AS-BUILT BASELINE MONITORING REPORT

FINAL

HONEY MILL MITIGATION SITE
Surry County, NC
DEQ Contract No. 7619
DMS Project No. 100083

Yadkin River Basin HUC 03040101
USACE Action ID No. SAW-2018-01789
NCDEQ DWR#: 18-1271
RFP #: 16-007406 / Issued: December 7, 2017

Data Collection Period: January 2021 – June 2021
Submission Date: September 15, 2021

PREPARED FOR:

NC Department of Environmental Quality
Division of Mitigation Services
1652 Mail Service Center
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September 14, 2021

Mr. Kelly Phillips
Project Manager
NCDEQ – Division of Mitigation Services
610 East Center Avenue, Suite 301
Mooresville, NC 28115

RE: Task 6 – Final As-built Baseline Monitoring Report
Honey Mill Mitigation Site, Surry County
Yadkin River Basin – HUC 03040101
DMS Project ID No. 100083 / DEQ Contract #7619

Dear Mr. Phillips:

Wildlands Engineering, Inc. (Wildlands) has reviewed the Division of Mitigation Services (DMS) comments from the Draft As-built Baseline Monitoring report for the Honey Mill Mitigation Site. The report and associated digital files have been updated to reflect those comments. The Final As-built Baseline Monitoring Document and Record Drawings are included. Wildlands' responses to DMS' report comments are noted below in *italics*.

Report Cover:

DMS comment: Add the RFP issuance date.

Wildlands' response: The RFP issuance date has been added to the report cover.

1.3.2 Restoration Type and Approach:

DMS comment: Consider adding to the first paragraph a reference to incorporation of agency comments, as appropriate, to the holistic design approach.

Wildlands' response: Text has been added to Section 1.2.3 that references the incorporation of the Interagency Review Teams' (IRT) comments/suggestions into the design approach.

Section 5.1 Record Drawing:

DMS comment: Rock sill was substituted for a log sill, riffle and structures were added or removed and grading changes were implemented at several locations during construction. Please preface this section by including discussion of the overall benefits/risks associated with these changes.

Wildlands' response: As requested, a brief discussion about changes made during construction and their potential effect on project performance is included in Section 5.1 of the As-Built Baseline Monitoring Report.

Digital Deliverable:

DMS comment: Please review all of the stream spatial features and make sure that each segment connects with one another using snapping (e.g. UT1 Restoration & UT1 No Credit, UT4 & UT4 BMP, UT5 & UT5, Venable Creek Reach 4 & UT4/UT5, etc.).

Wildlands' response: All stream spatial features have been reviewed and if needed, revised to connect with one another.

DMS comment: There are 30 photo points included in the submitted geodatabase, but only 26 are listed in Table 5. Please update Table 5 or the spatial data to reflect the accurate number of photo points.

Wildlands' response: The correct total number of photos is 30 (28 Photo points and 2 mature tree photos). Table 5 has been revised to correctly reflect this number.

DMS comment: Please submit an as-built dwg file.

Wildlands' response: The as-built dwg files for the Record Drawings are included in the Support Files as part of the digital data submittal.

Wildlands acknowledges that 180 days must separate MY0 versus MY1 data. Therefore, MY1 data collection will commence in mid - late fall and delivery of the MY1 report will be delayed until December 31st to account for this requirement.

As requested, Wildlands has included the Final Honey Mill Mitigation Site As-built Baseline Monitoring Report and Record Drawings with our written responses to your comments after the report cover page. In addition, a USB drive with the final electronic copy of the As-built Baseline Monitoring Report and Record Drawings and the electronic support files are included.

Sincerely,

Kristi Suggs
Senior Environmental Scientist
ksuggs@wildlandseng.com

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PREPARED BY:

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EXECUTIVE SUMMARY

Wildlands Engineering, Inc. (Wildlands) implemented a full-delivery stream mitigation project at the Honey Mill Mitigation Site (Site) for the North Carolina Department of Environmental Quality (DEQ) Division of Mitigation Services (DMS). The project restored and enhanced a total of 8,683 linear feet (LF) of perennial and intermittent stream in Surry County, NC. The Site is located within the Rutledge, Stoney and Flat Shoal Creek – Ararat River targeted local watershed (TWL)and NC Division of Water Resources (DWR) Subbasin 03-07-03. The project is providing 4,793.432 cool stream mitigation units (SMUs) for the Yadkin River Basin Hydrologic Unit Code (HUC) 03040101110020.

The Site's immediate drainage area as well as the surrounding watershed has a long history of agricultural activity. Stream and wetland functional stressors for the Site were related to both historic and current land use practices. Major stream stressors for the Site include livestock trampling and fecal coliform inputs, lack of stabilizing stream bank and riparian vegetation, active erosion, and incision. The effects of these stressors resulted in channel instability, degraded water quality, and the loss of both aquatic and riparian habitat throughout the Site's watershed when compared to reference conditions. The project approach for the Site focused on evaluating the Site's existing functional condition and evaluating its potential for recovery and need for intervention. The Site was selected based on its potential to support the objectives and goals of multiple conservation and watershed planning documents such as the 2009 Upper Yadkin River Basin Restoration Priorities (RBRP) and the 2015 North Carolina Wildlife Resource Communion's (NCWRC) Wildlife Action Plan (WAP).

The proposed project excludes livestock, creates stable stream banks, converts pasture to forest, and implements BMPs to filter agricultural runoff. These actions address stressors identified in the RBRP and the WAP by reducing fecal, nutrient, and sediment inputs to project streams, and ultimately to the Ararat River, and reconnect instream and terrestrial habitats on the Site to upstream and downstream resources. Approximately 20.2-acres of land has been placed under permanent conservation easement to protect the Site in perpetuity. The established project goals include:

- Improve stream channel stability,
- Treat concentrated agricultural run-off,
- Improve in-stream habitat,
- Restore and enhance native floodplain and wetland vegetation,
- Exclude livestock from streams, and
- Permanently protect the project site from harmful uses.

The Site's construction and as-built survey were completed from February - May 2021. Planting and baseline vegetation data collection occurred in late February and March 2021, respectively. Installation of monitoring features and sediment data collection was completed in February 2021. Fencing installation was completed in May 2021. 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 with little variation. The Site has been built as designed and is expected to meet the upcoming monitoring year's success criteria.

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APPENDICES

Section 1.0 PROJECT GOALS, BACKGROUND, AND ATTRIBUTES

1.1 Project Location and Setting

The Honey Mill Mitigation Site (Site) is in Surry County approximately 5 miles south of Mount Airy and 7 miles northeast of Dobson (Figure 1). Venable Creek, a tributary to the Ararat River, and its associated tributaries were restored and enhanced as part of this project. The Ararat River drains to the Yadkin River. The Yadkin-Pee Dee River basin covers an area of 7,200 square miles and many waters within the basin have been given a rating of impaired. The site is located within the Rutledge, Stoney, and Flat Shoal Creek – Ararat River targeted local watershed Hydrologic Unit Code (HUC) 03040101110020 and is proposed for mitigation credit in the Upper Yadkin Catalog Unit 03040101 (Yadkin 01).

The Site contains eight unnamed tributaries (UTs) to Venable Creek (UT1, UT2, UT2A, UT2B, UT3, UT4, UT5, and UT6) and the mainstem of Venable Creek, which has been broken into four reaches and flows in a north easterly direction through the site. Multiple riparian wetlands exist on-site, however, no credit is being sought for project wetlands.

The overall Site topography consists of steep, confined and moderately confined valleys along the tributaries and flow into a more open and gradually sloped valley along the mainstem of Venable Creek. The project begins at a roadway culvert located at the intersection of Little Mountain Church Road and Venable Creek. The watersheds for UT3, UT4, and UT6 are roughly bound by Venable Farm Road to the west. All of the reach watersheds are encompassed by the Venable Creek watershed, which extends south past Little Mountain Church Road. The Site is typically defined by forested and agricultural land use with sporadic development of rural homes.

Venable Creek's watershed is predominantly wooded in the headwaters, with one pasture present just upstream of Little Mountain Church Road. Venable Creek's banks are eroded within the pasture, which provides a fine sediment source to the project. UT1's watershed is predominantly forested on the hillslopes while the more gently sloped areas are in row crop production. UT1 is impounded downstream of the row crops, and this impoundment likely functions as a sediment sink for the watershed. Downstream of the impoundment, UT1 and its tributary flow through forest and pasture before joining just upstream of Siloam Road and the project boundary. Eroded sediments from stream banks are a minor sediment source to UT1. UT3, UT4, and UT6 all have eroded rills from nearby pastures contributing fine sediments at the inception point of the streams. Finally, an eroding farm road which enters the Venable Creek floodplain between UT4 and UT6 is a fine sediment source to Venable Creek.

Pre-construction conditions are outlined in Table 4 of Appendix 1 and Table 6 of Appendix 2.

1.2 Project Goals and Objectives

The Site is providing numerous ecological benefits within the Upper Yadkin Basin. The project goals were established with careful consideration to address stressors that were identified in the 2009 Upper Yadkin River Basin Restoration Priorities (RBRP) report and the 2015 North Carolina Wildlife Resource Commission's (NCWRC) Wildlife Action Plan (WAP). The project has improved stream functions through stream restoration and the conversion of maintained agricultural fields into riparian buffer within the Upper Yadkin River Basin, while creating a functional riparian corridor at the site level. Improvements are outlined below as project goals and objectives.

Goal	Objective
Exclude livestock from stream channels.	Install livestock fencing on all or portions of the Site and/or permanently remove livestock from all or portions of the Site to exclude livestock from stream channels and riparian areas.
Improve the stability of stream channels.	Reconstruct stream channels slated for restoration with stable dimensions and appropriate depth relative to the existing floodplain. Add bank revetments and in-stream structures to protect restored/ enhanced streams.
Improve instream habitat.	Install habitat features such as constructed steps, cover logs, and brush toes on restored reaches. Add woody materials to channel beds. Construct pools of varying depth.
Restore and enhance native floodplain vegetation.	Convert active cattle pasture to forested riparian buffers along all Site streams, which will slow and treat runoff from adjacent pasture before entering streams. Protect and enhance existing forested riparian buffers. Treat invasive species.
Treat concentrated agricultural runoff	Install agricultural BMPs in areas of concentrated agricultural runoff to treat runoff before it enters the stream channel.
Permanently protect the project site from harmful uses.	Establish a conservation easement on the Site. Exclude livestock from Site streams.

1.3 Project Structure, Restoration Type and Approach

The final mitigation plan was approved in October of 2020. Construction activities were completed in February 2021 by Main Stream Earthworks, Inc. Turner Land Surveying, PLLC completed the as-built survey in April 2021. Following construction, Bruton Natural Systems, Inc. completed riparian planting in February 2020.

A copy of the final sealed survey is included in Appendix 4. Field adjustments made during construction are described in further detail in section 5.1 and depicted in the record drawings in Appendix 4. Please refer to Appendix 1 for detailed project activity, history, contact information, and watershed/site background information.

1.3.1 Project Structure

Project mitigation components are outlined in the Mitigation Assets and Components Table (Table 1) and depicted in the Monitoring Plan View Maps (Figures 3.0 - 3.4) that are located in Appendix 1.

1.3.2 Restoration Type and Approach

The mitigation approaches proposed for the streams on the Site were developed to achieve the maximum potential for functional uplift relative to the existing conditions on the site. When feasible, Wildlands thoughtfully considered and implemented recommendations from the NC Interagency Review Team (IRT) as well as elements of stream restoration, enhancement I (EI), and enhancement II (EII). These efforts are extended to the stream origin on UT2, UT3, UT4, and UT6, and into the headwaters of UT2A and UT5; thereby, creating a holistic, watershed scale restoration for much of the Site.

Restoration and EI reaches were designed to create stable, functional stream channels with improved dimension and profile, while pattern adjustments were restricted to restoration reaches. Cross-sectional

areas were sized for frequent overbank flows. Bedforms were stabilized and varied with the use of in-stream structures to reduce channel erosion and improve aquatic habitat. Restoration reaches were constructed as Priority 1 except where Priority 2 grading was needed to transition with existing grade elevations and/or confluences. EI was used to transition between restoration and EII reaches. EII reaches retained their existing dimension, pattern, and profile. Work conducted consisted primarily of correcting trampled banks and stabilizing isolated areas of bank erosion.

All the project reaches are protected in perpetuity with the implementation of a conservation easement. Fencing was installed outside of the easement to exclude cattle from the project area, except for one area along the mainstem of Venable Creek where a short length of farm road and fence were installed within the easement. The buffer impacts resulting from this easement encroachment have been considered and are discussed in detail in Section 5.2. Invasive vegetation such as Chinese Privet, tree-of-heaven, and multi-flora rose were treated by either excavation or herbicide, as needed throughout the Site. The streambanks and floodplains were planted with native woody and herbaceous species as depicted in the planting plan of the record drawings located in Appendix 4.

Venable Creek

Venable Creek Reach 1 enters the Site from a 42" culvert under Little Mountain Church Road. Immediately downstream of the culvert, Venable Creek Reach 1 flows through the center of the moderately confined valley for approximately 91 linear feet (LF). Mitigation followed an EII approach and consisted of bank grading to stabilize impacts from cattle access. Reach 2 begins at Station 100+91, upstream of the UT1 confluence, and incorporates an enhacement I approach. Work consisted of addressing areas of bank erosion, adding in-stream structures such as rock sills, log sills, and constructed riffles, and adjusting the channel's profile; thereby, serving as the transition reach between the EII approach on Reach 1 and Priority 1 restoration on Reach 3. Reach 3 begins immediately below an an overhead power line crossing. Reach 3 was designed as a meandering C4 channel. In-stream structures such as rock sills, log sills, constructed riffles, log j-hooks, brush toe, and cover logs were added for grade control, bank stability, and habitat creation. Downstream of the UT3 confluence, the channel transitions back to an enhancement II approach at Reach 4. Venable Creek Reach 4 begins at Station 120+01 and is characterized by mature vegetation and areas of in-stream bedrock, with only a few areas along the banks needing stabilization. Here the valley narrows and the stream flows against the right valley wall for most of the reach. The entire stream corridor is wooded, except for a small section of open pasture in the left floodplain near the confluence with UT6. Venable Creek Reach 4 continues downstream and outlet's the project at Station 139+90.

