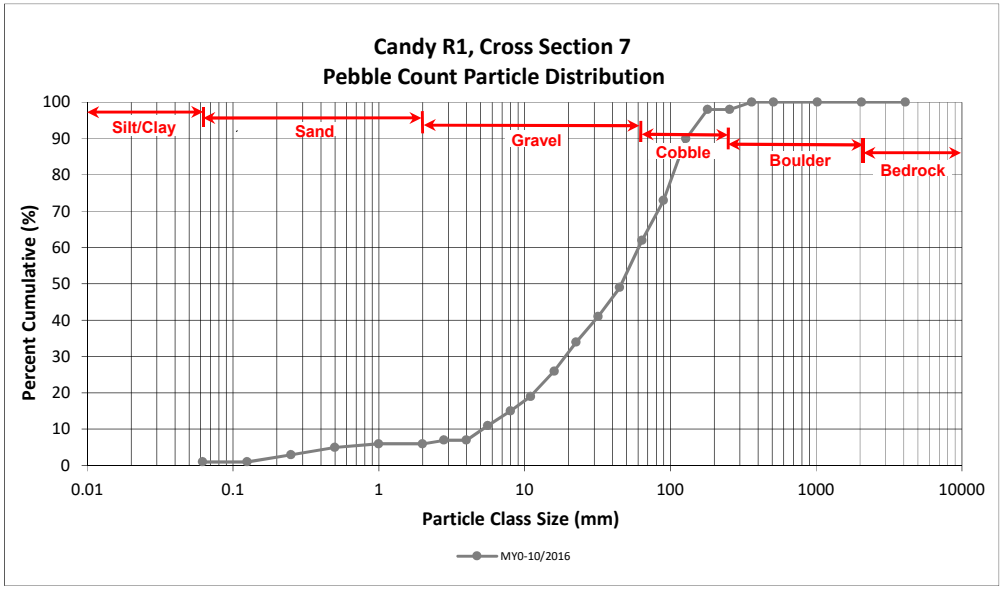
Reachwide and Cross Section Pebble Count Plots

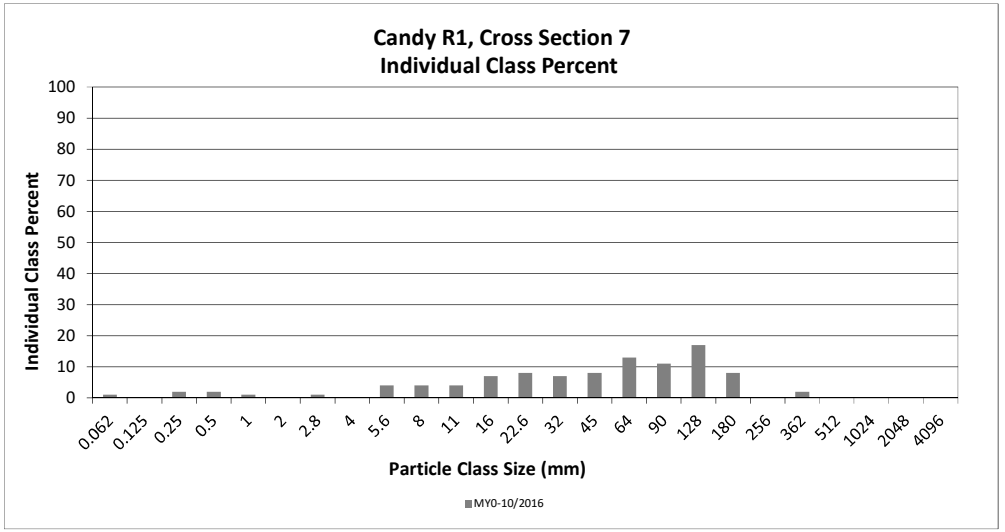
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Candy R1, Cross Section 7

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	1	1	1
SAND	Very fine	0.062	0.125			1
	Fine	0.125	0.250	2	2	3
	Medium	0.25	0.50	2	2	5
	Coarse	0.5	1.0	1	1	6
	Very Coarse	1.0	2.0			6
GRAVEL	Very Fine	2.0	2.8	1	1	7
	Very Fine	2.8	4.0			7
	Fine	4.0	5.6	4	4	11
	Fine	5.6	8.0	4	4	15
	Medium	8.0	11.0	4	4	19
	Medium	11.0	16.0	7	7	26
	Coarse	16.0	22.6	8	8	34
	Coarse	22.6	32	7	7	41
	Very Coarse	32	45	8	8	49
	Very Coarse	45	64	13	13	62
COBBLE	Small	64	90	11	11	73
	Small	90	128	17	17	90
	Large	128	180	8	8	98
	Large	180	256			98
BOULDER	Small	256	362	2	2	100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
			Total	**100**	**100**	**100**

Cross Section 7	
Channel materials (mm)	
D_{16} =	8.66
D_{35} =	23.75
D_{50} =	46.2
D_{84} =	113.0
D_{95} =	158.4
D_{100} =	362.0





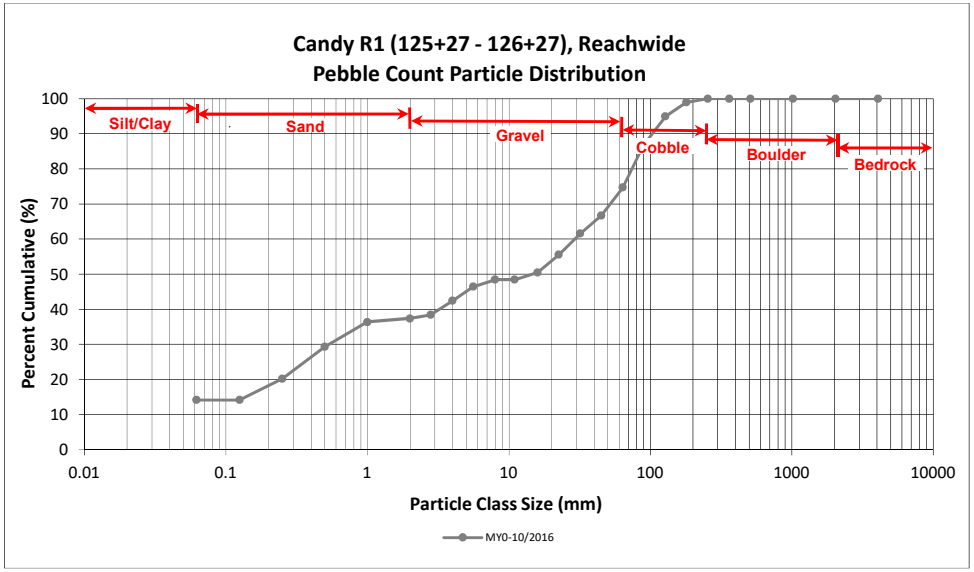
Reachwide and Cross Section Pebble Count Plots

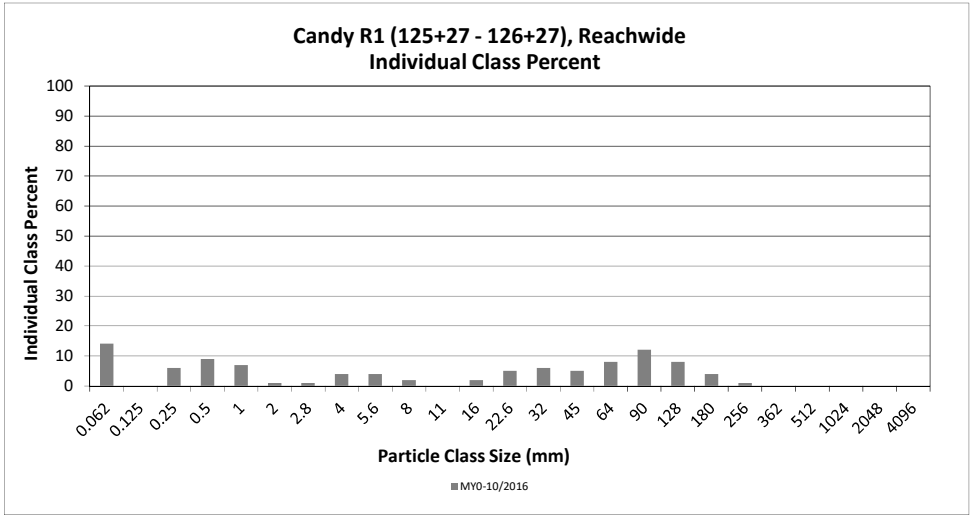
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Candy R1 (125+27 - 126+27), Reachwide

Particle Class		Diameter (mm)		Particle Count			Reach Summary	
		min	max	Riffle	Pool	Total	Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	4	10	14	14	14
SAND	Very fine	0.062	0.125					14
	Fine	0.125	0.250	2	4	6	6	20
	Medium	0.25	0.50	1	8	9	9	29
	Coarse	0.5	1.0	4	3	7	7	36
	Very Coarse	1.0	2.0		1	1	1	37
GRAVEL	Very Fine	2.0	2.8		1	1	1	38
	Very Fine	2.8	4.0		4	4	4	42
	Fine	4.0	5.6	2	2	4	4	46
	Fine	5.6	8.0	2		2	2	48
	Medium	8.0	11.0					48
	Medium	11.0	16.0	2		2	2	51
	Coarse	16.0	22.6	5		5	5	56
	Coarse	22.6	32	6		6	6	62
	Very Coarse	32	45	5		5	5	67
	Very Coarse	45	64	8		8	8	75
COBBLE	Small	64	90	12		12	12	87
	Small	90	128	8		8	8	95
	Large	128	180	4		4	4	99
	Large	180	256	1		1	1	100
BOULDER	Small	256	362					100
	Small	362	512					100
	Medium	512	1024					100
	Large/Very Large	1024	2048					100
BEDROCK	Bedrock	2048	>2048					100
			Total	**66**	**33**	**99**	**100**	**100**

Reachwide	
Channel materials (mm)	
D_{16} =	0.15
D_{35} =	0.87
D_{50} =	14.6
D_{84} =	83.0
D_{95} =	128.5
D_{100} =	256.0





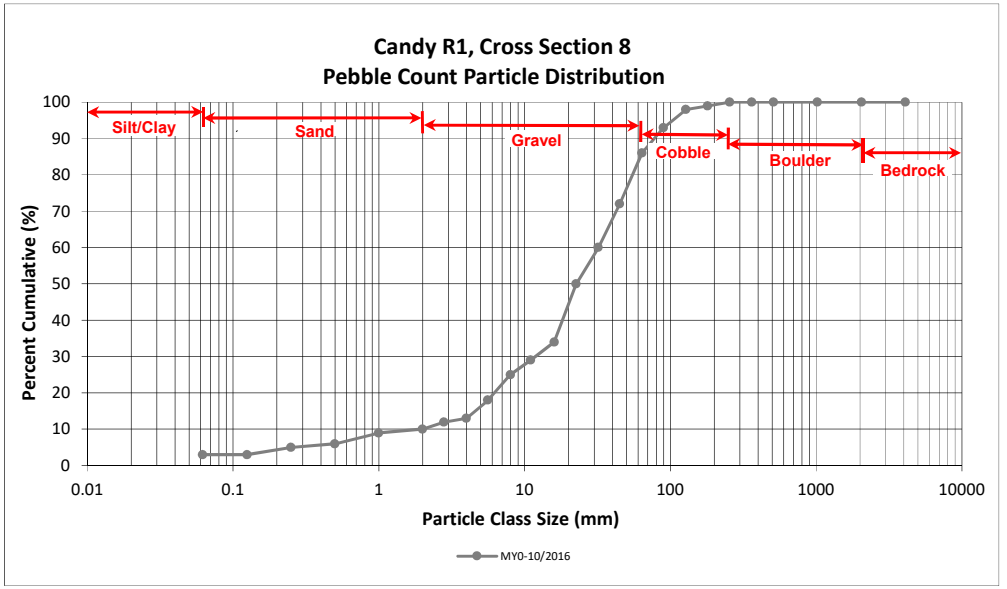
Reachwide and Cross Section Pebble Count Plots

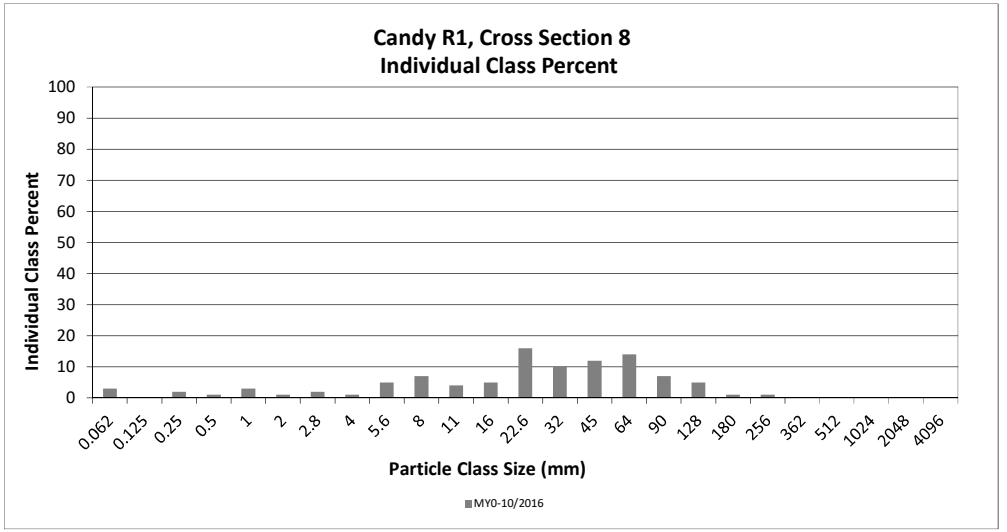
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Candy R1, Cross Section 8

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	3	3	3
SAND	Very fine	0.062	0.125			3
	Fine	0.125	0.250	2	2	5
	Medium	0.25	0.50	1	1	6
	Coarse	0.5	1.0	3	3	9
	Very Coarse	1.0	2.0	1	1	10
GRAVEL	Very Fine	2.0	2.8	2	2	12
	Very Fine	2.8	4.0	1	1	13
	Fine	4.0	5.6	5	5	18
	Fine	5.6	8.0	7	7	25
	Medium	8.0	11.0	4	4	29
	Medium	11.0	16.0	5	5	34
	Coarse	16.0	22.6	16	16	50
	Coarse	22.6	32	10	10	60
	Very Coarse	32	45	12	12	72
	Very Coarse	45	64	14	14	86
COBBLE	Small	64	90	7	7	93
	Small	90	128	5	5	98
	Large	128	180	1	1	99
	Large	180	256	1	1	100
BOULDER	Small	256	362			100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
			Total	**100**	**100**	**100**

Cross Section 8	
Channel materials (mm)	
D_{16} =	4.89
D_{35} =	16.35
D_{50} =	22.6
D_{84} =	60.9
D_{95} =	103.6
D_{100} =	256.0





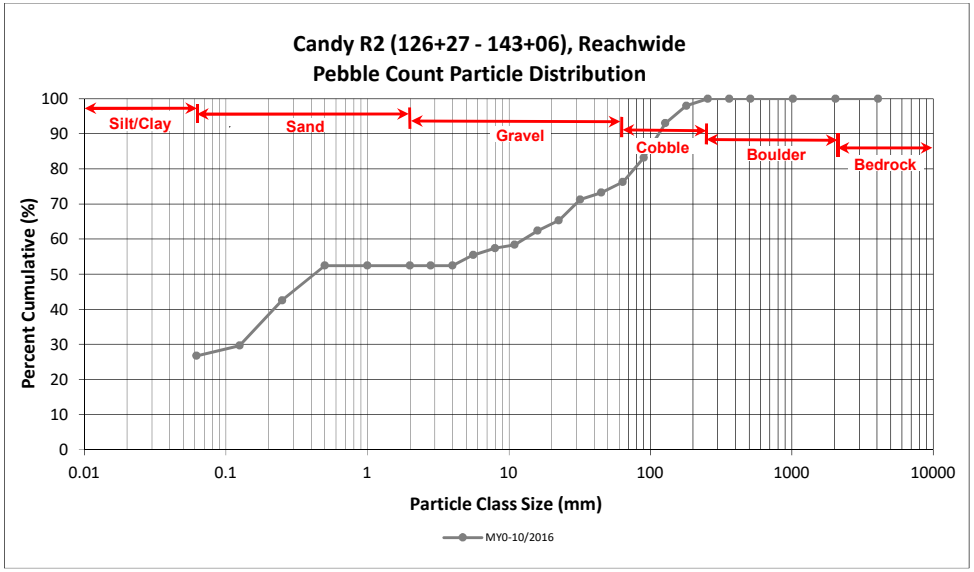
Reachwide and Cross Section Pebble Count Plots

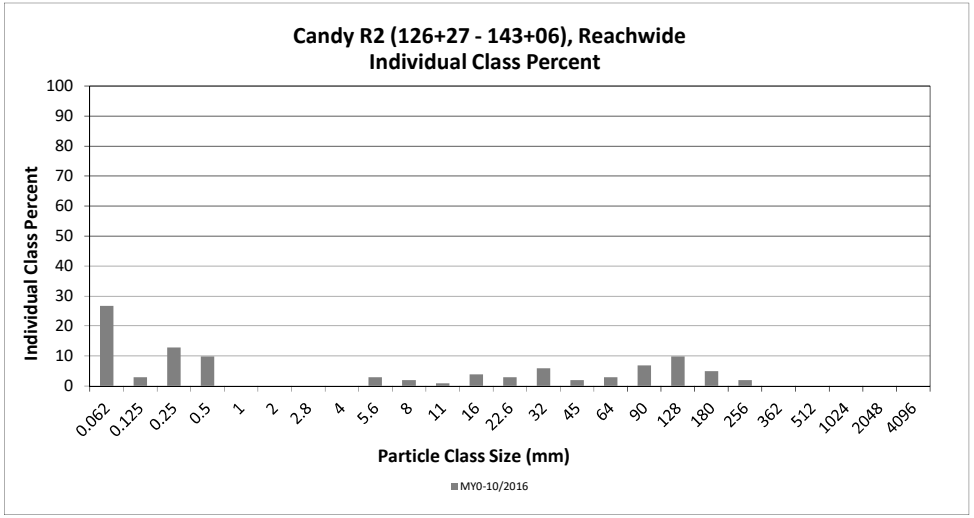
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Candy R2 (126+27 - 143+06), Reachwide

Particle Class		Diameter (mm)		Particle Count			Reach Summary	
		min	max	Riffle	Pool	Total	Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	2	25	27	27	27
SAND	Very fine	0.062	0.125		3	3	3	30
	Fine	0.125	0.250	1	12	13	13	43
	Medium	0.25	0.50	4	6	10	10	52
	Coarse	0.5	1.0					52
	Very Coarse	1.0	2.0					52
GRAVEL	Very Fine	2.0	2.8					52
	Very Fine	2.8	4.0					52
	Fine	4.0	5.6	1	2	3	3	55
	Fine	5.6	8.0	2		2	2	57
	Medium	8.0	11.0	1		1	1	58
	Medium	11.0	16.0	2	2	4	4	62
	Coarse	16.0	22.6	3		3	3	65
	Coarse	22.6	32	6		6	6	71
	Very Coarse	32	45	2		2	2	73
	Very Coarse	45	64	3		3	3	76
COBBLE	Small	64	90	7		7	7	83
	Small	90	128	10		10	10	93
	Large	128	180	5		5	5	98
	Large	180	256	2		2	2	100
BOULDER	Small	256	362					100
	Small	362	512					100
	Medium	512	1024					100
	Large/Very Large	1024	2048					100
BEDROCK	Bedrock	2048	>2048					100
			Total	**51**	**50**	**101**	**100**	**100**

Reachwide	
Channel materials (mm)	
D_{16} =	Silt/Clay
D_{35} =	0.17
D_{50} =	0.4
D_{84} =	92.7
D_{95} =	146.2
D_{100} =	256.0





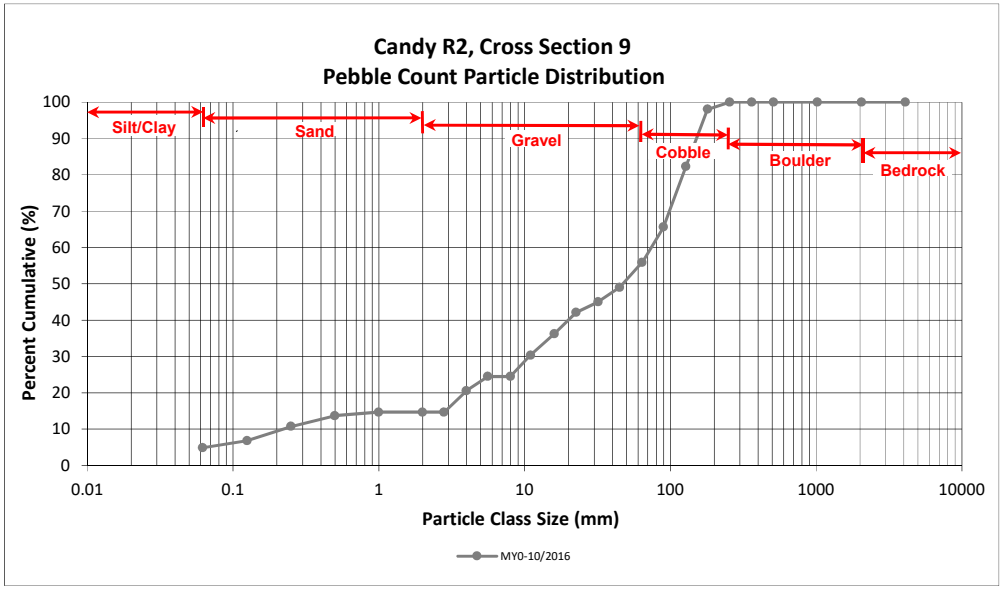
Reachwide and Cross Section Pebble Count Plots

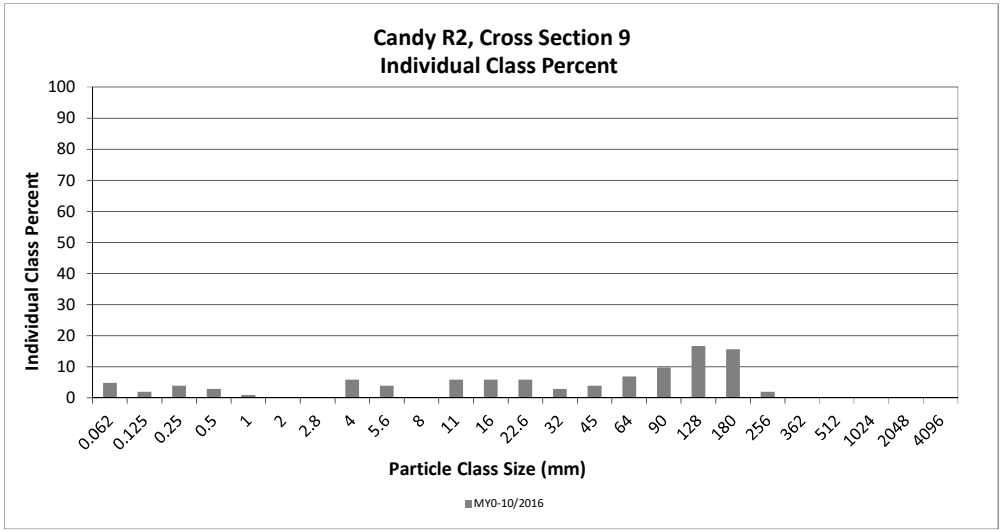
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Candy R2, Cross Section 9

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	5	5	5
SAND	Very fine	0.062	0.125	2	2	7
	Fine	0.125	0.250	4	4	11
	Medium	0.25	0.50	3	3	14
	Coarse	0.5	1.0	1	1	15
	Very Coarse	1.0	2.0			15
GRAVEL	Very Fine	2.0	2.8			15
	Very Fine	2.8	4.0	6	6	21
	Fine	4.0	5.6	4	4	25
	Fine	5.6	8.0			25
	Medium	8.0	11.0	6	6	30
	Medium	11.0	16.0	6	6	36
	Coarse	16.0	22.6	6	6	42
	Coarse	22.6	32	3	3	45
	Very Coarse	32	45	4	4	49
	Very Coarse	45	64	7	7	56
COBBLE	Small	64	90	10	10	66
	Small	90	128	17	17	82
	Large	128	180	16	16	98
	Large	180	256	2	2	100
BOULDER	Small	256	362			100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
			Total	**102**	**100**	**100**

Cross Section 9	
Channel materials (mm)	
D_{16} =	3.03
D_{35} =	14.75
D_{50} =	47.3
D_{84} =	132.7
D_{95} =	168.5
D_{100} =	256.0





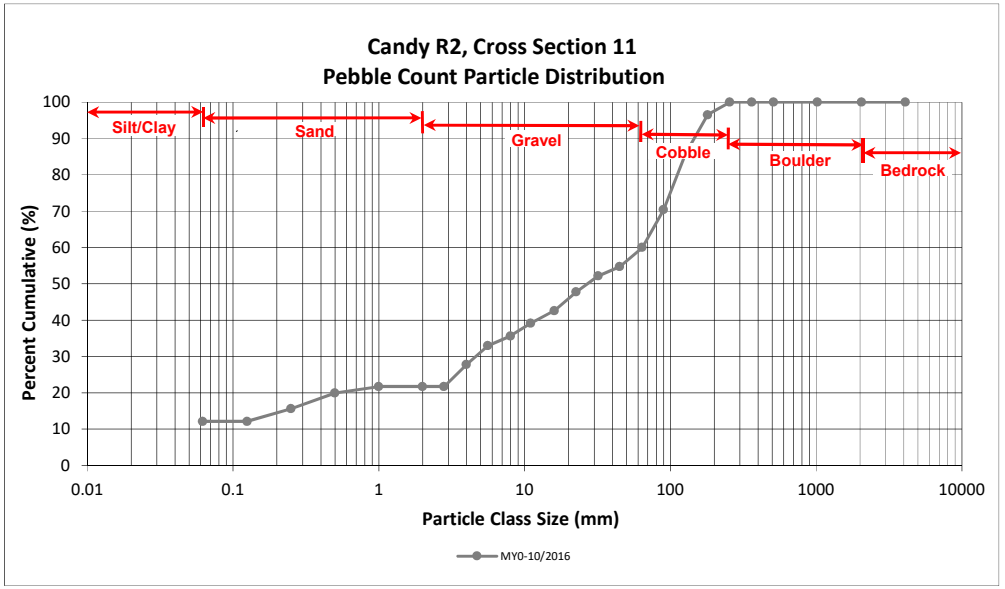
Reachwide and Cross Section Pebble Count Plots

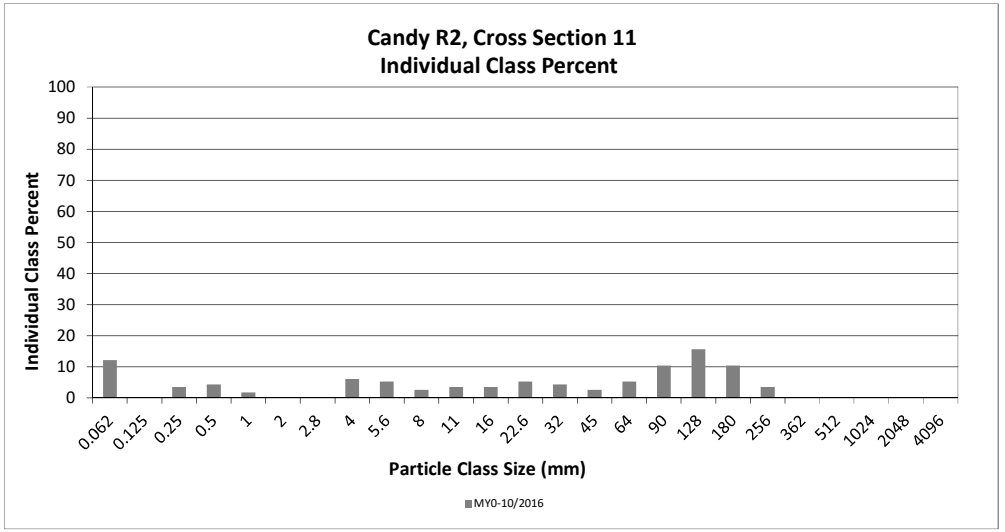
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Candy R2, Cross Section 11

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	14	12	12
SAND	Very fine	0.062	0.125			12
	Fine	0.125	0.250	4	3	16
	Medium	0.25	0.50	5	4	20
	Coarse	0.5	1.0	2	2	22
	Very Coarse	1.0	2.0			22
GRAVEL	Very Fine	2.0	2.8			22
	Very Fine	2.8	4.0	7	6	28
	Fine	4.0	5.6	6	5	33
	Fine	5.6	8.0	3	3	36
	Medium	8.0	11.0	4	3	39
	Medium	11.0	16.0	4	3	43
	Coarse	16.0	22.6	6	5	48
	Coarse	22.6	32	5	4	52
	Very Coarse	32	45	3	3	55
	Very Coarse	45	64	6	5	60
COBBLE	Small	64	90	12	10	70
	Small	90	128	18	16	86
	Large	128	180	12	10	97
	Large	180	256	4	3	100
BOULDER	Small	256	362			100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
			Total	**115**	**100**	**100**

Cross Section 11	
Channel materials (mm)	
D_{16} =	0.26
D_{35} =	7.32
D_{50} =	26.9
D_{84} =	122.1
D_{95} =	171.3
D_{100} =	256.0





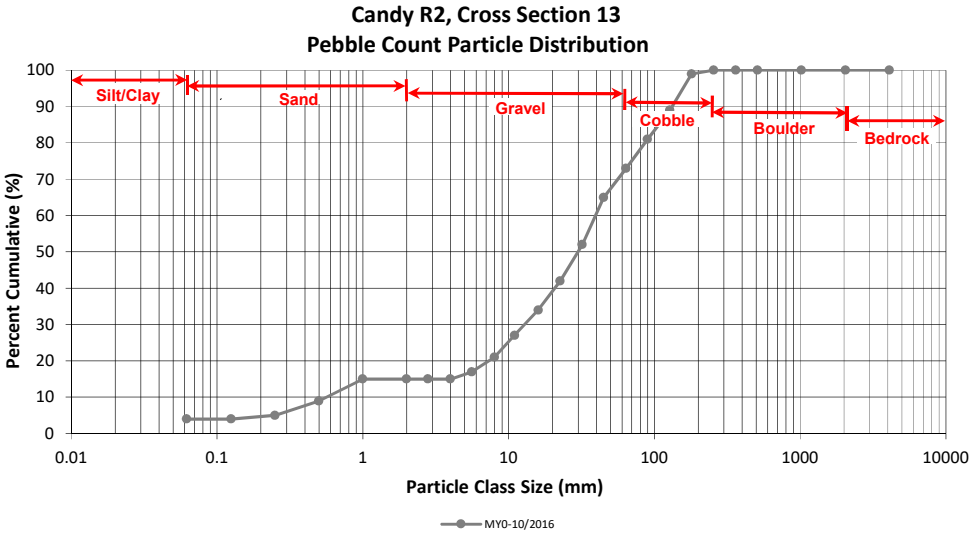
Reachwide and Cross Section Pebble Count Plots

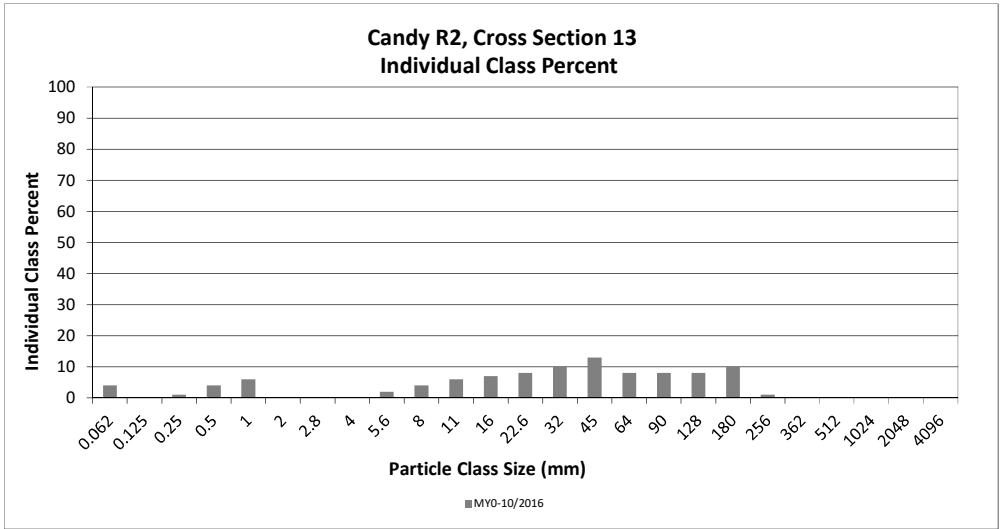
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Candy R2, Cross Section 13

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	4	4	4
SAND	Very fine	0.062	0.125			4
	Fine	0.125	0.250	1	1	5
	Medium	0.25	0.50	4	4	9
	Coarse	0.5	1.0	6	6	15
	Very Coarse	1.0	2.0			15
GRAVEL	Very Fine	2.0	2.8			15
	Very Fine	2.8	4.0			15
	Fine	4.0	5.6	2	2	17
	Fine	5.6	8.0	4	4	21
	Medium	8.0	11.0	6	6	27
	Medium	11.0	16.0	7	7	34
	Coarse	16.0	22.6	8	8	42
	Coarse	22.6	32	10	10	52
	Very Coarse	32	45	13	13	65
	Very Coarse	45	64	8	8	73
COBBLE	Small	64	90	8	8	81
	Small	90	128	8	8	89
	Large	128	180	10	10	99
	Large	180	256	1	1	100
BOULDER	Small	256	362			100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
			Total	**100**	**100**	**100**

Cross Section 13	
Channel materials (mm)	
D_{16} =	4.73
D_{35} =	16.71
D_{50} =	29.8
D_{84} =	102.7
D_{95} =	157.1
D_{100} =	256.0





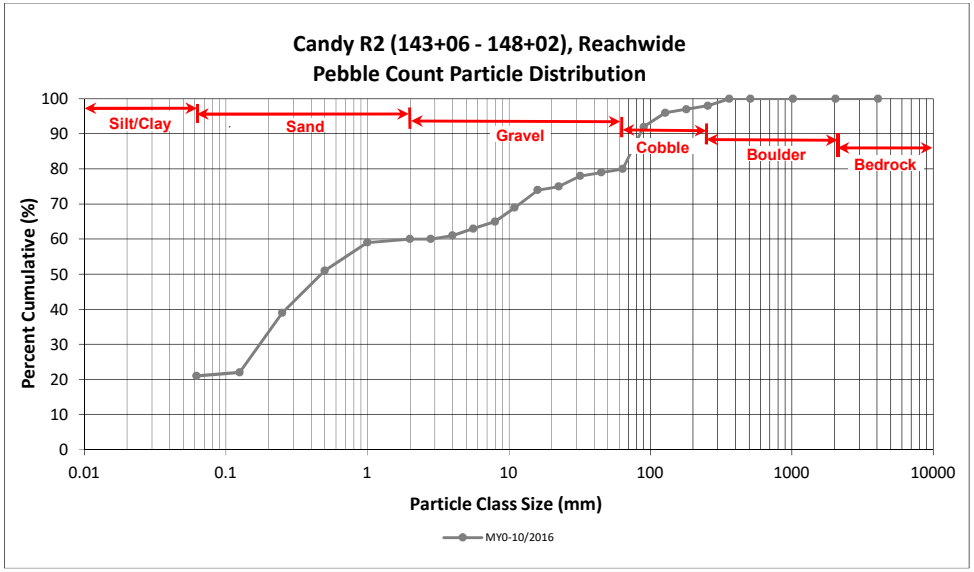
Reachwide and Cross Section Pebble Count Plots

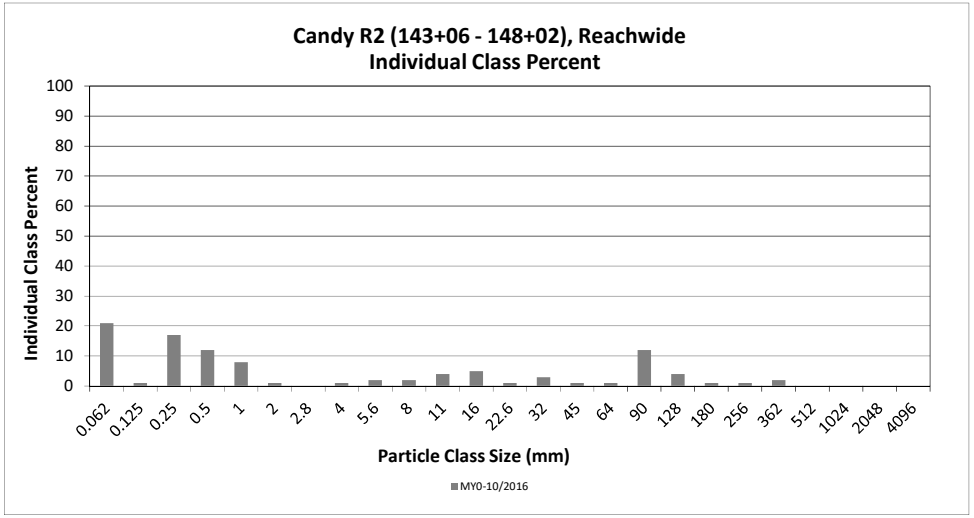
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Candy R2 (143+06 - 148+02), Reachwide

Particle Class		Diameter (mm)		Particle Count			Reach Summary	
		min	max	Riffle	Pool	Total	Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	4	17	21	21	21
SAND	Very fine	0.062	0.125	1		1	1	22
	Fine	0.125	0.250	4	13	17	17	39
	Medium	0.25	0.50	3	9	12	12	51
	Coarse	0.5	1.0	2	6	8	8	59
	Very Coarse	1.0	2.0	1		1	1	60
GRAVEL	Very Fine	2.0	2.8					60
	Very Fine	2.8	4.0		1	1	1	61
	Fine	4.0	5.6	1	1	2	2	63
	Fine	5.6	8.0	2		2	2	65
	Medium	8.0	11.0	3	1	4	4	69
	Medium	11.0	16.0	4	1	5	5	74
	Coarse	16.0	22.6	1		1	1	75
	Coarse	22.6	32	2	1	3	3	78
	Very Coarse	32	45	1		1	1	79
	Very Coarse	45	64	1		1	1	80
COBBLE	Small	64	90	12		12	12	92
	Small	90	128	4		4	4	96
	Large	128	180	1		1	1	97
	Large	180	256	1		1	1	98
BOULDER	Small	256	362	2		2	2	100
	Small	362	512					100
	Medium	512	1024					100
	Large/Very Large	1024	2048					100
BEDROCK	Bedrock	2048	>2048					100
			Total	**50**	**50**	**100**	**100**	**100**

Reachwide	
Channel materials (mm)	
D_{16} =	Silt/Clay
D_{35} =	0.21
D_{50} =	0.5
D_{84} =	71.7
D_{95} =	117.2
D_{100} =	362.0





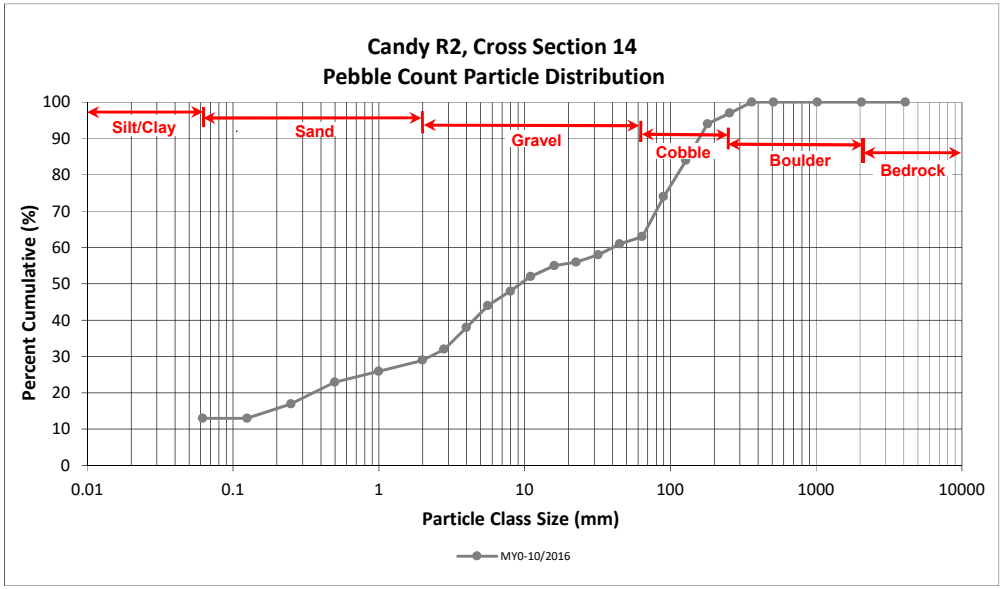
Reachwide and Cross Section Pebble Count Plots

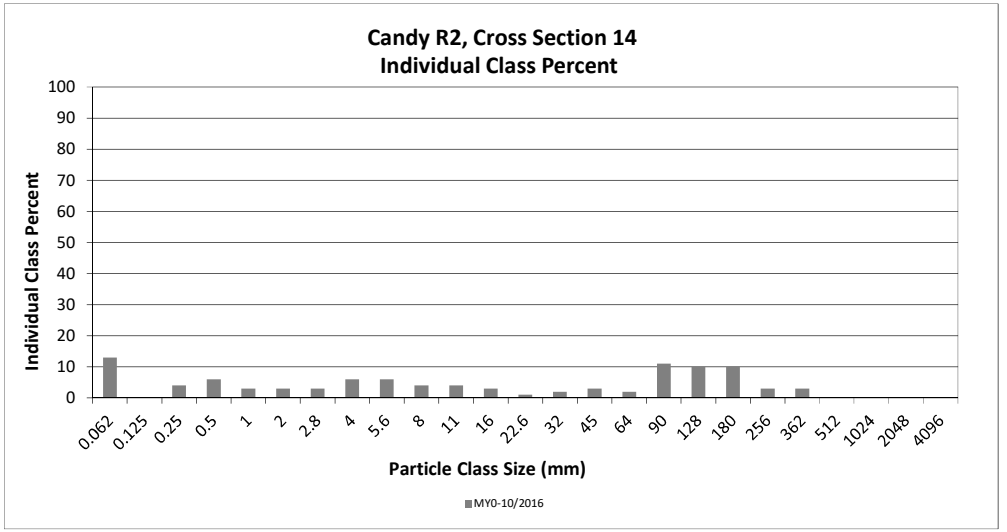
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Candy R2, Cross Section 14

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	13	13	13
SAND	Very fine	0.062	0.125			13
	Fine	0.125	0.250	4	4	17
	Medium	0.25	0.50	6	6	23
	Coarse	0.5	1.0	3	3	26
	Very Coarse	1.0	2.0	3	3	29
GRAVEL	Very Fine	2.0	2.8	3	3	32
	Very Fine	2.8	4.0	6	6	38
	Fine	4.0	5.6	6	6	44
	Fine	5.6	8.0	4	4	48
	Medium	8.0	11.0	4	4	52
	Medium	11.0	16.0	3	3	55
	Coarse	16.0	22.6	1	1	56
	Coarse	22.6	32	2	2	58
	Very Coarse	32	45	3	3	61
	Very Coarse	45	64	2	2	63
COBBLE	Small	64	90	11	11	74
	Small	90	128	10	10	84
	Large	128	180	10	10	94
	Large	180	256	3	3	97
BOULDER	Small	256	362	3	3	100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
			Total	**100**	**100**	**100**

Cross Section 14	
Channel materials (mm)	
D_{16} =	0.21
D_{35} =	3.35
D_{50} =	9.4
D_{84} =	128.0
D_{95} =	202.4
D_{100} =	362.0





Reachwide and Cross Section Pebble Count Plots

Candy Creek Mitigation Site

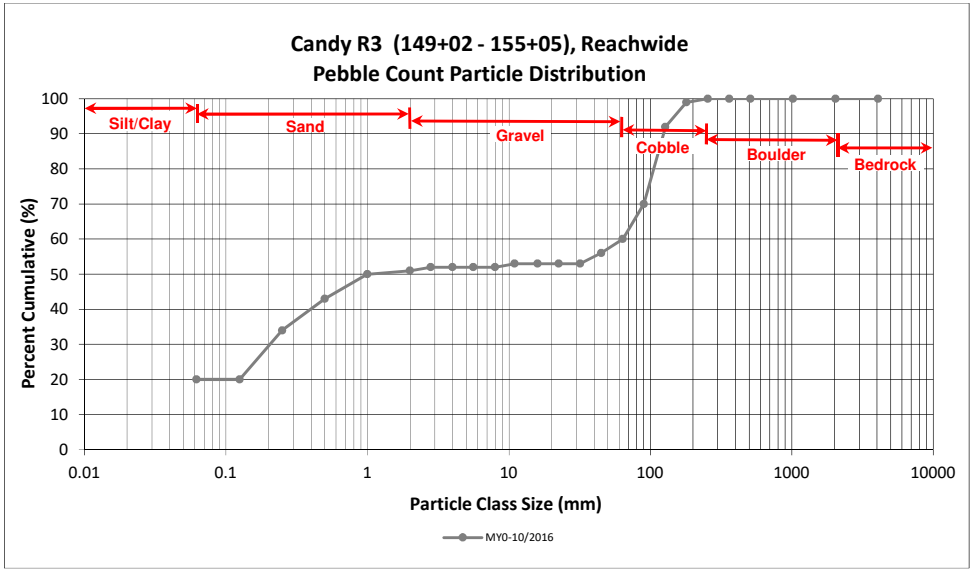
DMS Project No. 96315

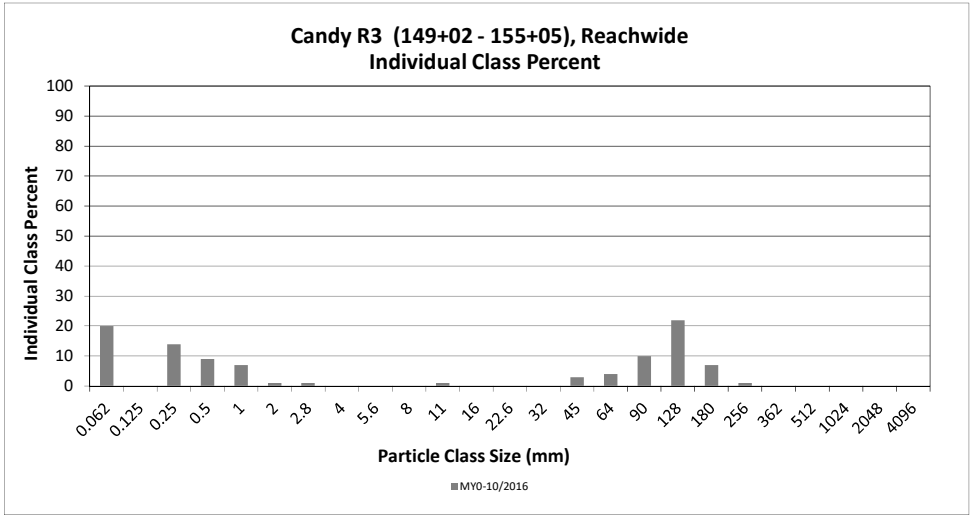
Monitoring Year 0 - 2017

Candy R3 (149+02 - 155+05), Reachwide

Particle Class		Diameter (mm)		Particle Count			Reach Summary	
		min	max	Riffle	Pool	Total	Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062		20	20	20	20
SAND	Very fine	0.062	0.125					20
	Fine	0.125	0.250	2	12	14	14	34
	Medium	0.25	0.50		9	9	9	43
	Coarse	0.5	1.0	2	5	7	7	50
	Very Coarse	1.0	2.0		1	1	1	51
GRAVEL	Very Fine	2.0	2.8		1	1	1	52
	Very Fine	2.8	4.0					52
	Fine	4.0	5.6					52
	Fine	5.6	8.0					52
	Medium	8.0	11.0		1	1	1	53
	Medium	11.0	16.0					53
	Coarse	16.0	22.6					53
	Coarse	22.6	32					53
	Very Coarse	32	45	2	1	3	3	56
	Very Coarse	45	64	4		4	4	60
COBBLE	Small	64	90	10		10	10	70
	Small	90	128	22		22	22	92
	Large	128	180	7		7	7	99
	Large	180	256	1		1	1	100
BOULDER	Small	256	362					100
	Small	362	512					100
	Medium	512	1024					100
	Large/Very Large	1024	2048					100
BEDROCK	Bedrock	2048	>2048					100
			Total	**50**	**50**	**100**	**100**	**100**

Reachwide	
Channel materials (mm)	
D_{16} =	Silt/Clay
D_{35} =	0.27
D_{50} =	1.0
D_{84} =	112.6
D_{95} =	148.1
D_{100} =	256.0





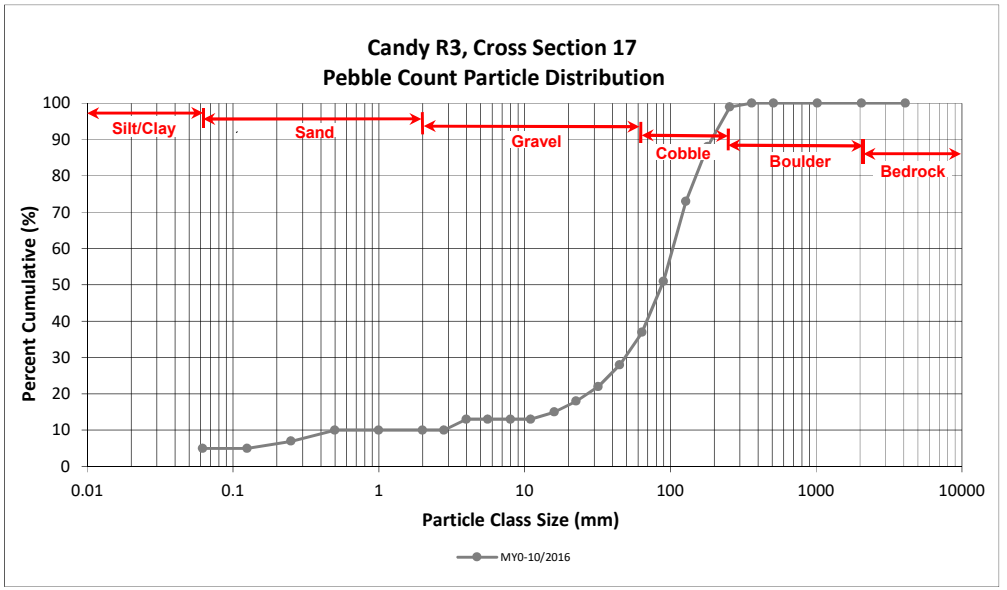
Reachwide and Cross Section Pebble Count Plots

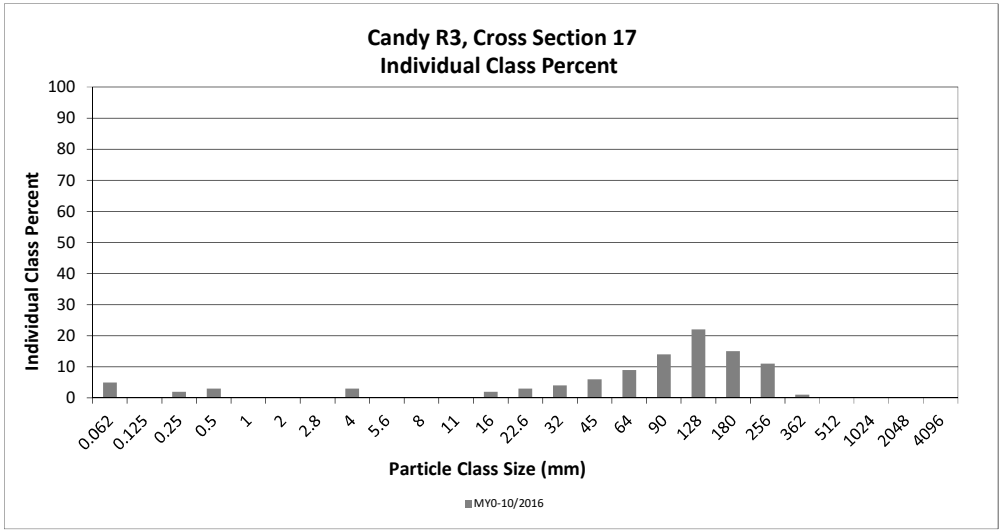
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Candy R3, Cross Section 17

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	5	5	5
SAND	Very fine	0.062	0.125			5
	Fine	0.125	0.250	2	2	7
	Medium	0.25	0.50	3	3	10
	Coarse	0.5	1.0			10
	Very Coarse	1.0	2.0			10
GRAVEL	Very Fine	2.0	2.8			10
	Very Fine	2.8	4.0	3	3	13
	Fine	4.0	5.6			13
	Fine	5.6	8.0			13
	Medium	8.0	11.0			13
	Medium	11.0	16.0	2	2	15
	Coarse	16.0	22.6	3	3	18
	Coarse	22.6	32	4	4	22
	Very Coarse	32	45	6	6	28
	Very Coarse	45	64	9	9	37
COBBLE	Small	64	90	14	14	51
	Small	90	128	22	22	73
	Large	128	180	15	15	88
	Large	180	256	11	11	99
BOULDER	Small	256	362	1	1	100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
			Total	**100**	**100**	**100**

Cross Section 17	
Channel materials (mm)	
D_{16} =	17.95
D_{35} =	59.18
D_{50} =	87.8
D_{84} =	164.4
D_{95} =	225.2
D_{100} =	362.0





Reachwide and Cross Section Pebble Count Plots

Candy Creek Mitigation Site

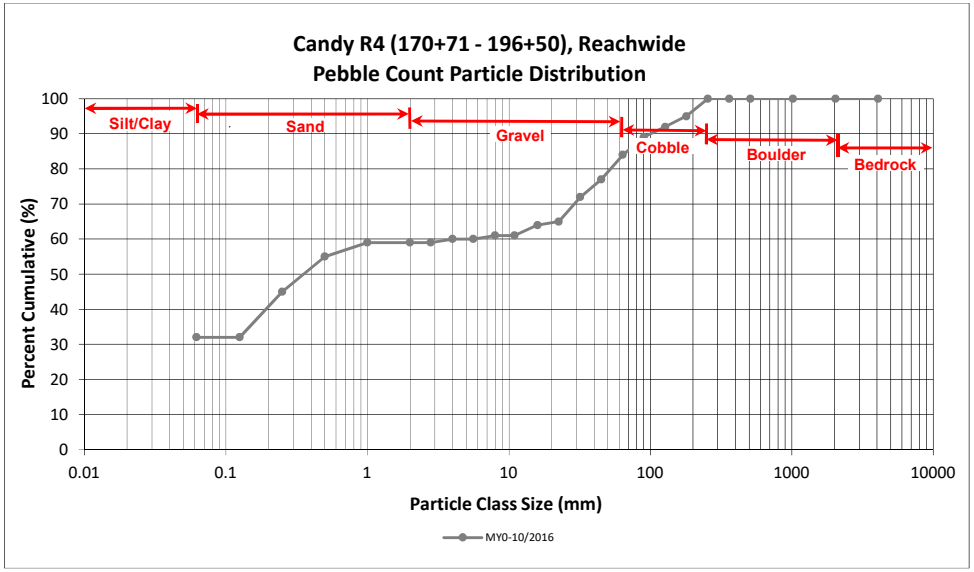
DMS Project No. 96315

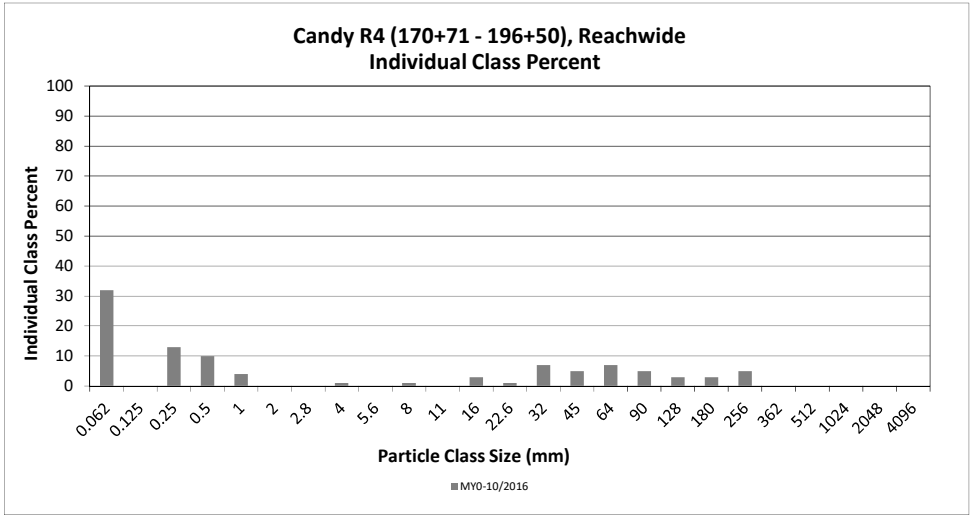
Monitoring Year 0 - 2017

Candy R4 (170+71 - 196+50), Reachwide

Particle Class		Diameter (mm)		Particle Count			Reach Summary	
		min	max	Riffle	Pool	Total	Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	7	25	32	32	32
SAND	Very fine	0.062	0.125					32
	Fine	0.125	0.250	1	12	13	13	45
	Medium	0.25	0.50		10	10	10	55
	Coarse	0.5	1.0	1	3	4	4	59
	Very Coarse	1.0	2.0					59
GRAVEL	Very Fine	2.0	2.8					59
	Very Fine	2.8	4.0	1		1	1	60
	Fine	4.0	5.6					60
	Fine	5.6	8.0	1		1	1	61
	Medium	8.0	11.0					61
	Medium	11.0	16.0	3		3	3	64
	Coarse	16.0	22.6	1		1	1	65
	Coarse	22.6	32	7		7	7	72
	Very Coarse	32	45	5		5	5	77
	Very Coarse	45	64	7		7	7	84
COBBLE	Small	64	90	5		5	5	89
	Small	90	128	3		3	3	92
	Large	128	180	3		3	3	95
	Large	180	256	5		5	5	100
BOULDER	Small	256	362					100
	Small	362	512					100
	Medium	512	1024					100
	Large/Very Large	1024	2048					100
BEDROCK	Bedrock	2048	>2048					100
			Total	**50**	**50**	**100**	**100**	**100**

Reachwide	
Channel materials (mm)	
D_{16} =	Silt/Clay
D_{35} =	0.15
D_{50} =	0.4
D_{84} =	64.0
D_{95} =	180.0
D_{100} =	256.0





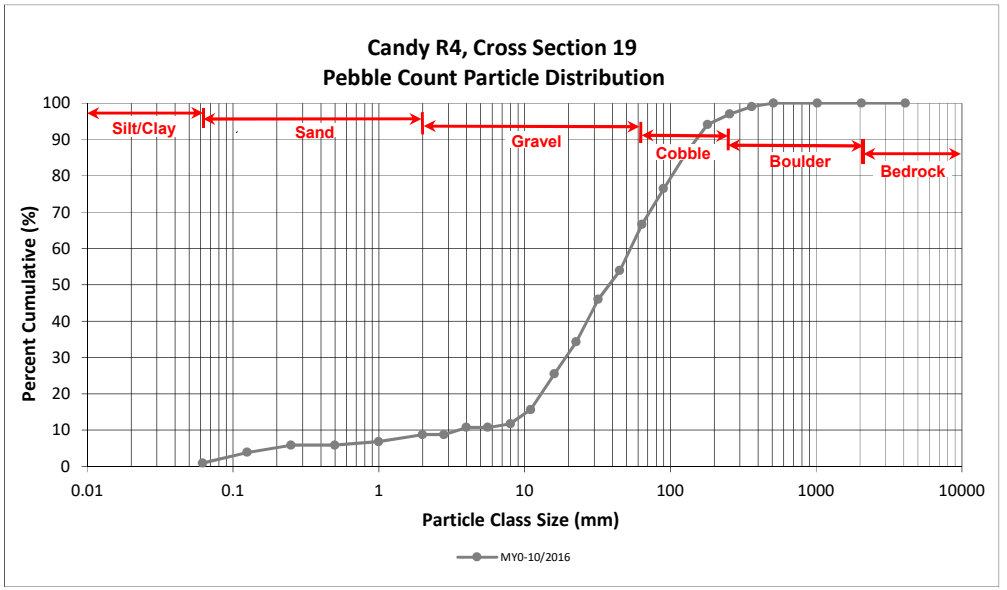
Reachwide and Cross Section Pebble Count Plots

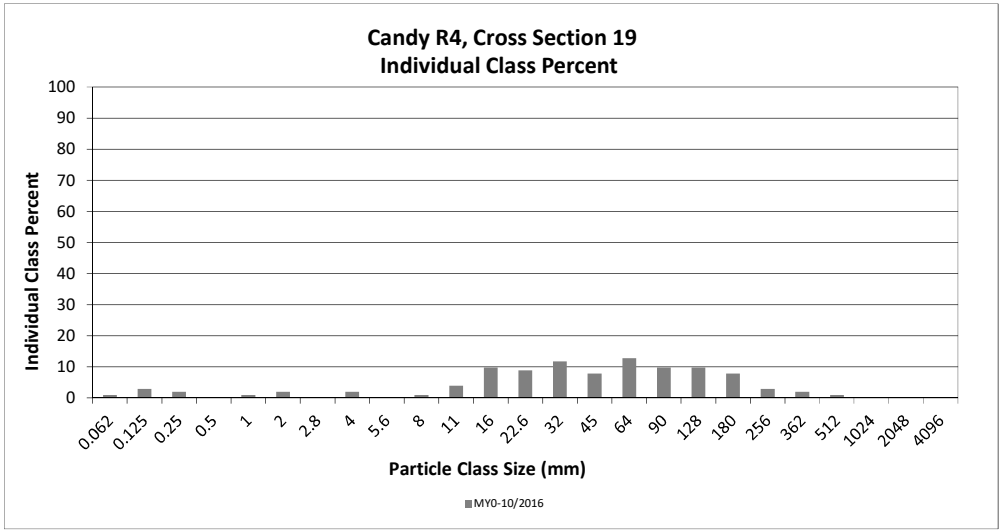
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Candy R4, Cross Section 19

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	1	1	1
SAND	Very fine	0.062	0.125	3	3	4
	Fine	0.125	0.250	2	2	6
	Medium	0.25	0.50			6
	Coarse	0.5	1.0	1	1	7
	Very Coarse	1.0	2.0	2	2	9
GRAVEL	Very Fine	2.0	2.8			9
	Very Fine	2.8	4.0	2	2	11
	Fine	4.0	5.6			11
	Fine	5.6	8.0	1	1	12
	Medium	8.0	11.0	4	4	16
	Medium	11.0	16.0	10	10	25
	Coarse	16.0	22.6	9	9	34
	Coarse	22.6	32	12	12	46
	Very Coarse	32	45	8	8	54
	Very Coarse	45	64	13	13	67
COBBLE	Small	64	90	10	10	76
	Small	90	128	10	10	86
	Large	128	180	8	8	94
	Large	180	256	3	3	97
BOULDER	Small	256	362	2	2	99
	Small	362	512	1	1	100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
			Total	**102**	**100**	**100**

Cross Section 18	
Channel materials (mm)	
D_{16} =	11.13
D_{35} =	23.06
D_{50} =	37.9
D_{84} =	118.0
D_{95} =	200.1
D_{100} =	512.0





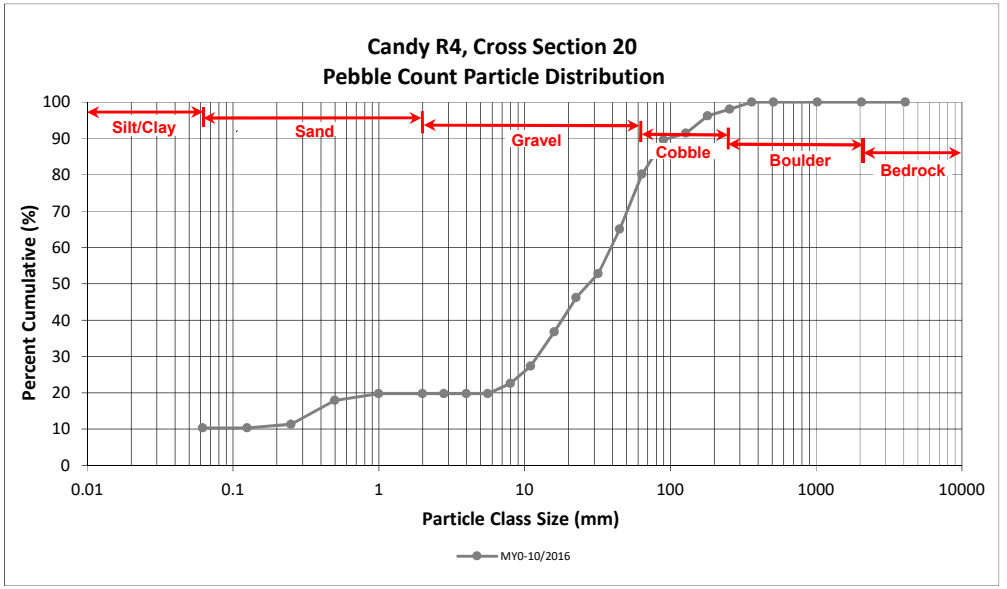
Reachwide and Cross Section Pebble Count Plots

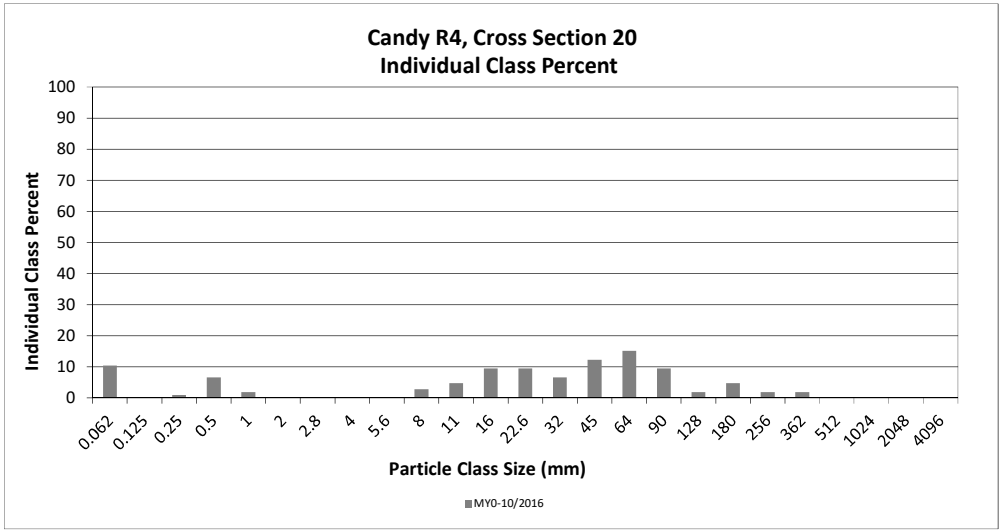
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Candy R4, Cross Section 20

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	11	10	10
SAND	Very fine	0.062	0.125			10
	Fine	0.125	0.250	1	1	11
	Medium	0.25	0.50	7	7	18
	Coarse	0.5	1.0	2	2	20
	Very Coarse	1.0	2.0			20
GRAVEL	Very Fine	2.0	2.8			20
	Very Fine	2.8	4.0			20
	Fine	4.0	5.6			20
	Fine	5.6	8.0	3	3	23
	Medium	8.0	11.0	5	5	27
	Medium	11.0	16.0	10	9	37
	Coarse	16.0	22.6	10	9	46
	Coarse	22.6	32	7	7	53
	Very Coarse	32	45	13	12	65
	Very Coarse	45	64	16	15	80
COBBLE	Small	64	90	10	9	90
	Small	90	128	2	2	92
	Large	128	180	5	5	96
	Large	180	256	2	2	98
BOULDER	Small	256	362	2	2	100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
			Total	**106**	**100**	**100**

Cross Section 20	
Channel materials (mm)	
D_{16} =	0.41
D_{35} =	14.90
D_{50} =	27.6
D_{84} =	73.5
D_{95} =	164.7
D_{100} =	362.0





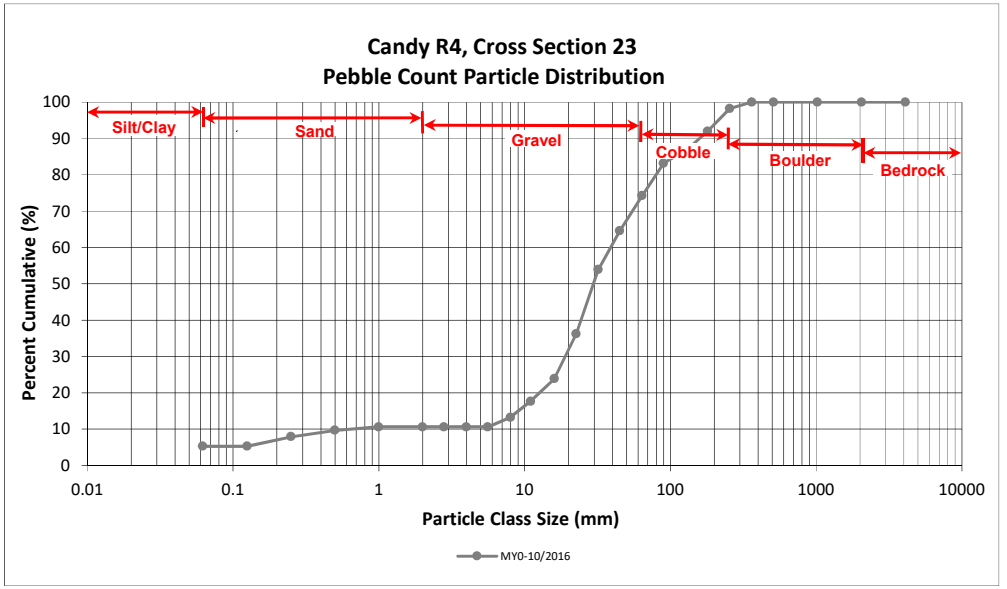
Reachwide and Cross Section Pebble Count Plots

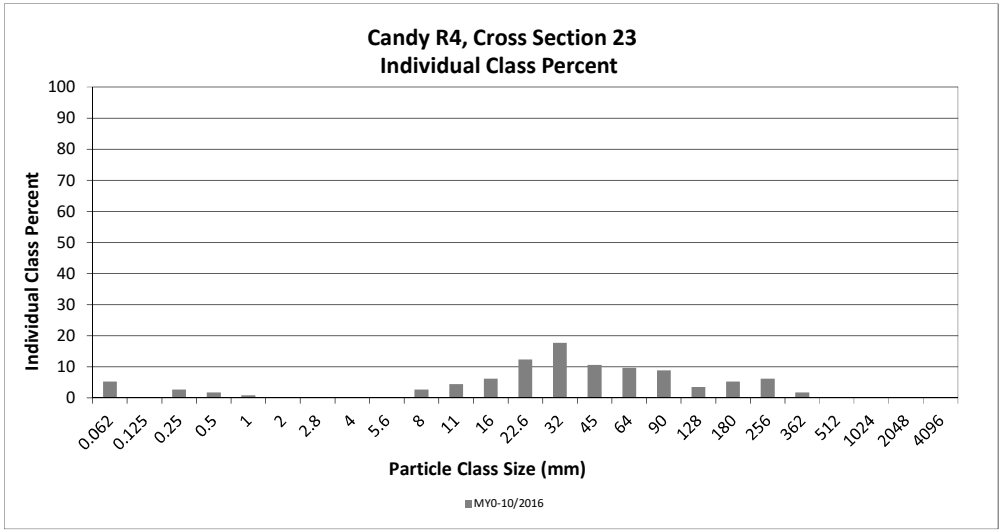
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Candy R4, Cross Section 23

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	6	5	5
SAND	Very fine	0.062	0.125			5
	Fine	0.125	0.250	3	3	8
	Medium	0.25	0.50	2	2	10
	Coarse	0.5	1.0	1	1	11
	Very Coarse	1.0	2.0			11
GRAVEL	Very Fine	2.0	2.8			11
	Very Fine	2.8	4.0			11
	Fine	4.0	5.6			11
	Fine	5.6	8.0	3	3	13
	Medium	8.0	11.0	5	4	18
	Medium	11.0	16.0	7	6	24
	Coarse	16.0	22.6	14	12	36
	Coarse	22.6	32	20	18	54
	Very Coarse	32	45	12	11	65
	Very Coarse	45	64	11	10	74
COBBLE	Small	64	90	10	9	83
	Small	90	128	4	4	87
	Large	128	180	6	5	92
	Large	180	256	7	6	98
BOULDER	Small	256	362	2	2	100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
			Total	**113**	**100**	**100**

Cross Section 23	
Channel materials (mm)	
D_{16} =	9.73
D_{35} =	21.81
D_{50} =	29.6
D_{84} =	97.6
D_{95} =	213.0
D_{100} =	362.0