UT1

UT1 is a perennial channel that flows into the Site from box culvert under Siloam Road and is immediately connected with its historic floodplain allowing for an immediate transition to Priority 1 restoration. The channel transitions to Priority 2 restoration before its confluence with Venable Creek Reach 2. UT1 was designed as a C4b and is moderately confined in the right floodplain and unconfined in the left floodplain. In-stream structures such as rock sills, log sills, constructed riffles, log j-hooks, and brush toe were added for grade control, bank stability, and habitat creation.

UT2 and UT2A

UT2 Reach 1 originates as an intermittent stream at a headcut and flows through a confined, wooded valley over a series of steps and cobble riffles. UT2 transitions to a perennial channel after 15 LF. UT2A is a perennial channel that originates offsite and, similar to UT2 Reach 1, flows through a confined, wooded valley over rock steps and cobble riffles. As UT2 Reach 1 approaches the confluence with UT2A, Reach 1's valley widens and flattens, and a riparian wetland has formed in the right floodplain. Enhancement II was implemented along both reaches and consisted of cattle exclusion and invasive species treatment.

UT2 Reach 2 begins at the UT2A confluence and flows approximately 73 linear feet to a newly installed culverted crossing. UT2 Reach 2 continues as a single thread channel until it enters Venable Creek Reach 3. The channel was restored with the implementation of Priority 1 restoration and designed as a Rosgen B4 channel. In-stream structures such as rock sills, log sills, constructed riffles, and brush toe were added as for grade control and bank stability.

UT2B

UT2B, a partially subsurface perennial stream, was daylighted at the project easement boundary and graded to tie into a new, downstream location of Venable Creek Reach 3. This section of stream was stabilized through the implementation of cascading riffles and grade control measures; however, no credit is being sought for the work.

UT3

UT3 Reach 1 begins at two hillside seeps on the western side of the Site that have been stabilized with bank grading and a step-pool stormwater conveyance (SPSC) Best Management Practice (BMP) designed to capture sediment and transition to a vegetative filter feature over time. Downstream of the BMP, enhancement II was implemented to stabilize pockets of bank erosion along UT3 Reach 1. As UT3 approaches Venable Creek, it transitions from a relatively straight and confined valley to a more open pasture. This marks the transition from Reach 1 to Reach 2. UT3 Reach 2 begins at a bedrock knickpoint allowing for an immediate transition to Priority 1 restoration. Priority 1 continues downstream to the confluence of Venable Creek Reach 3. In-stream structures such as rock sills, log sills, constructed riffles, and brush toe were added to provide grade control, bank stability, and in-stream habitat.

UT4

Similar to UT3, UT4 begins as a seep at the project's upstream boundary. Designed as a step-pool storm water conveyance channel, this BMP is also designed to capture sediment and transition to a vegetative filter feature over time. Enhancement II work begins on UT4 at Station 600+58 within a confined wooded valley. Though the upstream section of the channel was incised, it consisted of areas of vertical stability so only sections of the stream and adjacent hillslope were graded and stabilized. Further down the channel, at Station 603+28, the channel steepens; therefore, a rock cascade was implemented to its confluence with Venable Creek R4 to stabilize steep channel slopes, as well as areas of bank erosion.

UT5

UT5 is an intermittent channel that originates upstream of the easement within a narrow, wooded valley The stream transitions to a perennial channel approximately 105 LF downstream. Bed degradation had led to incision along the entire upstream section of the stream channel; however, the stream was not actively eroding, so, an enhancement II approach was implemented throughout the reach. Prior to construction, part of the downstream channel's flow had become disconnected from the original stream alignment. So, during construction, the disconnected portion of channel was abandoned and backfilled, and the flow was reconnected to its natural flow path before discharging into Venable Creek Reach 4.

UT6

UT6 Reach 1 begins as a perennial channel at a hillside seep within a 100-foot wide powerline easement. Since the channel receives agricultural run-off from an adjacent pasture on the northwestern side of the Site, a SPSC BMP was installed upstream of the start of UT6. An Enhancement II approach was implemented along Reach 1 because there were only a few isolated areas in need of bank stabilization, and the channel flows through a mostly wooded, narrow riparian buffer. UT6 reach 2 begins as the channel approaches an old farm road and an adjacent open field in the right floodplain. Here a ditch along the farm road had led the channel flow to follow its path and become disconnected from its natural channel. Downstream of this break, the relic UT6 channel forms. In order to reconnect UT6 with is natural relict channel, Priority 1 restoration was

needed. UT6 was designed as a Rosgen A4 channel with a steep cascading riffle to provide stability on the steeply sloped channel.

1.4 Project History, Contacts and Attribute Data

The Site was restored by Wildlands through a Full Delivery contract with DMS. Tables 2, 3, and 4 in Appendix 1 provide detailed information regarding the project activity and reporting history, project contacts, and project baseline information and attributes.

Section 2.0 PERFORMANCE STANDARDS

The stream performance criteria for the Site will follow approved performance criteria presented in the Honey Mill Mitigation Site Mitigation Plan (2020) and is based on the performance criteria presented in the DMS Stream and Wetland Mitigation Plan Template and Guidance (June 2017) and the NC IRT Wilmington District Stream and Wetland Compensatory Mitigation Update (10/24/2016). Annual monitoring and semi-annual site visits will be conducted to assess the condition of the finished project. Specific performance standard components are proposed for stream morphology, hydrology, and vegetation. Performance standards will be evaluated throughout the seven-year postconstruction monitoring period. The monitoring program designed to verify that performance standards are met is described in Section 3.

2.1 Streams

2.1.1 Dimension

Riffle cross sections on the restoration reaches should be stable and should show little change in bankfull area, bank height ratio, and width-to-depth ratio. 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 a vertically incised thalweg or eroding banks. However, if changes in the channel indicate a movement toward stability or enhanced habitat, such as a decrease in the width-to-depth ratio in meandering channels or an increase in pool depth, remedial action would not be taken.

2.1.2 Pattern and Profile

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. Annual longitudinal profile surveys are not required 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 2016 NC IRT Stream and Wetland Mitigation Guidance for the necessary reaches.

Visual assessments and photo documentation should indicate that streams are remaining stable and do not indicate a trend toward vertical or lateral instability. Signs of instability may include bank scour, bank migration, and bed incision. Additionally, UT2 Reach 2 shall be visually assessed annually to verify that the stream is maintaining single-thread channel.

2.1.3 Substrate

A pebble count was conducted at each surveyed riffle to characterize the pavement during the baseline monitoring only. A reach-wide pebble count will be performed in each restoration reach for monitoring years 1, 2, 3, 5 and 7. Reach-wide counts will be conducted for classification purposes. Restoration reaches should show maintenance of coarser materials in the riffle features and finer particles in the pool features. Riffles may fine over the course of monitoring due to the stabilization of contributing watershed sediment sources.

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 mid-channel bars 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 Hydrology Documentation

The occurrence of bankfull events will be documented on restoration reaches throughout the monitoring period. Four bankfull flow events must be documented within the seven-year monitoring period. The four bankfull events must occur in separate years. Stream monitoring will continue until performance standards in the form of four bankfull events in separate years have been documented. Evidence of bankfull events, such as the occurrence of debris lines and sediment deposition, will be documented with photos when possible.

2.2 Vegetation

The final vegetative success criteria will be the survival of 210 planted stems per acre in the riparian corridors 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 native species stems per acre at the end of the third monitoring year (MY3) and at least 260 stems per acre at the end of the fifth monitoring year (MY5). In NC mountain counties, planted trees must average 6 feet in height in each plot at the end of MY5 and 8 feet in height at Year 7. The extent of invasive species coverage will also be monitored and controlled as necessary throughout the required monitoring period. There is no performance success criteria associated with shaded area planting.

2.3 Visual Assessments

Visual assessments should support the specific performance standards for each metric as described above.

2.4 Schedule and Reporting

Monitoring reports will be prepared in the fall of each year of monitoring and submitted to DMS. Based on the DMS Annual Monitoring Report Format, Data Requirements, and Content Guidance (June 2017), 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,
- Project Asset Map of major project elements,
- Photographs showing views of the restored Site taken from fixed point stations,
- Current Conditions Plan View Maps (CCPV) with monitoring features and current problem areas noted such as stability and easement encroachment based on the cross-section surveys and annual visual assessments,
- Assessment of the stability of the stream based on the cross-sections,
- Vegetative data as described above including the identification of any invasion by undesirable plant species,
- A description of damage by animals or vandalism,
- Maintenance issues and recommended remediation measures will be detailed and documented, and
- Wildlife observations.

Section 3.0 MONITORING PLAN & METHODOLOGY

Annual monitoring will consist of collecting morphologic, vegetative, and hydrologic data to assess the project success based on the restoration goals, as outlined in the Honey Mill Mitigation Site Mitigation Plan (2020). Monitoring requirements will follow guidelines outlined in the DMS Annual Monitoring Report Format, Data Requirements, and Content Guidance (June 2017) and the NC IRT Stream and Wetland Mitigation Guidance (October 2016). Installed monitoring devices and plot locations closely mimic the locations of those proposed in the Site's Mitigation Plan. Deviations from these locations were made when professional judgement deemed them necessary to better represent as-built field conditions or when installation of the device in the proposed location was not physically feasible.

Project success will be assessed by measuring channel dimension, substrate composition, vegetation, surface water hydrology, and by analyzing photographs and performing visual assessments. Any high priority problem areas identified, such as unstable stream banks, bed instability, aggradation/degradation, and/or poor vegetation establishment will be evaluated on a case-by-case basis. The problem areas will be visually noted and reported to DMS staff in the annual report. Standard DMS monitoring reports will be submitted in monitoring years 1, 2, 3, 5, and 7. Monitoring activities in years 4 and 6 will be documented in a memorandum to include a project summary update, annual photos, and updated monitoring plan map. Closeout will occur seven years beyond completion of construction or once performance standards are met. All survey data will be georeferenced to North Carolina State Plane coordinates. Refer to Table 5 in Appendix 1 for the monitoring component summary.

3.1 Streams

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). Please refer to Figures 3.0 through 3.4 in Appendix 1 for monitoring locations discussed below.

3.1.1 Dimension

To assess channel dimension performance, 11 permanent cross-sections were installed along stream restoration or enhancement I reaches to represent approximately 50% riffles and 50% pools as defined in Table 19 of the Mitigation Plan. Cross-section locations were chosen in the field to be representative of the typical dimensions for each project reach. Each cross-section is permanently marked with rebar installed in concrete and ½ inch PVC pipes. Cross-section surveys will include points measured at all breaks in slope, including top of bank, bankfull, edge of water, and thalweg. Cross-section surveys will be conducted in monitoring years one, two, three, five, and seven. Photographs will be taken of the cross-sections looking upstream and downstream during the survey assessment.

3.1.2 Pattern and Profile

Longitudinal profile surveys will not be conducted during the seven-year post-construction 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 Stream Mitigation Guidelines issued in October 2016 by the NC IRT for the necessary reaches. Stream pattern and profile will be assessed visually as described below in Section 3.1.6.

3.1.3 Substrate

Reach-wide pebble counts will be performed on each restoration reach for classification purposes only and will be conducted in monitoring years one, two, three, five, and seven. Riffle 100-count substrate sampling was collected in each surveyed riffle cross-section during the baseline monitoring only to characterize pavement at as-built.

3.1.4 Photo Reference Points

A total of 28 permanent photograph reference points were established along the stream reaches and the floodplain area after construction. Photographs will be taken once a year to visually document stability for the seven-year monitoring period. Permanent markers were established and located with GPS equipment so that the same locations and view directions on the site are photographed each year. Photos will be used to monitor all stream reaches.

Longitudinal reference photos were established along the channel by taking a photo looking upstream and downstream. Cross-sectional photos will be taken of each permanent cross-section looking upstream and downstream.

Per the mitigation plan, two photo points documenting mature trees on the restored floodplain have also been added to monitor the health of mature trees over the course of the project.

3.1.5 Hydrology Documentation

The occurrence of bankfull events will be documented throughout the seven-year monitoring period using pressure transducers, photographs, and visual assessments such as debris lines. Streamflow stage will be monitored using a continuous stage recorder (pressure transducer) and referred to as a "crest gage" (CG). CGs were set to record bankfull events every three hours. One CG was installed along restoration reaches. The gage will be downloaded semi-annually to determine if a bankfull event has occurred. Photographs will be used to document the occurrence of debris lines and sediment deposition observed during field visits. The transducer data will be plotted and included in the annual monitoring reports.

3.1.6 Visual Assessment

Visual assessments will be performed along stream reaches on a semi-annual basis during the seven-year monitoring period. Areas of concern, such as channel instability (i.e., lateral and/or vertical instability and in-stream structure failure, instability, and/or piping), poor vegetation health and/or establishment (i.e. low stem density, bare areas, high mortality rates, and/or invasive species), easement encroachment, beaver activity, and/or livestock trespass will be mapped, photographed, and described in the annual monitoring reports. 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

Vegetation monitoring quadrants (9 permanent and 5 mobile) were installed across the Site to measure the survival of the planted trees. Vegetative plot monitoring will occur between July 1st and leaf drop during post-construction monitoring years 1, 2, 3, 5, and 7. Permanent plots will be monitored in accordance with the guidelines and procedures outlined in the 2016 NC IRT Stream and Wetland Mitigation Guidance to assess vegetative success. For both permanent and mobile plots, all woody stems, including exotic and invasive species, should be counted. Supplemental plantings and volunteer plants must be present for at least two growing seasons before counting toward performance standards in monitoring years five and seven. Exotic/invasive species will not count toward success of performance standards.