Reachwide and Cross Section Pebble Count Plots

Candy Creek Mitigation Site

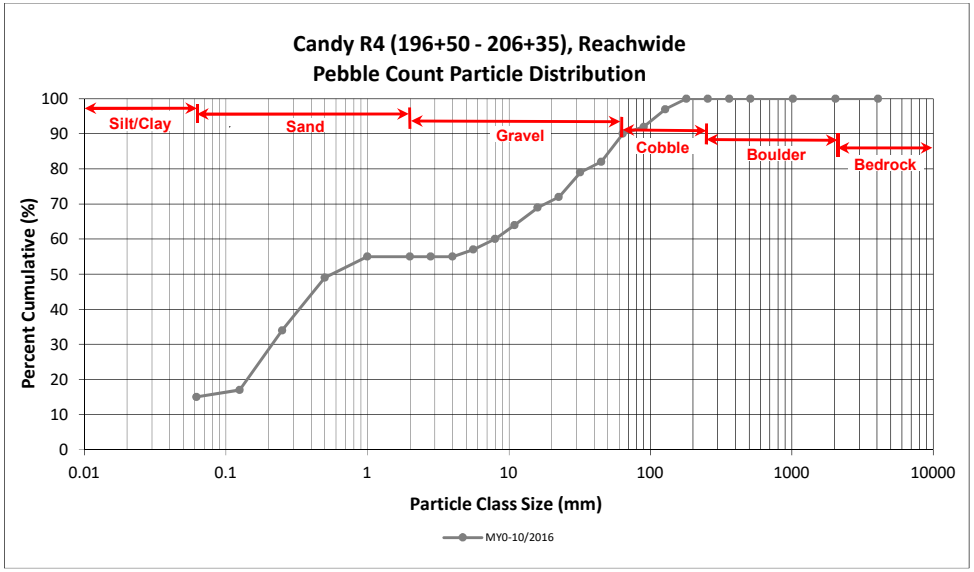
DMS Project No. 96315

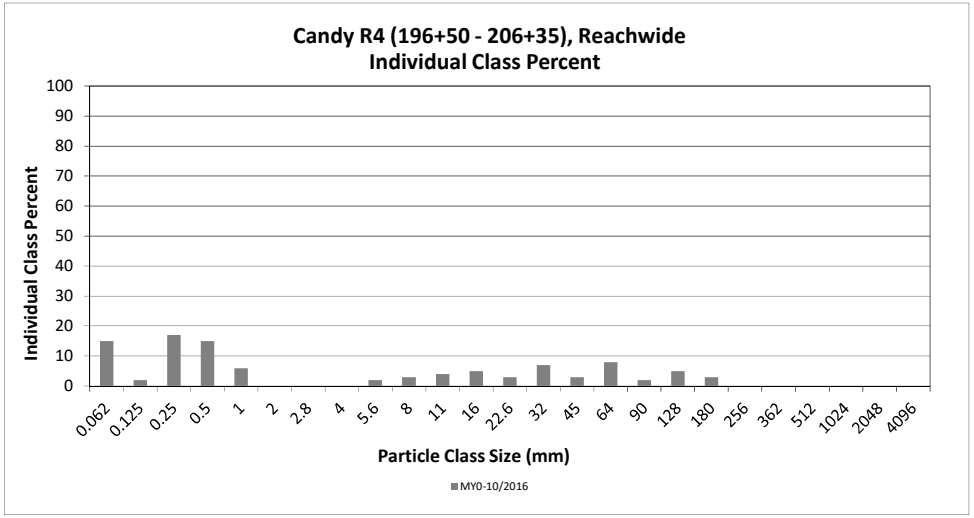
Monitoring Year 0 - 2017

Candy R4 (196+50 - 206+35), Reachwide

Particle Class		Diameter (mm)		Particle Count			Reach Summary	
		min	max	Riffle	Pool	Total	Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	6	9	15	15	15
SAND	Very fine	0.062	0.125		2	2	2	17
	Fine	0.125	0.250	1	16	17	17	34
	Medium	0.25	0.50	1	14	15	15	49
	Coarse	0.5	1.0	1	5	6	6	55
	Very Coarse	1.0	2.0					55
GRAVEL	Very Fine	2.0	2.8					55
	Very Fine	2.8	4.0					55
	Fine	4.0	5.6	1	1	2	2	57
	Fine	5.6	8.0	3		3	3	60
	Medium	8.0	11.0	4		4	4	64
	Medium	11.0	16.0	4	1	5	5	69
	Coarse	16.0	22.6	3		3	3	72
	Coarse	22.6	32	6	1	7	7	79
	Very Coarse	32	45	3		3	3	82
	Very Coarse	45	64	7	1	8	8	90
COBBLE	Small	64	90	2		2	2	92
	Small	90	128	5		5	5	97
	Large	128	180	3		3	3	100
	Large	180	256					100
BOULDER	Small	256	362					100
	Small	362	512					100
	Medium	512	1024					100
	Large/Very Large	1024	2048					100
BEDROCK	Bedrock	2048	>2048					100
			Total	**50**	**50**	**100**	**100**	**100**

Reachwide	
Channel materials (mm)	
D_{16} =	0.09
D_{35} =	0.26
D_{50} =	0.6
D_{84} =	49.1
D_{95} =	111.2
D_{100} =	180.0





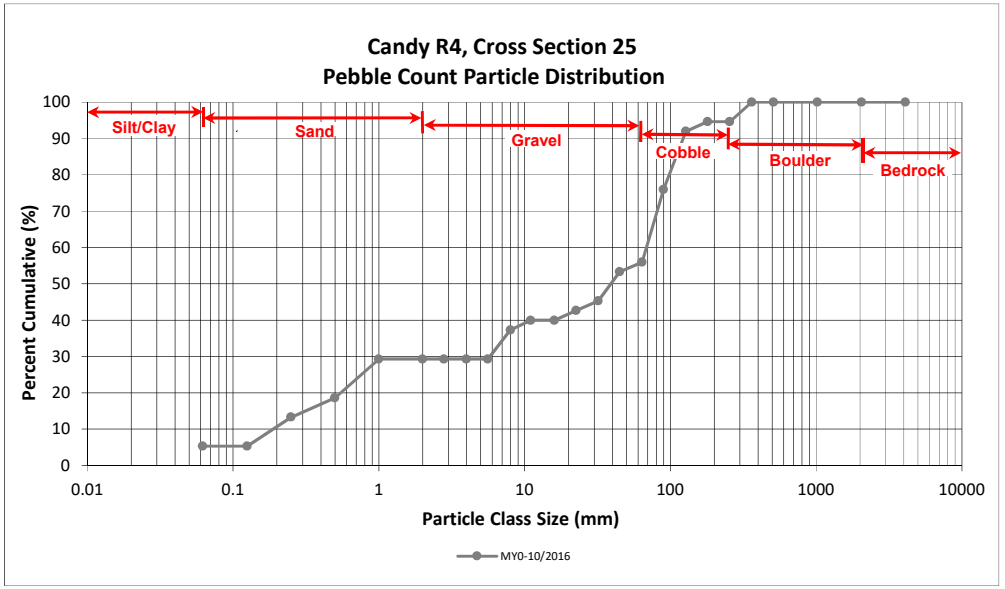
Reachwide and Cross Section Pebble Count Plots

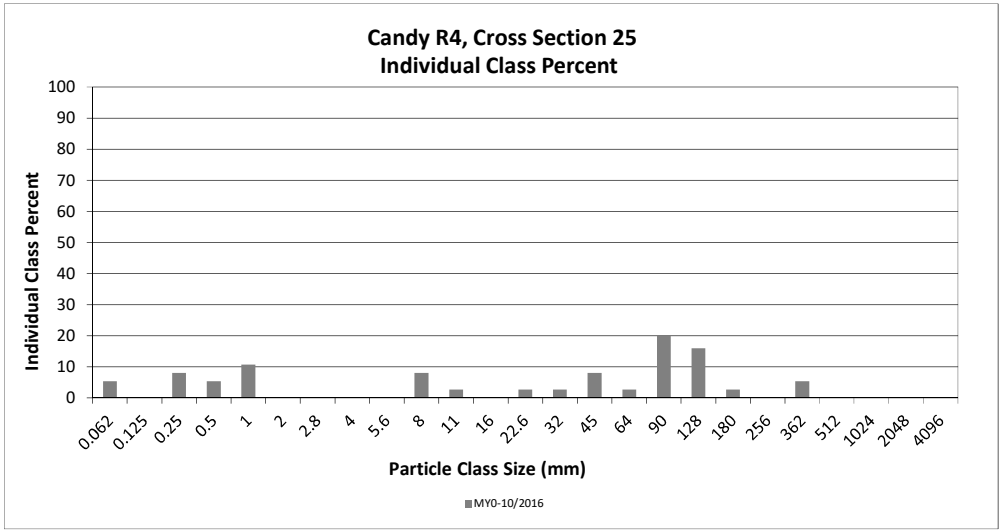
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

Candy R4, Cross Section 25

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	4	5	5
SAND	Very fine	0.062	0.125			5
	Fine	0.125	0.250	6	8	13
	Medium	0.25	0.50	4	5	19
	Coarse	0.5	1.0	8	11	29
	Very Coarse	1.0	2.0			29
GRAVEL	Very Fine	2.0	2.8			29
	Very Fine	2.8	4.0			29
	Fine	4.0	5.6			29
	Fine	5.6	8.0	6	8	37
	Medium	8.0	11.0	2	3	40
	Medium	11.0	16.0			40
	Coarse	16.0	22.6	2	3	43
	Coarse	22.6	32	2	3	45
	Very Coarse	32	45	6	8	53
	Very Coarse	45	64	2	3	56
COBBLE	Small	64	90	15	20	76
	Small	90	128	12	16	92
	Large	128	180	2	3	95
	Large	180	256			95
BOULDER	Small	256	362	4	5	100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
			Total	**75**	**100**	**100**

Cross Section 26	
Channel materials (mm)	
D_{16} =	0.35
D_{35} =	7.21
D_{50} =	39.0
D_{84} =	107.3
D_{95} =	261.6
D_{100} =	362.0





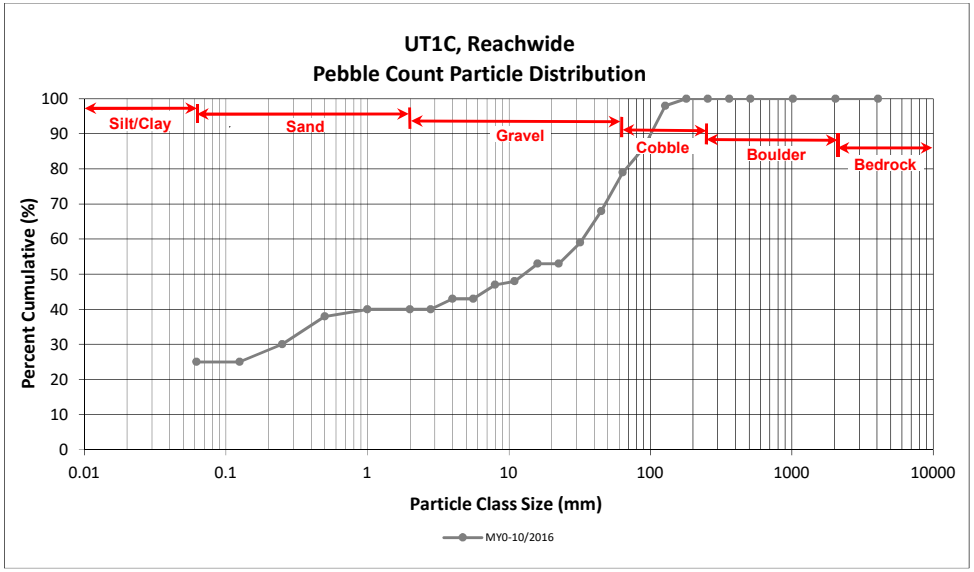
Reachwide and Cross Section Pebble Count Plots

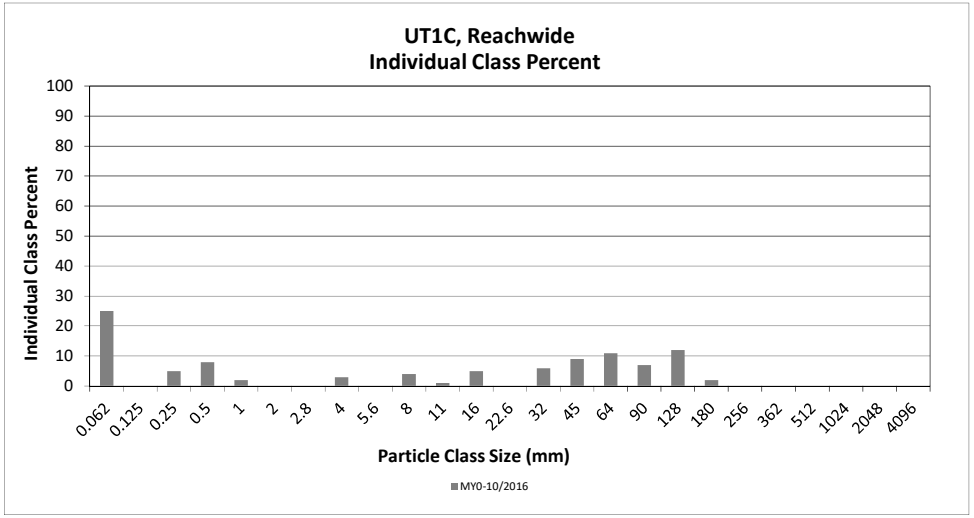
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

UT1C, Reachwide

Particle Class		Diameter (mm)		Particle Count			Reach Summary	
		min	max	Riffle	Pool	Total	Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	2	23	25	25	25
SAND	Very fine	0.062	0.125					25
	Fine	0.125	0.250		5	5	5	30
	Medium	0.25	0.50		8	8	8	38
	Coarse	0.5	1.0		2	2	2	40
	Very Coarse	1.0	2.0					40
GRAVEL	Very Fine	2.0	2.8					40
	Very Fine	2.8	4.0		3	3	3	43
	Fine	4.0	5.6					43
	Fine	5.6	8.0		4	4	4	47
	Medium	8.0	11.0		1	1	1	48
	Medium	11.0	16.0	4	1	5	5	53
	Coarse	16.0	22.6					53
	Coarse	22.6	32	4	2	6	6	59
	Very Coarse	32	45	8	1	9	9	68
	Very Coarse	45	64	11		11	11	79
COBBLE	Small	64	90	7		7	7	86
	Small	90	128	12		12	12	98
	Large	128	180	2		2	2	100
	Large	180	256					100
BOULDER	Small	256	362					100
	Small	362	512					100
	Medium	512	1024					100
	Large/Very Large	1024	2048					100
BEDROCK	Bedrock	2048	>2048					100
			Total	**50**	**50**	**100**	**100**	**100**

Reachwide	
Channel materials (mm)	
D_{16} =	Silt/Clay
D_{35} =	0.39
D_{50} =	12.8
D_{84} =	81.6
D_{95} =	117.2
D_{100} =	180.0





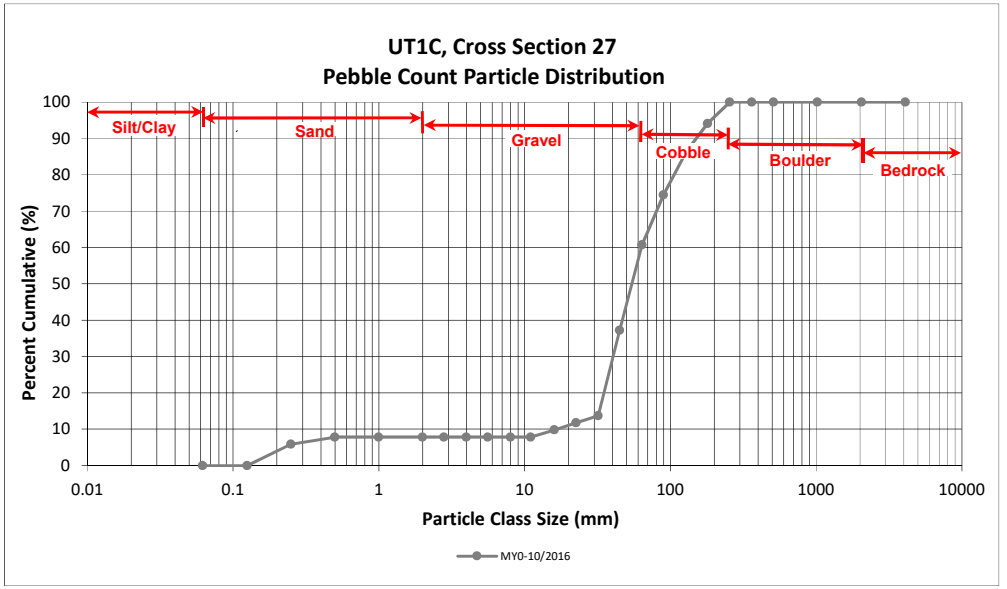
Reachwide and Cross Section Pebble Count Plots

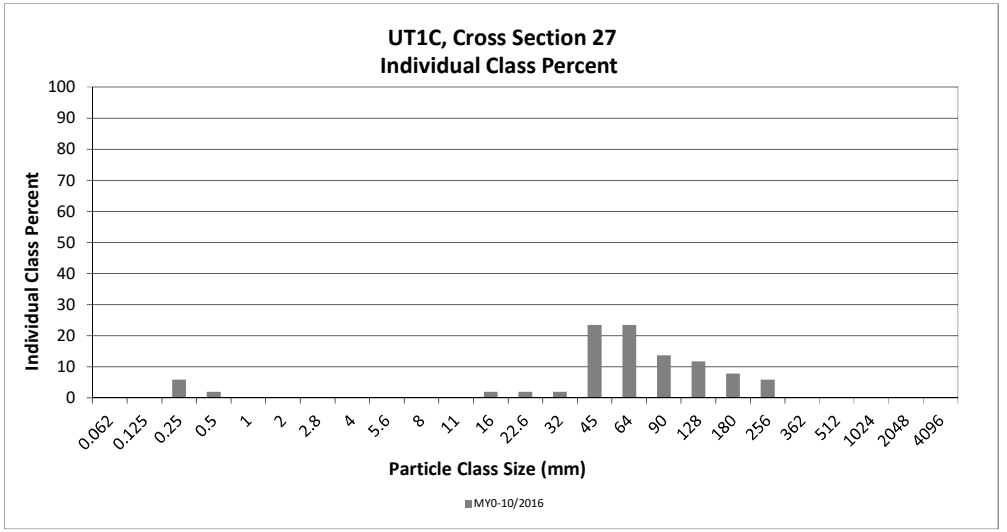
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

UT1C, Cross Section 27

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062			0
SAND	Very fine	0.062	0.125			0
	Fine	0.125	0.250	6	6	6
	Medium	0.25	0.50	2	2	8
	Coarse	0.5	1.0			8
	Very Coarse	1.0	2.0			8
GRAVEL	Very Fine	2.0	2.8			8
	Very Fine	2.8	4.0			8
	Fine	4.0	5.6			8
	Fine	5.6	8.0			8
	Medium	8.0	11.0			8
	Medium	11.0	16.0	2	2	10
	Coarse	16.0	22.6	2	2	12
	Coarse	22.6	32	2	2	14
	Very Coarse	32	45	24	24	37
	Very Coarse	45	64	24	24	61
COBBLE	Small	64	90	14	14	75
	Small	90	128	12	12	86
	Large	128	180	8	8	94
	Large	180	256	6	6	100
BOULDER	Small	256	362			100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
			Total	**102**	**100**	**100**

Cross Section 28	
Channel materials (mm)	
D_{16} =	33.07
D_{35} =	43.55
D_{50} =	54.5
D_{84} =	119.6
D_{95} =	189.8
D_{100} =	256.0





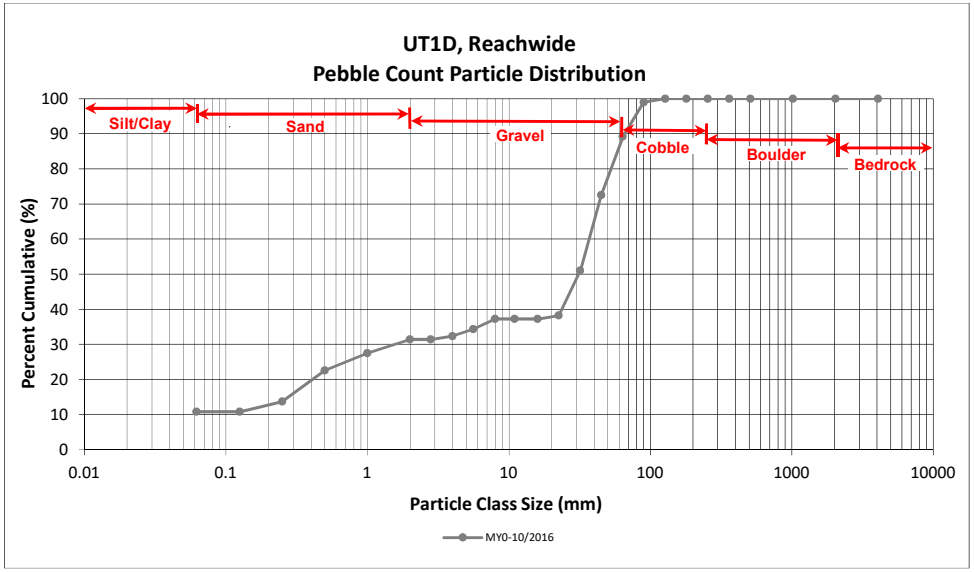
Reachwide and Cross Section Pebble Count Plots

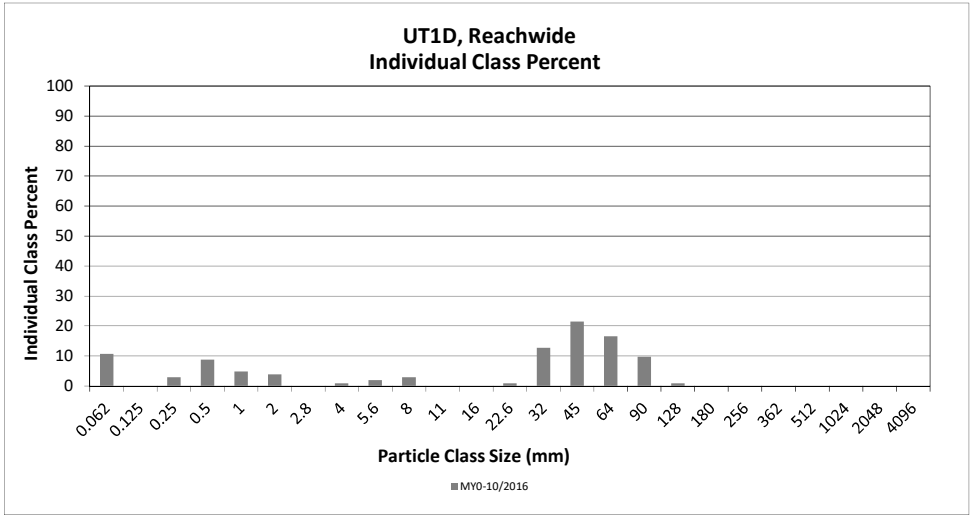
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

UT1D, Reachwide

Particle Class		Diameter (mm)		Particle Count			Reach Summary	
		min	max	Riffle	Pool	Total	Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062		11	11	11	11
SAND	Very fine	0.062	0.125					11
	Fine	0.125	0.250		3	3	3	14
	Medium	0.25	0.50		9	9	9	23
	Coarse	0.5	1.0		5	5	5	27
	Very Coarse	1.0	2.0		4	4	4	31
GRAVEL	Very Fine	2.0	2.8					31
	Very Fine	2.8	4.0		1	1	1	32
	Fine	4.0	5.6		2	2	2	34
	Fine	5.6	8.0		3	3	3	37
	Medium	8.0	11.0					37
	Medium	11.0	16.0					37
	Coarse	16.0	22.6		1	1	1	38
	Coarse	22.6	32	8	5	13	13	51
	Very Coarse	32	45	16	6	22	22	73
	Very Coarse	45	64	15	2	17	17	89
COBBLE	Small	64	90	10		10	10	99
	Small	90	128	1		1	1	100
	Large	128	180					100
	Large	180	256					100
BOULDER	Small	256	362					100
	Small	362	512					100
	Medium	512	1024					100
	Large/Very Large	1024	2048					100
BEDROCK	Bedrock	2048	>2048					100
			Total	**50**	**52**	**102**	**100**	**100**

Reachwide	
Channel materials (mm)	
D_{16} =	0.30
D_{35} =	6.09
D_{50} =	31.2
D_{84} =	57.3
D_{95} =	78.3
D_{100} =	128.0





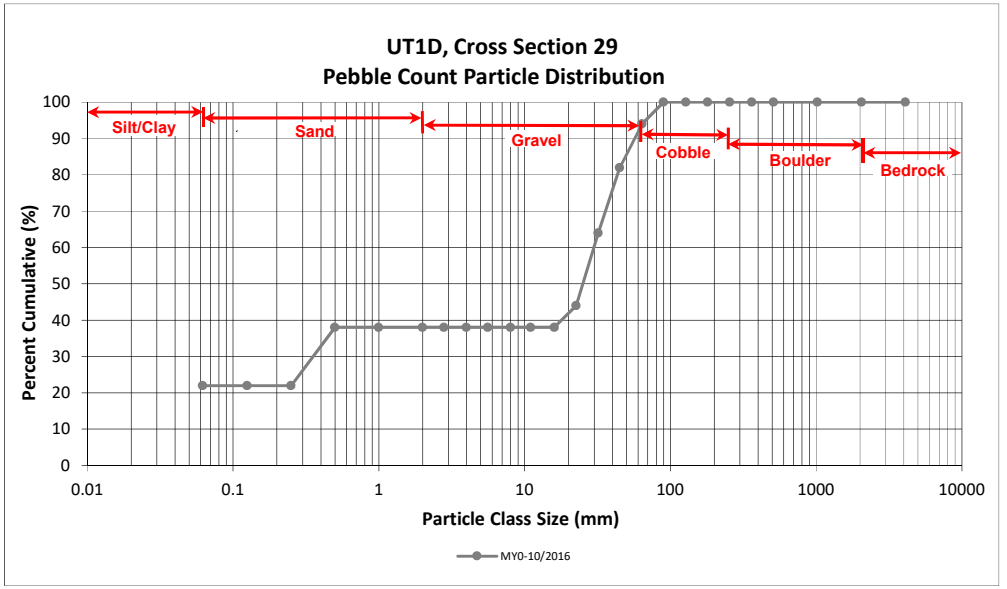
Reachwide and Cross Section Pebble Count Plots

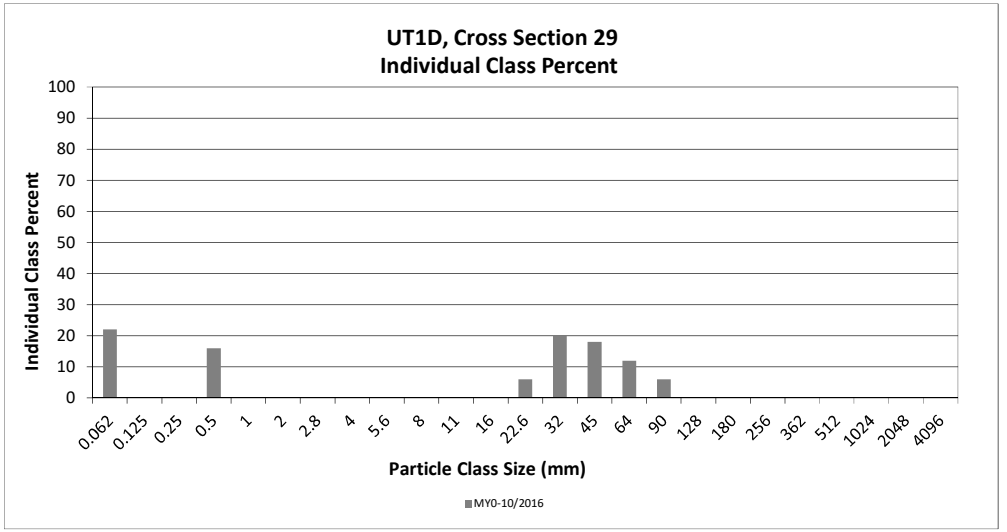
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

UT1D, Cross Section 29

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	11	22	22
SAND	Very fine	0.062	0.125			22
	Fine	0.125	0.250			22
	Medium	0.25	0.50	8	16	38
	Coarse	0.5	1.0			38
	Very Coarse	1.0	2.0			38
GRAVEL	Very Fine	2.0	2.8			38
	Very Fine	2.8	4.0			38
	Fine	4.0	5.6			38
	Fine	5.6	8.0			38
	Medium	8.0	11.0			38
	Medium	11.0	16.0			38
	Coarse	16.0	22.6	3	6	44
	Coarse	22.6	32	10	20	64
	Very Coarse	32	45	9	18	82
	Very Coarse	45	64	6	12	94
COBBLE	Small	64	90	3	6	100
	Small	90	128			100
	Large	128	180			100
	Large	180	256			100
BOULDER	Small	256	362			100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
			Total	**50**	**100**	**100**

Cross Section 29	
Channel materials (mm)	
D_{16} =	Silt/Clay
D_{35} =	0.44
D_{50} =	25.1
D_{84} =	47.7
D_{95} =	67.7
D_{100} =	90.0





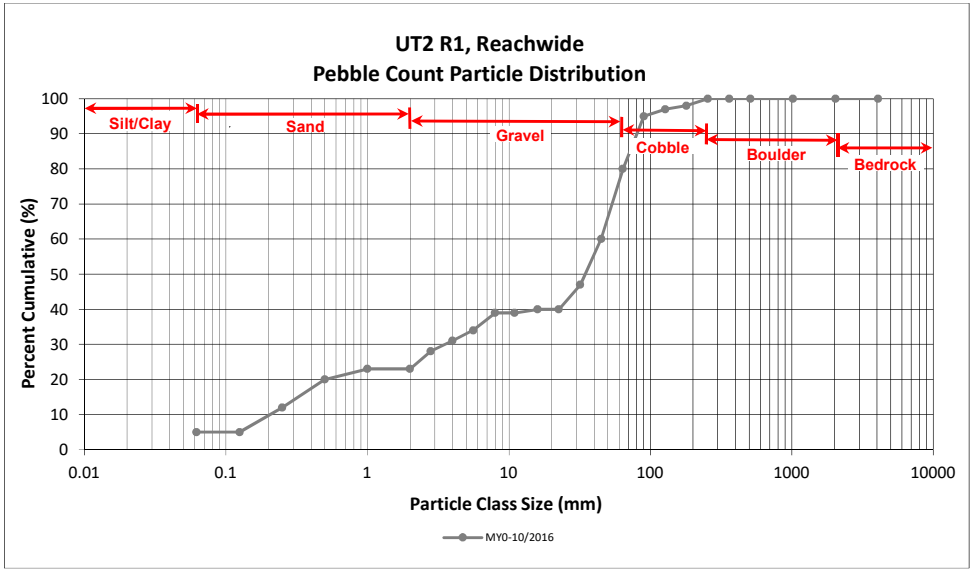
Reachwide and Cross Section Pebble Count Plots

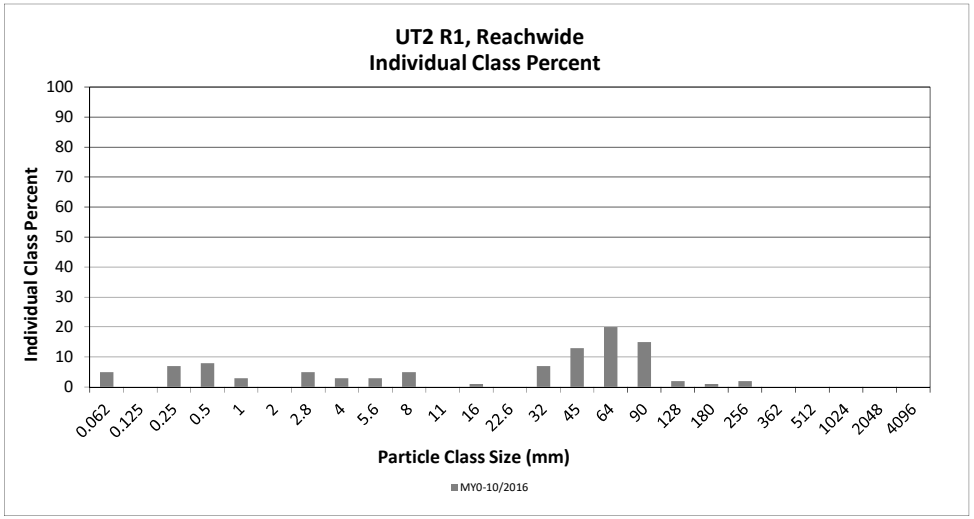
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

UT2 R1, Reachwide

Particle Class		Diameter (mm)		Particle Count			Reach Summary	
		min	max	Riffle	Pool	Total	Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	1	4	5	5	5
SAND	Very fine	0.062	0.125					5
	Fine	0.125	0.250	2	5	7	7	12
	Medium	0.25	0.50	3	5	8	8	20
	Coarse	0.5	1.0		3	3	3	23
	Very Coarse	1.0	2.0					23
GRAVEL	Very Fine	2.0	2.8		5	5	5	28
	Very Fine	2.8	4.0		3	3	3	31
	Fine	4.0	5.6	1	2	3	3	34
	Fine	5.6	8.0	3	2	5	5	39
	Medium	8.0	11.0					39
	Medium	11.0	16.0		1	1	1	40
	Coarse	16.0	22.6					40
	Coarse	22.6	32	5	2	7	7	47
	Very Coarse	32	45	13		13	13	60
	Very Coarse	45	64	18	2	20	20	80
COBBLE	Small	64	90	12	3	15	15	95
	Small	90	128	2		2	2	97
	Large	128	180		1	1	1	98
	Large	180	256		2	2	2	100
BOULDER	Small	256	362					100
	Small	362	512					100
	Medium	512	1024					100
	Large/Very Large	1024	2048					100
BEDROCK	Bedrock	2048	>2048					100
			Total	**60**	**40**	**100**	**100**	**100**

Reachwide	
Channel materials (mm)	
D_{16} =	0.35
D_{35} =	6.01
D_{50} =	34.6
D_{84} =	70.1
D_{95} =	90.0
D_{100} =	256.0





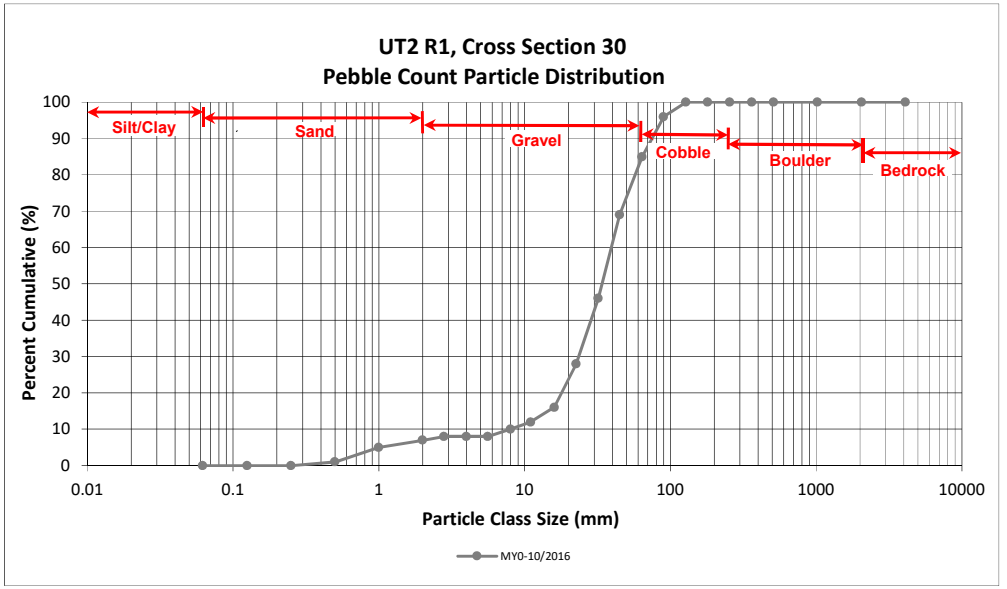
Reachwide and Cross Section Pebble Count Plots

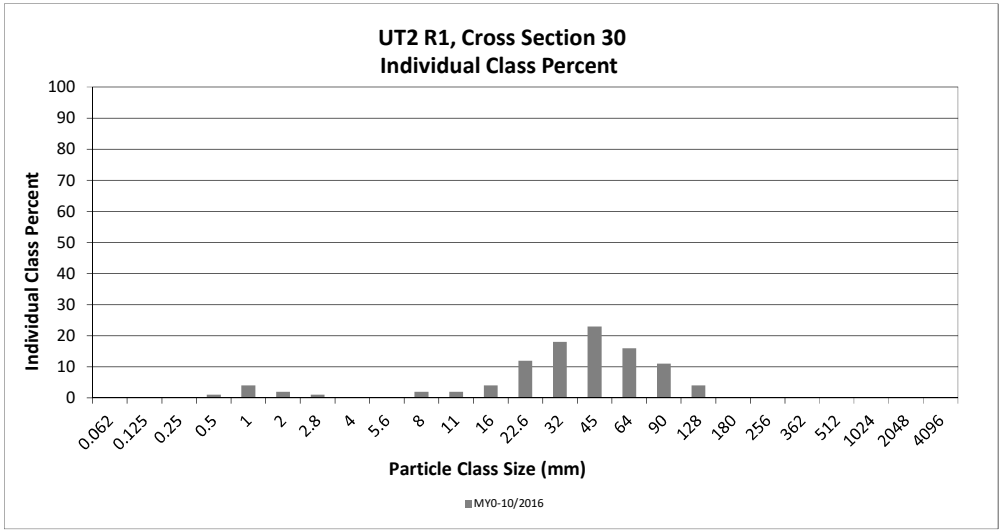
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

UT2 R1, Cross Section 30

Particle Class		Diameter (mm) min	Diameter (mm) max	Riffle 100-Count	Summary: Class Percentage	Summary: Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062			0
SAND	Very fine	0.062	0.125			0
	Fine	0.125	0.250			0
	Medium	0.25	0.50	1	1	1
	Coarse	0.5	1.0	4	4	5
	Very Coarse	1.0	2.0	2	2	7
GRAVEL	Very Fine	2.0	2.8	1	1	8
	Very Fine	2.8	4.0			8
	Fine	4.0	5.6			8
	Fine	5.6	8.0	2	2	10
	Medium	8.0	11.0	2	2	12
	Medium	11.0	16.0	4	4	16
	Coarse	16.0	22.6	12	12	28
	Coarse	22.6	32	18	18	46
	Very Coarse	32	45	23	23	69
	Very Coarse	45	64	16	16	85
COBBLE	Small	64	90	11	11	96
	Small	90	128	4	4	100
	Large	128	180			100
	Large	180	256			100
BOULDER	Small	256	362			100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
			Total	**100**	**100**	**100**

Cross Section 30	
Channel materials (mm)	
D_{16} =	16.00
D_{35} =	25.87
D_{50} =	34.0
D_{84} =	62.6
D_{95} =	87.3
D_{100} =	128.0





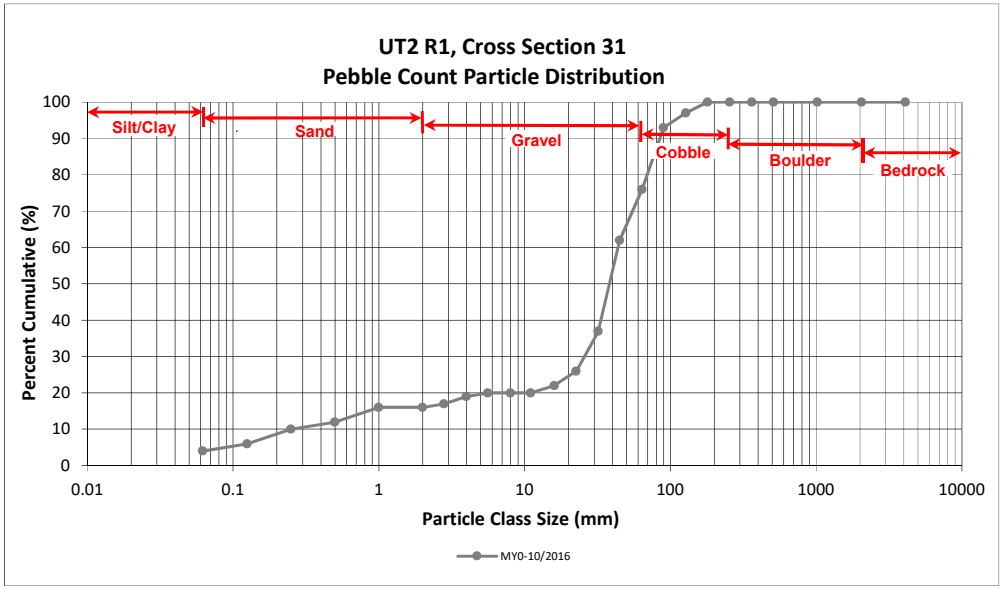
Reachwide and Cross Section Pebble Count Plots

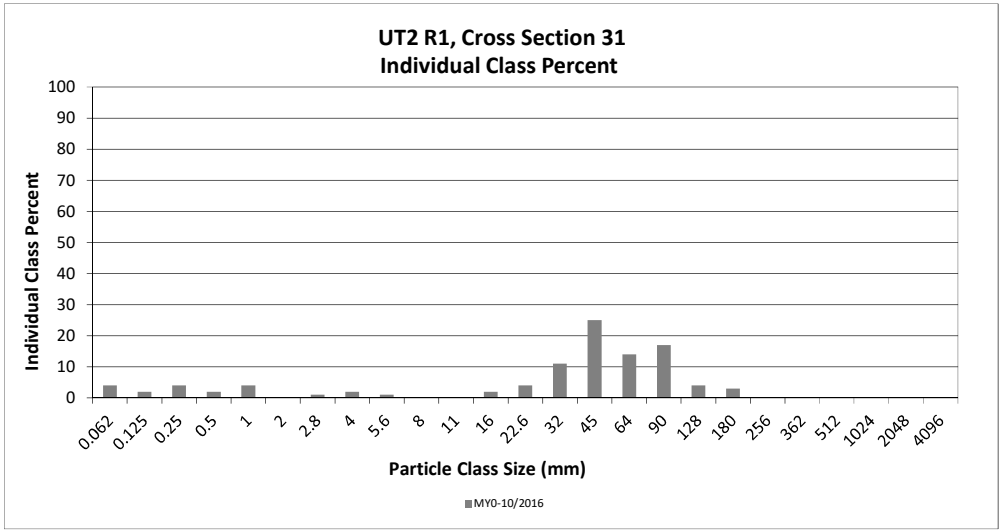
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

UT2 R1, Cross Section 31

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	4	4	4
SAND	Very fine	0.062	0.125	2	2	6
	Fine	0.125	0.250	4	4	10
	Medium	0.25	0.50	2	2	12
	Coarse	0.5	1.0	4	4	16
	Very Coarse	1.0	2.0			16
GRAVEL	Very Fine	2.0	2.8	1	1	17
	Very Fine	2.8	4.0	2	2	19
	Fine	4.0	5.6	1	1	20
	Fine	5.6	8.0			20
	Medium	8.0	11.0			20
	Medium	11.0	16.0	2	2	22
	Coarse	16.0	22.6	4	4	26
	Coarse	22.6	32	11	11	37
	Very Coarse	32	45	25	25	62
	Very Coarse	45	64	14	14	76
COBBLE	Small	64	90	17	17	93
	Small	90	128	4	4	97
	Large	128	180	3	3	100
	Large	180	256			100
BOULDER	Small	256	362			100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
			Total	**100**	**100**	**100**

Cross Section 31	
Channel materials (mm)	
D_{16} =	1.00
D_{35} =	30.04
D_{50} =	38.2
D_{84} =	75.1
D_{95} =	107.3
D_{100} =	180.0





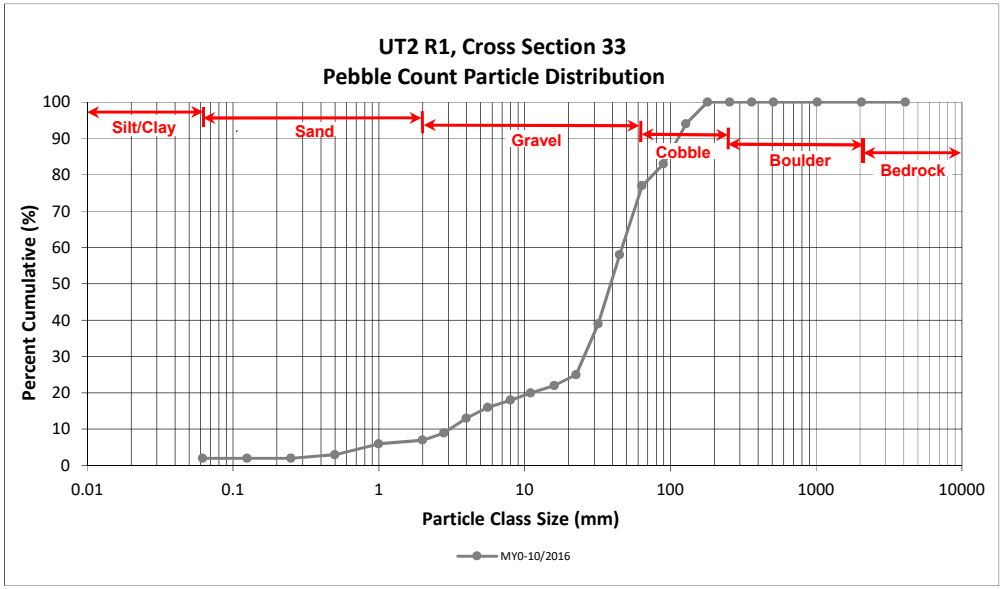
Reachwide and Cross Section Pebble Count Plots

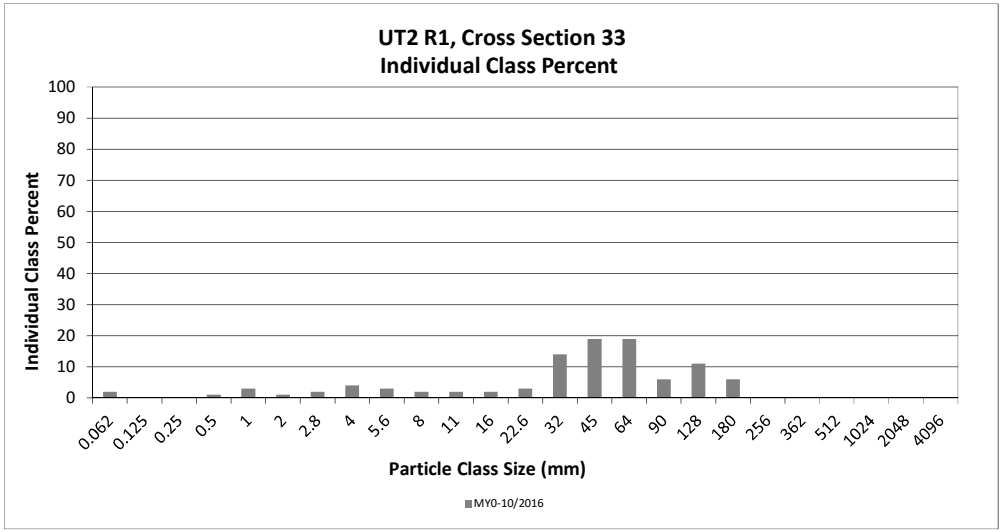
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

UT2 R1, Cross Section 33

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	2	2	2
SAND	Very fine	0.062	0.125			2
	Fine	0.125	0.250			2
	Medium	0.25	0.50	1	1	3
	Coarse	0.5	1.0	3	3	6
	Very Coarse	1.0	2.0	1	1	7
GRAVEL	Very Fine	2.0	2.8	2	2	9
	Very Fine	2.8	4.0	4	4	13
	Fine	4.0	5.6	3	3	16
	Fine	5.6	8.0	2	2	18
	Medium	8.0	11.0	2	2	20
	Medium	11.0	16.0	2	2	22
	Coarse	16.0	22.6	3	3	25
	Coarse	22.6	32	14	14	39
	Very Coarse	32	45	19	19	58
	Very Coarse	45	64	19	19	77
COBBLE	Small	64	90	6	6	83
	Small	90	128	11	11	94
	Large	128	180	6	6	100
	Large	180	256			100
BOULDER	Small	256	362			100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
			Total	**100**	**100**	**100**

Cross Section 33	
Channel materials (mm)	
D_{16} =	5.60
D_{35} =	28.97
D_{50} =	39.0
D_{84} =	92.9
D_{95} =	135.5
D_{100} =	180.0





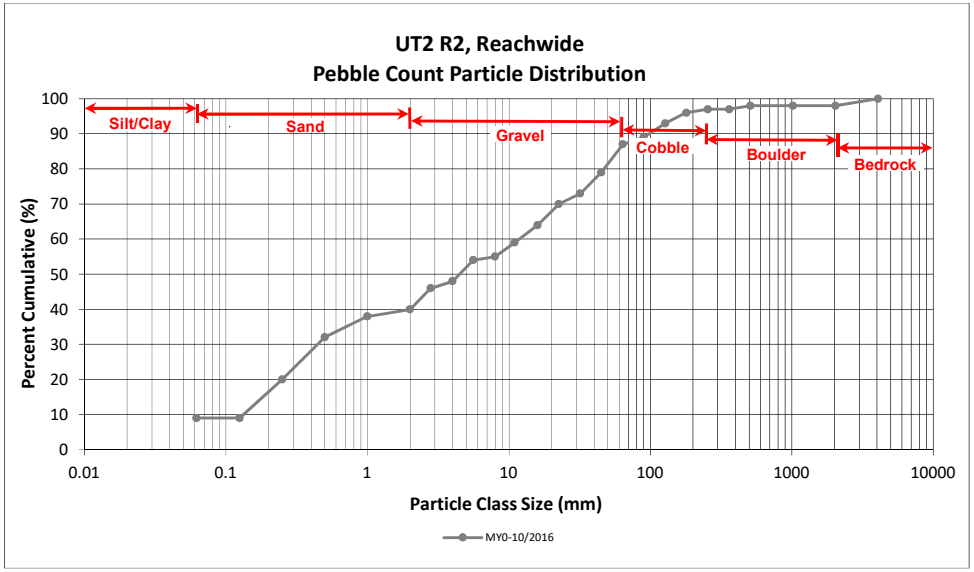
Reachwide and Cross Section Pebble Count Plots

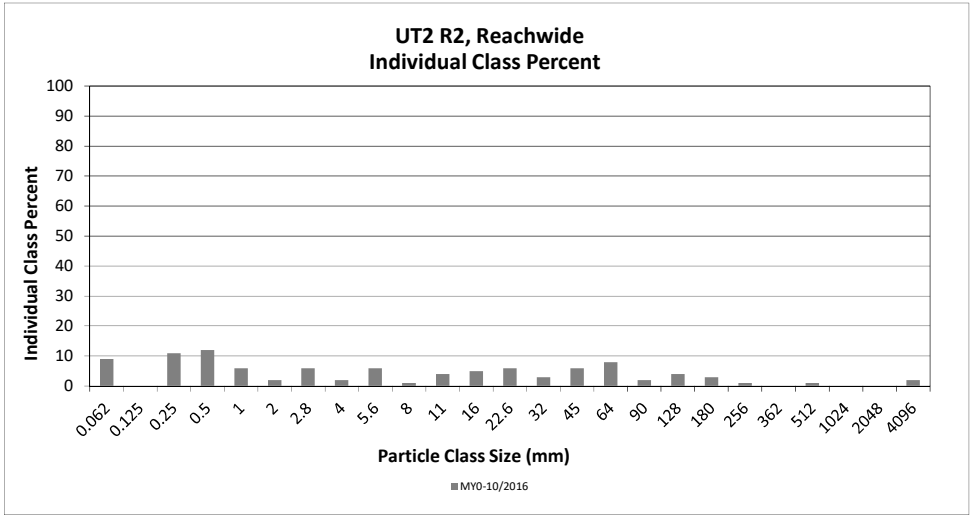
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

UT2 R2, Reachwide

Particle Class		Diameter (mm)		Particle Count			Reach Summary	
		min	max	Riffle	Pool	Total	Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	1	8	9	9	9
SAND	Very fine	0.062	0.125					9
	Fine	0.125	0.250	1	10	11	11	20
	Medium	0.25	0.50	1	11	12	12	32
	Coarse	0.5	1.0	1	5	6	6	38
	Very Coarse	1.0	2.0	1	1	2	2	40
GRAVEL	Very Fine	2.0	2.8	1	5	6	6	46
	Very Fine	2.8	4.0	1	1	2	2	48
	Fine	4.0	5.6	1	5	6	6	54
	Fine	5.6	8.0	1		1	1	55
	Medium	8.0	11.0	2	2	4	4	59
	Medium	11.0	16.0	5		5	5	64
	Coarse	16.0	22.6	5	1	6	6	70
	Coarse	22.6	32	3		3	3	73
	Very Coarse	32	45	6		6	6	79
	Very Coarse	45	64	8		8	8	87
COBBLE	Small	64	90	2		2	2	89
	Small	90	128	4		4	4	93
	Large	128	180	3		3	3	96
	Large	180	256	1		1	1	97
BOULDER	Small	256	362					97
	Small	362	512	1		1	1	98
	Medium	512	1024					98
	Large/Very Large	1024	2048					98
BEDROCK	Bedrock	2048	>2048	1	1	2	2	100
			Total	**50**	**50**	**100**	**100**	**100**

Reachwide	
Channel materials (mm)	
D_{16} =	0.19
D_{35} =	0.71
D_{50} =	4.5
D_{84} =	56.1
D_{95} =	160.7
D_{100} =	>2048





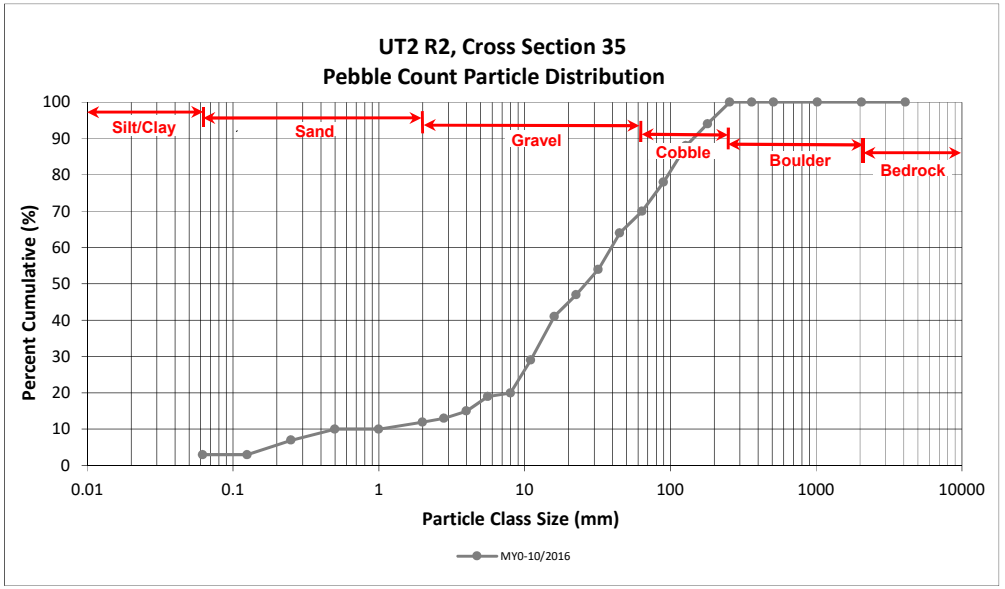
Reachwide and Cross Section Pebble Count Plots

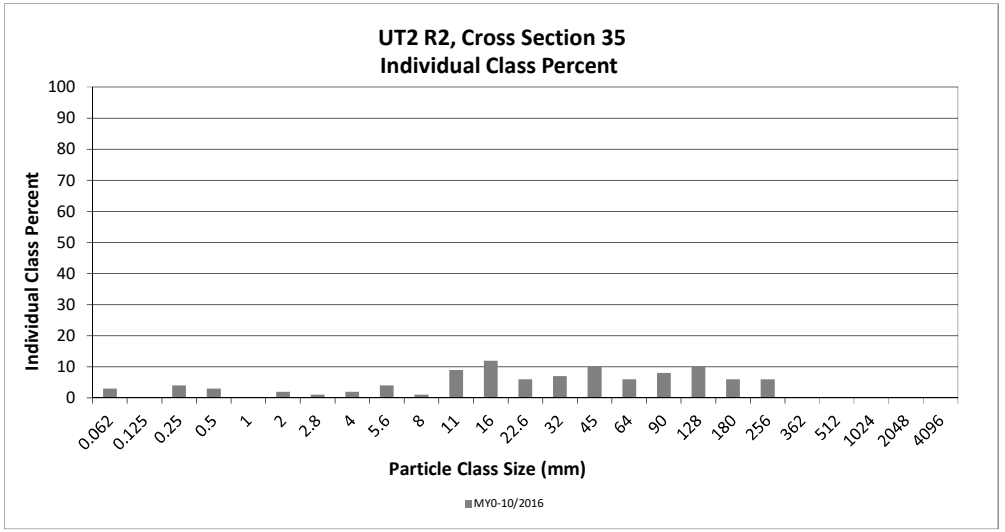
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

UT2 R2, Cross Section 35

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	3	3	3
SAND	Very fine	0.062	0.125			3
	Fine	0.125	0.250	4	4	7
	Medium	0.25	0.50	3	3	10
	Coarse	0.5	1.0			10
	Very Coarse	1.0	2.0	2	2	12
GRAVEL	Very Fine	2.0	2.8	1	1	13
	Very Fine	2.8	4.0	2	2	15
	Fine	4.0	5.6	4	4	19
	Fine	5.6	8.0	1	1	20
	Medium	8.0	11.0	9	9	29
	Medium	11.0	16.0	12	12	41
	Coarse	16.0	22.6	6	6	47
	Coarse	22.6	32	7	7	54
	Very Coarse	32	45	10	10	64
	Very Coarse	45	64	6	6	70
COBBLE	Small	64	90	8	8	78
	Small	90	128	10	10	88
	Large	128	180	6	6	94
	Large	180	256	6	6	100
BOULDER	Small	256	362			100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
			Total	**100**	**100**	**100**

Cross Section 34	
Channel materials (mm)	
D_{16} =	4.35
D_{35} =	13.27
D_{50} =	26.2
D_{84} =	111.2
D_{95} =	190.9
D_{100} =	256.0





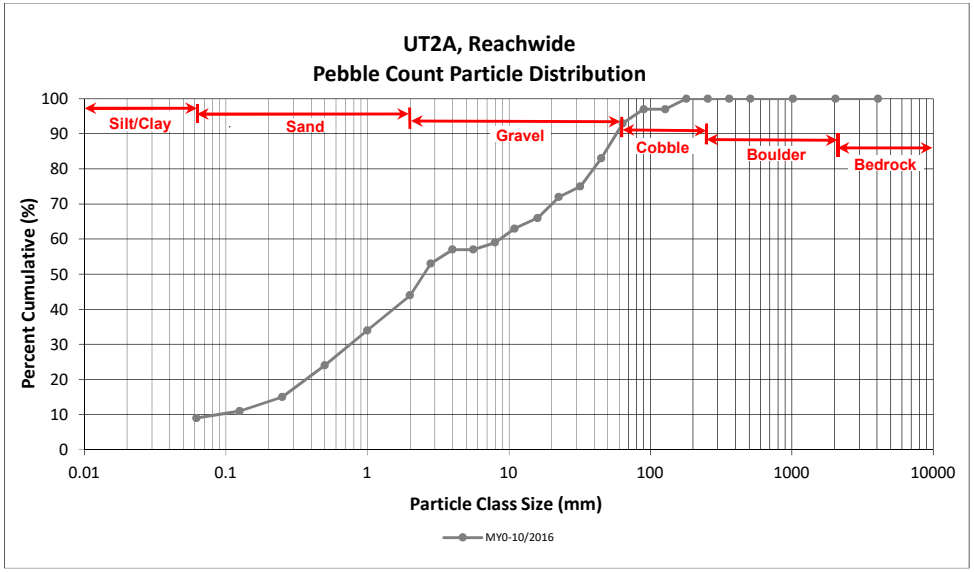
Reachwide and Cross Section Pebble Count Plots

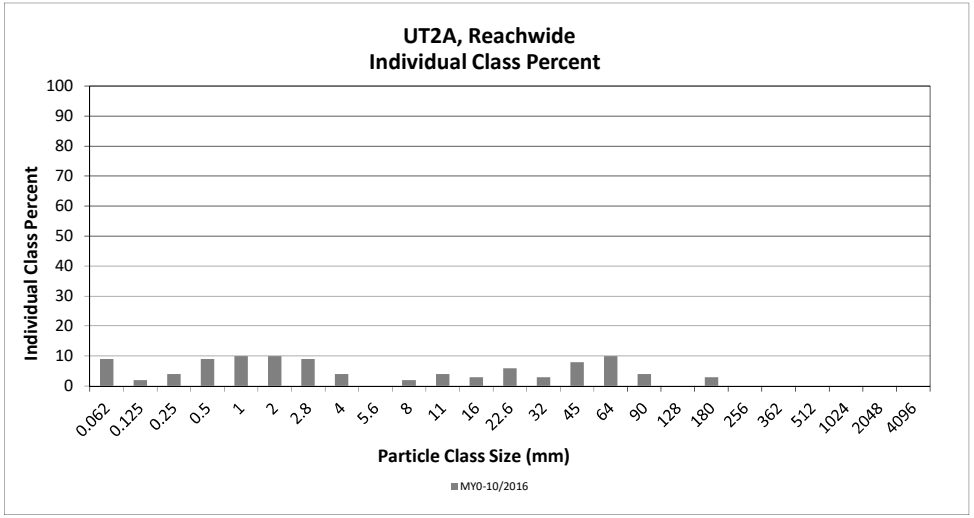
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

UT2A, Reachwide

Particle Class		Diameter (mm)		Particle Count			Reach Summary	
		min	max	Riffle	Pool	Total	Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	2	7	9	9	9
SAND	Very fine	0.062	0.125	1	1	2	2	11
	Fine	0.125	0.250	3	1	4	4	15
	Medium	0.25	0.50	0	9	9	9	24
	Coarse	0.5	1.0	0	10	10	10	34
	Very Coarse	1.0	2.0	1	9	10	10	44
GRAVEL	Very Fine	2.0	2.8	2	7	9	9	53
	Very Fine	2.8	4.0	1	3	4	4	57
	Fine	4.0	5.6	0	0			57
	Fine	5.6	8.0	1	1	2	2	59
	Medium	8.0	11.0	4	0	4	4	63
	Medium	11.0	16.0	2	1	3	3	66
	Coarse	16.0	22.6	6	0	6	6	72
	Coarse	22.6	32	3	0	3	3	75
	Very Coarse	32	45	7	1	8	8	83
	Very Coarse	45	64	10		10	10	93
COBBLE	Small	64	90	4		4	4	97
	Small	90	128	0				97
	Large	128	180	3		3	3	100
	Large	180	256					100
BOULDER	Small	256	362					100
	Small	362	512					100
	Medium	512	1024					100
	Large/Very Large	1024	2048					100
BEDROCK	Bedrock	2048	>2048					100
			Total	**50**	**50**	**100**	**100**	**100**

Reachwide	
Channel materials (mm)	
D_{16} =	0.27
D_{35} =	1.07
D_{50} =	2.5
D_{84} =	46.6
D_{95} =	75.9
D_{100} =	180.0





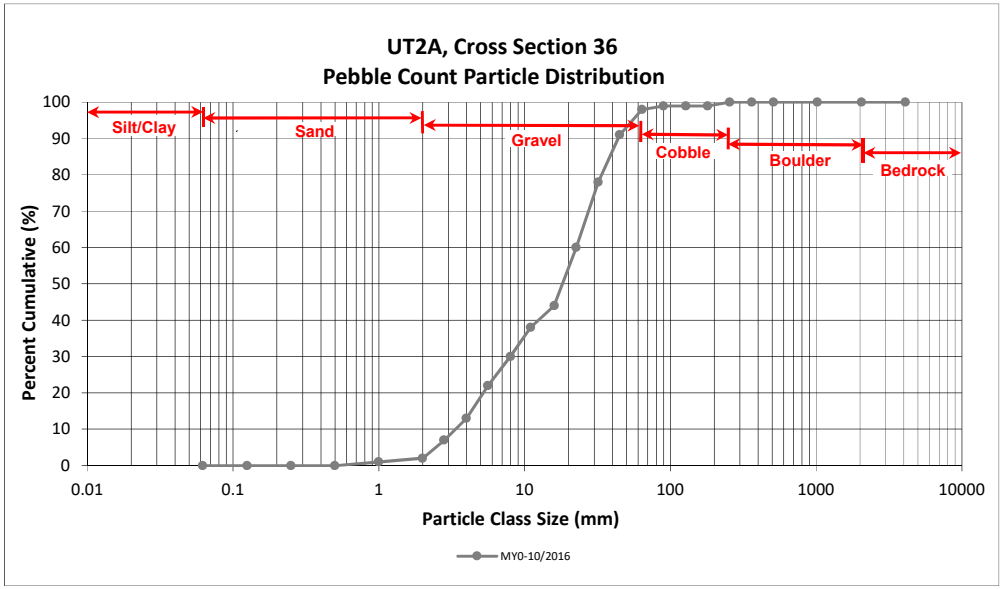
Reachwide and Cross Section Pebble Count Plots

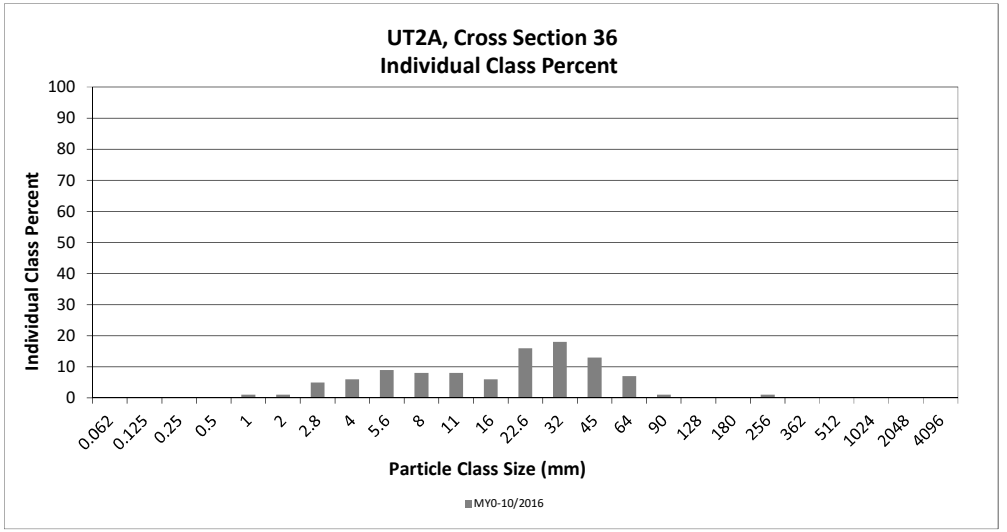
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

UT2A, Cross Section 36

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	0	0	0
SAND	Very fine	0.062	0.125	0	0	0
	Fine	0.125	0.250	0	0	0
	Medium	0.25	0.50	0	0	0
	Coarse	0.5	1.0	1	1	1
	Very Coarse	1.0	2.0	1	1	2
GRAVEL	Very Fine	2.0	2.8	5	5	7
	Very Fine	2.8	4.0	6	6	13
	Fine	4.0	5.6	9	9	22
	Fine	5.6	8.0	8	8	30
	Medium	8.0	11.0	8	8	38
	Medium	11.0	16.0	6	6	44
	Coarse	16.0	22.6	16	16	60
	Coarse	22.6	32	18	18	78
	Very Coarse	32	45	13	13	91
	Very Coarse	45	64	7	7	98
COBBLE	Small	64	90	1	1	99
	Small	90	128	0	0	99
	Large	128	180	0	0	99
	Large	180	256	1	1	100
BOULDER	Small	256	362			100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
			Total	**100**	**100**	**100**

Cross Section 36	
Channel materials (mm)	
D_{16} =	4.47
D_{35} =	9.76
D_{50} =	18.2
D_{84} =	37.5
D_{95} =	55.0
D_{100} =	256.0





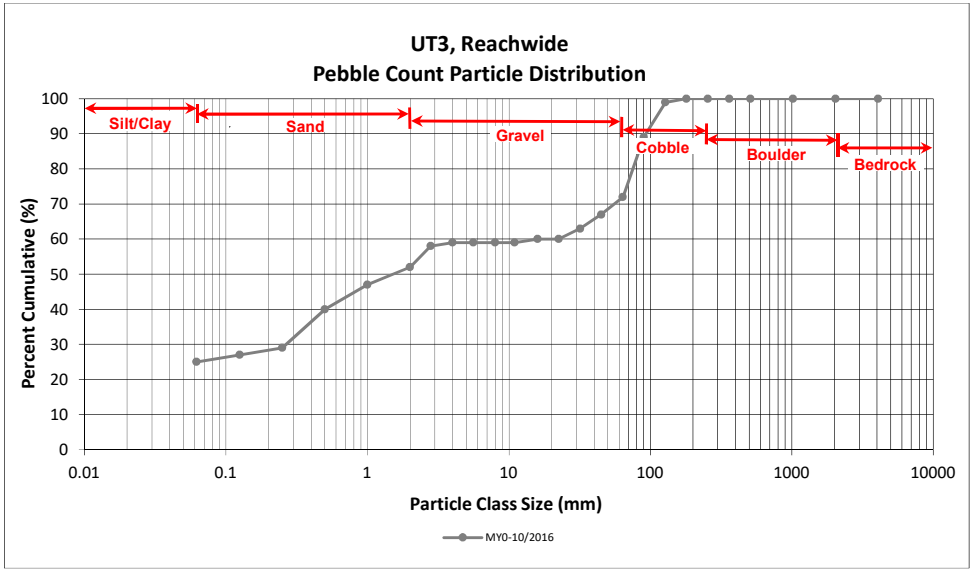
Reachwide and Cross Section Pebble Count Plots

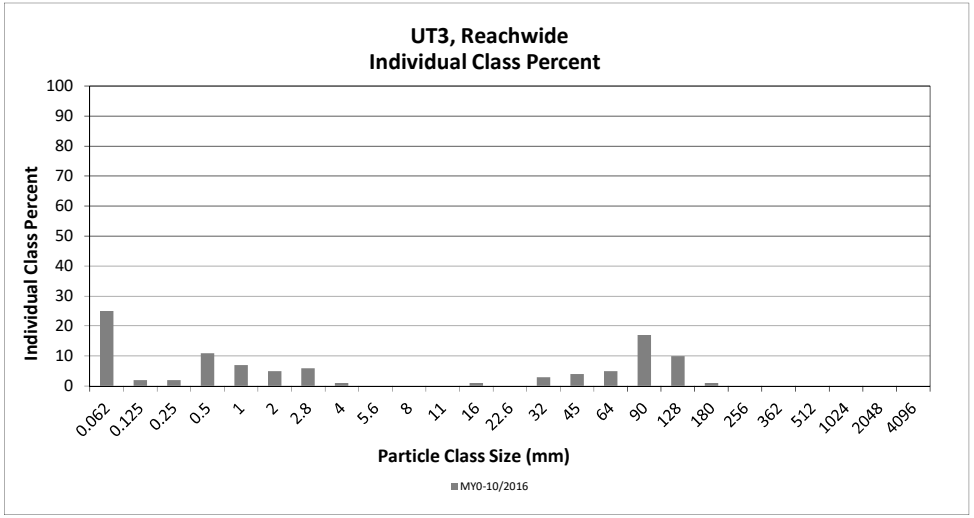
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

UT3, Reachwide

Particle Class		Diameter (mm)		Particle Count			Reach Summary	
		min	max	Riffle	Pool	Total	Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	2	23	25	25	25
SAND	Very fine	0.062	0.125	2		2	2	27
	Fine	0.125	0.250	1	1	2	2	29
	Medium	0.25	0.50	1	10	11	11	40
	Coarse	0.5	1.0	1	6	7	7	47
	Very Coarse	1.0	2.0	1	4	5	5	52
GRAVEL	Very Fine	2.0	2.8	1	5	6	6	58
	Very Fine	2.8	4.0		1	1	1	59
	Fine	4.0	5.6					59
	Fine	5.6	8.0					59
	Medium	8.0	11.0					59
	Medium	11.0	16.0	1		1	1	60
	Coarse	16.0	22.6					60
	Coarse	22.6	32	3		3	3	63
	Very Coarse	32	45	4		4	4	67
	Very Coarse	45	64	5		5	5	72
COBBLE	Small	64	90	17		17	17	89
	Small	90	128	10		10	10	99
	Large	128	180	1		1	1	100
	Large	180	256					100
BOULDER	Small	256	362					100
	Small	362	512					100
	Medium	512	1024					100
	Large/Very Large	1024	2048					100
BEDROCK	Bedrock	2048	>2048					100
			Total	**50**	**50**	**100**	**100**	**100**

Reachwide	
Channel materials (mm)	
D_{16} =	Silt/Clay
D_{35} =	0.36
D_{50} =	1.5
D_{84} =	81.4
D_{95} =	111.2
D_{100} =	180.0





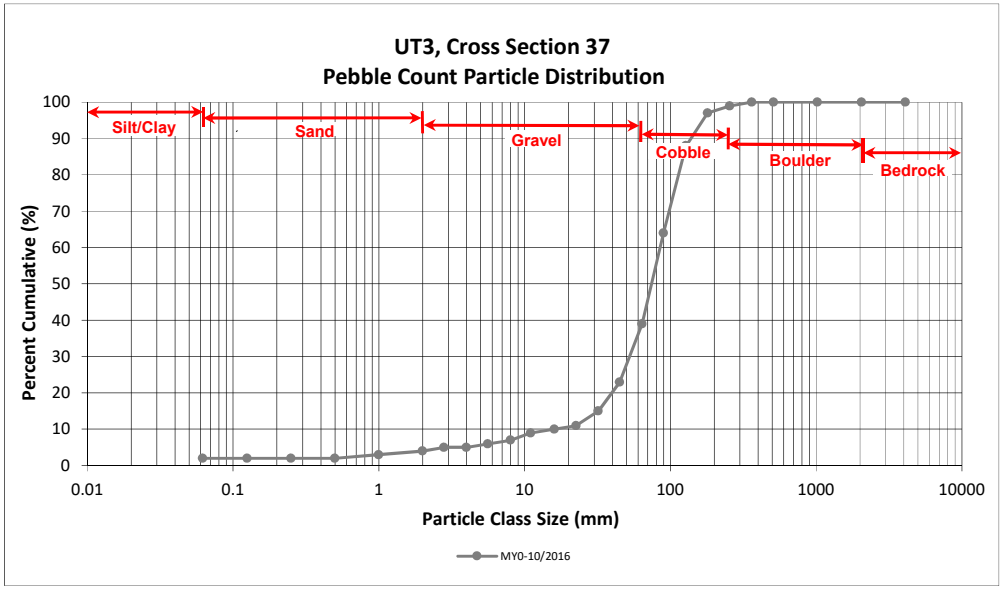
Reachwide and Cross Section Pebble Count Plots

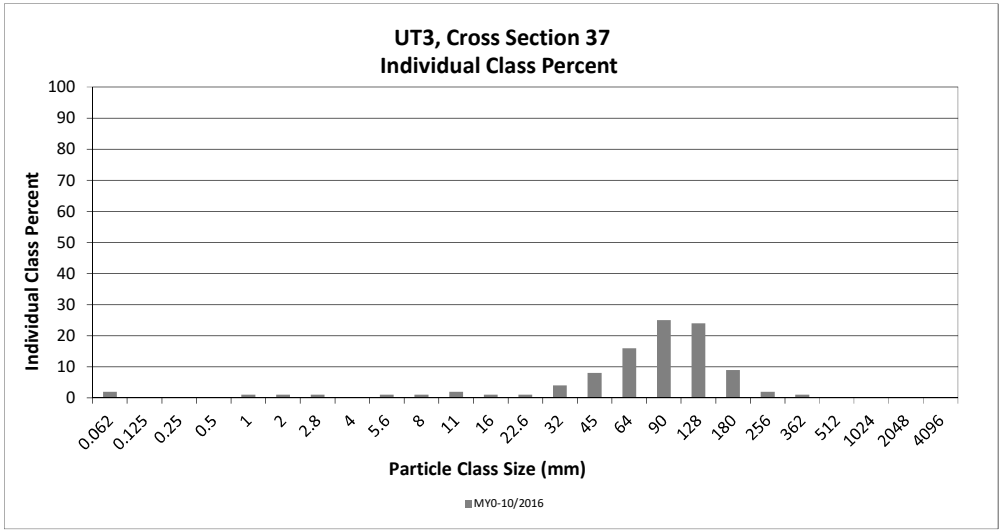
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