A total of 9 permanent vegetation plots were established within the project easement area. Permanent vegetation plots were randomly established within the open, planted stream riparian buffer areas to capture the heterogeneity of the designed vegetative communities. The locations of permanent vegetation plots were chosen using the same distribution throughout the planting areas, as shown in the Site's Mitigation Plan, and to best represent the planted areas within the easement.

All of the permanent vegetative plots were established either as a standard 10-meter by 10-meter square

plot or an optional 5-meter by 20-meter rectangular plot. The vegetation plot corners have been marked and are recoverable either through field identification or with the use of a GPS unit. Reference photographs were taken at the origin looking diagonally across the plot to the opposite corner during MY0 in March 2021. Subsequent assessments in monitoring years one, two, three, five, and seven, following baseline survey, will capture the same reference photograph locations.

Beginning in MY1, individual permanent plot data will include diameter, height, density, and percent survival. Planted woody stems were marked and mapped in MY0 and will be re-marked, if needed, during subsequent monitoring year assessments using a known origin so they can be found. Mortality will be determined from the difference between the baseline year's living planted stems and the current year's living planted stems.

To evaluate random vegetation performance for the Site, 5 mobile vegetation plots were established in MY0, for use in MY1, using a circular or 100 m^2 square/rectangular plot. Mobile plots will be re-established in different and random locations throughout the open, planted conservation easement in monitoring years 2, 3, 5, and 7. These locations will be geographically recorded and depicted in the CCPV maps for the corresponding monitoring assessment year. Mobile vegetation plot assessments will document the number of stems, number and type of species, and stem height within the plot.

Please refer to Figures 3.0 through 3.4 in Appendix 1 for the permanent and mobile (MY0/MY1) vegetation monitoring plot locations.

Section 4.0 ADAPTIVE MANAGEMENT AND CONTINGENCY PLAN

4.1 Adaptive Management 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 or until performance standards are met. These site inspections may identify site components and features that require routine maintenance. Routine maintenance for stream features should be most often expected in the first two years following site construction. The need for maintenance will be evaluated annually during monitoring activities. Maintenance may include the following activities.

Component/ Feature	Maintenance through project close-out
Stream	Routine channel maintenance and repair activities may include chinking of in-stream structures to prevent piping, securing of loose coir matting, and supplemental installations of live stakes and other target vegetation along the channel – these shall be conducted where success criteria are threatened or at the discretion of the Designer. Areas where storm water and floodplain flows intercept the channel may also require maintenance to prevent bank failures and head-cutting. Beaver activity will be monitored and beaver dams on project streams will typically be removed, at the discretion of the Designer, during the monitoring period to allow for bank stabilization and stream development outside of this type of influence.
BMP	Routine BMP Maintenance and repair activities may include chinking of BMP structures to prevent piping and securing of loose coir fiber matting.
Vegetation	Vegetation shall be maintained to ensure the health and vigor of the targeted community. Routine vegetation maintenance and repair activities may include supplemental planting, pruning, mulching, and fertilizing. Exotic invasive plant species treatment will be conducted per the Invasive Species Treatment Plan, outlined in Appendix 7 of the Honey Mill Mitigation Plan (2020), and in accordance with NC Department of Agriculture (NCDA) rules and regulations.
Site Boundary	Site boundaries shall be identified in the field to ensure clear distinction between the mitigation 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.

The Wildlands Team will develop necessary adaptive measures or implement appropriate remedial actions in the event that the Site or a specific component of the Site fails to achieve the success criteria outlined above. The project-specific monitoring plan developed during the design phase identifies an appropriate threshold for maintenance intervention based on the monitored items. Any actions implemented will be designed to achieve the success criteria specified previously and will include a work schedule and updated monitoring criteria. If, during annual monitoring it is determined the Site's ability to achieve Site performance standards are jeopardized, Wildlands will notify the members of the DMS and work with them to develop contingency plans and remedial actions.

Section 5.0 AS-BUILT CONDITION (BASELINE)

The Site construction and planting were completed by March 1, 2021. The installation of monitoring features was completed in early February of 2021. The as-built survey, which included developing an as-built topographic surface and locating the channel boundaries, structures, and cross-sections, was completed in April of 2021. The collection of sediment and vegetative data were completed in mid-April of 2021. Fencing installation was completed and surveyed in May 2021.

5.1 Record Drawings

Changes were implemented at several locations during construction including material type, the addition and/or removal of structures, and grading. These changes were made due to unforeseen site conditions and availability of on-site materials. In all instances, the changes provide the same, if not better, stability, habitat, and functional uplift. A sealed half-size record drawing is located in Appendix 4 and includes redlines for any significant field adjustments made during construction that were different from the design plans. Specific changes by each project area are detailed below:

5.1.1 Venable Creek Reach 2

- Sta. 102+45: Brush toe removed because rock j-hook angle provided additional bank protection.

5.1.2 Venable Creek Reach 3

- Sta. 105+05: Lunker log not installed due to bedrock in channel and on banks.
- 38 linear feet of fence line and a 10-foot wide farm path encroach into the easement. (Further details in Section 5.2)
- Sta. 117+50 - 117+75: Floodplain pool added to direct flow into proposed channel.

5.1.3 UT2

- Sta. 308+33, 308+48, 309+25, 309+75, 309+94, and 310+28: Rock sills added at engineer's discretion for additional stability.
- Sta. 310+61: Rock sill added at engineer's discretion for additional stability.
- Sta. 310+90: Log sill added at engineer's discretion for additional stability.

5.1.4 UT3 Reach 1

- Sta. 502+85 – 503+30: Bedform had eroded from existing conditions. Bank grading is tied to current condition elevations.
- Sta. 504+67 – 505+17: Riffle material added to stabilize channel.
- Sta. 507+38 – 507+78: Laid back banks at 2.5:1 or flatter to stabilize eroding stream as part of enhancement II work. Bedrock was exposed in existing channel.

5.1.5 UT3 Reach 2

- Sta. 508+57: Rock sill replaces log sill due to additional rock in area.
- Sta. 508+92: Log sill removed at engineer's discretion.

5.1.6 UT5

- Sta. 700+00 – 701+05: Alignment revised based on field data points collected.
- Sta. 704+50 – Riffle material removed at engineer's discretion.

5.1.7 Vegetation Planting Plan

As previously stated, bare root planting was completed by March 1, 2021. Changes to the as-built planting list were made to account for the species availability at the time of planting and some areas of supplemental planting were removed at the engineer's discretion. Specific changes to the plant species lists are outlined below.

Open/Graded Buffer Planting Zone –

- The following bareroot species were removed from the planting list due to the lack of available species at the time of planting: American strawberry bush (*Euonymus americanus*).
- The remaining species' "Percent of Stems" were adjusted accordingly.

Shaded Area Buffer Planting Zone –

- The following bareroot species were removed from the planting list due to the lack of available species at the time of planting: American Holly (*Ilex opaca*), sourwood (*Oxydendrum arboreum*), American strawberry bush (*Euonymus americanus*), and sweetshrub (*Calycanthus floridus*).
- The remaining species' "Percent of Stems" were adjusted accordingly.

Streambank Planting Zone –

- The species in the streambank planting zone remained consistent with the Mitigation Plan with only slight adjustments to the planted percentages. See the planting plan on Sheet 2.1 of the record drawings for adjusted percentages.

5.1.8 Fencing

- Fence lines were adjusted along the easement to account for adjacent land uses and site conditions. See Sheet 3.1 in the record drawings for adjustment locations.
- Fence line was removed due to an adjacent land use change. See Sheet 3.1 in record drawings for removal location.

5.2 Encroachment Impacts

5.2.1 Fencing Encroachment

On Sheet 1.3 of the record drawings the fence line encroaches into the conservation easement. The encroachment is due to miscommunication with the surveyor about the placement of the easement line. The landowner requested a 10-foot wide travel corridor between the conservation easement and an eastern hillslope to maintain vehicular access between Little Mountain Church Road and the northern portion of the property. However, the recorded easement crossed the toe of the hillslope and cut off the 10' access corridor. The hill side slopes vary between 1.5:1 and 2:1, with an elevation gain of 254 feet; thereby, making cutting out a roadbed at the toe of slope infeasible. Establishing a travel way over the hill was also unfeasible due to the side slopes.

Wildlands contacted the DMS and the State Purchasing Office (SPO) on 10/23/2020 about the issue. The SPO stated that the easement did not need to be revised. Instead, we should proceed with building the farm path and the fence along the farm path as needed. However, the existing easement language must allow exceptions for infrastructure and the farm path and fence line will need to be recorded on the as-built plan set.

As discussed with DMS and SPO on 10/23/20, the 10-foot wide access path has been fenced within the easement and signage has been installed along the platted Conservation Easement boundary. See Sheet 1.3 of the record drawing for documentation. This encroachment upon the 30-foot buffer width affects 38 LF of Venable Creek. The overall buffer impacts have been calculated to be 2.77%, which is below the allowable 5% threshold.

5.2.2 Pipe Encroachment

On Sheet 1.16 of the record drawings the farm crossing culvert on UT2 Reach 2 extends into the extends into the conservation easement on the upstream side and downstream side of the internal easement crossing approximately 4 liner feet and 6 linear feet, respectively. This encroachment was included on the Mitigation Plan set for the project; however, the length adjustment was inadvertently excluded from the reach length calculation in the Project Asset Table. A loss of 10 linear feet is reflected in the total as-built linear footage for UT2 Reach 2 in Table 1 of Appendix 1

5.3 Baseline Data Assessment

MY0 was conducted between February and June 2021. Cross-section and longitudinal profile data collection were completed by April 30, 2021. The collection of sediment and vegetative data were completed by mid-March 2021. Locations of the monitoring features are depicted in Figures 3.0 through 3.4 in Appendix 1. The first annual monitoring assessment (MY1) will be completed in the fall of 2021. The streams will be monitored for a total of seven years, with the final monitoring activities scheduled for 2027.

5.3.1 Morphological State of the Channel

Please refer to Appendix 2 for summary data tables, morphological plots, and stream photographs.

Profile

The MY0 profiles generally match the profile design parameters. As-built channel slopes calculated for restoration and enhancement I reaches resulted in slopes slightly greater than those of design; however, as-built reviews showed no visual indicators of vertically instability. Variations from the design profile often reflect field changes during construction as a result of field conditions and do not constitute a problem or indicate a need for remedial actions. Channels profiles will continue to be assessed visually during the CCPV Site walks.

Dimension

The MY0 dimension numbers closely match the design parameters with minor variations. On some reaches the parameters slightly exceed design parameters; however, channels are likely to narrow over time as vegetation is established. This narrowing over time would not be an indicator of instability in and of itself. On-site as-built reviews showed no visual indicators of lateral instability.

Substrate

Reach-wide pebble counts were performed on each restoration reach to establish stream classification at baseline conditions, and riffle 100-count substrate sampling was collected at each surveyed riffle cross-section to characterize pavement at as-built. Sediment analysis results were similar to design parameters, with most reaches having a median particle size classification of medium to coarse gravel. Variations immediately after construction are normal because coarser materials are used to provide immediate grade control on the newly constructed channel. Over time, the channel will continue to move gravels and finer sediments into the system creating a mix of coarse substrate in the riffles and fine sediments in the pools. On-site as-built reviews showed no visual indicators of instability within riffle or pools.

Bankfull Events

Bankfull events recorded following completion of construction will be reported in the Year 1 monitoring report.

5.3.2 Vegetation

The overall MY0 planted density ranged from 364 stems/acre to 607 stems/acre. The overall MY0 planted density for mobile vegetation plots ranged from 445 stems/acre to 688 stems/acre. All plots exceed the interim measure of vegetative success of at least 320 planted stems per acre required at the end of the third monitoring year. Summary data and photographs of each plot can be found in Appendix 3. Deviations from the Mitigation Plan's planting plan are outlined in Section 5.17, as well as on Sheets 2.1 through 2.7 of the record drawings in Appendix 4.

Section 6.0 CREDIT RELEASE SCHEDULE

All credit releases will be based on the total credit generated as reported by the as-built survey of the mitigation site. Under no circumstances shall any mitigation project be debited until the necessary Department of the Army (DA) authorization has been received for its construction or the District Engineer (DE) has otherwise provided written approval for the project in the case where no DA authorization is required for construction of the mitigation project. The DE, in consultation with the Interagency Review Team (IRT), will determine if performance standards have been satisfied sufficiently to meet the requirements of the release schedules below. In cases where some performance standards have not been met, credits may still be released depending on the specifics of the case. Monitoring may be required to restart or be extended, depending on the extent to which the site fails to meet the specified performance standard. The release of project credits will be subject to the criteria described as follows:

Table A: Credit Release Schedule – Stream Credits – *Honey Mill Mitigation Site*

Credit Release Milestone	Release Activity	ILF/NCDMS	
		Interim Release	Total Released
2*	Completion of all initial physical and biological improvements made pursuant to the Mitigation Plan.	30%	30%
3	First year monitoring report demonstrates that channels are stable interim performance standards are being met.	10%	40%
4	Second year monitoring report demonstrates that channels are stable interim performance standards are being met.	10%	50%
5	Third year monitoring report demonstrates that channels are stable interim performance standards are being met.	10%	60%
6**	Fourth year monitoring report demonstrates that channels are stable interim performance standards are being met.	5%	65% (75%***)
7	Fifth year monitoring report demonstrates that channels are stable interim performance standards are being met.	10%	75% (85%***)
8**	Sixth year monitoring report demonstrates that channels are stable interim performance standards are being met.	5%	80% (90%***)
9	Seventh year monitoring report demonstrates that channels are stable performance standards have been met and project has received closeout approval.	10%	90% (100%***)

*For ILF sites (including all NCDMS projects), no initial release of credits (Milestone 1) is provided because ILF programs utilized advance credits, so no initial release is necessary to help fund site construction. To account for this, the 15% credit release associated with the first milestone (bank establishment) is held until the second milestone, so that the total credits release at the second milestone is 30%. In order for NCDMS to receive the 30% release (shown in the schedules as Milestone 2), they must comply with the credit release requirements stated in Section IV(I)(3) of the approved NCDMS Instrument.

**Please note that vegetation data may not be required with monitoring reports submitted during these monitoring years unless otherwise required by the Mitigation Plan or directed by the NCIRT.

***10% reserve of credits to be held back until the bankfull event performance standard has been met.

Section 7.0 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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Simon, A. 1989. A model of channel response in disturbed alluvial channels. Earth Surface Processes and Landforms 14(1):11-26.

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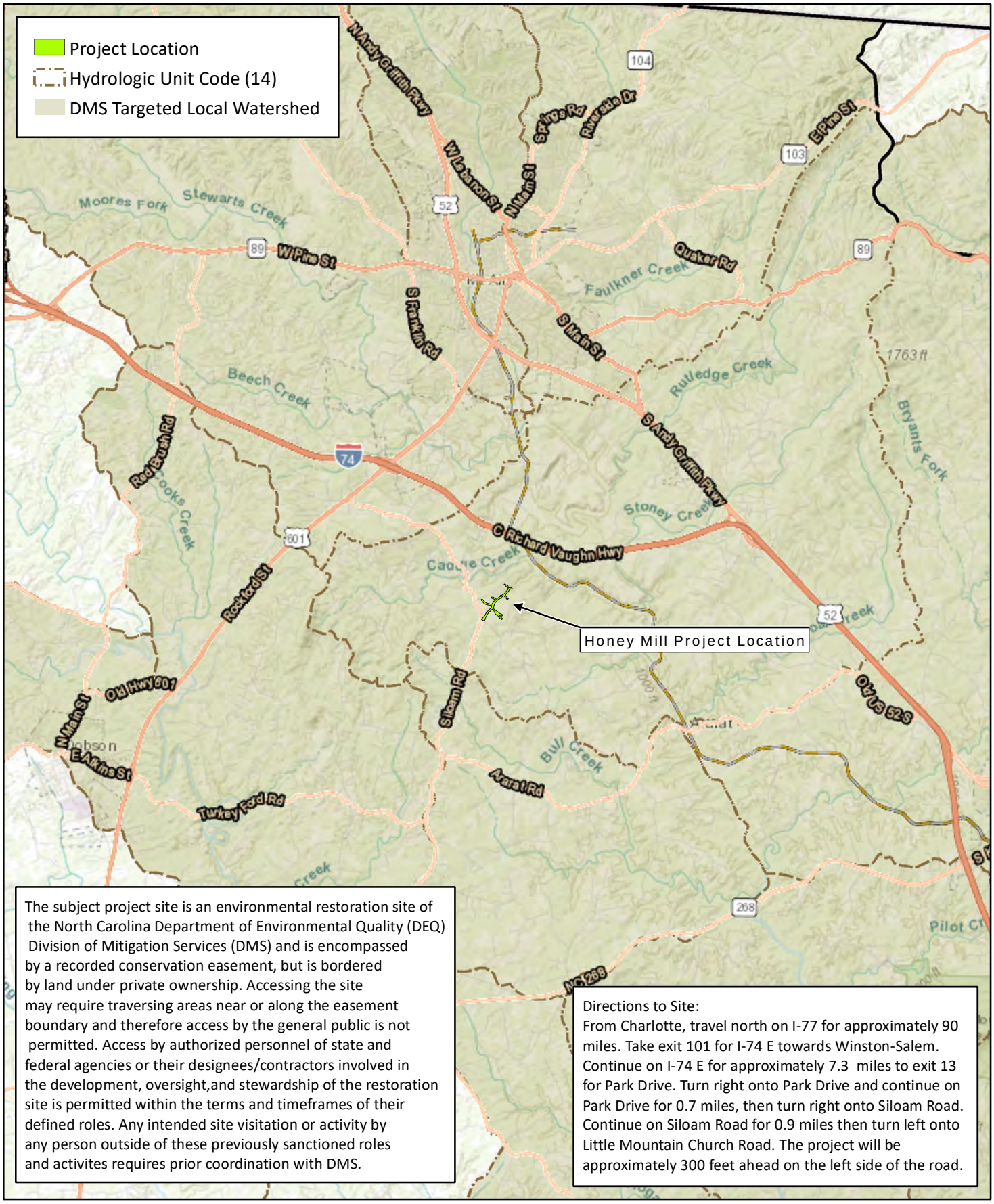
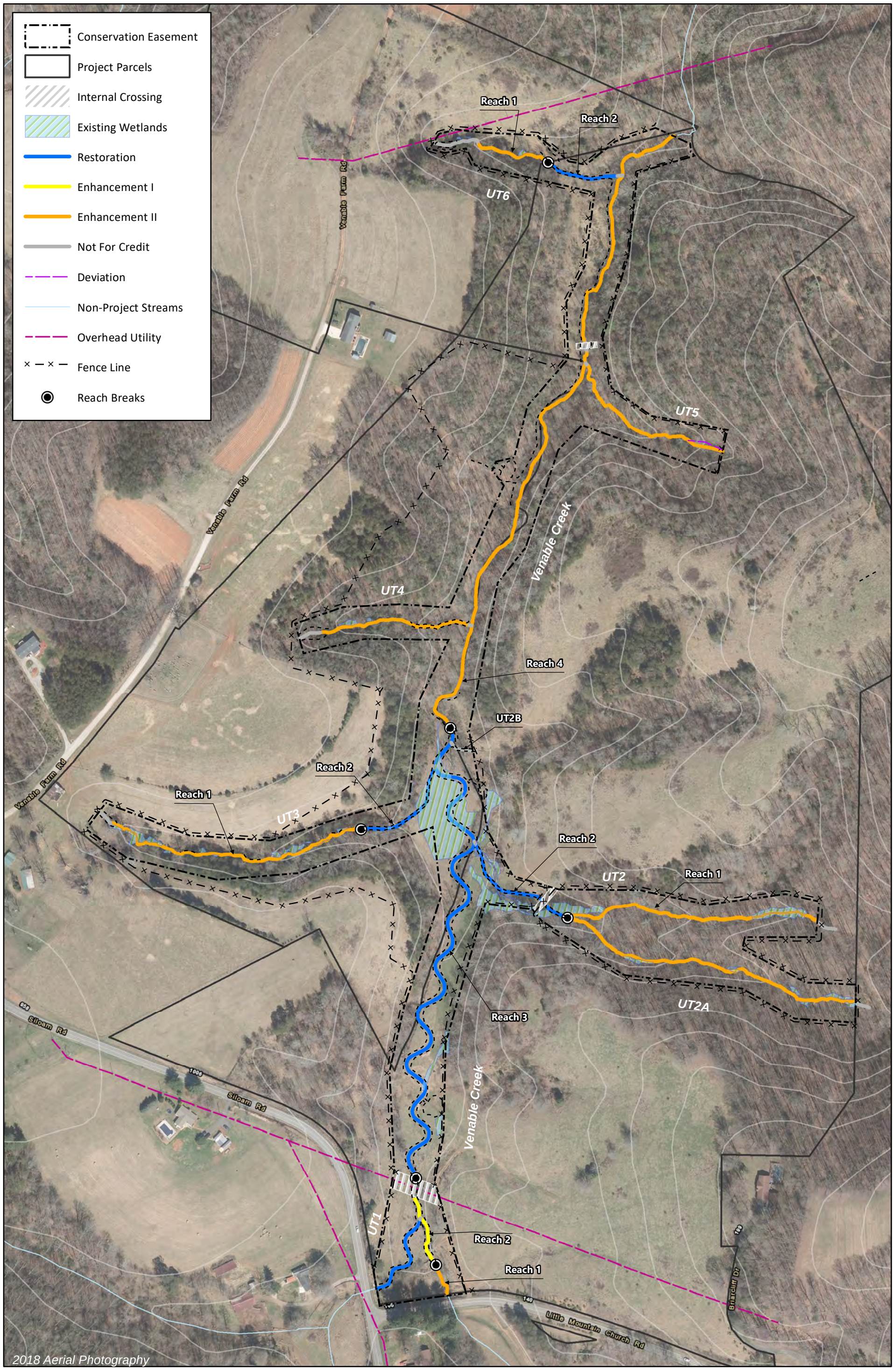
APPENDIX 1. General Figures, Tables, and Documentation



WILDLANDS ENGINEERING

Figure 1 Project Vicinity Map
Honey Mill Mitigation Site
DMS Project No, 100083
Monitoring Year 0 - 2021
Surry County, NC



WILDLANDS ENGINEERING

0 250 500 Feet

Figure 2 Project Component/Asset Map
Honey Mill Mitigation Site
DMS Project No.100083
Monitoring Year 0 - 2021
Surry County, NC

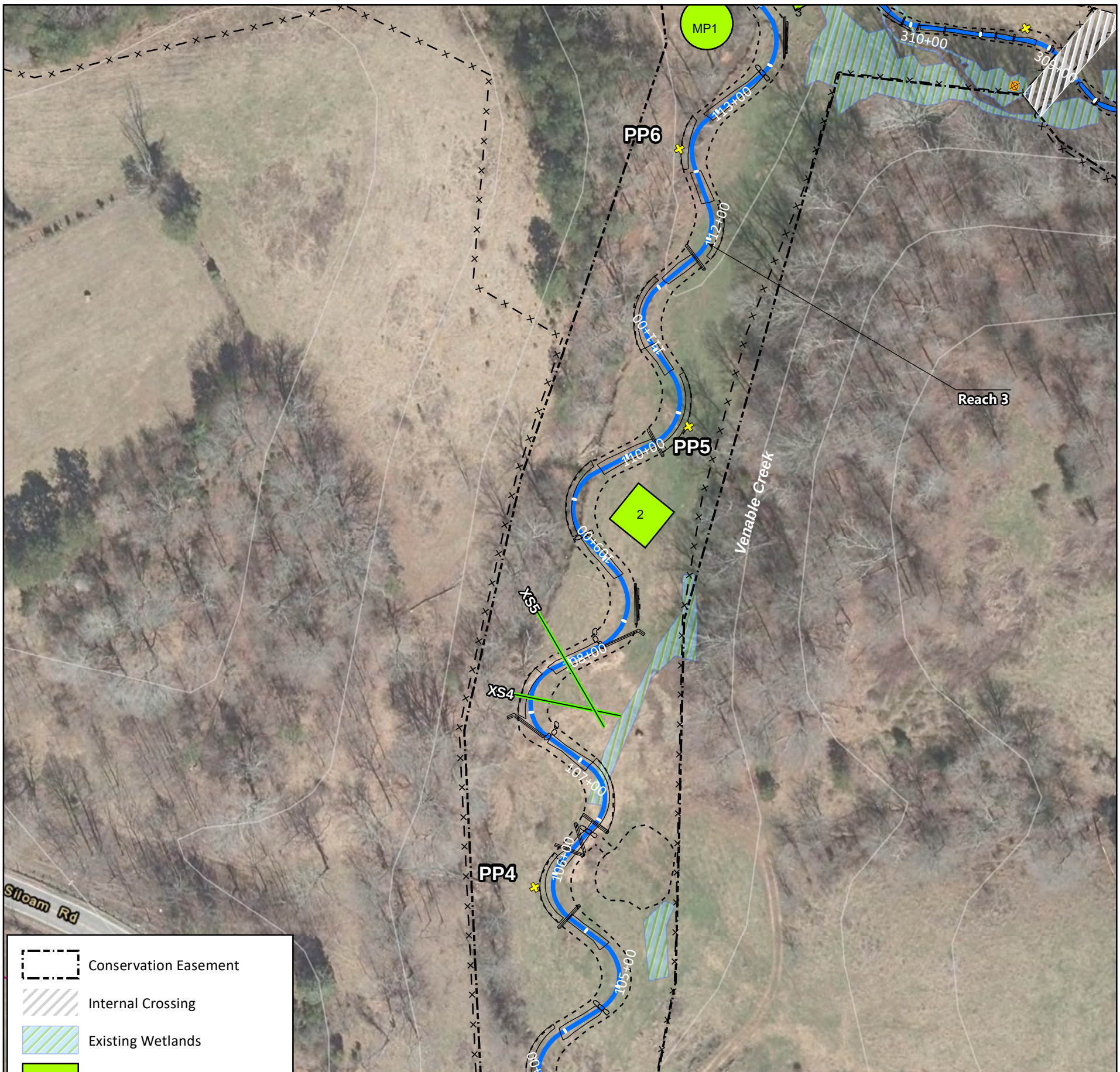
Conservation Easement
Project Parcels
Sheet Boundary
Existing Wetlands
Internal Crossing
Vegetation Plots (Permanent)
Vegetation Plots (Mobile)
Stream Restoration
Stream Enhancement I
Stream Enhancement II
Not For Credit
Non-Project Streams
Deviation
Bankfull
Fence Line
Overhead Utility
Topographical Contour (20')
Cross Sections
Crest Gage
Barotroll
Photo Points
Reach Breaks

Sheet 3.4
Sheet 3.3
Sheet 3.2
Sheet 3.1
Reach 1
Reach 2
UT6
UT5
UT4
Venable Creek
Reach 4
UT2B
Reach 2
UT3
Reach 1
Reach 2
UT2
Reach 1
UT2A
Reach 3
Venable Farm Rd
Siloam Rd
UT1
Reach 2
Reach 1
Briarcliff Dr
Little Mountain Church Rd
2018 Aerial Photography