UT3, Cross Section 37

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	2	2	2
SAND	Very fine	0.062	0.125			2
	Fine	0.125	0.250			2
	Medium	0.25	0.50			2
	Coarse	0.5	1.0	1	1	3
	Very Coarse	1.0	2.0	1	1	4
GRAVEL	Very Fine	2.0	2.8	1	1	5
	Very Fine	2.8	4.0			5
	Fine	4.0	5.6	1	1	6
	Fine	5.6	8.0	1	1	7
	Medium	8.0	11.0	2	2	9
	Medium	11.0	16.0	1	1	10
	Coarse	16.0	22.6	1	1	11
	Coarse	22.6	32	4	4	15
	Very Coarse	32	45	8	8	23
	Very Coarse	45	64	16	16	39
COBBLE	Small	64	90	25	25	64
	Small	90	128	24	24	88
	Large	128	180	9	9	97
	Large	180	256	2	2	99
BOULDER	Small	256	362	1	1	100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
			Total	**100**	**100**	**100**

Cross Section 37	
Channel materials (mm)	
D_{16} =	33.39
D_{35} =	58.61
D_{50} =	74.4
D_{84} =	120.7
D_{95} =	166.9
D_{100} =	362.0





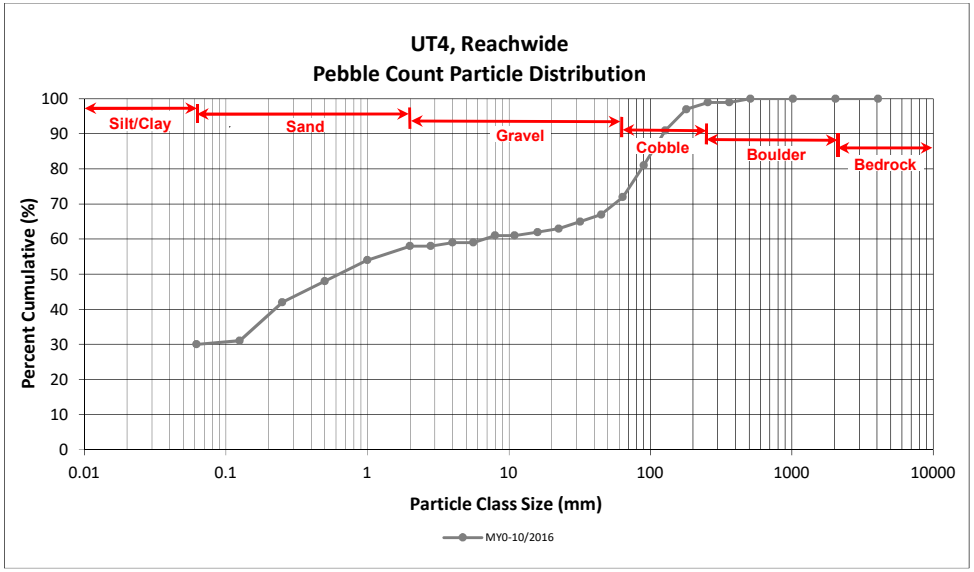
Reachwide and Cross Section Pebble Count Plots

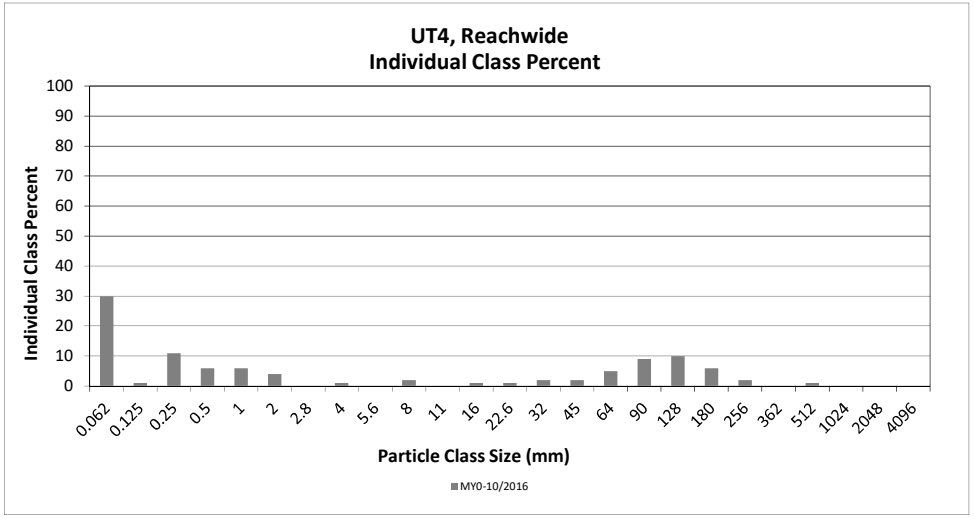
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

UT4, Reachwide

Particle Class		Diameter (mm)		Particle Count			Reach Summary	
		min	max	Riffle	Pool	Total	Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	0	30	30	30	30
SAND	Very fine	0.062	0.125	0	1	1	1	31
	Fine	0.125	0.250	5	6	11	11	42
	Medium	0.25	0.50	2	4	6	6	48
	Coarse	0.5	1.0	2	4	6	6	54
	Very Coarse	1.0	2.0	0	4	4	4	58
GRAVEL	Very Fine	2.0	2.8	0				58
	Very Fine	2.8	4.0	1		1	1	59
	Fine	4.0	5.6	0				59
	Fine	5.6	8.0	1	1	2	2	61
	Medium	8.0	11.0	0				61
	Medium	11.0	16.0	1		1	1	62
	Coarse	16.0	22.6	1		1	1	63
	Coarse	22.6	32	2		2	2	65
	Very Coarse	32	45	2		2	2	67
	Very Coarse	45	64	5		5	5	72
COBBLE	Small	64	90	9		9	9	81
	Small	90	128	10		10	10	91
	Large	128	180	6		6	6	97
	Large	180	256	2		2	2	99
BOULDER	Small	256	362	0				99
	Small	362	512	1		1	1	100
	Medium	512	1024					100
	Large/Very Large	1024	2048					100
BEDROCK	Bedrock	2048	>2048					100
			Total	**50**	**50**	**100**	**100**	**100**

Reachwide	
Channel materials (mm)	
D_{16} =	Silt/Clay
D_{35} =	0.16
D_{50} =	0.6
D_{84} =	100.0
D_{95} =	160.7
D_{100} =	512.0





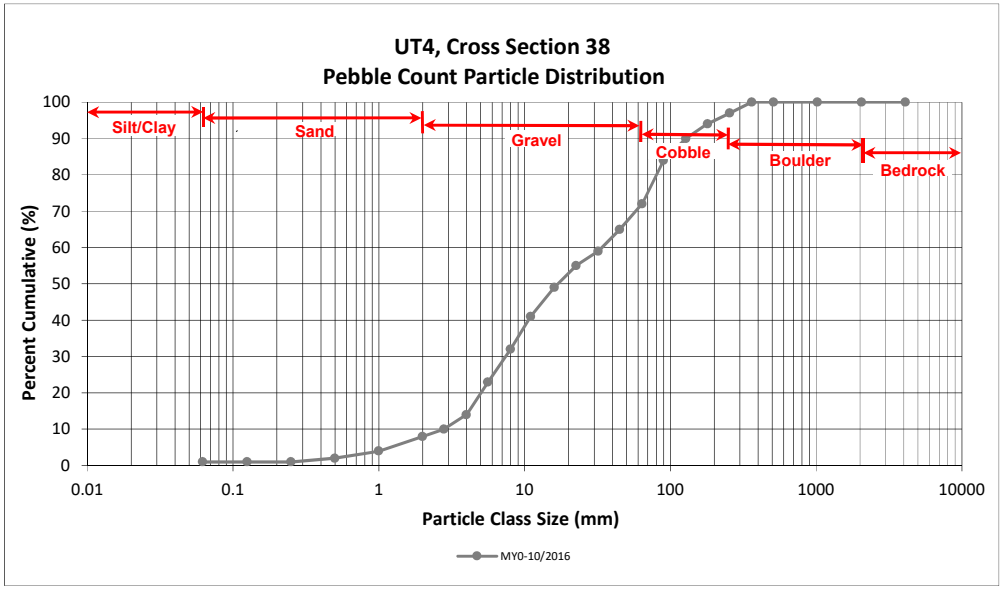
Reachwide and Cross Section Pebble Count Plots

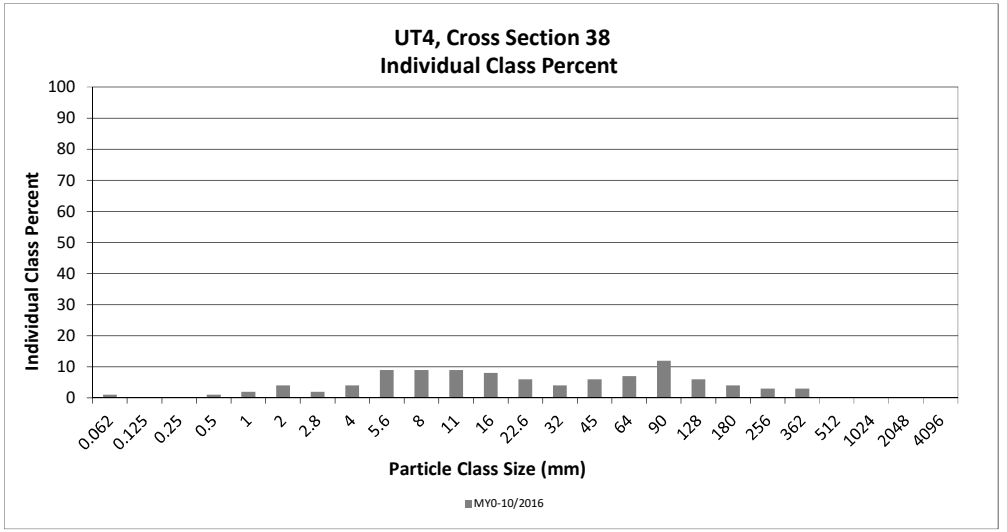
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

UT4, Cross Section 38

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	1	1	1
SAND	Very fine	0.062	0.125	0	0	1
	Fine	0.125	0.250	0	0	1
	Medium	0.25	0.50	1	1	2
	Coarse	0.5	1.0	2	2	4
	Very Coarse	1.0	2.0	4	4	8
GRAVEL	Very Fine	2.0	2.8	2	2	10
	Very Fine	2.8	4.0	4	4	14
	Fine	4.0	5.6	9	9	23
	Fine	5.6	8.0	9	9	32
	Medium	8.0	11.0	9	9	41
	Medium	11.0	16.0	8	8	49
	Coarse	16.0	22.6	6	6	55
	Coarse	22.6	32	4	4	59
	Very Coarse	32	45	6	6	65
	Very Coarse	45	64	7	7	72
COBBLE	Small	64	90	12	12	84
	Small	90	128	6	6	90
	Large	128	180	4	4	94
	Large	180	256	3	3	97
BOULDER	Small	256	362	3	3	100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
			Total	**100**	**100**	**100**

Cross Section 38	
Channel materials (mm)	
D_{16} =	4.31
D_{35} =	8.90
D_{50} =	16.9
D_{84} =	90.0
D_{95} =	202.4
D_{100} =	362.0





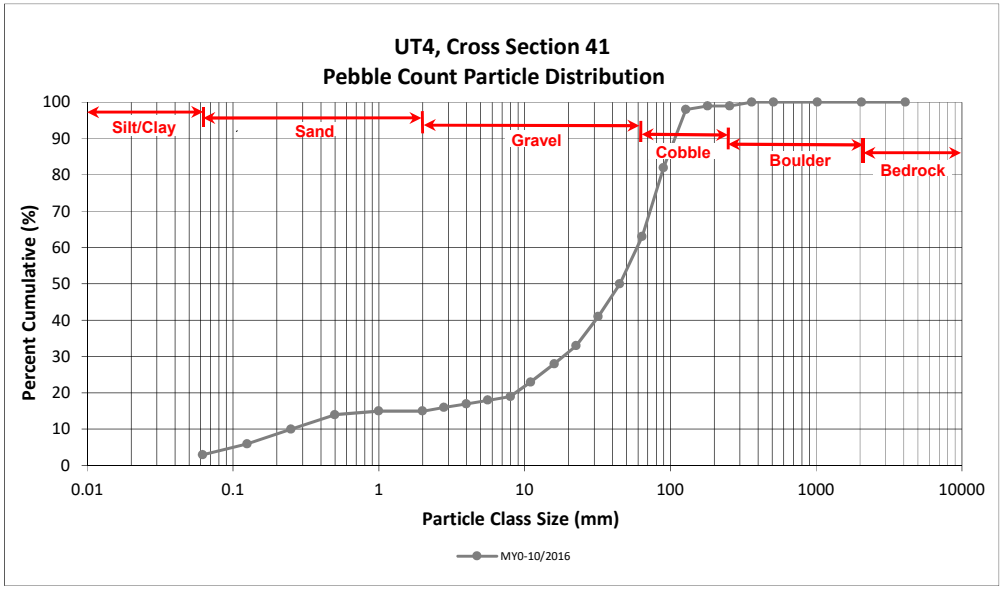
Reachwide and Cross Section Pebble Count Plots

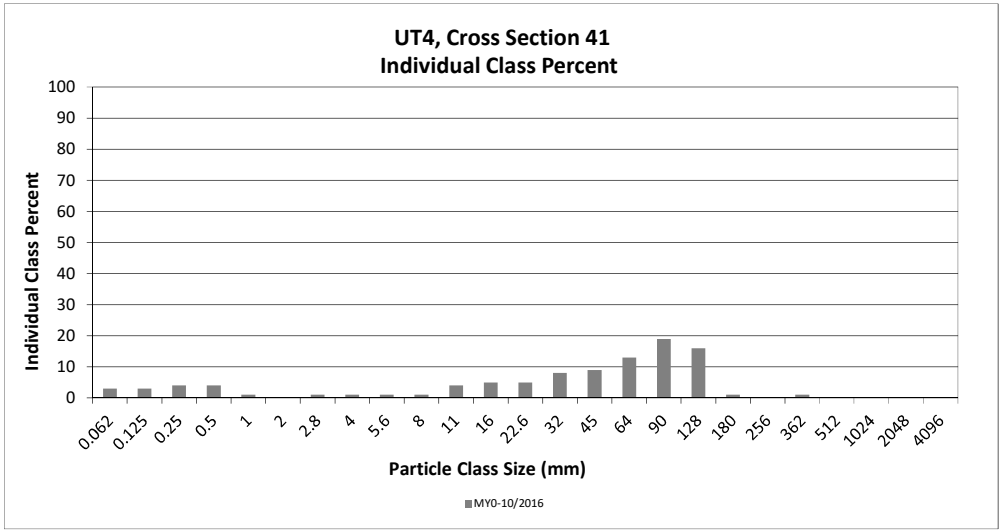
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

UT4, Cross Section 41

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	3	3	3
SAND	Very fine	0.062	0.125	3	3	6
	Fine	0.125	0.250	4	4	10
	Medium	0.25	0.50	4	4	14
	Coarse	0.5	1.0	1	1	15
	Very Coarse	1.0	2.0	0	0	15
GRAVEL	Very Fine	2.0	2.8	1	1	16
	Very Fine	2.8	4.0	1	1	17
	Fine	4.0	5.6	1	1	18
	Fine	5.6	8.0	1	1	19
	Medium	8.0	11.0	4	4	23
	Medium	11.0	16.0	5	5	28
	Coarse	16.0	22.6	5	5	33
	Coarse	22.6	32	8	8	41
	Very Coarse	32	45	9	9	50
	Very Coarse	45	64	13	13	63
COBBLE	Small	64	90	19	19	82
	Small	90	128	16	16	98
	Large	128	180	1	1	99
	Large	180	256	0	0	99
BOULDER	Small	256	362	1	1	100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
			Total	**100**	**100**	**100**

Cross Section 41	
Channel materials (mm)	
D_{16} =	2.80
D_{35} =	24.65
D_{50} =	45.0
D_{84} =	94.1
D_{95} =	119.8
D_{100} =	362.0





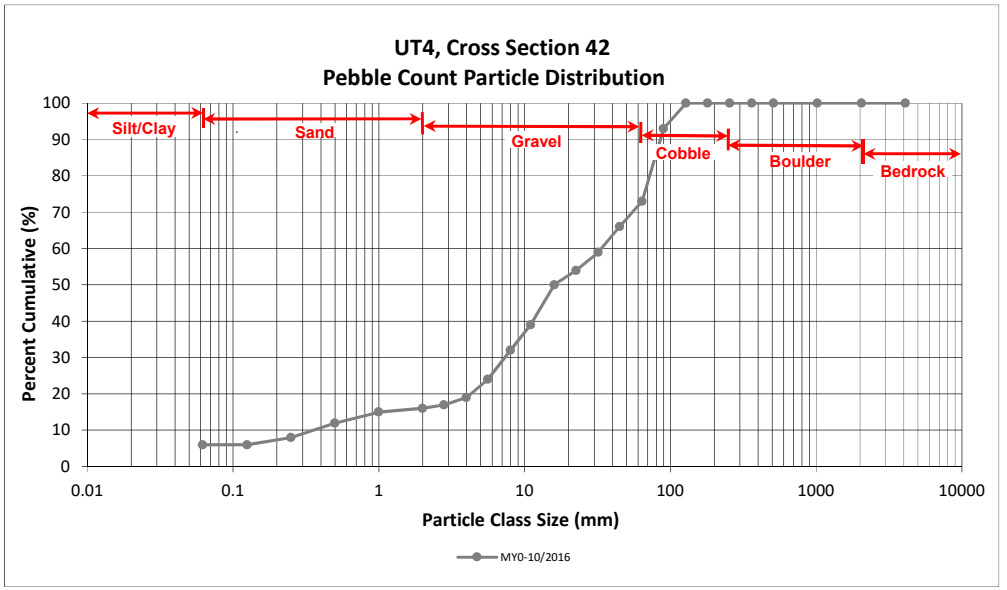
Reachwide and Cross Section Pebble Count Plots

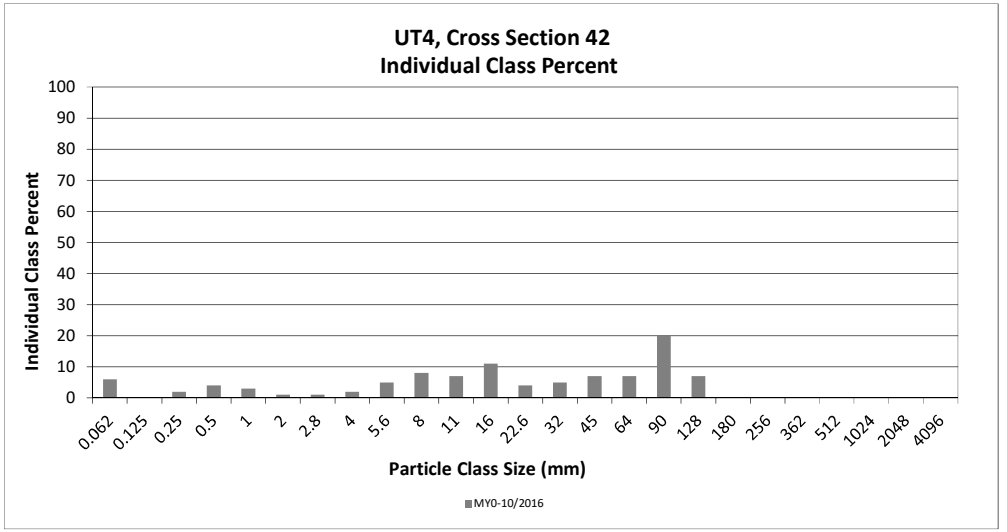
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

UT4, Cross Section 42

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	6	6	6
SAND	Very fine	0.062	0.125	0	0	6
	Fine	0.125	0.250	2	2	8
	Medium	0.25	0.50	4	4	12
	Coarse	0.5	1.0	3	3	15
	Very Coarse	1.0	2.0	1	1	16
GRAVEL	Very Fine	2.0	2.8	1	1	17
	Very Fine	2.8	4.0	2	2	19
	Fine	4.0	5.6	5	5	24
	Fine	5.6	8.0	8	8	32
	Medium	8.0	11.0	7	7	39
	Medium	11.0	16.0	11	11	50
	Coarse	16.0	22.6	4	4	54
	Coarse	22.6	32	5	5	59
	Very Coarse	32	45	7	7	66
	Very Coarse	45	64	7	7	73
COBBLE	Small	64	90	20	20	93
	Small	90	128	7	7	100
	Large	128	180			100
	Large	180	256			100
BOULDER	Small	256	362			100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
			Total	**100**	**100**	**100**

Cross Section 43	
Channel materials (mm)	
D_{16} =	2.00
D_{35} =	9.17
D_{50} =	16.0
D_{84} =	77.2
D_{95} =	99.5
D_{100} =	128.0





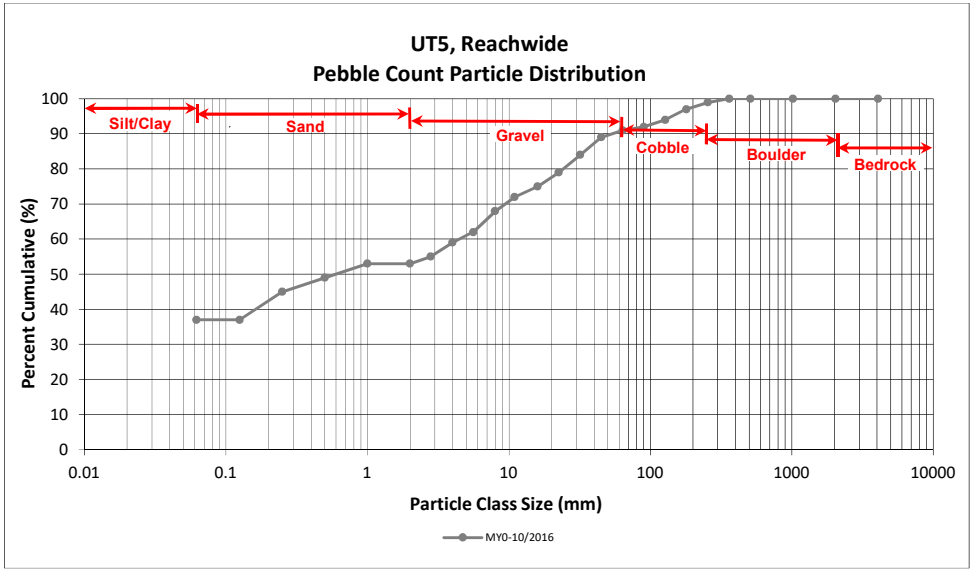
Reachwide and Cross Section Pebble Count Plots

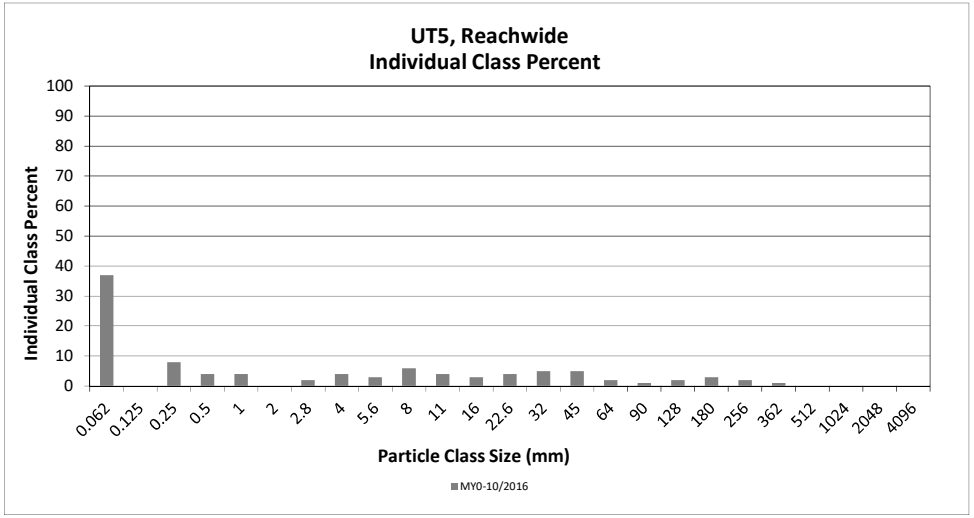
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

UT5, Reachwide

Particle Class		Diameter (mm)		Particle Count			Reach Summary	
		min	max	Riffle	Pool	Total	Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	3	34	37	37	37
SAND	Very fine	0.062	0.125	0	0			37
	Fine	0.125	0.250	2	6	8	8	45
	Medium	0.25	0.50	3	1	4	4	49
	Coarse	0.5	1.0	1	3	4	4	53
	Very Coarse	1.0	2.0	0	0			53
GRAVEL	Very Fine	2.0	2.8	1	1	2	2	55
	Very Fine	2.8	4.0	3	1	4	4	59
	Fine	4.0	5.6	3	0	3	3	62
	Fine	5.6	8.0	3	3	6	6	68
	Medium	8.0	11.0	3	1	4	4	72
	Medium	11.0	16.0	3		3	3	75
	Coarse	16.0	22.6	4		4	4	79
	Coarse	22.6	32	5		5	5	84
	Very Coarse	32	45	5		5	5	89
	Very Coarse	45	64	2		2	2	91
COBBLE	Small	64	90	1		1	1	92
	Small	90	128	2		2	2	94
	Large	128	180	3		3	3	97
	Large	180	256	2		2	2	99
BOULDER	Small	256	362	1		1	1	100
	Small	362	512					100
	Medium	512	1024					100
	Large/Very Large	1024	2048					100
BEDROCK	Bedrock	2048	>2048					100
			Total	**50**	**50**	**100**	**100**	**100**

Reachwide	
Channel materials (mm)	
D_{16} =	Silt/Clay
D_{35} =	Silt/Clay
D_{50} =	0.6
D_{84} =	32.0
D_{95} =	143.4
D_{100} =	362.0





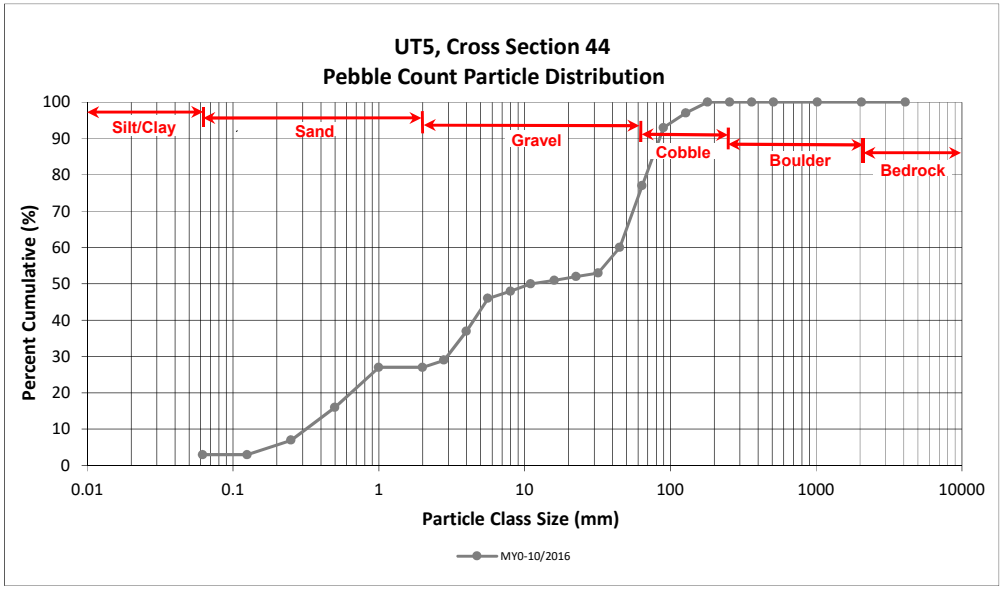
Reachwide and Cross Section Pebble Count Plots

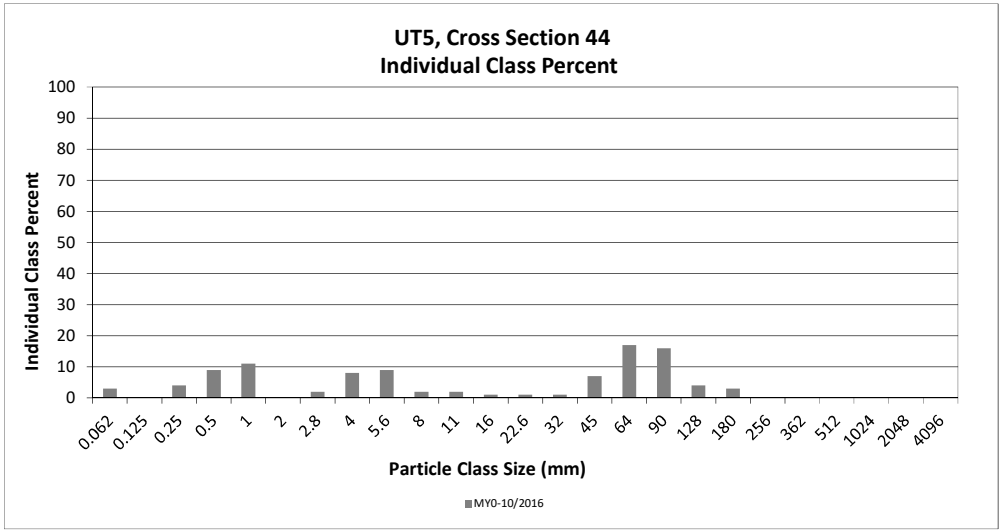
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

UT5, Cross Section 44

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	3	3	3
SAND	Very fine	0.062	0.125	0	0	3
	Fine	0.125	0.250	4	4	7
	Medium	0.25	0.50	9	9	16
	Coarse	0.5	1.0	11	11	27
	Very Coarse	1.0	2.0	0	0	27
GRAVEL	Very Fine	2.0	2.8	2	2	29
	Very Fine	2.8	4.0	8	8	37
	Fine	4.0	5.6	9	9	46
	Fine	5.6	8.0	2	2	48
	Medium	8.0	11.0	2	2	50
	Medium	11.0	16.0	1	1	51
	Coarse	16.0	22.6	1	1	52
	Coarse	22.6	32	1	1	53
	Very Coarse	32	45	7	7	60
	Very Coarse	45	64	17	17	77
COBBLE	Small	64	90	16	16	93
	Small	90	128	4	4	97
	Large	128	180	3	3	100
	Large	180	256			100
BOULDER	Small	256	362			100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
			Total	**100**	**100**	**100**

Cross Section 45	
Channel materials (mm)	
D_{16} =	0.50
D_{35} =	3.66
D_{50} =	11.0
D_{84} =	74.3
D_{95} =	107.3
D_{100} =	180.0





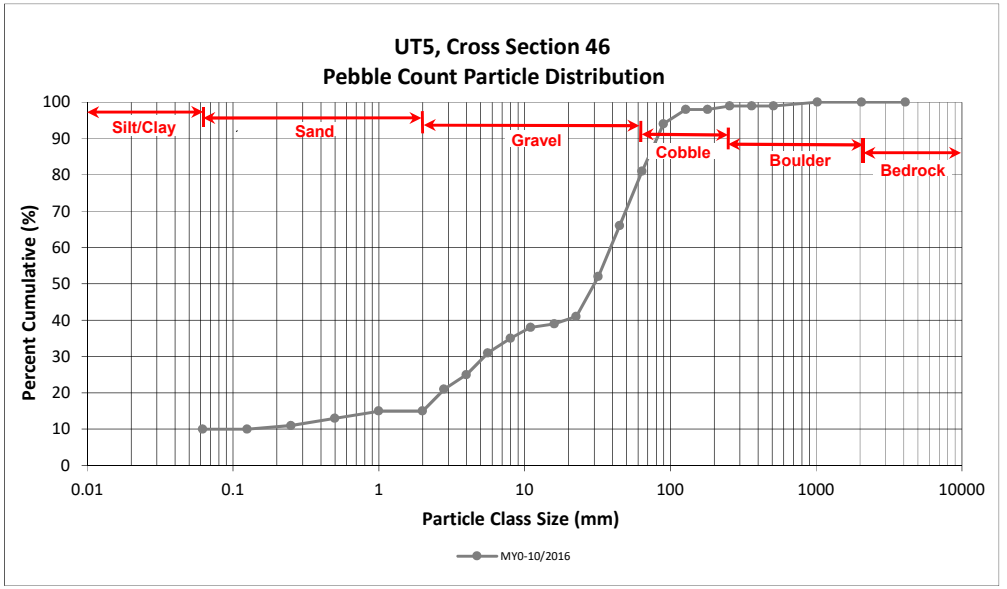
Reachwide and Cross Section Pebble Count Plots

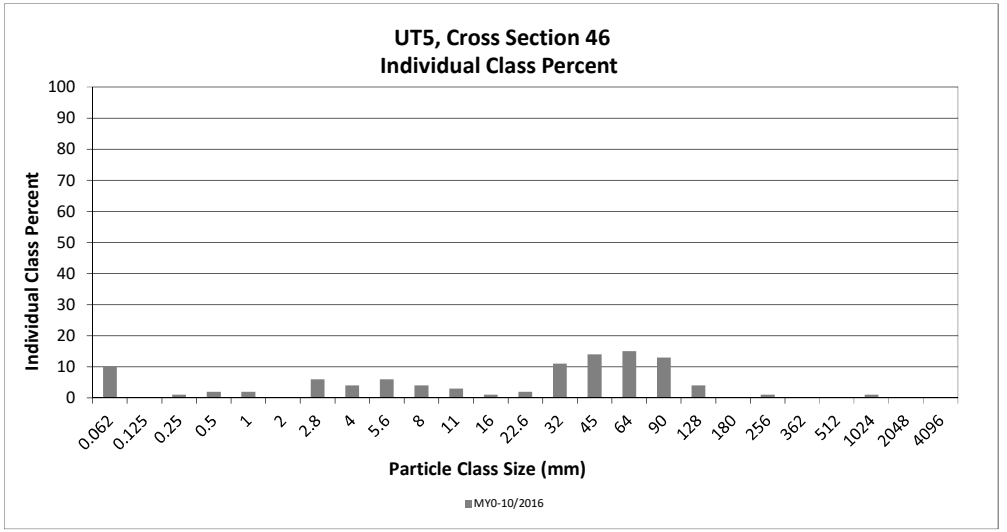
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

UT5, Cross Section 46

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	10	10	10
SAND	Very fine	0.062	0.125	0	0	10
	Fine	0.125	0.250	1	1	11
	Medium	0.25	0.50	2	2	13
	Coarse	0.5	1.0	2	2	15
	Very Coarse	1.0	2.0	0	0	15
GRAVEL	Very Fine	2.0	2.8	6	6	21
	Very Fine	2.8	4.0	4	4	25
	Fine	4.0	5.6	6	6	31
	Fine	5.6	8.0	4	4	35
	Medium	8.0	11.0	3	3	38
	Medium	11.0	16.0	1	1	39
	Coarse	16.0	22.6	2	2	41
	Coarse	22.6	32	11	11	52
	Very Coarse	32	45	14	14	66
	Very Coarse	45	64	15	15	81
COBBLE	Small	64	90	13	13	94
	Small	90	128	4	4	98
	Large	128	180	0	0	98
	Large	180	256	1	1	99
BOULDER	Small	256	362			99
	Small	362	512			99
	Medium	512	1024	1	1	100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
			Total	**100**	**100**	**100**

Cross Section 46	
Channel materials (mm)	
D_{16} =	2.12
D_{35} =	8.00
D_{50} =	30.0
D_{84} =	69.2
D_{95} =	98.3
D_{100} =	1024.0





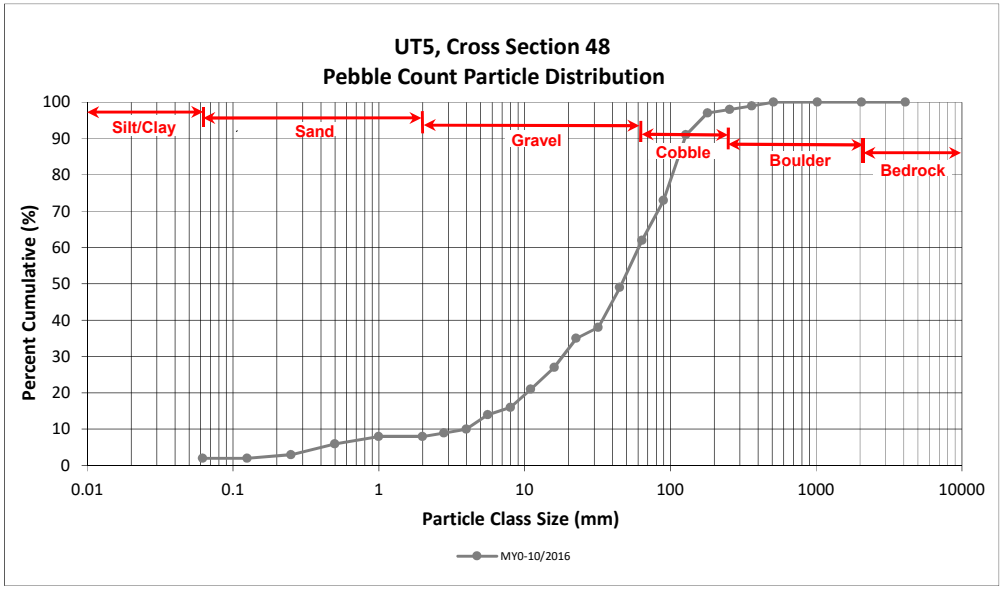
Reachwide and Cross Section Pebble Count Plots

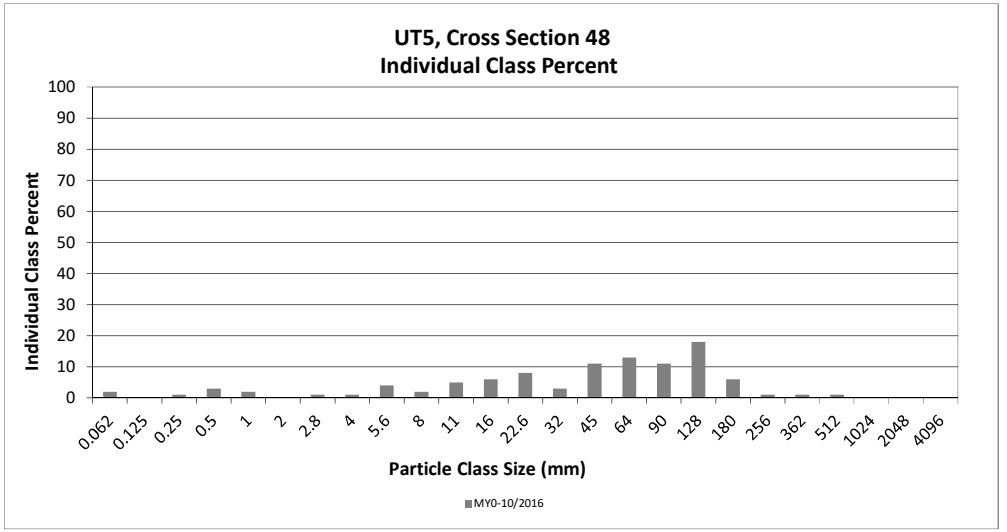
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

UT5, Cross Section 48

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	2	2	2
SAND	Very fine	0.062	0.125	0	0	2
	Fine	0.125	0.250	1	1	3
	Medium	0.25	0.50	3	3	6
	Coarse	0.5	1.0	2	2	8
	Very Coarse	1.0	2.0	0	0	8
GRAVEL	Very Fine	2.0	2.8	1	1	9
	Very Fine	2.8	4.0	1	1	10
	Fine	4.0	5.6	4	4	14
	Fine	5.6	8.0	2	2	16
	Medium	8.0	11.0	5	5	21
	Medium	11.0	16.0	6	6	27
	Coarse	16.0	22.6	8	8	35
	Coarse	22.6	32	3	3	38
	Very Coarse	32	45	11	11	49
	Very Coarse	45	64	13	13	62
COBBLE	Small	64	90	11	11	73
	Small	90	128	18	18	91
	Large	128	180	6	6	97
	Large	180	256	1	1	98
BOULDER	Small	256	362	1	1	99
	Small	362	512	1	1	100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
			Total	**100**	**100**	**100**

Cross Section 48	
Channel materials (mm)	
D_{16} =	8.00
D_{35} =	22.60
D_{50} =	46.2
D_{84} =	111.6
D_{95} =	160.7
D_{100} =	512.0





STREAM PHOTOGRAPHS

Candy Creek Reach 1
Monitoring Year 0

	
Photo Point 1 – looking upstream *(03/06/2017)*	**Photo Point 1** – look downstream *(03/06/2017)*
	
Photo Point 2 – looking upstream *(03/06/2017)*	**Photo Point 2** – looking downstream *(03/06/2017)*
	
Photo Point 3 – looking upstream *(03/06/2017)*	**Photo Point 3** – looking downstream *(03/06/2017)*

	
Photo Point 4 – looking upstream *(03/06/2017)*	**Photo Point 4** – looking downstream *(03/06/2017)*
	
Photo Point 5 – looking upstream *(03/06/2017)*	**Photo Point 5** – looking downstream *(03/06/2017)*
	
Photo Point 6 – looking upstream *(03/06/2017)*	**Photo Point 6** – looking downstream *(03/06/2017)*

	
Photo Point 7 – looking upstream *(03/06/2017)*	**Photo Point 7** – looking downstream *(03/06/2017)*
	
Photo Point 8 – looking upstream *(03/06/2017)*	**Photo Point 8** – looking downstream *(03/06/2017)*
	
Photo Point 9 – looking upstream *(03/06/2017)*	**Photo Point 9** – looking downstream *(03/06/2017)*

	
Photo Point 10 – looking upstream *(03/06/2017)*	**Photo Point 10** – looking downstream *(03/06/2017)*
	
Photo Point 11 – looking upstream *(03/06/2017)*	**Photo Point 11** – looking downstream *(03/06/2017)*
	
Photo Point 12 – looking upstream *(03/06/2017)*	**Photo Point 12** – looking downstream *(03/06/2017)*

	
Photo Point 13 – looking upstream *(03/06/2017)*	**Photo Point 13** – looking downstream *(03/06/2017)*

STREAM PHOTOGRAPHS

Candy Creek Reach 2
Monitoring Year 0

	
Photo Point 14 – looking upstream *(03/06/2017)*	**Photo Point 14** – looking downstream *(03/06/2017)*
	
Photo Point 15 – looking upstream *(03/06/2017)*	**Photo Point 15** – looking downstream *(03/06/2017)*
	
Photo Point 16 – looking upstream *(03/06/2017)*	**Photo Point 16** – looking downstream *(03/06/2017)*

	
Photo Point 17 – looking upstream *(03/06/2017)*	**Photo Point 17** – looking downstream *(03/06/2017)*
	
Photo Point 18 – looking upstream *(03/06/2017)*	**Photo Point 18** – looking downstream *(03/06/2017)*
	
Photo Point 19 – looking upstream *(03/07/2017)*	**Photo Point 19** – looking downstream *(03/07/2017)*

	
Photo Point 20 – looking upstream *(03/07/2017)*	**Photo Point 20** – looking downstream *(03/07/2017)*
	
Photo Point 21 – looking upstream *(03/07/2017)*	**Photo Point 21** – looking downstream *(03/07/2017)*
	
Photo Point 22 – looking upstream *(03/07/2017)*	**Photo Point 22** – looking downstream *(03/07/2017)*

Photo Point 23 – looking upstream *(03/07/2017)*

Photo Point 23 – looking downstream *(03/07/2017)*

Photo Point 24 – looking upstream *(03/07/2017)*

STREAM PHOTOGRAPHS

Candy Creek Reach 3
Monitoring Year 0

Photo Point 24 – looking downstream *(03/07/2017)*

Photo Point 25 – looking upstream *(03/07/2017)*

Photo Point 25 – looking downstream *(03/07/2017)*

Photo Point 26 – looking upstream *(03/07/2017)*

Photo Point 26 – looking downstream *(03/07/2017)*

	
Photo Point 27 – looking upstream *(03/07/2017)*	**Photo Point 27** – looking downstream *(03/07/2017)*
	
Photo Point – looking upstream *(03/07/2017)*	**Photo Point 28** – looking downstream *(03/07/2017)*
	
Photo Point 29 – looking upstream *(03/07/2017)*	**Photo Point 29** – looking downstream *(03/07/2017)*

	
Photo Point 30 – looking upstream *(03/07/2017)*	**Photo Point 30** – looking downstream *(03/07/2017)*
	
Photo Point 31 – looking upstream *(03/07/2017)*	**Photo Point 31** – looking downstream *(03/07/2017)*
	
Photo Point 32 – looking upstream *(03/07/2017)*	**Photo Point 32** – looking downstream *(03/07/2017)*

	
Photo Point 33 – looking upstream *(03/07/2017)*	**Photo Point 33** – looking downstream *(03/07/2017)*
	
Photo Point 34 – looking upstream *(03/07/2017)*	**Photo Point 34** – looking downstream *(03/07/2017)*

STREAM PHOTOGRAPHS

Candy Creek Reach 4
Monitoring Year 0

	
Photo Point 35 – looking upstream *(03/07/2017)*	**Photo Point 35** – looking downstream *(03/07/2017)*
	
Photo Point 36 – looking upstream *(03/07/2017)*	**Photo Point 36** – looking downstream *(03/07/2017)*
	
Photo Point 37 – looking upstream *(03/07/2017)*	**Photo Point 37** – looking downstream *(03/07/2017)*

	
Photo Point 38 – looking upstream *(03/07/2017)*	**Photo Point 38** – looking downstream *(03/07/2017)*
	
Photo Point 39 – looking upstream *(03/07/2017)*	**Photo Point 39** – looking downstream *(03/07/2017)*
	
Photo Point 40 – looking upstream *(03/07/2017)*	**Photo Point 40** – looking downstream *(03/07/2017)*

	
Photo Point 41 – looking upstream *(03/07/2017)*	**Photo Point 41** – looking downstream *(03/07/2017)*
	
Photo Point 42 – looking upstream *(03/07/2017)*	**Photo Point 42** – looking downstream *(03/07/2017)*
	
Photo Point 43 – looking upstream *(03/07/2017)*	**Photo Point 43** – looking downstream *(03/07/2017)*

	
Photo Point 44 – looking upstream *(03/07/2017)*	**Photo Point 44** – looking downstream *(03/07/2017)*
	
Photo Point 45 – looking upstream *(03/07/2017)*	**Photo Point 45** – looking downstream *(03/07/2017)*
	
Photo Point 46 – looking upstream *(03/07/2017)*	**Photo Point 46** – looking downstream *(03/07/2017)*

	
Photo Point 47 – looking upstream *(03/07/2017)*	**Photo Point 47** – looking downstream *(03/07/2017)*
	
Photo Point 48 – looking upstream *(03/07/2017)*	**Photo Point 48** – looking downstream *(03/07/2017)*
	
Photo Point 49 – looking upstream *(03/07/2017)*	**Photo Point 49** – looking downstream *(03/07/2017)*

	
Photo Point 50 – looking upstream *(03/07/2017)*	**Photo Point 50** – looking downstream *(03/07/2017)*
	
Photo Point 51 – looking upstream *(03/07/2017)*	**Photo Point 51** – looking downstream *(03/07/2017)*
	
Photo Point 52 – looking upstream *(03/07/2017)*	**Photo Point 52** – looking downstream *(03/07/2017)*

STREAM PHOTOGRAPHS

Unnamed Tributaries 1C and 1D
Monitoring Year 0

	
Photo Point 53 – looking upstream *(03/07/2017)*	**Photo Point 53** – looking downstream *(03/07/2017)*
	
Photo Point 54 – looking upstream *(03/07/2017)*	**Photo Point 54** – looking downstream *(03/07/2017)*
	
Photo Point 55 – looking upstream *(03/07/2017)*	**Photo Point 55** – looking downstream *(03/07/2017)*

	
Photo Point 56 – looking upstream *(03/07/2017)*	**Photo Point 56** – looking downstream *(03/07/2017)*
	
Photo Point 57 – looking upstream *(03/07/2017)*	**Photo Point 57** – looking downstream *(03/07/2017)*

STREAM PHOTOGRAPHS

Unnamed Tributaries 2, 2A, and 2B
Monitoring Year 0

	
Photo Point 58 – looking upstream *(03/07/2017)*	**Photo Point 58** – looking downstream *(03/07/2017)*
	
Photo Point 59 – looking upstream *(03/07/2017)*	**Photo Point 59** – looking downstream *(03/07/2017)*
	
Photo Point 60 – looking upstream *(03/07/2017)*	**Photo Point 60** – looking downstream *(03/07/2017)*

	
Photo Point 61 – looking upstream *(03/07/2017)*	**Photo Point 61** – looking downstream *(03/07/2017)*
	
Photo Point 62 – looking upstream *(03/07/2017)*	**Photo Point 62** – looking downstream *(03/07/2017)*
	
Photo Point 63 – looking upstream *(03/07/2017)*	**Photo Point 63** – looking downstream *(03/07/2017)*

	
Photo Point 64 – looking upstream *(03/07/2017)*	**Photo Point 64** – looking downstream *(03/07/2017)*
	
Photo Point 65 – looking upstream *(03/07/2017)*	**Photo Point 65** – looking downstream *(03/07/2017)*
	
Photo Point 66 – looking upstream *(03/07/2017)*	**Photo Point 66** – looking downstream *(03/07/2017)*

	
Photo Point 67 – looking upstream *(03/07/2017)*	**Photo Point 67** – looking downstream *(03/07/2017)*
	
Photo Point 68 – looking upstream *(03/07/2017)*	**Photo Point 68** – looking downstream *(03/07/2017)*
	
Photo Point 69 – looking upstream *(03/07/2017)*	**Photo Point 69** – looking downstream *(03/07/2017)*

	
Photo Point 70 – looking upstream *(03/07/2017)*	**Photo Point 70** – looking downstream *(03/07/2017)*
	
Photo Point 71 – looking upstream *(03/07/2017)*	**Photo Point 71** – looking downstream *(03/07/2017)*
	
Photo Point 72 – looking upstream *(03/07/2017)*	**Photo Point 72** – looking downstream *(03/07/2017)*

	
Photo Point 73 – looking upstream *(03/07/2017)*	**Photo Point 73** – looking downstream *(03/07/2017)*

STREAM PHOTOGRAPHS

Unnamed Tributaries 3, 4, and 5
Monitoring Year 0

	
Photo Point 74 – looking upstream *(03/06/2017)*	**Photo Point 74** – look downstream *(03/06/2017)*
	
Photo Point 75 – looking upstream *(03/06/2017)*	**Photo Point 75** – looking downstream *(03/06/2017)*
	
Photo Point 76 – looking upstream *(03/06/2017)*	**Photo Point 76** – looking downstream *(03/06/2017)*

	
Photo Point 77 – looking upstream *(03/06/2017)*	**Photo Point 77** – looking downstream *(03/06/2017)*
	
Photo Point 78 – looking upstream *(03/06/2017)*	**Photo Point 78** – looking downstream *(03/06/2017)*
	
Photo Point 79 – looking upstream *(03/06/2017)*	**Photo Point 79** – looking downstream *(03/06/2017)*

	
Photo Point 80 – looking upstream *(03/06/2017)*	**Photo Point 80** – looking downstream *(03/06/2017)*
	
Photo Point 81 – looking upstream *(03/06/2017)*	**Photo Point 81** – looking downstream *(03/06/2017)*
	
Photo Point 82 – looking upstream *(03/06/2017)*	**Photo Point 82** – looking downstream *(03/06/2017)*

	
Photo Point 83 – looking upstream *(03/06/2017)*	**Photo Point 83** – looking downstream *(03/06/2017)*
	
Photo Point 84 – looking upstream *(03/06/2017)*	**Photo Point 84** – looking downstream *(03/06/2017)*
	
Photo Point 85 – looking upstream *(03/06/2017)*	**Photo Point 85** – looking downstream *(03/06/2017)*

APPENDIX 3. Vegetation Plot Data

Table 9. Planted and Total Stems
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

			Current Plot Data (MY0 2017)																				
			Vegetation Plot 1			Vegetation Plot 2			Vegetation Plot 3			Vegetation Plot 4			Vegetation Plot 5			Vegetation Plot 6			Vegetation Plot 7		
Scientific Name	Common Name	Species Type	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
Betula nigra	River Birch	Tree	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	4	4	2	2	2
Fraxinus pennsylvanica	Green ash	Tree	3	3	3	2	2	2	3	3	3	2	2	2	3	3	3	2	2	2	3	3	3
Platanus occidentalis	American sycamore	Tree	3	3	3	2	2	2	3	3	3	2	2	2	2	2	2	3	3	3	3	3	3
Quercus michauxii	Swamp chestnut oak	Tree				3	3	3	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3
Quercus pagoda	Cherrybark oak	Tree	3	3	3	2	2	2	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1
Quercus phellos	Willow oak	Tree	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2	3	3	3
		Stem count	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
		Size (ares)		1			1			1			1			1			1			1	
		Size (ACRES)		0.02			0.02			0.02			0.02			0.02			0.02			0.02	
		Species count	5	5	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
		Stems per ACRE	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607

			Current Plot Data (MY0 2017)																				
			Vegetation Plot 8			Vegetation Plot 9			Vegetation Plot 10			Vegetation Plot 11			Vegetation Plot 12			Vegetation Plot 13			Vegetation Plot 14		
Scientific Name	Common Name	Species Type	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
Betula nigra	River birch	Tree	3	3	3	3	3	3	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3
Fraxinus pennsylvanica	Green ash	Tree	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2	3	3	3	2	2	2
Platanus occidentalis	American sycamore	Tree	3	3	3	2	2	2	3	3	3	2	2	2	3	3	3	2	2	2	3	3	3
Quercus michauxii	Swamp chestnut oak	Tree	1	1	1	2	2	2	3	3	3	2	2	2	3	3	3	2	2	2	3	3	3
Quercus pagoda	Cherrybark oak	Tree	2	2	2	2	2	2	1	1	1	2	2	2	1	1	1	2	2	2	2	2	2
Quercus phellos	Willow oak	Tree	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2
		Stem count	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
		Size (ares)		1			1			1			1			1			1			1	
		Size (ACRES)		0.02			0.02			0.02			0.02			0.02			0.02			0.02	
		Species count	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
		Stems per ACRE	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607

			Current Plot Data (MY0 2017)																				
			Vegetation Plot 15			Vegetation Plot 16			Vegetation Plot 17			Vegetation Plot 18			Vegetation Plot 19			Vegetation Plot 20			Vegetation Plot 21		
Scientific Name	Common Name	Species Type	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
Betula nigra	River birch	Tree	2	2	2	3	3	3	2	2	2	3	3	3	2	2	2	2	2	2	2	2	2
Fraxinus pennsylvanica	Green ash	Tree	3	3	3	3	3	3	3	3	3	2	2	2	3	3	3	3	3	3	2	2	2
Platanus occidentalis	American sycamore	Tree	3	3	3	3	3	3	3	3	3	1	1	1	4	4	4	3	3	3	3	3	3
Quercus michauxii	Swamp chestnut oak	Tree	4	4	4	2	2	2	3	3	3	4	4	4	2	2	2	2	2	2	3	3	3
Quercus pagoda	Cherrybark oak	Tree	2	2	2	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3
Quercus phellos	Willow oak	Tree	4	4	4	3	3	3	2	2	2	3	3	3	2	2	2	3	3	3	2	2	2
		Stem count	18	18	18	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
		Size (ares)		1			1			1			1			1			1			1	
		Size (ACRES)		0.02			0.02			0.02			0.02			0.02			0.02			0.02	
		Species count	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
		Stems per ACRE	728	728	728	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607

Exceeds requirements by 10%
Exceeds requirements, but by less than 10%
Fails to meet requirements, by less than 10%
Fails to meet requirements by more than 10%
Volunteers included

PnoLS: Number of planted stems excluding live stakes
P-All: Number of planted stems including live stakes
T: Total stems

Table 9. Planted and Total Stems
Candy Creek Mitigation Site
DMS Project No. 96315
Monitoring Year 0 - 2017

			Current Plot Data (MY0 2017)																				
			Vegetation Plot 22			Vegetation Plot 23			Vegetation Plot 24			Vegetation Plot 25			Vegetation Plot 26			Vegetation Plot 27			Vegetation Plot 28		
Scientific Name	Common Name	Species Type	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
Betula nigra	River birch	Tree	2	2	2	2	2	2	3	3	3	1	1	1	2	2	2	2	2	2	3	3	3
Fraxinus pennsylvanica	Green ash	Tree	3	3	3	3	3	3	2	2	2	3	3	3	3	3	3	2	2	2	3	3	3
Platanus occidentalis	American sycamore	Tree	2	2	2	3	3	3	2	2	2	4	4	4	3	3	3	3	3	3	3	3	3
Quercus michauxii	Swamp chestnut oak	Tree	2	2	2	3	3	3	3	3	3	2	2	2	3	3	3	3	3	3	2	2	2
Quercus pagoda	Cherrybark oak	Tree	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Quercus phellos	Willow oak	Tree	3	3	3	2	2	2	3	3	3	3	3	3	2	2	2	3	3	3	2	2	2
Stem count			15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Size (ares)				1			1			1			1			1			1			1	
Size (ACRES)				0.02			0.02			0.02			0.02			0.02			0.02			0.02	
Species count			6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Stems per ACRE			607	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607

			Current Plot Data (MY0 2017)																				
			Vegetation Plot 29			Vegetation Plot 30			Vegetation Plot 31			Vegetation Plot 32			Vegetation Plot 33			Vegetation Plot 34			Vegetation Plot 35		
Scientific Name	Common Name	Species Type	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
Betula nigra	River birch	Tree				3	3	3	2	2	2	2	2	2	3	3	3	2	2	2	3	3	3
Fraxinus pennsylvanica	Green ash	Tree	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2
Platanus occidentalis	American sycamore	Tree	1	1	1	2	2	2	3	3	3	3	3	3	3	3	3	2	2	2	3	3	3
Quercus michauxii	Swamp chestnut oak	Tree	7	7	7	2	2	2	3	3	3	3	3	3	2	2	2	3	3	3	4	4	4
Quercus pagoda	Cherrybark oak	Tree	3	3	3	2	2	2	2	2	2	1	1	1	1	1	1	2	2	2	1	1	1
Quercus phellos	Willow oak	Tree	2	2	2	3	3	3	2	2	2	3	3	3	3	3	3	3	3	3	2	2	2
Stem count			15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Size (ares)				1			1			1			1			1			1			1	
Size (ACRES)				0.02			0.02			0.02			0.02			0.02			0.02			0.02	
Species count			5	5	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Stems per ACRE			607	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607	607

			Current Plot Data (MY0 2017)															Annual Summaries		
			Vegetation Plot 36			Vegetation Plot 37			Vegetation Plot 38			Vegetation Plot 39			Vegetation Plot 40			MY0 (3/2017)		
Scientific Name	Common Name	Species Type	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
Betula nigra	River birch	Tree	3	3	3	1	1	1	2	2	2	4	4	4	1	1	1	98	98	98
Fraxinus pennsylvanica	Green ash	Tree	2	2	2	3	3	3	3	3	3	3	3	3	2	2	2	107	107	107
Platanus occidentalis	American sycamore	Tree	3	3	3	3	3	3	3	3	3	1	1	1	4	4	4	107	107	107
Quercus michauxii	Swamp chestnut oak	Tree	3	3	3	3	3	3	2	2	2	3	3	3	3	3	3	109	109	109
Quercus pagoda	Cherrybark oak	Tree	2	2	2	3	3	3	2	2	2	2	2	2	2	2	2	75	75	75
Quercus phellos	Willow oak	Tree	2	2	2	2	2	2	3	3	3	2	2	2	3	3	3	107	107	107
Stem count			15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	603	603	603
Size (ares)				1			1			1			1			1			40	
Size (ACRES)				0.02			0.02			0.02			0.02			0.02			0.99	
Species count			6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Stems per ACRE			607	607	607	607	607	607	607	607	607	607	607	607	607	607	607	610	610	610

Exceeds requirements by 10%
Exceeds requirements, but by less than 10%
Fails to meet requirements, by less than 10%
Fails to meet requirements by more than 10%
Volunteers included

PnoLS: Number of planted stems excluding live stakes
P-All: Number of planted stems including live stakes
T: Total stems

VEGETATION PHOTOGRAPHS

Monitoring Year 0

Vegetation Plot 1 *(03/07/2017)*

Vegetation Plot 2 *(03/07/2017)*

Vegetation Plot 3 *(03/07/2017)*

Vegetation Plot 4 *(03/07/2017)*

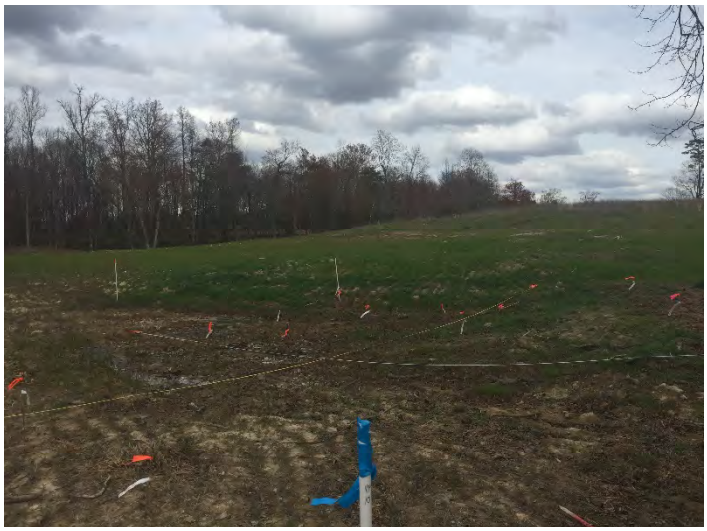
Vegetation Plot 5 *(03/07/2017)*

Vegetation Plot 6 *(03/07/2017)*

Vegetation Plot 7 *(03/07/2017)*

Vegetation Plot 8 *(03/07/2017)*

Vegetation Plot 9 *(03/07/2017)*



Vegetation Plot 10 *(03/07/2017)*

Vegetation Plot 11 *(03/07/2017)*

Vegetation Plot 12 *(03/07/2017)*

Vegetation Plot 13 *(03/07/2017)*

Vegetation Plot 14 *(03/07/2017)*

Vegetation Plot 15 *(03/07/2017)*

Vegetation Plot 16 *(03/07/2017)*

Vegetation Plot 17 *(03/07/2017)*

Vegetation Plot 18 *(03/07/2017)*

Vegetation Plot 19 *(03/07/2017)*

Vegetation Plot 20 *(03/07/2017)*

Vegetation Plot 21 *(03/07/2017)*

Vegetation Plot 22 *(03/07/2017)*

Vegetation Plot 23 *(03/07/2017)*

Vegetation Plot 24 *(03/07/2017)*

Vegetation Plot 25 *(03/07/2017)*

Vegetation Plot 26 *(03/07/2017)*

Vegetation Plot 27 *(03/07/2017)*

Vegetation Plot 28 *(03/07/2017)*

Vegetation Plot 29 *(03/07/2017)*

Vegetation Plot 30 *(03/07/2017)*

Vegetation Plot 31 *(03/07/2017)*

Vegetation Plot 32 *(03/07/2017)*

Vegetation Plot 33 *(03/07/2017)*

Vegetation Plot 34 *(03/07/2017)*

Vegetation Plot 35 *(03/07/2017)*

Vegetation Plot 36 *(03/07/2017)*

	
Vegetation Plot 37 *(03/07/2017)*	**Vegetation Plot 38** *(03/07/2017)*
	
Vegetation Plot 39 *(03/07/2017)*	**Vegetation Plot 40** *(03/07/2017)*

APPENDIX 4. Record Drawings

Candy Creek Mitigation Site-Record Drawings

Guilford County, North Carolina

Cape Fear River Basin - HUC 03030002

for

NC DEQ

Division of Mitigation Services

Vicinity Map
Not to Scale

Environmental Quality

RECORD DRAWINGS
ISSUED MAY 30, 2017

CERTIFICATE OF SURVEY AND ACCURACY

I, NOLAN R. CARMACK, CERTIFY THAT THE GROUND TOPOGRAPHIC SURVEY PORTION OF THIS PROJECT WAS COMPLETED UNDER MY DIRECT SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY DIRECT SUPERVISION, THAT THE RECORD DRAWINGS WERE PREPARED BY WILDLANDS ENGINEERING, INC FROM DIGITAL FILES PROVIDED BY KEE MAPPING AND SURVEYING, PA AS SHOWN ON AN AS-BUILT SURVEY FOR "THE STATE OF NC, DIVISION OF MITIGATION SERVICES" DATED MAY 2, 2017 ; THAT THIS SURVEY WAS PERFORMED AT THE 95% CONFIDENCE LEVEL TO MEET THE FEDERAL GEOGRAPHIC DATA COMMITTEE STANDARDS; THAT THIS SURVEY WAS PERFORMED TO MEET THE REQUIREMENTS FOR A TOPOGRAPHIC SURVEY TO THE ACCURACY OF CLASS A HORIZONTAL AND CLASS C VERTICAL WHERE APPLICABLE; THAT THE ORIGINAL DATA WAS OBTAINED BETWEEN THE DATES OF 12/12/16 - 3/29/17 ; THAT THE CONTOURS SHOWN AS BROKEN LINES MAY NOT MEET THE STATED STANDARD AND ALL COORDINATES ARE BASED ON NAD 83 (NSRS 2011) AND ALL ELEVATIONS ARE BASE ON NAVD 88; THAT THIS MAP MEETS THE SPECIFICATIONS FOR TOPOGRAPHIC SURVEYS AS STATED IN TITLE 21, CHAPTER 56, SECTION .1606; THAT THIS MAP WAS NOT PREPARED IN ACCORDANCE WITH G.S. 47-30, AS AMENDED AND DOES NOT REPRESENT AN OFFICIAL BOUNDARY SURVEY.

WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER, AND SEAL THIS THE 30th DAY OF May, 2017.

OFFICIAL SEAL

NORTH CAROLINA PROFESSIONAL SEAL L-5076 LAND SURVEYOR NOLAN R. CARMACK

NOLAN R. CARMACK, PLS L-5076

Sheet Index

Project Directory

Engineering:
Wildlands Engineering, Inc
License No. F-0831
1430 South Mint Street
Suite 104
Charlotte, NC 28203
Aaron Earley, PE
704-332-7754

Surveying:
Kee Mapping and Surveying, PA
88 Central Avenue
Asheville, NC 28801
Nolan Carmack, PLS
828-575-9021

Owner:
NCDEQ
Division of Mitigation Services
217 West Jones St., Ste 3000A
Raleigh, NC 27603
Jeff Schaffer
919-707-8308

DMS #: 96315

WILDLANDS ENGINEERING
1430 S. Mint St, Suite 104
Charlotte, NC 28203
Phone: 704.332.7754
Fax: 704.332.3306
Firm License No. F-0831

NORTH CAROLINA PROFESSIONAL SEAL 023460 ENGINEER AARON S. EARLEY 5-2-17

Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

Title Sheet

Date:	May 30, 2017
Job Number:	005-02145
Project Engineer:	ASE
Drawn By:	SJD
Checked By:	JL

Revisions:

Sheet 1.0

Mon 30, 2017

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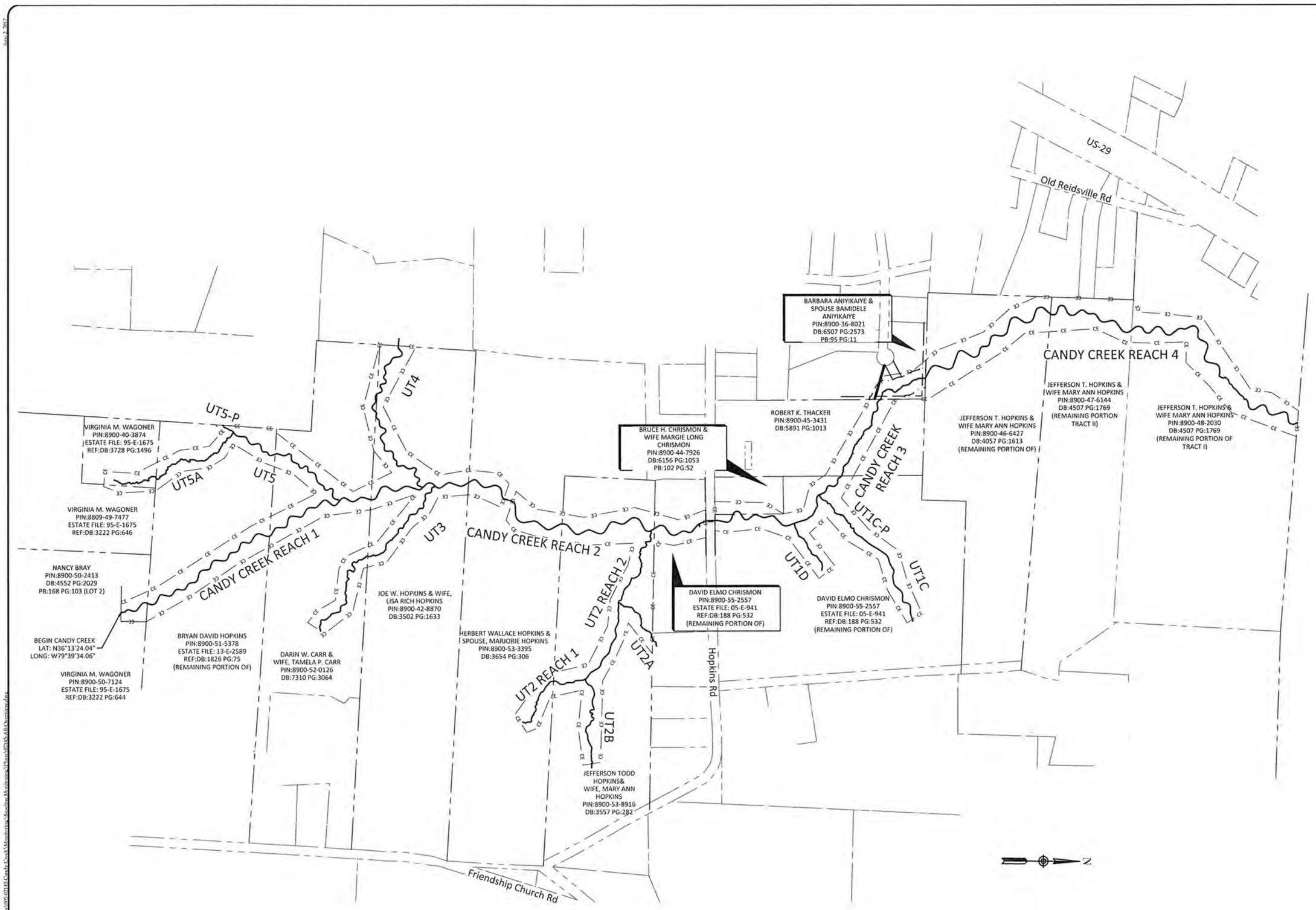

WILDLANDS
ENGINEERING
1430 S. Mint Street, Suite 104
Charlotte, NC 28203
Tel: 704.332.7754
Fax: 704.332.3306
Firm License No. F-0831

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 029340 KARIN S. EHRMAN 6-2-17

Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

Project Overview

Revisions:

Date:	May 30, 2017
Job Number:	005-02145
Project Engineer:	ASE
Drawn By:	SJD
Checked By:	JL

Sheet 1.1

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As-Built Features

- 10+00 As-Built Thalweg Alignment
- 100 As-Built Major Contour (5' Interval)
- As-Built Minor Contour

As-Built Structures

- As-Built Various Constructed Riffles
- As-Built Brush Toe

AS-BUILT DRAWINGS:
Deviations from the design will be shown in red.

As-Built Structures

- As-Built Log Sill
- As-Built Lunker Log
- As-Built Log J-Hook
- As-Built Rock J-Hook
- As-Built Log Vane
- As-Built Rock Cross Vane
- As-Built Boulder Sill
- As-Built Boulder Toe Protection
- As-Built Permanent Crossing

Existing Features

- Existing Property Line
- 100 Existing Major Contour (5' Interval)
- Existing Minor Contour
- OHE — OHE — OHE Existing Overhead Electric
- Existing Power Pole
- Existing Easement
- x — x Existing Fence
- FOC — FOC — FOC Existing Fiber Optic Cable
- UUE — UUE — UUE Existing Underground Utility Easement
- OUE — OUE — OUE Existing Overhead Utility Easement
- SS — SS — SS Existing Sanitary Sewer
- SSE — SSE — SSE Existing Sanitary Sewer Easement
- Existing Storm Pipe
- Existing Trail
- Existing Wetland
- Existing Tree
- Existing Groundwater Well
- Existing Bedrock
- Existing Road

Proposed Features

- CE — CE — CE Recorded Conservation Easement
- CE-XS — CE-XS Reserved Stream Crossing
- TCE — TCE — TCE Proposed Temporary Construction Easement
- 10+00 Proposed Thalweg Alignment
- Proposed Bankfull
- 100 Proposed Major Contour (5' Interval)
- Proposed Minor Contour
- B — B — B Proposed Back of Bench
- Proposed Tree Removal
- Proposed Tree Save
- SAF — SAF — SAF Proposed Safety Fence
- |X| — |X| — |X| Proposed Silt Fence
- Proposed Temporary Silt Fence Gravel Outlet
- Proposed Temporary Rock Sediment Dam

Proposed Structures

- Proposed Various Constructed Riffles
- Proposed Brush Toe
- Proposed Brush Mattress
- Proposed Vernal Pool
- Proposed Channel Plug
- Proposed Transplanted Sod Mat
- Proposed Vegetated Soil Lift

Proposed Structures

- Proposed Log Sill
- Proposed Lunker Log
- Proposed Log J-Hook
- Proposed Rock J-Hook
- Proposed Log Vane
- Proposed Root Wad
- Proposed Rock Cross Vane
- Proposed Boulder Sill
- Proposed Boulder Toe Protection
- Proposed Permanent Crossing
- Proposed Temporary Crossing
- Proposed Temporary Construction Entrance

PROJECT NOTES:

Topographic survey was completed by Kee Mapping and Surveying in March 2015. Parcel boundary survey completed by Kee Mapping and Surveying in 2015. As-Built survey completed March 2017

Riffle selection will be varied based on available materials at the Engineers' discretion. Field coordination will be required.