WILDLANDS ENGINEERING

0 250 500 Feet

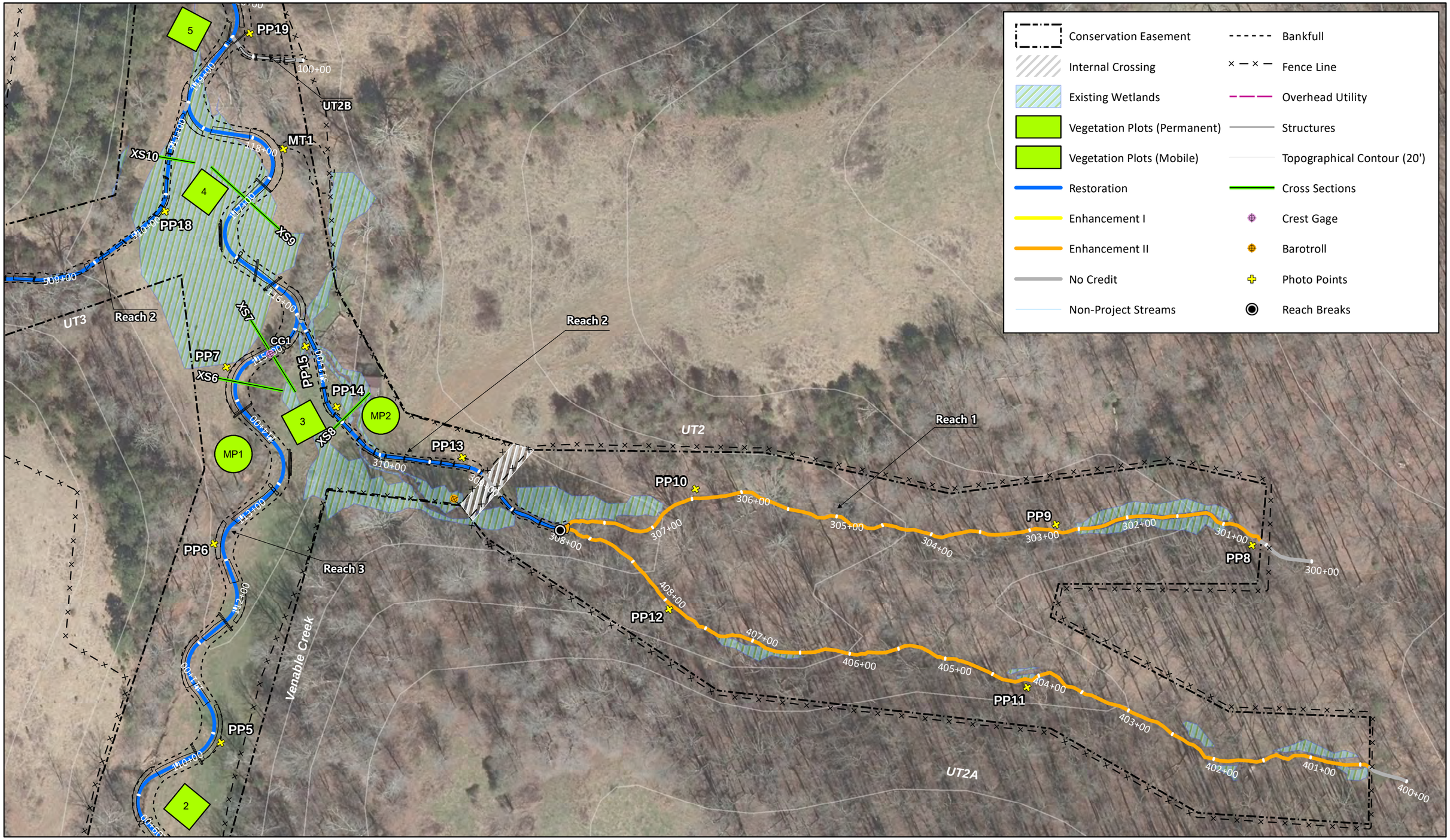
Figure 3.0 Monitoring Plan View (Key)
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021
Surry County, NC



WILDLANDS ENGINEERING

0 80 160 Feet

Figure 3.1 Monitoring Plan View
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021
Surry County, NC



WILDLANDS ENGINEERING

0 90 180 Feet

Figure 3.2 Monitoring Plan View
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021
Surry County, NC

Conservation Easement
Internal Crossing
Existing Wetlands
Vegetation Plots (Permanent)
Vegetation Plots (Mobile)
Stream Restoration
Stream Enhancement I
Stream Enhancement II
Not For Credit
Bankfull
Fence Line
Overhead Utility
Structures
Cross Sections
Photo Points
Reach Breaks

MP4
MT2
PP22
PP21
PP20
PP19
PP18
PP17
PP16
MP3
MT1
XS10
XS9
6
5
4
UT4
UT2B
UT3
Reach 4
Reach 2
Reach 3
Reach 1
Venable Creek
600+00
601+00
602+00
603+00
604+00
120+00
121+00
122+00
123+00
124+00
125+00
126+00
127+00
128+00
500+00
501+00
502+00
503+00
504+00
505+00
506+00
507+00
508+00
509+00
510+00
511+00
118+00
119+00
2018 Aerial Photography

WILDLANDS ENGINEERING

0 100 200 Feet

Figure 3.3 Monitoring Plan View
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021
Surry County, NC

Conservation Easement
Internal Crossing
Existing Wetlands
Vegetation Plots (Permanent)
Vegetation Plots (Mobile)
Overhead Utility
Stream Restoration
Stream Enhancement I
Stream Enhancement II
No Credit
Alignment Deviation
Non-Project Streams
Bankfull
Fence Line
Structures
Cross Sections
Photo Points
Reach Breaks

Reach 1
Reach 2
PP28
MP5
PP27
PP26
PP25
MP4
MT2
PP24
PP23
PP22
XS11
UT6
UT5
9
8
7
800+00
801+00
802+00
803+00
804+00
805+00
138+00
139+00
140+00
137+00
136+00
135+00
134+00
133+00
132+00
131+00
130+00
129+00
128+00
704+00
703+00
702+00
701+00
700+00
2018 Aerial Photography

WILDLANDS ENGINEERING

0 90 180 Feet

Figure 3.4 Monitoring Plan View
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021
Surry County, NC

Table 1. Mitigation Assets and Components

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021

Project Components							
Project Area /Reach	**Existing Footage (LF) or Acreage**	**Mitigation Plan Footage/ Acreage[1, 2, 3]**	**Mitigation Category**	**Restoration Level**	**Priority Level**	**Mitigation Ratio (X:1)**	**As-Built Footage/Acreage**
Venable Creek Reach 1	3,823	91	Cool	Enhancement II	N/A	2.500	91.000
Venable Creek Reach 2		211		Enhancement I	P3, P4	1.500	211.000
Venable Creek Reach 3		1647		Restoration	P1	1.000	1,647.000
Venable Creek Reach 4		1958		Enhancement II	P3, P4	2.500	1,958.000
UT1	179	273	Cool	Restoration	P2	1.000	273.000
UT2 Reach 1	1,154	742	Cool	Enhancement II	N/A	4.000	742.000
UT2 Reach 2		342		Restoration	P1	1.000	332.000
UT2A	889	893	Cool	Enhancement II	N/A	4.000	893.000
UT2B	34	70	Cool	N/A	N/A	0.000	70.000
UT3 Reach 1	1,236	784	Cool	Enhancement II	N/A	3.000	784.000
UT3 Reach 2		306		Restoration	P1/P2	1.000	306.000
UT4	446	440	Cool	Enhancement II	N/A	3.000	440.000
UT5	552	518	Cool	Enhancement II	N/A	3.000	518.000
UT6 Reach 1	588	214	Cool	Enhancement II	N/A	3.000	213.000
UT6 Reach 2		205		Restoration	P1	1.000	205.000

Notes:

1. Internal culvert crossing and external break excluded from the credited stream footage.
2. No direct credit for BMP's.
3. UT6 originates within an overhead powerline easement. The conservation easement extends up to UT6's origin under the powerline, but proposed crediting does not begin until the stream exits the overhead easement.

Project Credits							
Restoration Level	**Stream**			**Riparian Wetland**		**Non-Riparian Wetland**	**Coastal Marsh**
	Warm	**Cool**	**Cold**	**Riverine**	**Non-Riv**		
Restoration	N/A	2,772.812	N/A	N/A	N/A	N/A	N/A
Re-establishment				N/A	N/A	N/A	N/A
Rehabilitation				N/A	N/A	N/A	N/A
Enhancement				N/A	N/A	N/A	N/A
Enhancement I	N/A	140.566	N/A				
Enhancement II	N/A	1,880.054	N/A				
Creation				N/A	N/A	N/A	N/A
Preservation	N/A	N/A	N/A	N/A	N/A	N/A	
Totals	**N/A**	**4,793.432**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**

Table 2. Project Activity and Reporting History

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021

Activity or Report		Data Collection Complete	Completion or Delivery
404 Permit		September 2020	October 2020
Mitigation Plan		August 2019 - October 2020	October 2020
Final Design - Construction Plans		September 2020	September 2020
Construction		November 2020 - February 2021	February 2021
Temporary S&E mix applied to entire project area[1]		February 2021	February 2021
Permanent seed mix applied to reach/segments[1]		February 2021	February 2021
Bare root and live stake plantings for reach/segments		March 2021	March 2021
Baseline Monitoring (Year 0)	Stream Survey	March - June 2021	June 2021
	Vegetation Survey	March 2021	
	Remediation	N/A	N/A
	Encroachment		
Year 1 Monitoring	Stream Survey		
	Vegetation Survey		
	Remediation		
	Encroachment		
Year 2 Monitoring	Stream Survey		
	Vegetation Survey		
	Remediation		
	Encroachment		
Year 3 Monitoring	Stream Survey		
	Vegetation Survey		
	Remediation		
	Encroachment		
Year 4 Monitoring	Stream Survey		
	Vegetation Survey		
	Remediation		
	Encroachment		
Year 5 Monitoring	Stream Survey		
	Vegetation Survey		
	Remediation		
	Encroachment		
Year 6 Monitoring	Stream Survey		
	Vegetation Survey		
	Remediation		
	Encroachment		
Year 7 Monitoring	Stream Survey		
	Vegetation Survey		
	Remediation		
	Encroachment		

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

Table 3. Project Contact Table

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021

Designers Aaron Earley, PE, CFM	**Wildlands Engineering, Inc.** 1430 South Mint Street, Suite 104 Charlotte, NC 28203 704.332.7754
Construction Contractors	**Main Stream Earthworks, Inc.** 631 Camp Dan Valley Rd Reidsville, NC 27320
Planting Contractor	**Bruton Natural Systems, Inc.** PO Box 1197 Fremont, NC 27830
Seeding Contractor	**Main Stream Earthworks, Inc.** 631 Camp Dan Valley Rd Reidsville, NC 27320
Seed Mix Sources	**Green Resource LLC**
Nursery Stock Suppliers	
Bare Roots Live Stakes	**Bruton Natural Systems, Inc.**
Herbaceous Plugs	**Wetland Plants Inc.**
Monitoring Performers	**Wildlands Engineering, Inc.**
Monitoring, POC	Kristi Suggs (704) 332.7754 x.110

Table 4. Project Information and Attributes
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021

Project Information	
Project Name	Honey Mill Mitigation Site
	Surry County
Project Area (acres)	20.2
Project Coordinates (latitude and longitude)	36° 25' 43.03"N 80° 36' 39.01"W
Planted Acreage (Acre of Woody Stems Planted)	5 acres (full planting) plus supplemental planting

Project Watershed Summary Information	
Physiographic Province	Piedmont Physiographic Province
River Basin	Yadkin River
USGS Hydrologic Unit 8-digit	03040101
USGS Hydrologic Unit 14-digit	03040101110020
DWR Sub-basin	03-07-03
Project Drainage Area (acres)	705
Project Drainage Area Percentage of Impervious Area	0.8%
2011 NLCD Land Use Classification	Forest (65%), Cultivated (21%), Shrubland (5%), Urban (9%), Open Water (0%)

Reach Summary Information

Parameters	Venable Creek R1	Venable Creek R2	Venable Creek R3	Venable Creek R4	UT1	UT2 R1	UT2 R2	UT2A	UT2B	UT3 R1	UT3 R2	UT4	UT5	UT6 R1	UT6 R2
Length of reach (linear feet) - Post-Restoration	91	211	1,647	1,958	273	742	332	893	80	784	306	440	518	213	205
Valley confinement (Confined, moderately confined, unconfined)	Moderately Confined	Moderately Confined	Unconfined	Confined	Unconfined	Confined	Unconfined	Confined	Unconfined	Confined	Confined to Unconfined	Confined	Confined	Confined	Confined
Drainage area (acres)	183	519	599	705	334	21	43	21	9	15	18	9	12	8	10
Perennial (P), Intermittent (I), Ephemeral (E)	P	P	P	P	P	I/ P	P	P	P	P	P	P	I/ P	P	P
NCDWR Water Quality Classification	Class C														
Morphological Description (stream type) - Pre-Restoration	N/A	E4	E/C4	N/A	E4b	N/A	C4b	N/A	N/A	N/A	E4b	N/A	N/A	N/A	A4
Morphological Description (stream type) - Post-Restoration	N/A	B4	C4	N/A	C4b	N/A	B4	N/A	N/A	N/A	C4b	N/A	N/A	N/A	A4
Evolutionary trend (Simon's Model) - Pre- Restoration	N/A	III	IV	N/A	III	N/A	IV->V	N/A	N/A	N/A	III	N/A	N/A	N/A	III
FEMA classification	N/A														

Regulatory Considerations

Regulation	Applicable?	Resolved?	Supporting Documentation
Waters of the United States - Section 404	Yes	Yes	USACE Action ID #SAW-2018-01789
Waters of the United States - Section 401	Yes	Yes	DWR# 18-1271
Division of Land Quality (Erosion and Sediment Control)	Yes	Yes	NPDES Construction Stormwater General Permit NCG010000
Endangered Species Act	Yes	Yes	Categorical Exclusion Document in Mitigation Plan
Historic Preservation Act	Yes	Yes	Categorical Exclusion Document in Mitigation Plan
Coastal Zone Management Act (CZMA)/Coastal Area Management	No	N/A	N/A
FEMA Floodplain Compliance	No	N/A	N/A
Essential Fisheries Habitat	No	N/A	N/A