WILDLANDS ENGINEERING
1430 S. Mint St, Suite 104
Charlotte, NC 28203
Tel: 704.332.7754
Fax: 704.332.3306
Firm License No. F-0831

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 029340 AARON S. EARLEY

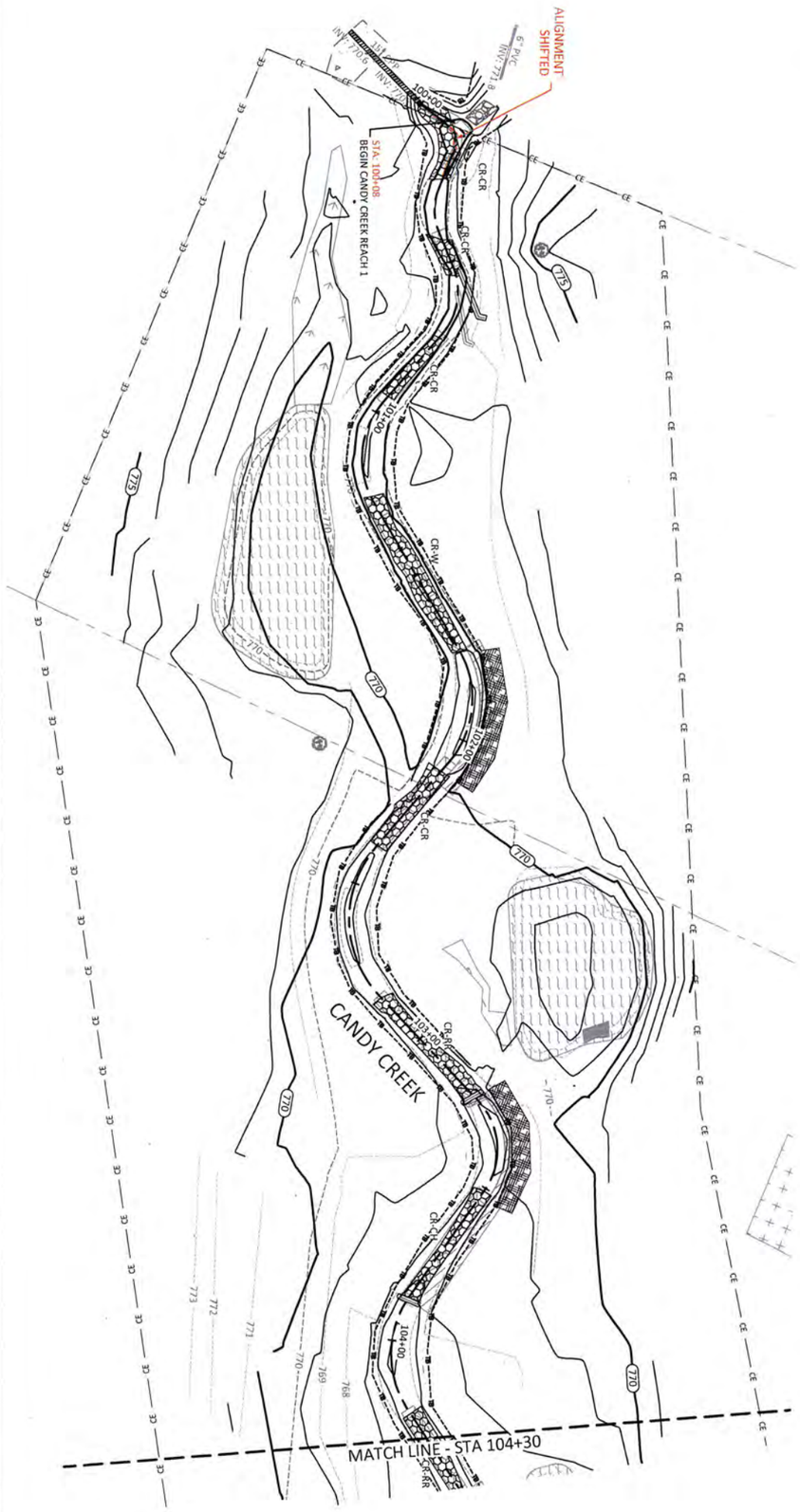
Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

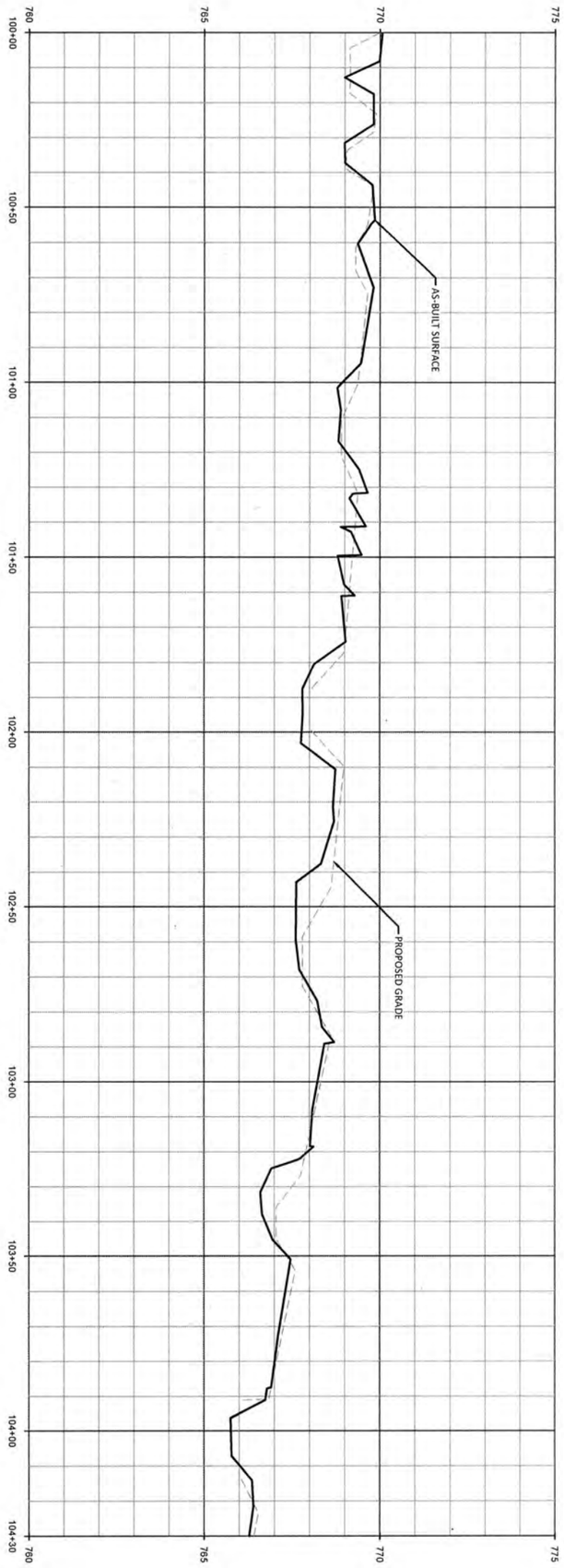
General Notes and Symbols

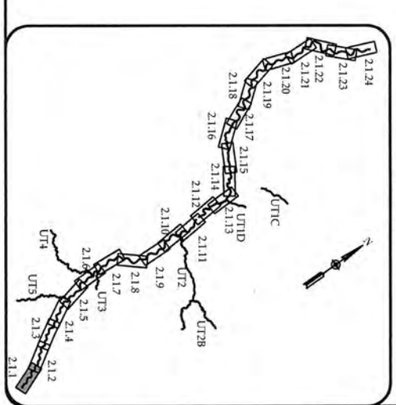
Revisions:

Date: May 30, 2017
Job Number: 005-02145
Project Engineer: ASE
Drawn By: SJD
Checked By: JL

Sheet 1.2







Sheet Index

Date:	May 30, 2017
Job Number:	005-02145
Project Engineer:	ASE
Drawn By:	SJD
Checked By:	JL

Revisions:

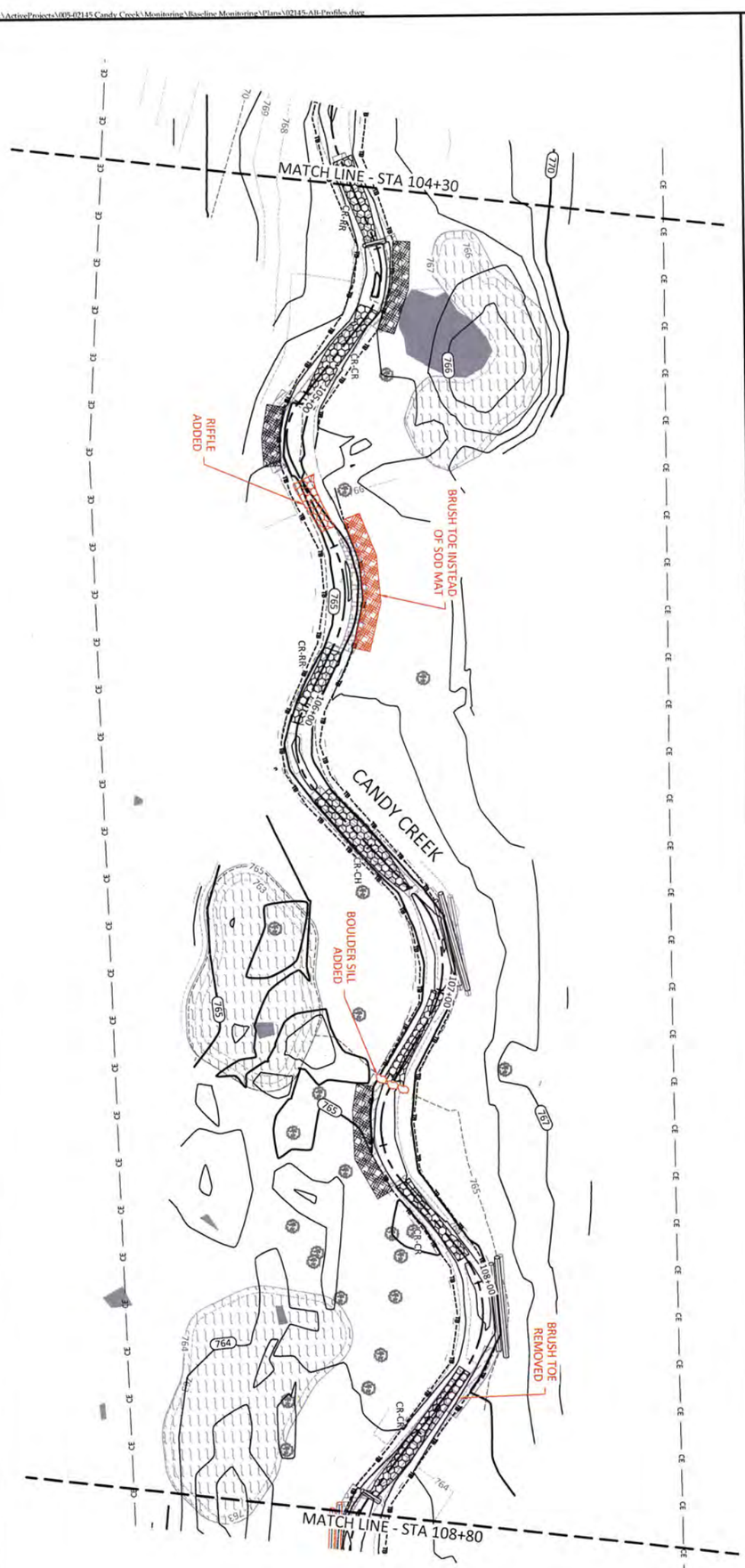
2.1.1
Sheet

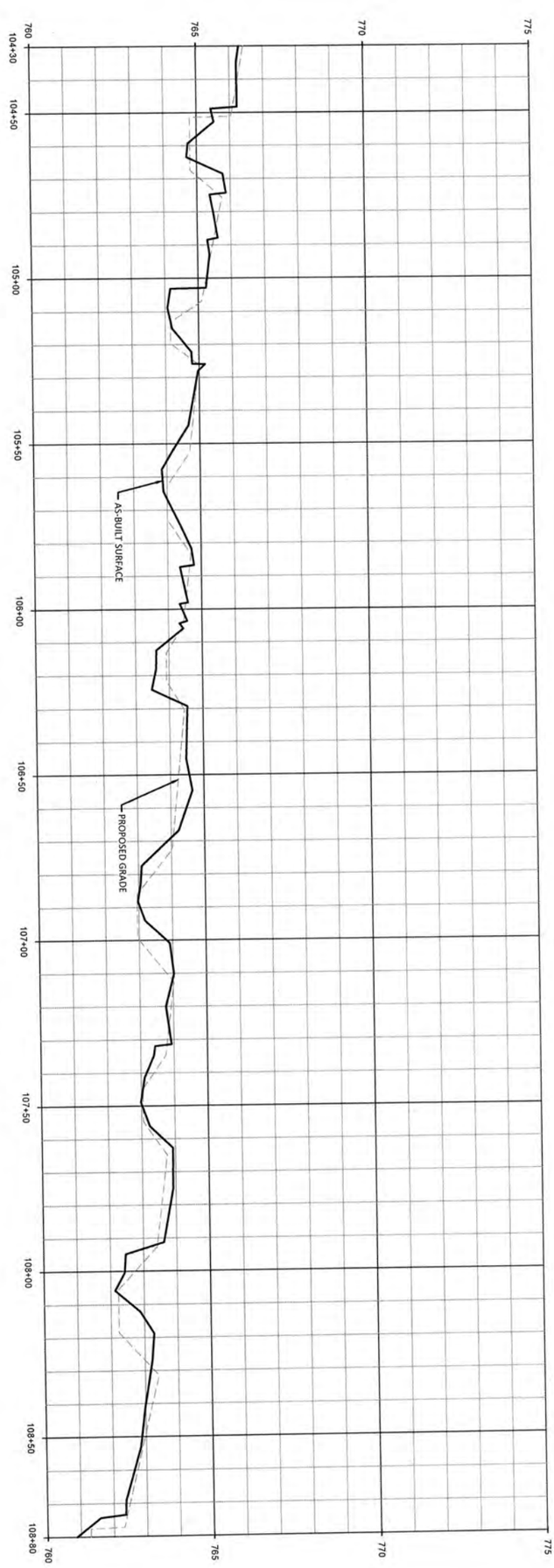
Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

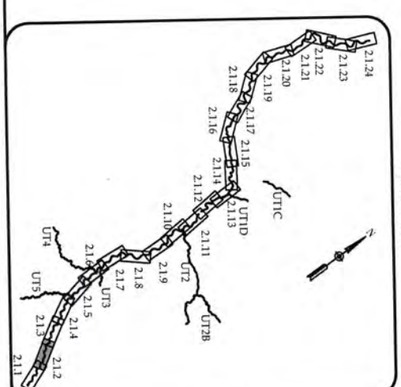
Candy Creek Reach 1
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER ERIN S. EARLEY
6-2-17

WILDLANDS ENGINEERING
1430 S. Mint St, Suite 104
Charlotte, NC 28203
Tel: 704.332.7754
Fax: 704.332.3306
Firm License No. F-0831







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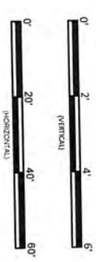

Date:	May 30, 2017
Job Number:	005-02145
Project Engineer:	ASE
Drawn By:	SJD
Checked By:	JL

Revisions:

2.1.2
Sheet

Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

Candy Creek Reach 1
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER AARON S. EARLEY
6-2-17

WILDLANDS ENGINEERING
1430 S. Mint St, Suite 104
Charlotte, NC 28203
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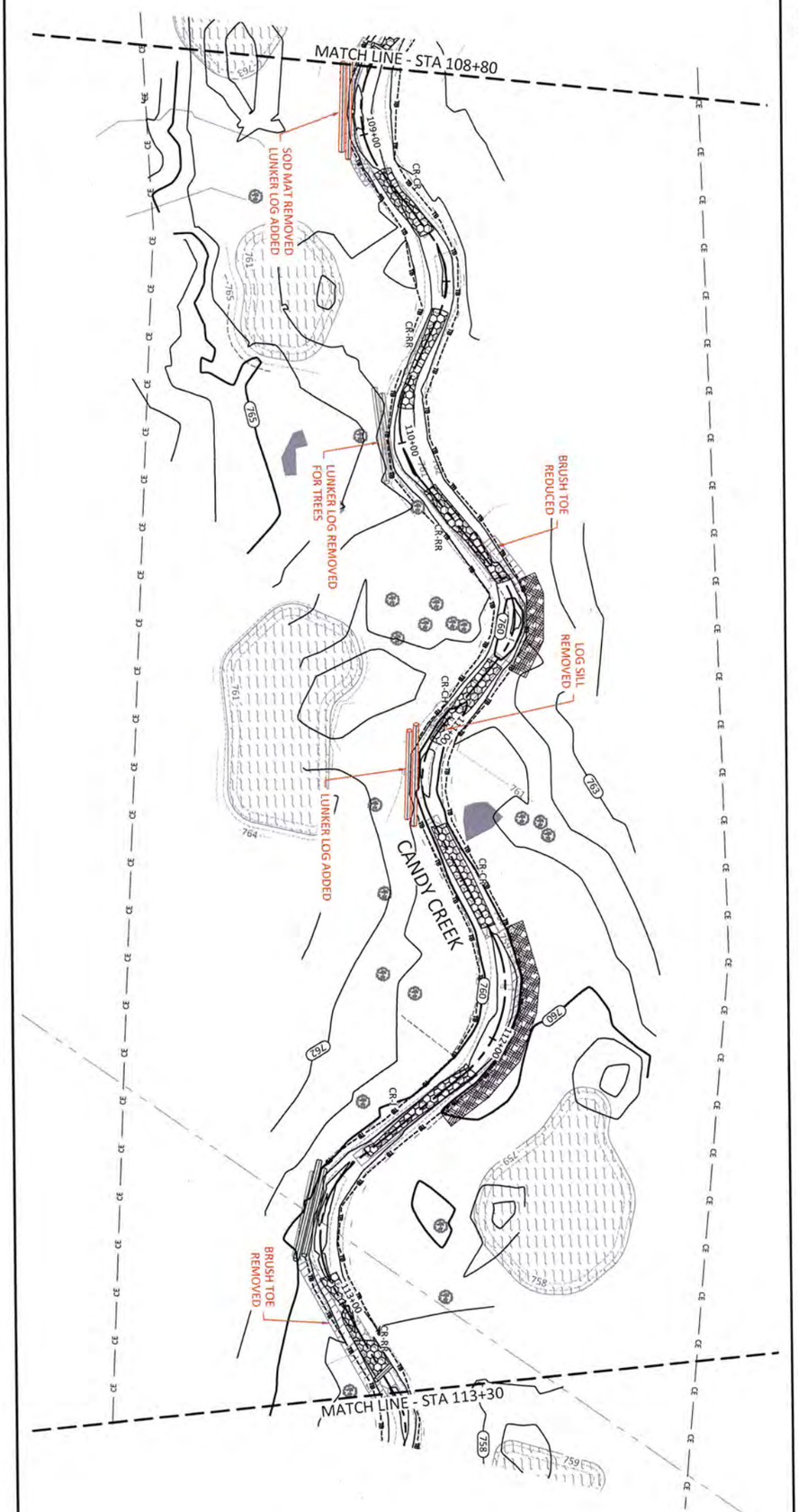
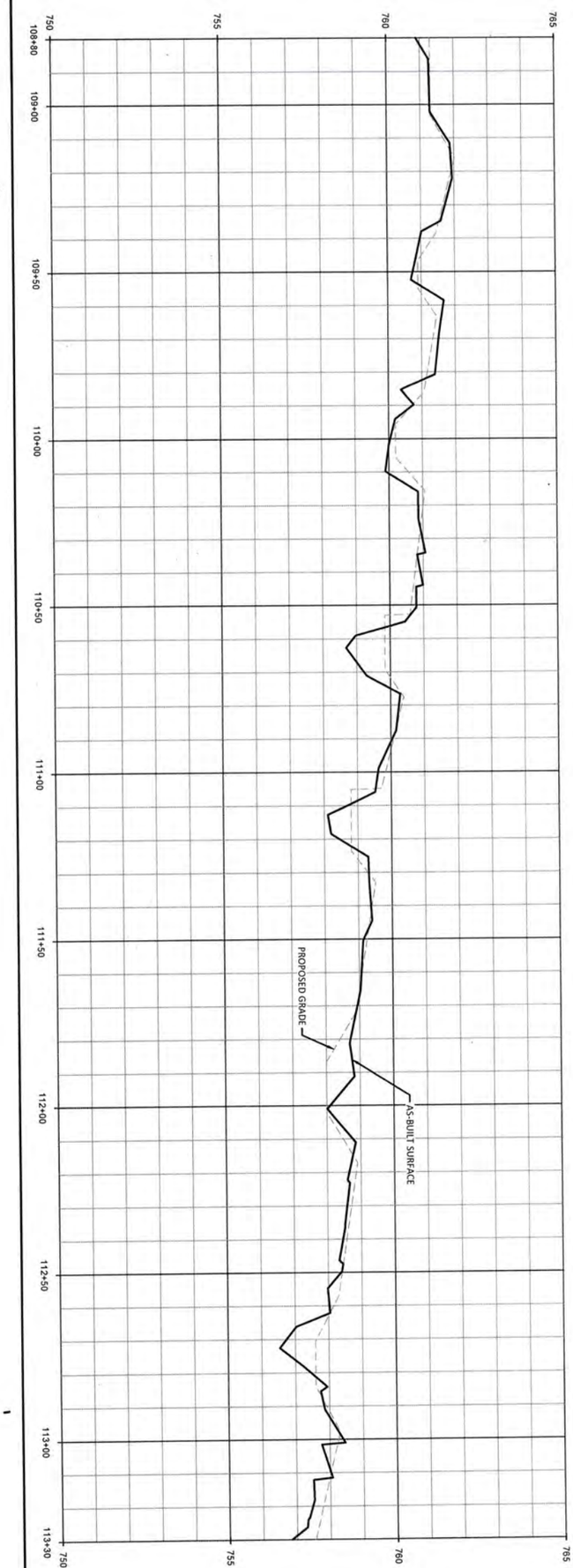
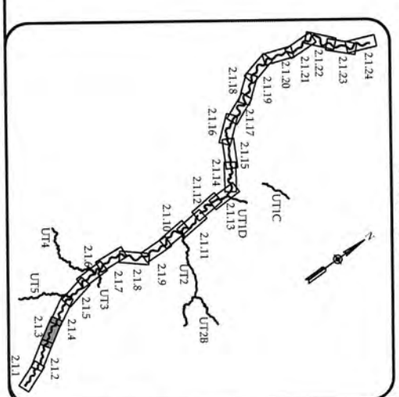
Firm License No. F-0831







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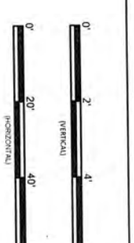

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Checked By:	JL

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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

Candy Creek Reach 1
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER AARON SARVEY
6-2-17

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Charlotte, NC 28203
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Fax: 704.332.3306
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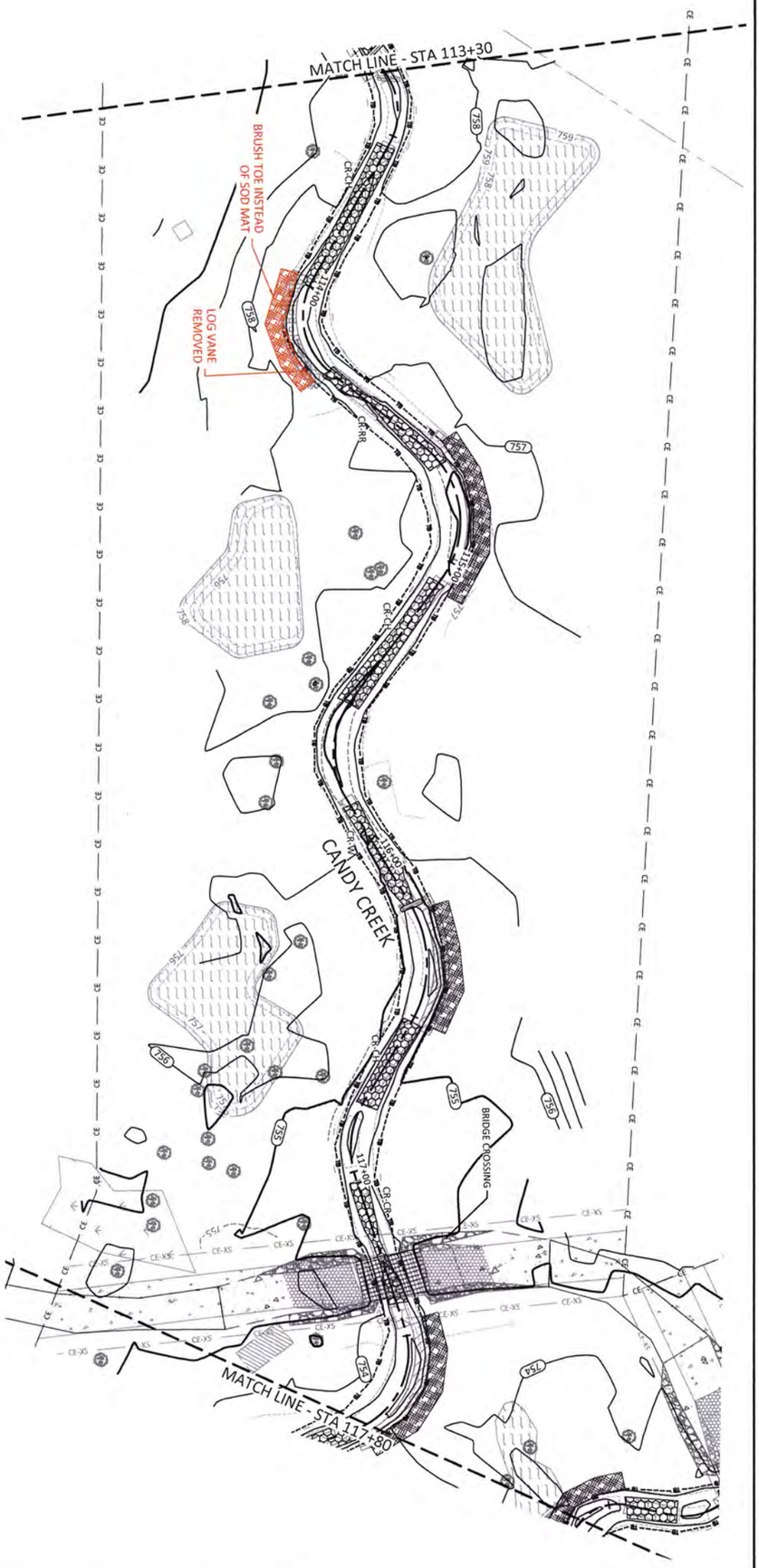

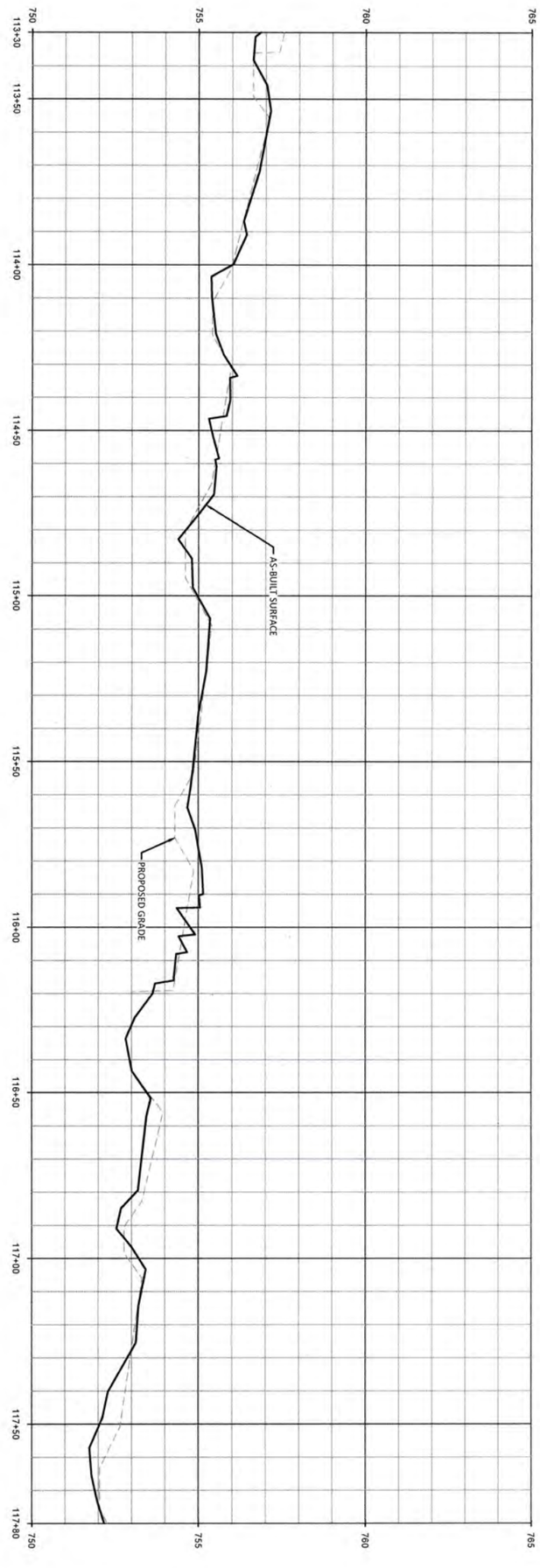

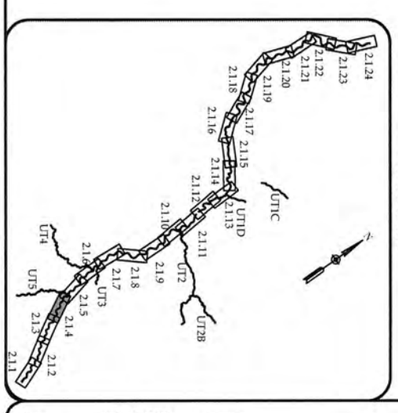

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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

Candy Creek Reach 1
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER AARON S. EARLEY
6-2-17

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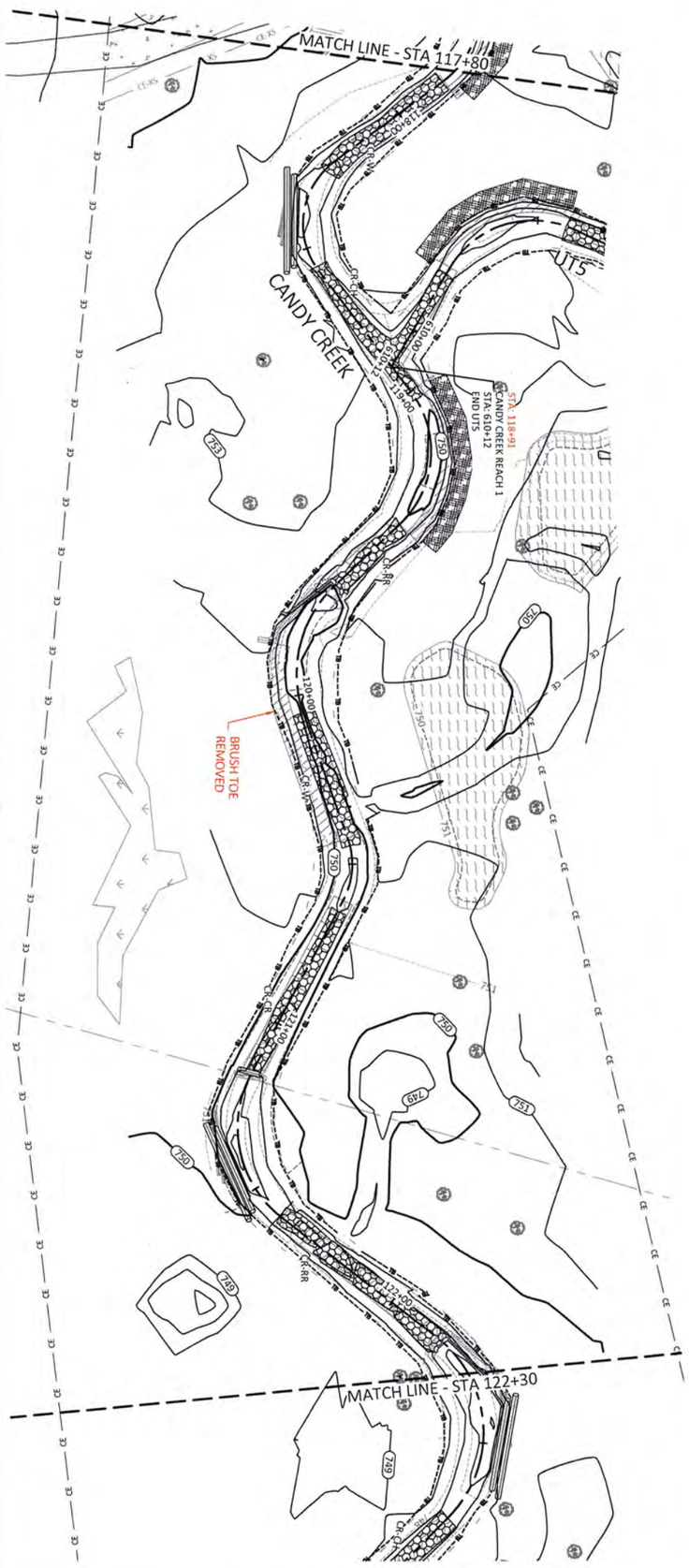
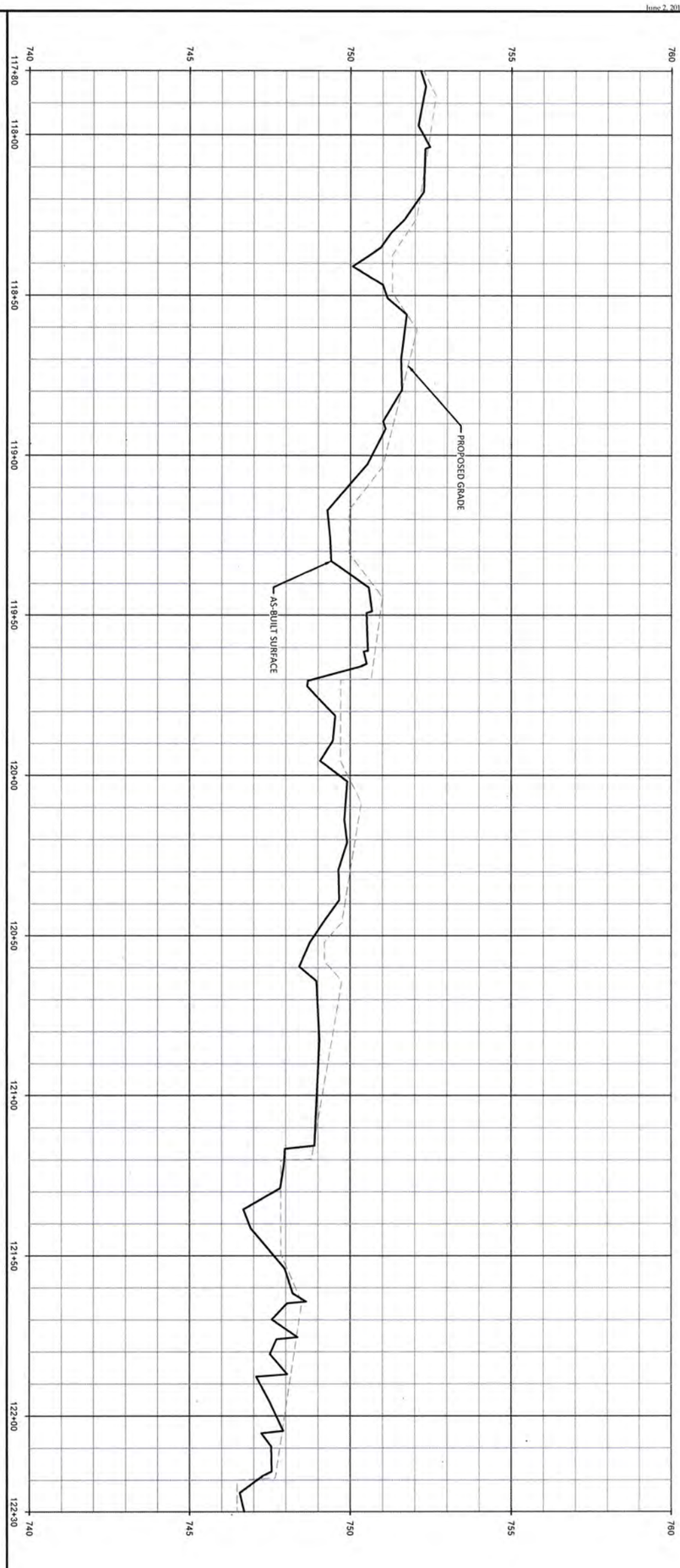
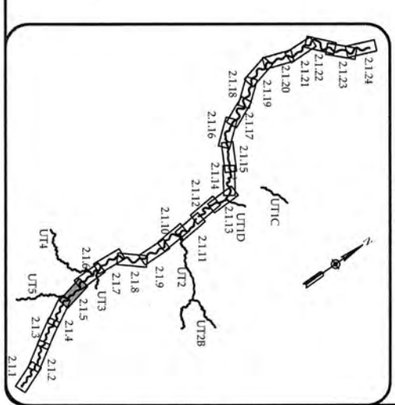
Charlotte, NC 28203
Tel: 704.332.7754
Fax: 704.332.3306
Firm License No. F-0831







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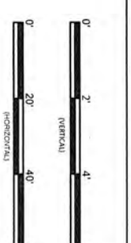

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Checked By:	JL

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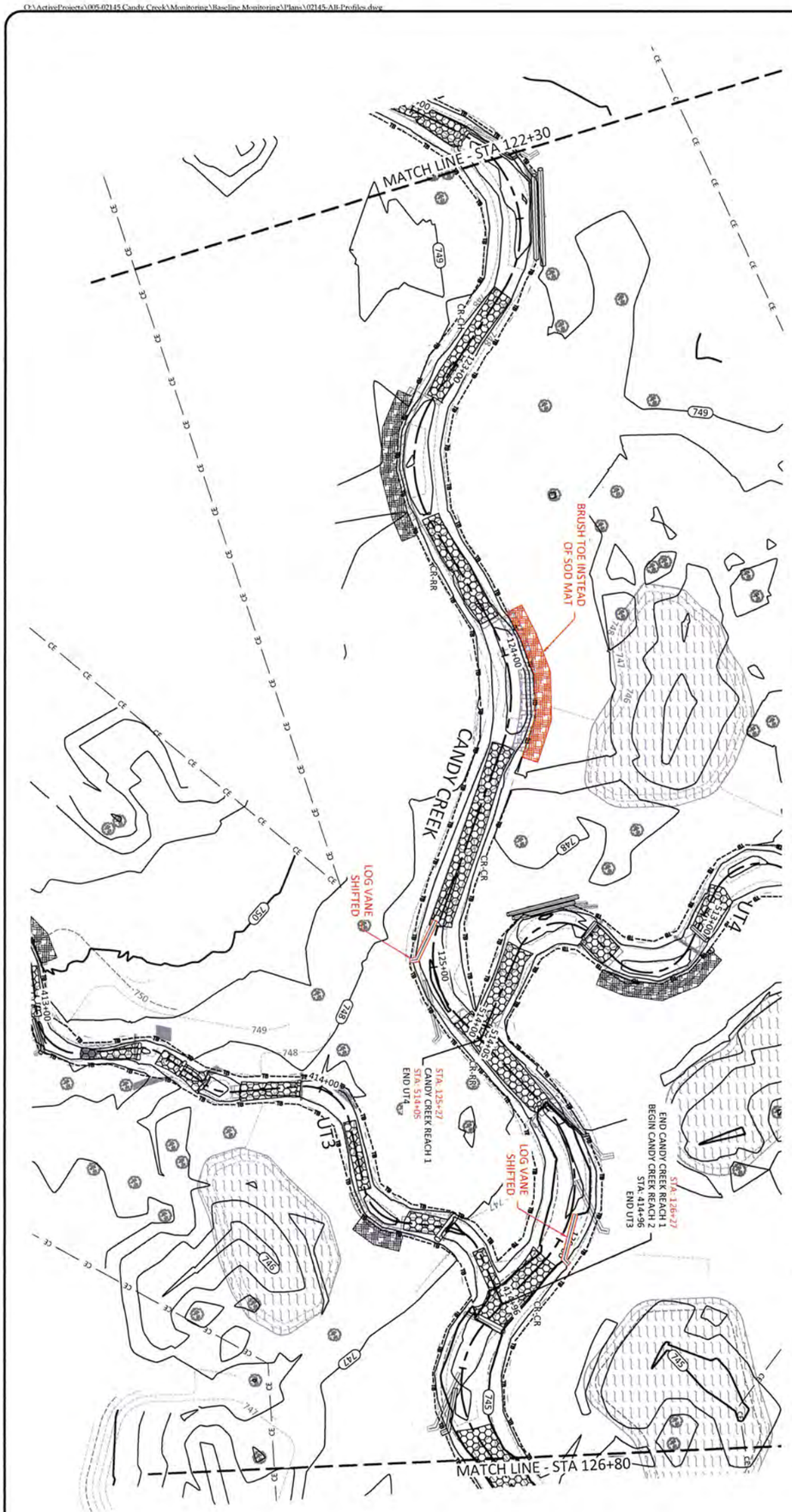
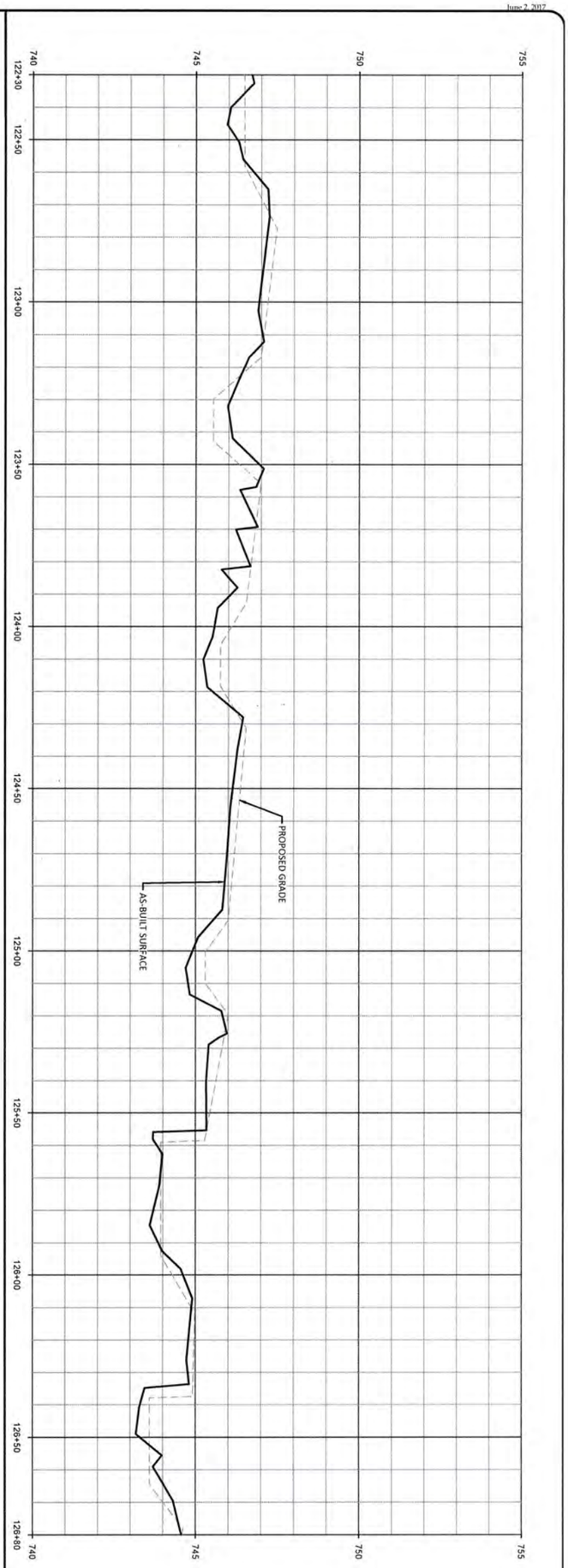
Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

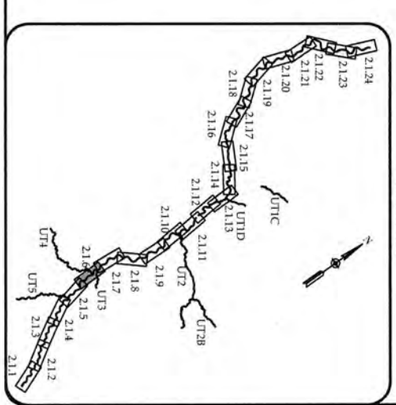
Candy Creek Reach 1
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER JAMES S. LEARLEY
6-2-17

WILDLANDS ENGINEERING
1430 S. Mint St, Suite 104
Charlotte, NC 28203
Tel: 704.332.7754
Fax: 704.332.3306
Firm License No. F-0831







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N

0' 20' 40' 60' (HORIZONTAL)

0' 2' 4' 6' (VERTICAL)

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Job Number:	005-02145
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Drawn By:	SJD
Checked By:	JL

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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

Candy Creek Reach 1 & 2
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER AARON S. EARLEY
6-2-17

WILDLANDS ENGINEERING
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Charlotte, NC 28203
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Fax: 704.332.3306
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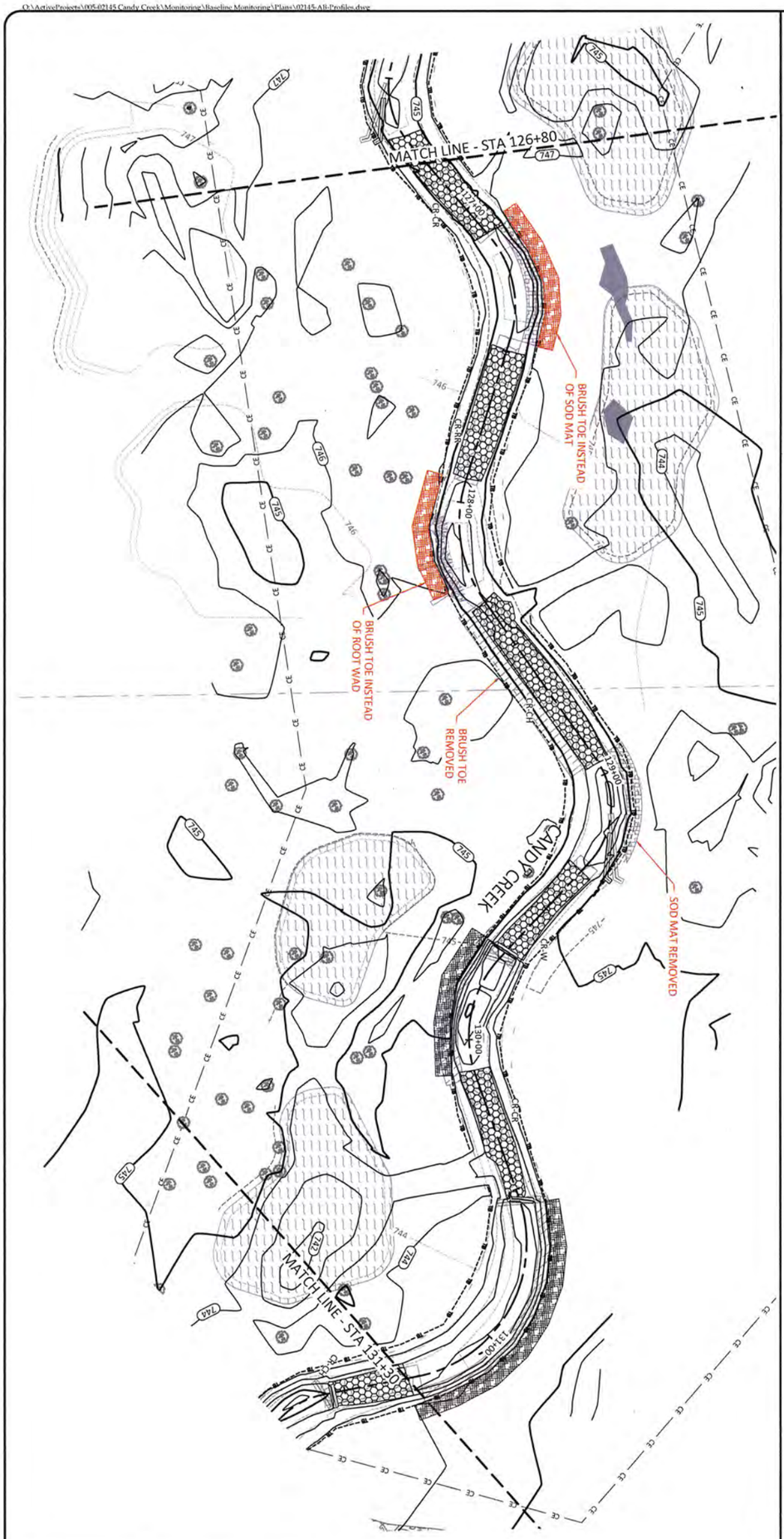

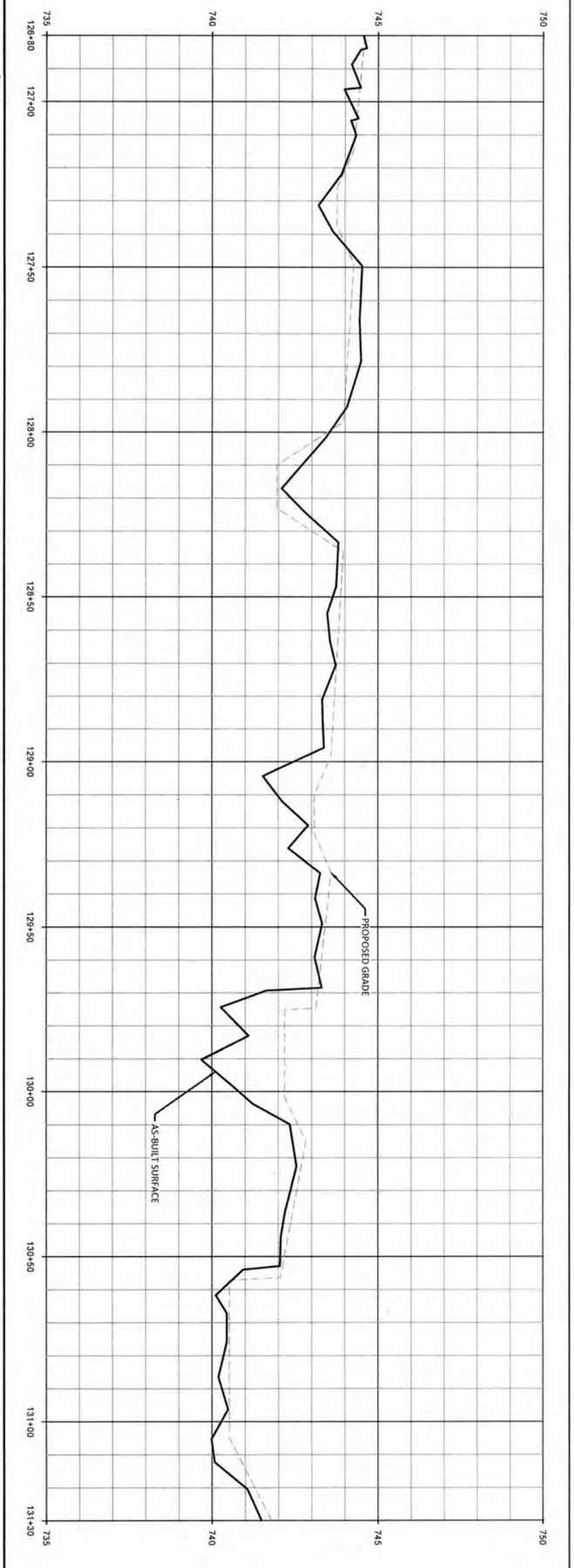

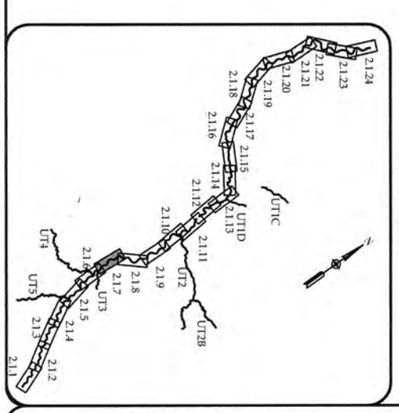

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N

0' 20' 40' 80' (HORIZONTAL)

0' 2' 4' 6' (VERTICAL)

Date:	May 30, 2017
Job Number:	005-02145
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Checked By:	JL

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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

Candy Creek Reach 2
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER AARON S. EARLEY

6-2-17

WILDLANDS ENGINEERING
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Charlotte, NC 28203
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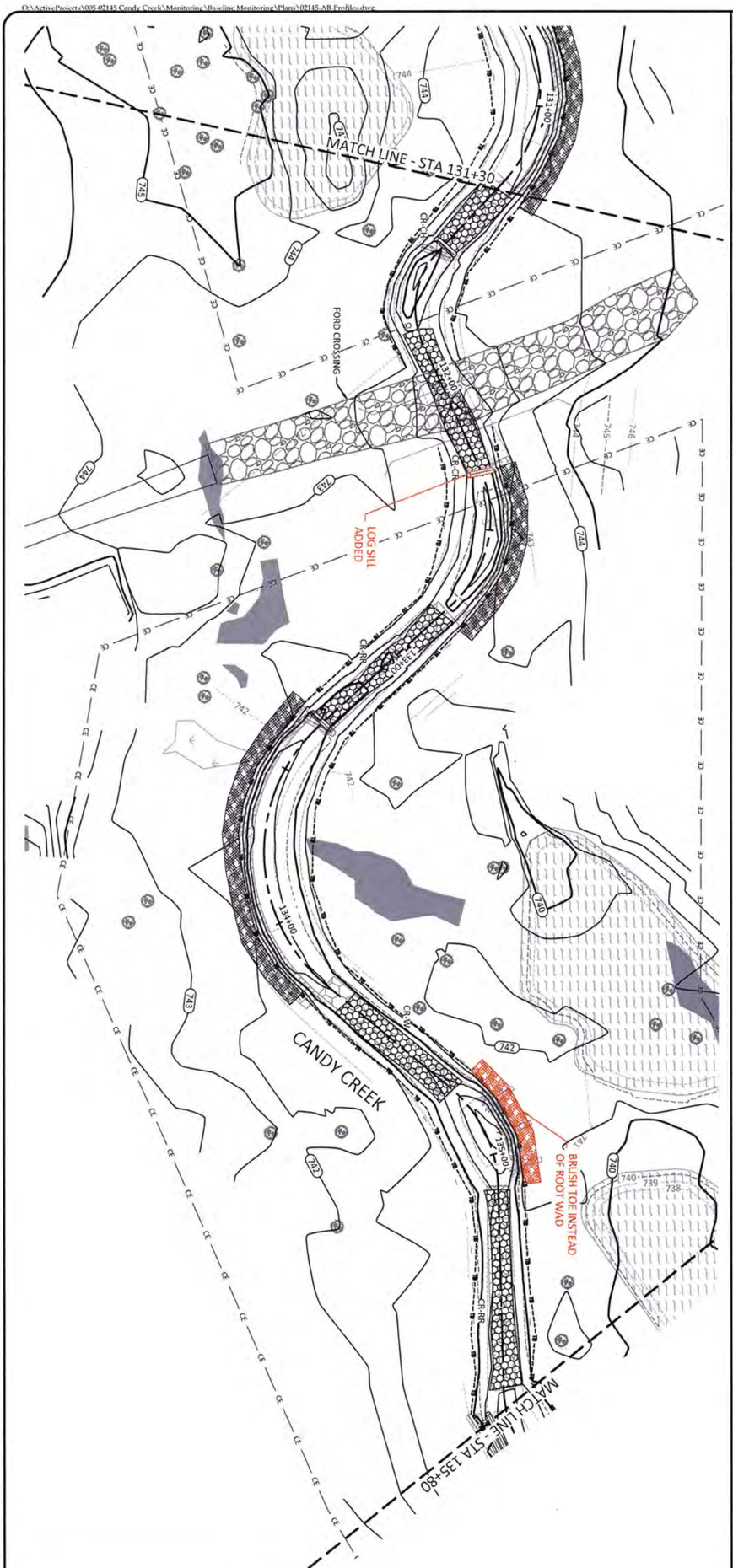
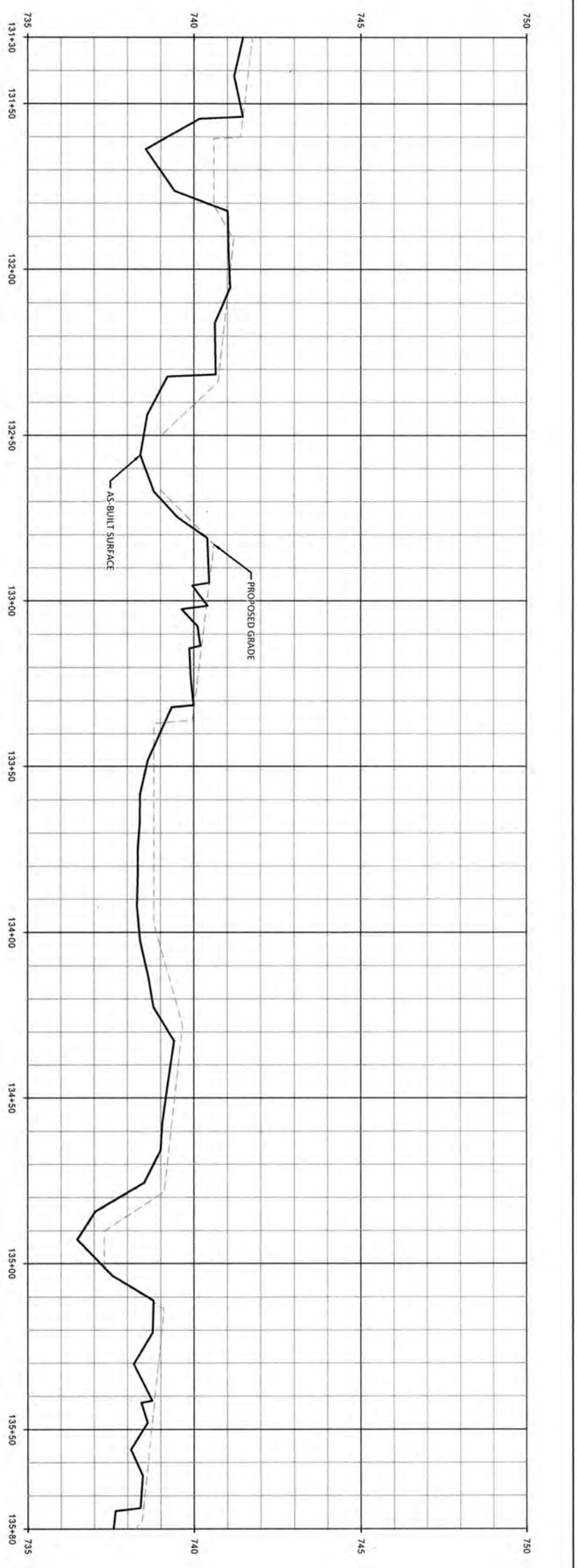
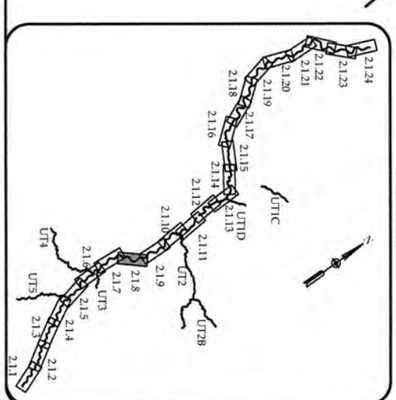
Fax: 704.332.3306
Firm License No. F-0831







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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

Candy Creek Reach 2
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER JASON S. EARLEY
6-2-17

WILDLANDS ENGINEERING
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Charlotte, NC 28203
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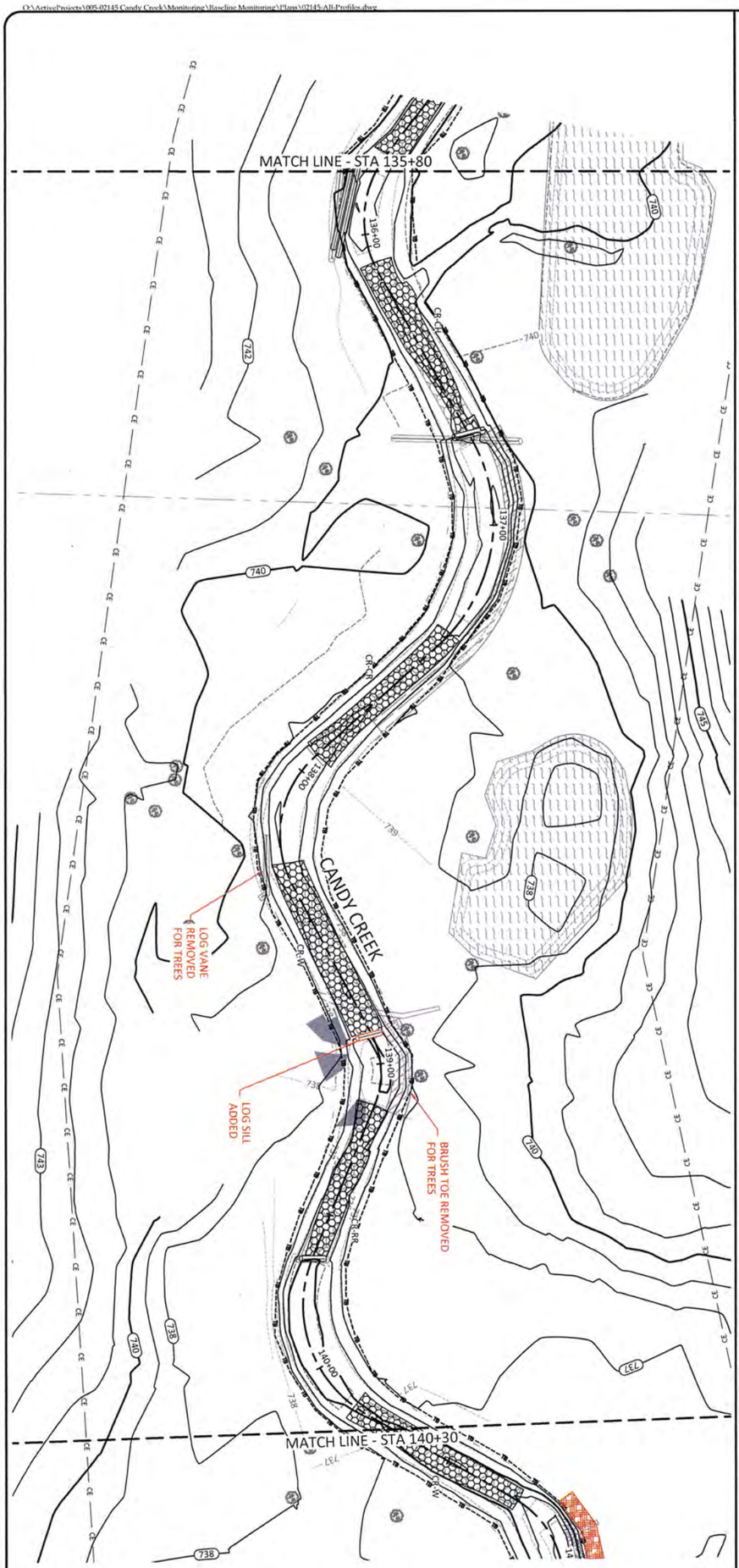
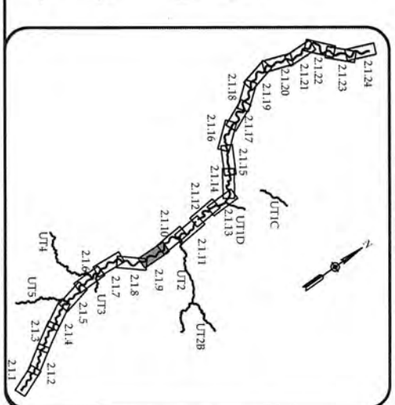
Fax: 704.332.3306
Firm License No. F-0831





Date:	May 30, 2017
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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

Candy Creek Reach 2
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL SEAL 023340 ENGINEER AARON S. EARLEY
6-2-17

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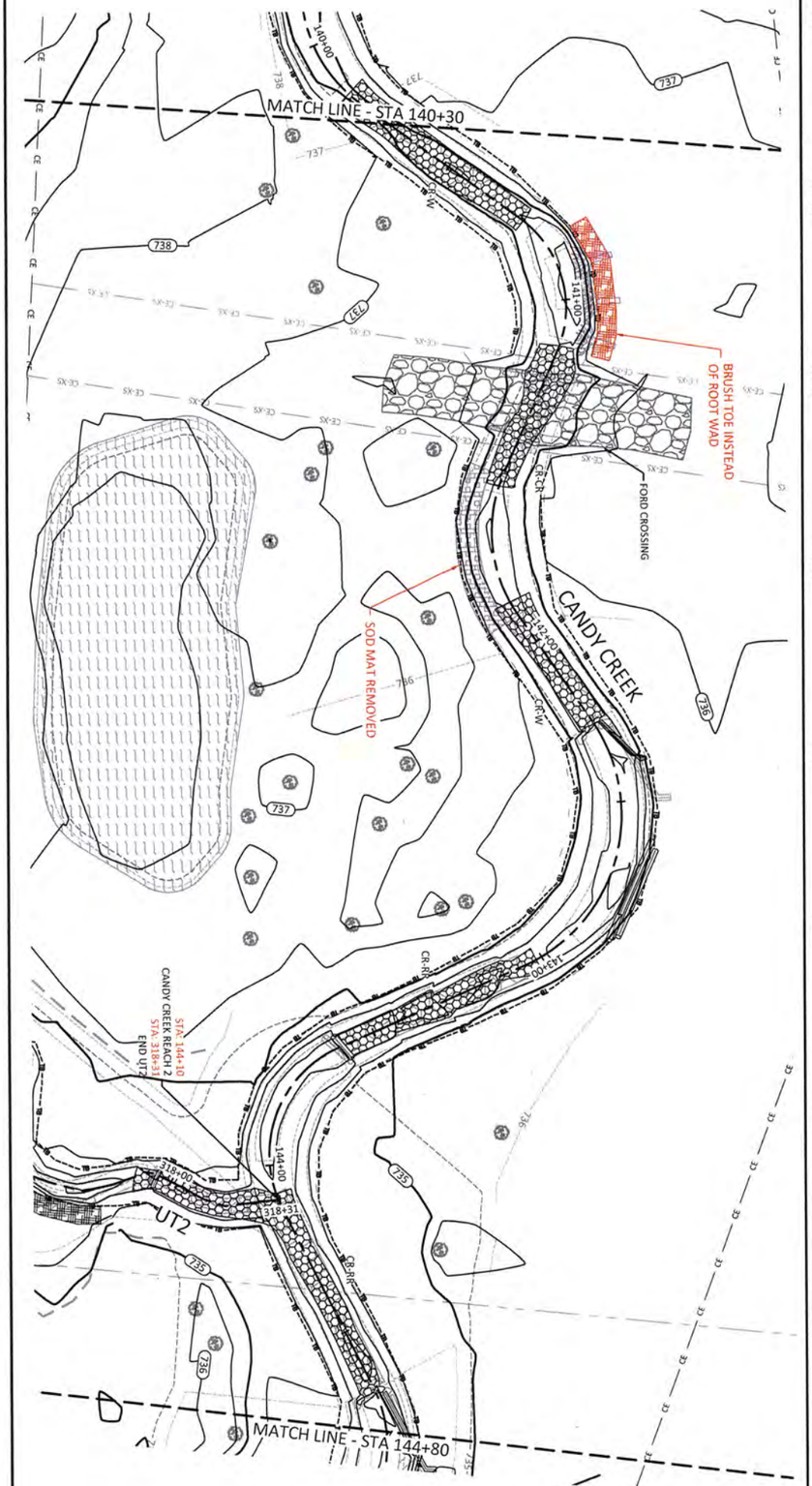

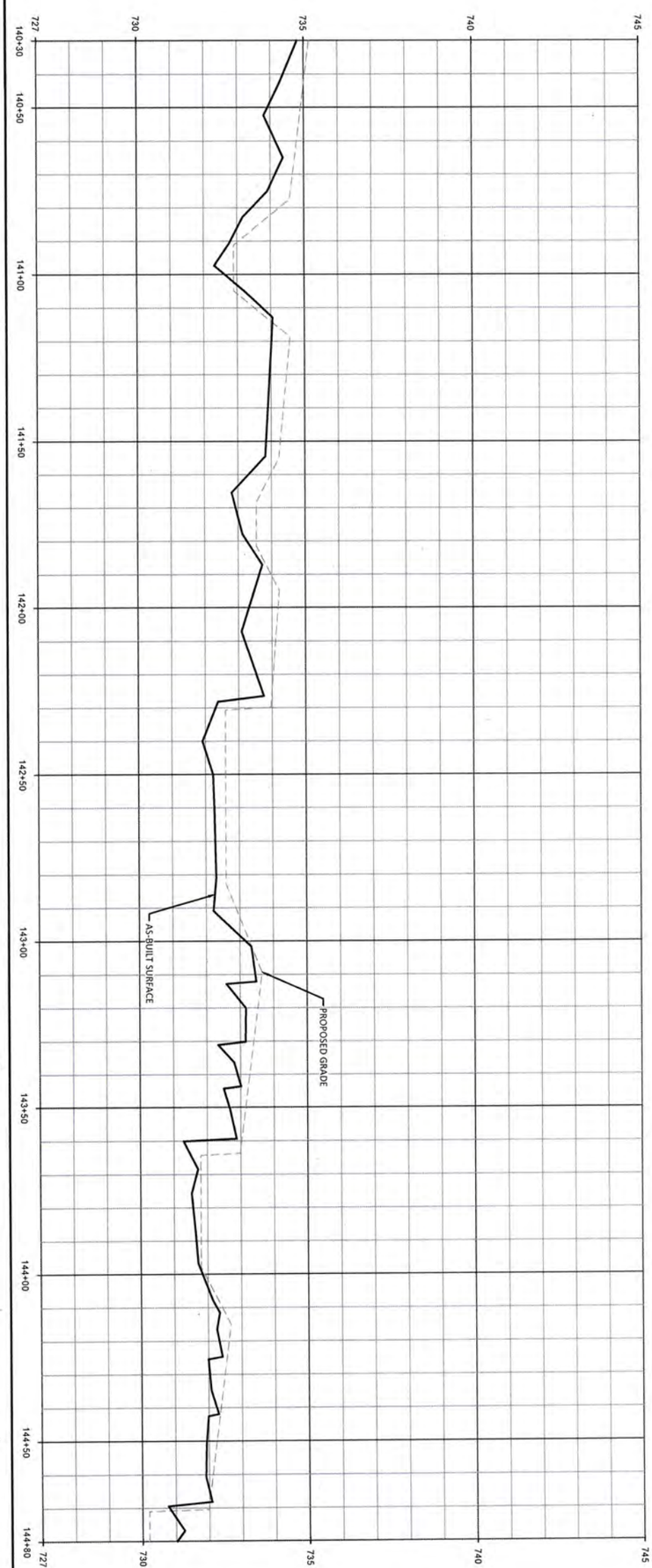

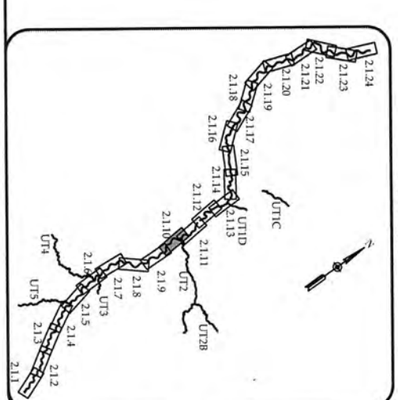

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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

Candy Creek Reach 2
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER AARON S. EARLEY
6-2-17

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Charlotte, NC 28203
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Fax: 704.332.3306
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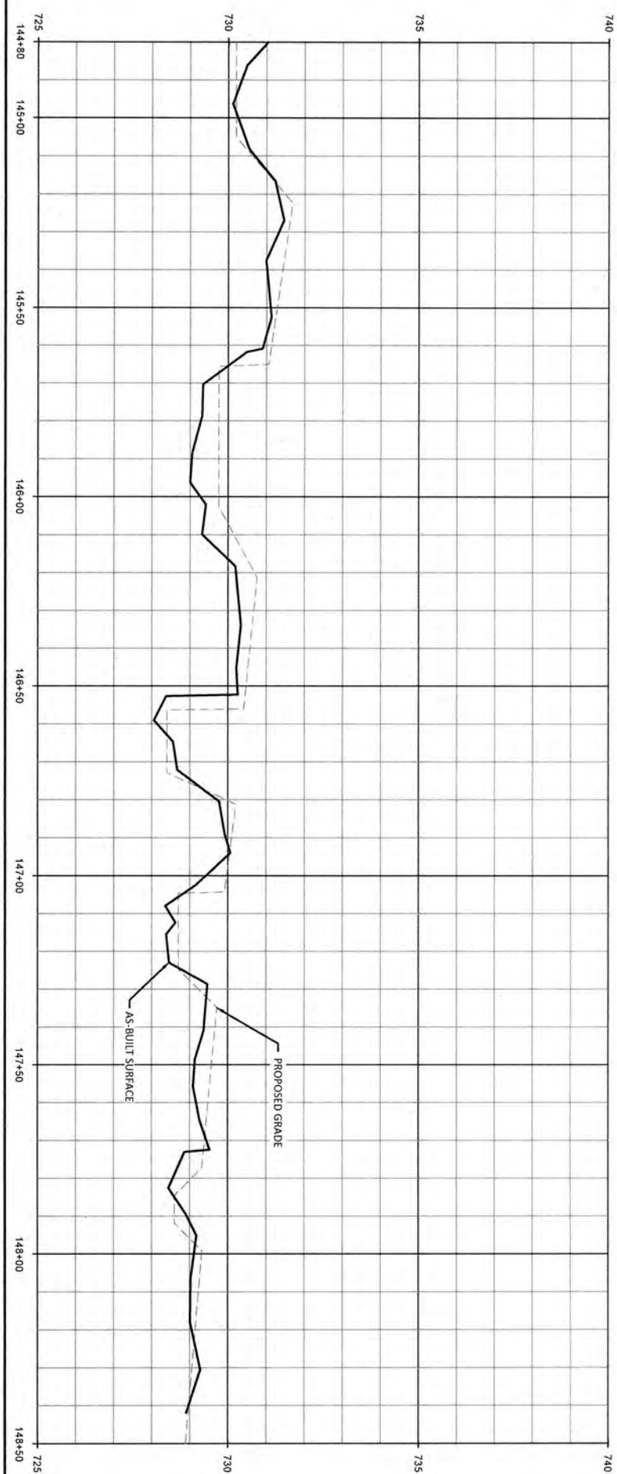

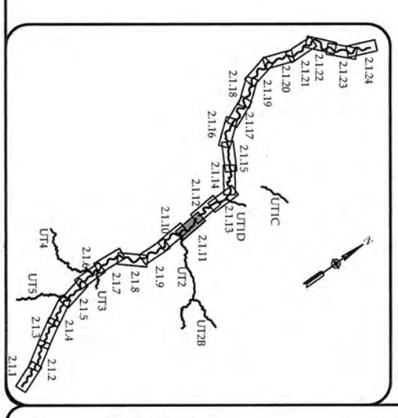

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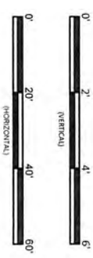

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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

Candy Creek Reach 2 & Reach 3
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER AARON S. EARLEY
6-2-17

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Fax: 704.332.3306
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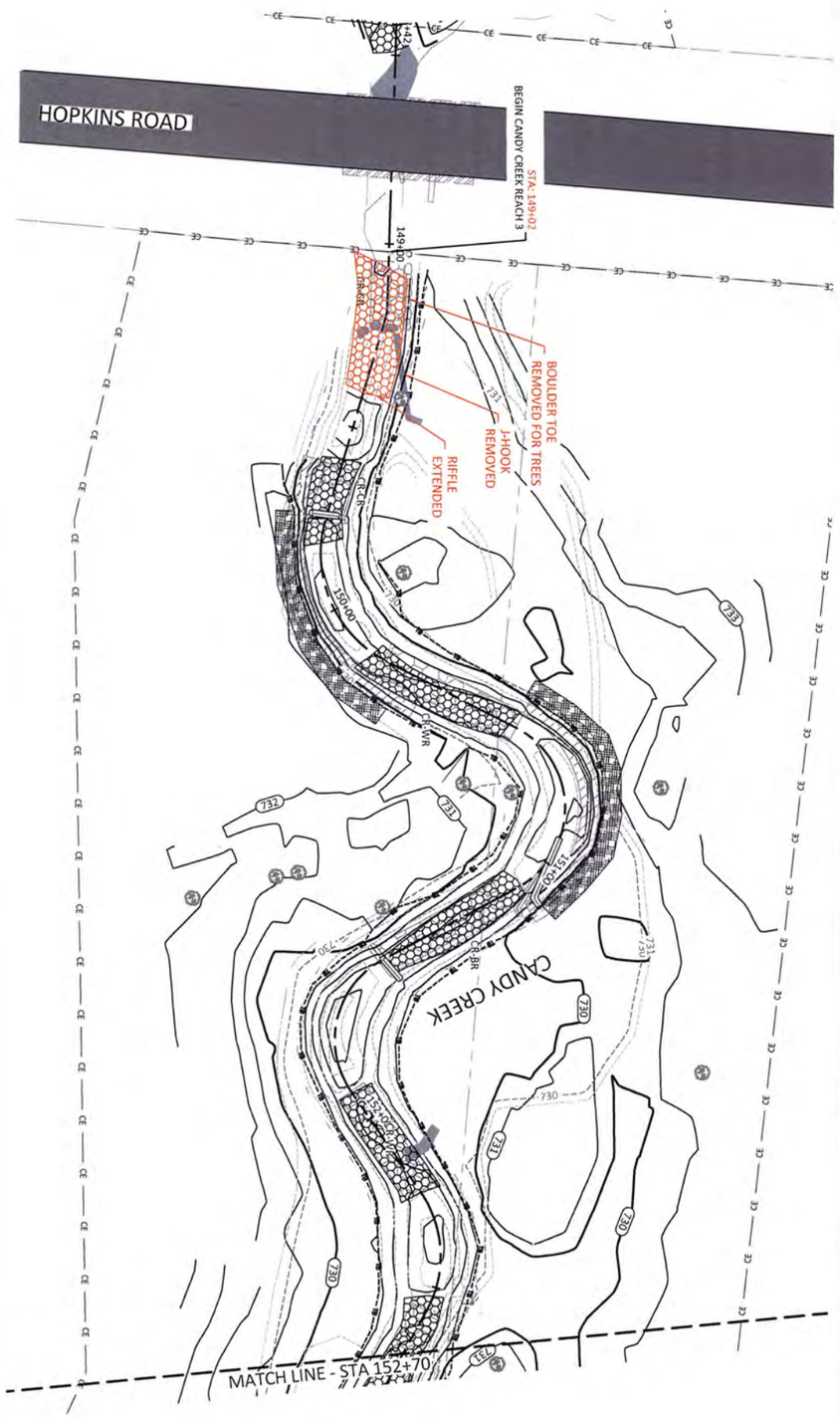

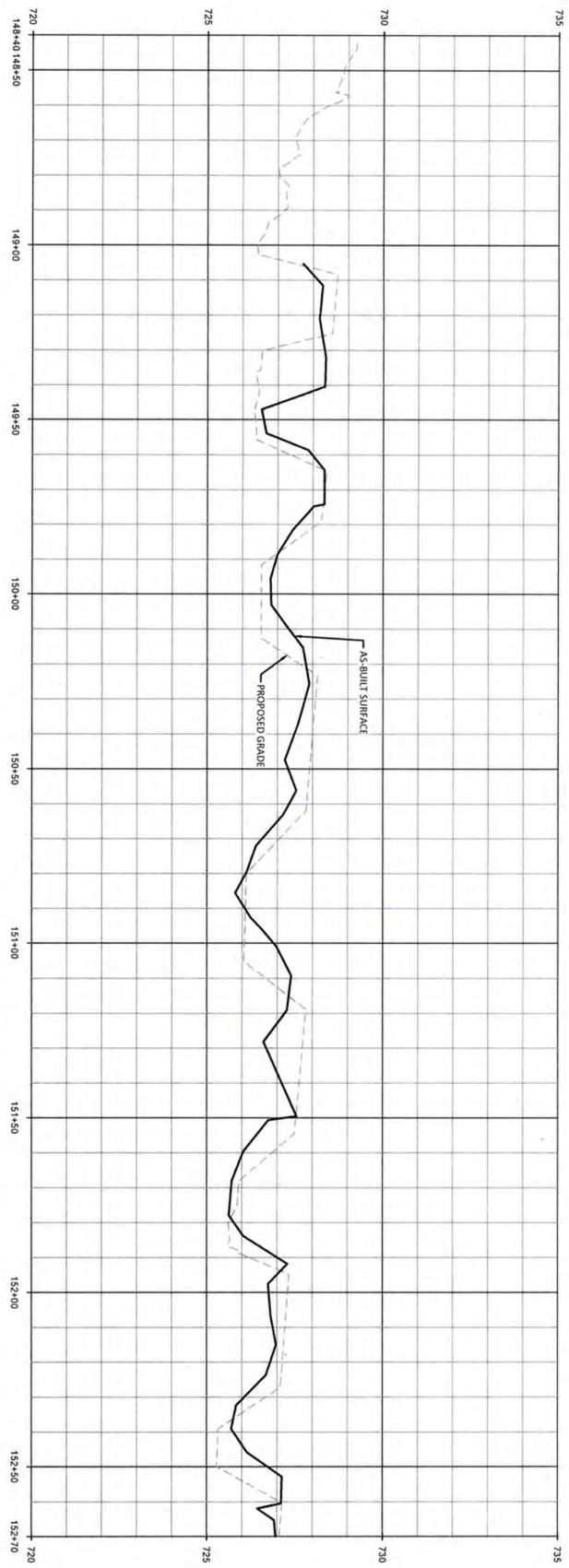

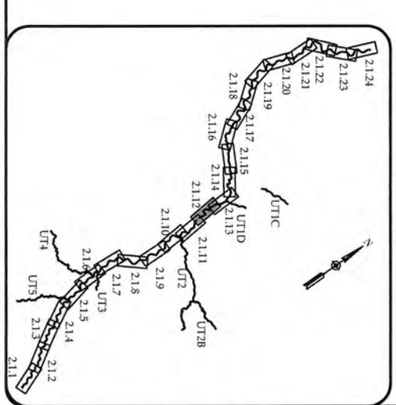

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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

Candy Creek Reach 3
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER AARON S. EARLEY
6-2-17

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Charlotte, NC 28203
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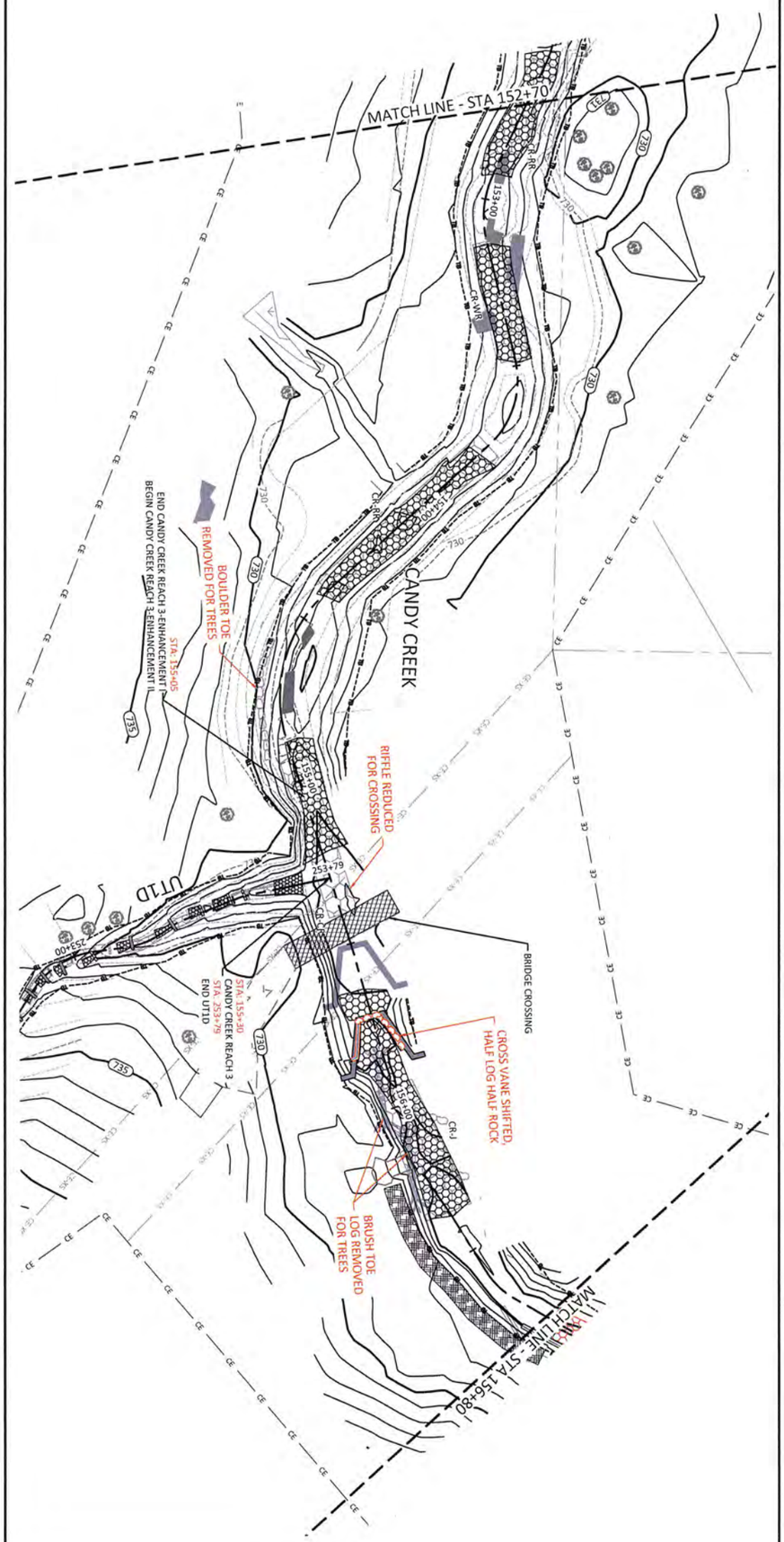

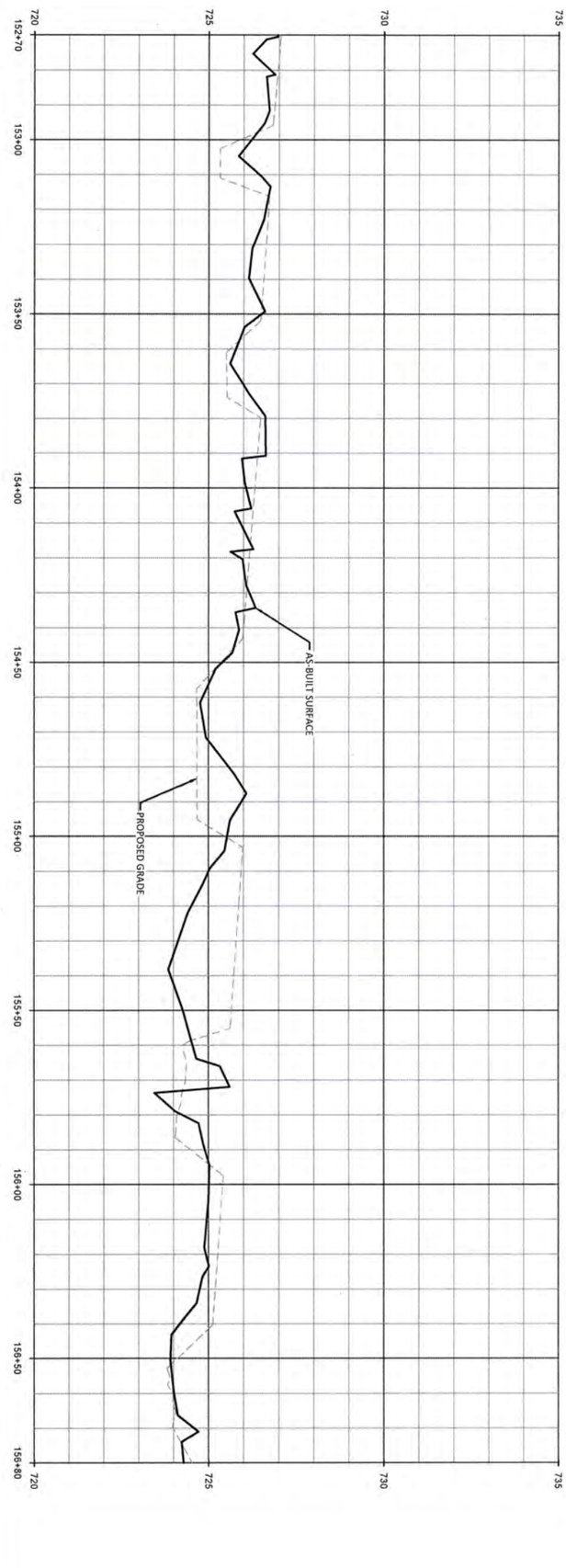

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N

0' 20' 40' 60' (HORIZONTAL)

0' 2' 4' 6' (VERTICAL)

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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

Candy Creek Reach 3
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER AARON S. EARLEY
6-2-17

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ENGINEERING
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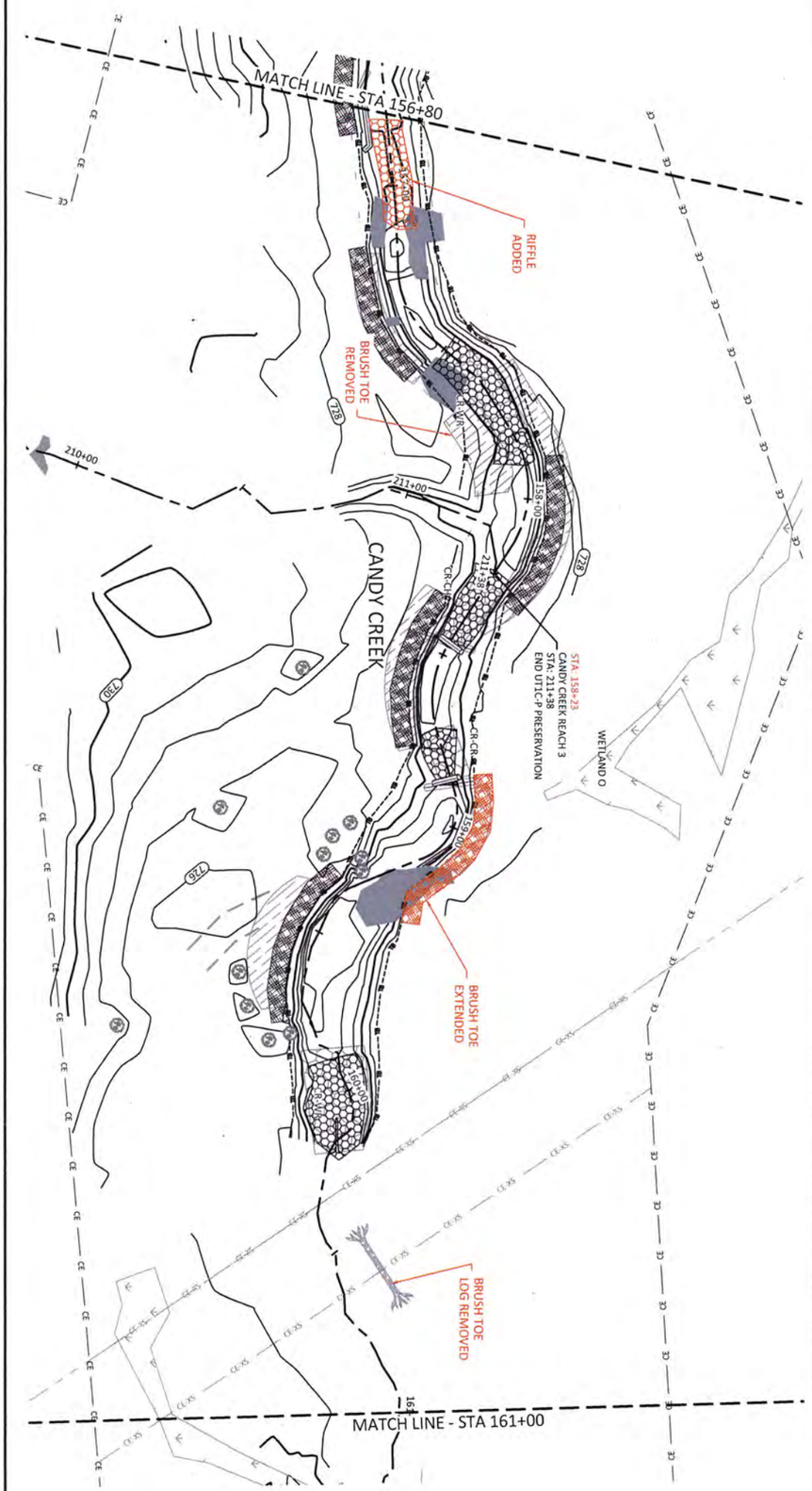
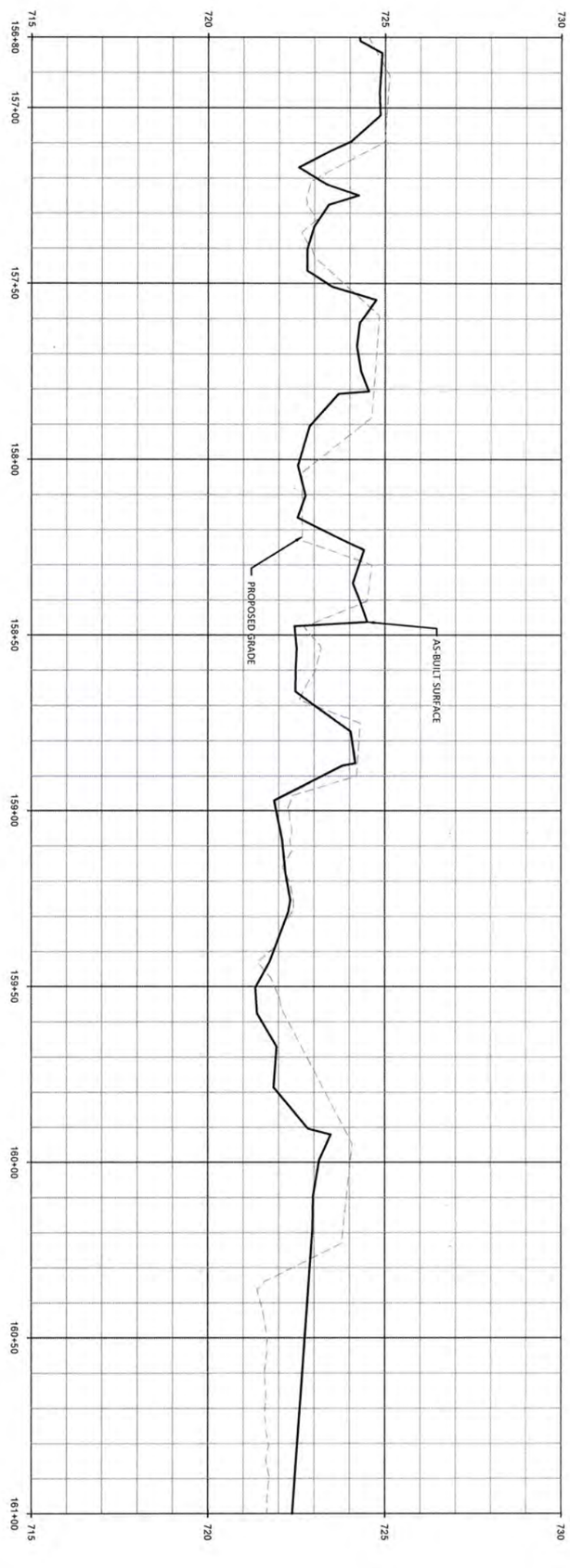
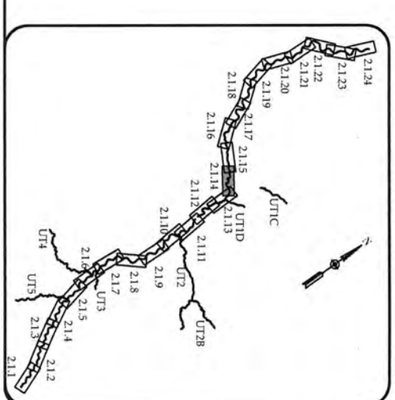
Charlotte, NC 28203
Tel: 704.332.7754
Fax: 704.332.3306
Firm License No. F-0831







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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

Candy Creek Reach 3
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER AARON EARLEY
6-2-17

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Charlotte, NC 28203
Tel: 704.332.7754
Fax: 704.332.3306
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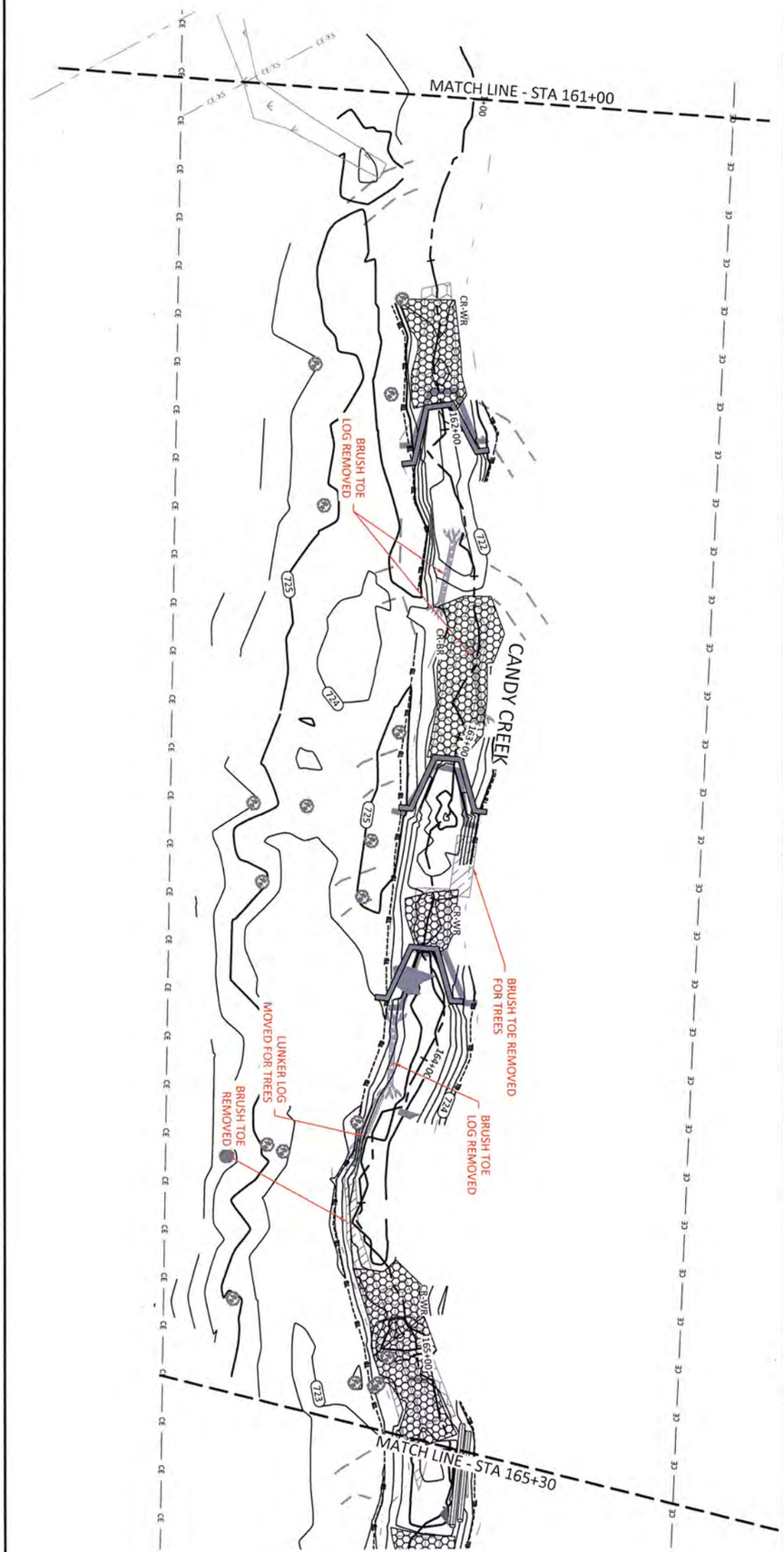

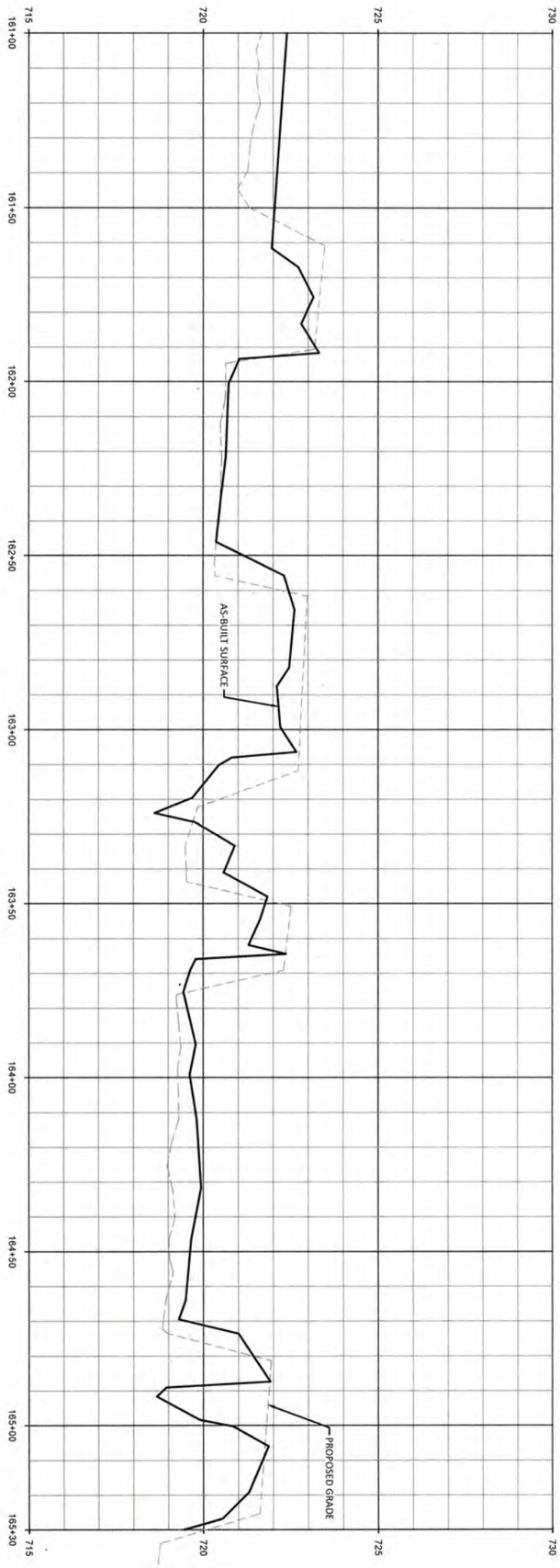

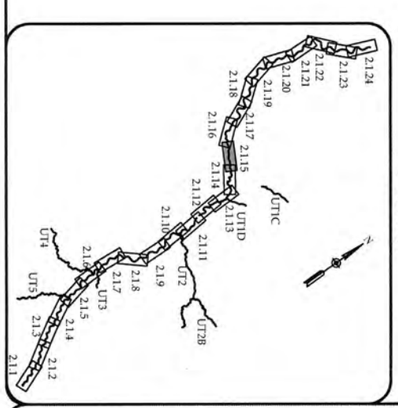

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Job Number:	005-02145
Project Engineer:	ASE
Drawn By:	SJD
Checked By:	JL

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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

Candy Creek Reach 3
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER AARON S. EARLEY
6-27-17

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Charlotte, NC 28203
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Fax: 704.332.3306
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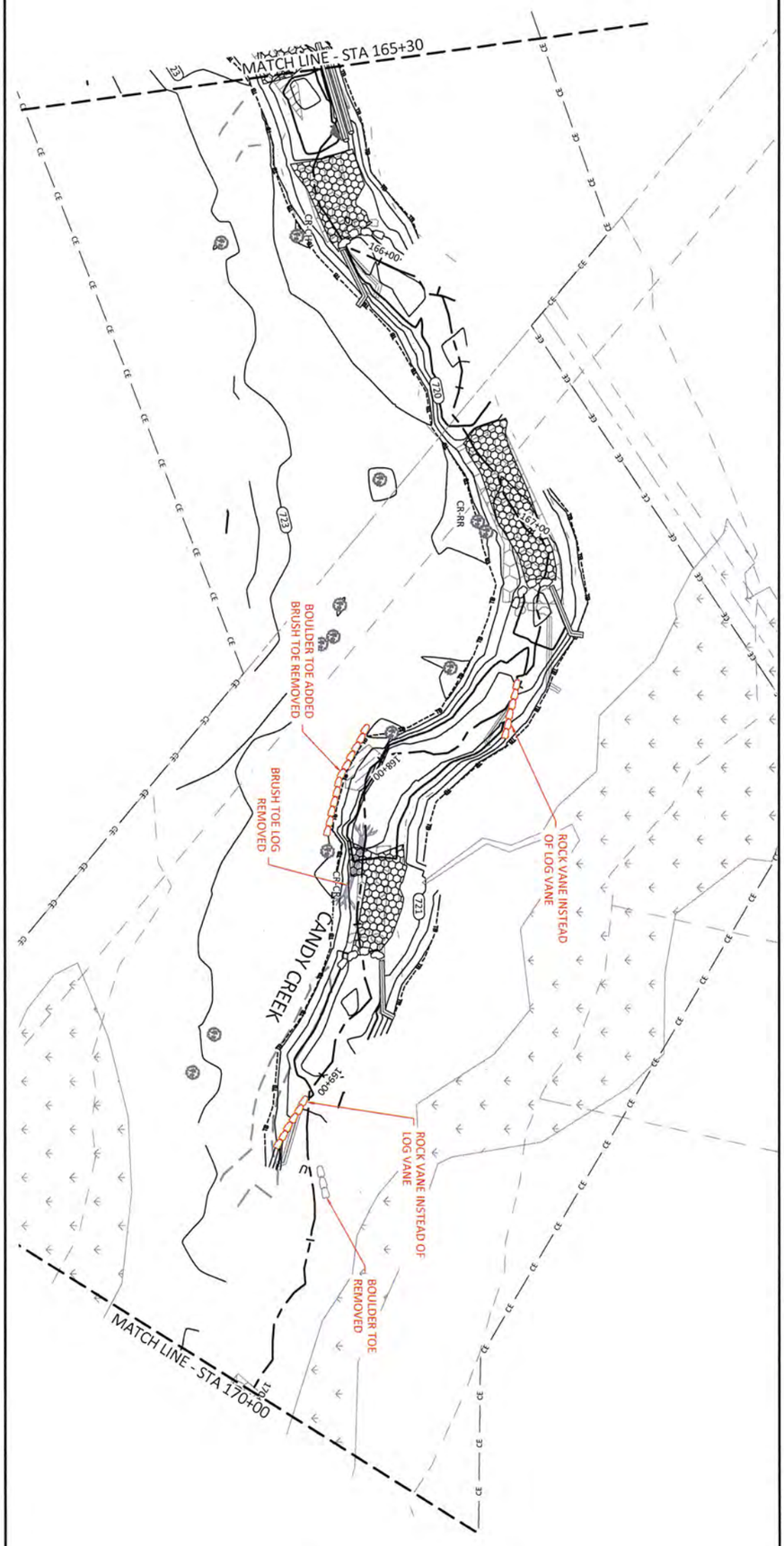

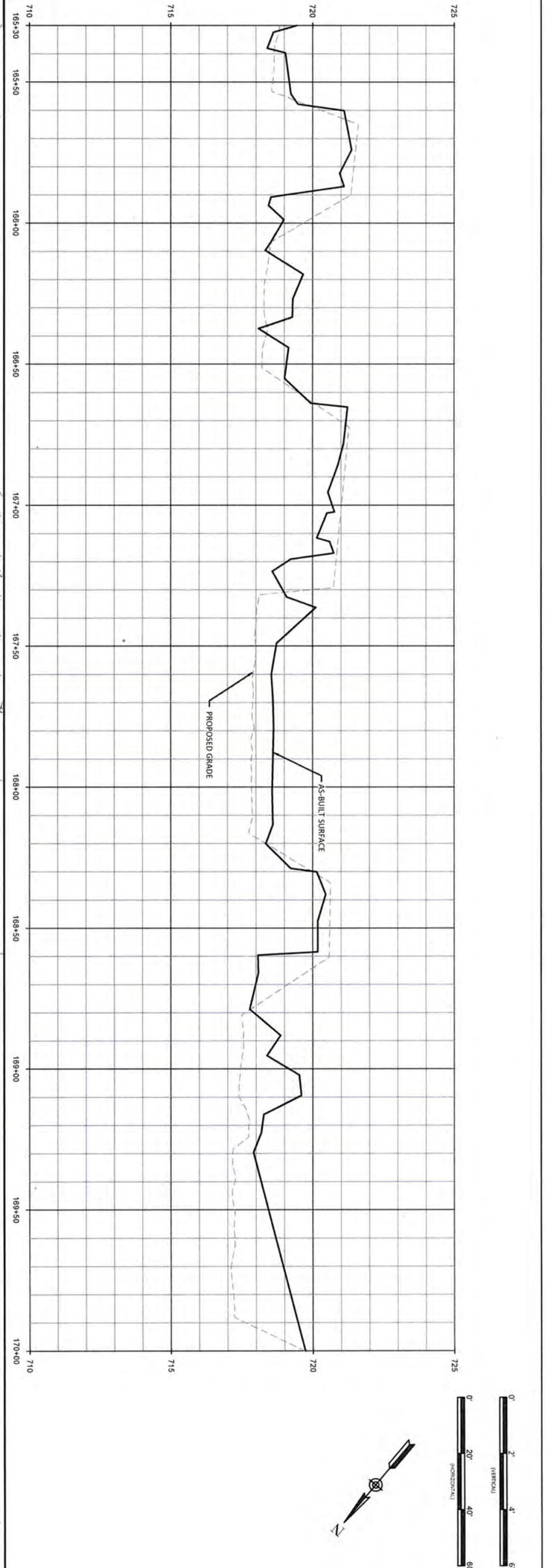

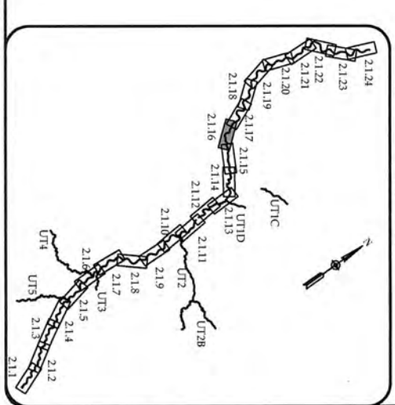

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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

Candy Creek Reach 3
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER AARON S. EARLEY
6-2-17

WILDLANDS ENGINEERING
1430 S. Mint St, Suite 104
Charlotte, NC 28203
Tel: 704.332.7754
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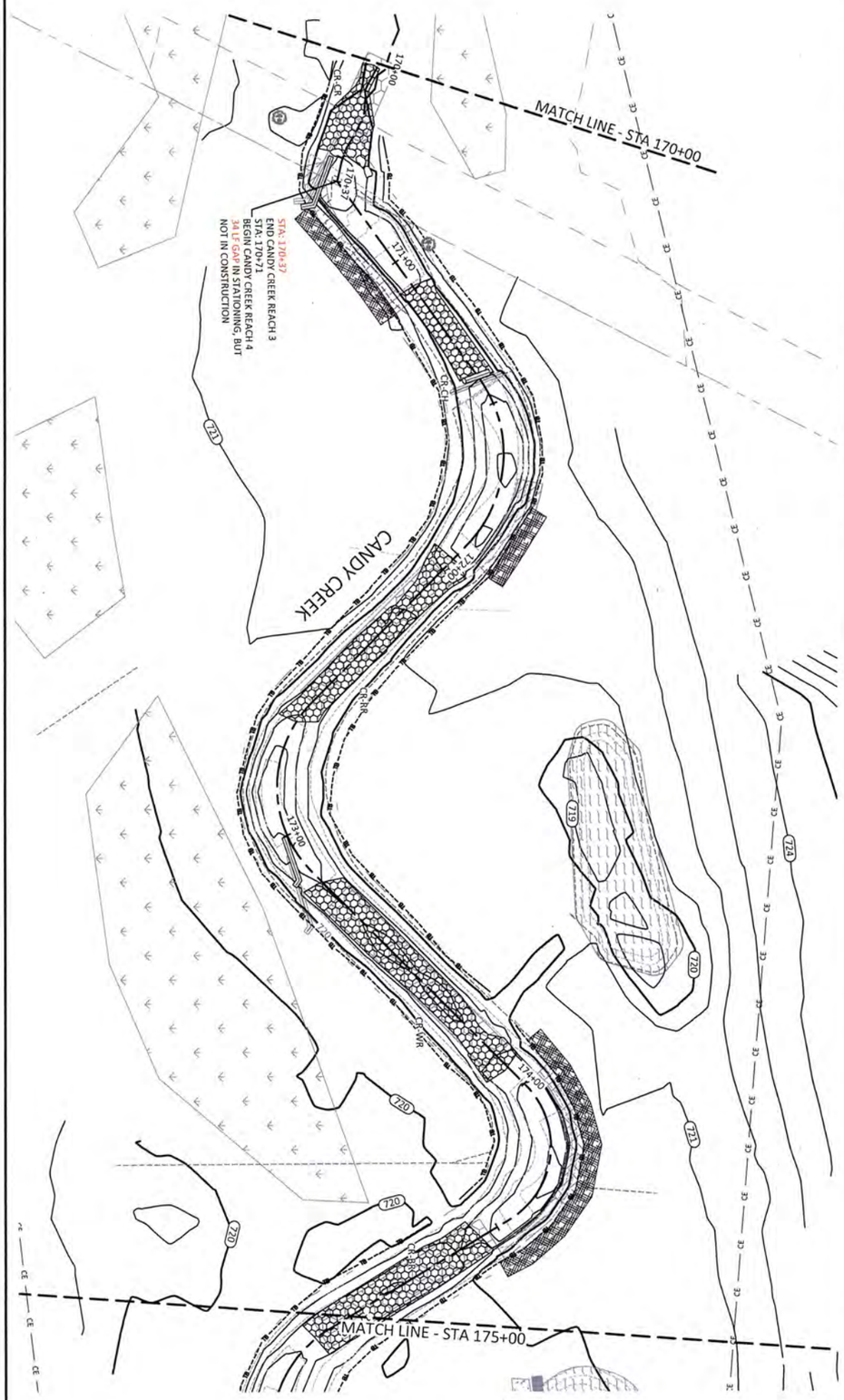

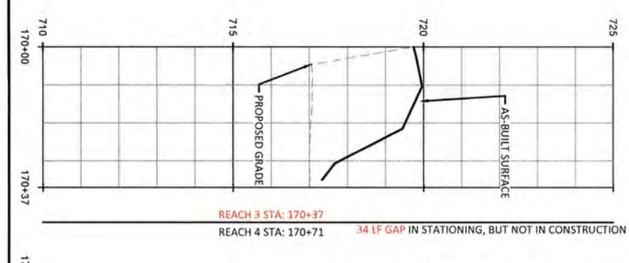

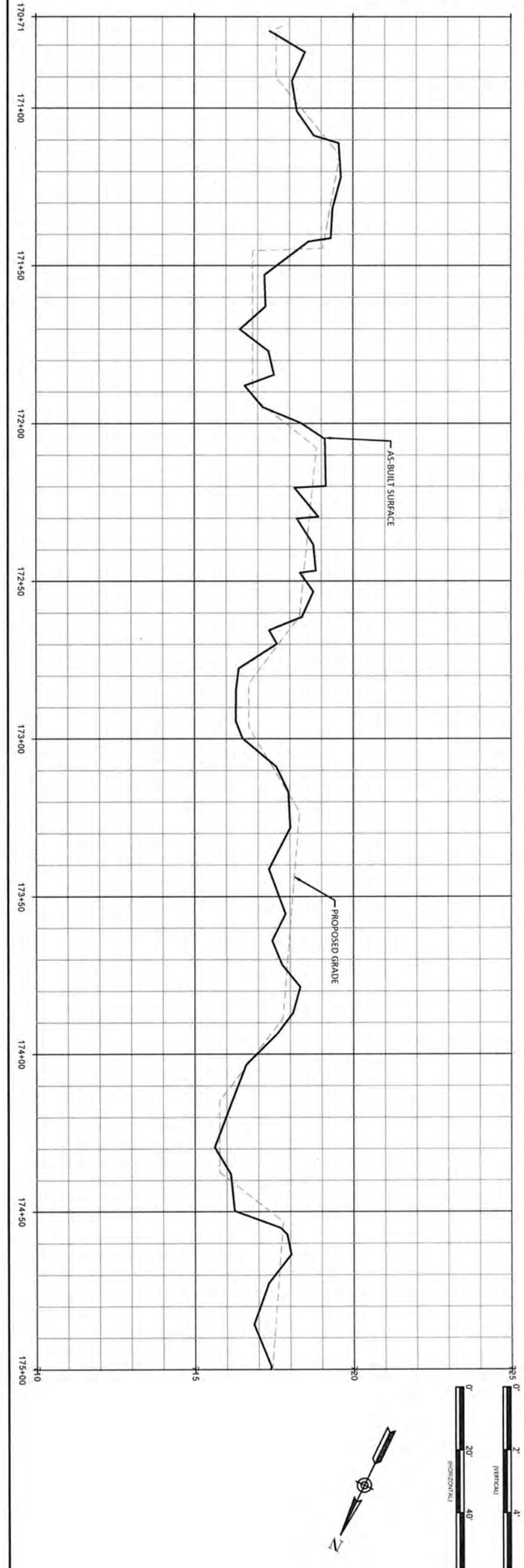

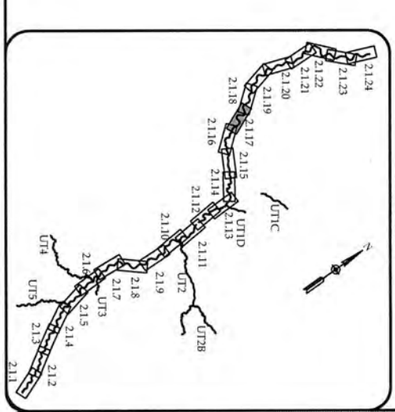

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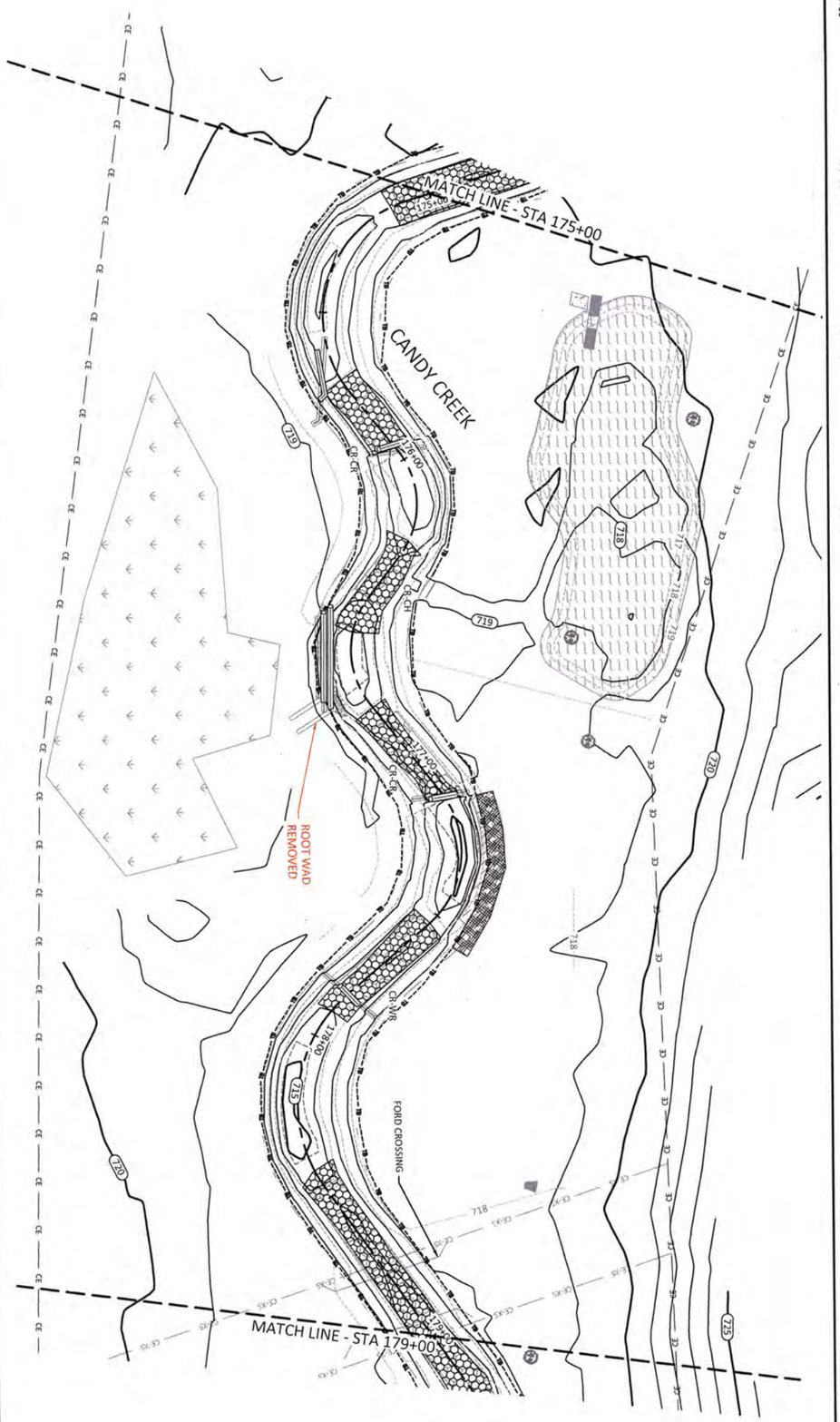
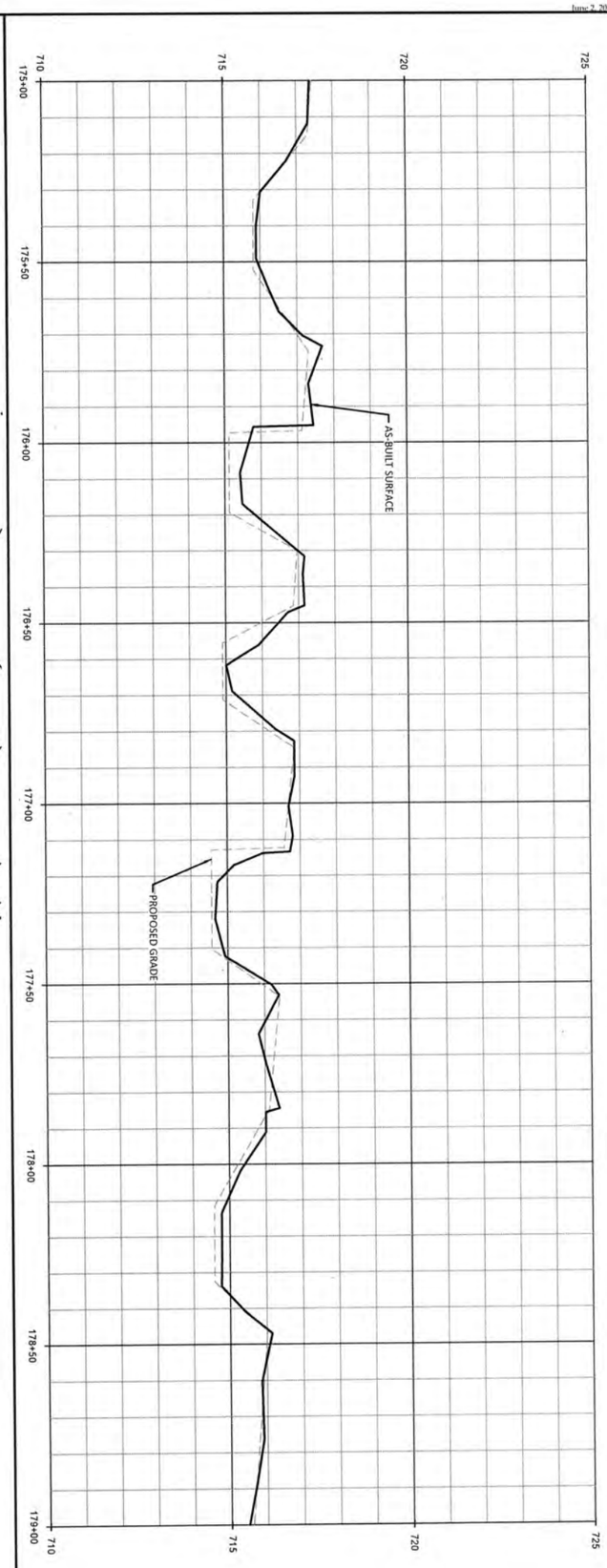
Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

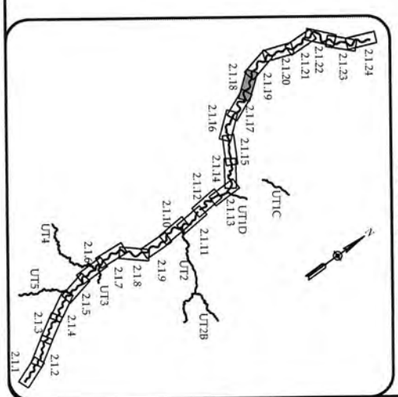
Candy Creek Reach 3 & 4
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 029340 AARON S. EARLEY
6-2-17

WILDLANDS ENGINEERING
1430 S. Mint St, Suite 104
Charlotte, NC 28203
Tel: 704.332.7754
Fax: 704.332.3306
Firm License No. F-0831







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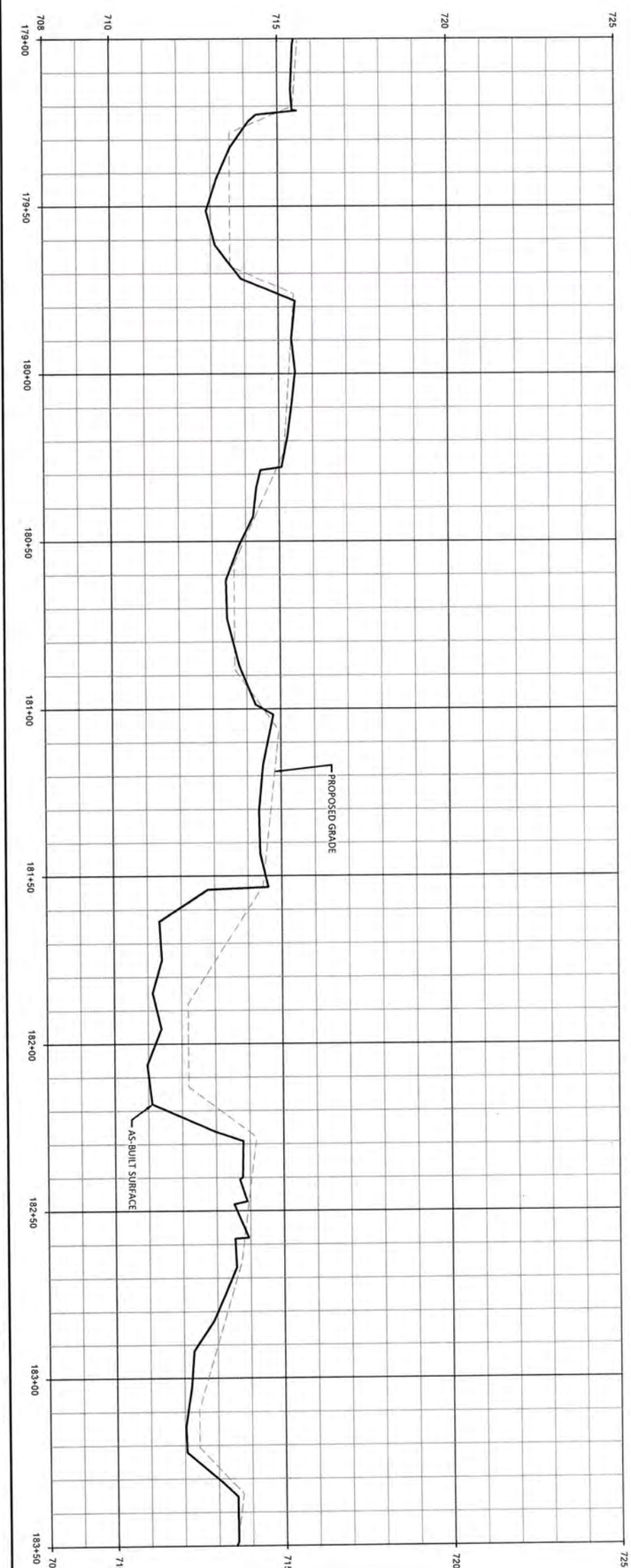
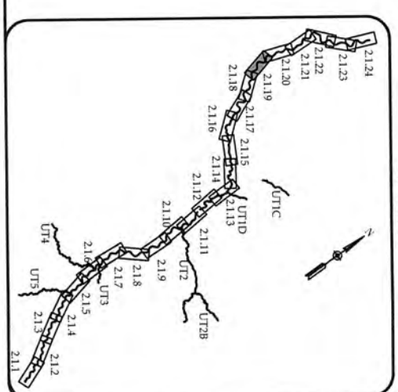
Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

Candy Creek Reach 4
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER JASON S. EARLEY
6-2-17

WILDLANDS ENGINEERING
1430 S. Mint St, Suite 104
Charlotte, NC 28203
Tel: 704.332.7754
Fax: 704.332.3306
Firm License No. F-0831





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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

Candy Creek Reach 4
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER AARON S. EARLEY
6-2-17

WILDLANDS ENGINEERING
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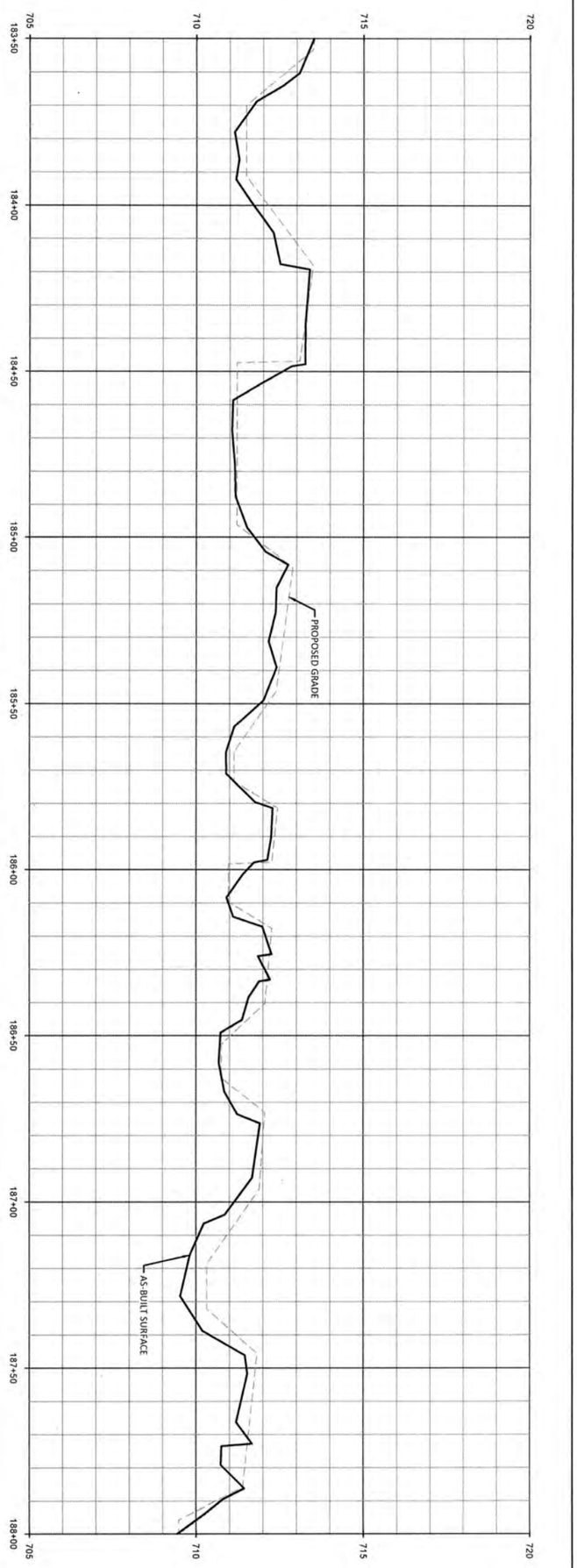
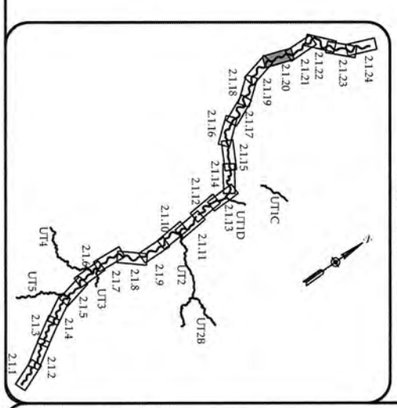
Charlotte, NC 28203
Tel: 704.332.7754
Fax: 704.332.3306
Firm License No. F-0831





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Candy Creek Mitigation Site-Record Drawings
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Candy Creek Reach 4
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER AARON S. EARLE
6-2-17

WILDLANDS ENGINEERING
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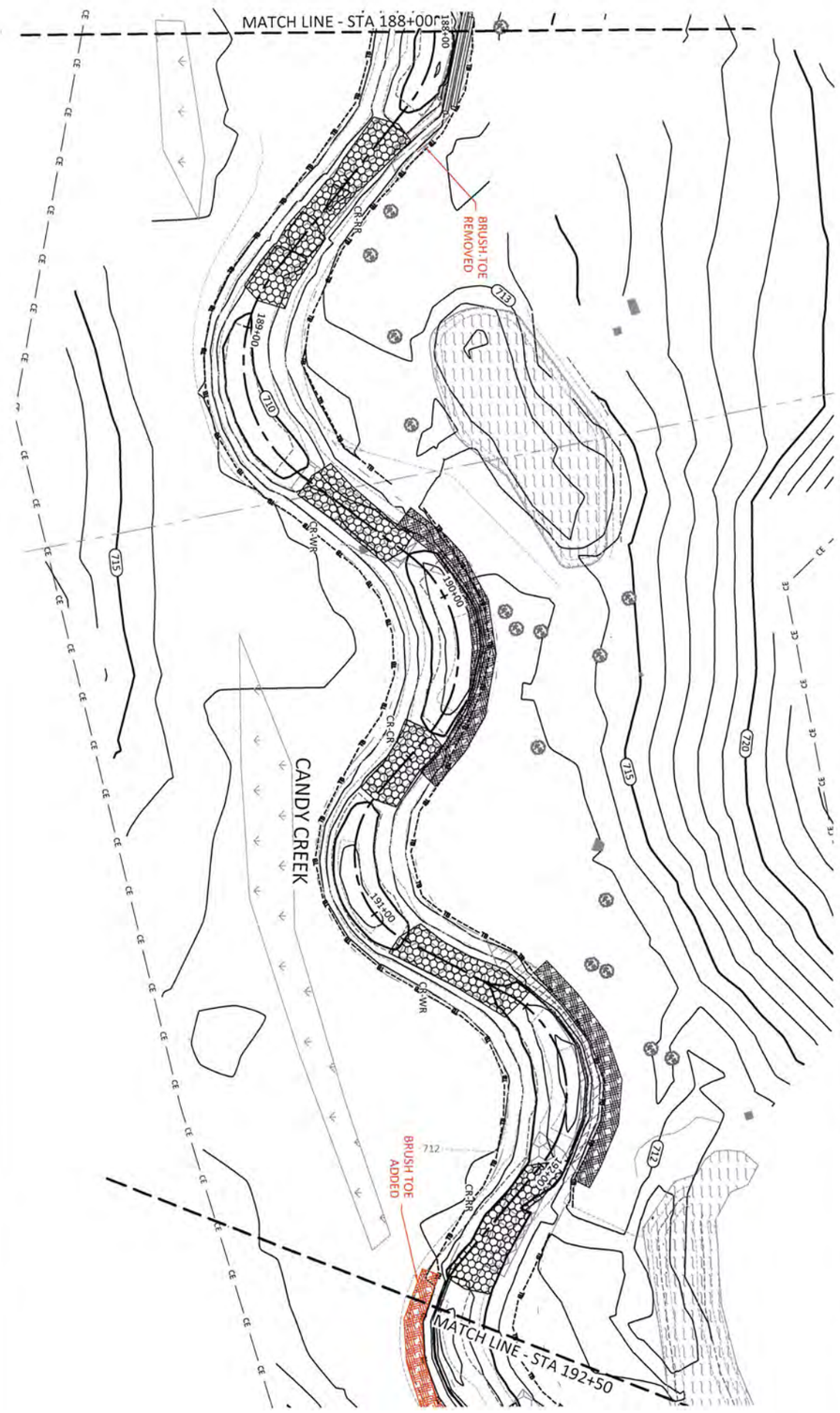
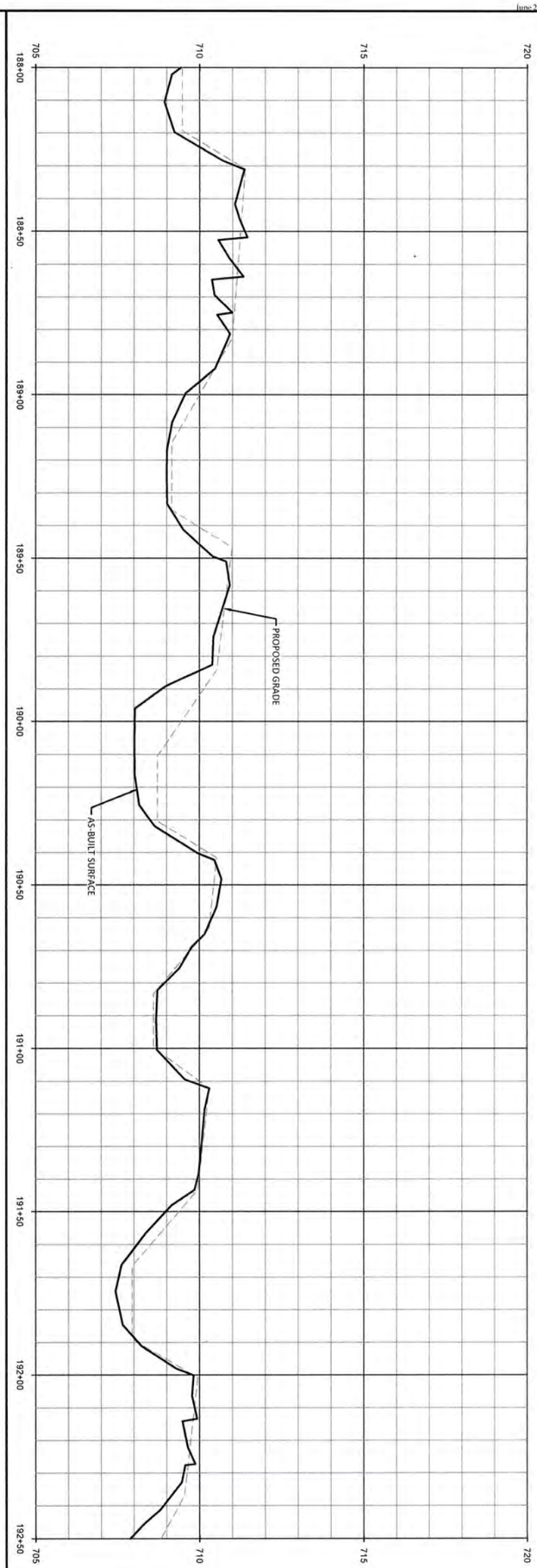
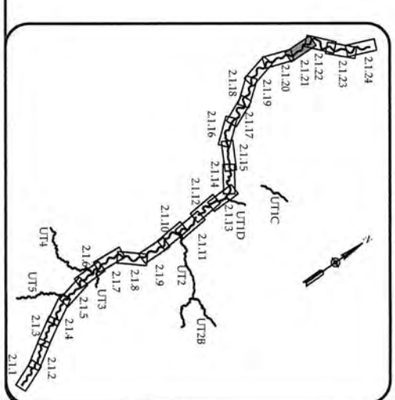
Charlotte, NC 28203
Tel: 704.332.7754
Fax: 704.332.3306
Firm License No. F-0831







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NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER AARON S. EARLY
6-2-17

WILDLANDS
ENGINEERING
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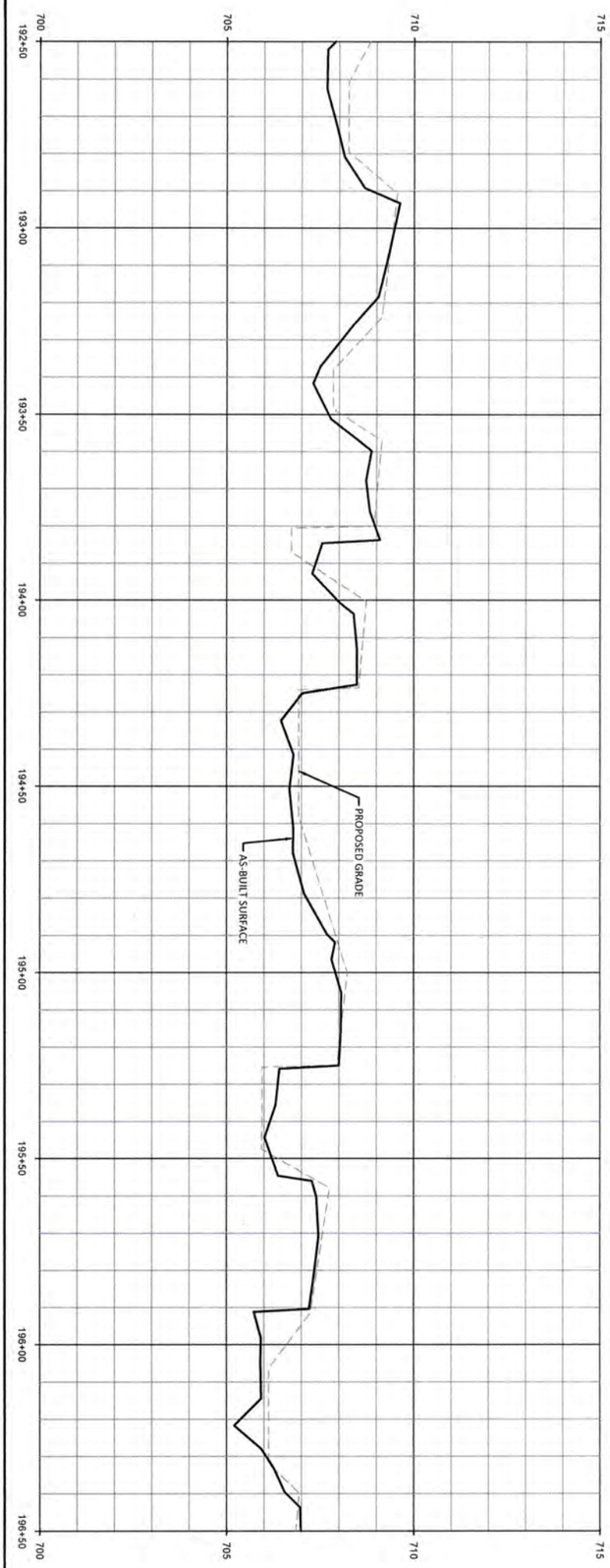
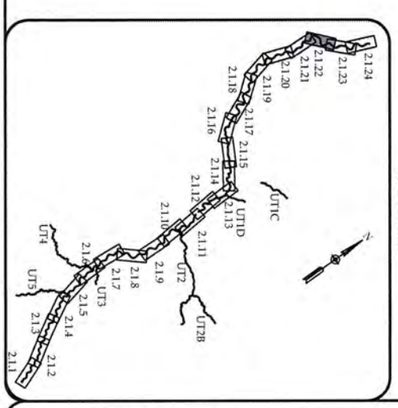
Charlotte, NC 28203
Tel: 704.332.7754
Fax: 704.332.3306
Firm License No. F-0831





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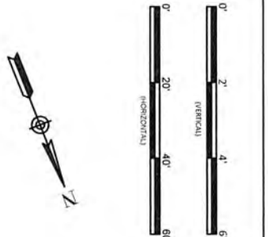

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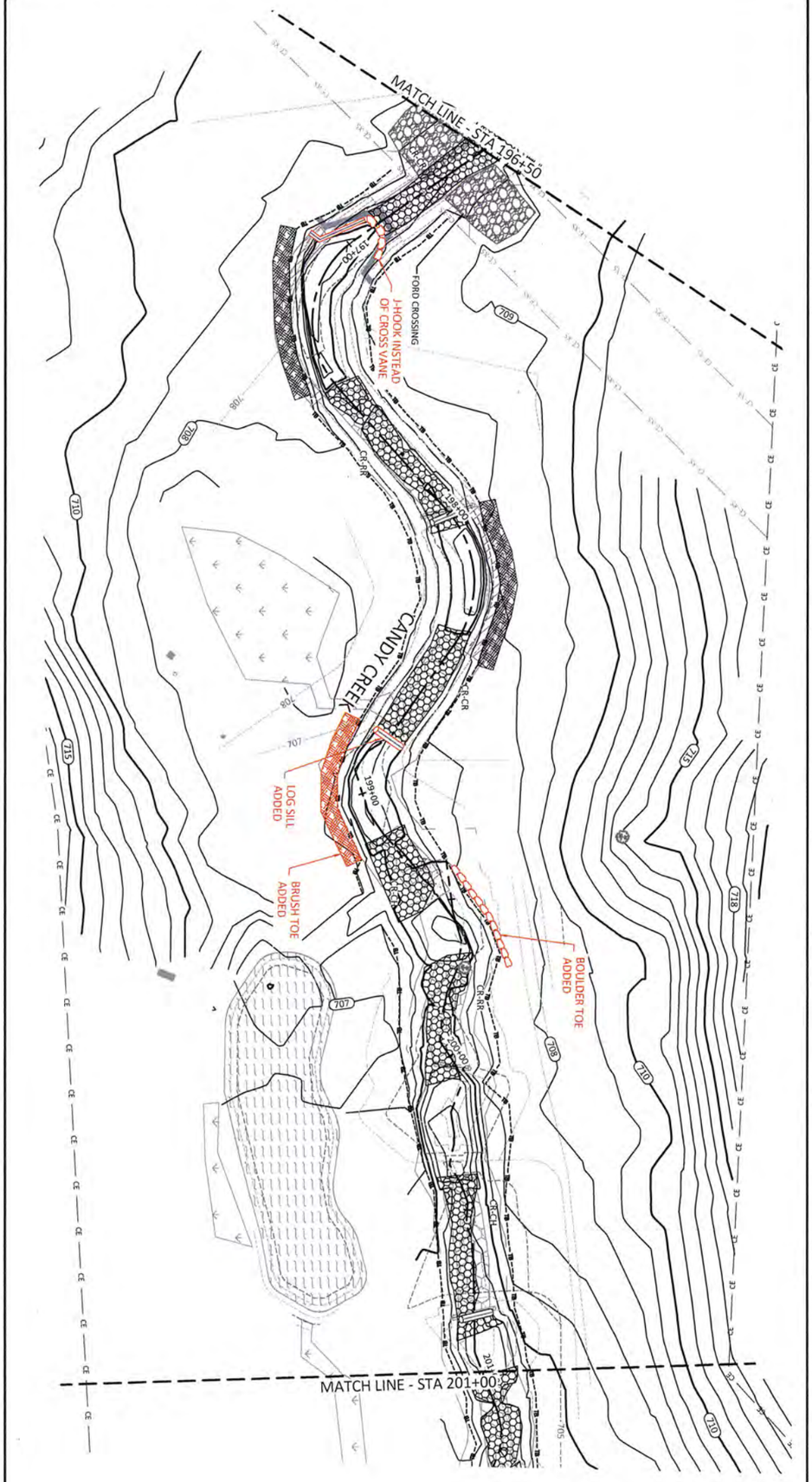
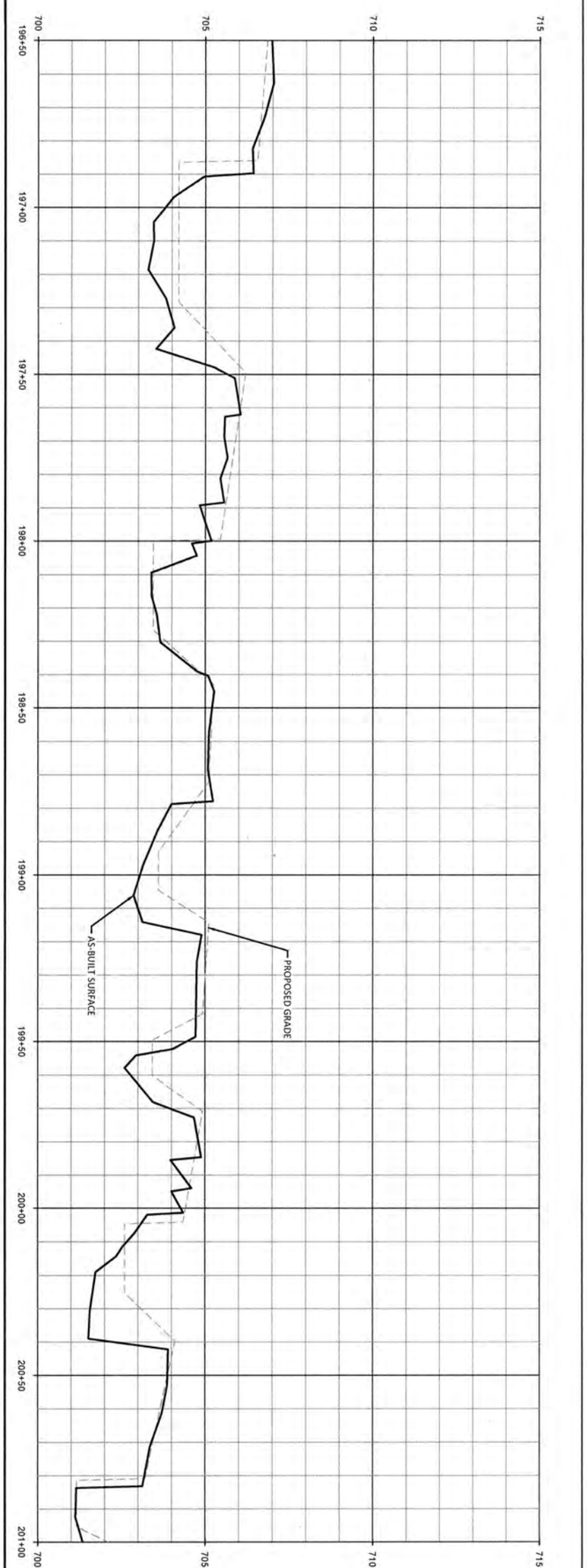
Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