Table 5. Monitoring Component Summary

Honey Mill Mitigation Site

DMS Project No. 100083

Monitoring Year 0 - 2021

Parameter	Monitoring Feature	Quantity/Length by Reach							Frequency	Notes
		VC Reach 1	VC Reach 2	VC Reach 3	VC Reach 4	UT1	UT2 Reach 1	UT2 Reach 2		
Dimension	Riffle Cross-sections	N/A	1	3	N/A	1	N/A	1	Year 1, 2, 3, 5, and 7	1
	Pool Cross-sections	N/A	0	2	N/A	1	N/A	0		
Pattern	Pattern	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2
Profile	Longitudinal Profile	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Substrate	Reach wide (RW) Pebble Count	N/A	1 RW	1 RW	N/A	1 RW	N/A	1 RW	Year 1, 2, 3, 5, and 7	3
Hydrology	Crest Gage (CG) and/or Stream Flow Gage (SG)	N/A	1 CG		N/A	N/A	N/A		Semi- Annual	4
Vegetation	CVS Level 2/Mobile Plots (Permanent/Mobile)	8 (5/3)							Year 1, 2, 3, 5, and 7	5
Visual Assessment		Y	Y	Y	Y	Y	Y	Y	Semi- Annual	
Exotic and nuisance vegetation									Semi- Annual	6
Project Boundary									Semi- Annual	7
Reference Photos	Stream/ Mature Tree Photographs	18/ 2							Annual	8

Parameter	Monitoring Feature	Quantity/Length by Reach							Frequency	Notes
		UT2A	UT3 Reach 1	UT3 Reach 2	UT4	UT5	UT6 Reach 1	UT6 Reach 2		
Dimension	Riffle Cross-sections	N/A	N/A	1	N/A	N/A	N/A	1	Year 1, 2, 3, 5, and 7	1
	Pool Cross-sections	N/A	N/A	0	N/A	N/A	N/A	0		
Pattern	Pattern	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2
Profile	Longitudinal Profile	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Substrate	Reach wide (RW) pebble count	N/A	N/A	1 RW	N/A	N/A	N/A	1 RW	Year 1, 2, 3, 5, and 7	3
Hydrology	Crest Gage(CG) and/or Stream Flow Gage (SG)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Semi- Annual	4
Vegetation	CVS Level 2/Mobile Plots (Permanent/Mobile)	6 (4/2)							Year 1, 2, 3, 5, and 7	5
Visual Assessment		Y	Y	Y	Y	Y	Y	Y	Semi- Annual	
Exotic and nuisance vegetation									Semi- Annual	6
Project Boundary									Semi- Annual	7
Reference Photos	Photographs	10							Annual	

1. Cross-sections are permanently marked with rebar to establish location. Surveys include points measured at all breaks in slope, including top of bank, bankfull, edge of water, and thalweg.

2. Pattern and profile are assessed visually during semi-annual site visits. Longitudinal profile was collected during as-built baseline monitoring survey only, unless observations indicate widespread l vertical stability (greater than 10% of reach is affected) and profile survey is warranted in additional years to monitor adjustments or survey repair work.

3. Riffle 100-count substrate sampling were collected during the baseline monitoring only. Substrate assessments in subsequent monitoring years will consist of reachwide substrate monitoring.

4. Crest gages and/or stream gages are monitored using automated pressure transducers. Transducers are set to record bank full events at least twice a day and stream flow at least every 3 hours ar inspected quarterly or semi-annually. Evidence of bankfull and stream flow events are documented with a photo when possible.

5. Both mobile and permanent vegetation plots are utilized to evaluate the vegetation performance for the open areas planted. 2% of the open planted acreage are monitored with permanent and plots. Permanent vegetation monitoring plot assessments follow CVS Level 2 protocols. Mobile vegetation monitoring plot assessments document number of planted stems and species using a circular m2 square/rectangular plot. Planted shaded areas are visually assessed.

6. Locations of exotic and nuisance vegetation are mapped.

7. Locations of vegetation damage, boundary encroachments, etc. are mapped.

8. Two additional photo points have been established to document mature tree save areas.

APPENDIX 2. Morphological Summary Data and Plots

Table 6. Baseline Stream Data Summary
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021

	Pre-Existing Condition																	
Parameter	**Venable Creek R2**			**Venable Creek R3**			**UT1**			**UT2 R2**			**UT3 R2**			**UT6 R2**		
	Min	**Max**	**n**	**Min**	**Max**	**n**	**Min**	**Max**	**n**	**Min**	**Max**	**n**	**Min**	**Max**	**n**	**Min**	**Max**	**n**
Dimension and Substrate - Riffle																		
Bankfull Width (ft)	10.6		1	10.5	10.8	2	8.7		1	4.0		1	4.2		1	2.1		1
Floodprone Width (ft)	46		1	90	113	2	69		1	11		1	27		1	8		1
Bankfull Mean Depth (ft)	1.5		1	1.6	1.7	2	1.1		1	0.3		1	0.9		1	0.8		1
Bankfull Max Depth (ft)	2.0		1	2.2	2.3	2	1.6		1	0.4		1	1.1		1	1.1		1
Bankfull Cross-sectional Area (ft^2)	15.6		1	16.9	18.1	2	9.8		1	1.2		1	3.8		1	1.6		1
Width/Depth Ratio	7.2		1	6.1	6.9	2	7.6		1	12.7		1	4.7		1	2.7		1
Entrenchment Ratio[1]	4.3		1	8.6	10.5	2	7.9		1	2.7		1	6.4		1	3.7		1
Bank Height Ratio	1.6		1	1.3	1.6	2	1.4		1	1.0		1	1.5		1	2.6		1
Max part size (mm) mobilized at bankfull	40.6		1	13.3		2	9.5		1	24.1		1	3.1		1	8.5		1
Rosgen Classification	E4			E/C4			E4b			C4b			E4b			A4		
Bankfull Discharge (cfs)	75			83			52			10			6			4		
Sinuosity	1.08			1.14			1.04			1.18			1.47			1.01		
Bankfull/Channel Slope (ft/ft)[2]	0.0190			0.0136			0.0212			0.0352			0.0369			0.0870		
	Design																	
Parameter	**Venable Creek R2**			**Venable Creek R3**			**UT1**			**UT2 R2**			**UT3 R2**			**UT6 R2**		
	Min	**Max**	**n**	**Min**	**Max**	**n**	**Min**	**Max**	**n**	**Min**	**Max**	**n**	**Min**	**Max**	**n**	**Min**	**Max**	**n**
Dimension and Substrate - Riffle																		
Bankfull Width (ft)	15.0		1	15.6		1	11.5		1	5.6		1	4.9		1	3.7		1
Floodprone Width (ft)	30		1	34		1	25		1	11		1	10		1	5		1
Bankfull Mean Depth (ft)	1.1		1	1.1		1	1.0		1	0.5		1	0.4		1	0.3		1
Bankfull Max Depth (ft)	---		1	---		1	---		1	---		1	---		1	---		1
Bankfull Cross-sectional Area (ft^2)	16.4		1	17.3		1	11.1		1	2.6		1	1.9		1	1.2		1
Width/Depth Ratio	13.8		1	14.1		1	11.8		1	12.1		1	12.3		1	11.2		1
Entrenchment Ratio[1]	2.0+		1	2.2+		1	2.2+		1	2.0+		1	2.0+		1	1.4+		1
Bank Height Ratio	1.0-1.1		1	1.0-1.1		1	1.0-1.1		1	1.0-1.1		1	1.0-1.1		1	1.0-1.1		1
Max part size (mm) mobilized at bankfull	---		1	---		1	9.5		1	24.1		1	3.1		1	8.5		1
Rosgen Classification	B4			C4			C4b			B4			B4			A4		
Bankfull Discharge (cfs)	75			83			52			10			6			4		
Sinuosity	1.08			1.29			1.14			1.02			1.02			1.00		
Bankfull/Channel Slope (ft/ft)[2]	0.0230			0.0140			0.0210			0.0380			0.0340			0.0822		
	As-Built/ Baseline																	
Parameter	**Venable Creek R2**			**Venable Creek R3**			**UT1**			**UT2 R2**			**UT3 R2**			**UT6 R2**		
	Min	**Max**	**n**	**Min**	**Max**	**n**	**Min**	**Max**	**n**	**Min**	**Max**	**n**	**Min**	**Max**	**n**	**Min**	**Max**	**n**
Dimension and Substrate - Riffle																		
Bankfull Width (ft)	15.0		1	14.6	15.8	3	12.1		1	9.3		1	6.2		1	6.6		1
Floodprone Width (ft)	68		1	93	104	3	75		1	57		1	51		1	33		1
Bankfull Mean Depth (ft)	1.3		1	1.1	1.2	3	0.9		1	0.5		1	0.5		1	0.4		1
Bankfull Max Depth (ft)	2.1		1	1.8	2.0	3	1.6		1	0.8		1	0.7		1	0.7		1
Bankfull Cross-sectional Area (ft^2)[1]	20.2		1	16.0	19.4	3	11.0		1	4.8		1	2.8		1	3.0		1
Width/Depth Ratio	11.1		1	12.8	14.2	3	13.4		1	17.8		1	13.5		1	15.0		1
Entrenchment Ratio[1]	4.5		1	6.0	6.7	3	6.2		1	6.1		1	8.2		1	5.0		1
Bank Height Ratio	1.0		1	1.0		3	1.0		1	1.0		1	1.0		1	1.0		1
Max part size (mm) mobilized at bankfull	17.1		1	24.7		3	14.8		1	19.0		1	14.8		1	17.7		1
Rosgen Classification	B4			C4			C4b			B4			B4			A4		
Bankfull Discharge (cfs)	142			78	100	3	54			24			12			19		
Sinuosity	1.03			1.31			1.20			1.05			1.05			1.05		
Bankfull/Channel Slope (ft/ft)[2]	0.0245			0.0152			0.0232			0.0440			0.0387			0.0869		

1. ER for the baseline/monitoring parameters are based on the width of the cross-section
2. Channel slope is calculated from the surface of the channel bed rather than water surface.
(---): Data was not provided, N/A: Not Applicable

Table 7. Morphology and Hydraulic Summary (Dimensional Parameters - Cross-Section)

Honey Mill Mitigation Site

DMS Project No. 100083

Monitoring Year 0 - 2021

	UT1 Cross-Section 1 Pool								UT1 Cross-Section 2 Riffle								Venable Creek R2 Cross-Section 3 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**
Bankfull Elevation (ft) - Based on AB-Bankfull[1] Area	1039.7								1039.2								1034.6							
Bank Height Ratio - Based on AB Bankfull[1] Area	N/A								1.0								1.0							
Thalweg Elevation (ft)	1037.6								1037.6								1032.5							
LTOB[2] Elevation (ft)	1039.7								1039.2								1034.6							
LTOB[2] Max Depth (ft)	2.1								1.6								2.1							
LTOB[2] Cross Sectional Area (ft^2)	18.1								11.0								20.2							
	Venable Creek R3 Cross-Section 4 Pool								**Venable Creek R3 Cross-Section 5 Riffle**								**Venable Creek R3 Cross-Section 6 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**
Bankfull Elevation (ft) - Based on AB-Bankfull[1] Area	1024.7								1024.1								1016.3							
Bank Height Ratio - Based on AB Bankfull[1] Area	N/A								1.0								N/A							
Thalweg Elevation (ft)	1024.7								1022.3								1013.1							
LTOB[2] Elevation (ft)	1021.4								1024.1								1016.3							
LTOB[2] Max Depth (ft)	3.3								1.8								3.2							
LTOB[2] Cross Sectional Area (ft^2)	33.4								17.1								33.3							
	Venable Creek R3 Cross-Section 7 Riffle								**UT2 R2 Cross-Section 8 Riffle**								**Venable Creek R3 Cross Section 9 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**
Bankfull Elevation (ft) - Based on AB-Bankfull[1] Area	1015.9								1020.0								1011.6							
Bank Height Ratio - Based on AB Bankfull[1] Area	1.0								1.0								1.0							
Thalweg Elevation (ft)	1013.9								1019.1								1009.8							
LTOB[2] Elevation (ft)	1015.9								1020.0								1011.6							
LTOB[2] Max Depth (ft)	2.0								0.8								1.8							
LTOB[2] Cross Sectional Area (ft^2)	19.4								4.8								16.0							
	UT3 R2 Cross Section 10 Riffle								**UT6 R2 Cross-Section 11 Riffle**															
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**								
Bankfull Elevation (ft) - Based on AB-Bankfull[1] Area	1011.9								998.6															
Bank Height Ratio - Based on AB Bankfull[1] Area	1.0								1.0															
Thalweg Elevation (ft)	1011.2								997.9															
LTOB[2] Elevation (ft)	1011.9								998.6															
LTOB[2] Max Depth (ft)	0.7								0.7															
LTOB[2] Cross Sectional Area (ft^2)	2.8								3.0															

[1]Bank Height Ratio (BHR) takes the As-built bankful area as the basis for adjusting each subsequent years bankfull elevation.

[2]LTOB Area and Max depth - These are based on the LTOB elevation for each years survey (The same elevation used for the LTOB in the BHR calculation). Area below the LTOB elevation will be used and tracked for each year as above. The difference between the LTOB elevation and the thalweg elevation (same as in the BHR calculation) will be recroded and tracked above as LTOB max depth.