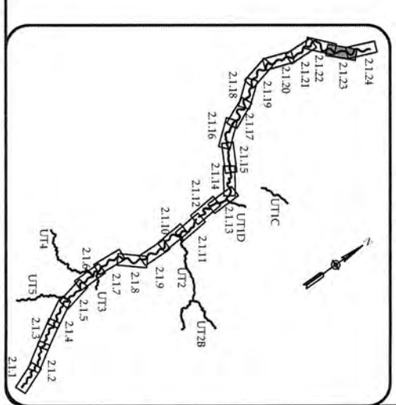
Candy Creek Reach 4
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER JARIN S. EARLEY
6-2-17

WILDLANDS ENGINEERING
1430 S. Mint St, Suite 104
Charlotte, NC 28203
Tel: 704.332.7754
Fax: 704.332.3306
Firm License No. F-0831







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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

Candy Creek Reach 4
Stream Plan and Profile

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6-2-17

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Charlotte, NC 28203
Tel: 704.332.7754
Fax: 704.332.3306
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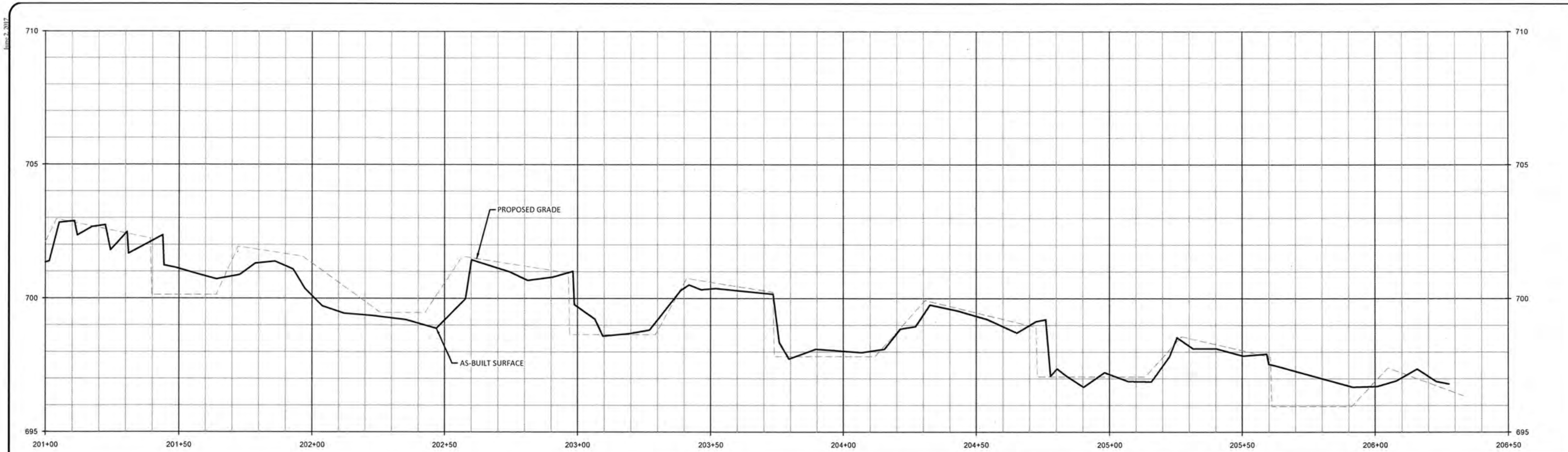

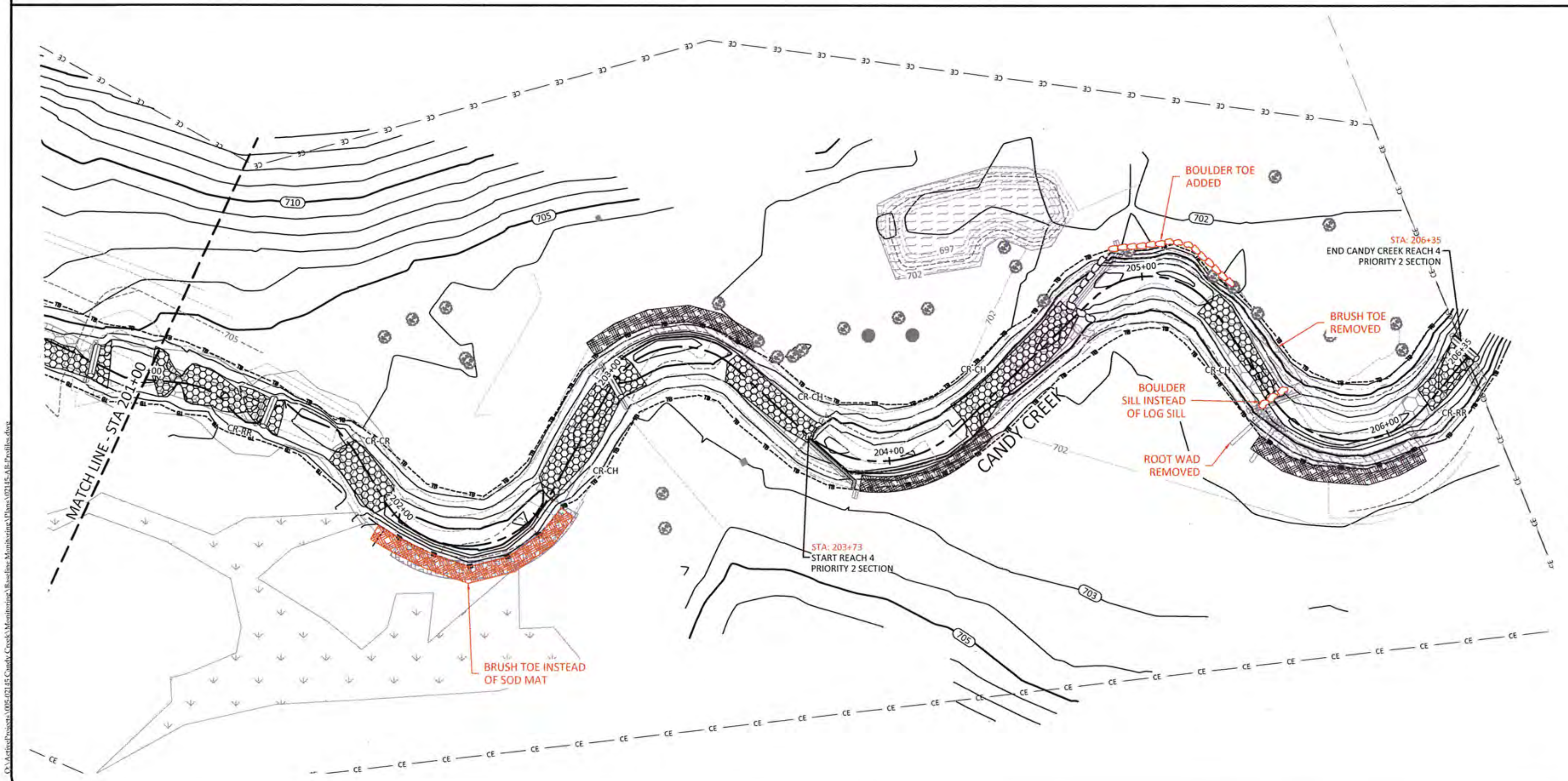

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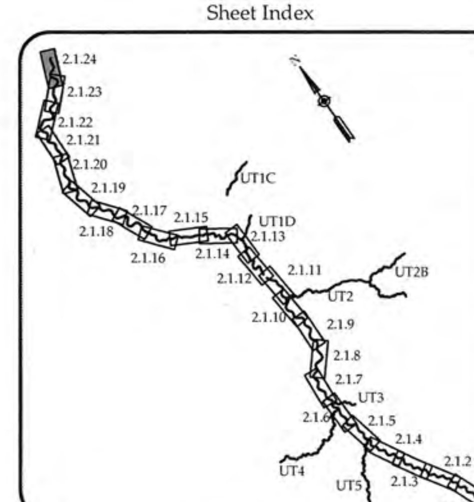

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Charlotte, NC 28203
Tel: 704.332.7754
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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

Candy Creek Reach 4
Stream Plan and Profile

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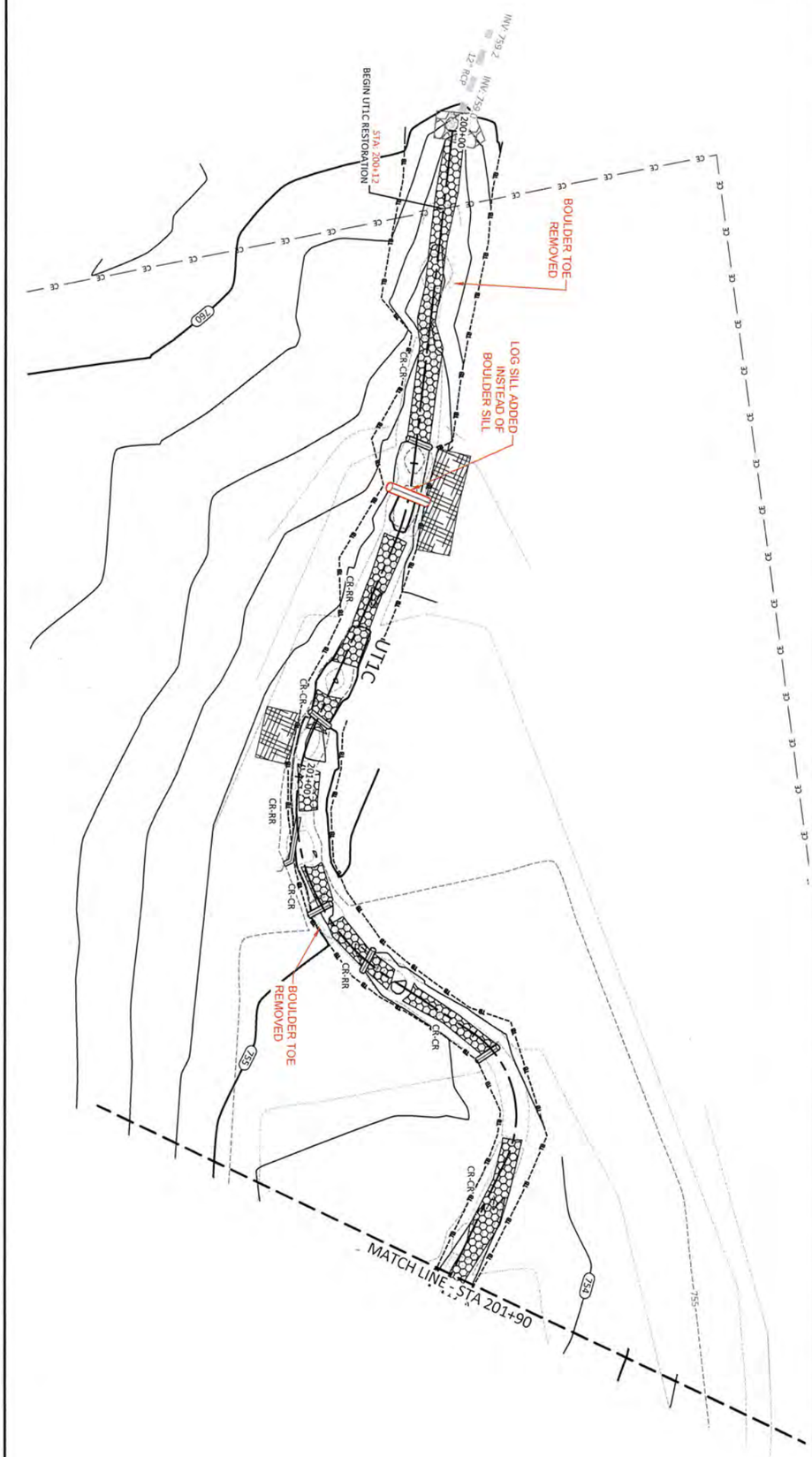

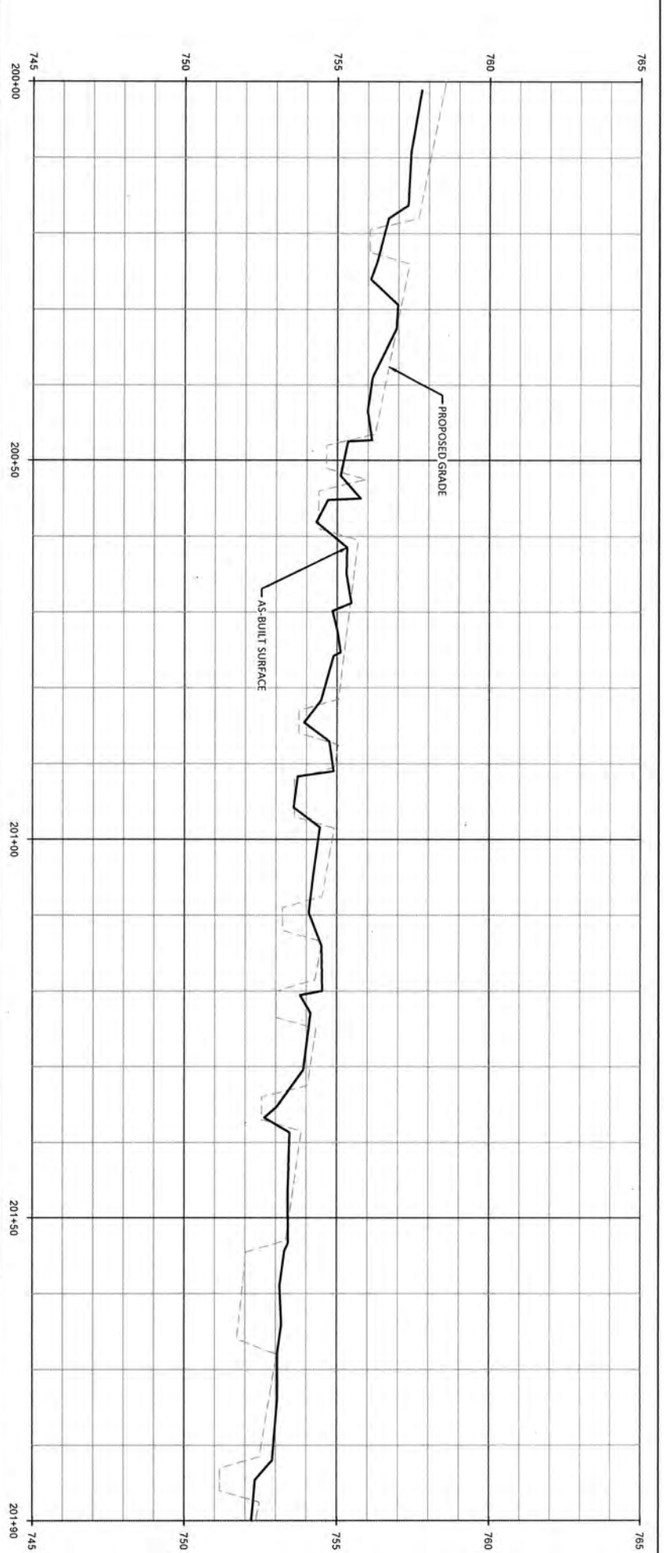

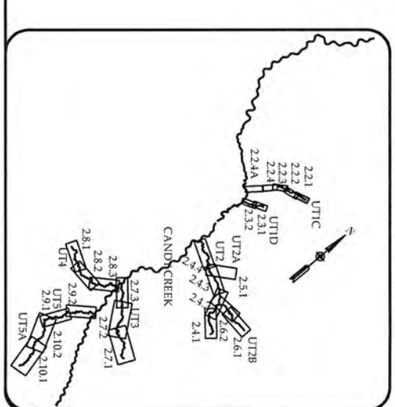

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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

UT1C
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER AARON S. EARLEY
6-2-17

WILDLANDS
ENGINEERING
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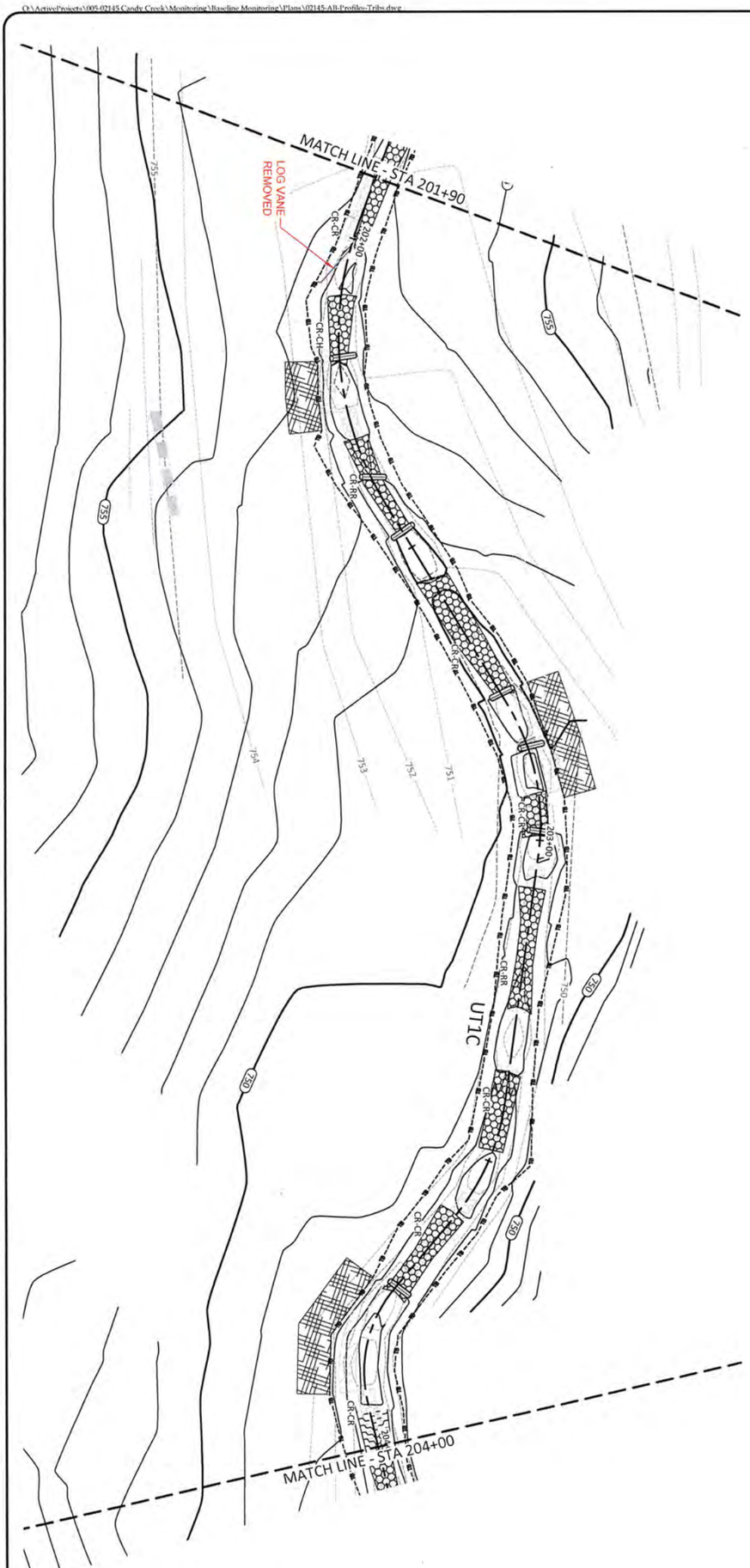
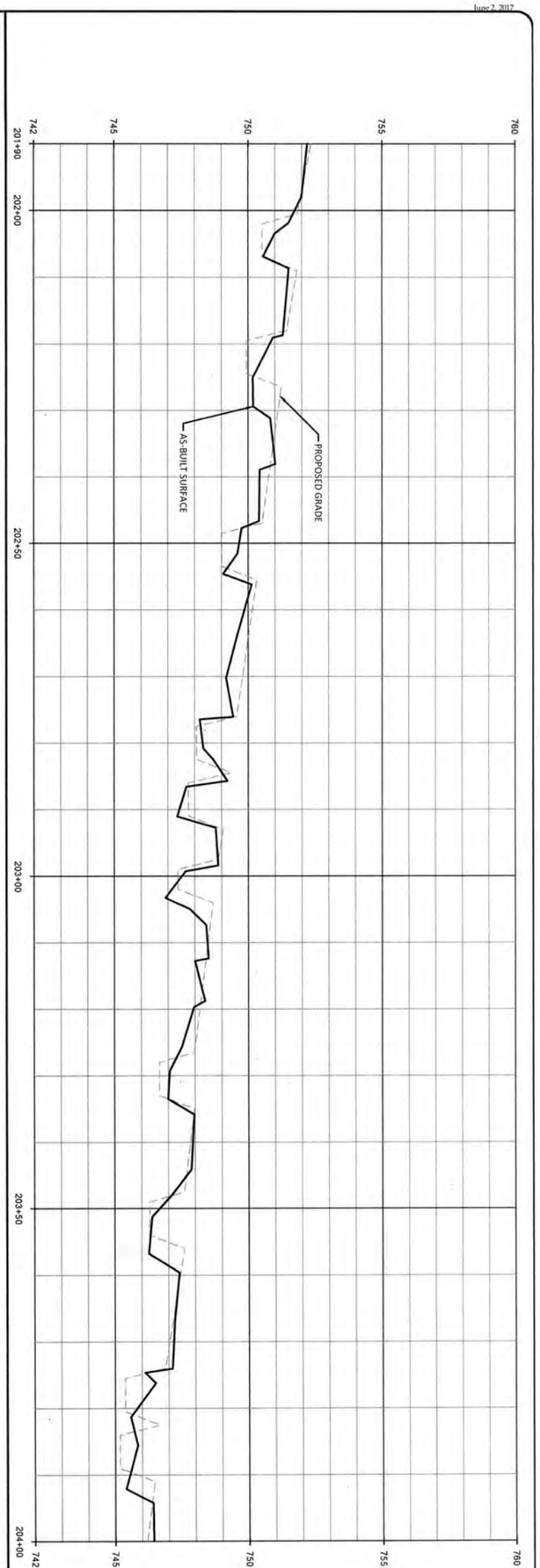
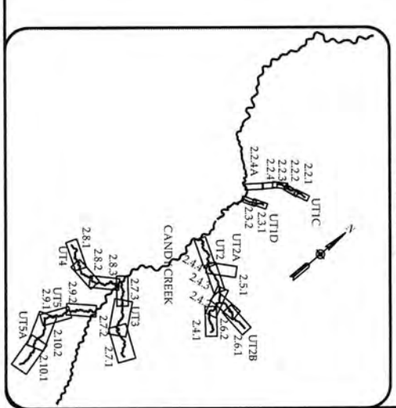
Charlotte, NC 28203
Tel: 704.332.7754
Fax: 704.332.3306
Firm License No. F-0831







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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

UT1C
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER AARON S. CARLEY
6-2-17

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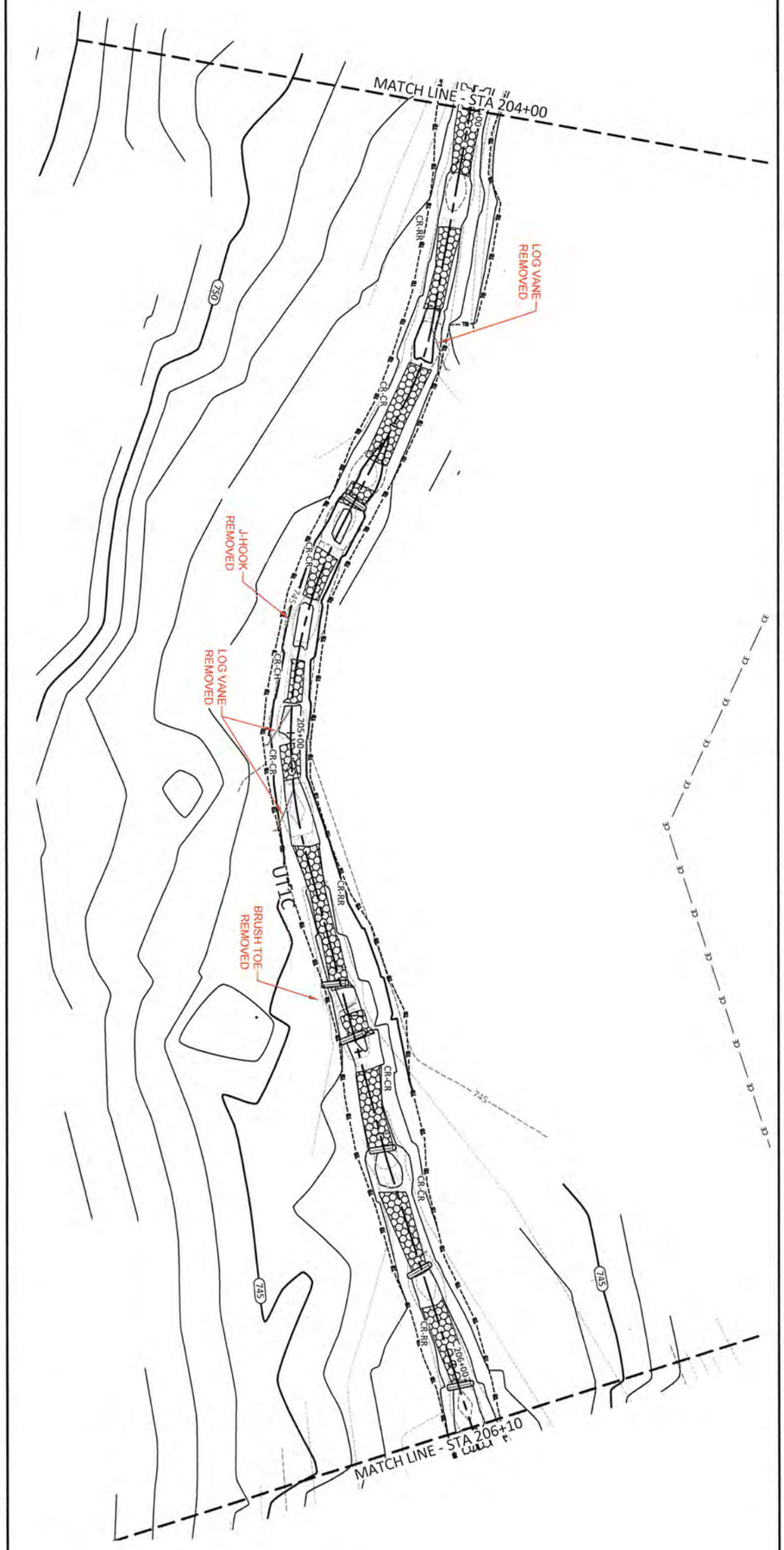
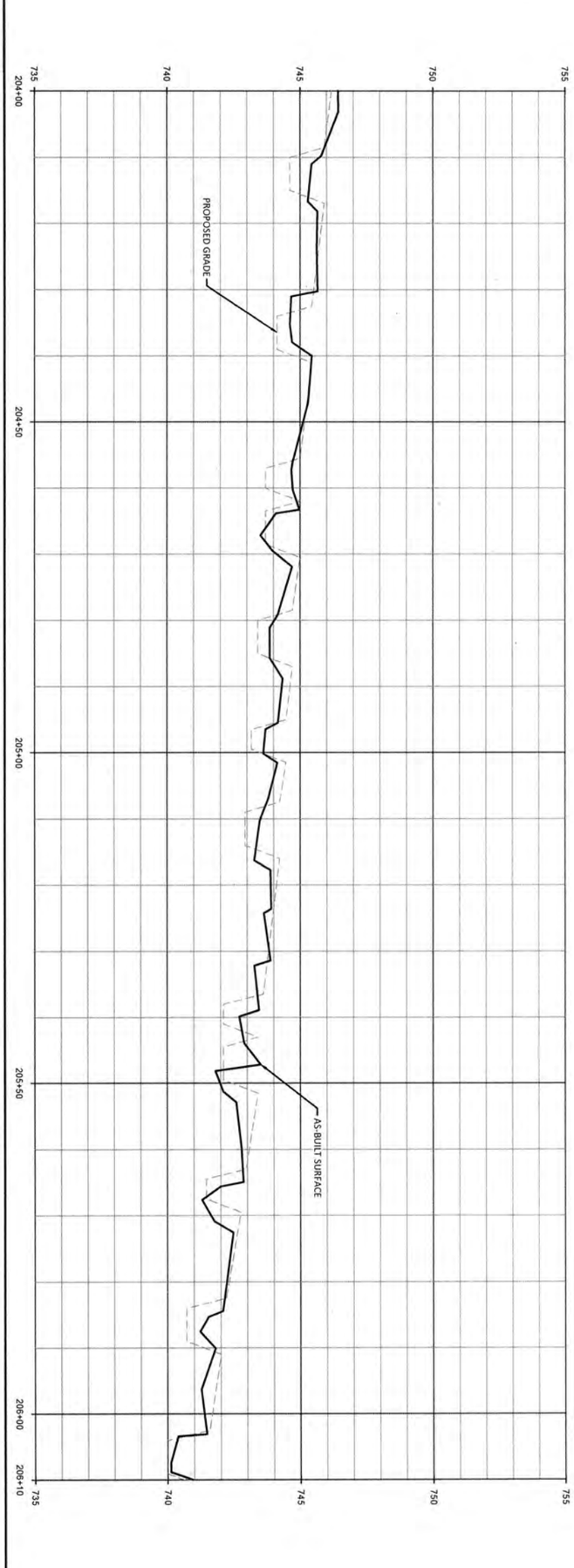
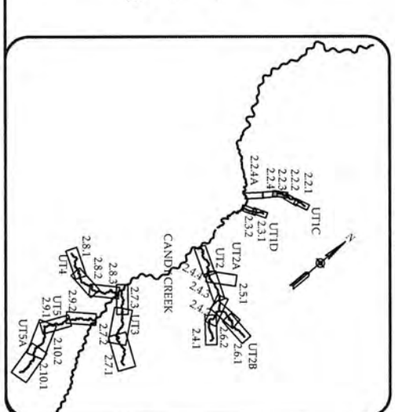
Charlotte, NC 28203
Tel: 704.332.7754
Fax: 704.332.3306
Firm License No. F-0831







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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

UT1C
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER AARON S. EARLEY
6-2-17

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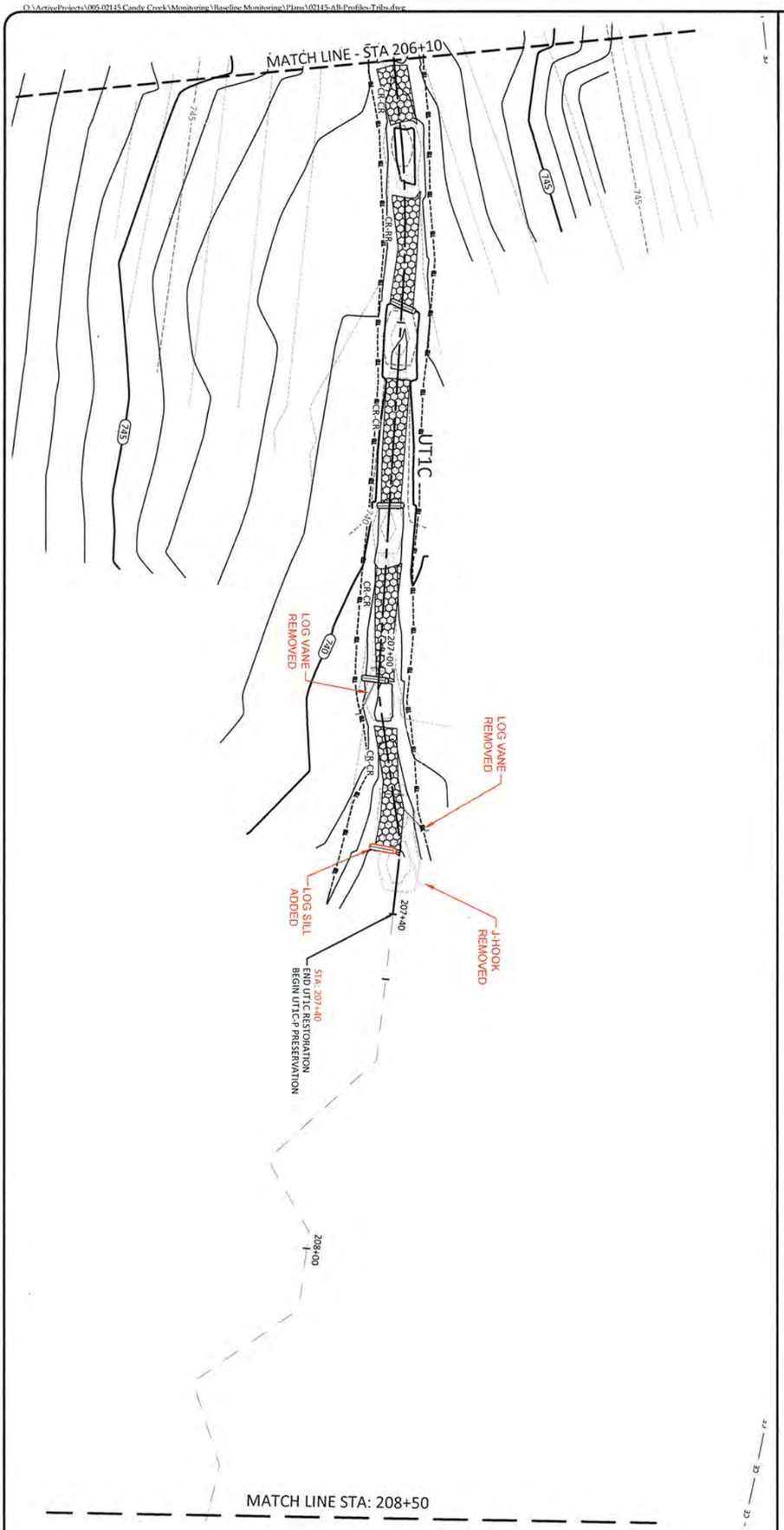
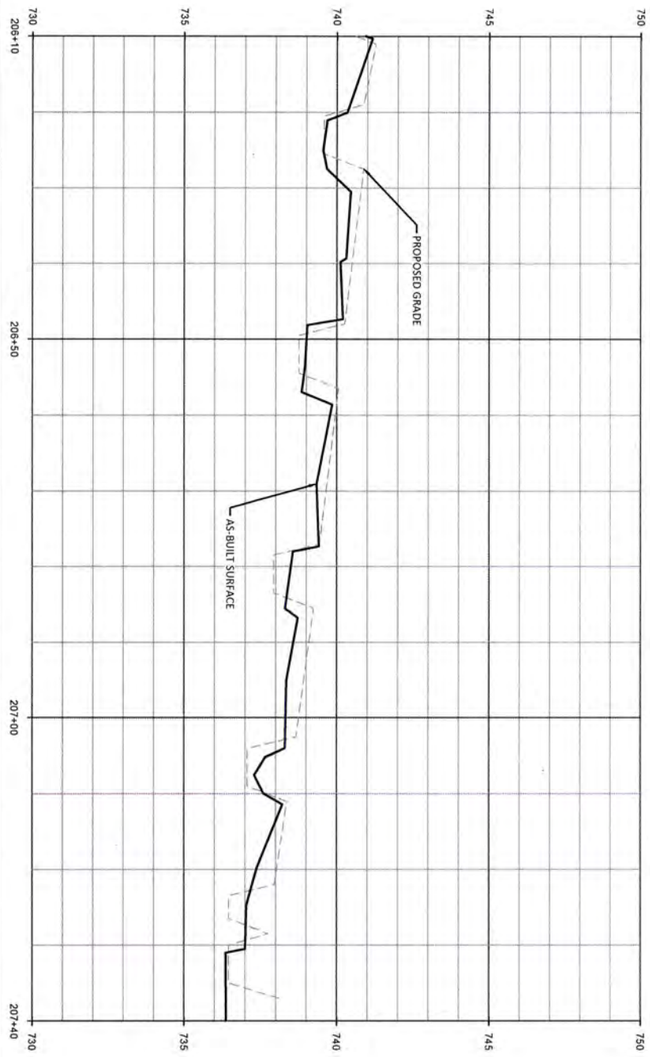
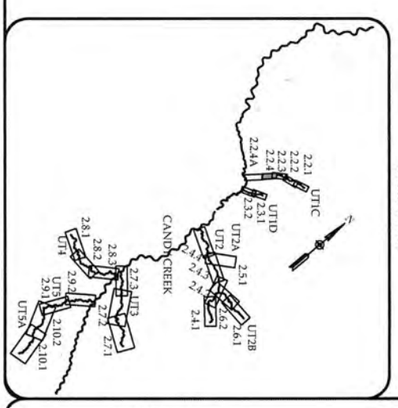
Charlotte, NC 28203
Tel: 704.332.7754
Fax: 704.332.3306
Firm License No. F-0831







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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

UT1C
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER MARK S. EARLEY
6-2-17

WILDLANDS ENGINEERING
1430 S. Mint St, Suite 104
Charlotte, NC 28203
Tel: 704.332.7754
Fax: 704.332.3306
Firm License No. F-0831

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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

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Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER AARON S. EARLEY
6-2-17

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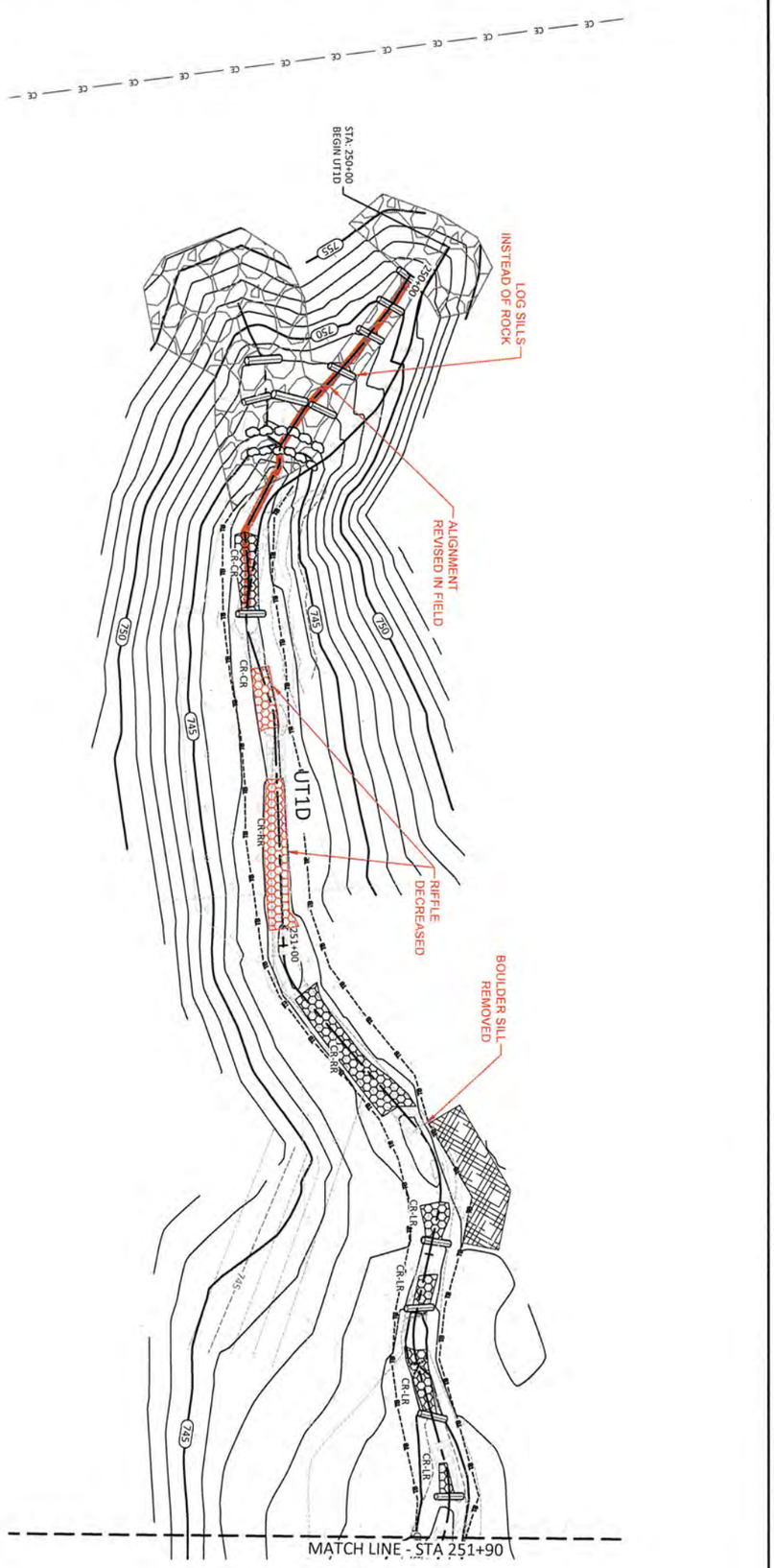
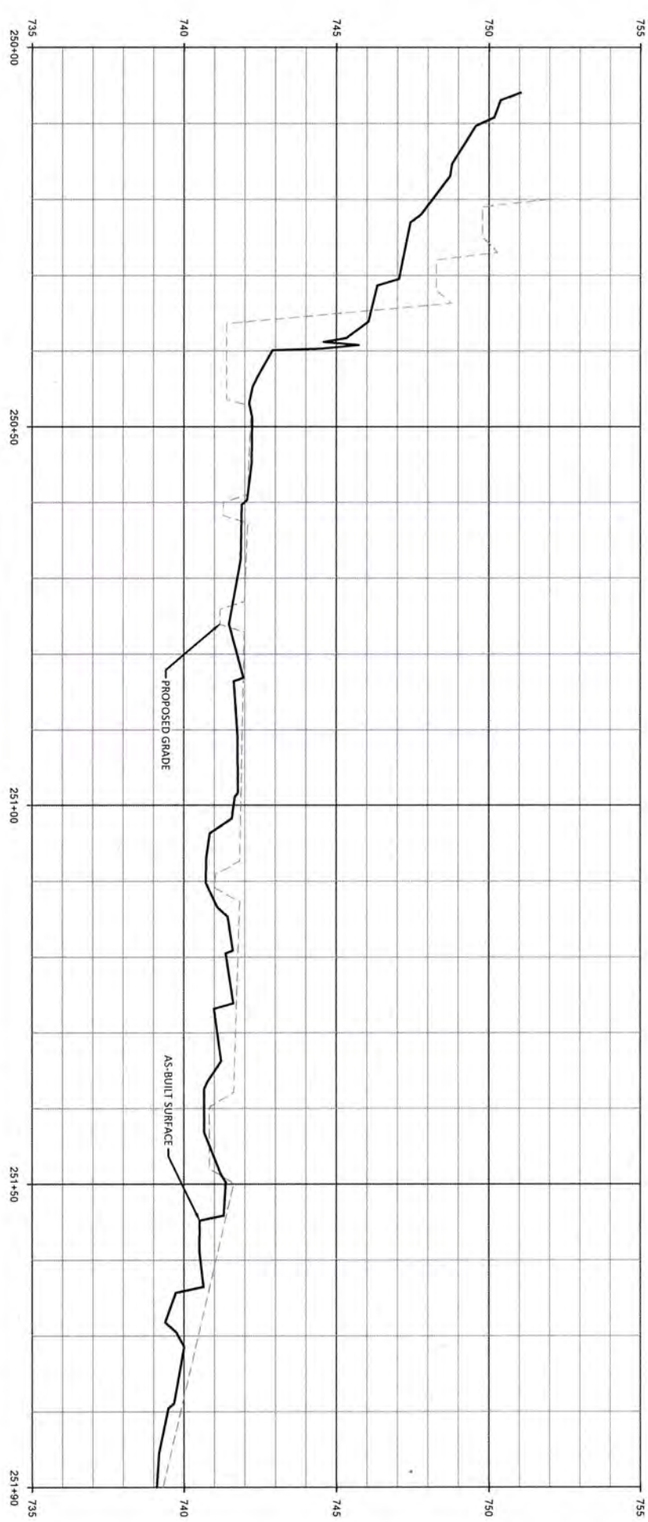
Charlotte, NC 28203
Tel: 704.332.7754
Fax: 704.332.3306
Firm License No. F-0831





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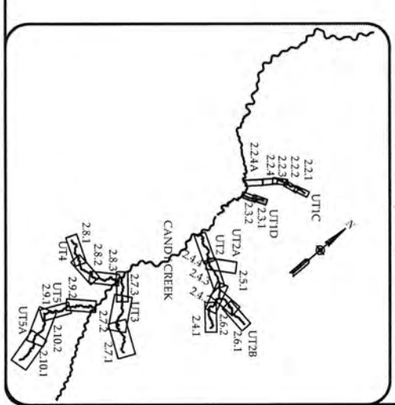

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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

UT1D
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER LARRY S. EARLEY
6-2-17

WILDLANDS ENGINEERING
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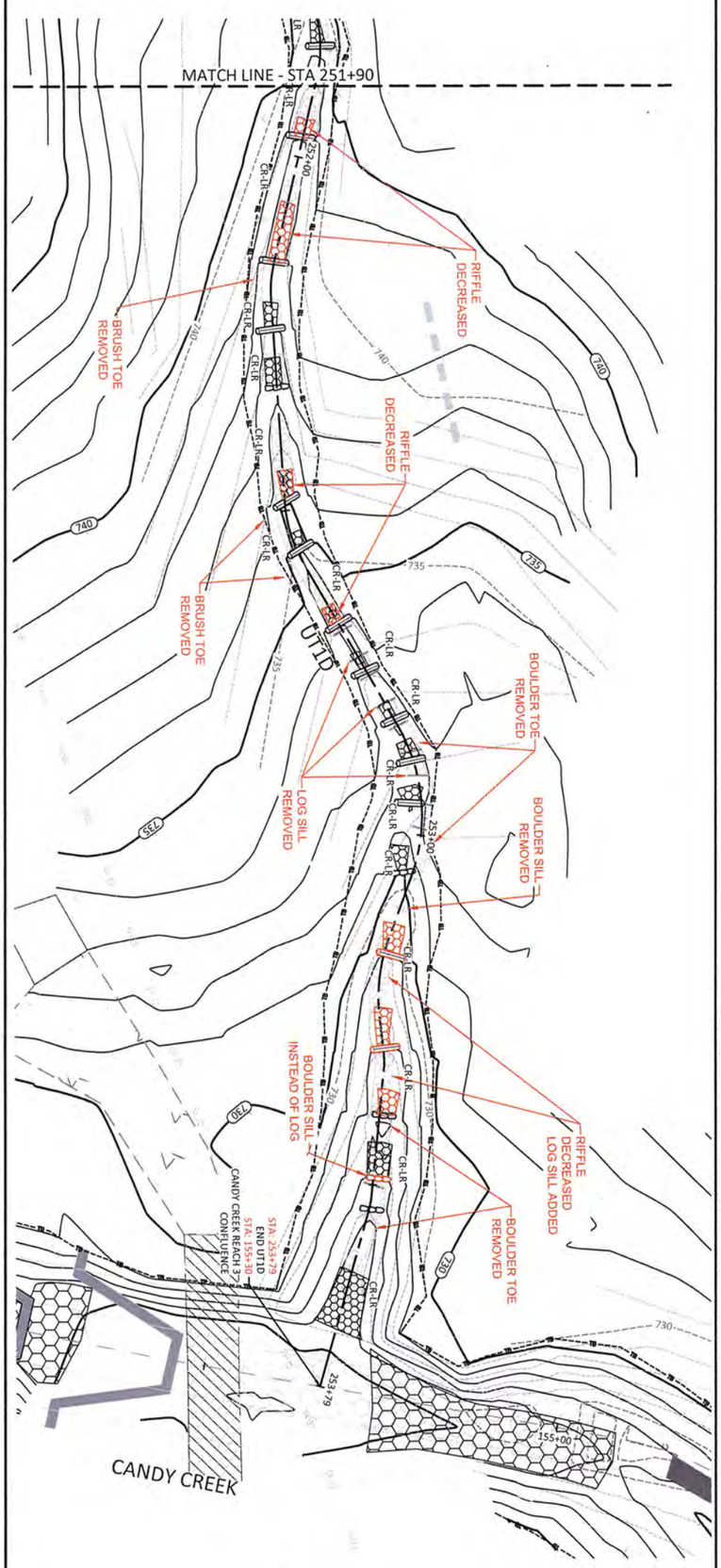
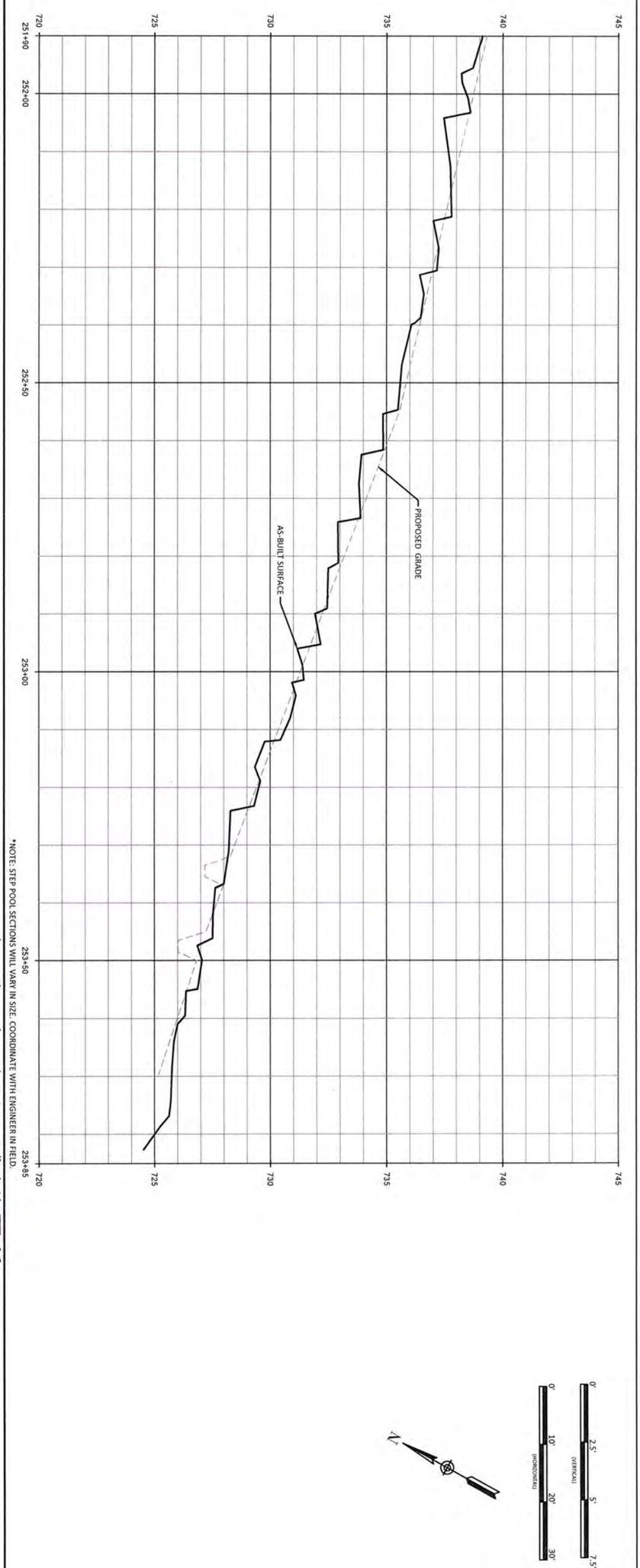
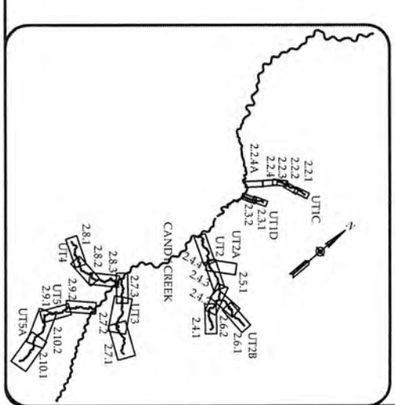
Charlotte, NC 28203
Tel: 704.332.7754
Fax: 704.332.3306
Firm License No. F-0831







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Guilford County, North Carolina

UT1D
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL SEAL 029349 ENGINEER AARON S. EARLEY
6-2-17

WILDLANDS ENGINEERING
1430 S. Mint St, Suite 104
Charlotte, NC 28203
Tel: 704.332.7754
Fax: 704.332.3306
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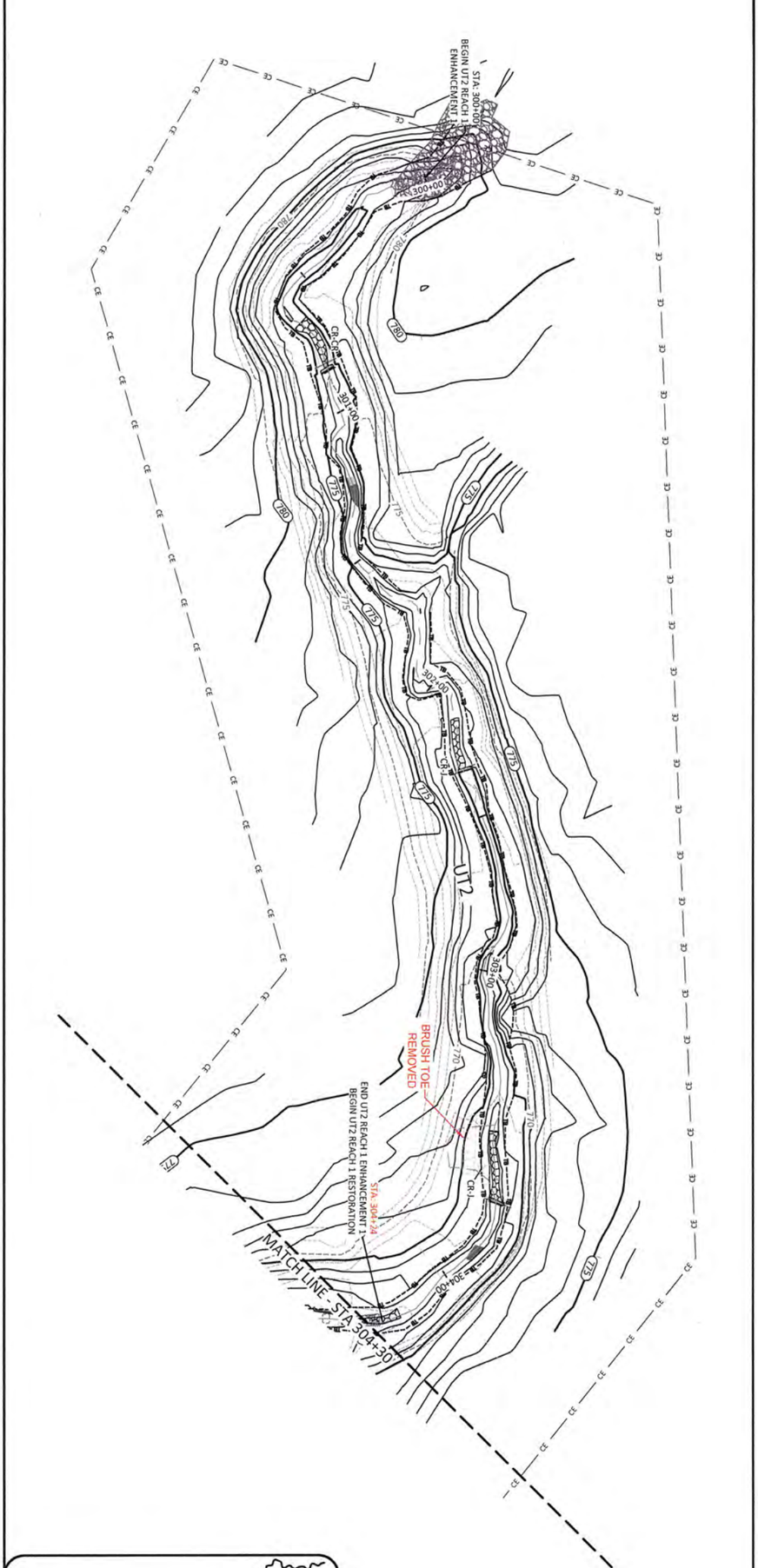

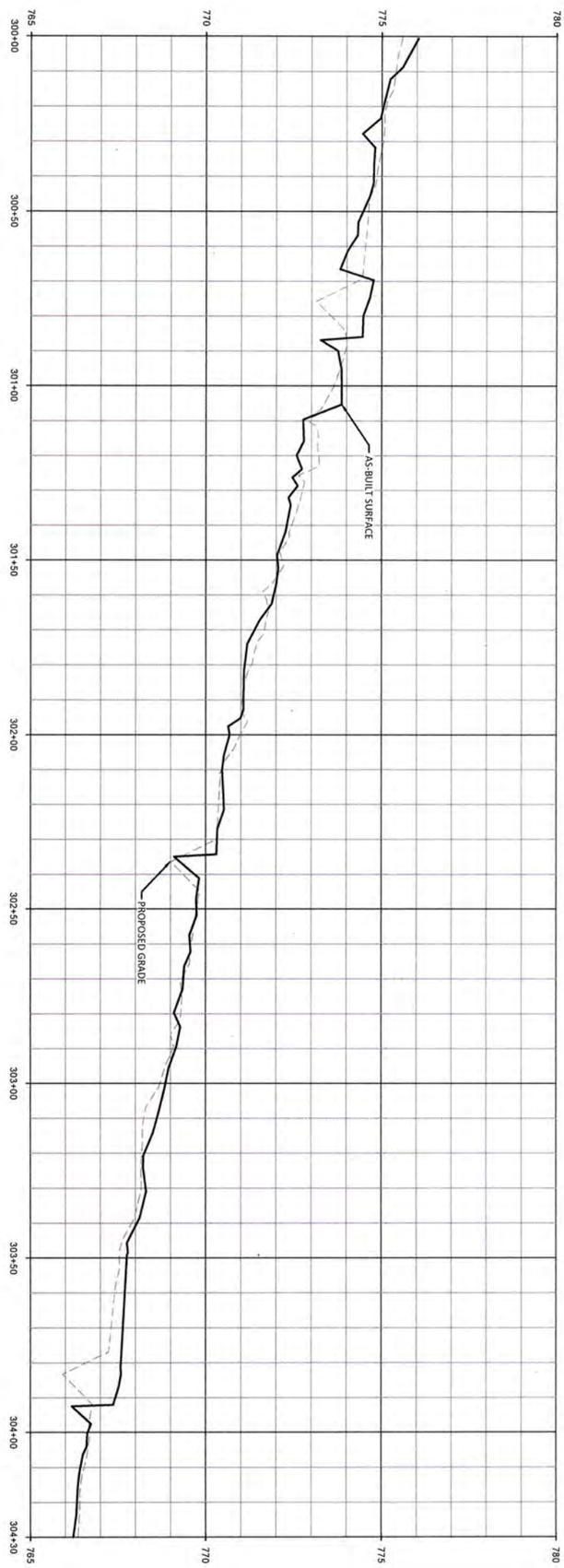

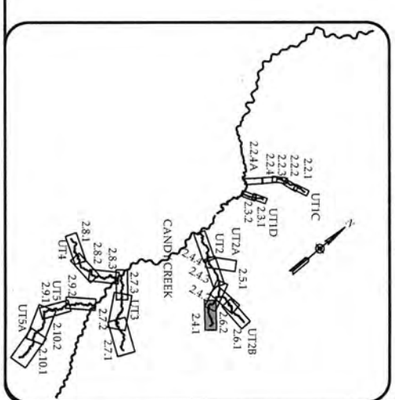

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Checked By:	JL

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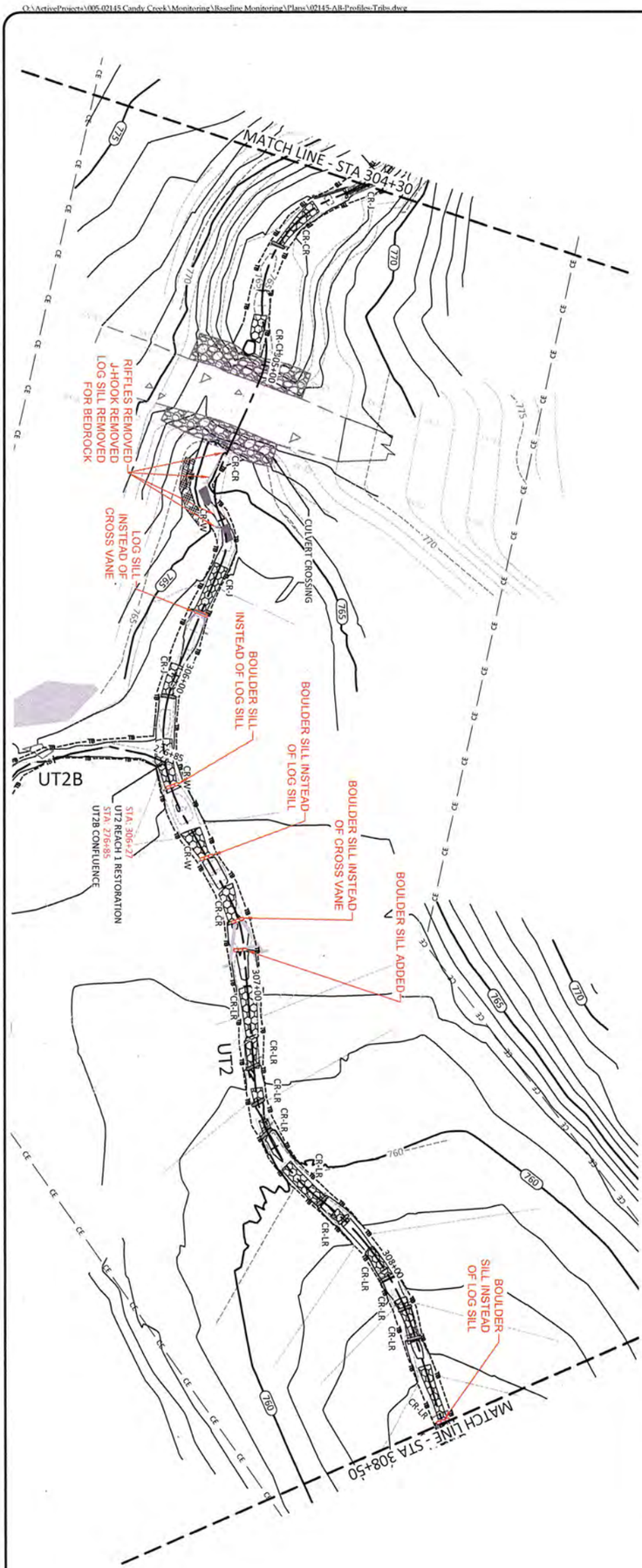
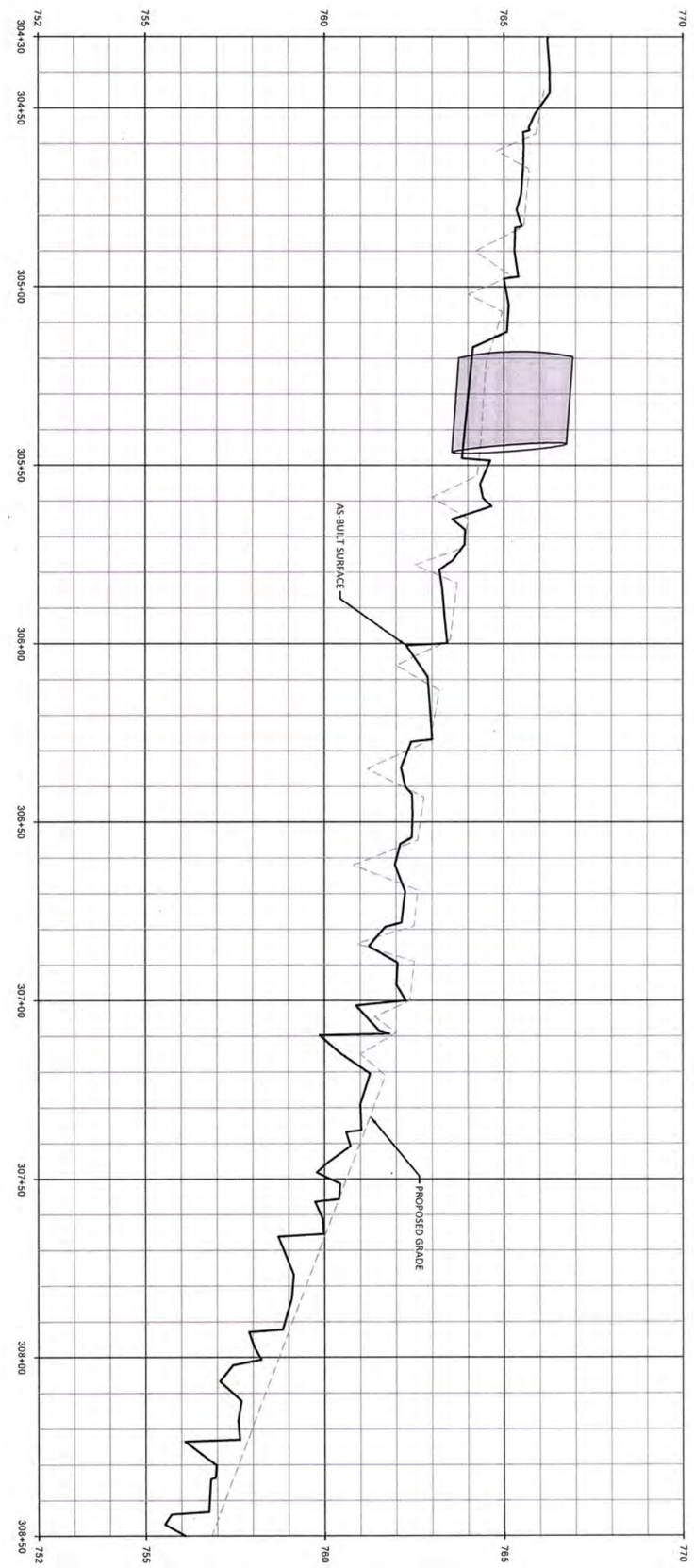
Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

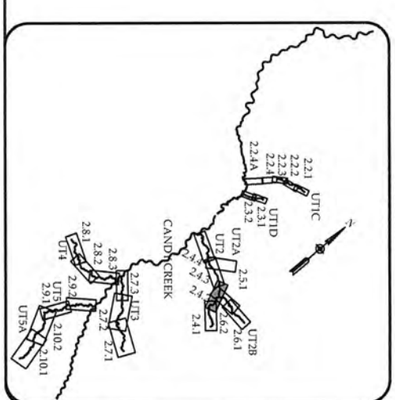
UT2 Reach 1
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER JASON S. EARLEY
6-2-17

WILDLANDS ENGINEERING
1430 S. Mint St, Suite 104
Charlotte, NC 28203
Tel: 704.332.7754
Fax: 704.332.3306
Firm License No. F-0831







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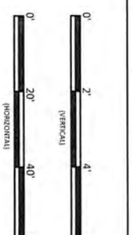

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Checked By:	JL

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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

UT2 Reach 1
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER AARON S. EARLEY
6-2-17

WILDLANDS ENGINEERING
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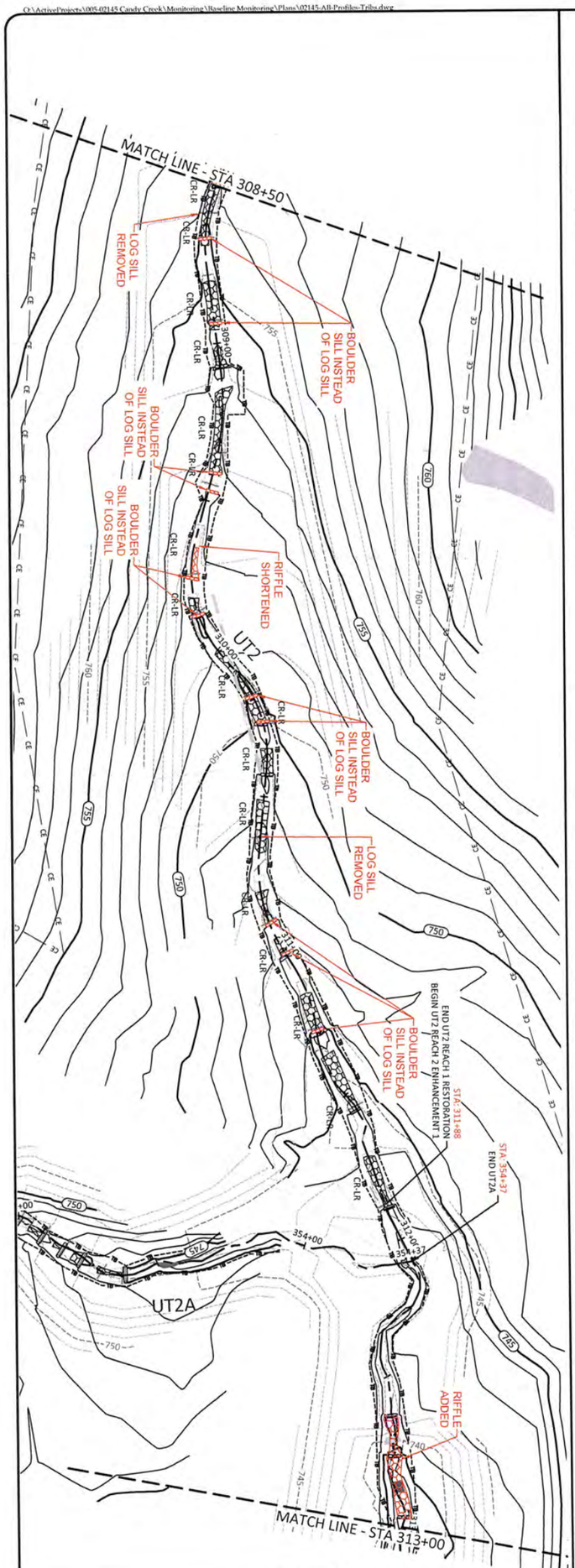
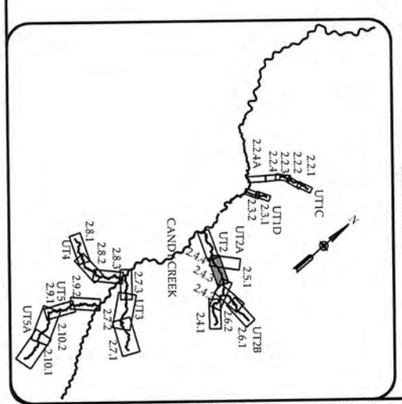
Charlotte, NC 28203
Tel: 704.332.7754
Fax: 704.332.3306
Firm License No. F-0831





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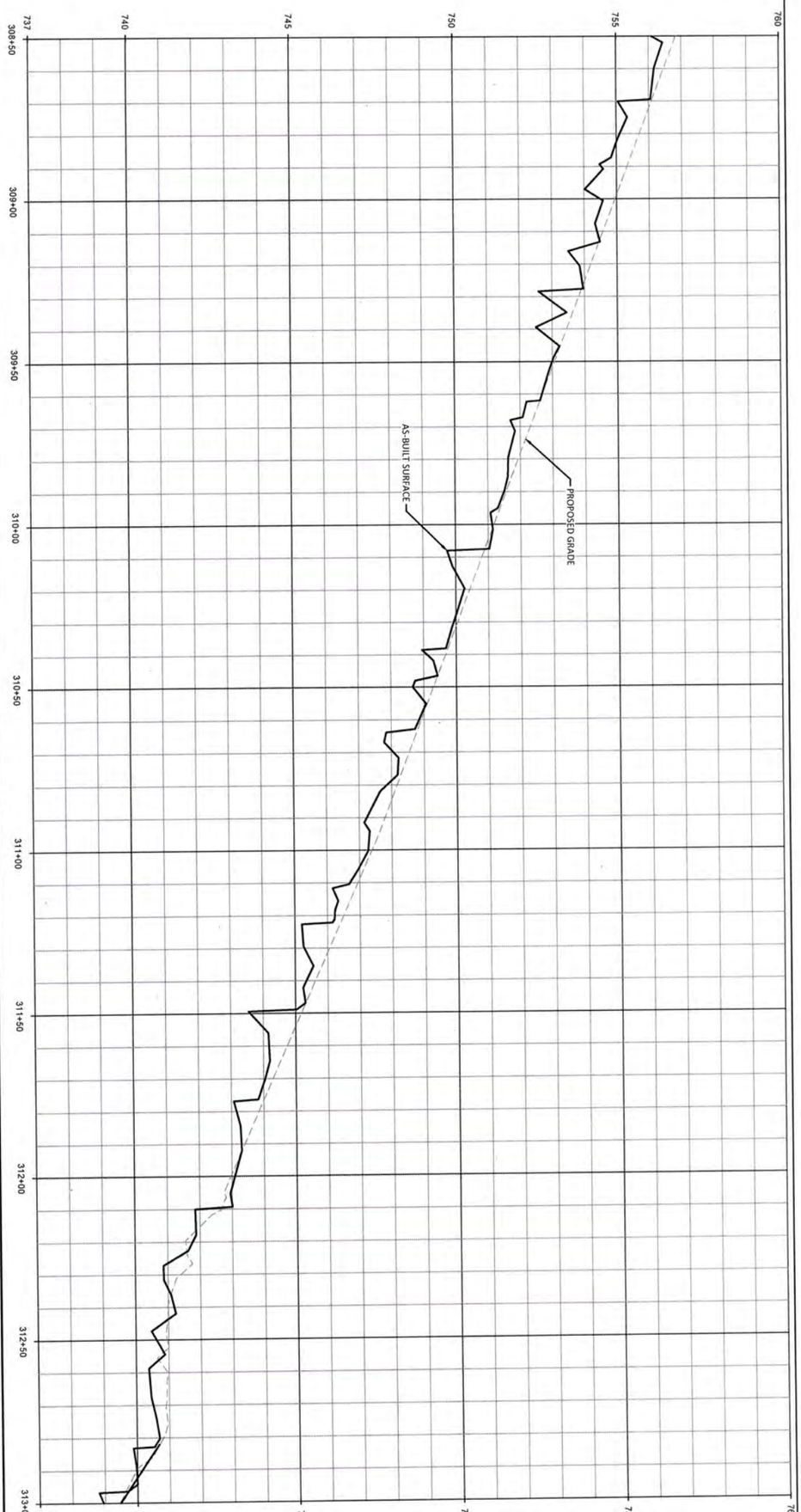