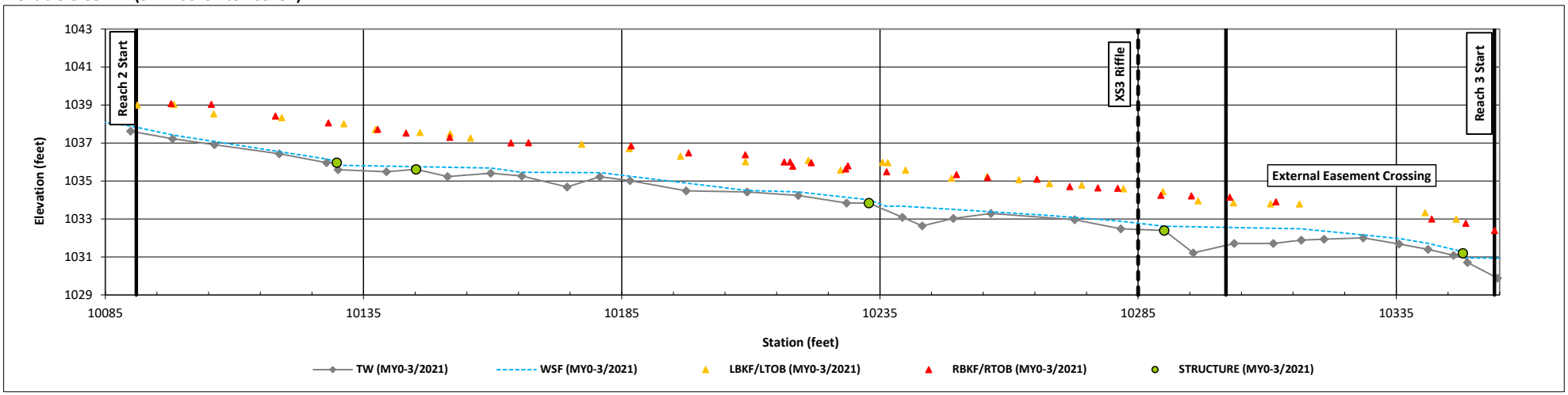
Longitudinal Profile Plots

Honey Mill Mitigation Site

DMS Project No. 100083

Monitoring Year 0 - 2021

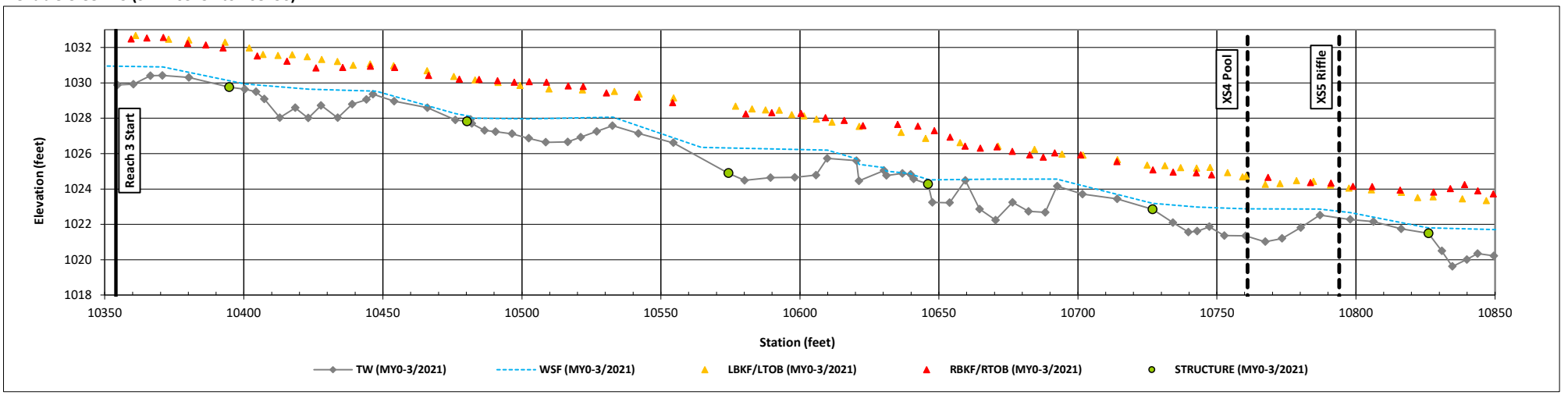
Venable Creek R2 (STA 100+91 to 103+54)



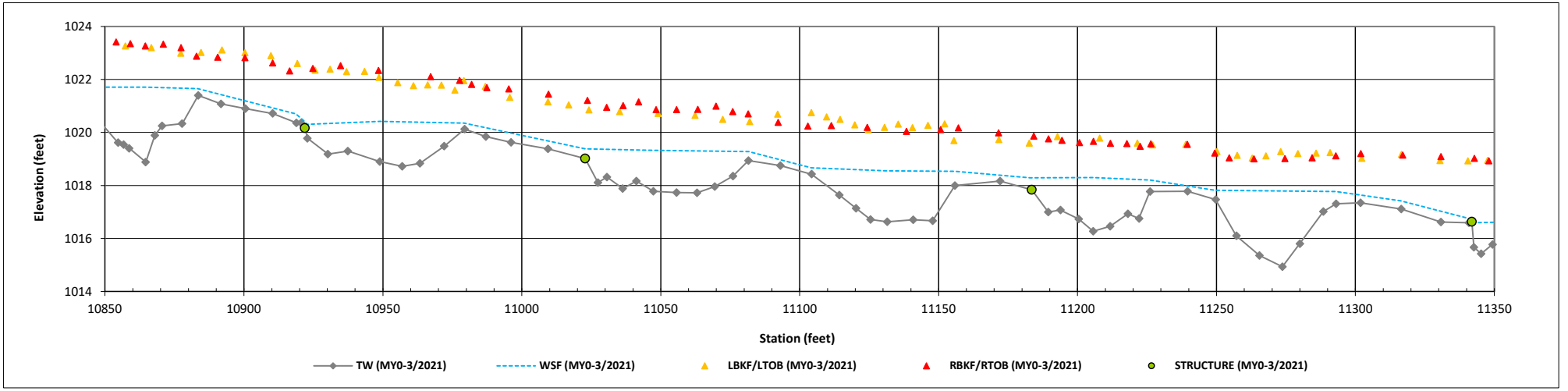
Longitudinal Profile Plots

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021

Venable Creek R3 (STA 103+54 to 108+50)



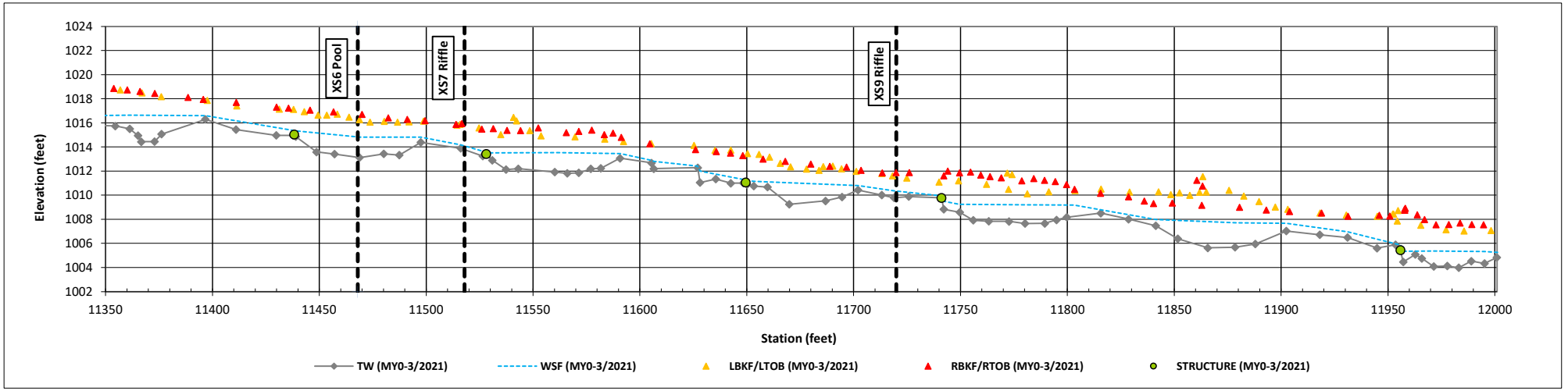
Venable Creek R3 (STA 108+50 to 113+50)



Longitudinal Profile Plots

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021

Venable Creek R3 (STA 113+50 to 120+01)



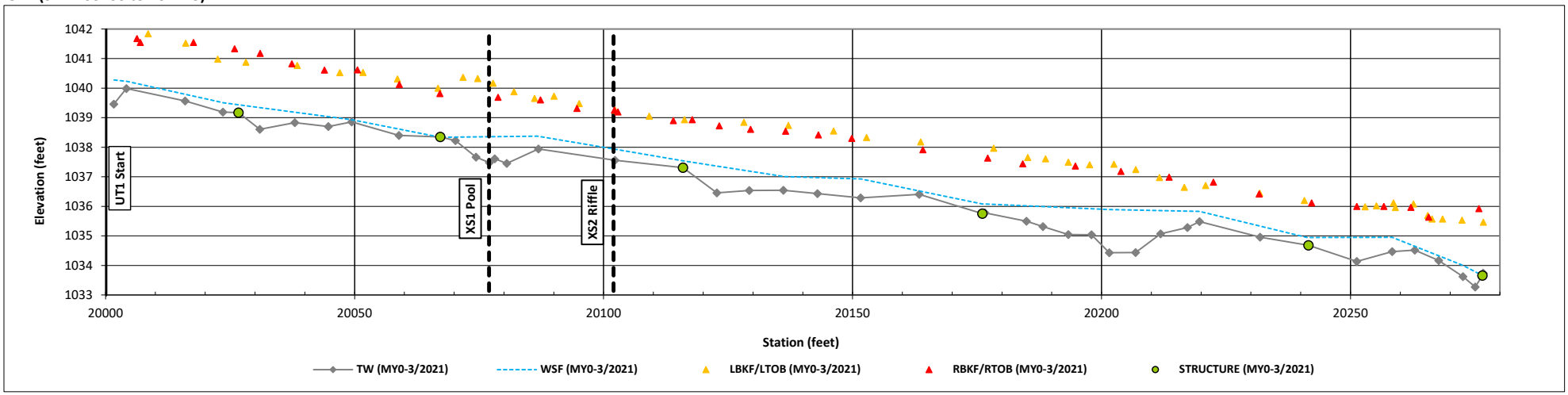
Longitudinal Profile Plots

Honey Mill Mitigation Site

DMS Project No. 100083

Monitoring Year 0 - 2021

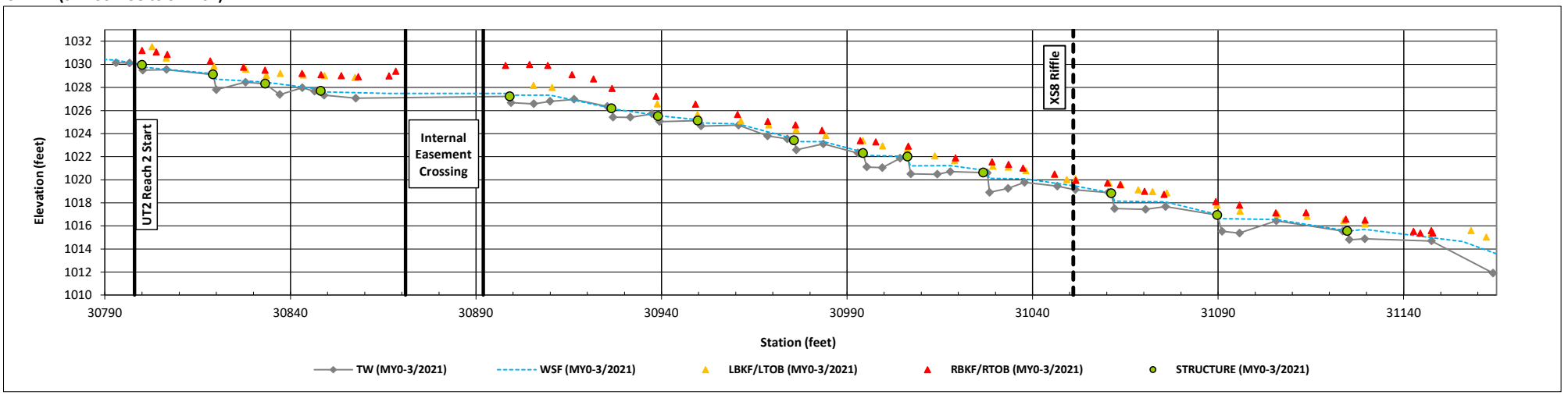
UT1 (STA 200+00 to 202+73)



Longitudinal Profile Plots

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021

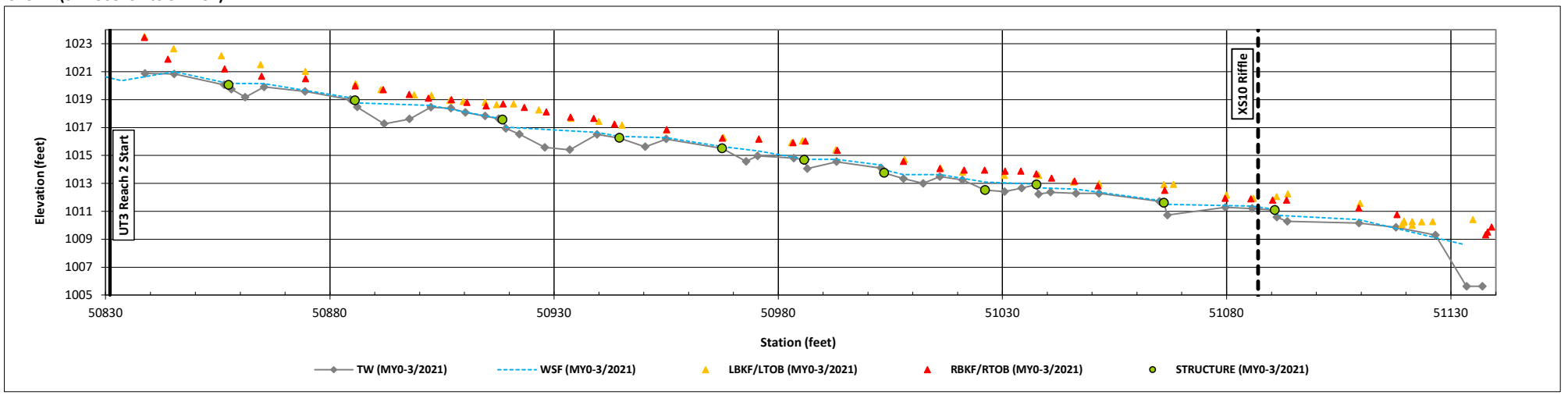
UT2 R2 (STA 307+98 to 311+61)