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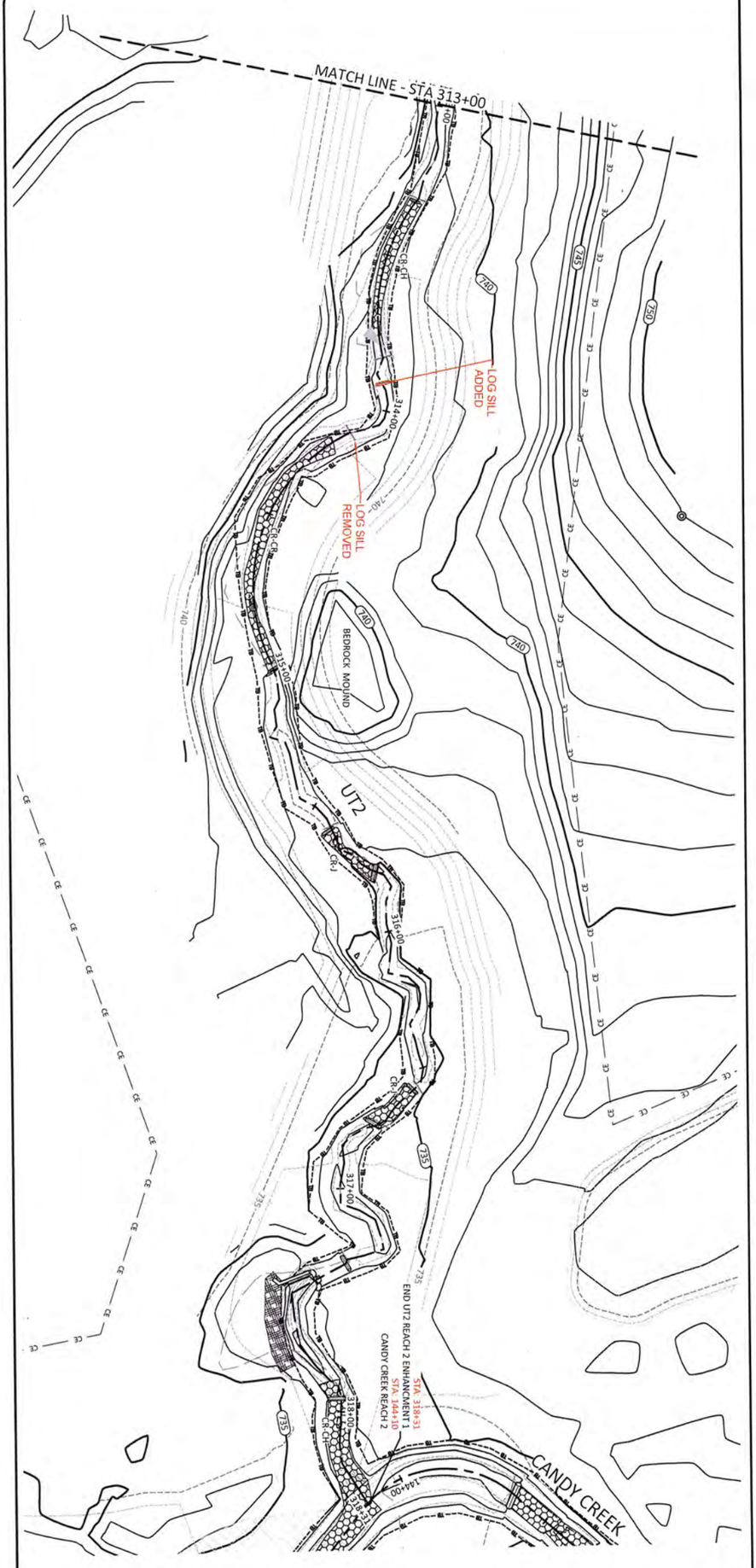
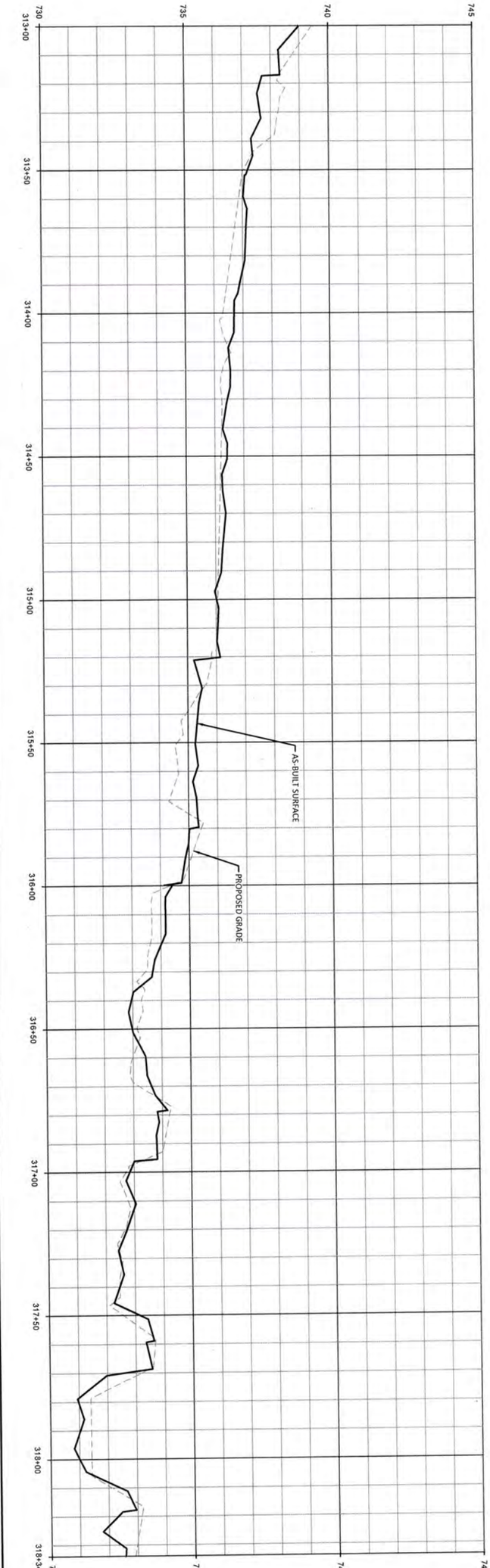
Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

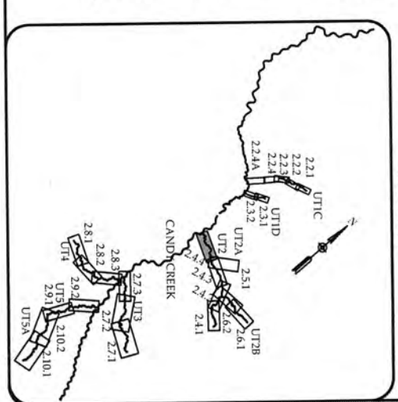
UT2 Reach 1 & 2
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL SEAL 029348 ENGINEER AARON S. EARLEY
6-2-17

WILDLANDS ENGINEERING
1430 S. Mint St, Suite 104
Charlotte, NC 28203
Tel: 704.332.7754
Fax: 704.332.3306
Firm License No. F-0831







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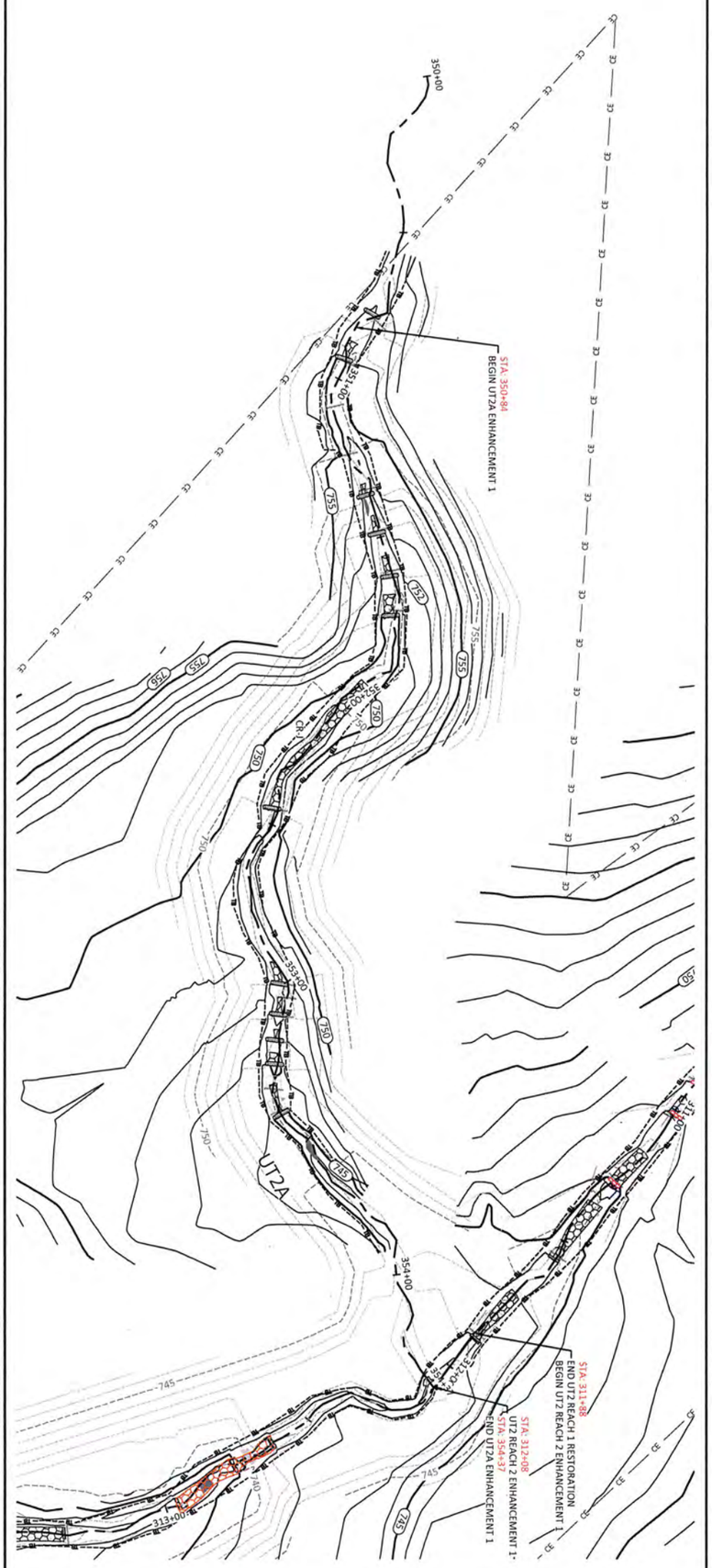
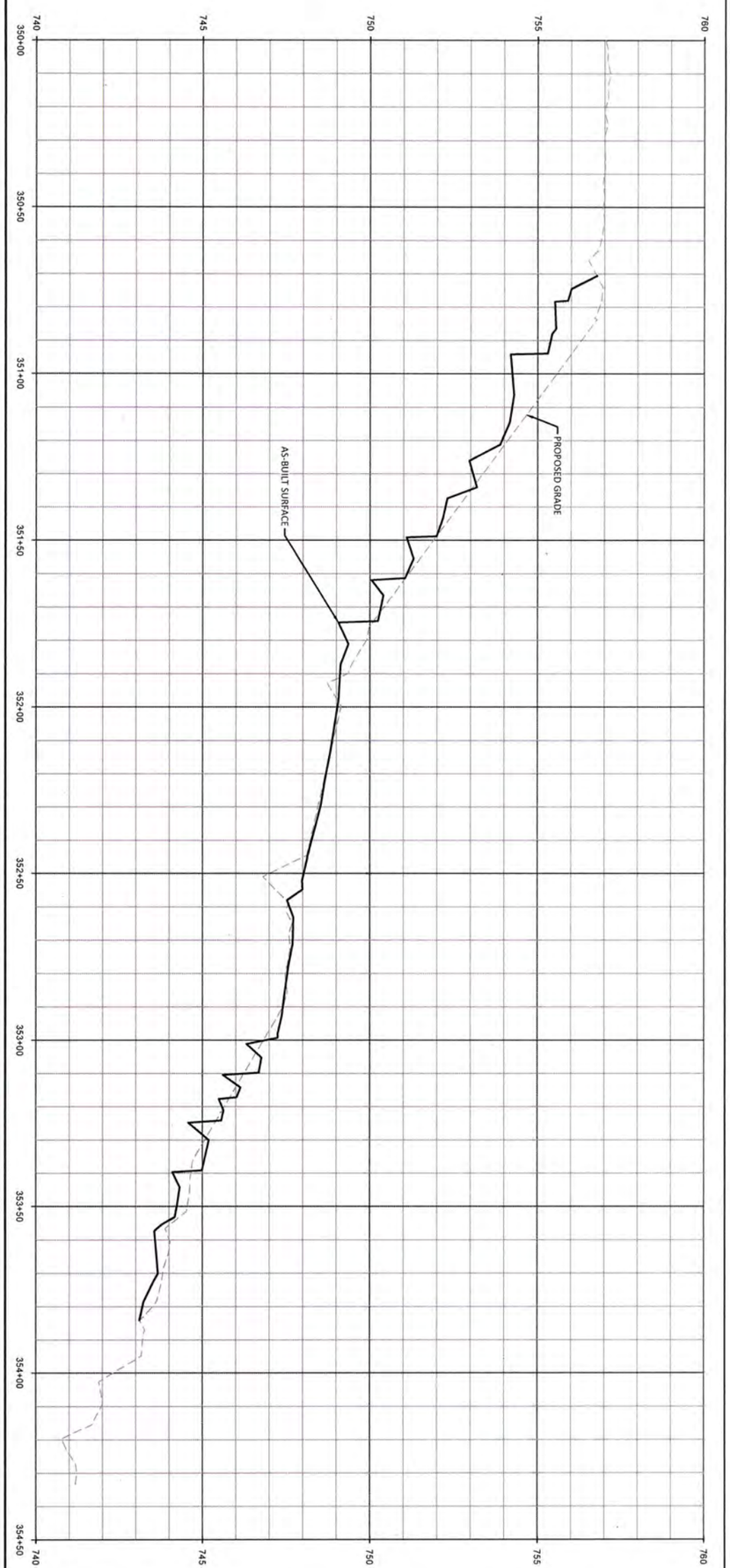
Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

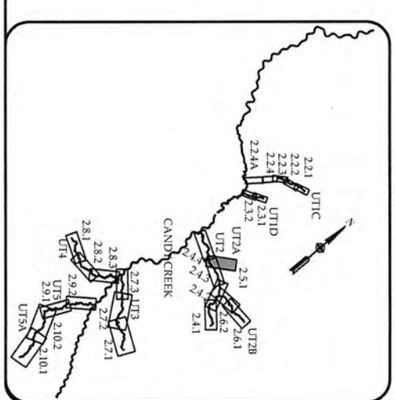
UT2 Reach 2
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER AARON S. EARLY
6-2-17

WILDLANDS ENGINEERING
1430 S. Mint St, Suite 104
Charlotte, NC 28203
Tel: 704.332.7754
Fax: 704.332.3306
Firm License No. F-0831







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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

UT2A
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER AARON S. EARLEY
6-2-17

WILDLANDS ENGINEERING
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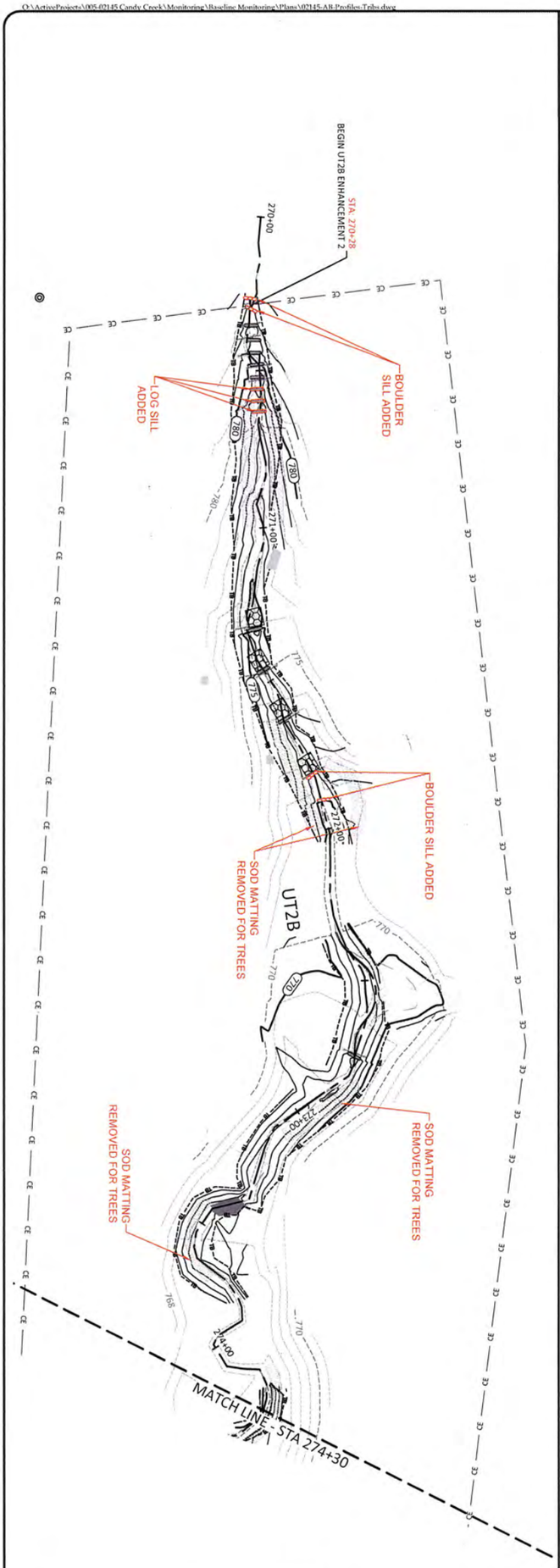
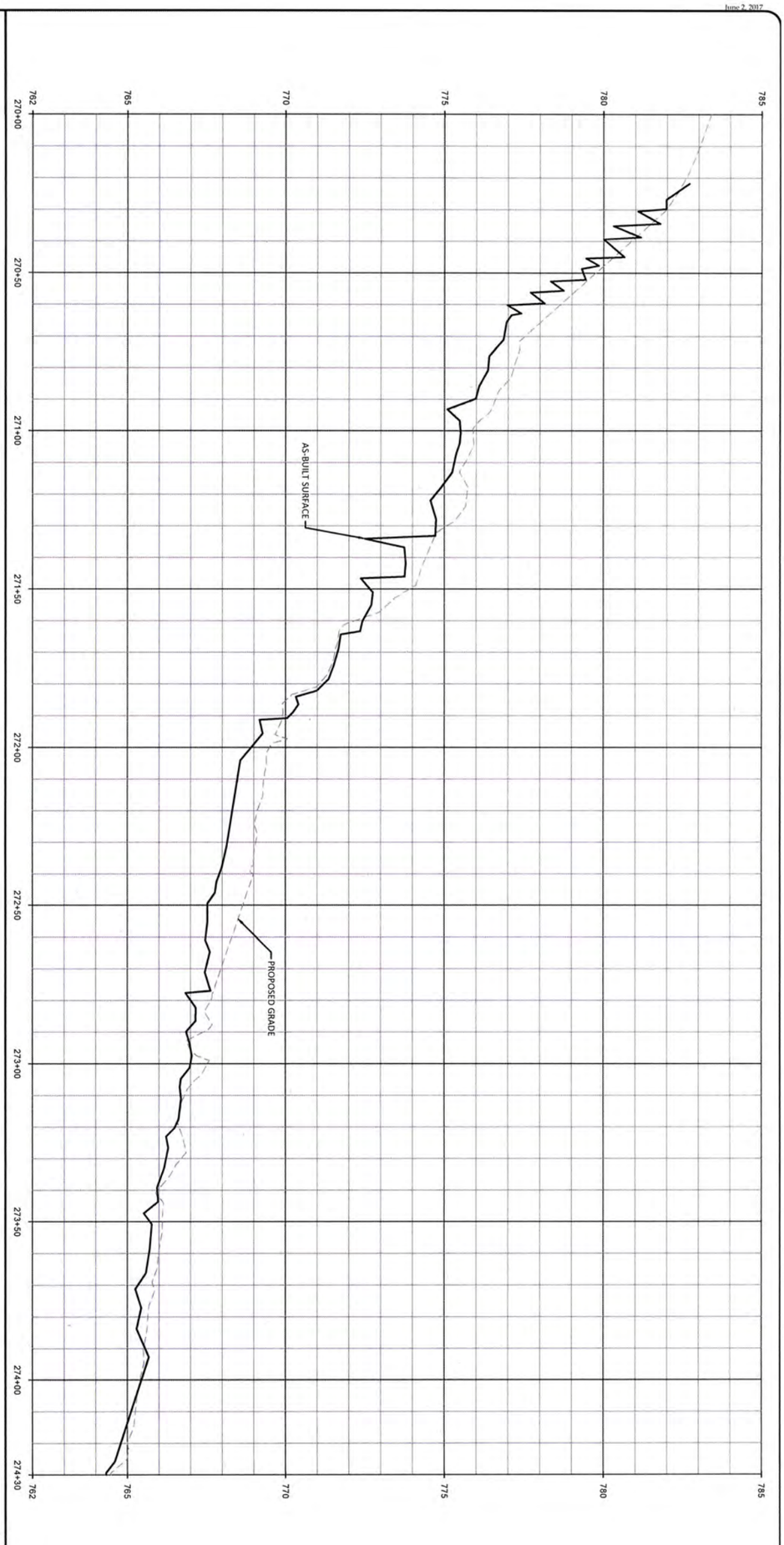
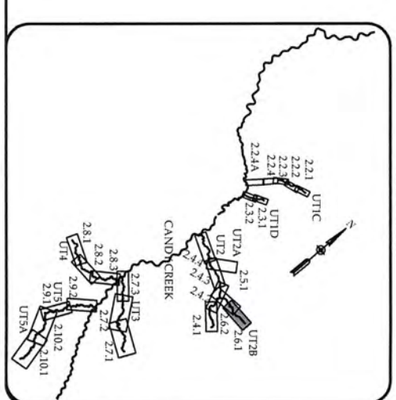
Charlotte, NC 28203
Tel: 704.332.7754
Fax: 704.332.3306
Firm License No. F-0831







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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

UT2B
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER AARON S. EARLEY
6-2-17

WILDLANDS ENGINEERING
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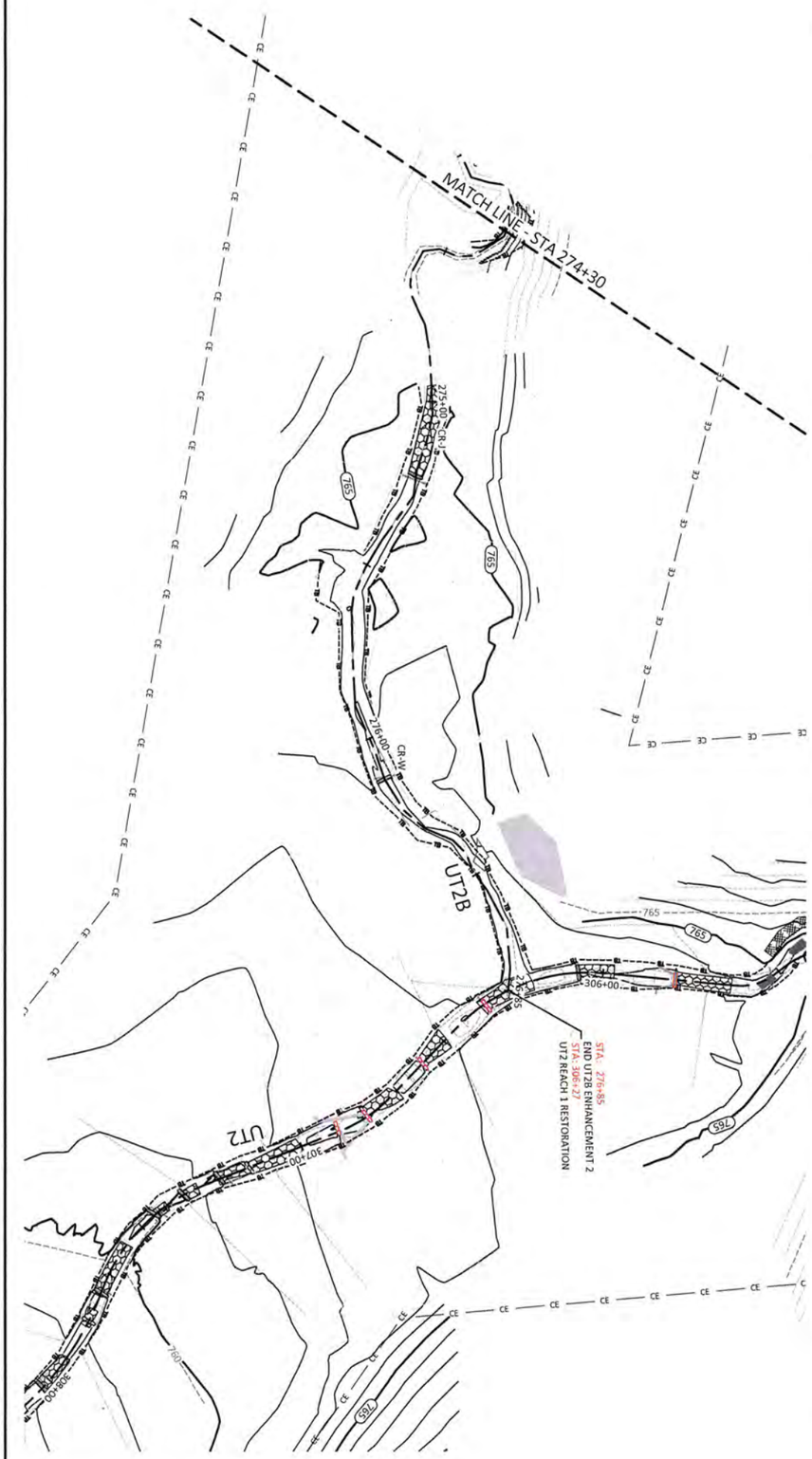
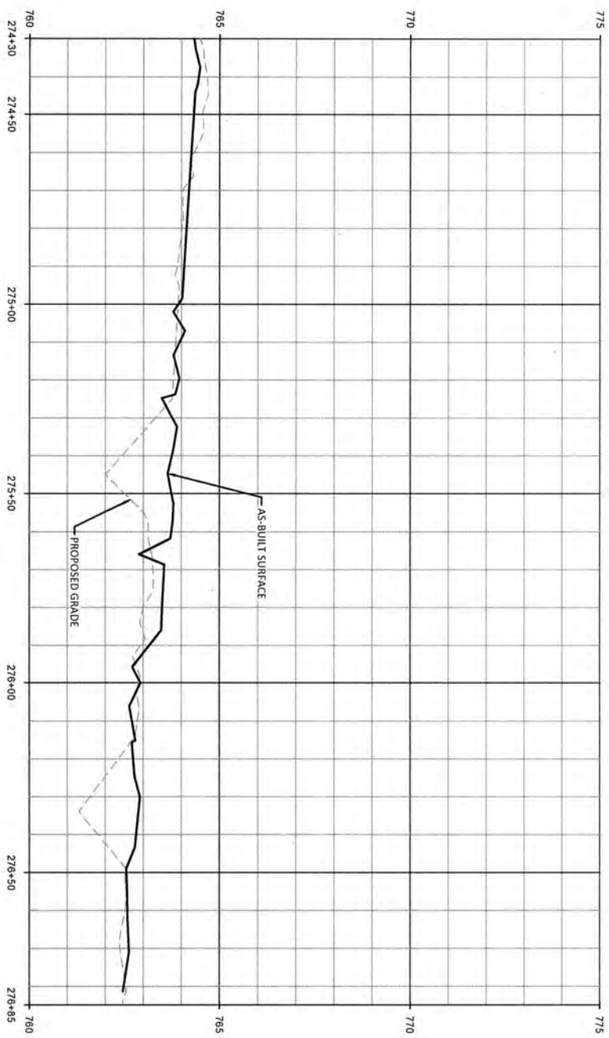
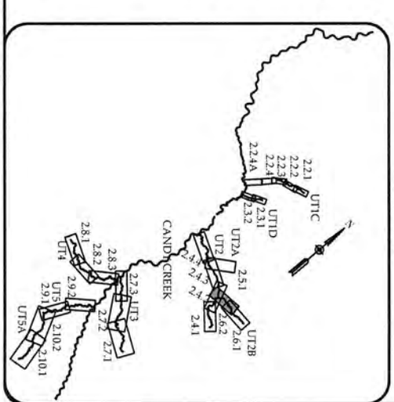
Charlotte, NC 28203
Tel: 704.332.7754
Fax: 704.332.3306
Firm License No. F-0831







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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

UT2B
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER ALTON S. EARLY
6-2-17

WILDLANDS
ENGINEERING
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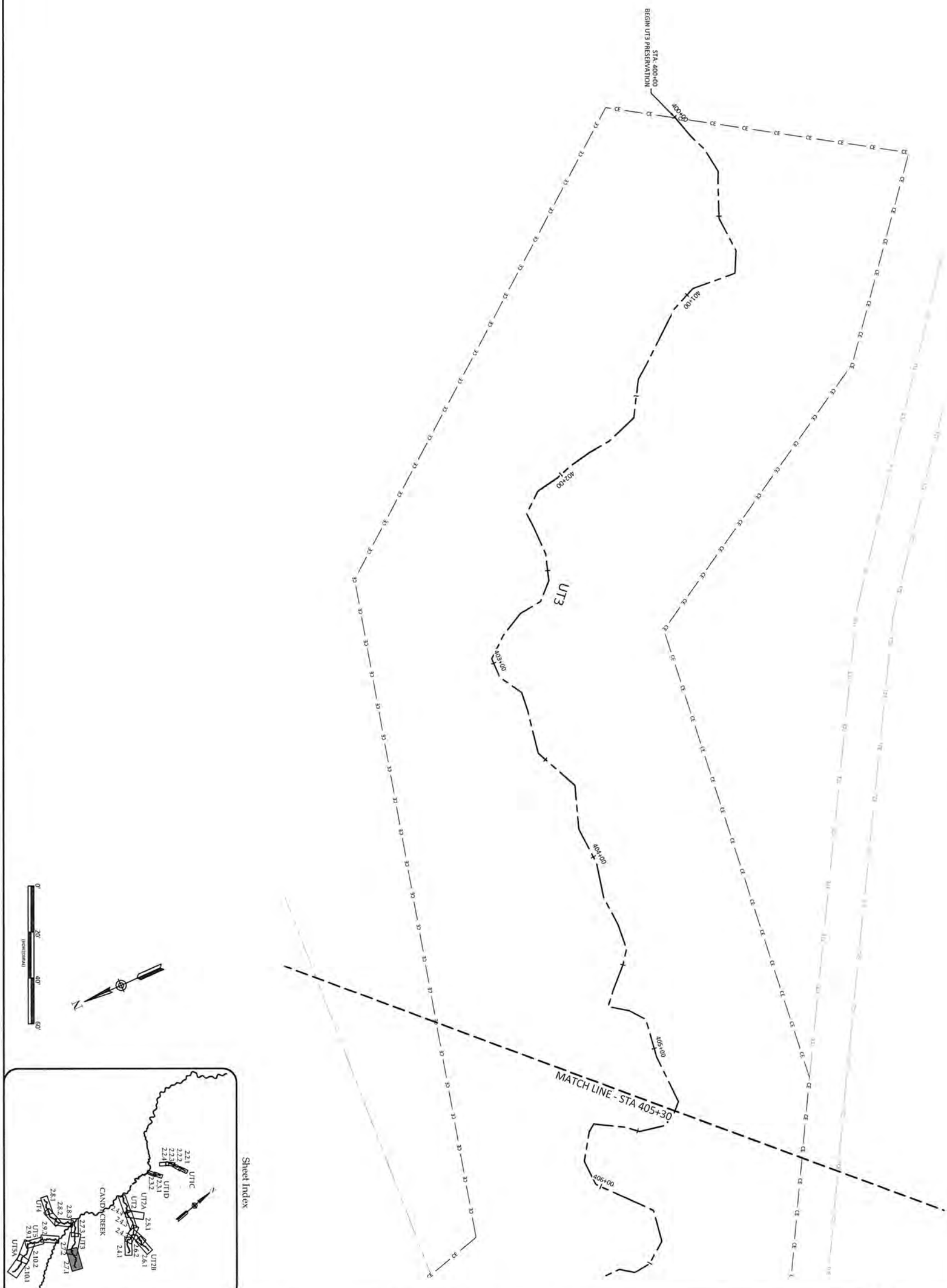
Charlotte, NC 28203
Tel: 704.332.7754
Fax: 704.332.3306
Firm License No. F-0831



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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

UT3
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER AARON S. EARLEY
6-2-17

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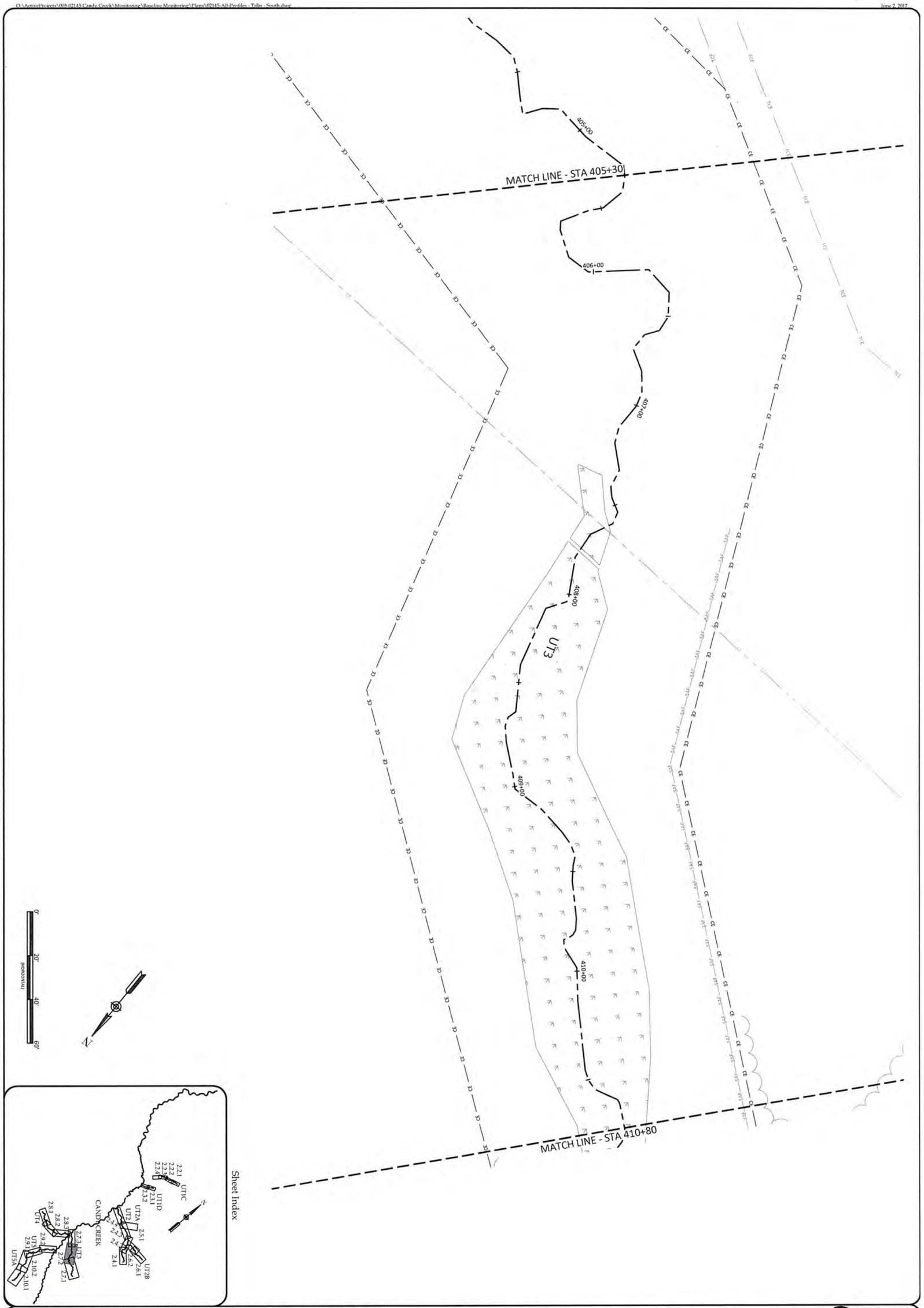
Charlotte, NC 28203
Tel: 704.332.7754
Fax: 704.332.3306
Firm License No. F-0831



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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

UT3
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 029340 AARON S. EARLEY
6-2-17

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Charlotte, NC 28203
Tel: 704.332.7754
Fax: 704.332.3306
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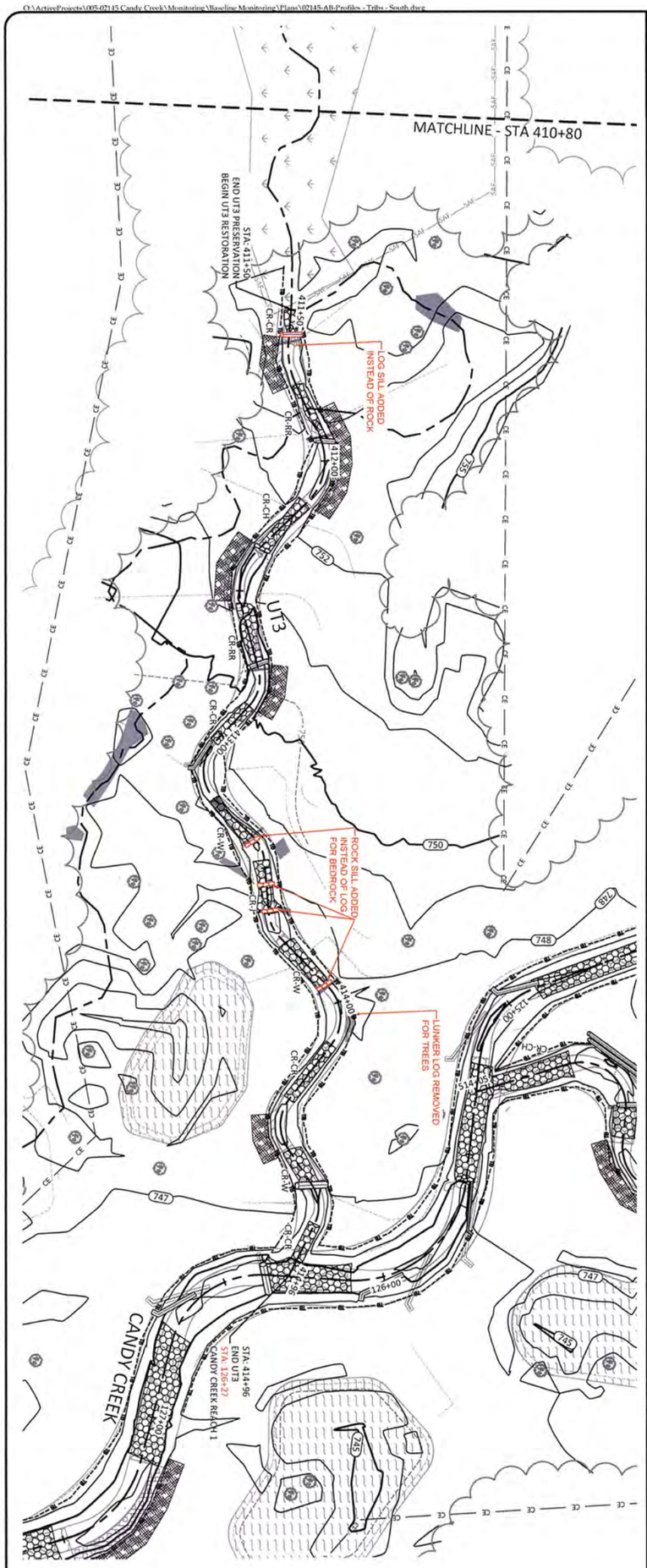

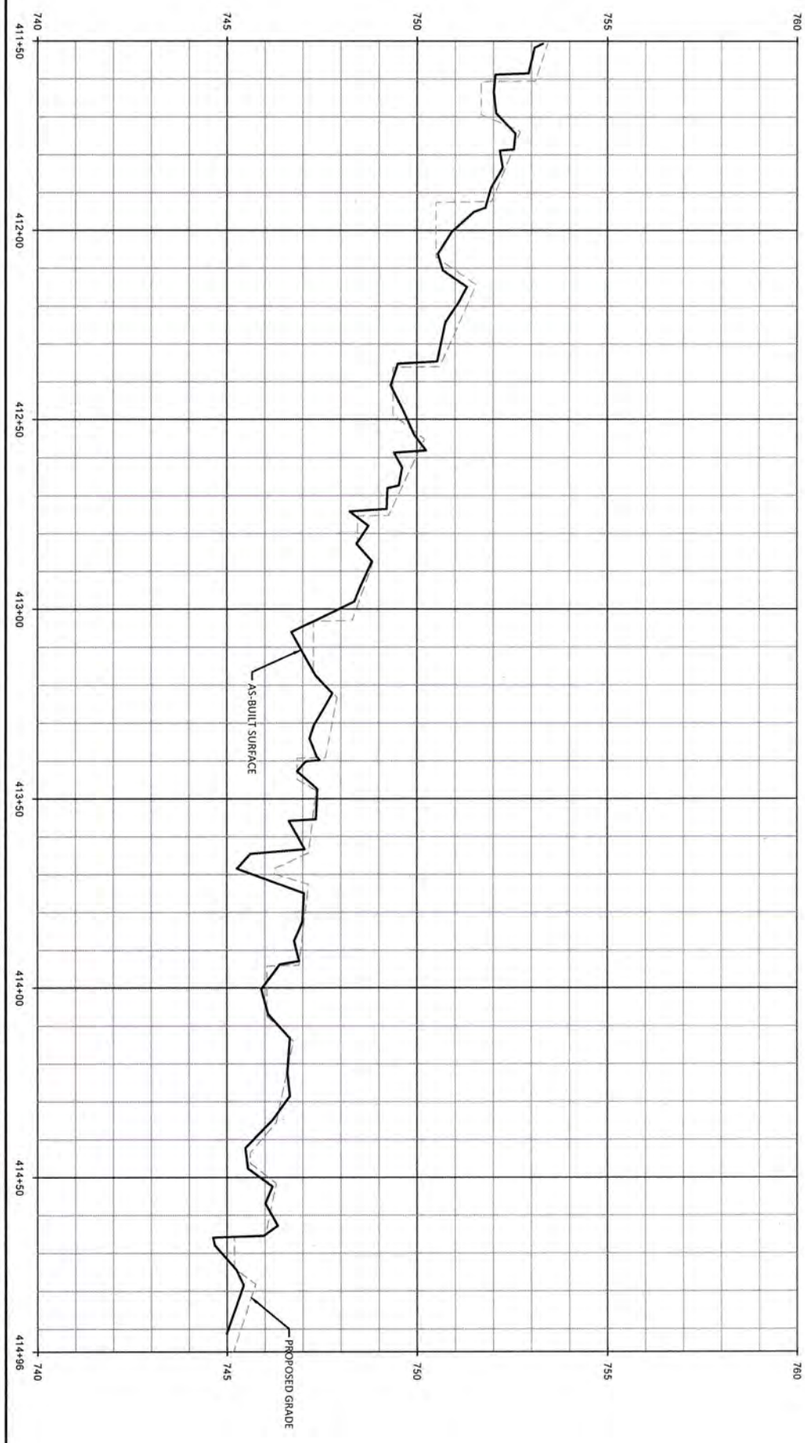

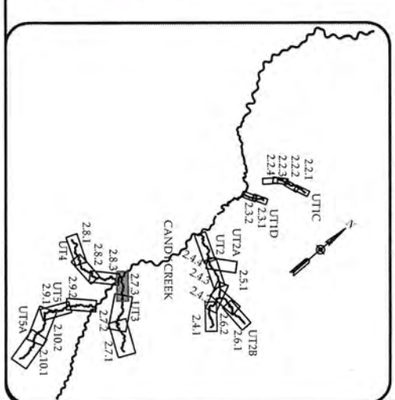

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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

UT3
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER AARON S. EARLEY
6-2-17

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Charlotte, NC 28203
Tel: 704.332.7754
Fax: 704.332.3306
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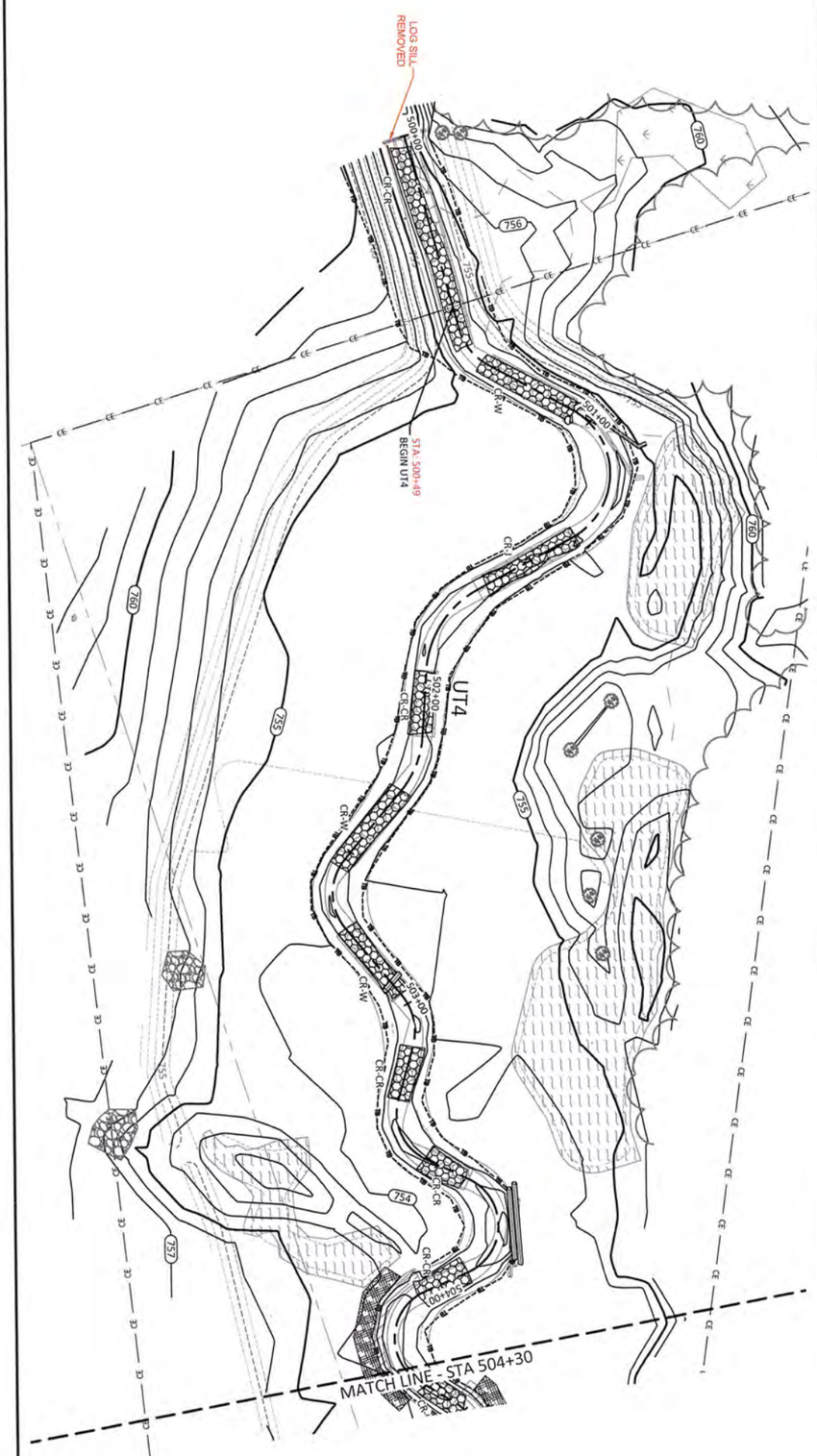

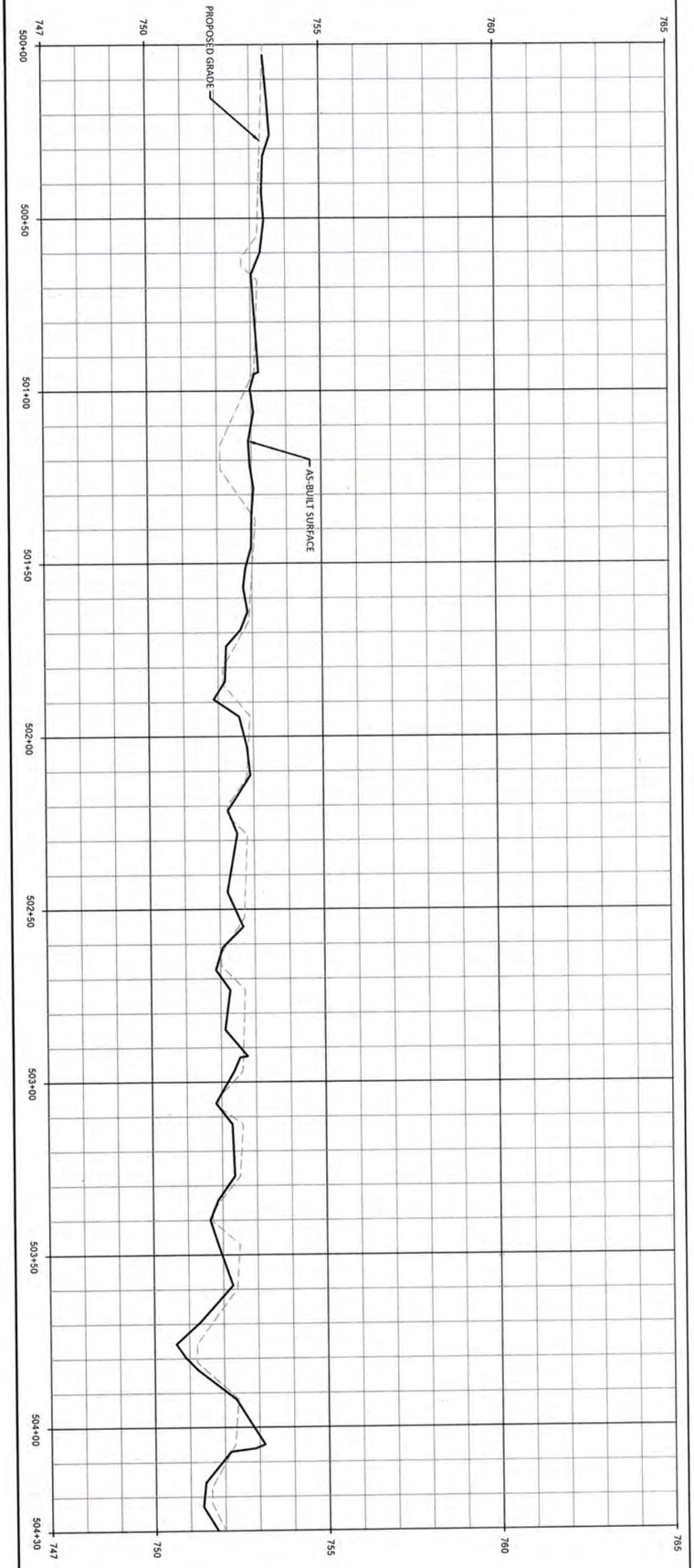

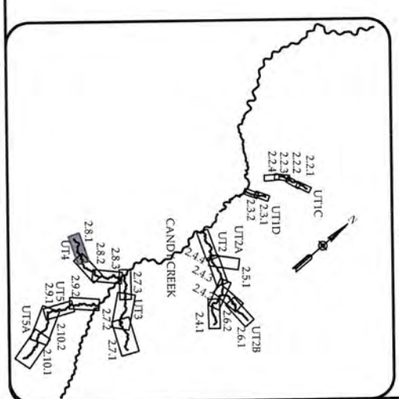

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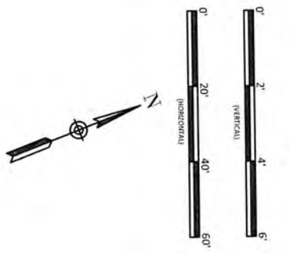

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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

UT4
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER AARON S. EARLEY
6-2-17

WILDLANDS ENGINEERING
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Charlotte, NC 28203
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Fax: 704.332.3306
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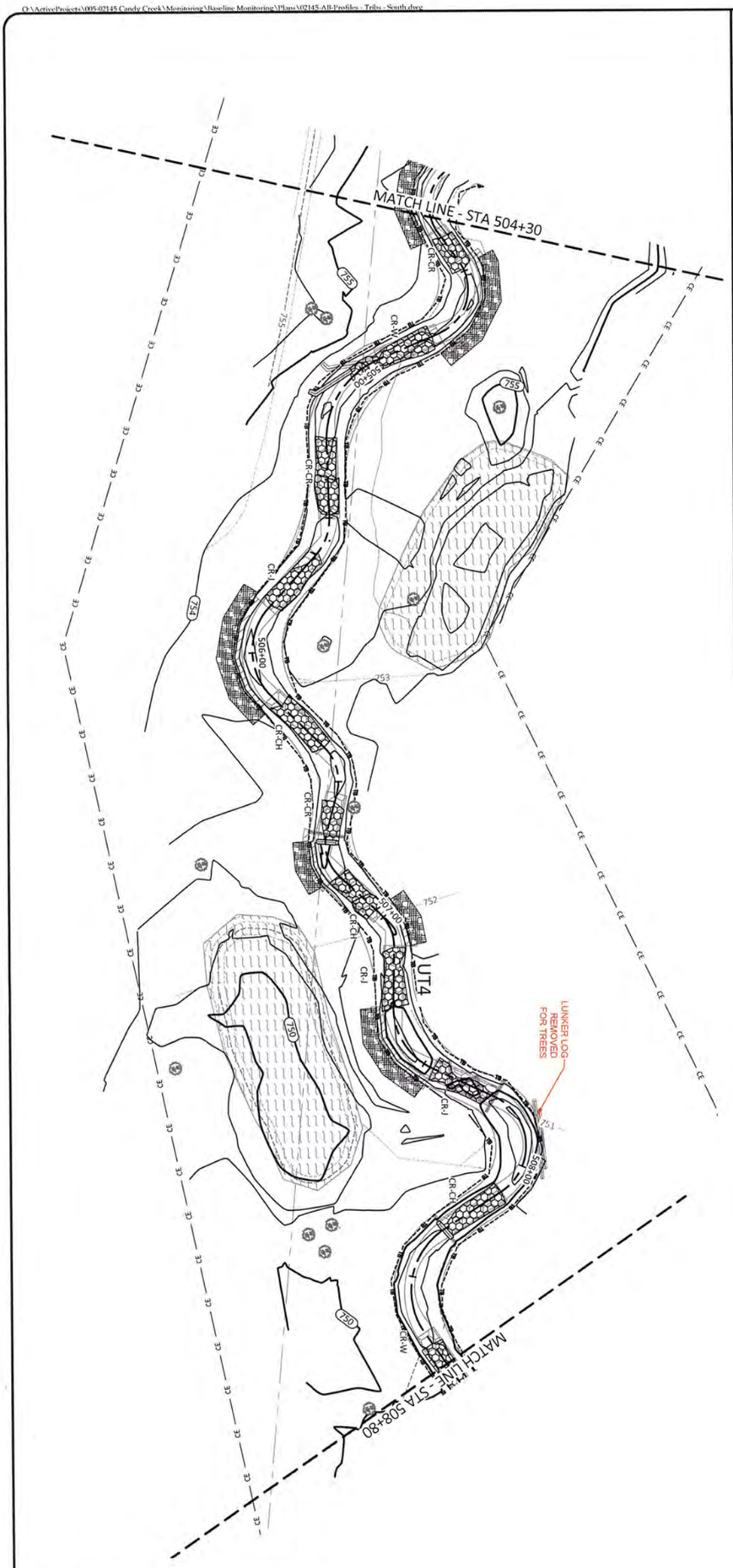

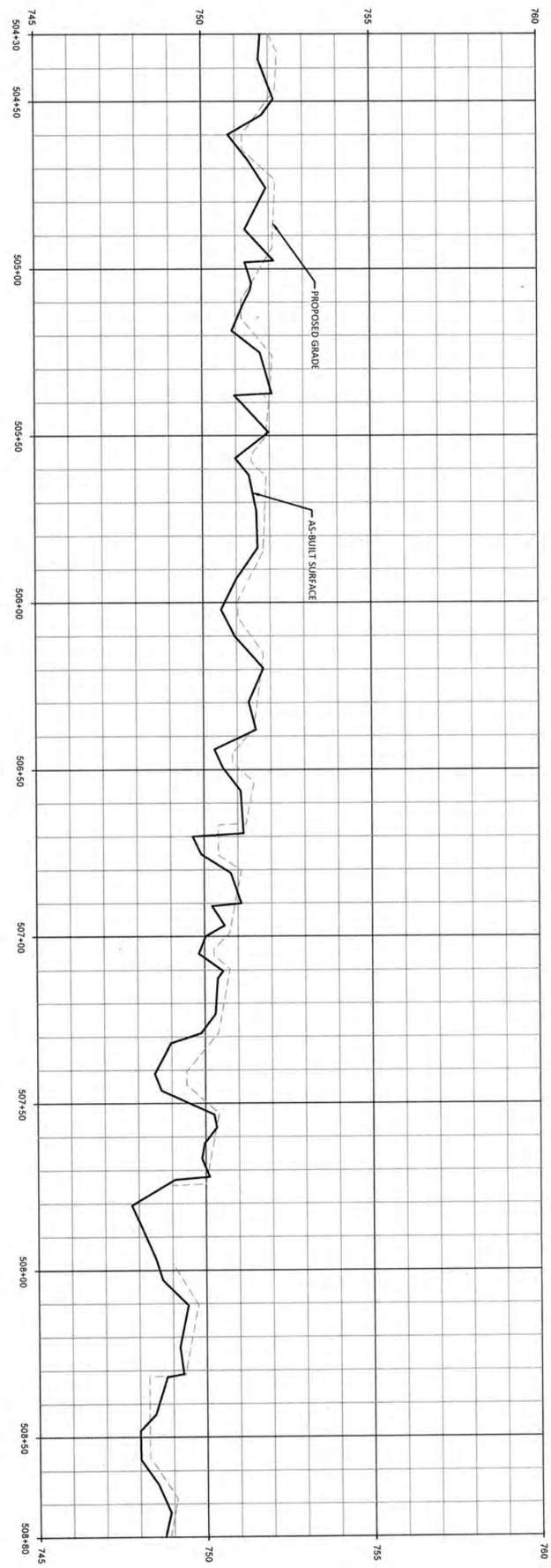

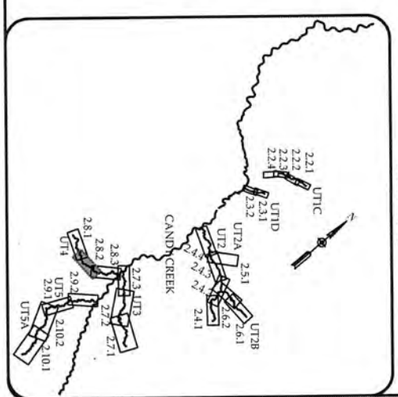

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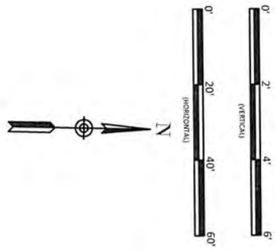

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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

UT4
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL SEAL 029346 ENGINEER AARON S. EARLEY
6-2-17

WILDLANDS ENGINEERING
1430 S. Mint St, Suite 104
Charlotte, NC 28203
Tel: 704.332.7754
Fax: 704.332.3306
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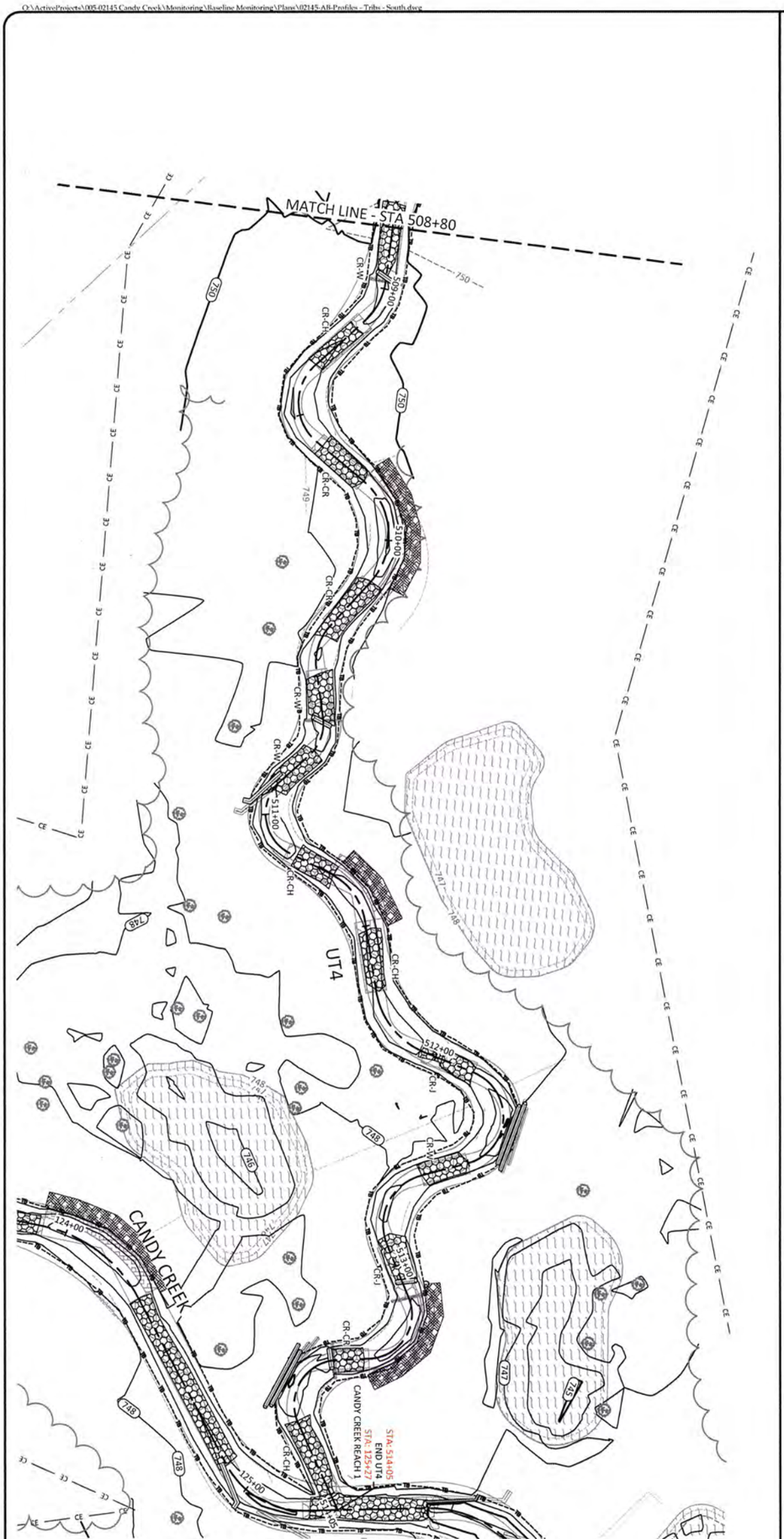
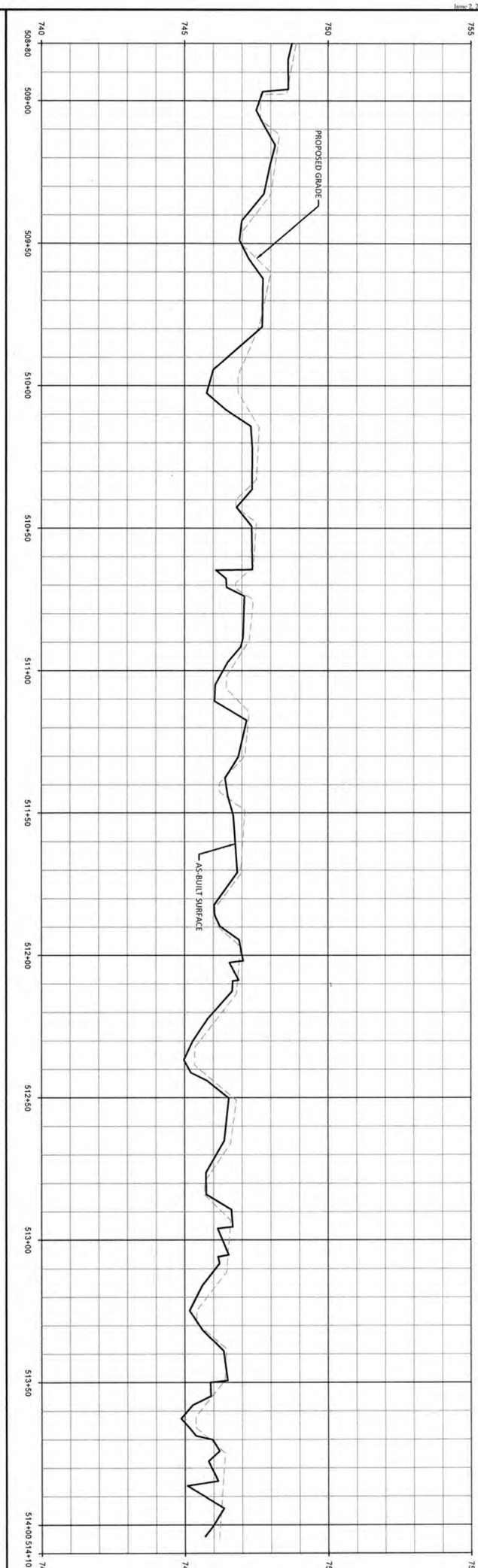
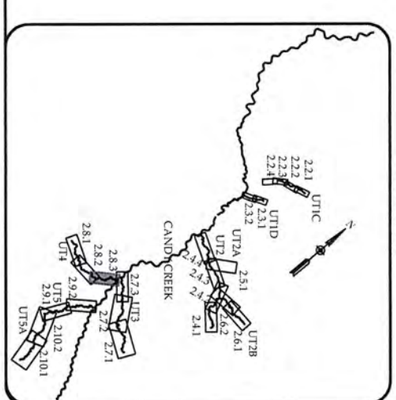
June 2, 2017







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0' 20' 40' 60' (HORIZONTAL)

0' 2' 4' 6' (VERTICAL)

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Checked By:	JL

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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

UT4
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL SEAL 029348 ENGINEER AARON S. EARLEY
6-2-17

WILDLANDS ENGINEERING
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Charlotte, NC 28203
Tel: 704.332.7754
Fax: 704.332.3306
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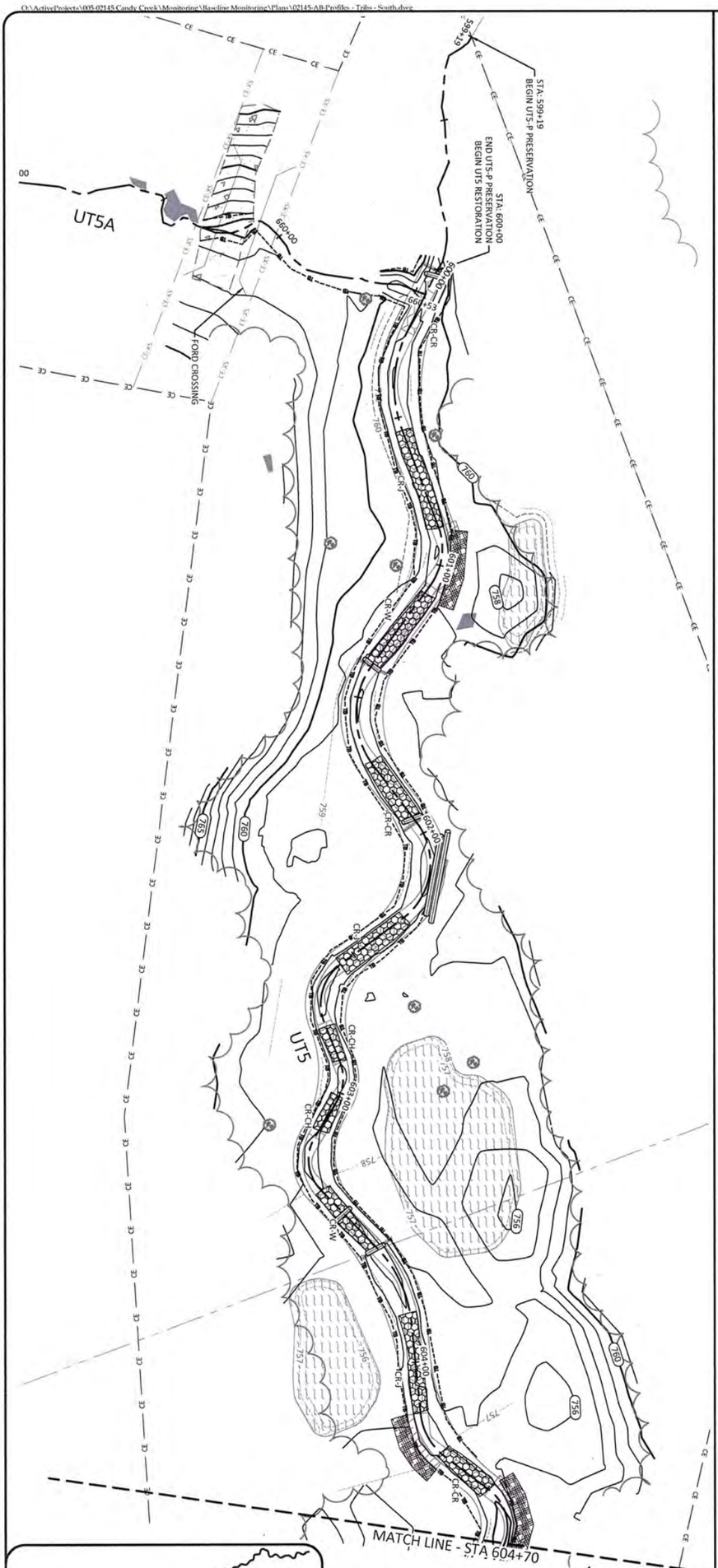

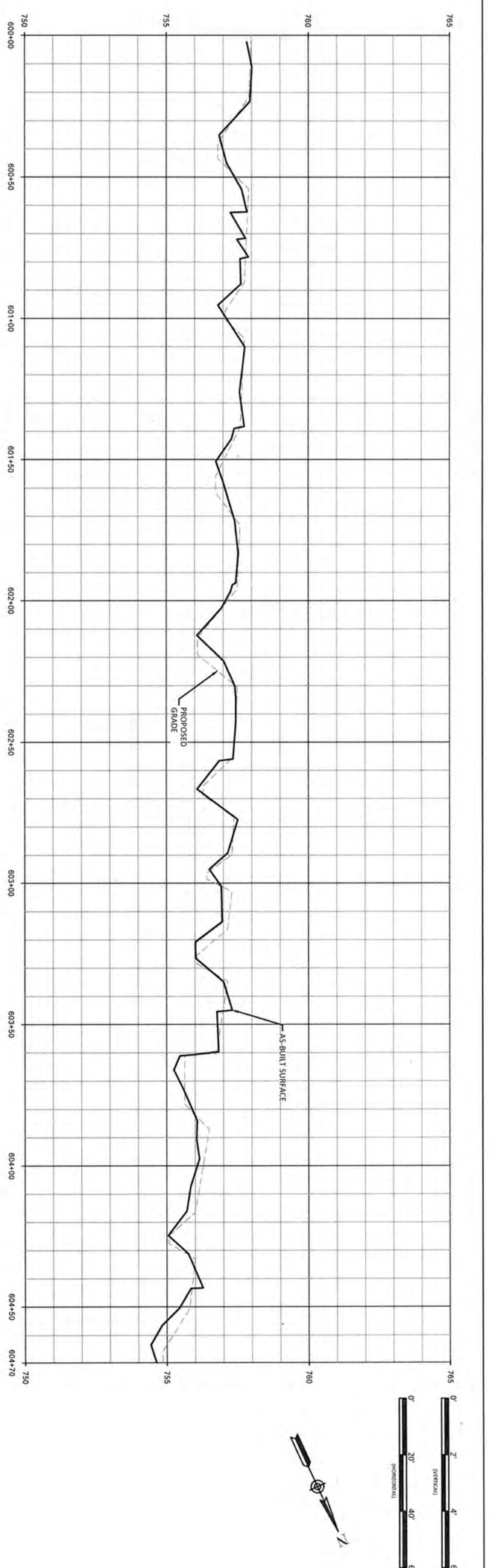

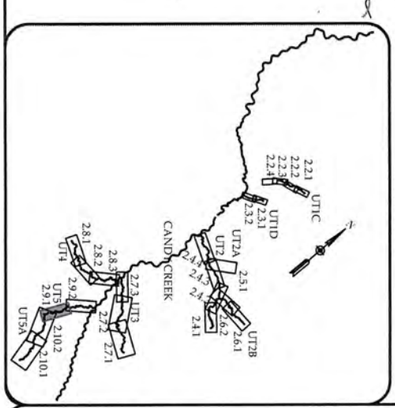

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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

UT5
Stream Plan and Profile

NORTH CAROLINA PROFESSIONAL SEAL 028840 ENGINEER AARON S. EARLEY
6-2-17

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Charlotte, NC 28203
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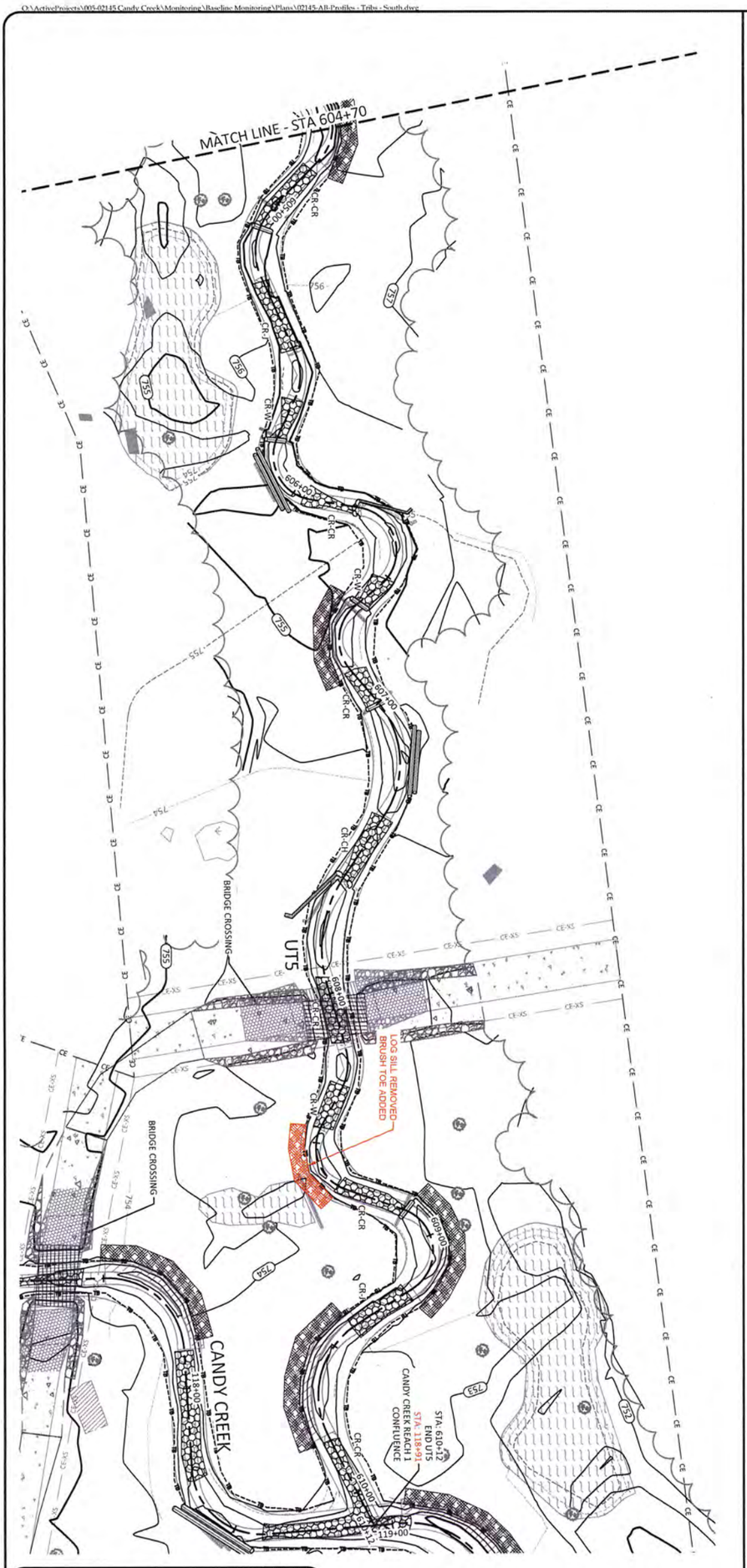

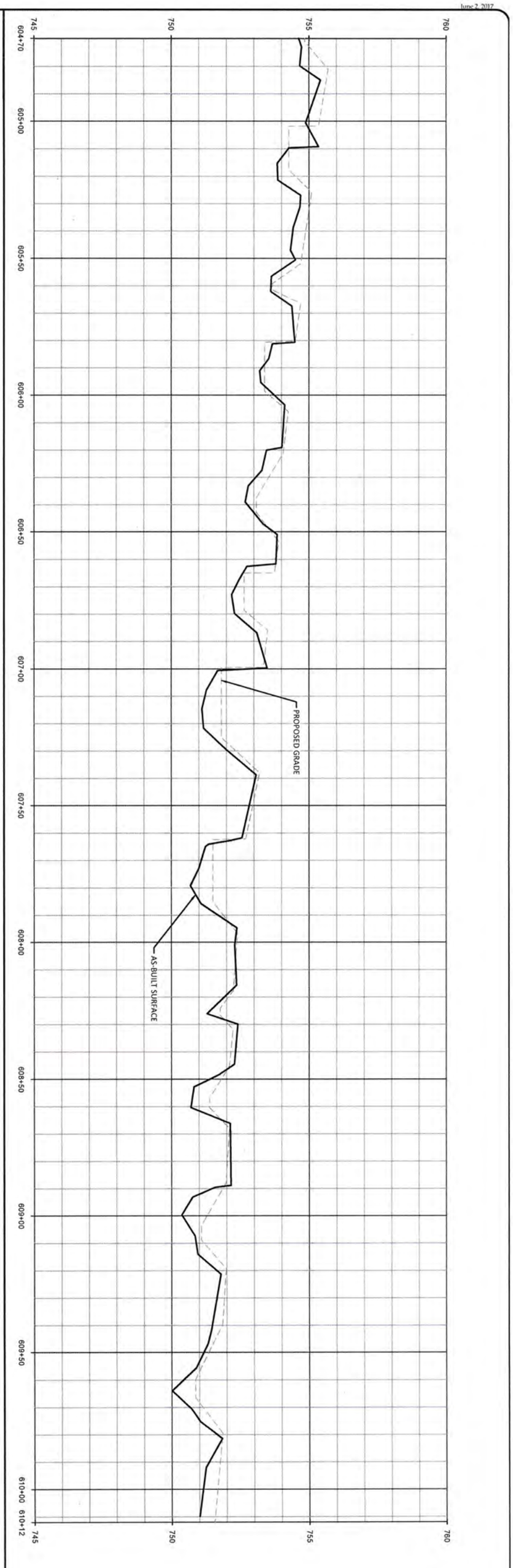

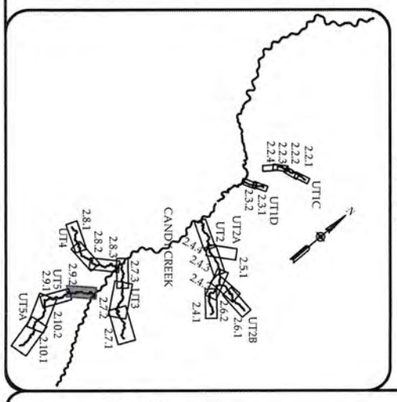

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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

UT5
Stream Plan and Profile

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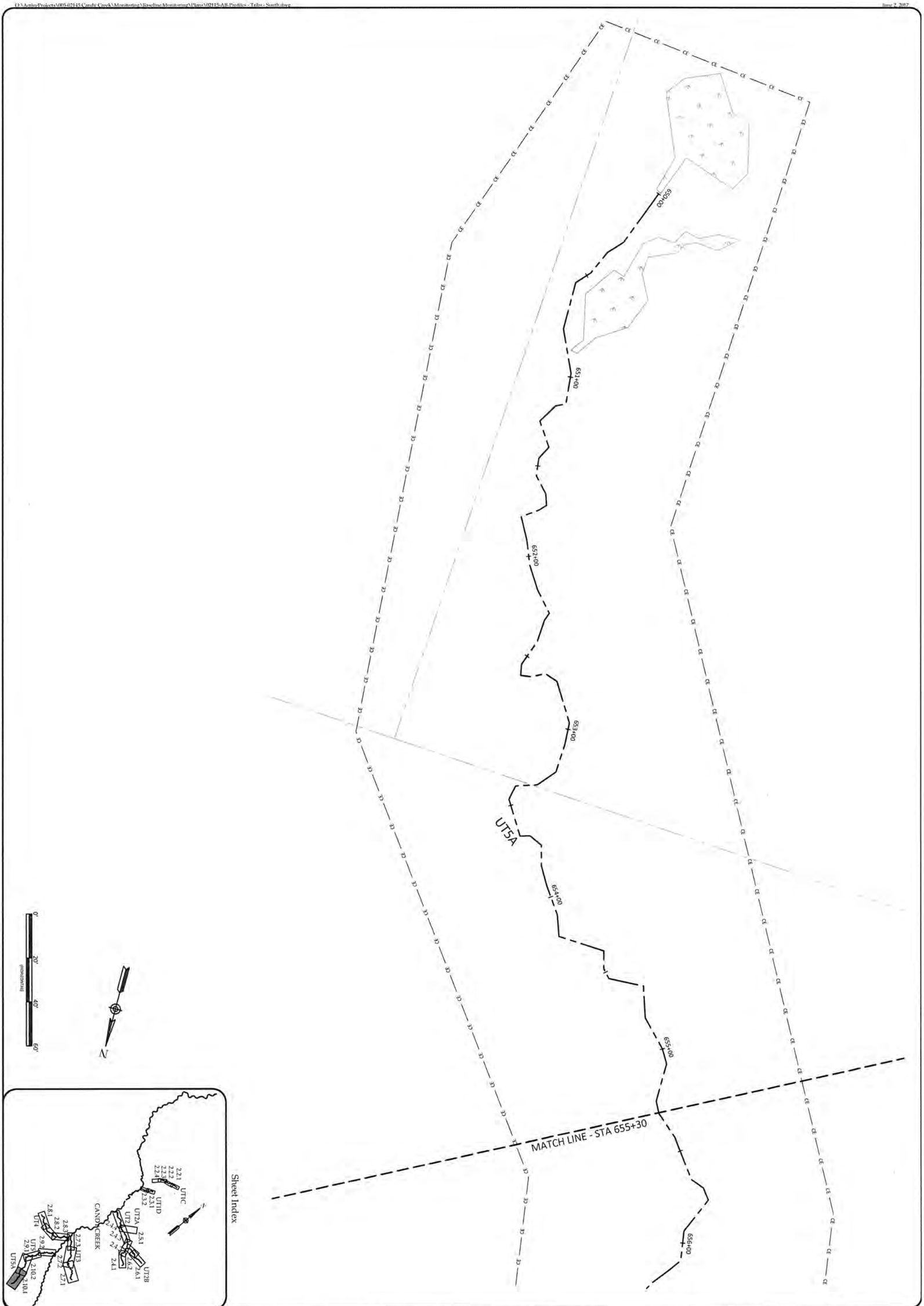

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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

UT5A
Stream Plan and Profile

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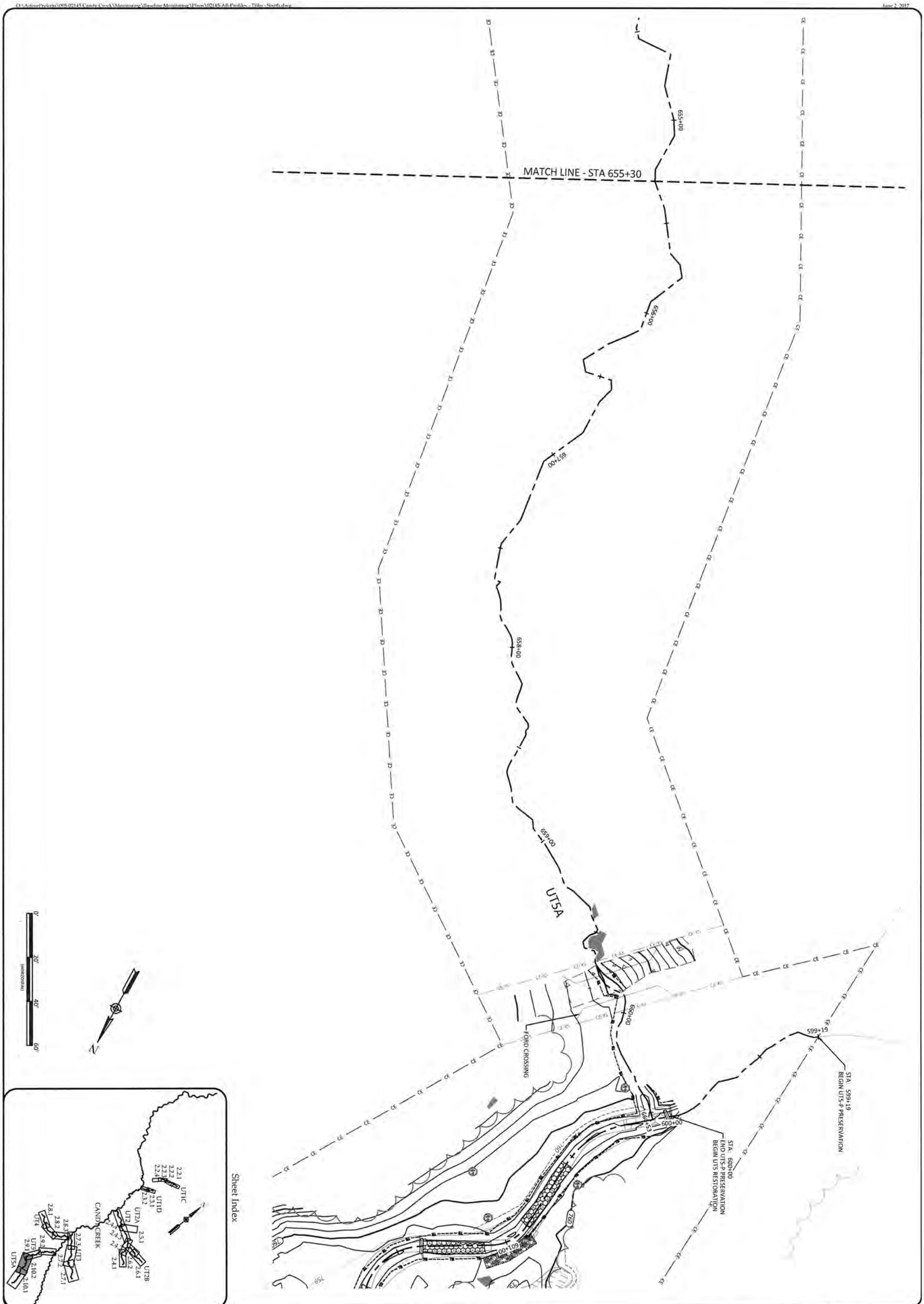

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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

UT5A
Stream Plan and Profile

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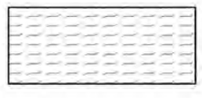
Streambank Planting Zone						
Live Stakes and Herbaceous Plugs						
Species	**Common Name**	**Max Spacing**	**Indiv. Spacing**	**Min. Size**	**Stratum**	**# of Stems**
Physocarpus opulifolius	Ninebark	8 ft.	2-8 ft.	0.5"-1.5" cal.	Shrub	20%
Cornus ammomum	Silky Dogwood	8 ft.	2-8 ft.	0.5"-1.5" cal.	Shrub	40%
Salix sericea	Silky Willow	8 ft.	2-8 ft.	0.5"-1.5" cal.	Shrub	40%
Juncus effusus	Common Rush	5 ft.	4-6 ft.	1.0"-2.0" plug	Herb	N\A
Carex alata	Broadwing Sedge	5 ft.	4-6 ft.	1.0"-2.0" plug	Herb	N\A
						100%

Hatching represents that Streambank planting occurs along the stream. See Detail 4, Sheet 5.8 for planting specifics.

Buffer Planting Zone						
Bare Root						
Species	**Common Name**	**Max Spacing**	**Indiv. Spacing**	**Min. Caliper Size**	**Stratum**	**# of Stems**
~~*Alnus serrulata*~~	~~Tag Alder~~	~~12 ft.~~	~~6-12 ft.~~	~~0.25"-1.0"~~	~~Canopy~~	~~15%~~
Quercus phellos	Willow Oak	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	~~15%~~ 20%
Platanus occidentalis	Sycamore	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	15%
Betula nigra	River Birch	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	15%
Quercus pagoda	Cherrybark Oak	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	~~10%~~ 20%
Quercus michauxii	Swamp Chestnut Oak	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	15%
Fraxinus pennsylvanica	Green Ash	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	15%
Carpinus caroliniana	Ironwood	18 ft.	6-18 ft.	0.25"-1.0"	Shrub	*
Viburnum dentatum	Arrowwood Viburnum	18 ft.	6-18 ft.	0.25"-1.0"	Shrub	*
						100%

*Within the existing wooded canopy, Ironwood and Arrowwood Viburnum are to be planted in lieu of Sycamore and River Birch.

Vernal Pool Planting Zone						
Herbaceous Plugs						
Species	**Common Name**	**Max Spacing**	**Indiv. Spacing**	**Min. Size**	**Stratum**	**# of Stems**
Colonagrostis canadensis	Bluejoint Grass	5 ft.	3-5 ft.	1.0"-2.0" plug	Herb	30%
Carex alata	Broadwing Sedge	5 ft.	3-5 ft.	1.0"-2.0" plug	Herb	35%
Juncus effusus	Common Rush	5 ft.	3-5 ft.	1.0"-2.0" plug	Herb	35%
						100%



All disturbed areas within conservation easement and all internal crossings.

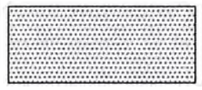
Riparian seeding only within internal crossings.

Permanent Riparian Seeding				
Pure Live Seed (20 lbs/ acre)				
Approved Date	**Species Name**	**Common Name**	**Stratum**	**Density (lbs/acre)**
All Year	*Panicum rigidulum*	Redtop Panicgrass	Herb	1.5
All Year	*Agrostis hyemalis*	Winter Bentgrass	Herb	1.5
All Year	*Chasmanthium latifolium*	Indian Woodoats	Herb	1.5
All Year	*Rudbeckia hirta*	Blackeyed Susan	Herb	1.0
All Year	*Coreopsis lanceolata*	Lanceleaf Coreopsis	Herb	0.2
All Year	*Carex vulpinoidea*	Fox Sedge	Herb	1.5
All Year	*Panicum clandestinum*	Deertongue	Herb	3.0
All Year	*Elymus virginicus*	Virginia Wild Rye	Herb	2.5
All Year	*Panicum virgatum*	Switchgrass	Herb	3.5
All Year	*Schizachyrium scoparium*	Little Bluestem	Herb	2.5
All Year	*Asclepias syrica*	Common Milkweed	Herb	0.5
All Year	*Lobelia cardinalis L.*	Cardinal Flower	Herb	0.4
All Year	*Eupatorium perfoliatum*	Boneset	Herb	0.2
All Year	*Liatris spicata*	Dense Blazing Star	Herb	0.2

All disturbed areas.

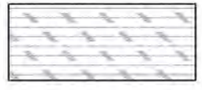
Temporary Seeding				
Pure Live Seed				
Approved Date	**Species Name**	**Common Name**	**Stratum**	**Density (lbs/acre)**
Aug 15 - May 1	*Secale cereale*	Rye Grain	Herb	140
May 1 - Aug 15	*Setaria italica*	German Millet	Herb	50

Non-Pasture disturbed areas.



Stabilization Seeding Outside Easement				
Approved Date	**Species Name**	**Stratum**	**Common Name**	**Density (lbs/acre)**
All Year	*Festuca arundinacea*	Herb	Tall Fescue	80

Pasture areas outside easement.



Pasture Seeding				
Approved Date	**Species Name**	**Stratum**	**Common Name**	**Density (lbs/acre)**
All Year	*Festuca arundinacea*	Herb	Tall Fescue	80
All Year	*Trifolium repens*	Herb	White Clover	8

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6-2-17

Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

Plant Lists
Planting Plan

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June 2, 2017

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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

Candy Creek Reach 1
Planting Plan

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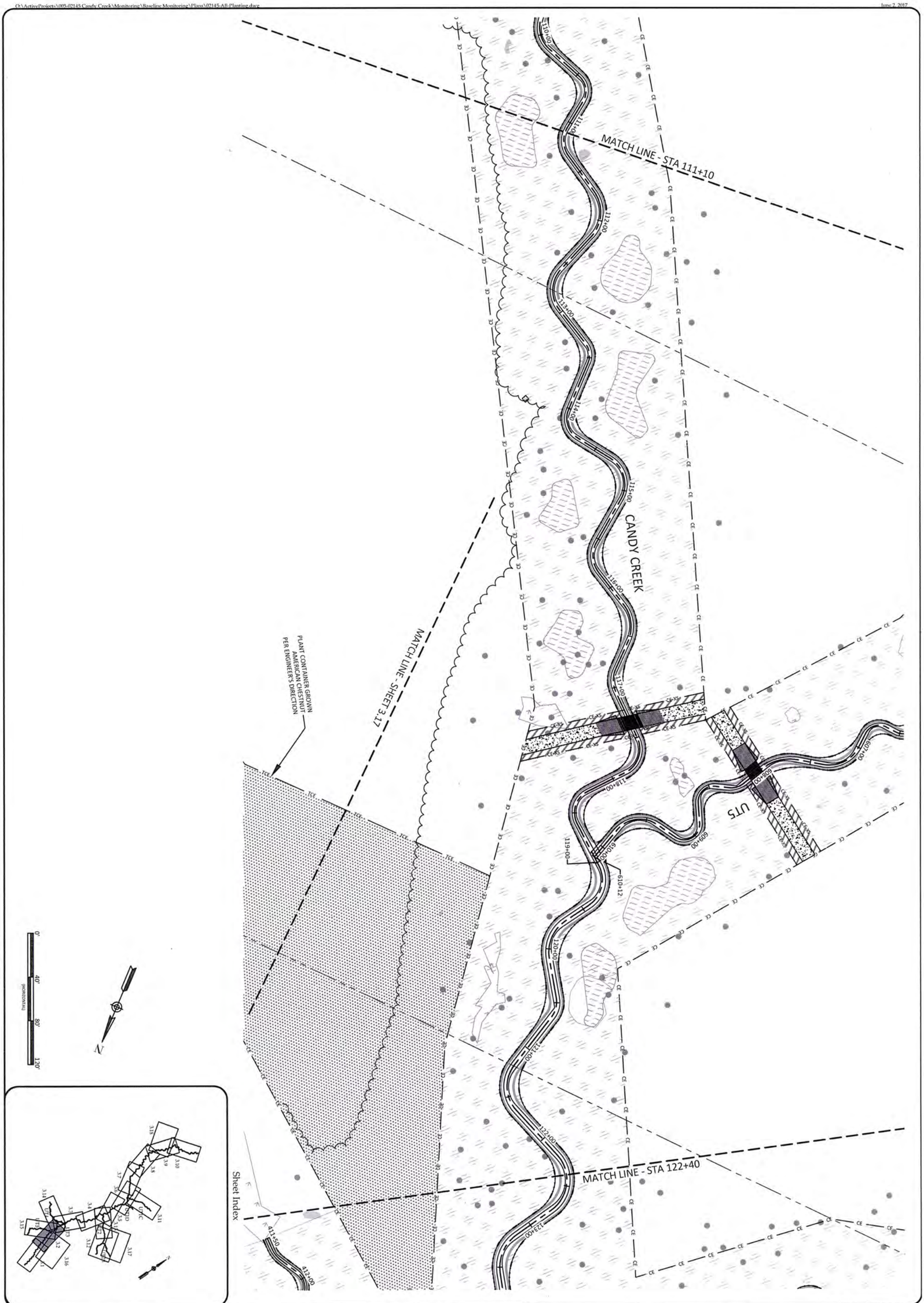

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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

Candy Creek Reach 1
Planting Plan

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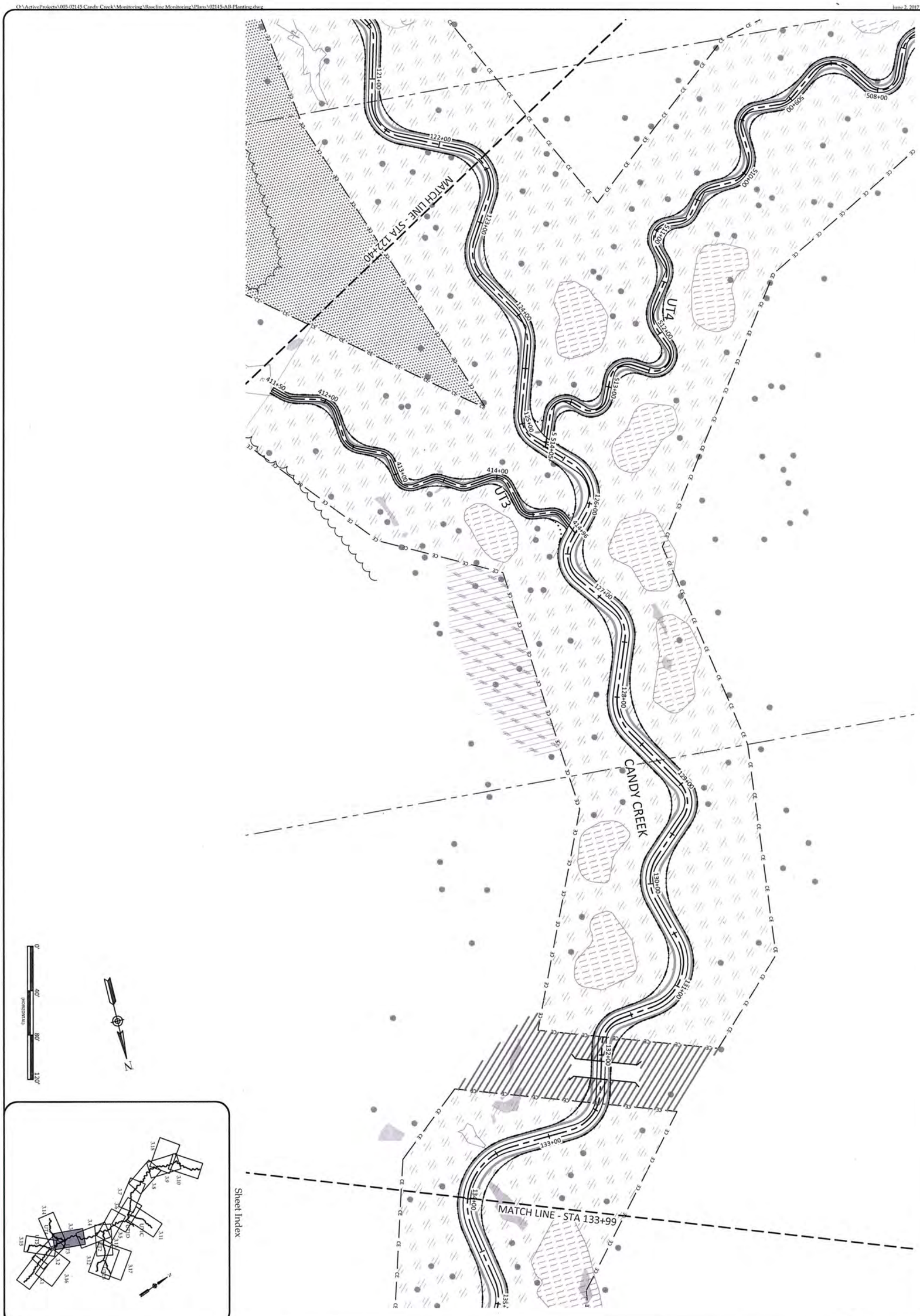

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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

Candy Creek Reach 1 & 2
Planting Plan

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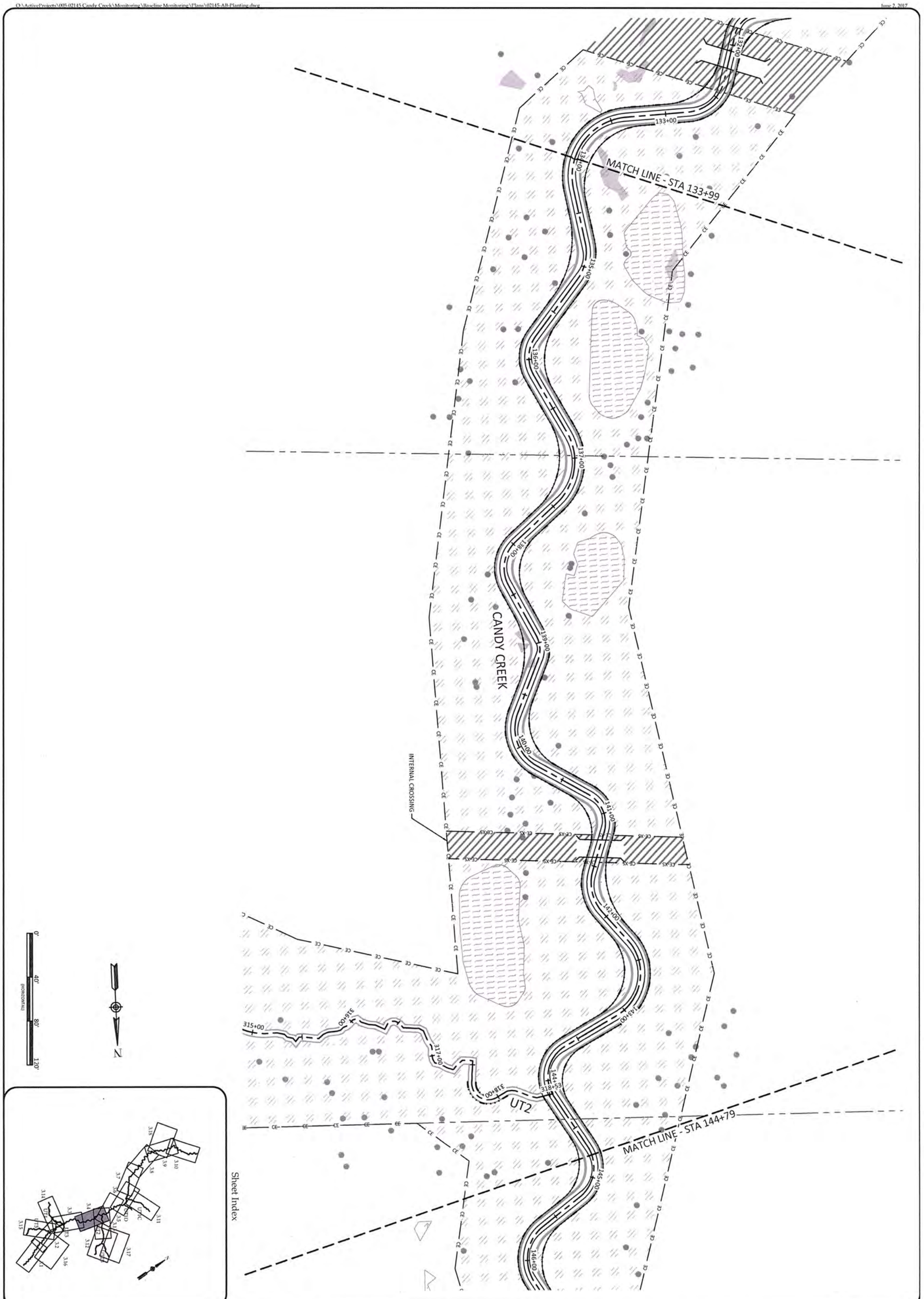

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Candy Creek Reach 2
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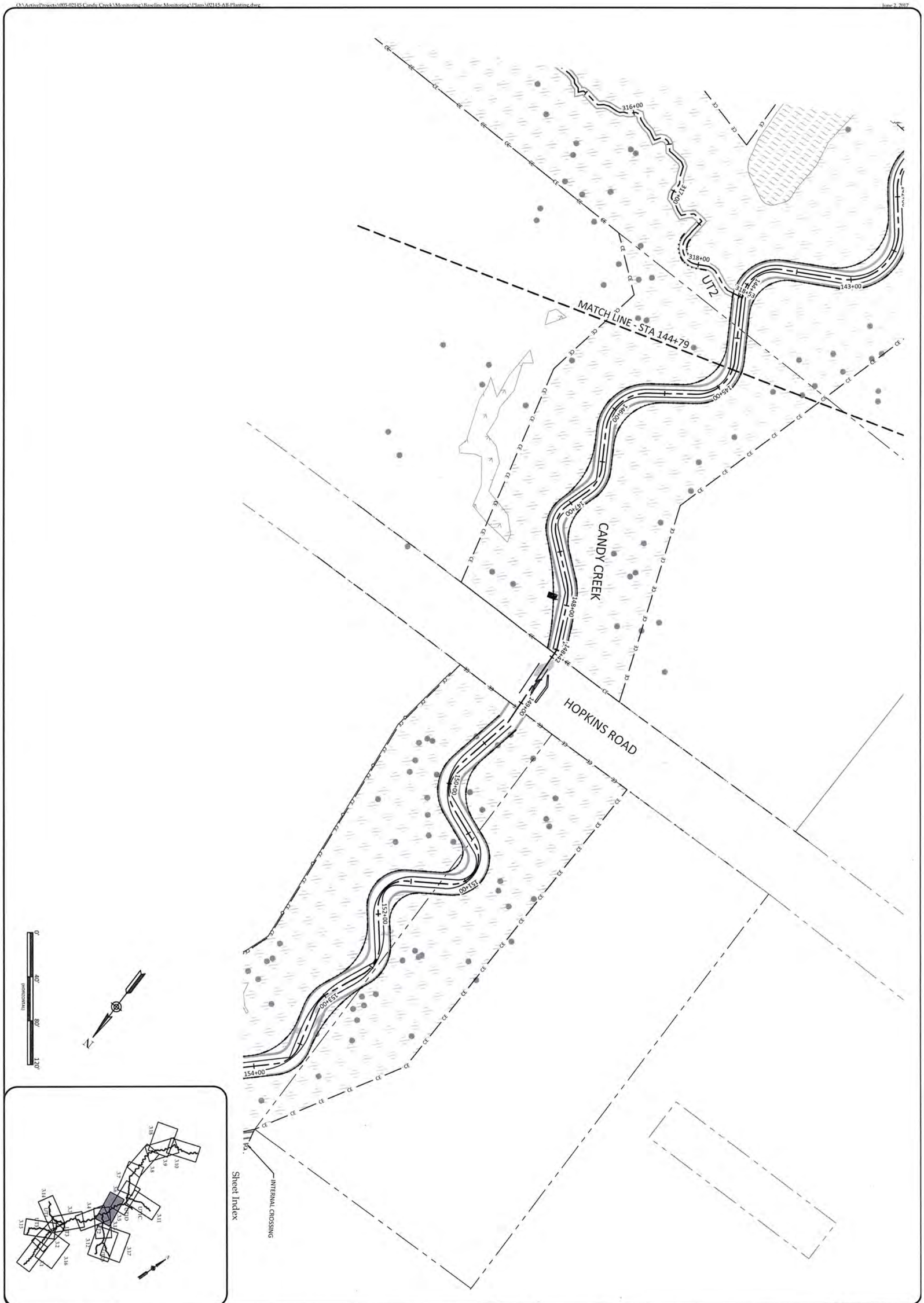

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Candy Creek Mitigation Site-Record Drawings
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Candy Creek Reach 2 & 3
Planting Plan

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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

Candy Creek Reach 3
Planting Plan

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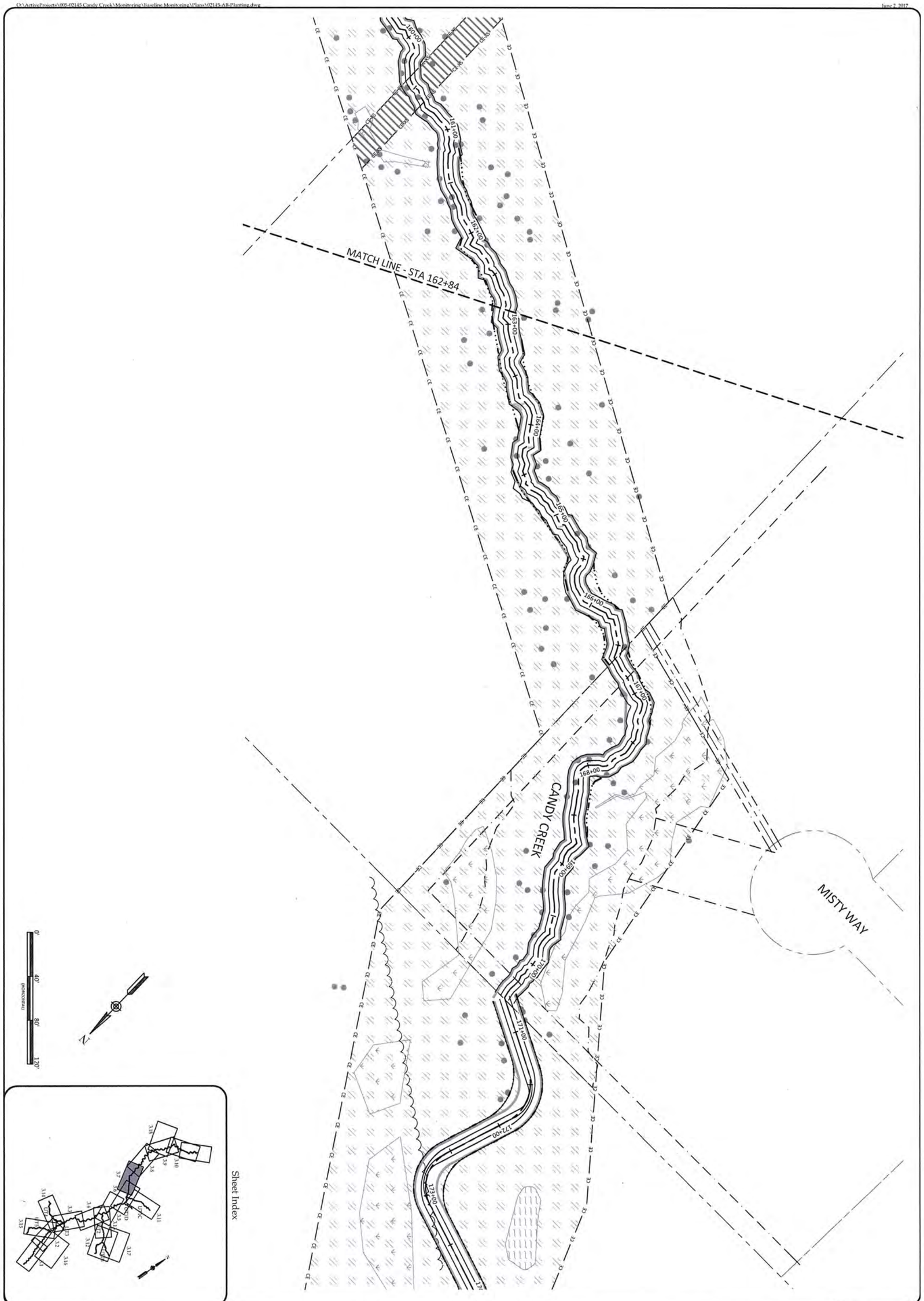

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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

Candy Creek Reach 3 & 4
Planting Plan

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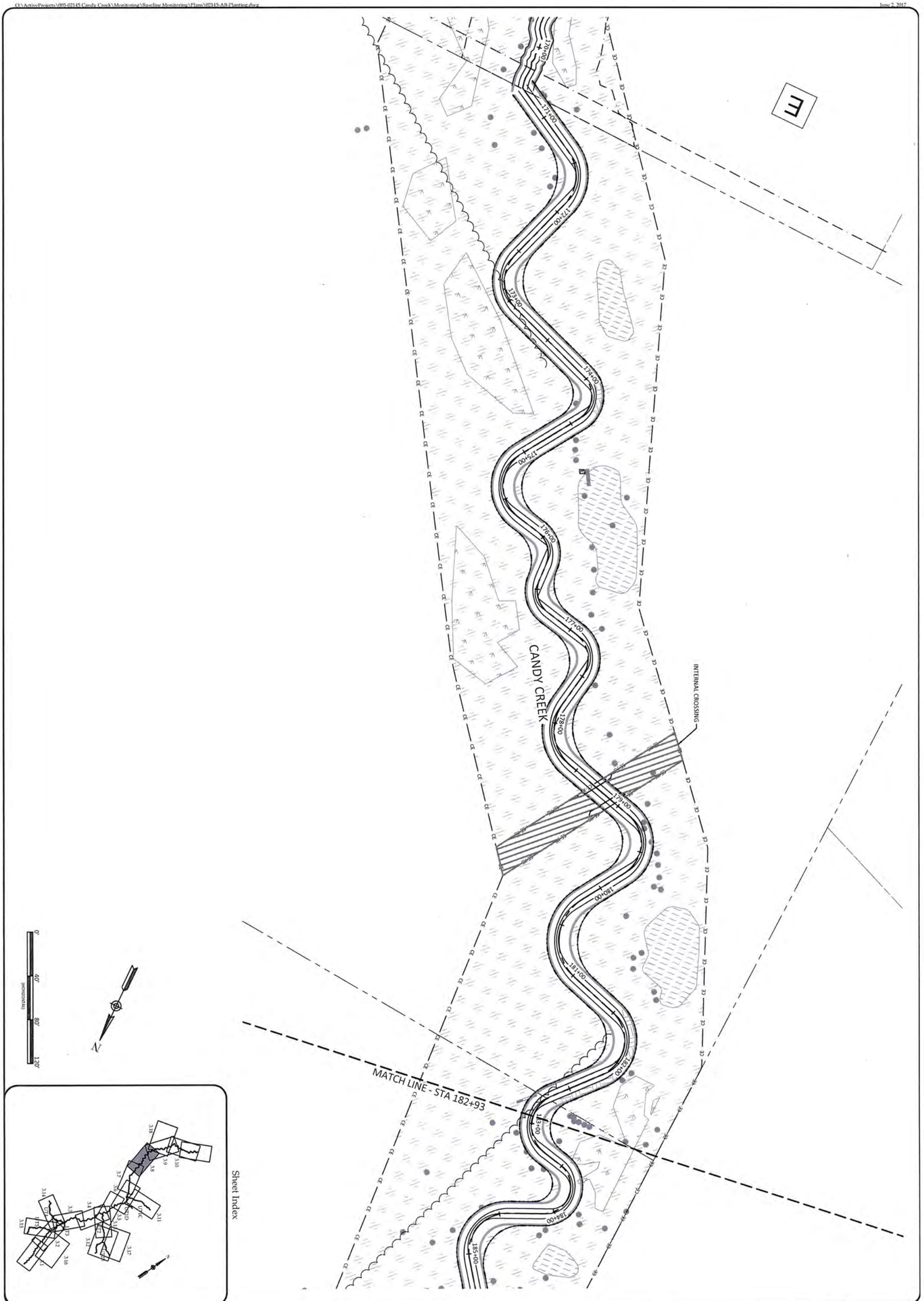

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Candy Creek Reach 4
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Candy Creek Reach 4
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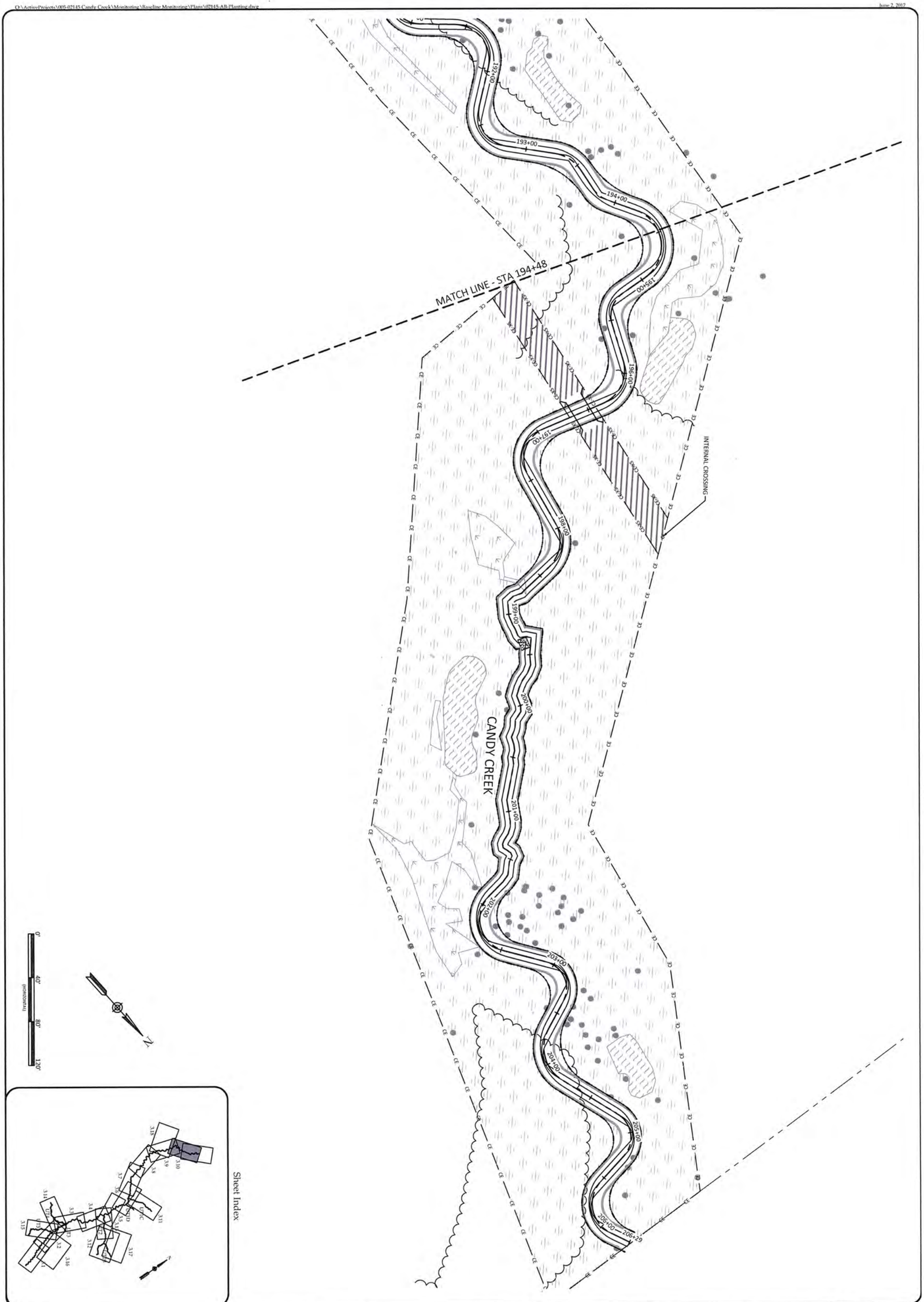

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Guilford County, North Carolina

Candy Creek Reach 4
Planting Plan

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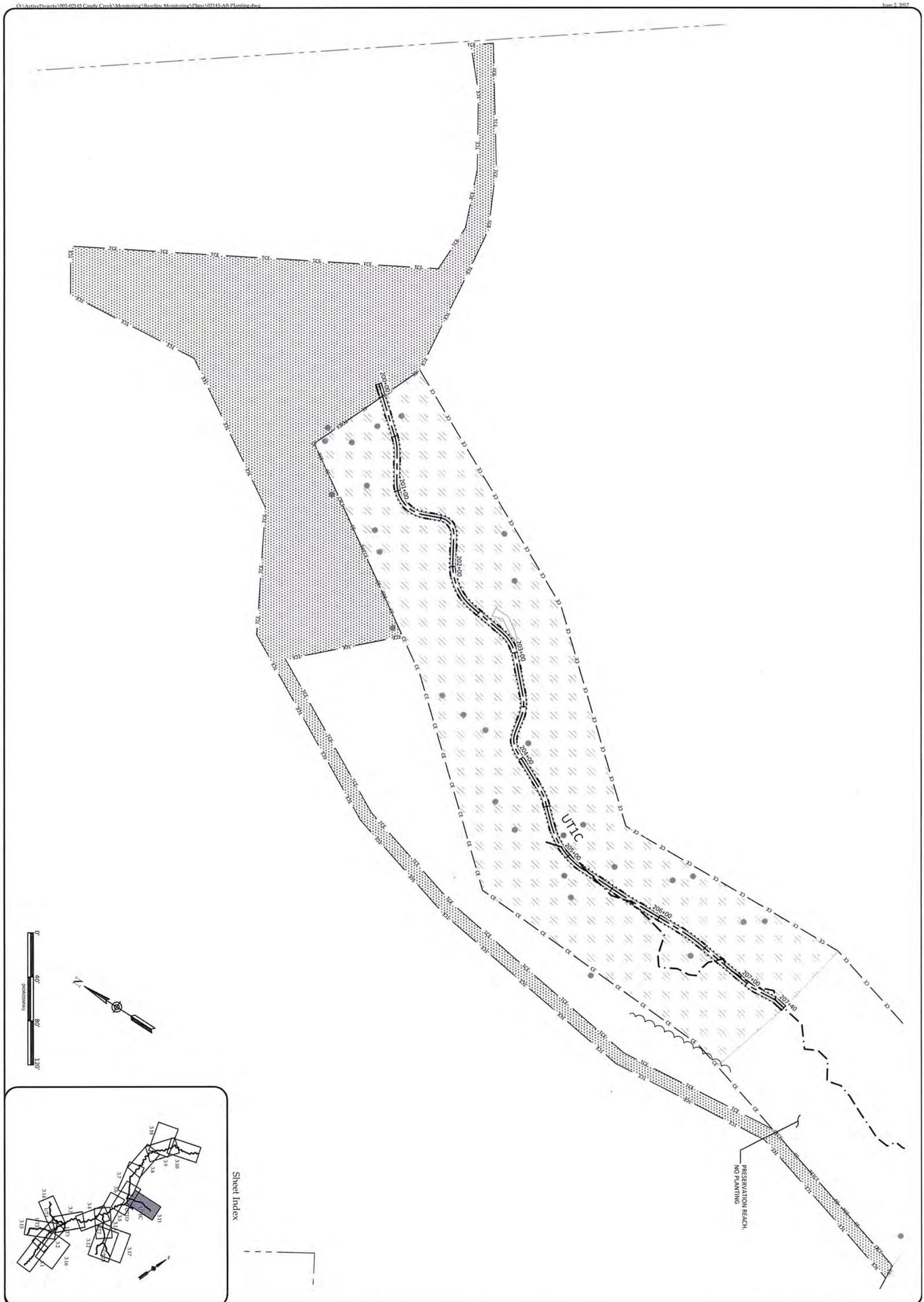

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UT1C
Planting Plan

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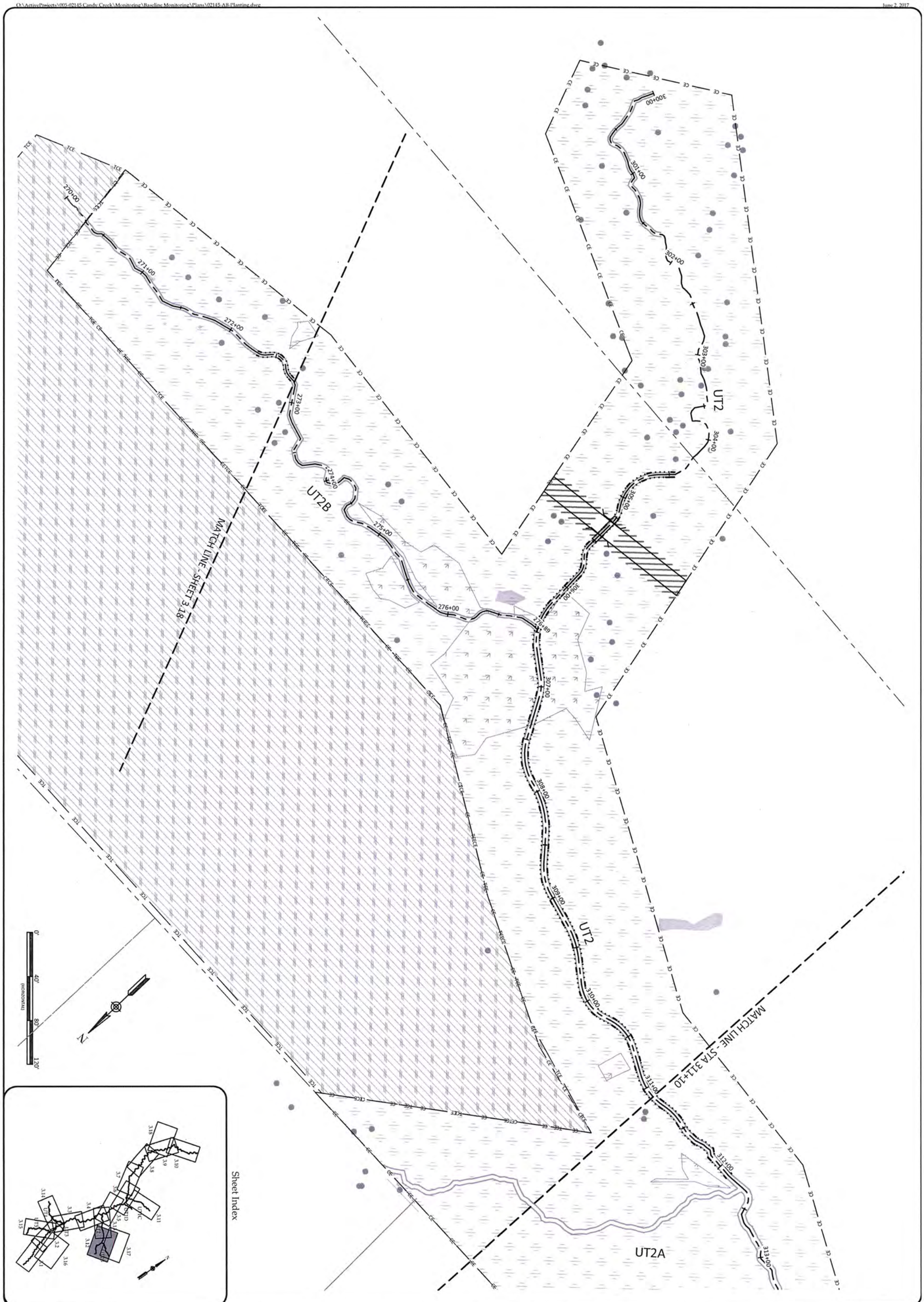

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Guilford County, North Carolina

UT2
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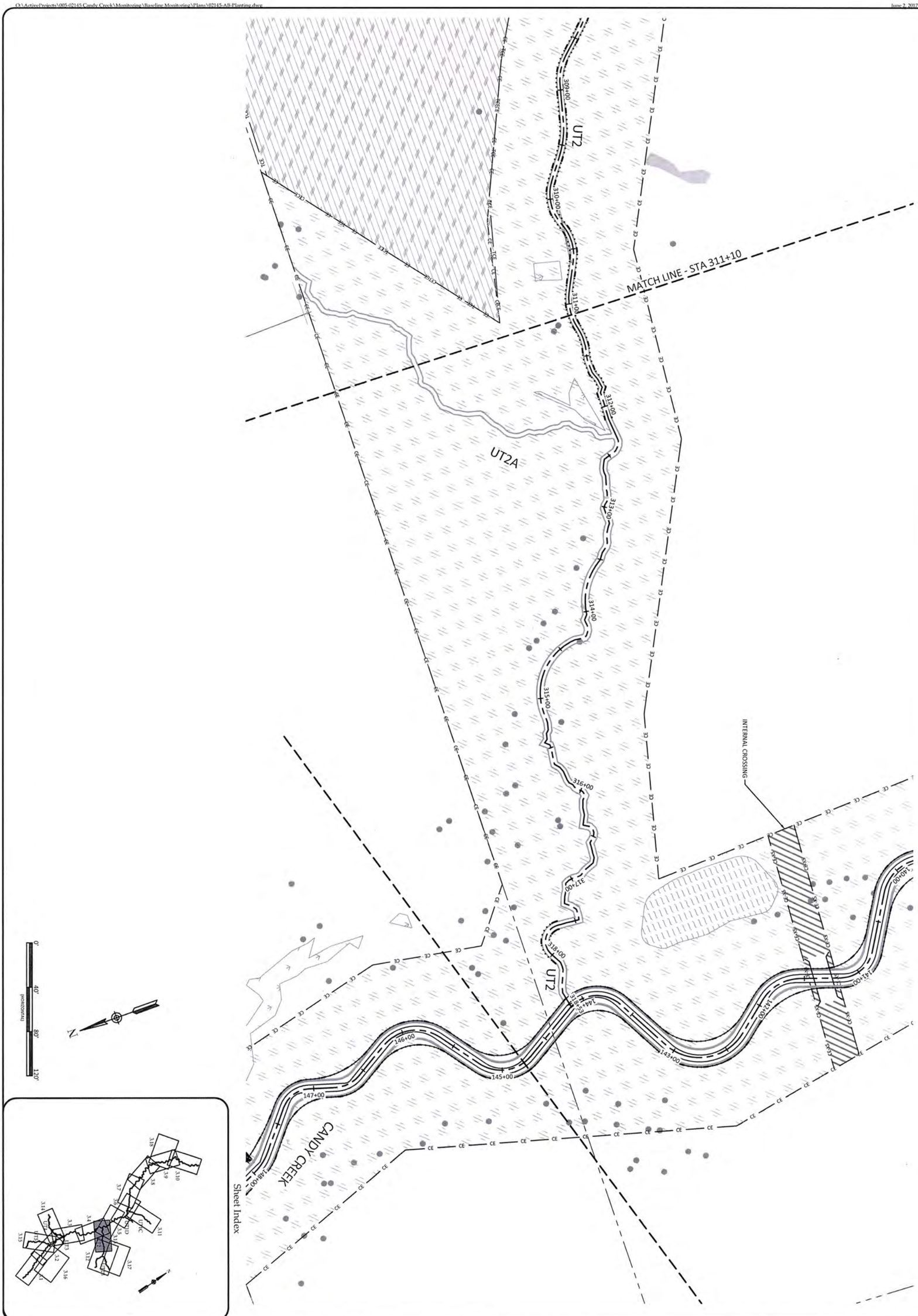

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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

UT2
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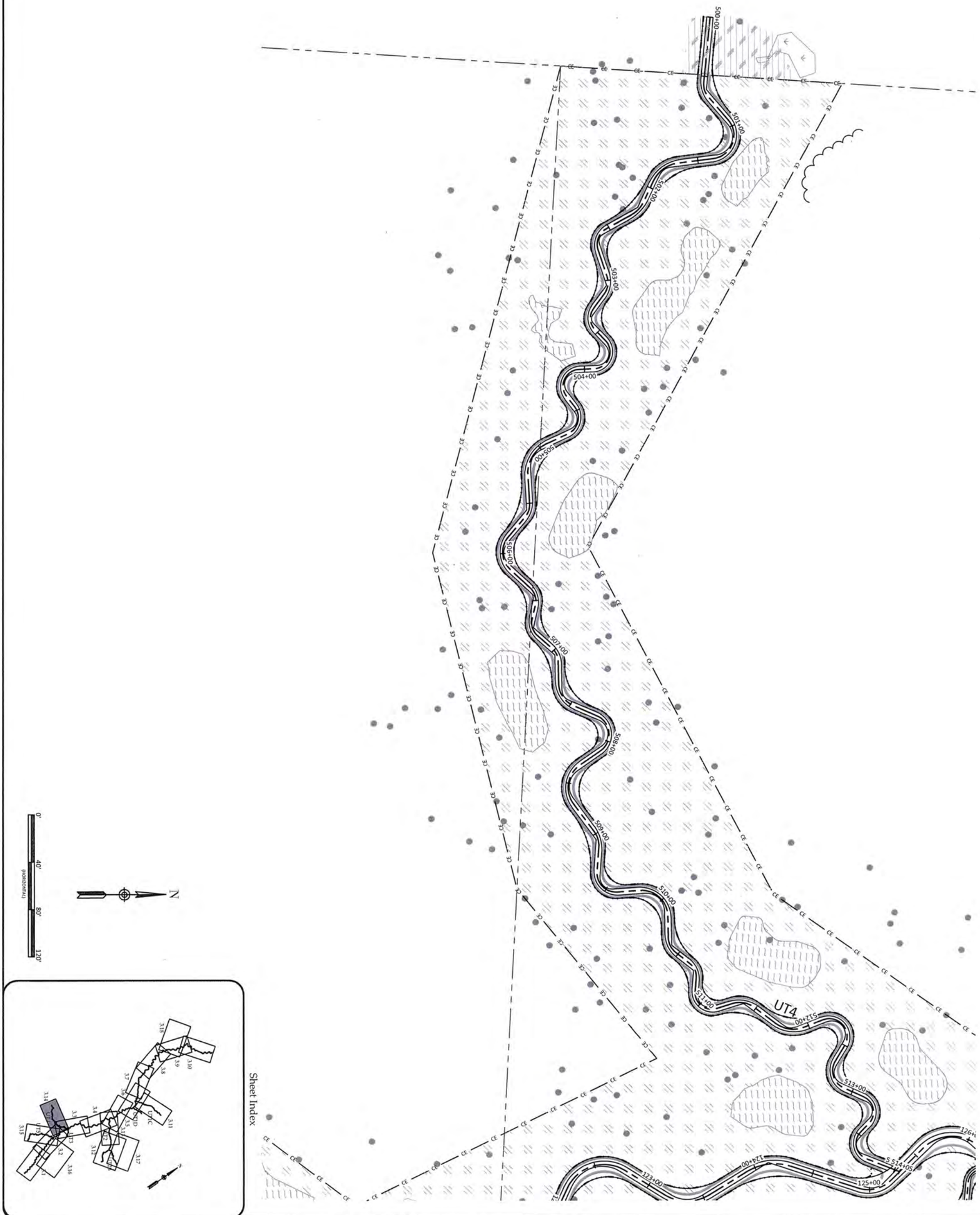

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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

UT4
Planting Plan

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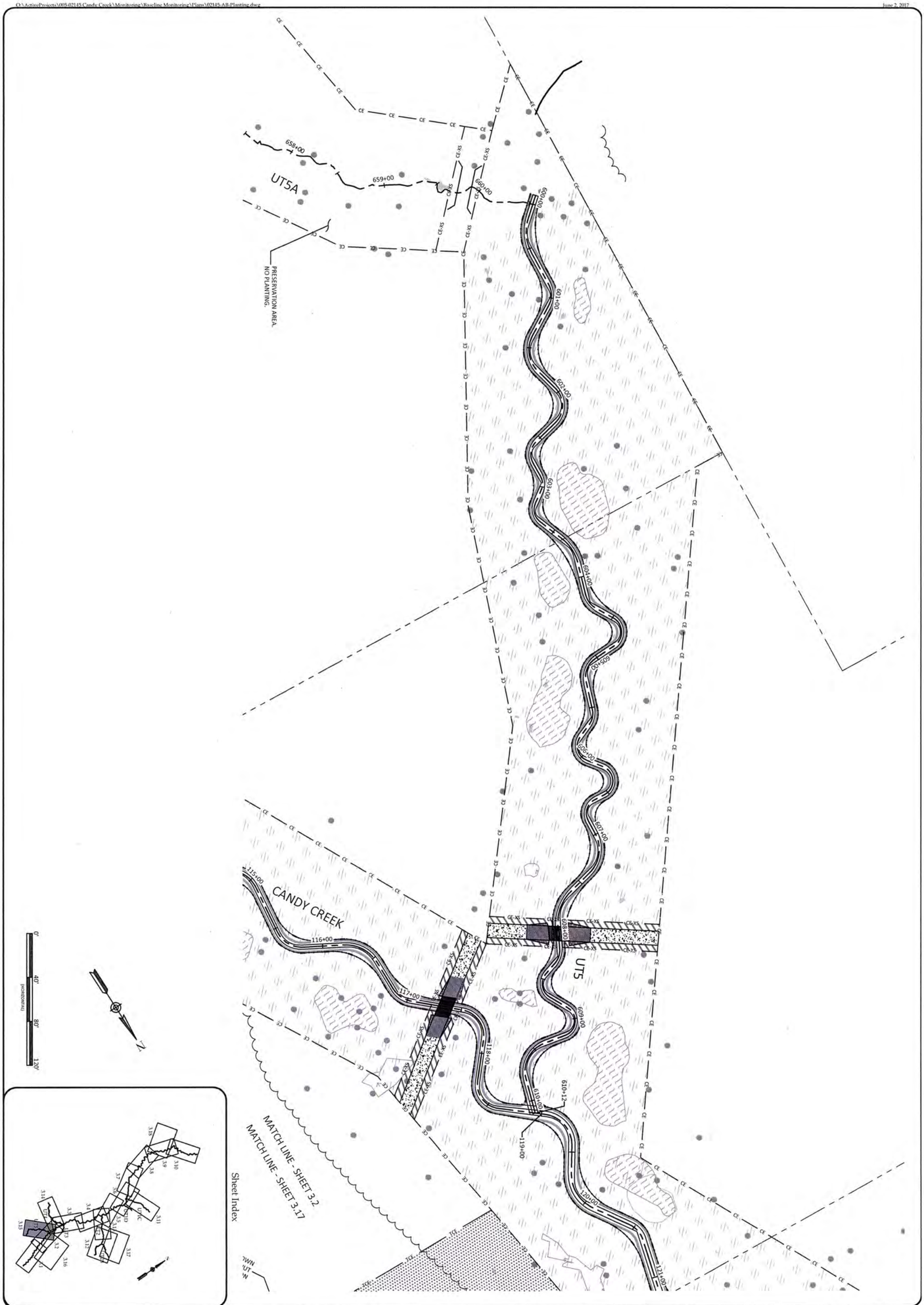

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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

UT5
Planting Plan

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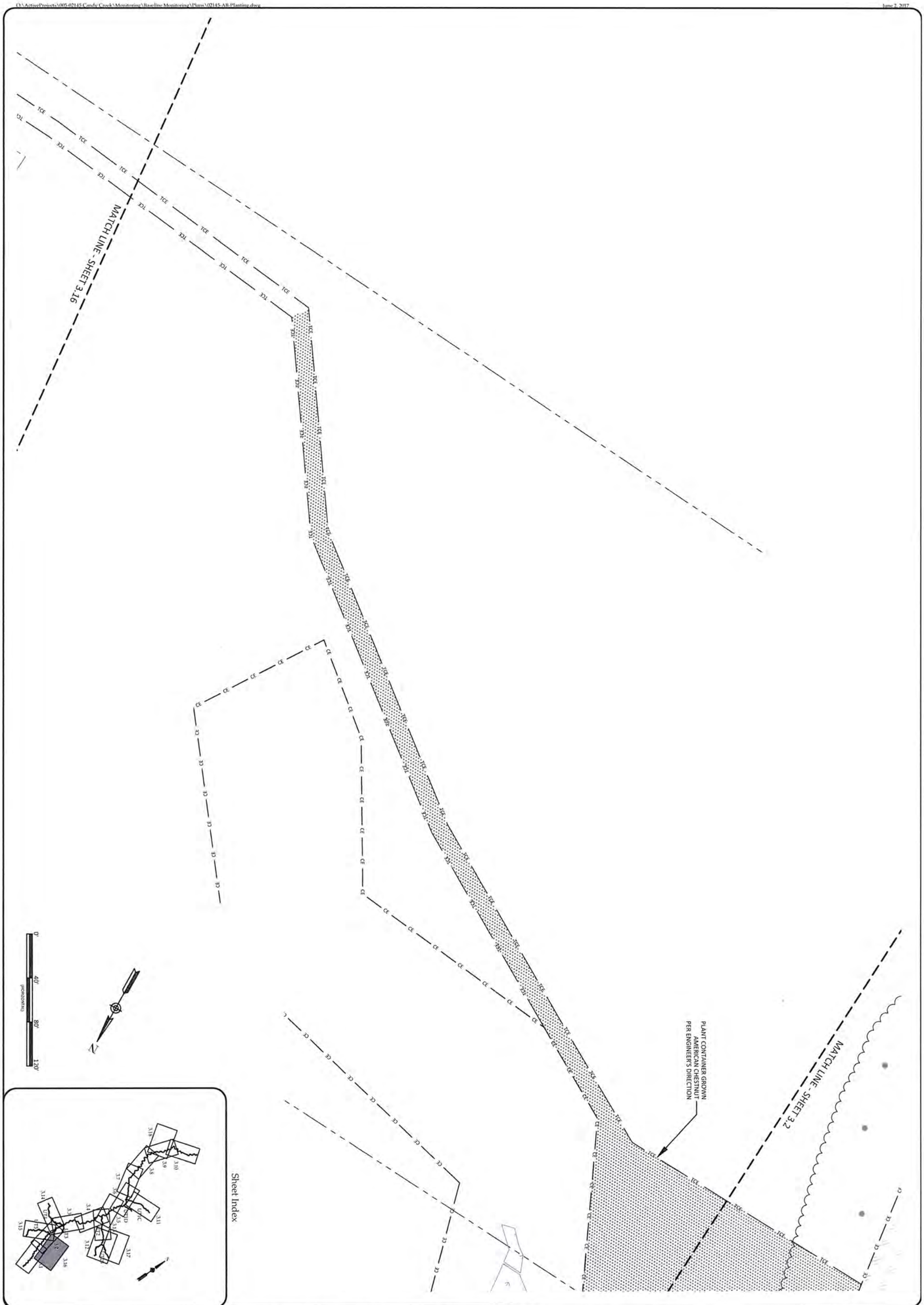

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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

TCE
Planting Plan

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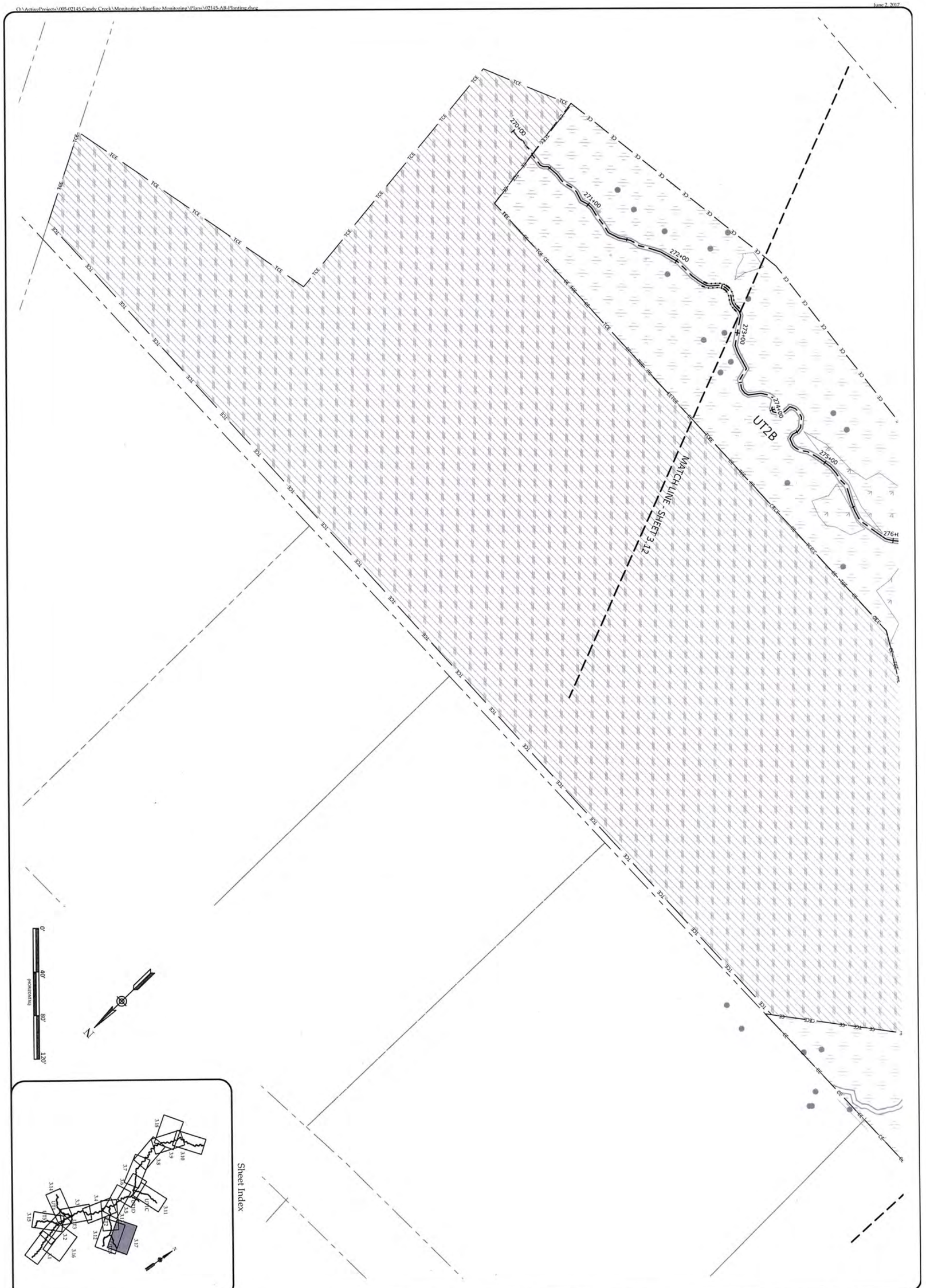

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Date:	May 30, 2017
Job Number:	005-02145
Project Engineer:	ASE
Drawn By:	SJD
Checked By:	JL

Revisions:

3.17

Sheet

Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

UT2B TCE
Planting Plan

NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER JASON S. EARLEY
6-2-17

WILDLANDS ENGINEERING
1430 S. Mint St, Suite 104
Charlotte, NC 28203
Tel: 704.332.7754
Fax: 704.332.3306
Firm License No. F-0831

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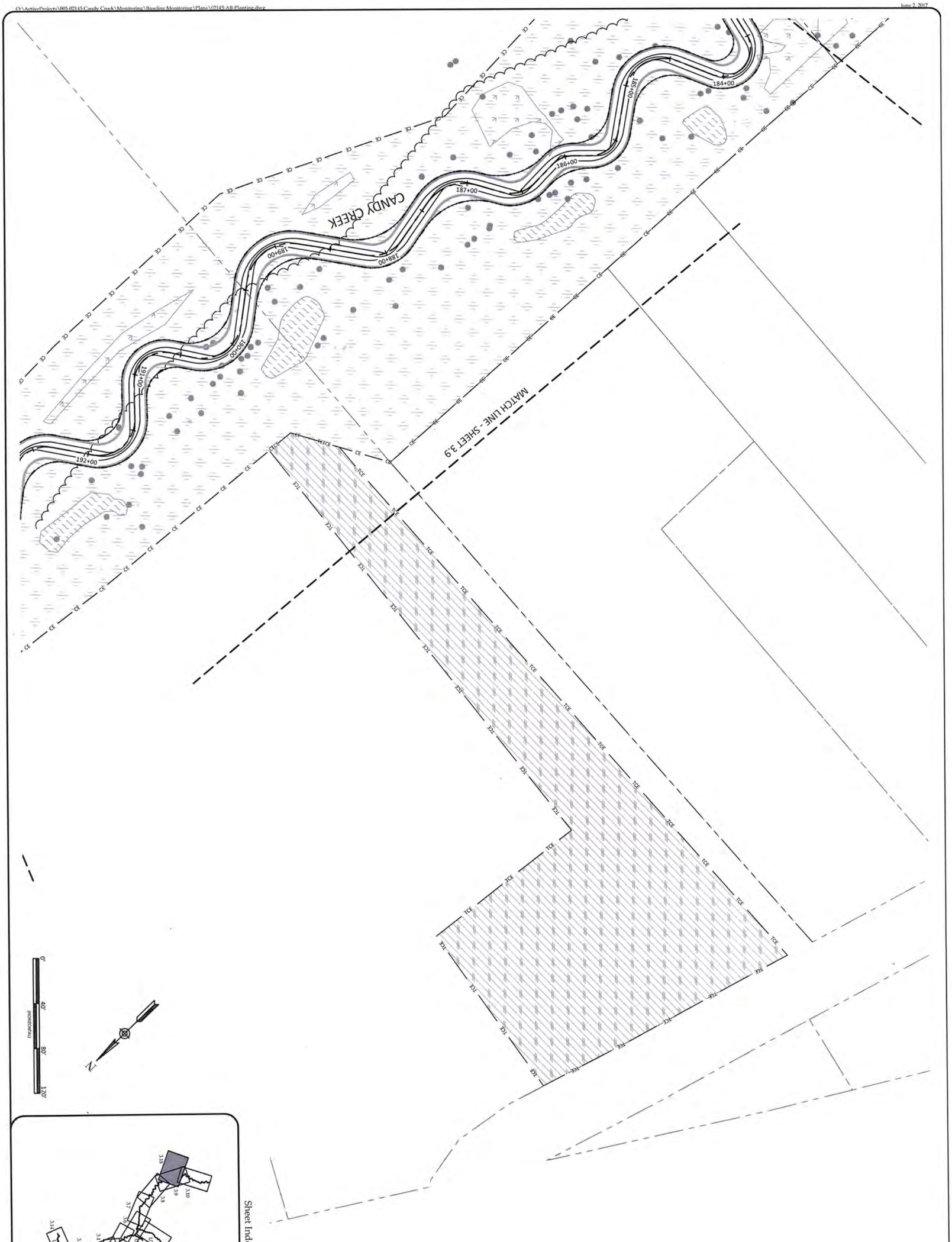
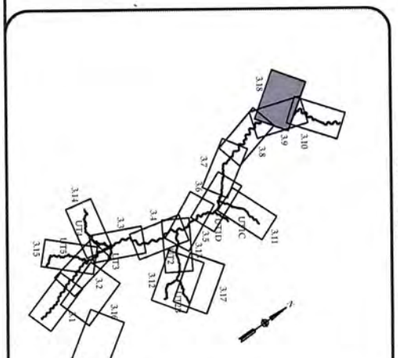
June 2, 2017





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Date:	May 30, 2017
Job Number:	005-02145
Project Engineer:	ASE
Drawn By:	SJD
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Candy Creek Mitigation Site-Record Drawings
Guilford County, North Carolina

TCE
Planting Plan

NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER AARON S. CARLSON

6-2-17

WILDLANDS ENGINEERING
1430 S. Mint St, Suite 104
Charlotte, NC 28203
Tel: 704.332.7754
Fax: 704.332.3306
Firm License No. F-0831