Longitudinal Profile Plots

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021

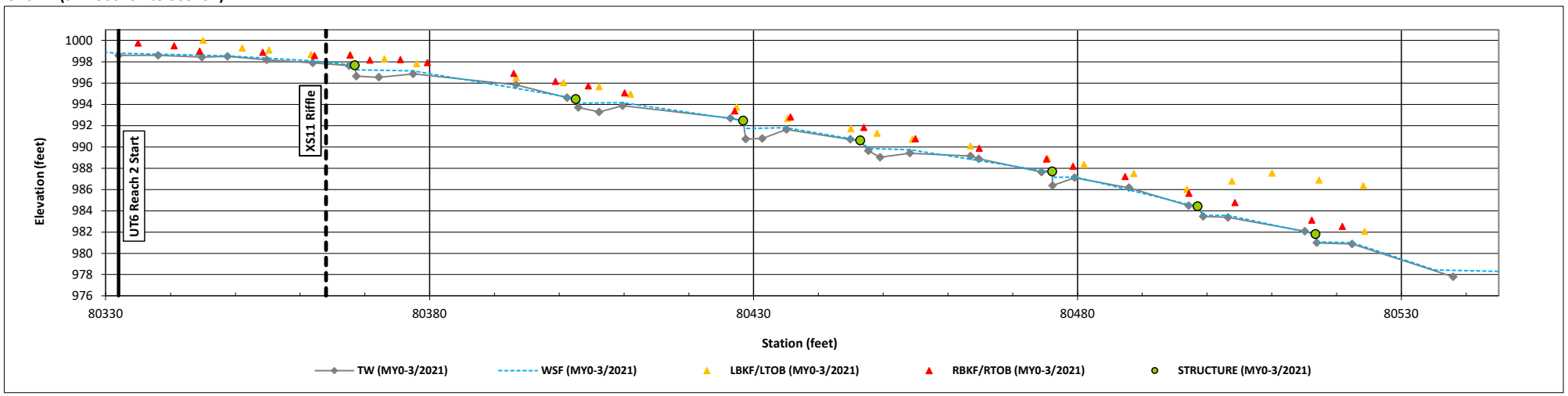
UT3 R2 (STA 508+31 to 511+37)



Longitudinal Profile Plots

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021

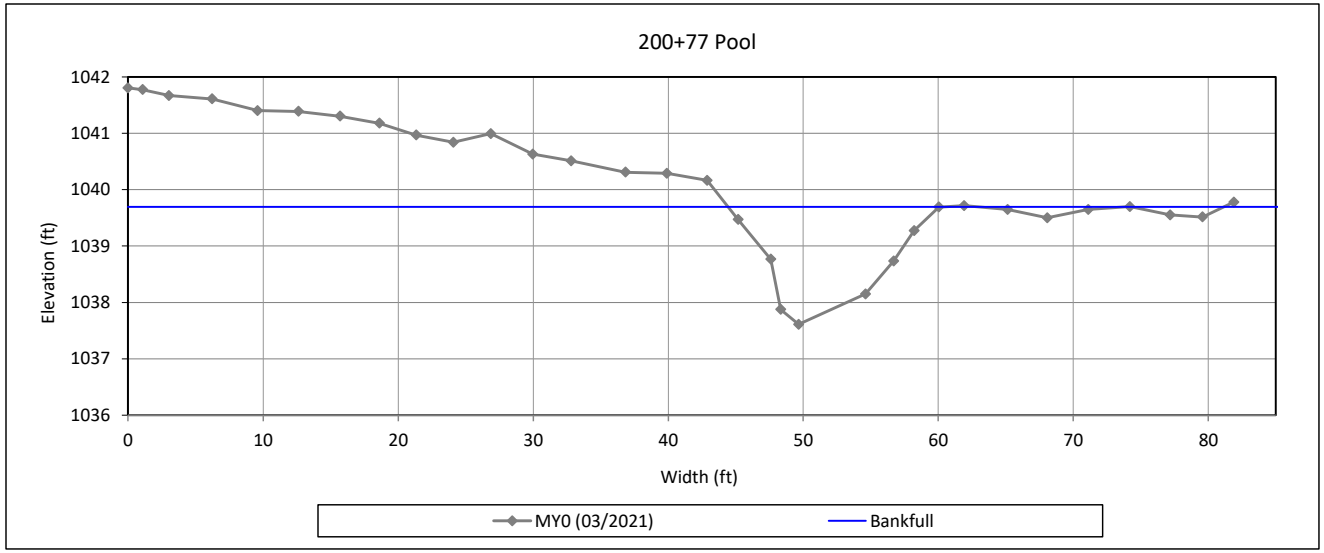
UT6 R2 (STA 803+32 to 805+37)



Cross-Section Plots

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021

Cross-Section 1-UT1



Bankfull Dimensions	
18.1	x-section area (ft.sq.)
15.6	width (ft)
1.2	mean depth (ft)
2.1	max depth (ft)
16.4	wetted perimeter (ft)
1.1	hydraulic radius (ft)
13.4	width-depth ratio

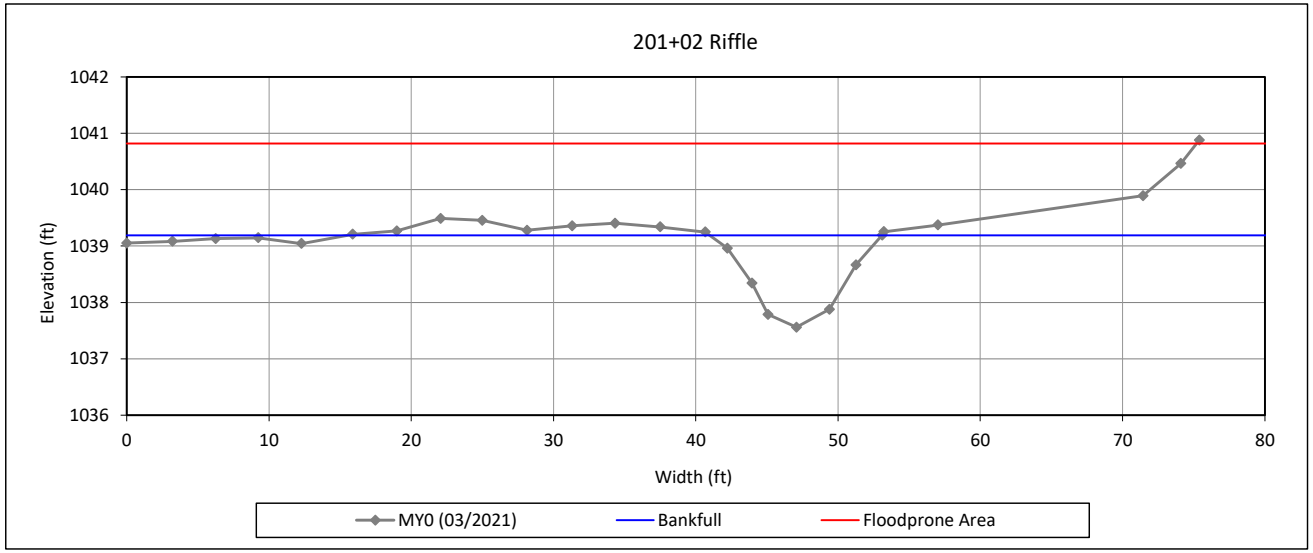
Survey Date: 03/2021
Field Crew: Turner Land Surveying

View Downstream

Cross-Section Plots

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021

Cross-Section 2-UT1



Bankfull Dimensions

11.0	x-section area (ft.sq.)
12.1	width (ft)
0.9	mean depth (ft)
1.6	max depth (ft)
12.6	wetted perimeter (ft)
0.9	hydraulic radius (ft)
13.4	width-depth ratio
75.2	W flood prone area (ft)
6.2	entrenchment ratio
1.0	low bank height ratio

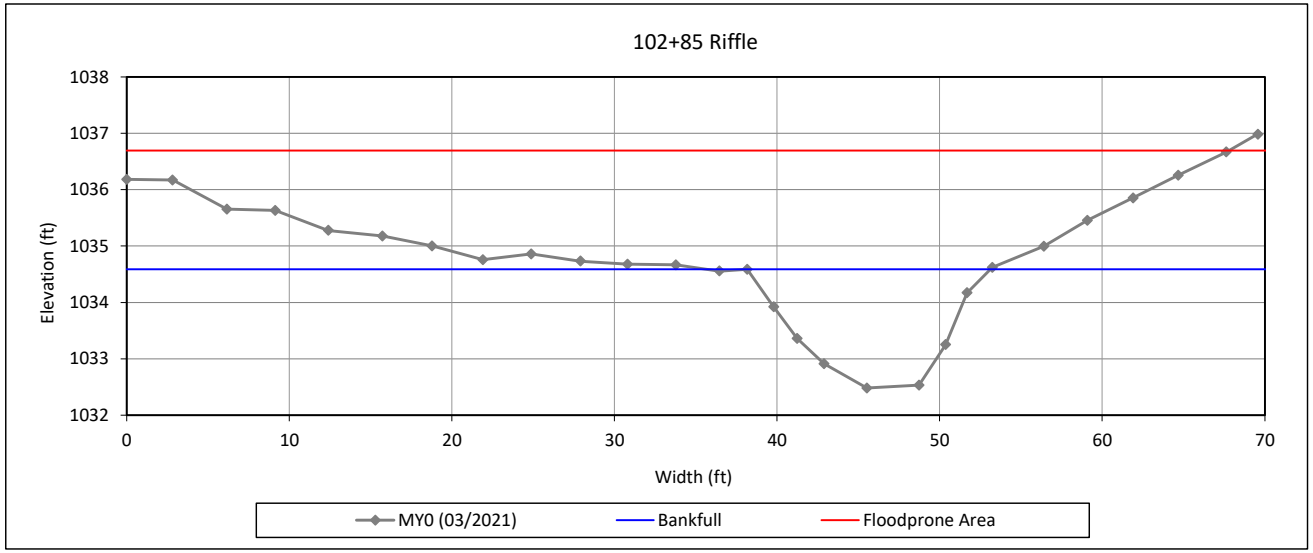
Survey Date: 03/2021
Field Crew: Turner Land Surveying

View Downstream

Cross-Section Plots

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021

Cross-Section 3-Venable Creek R2



Bankfull Dimensions

20.2	x-section area (ft.sq.)
15.0	width (ft)
1.3	mean depth (ft)
2.1	max depth (ft)
15.8	wetted perimeter (ft)
1.3	hydraulic radius (ft)
11.1	width-depth ratio
67.8	W flood prone area (ft)
4.5	entrenchment ratio
1.0	low bank height ratio

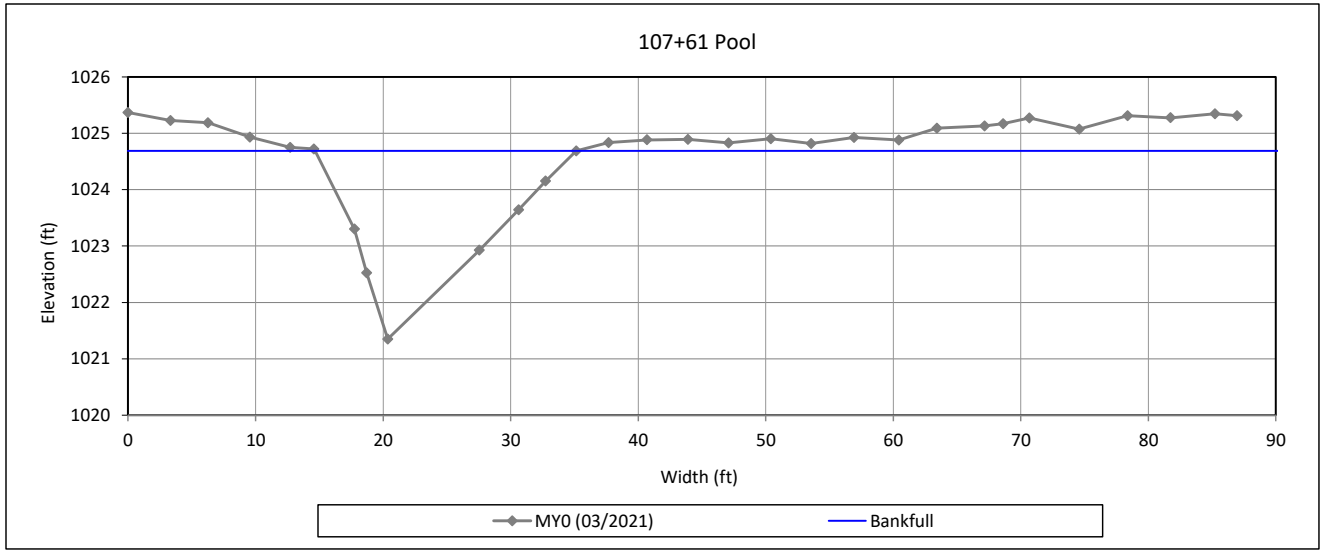
Survey Date: 03/2021
Field Crew: Turner Land Surveying

View Downstream

Cross-Section Plots

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021

Cross-Section 4-Venable Creek R3



Bankfull Dimensions	
33.4	x-section area (ft.sq.)
20.5	width (ft)
1.6	mean depth (ft)
3.3	max depth (ft)
21.8	wetted perimeter (ft)
1.5	hydraulic radius (ft)
12.6	width-depth ratio

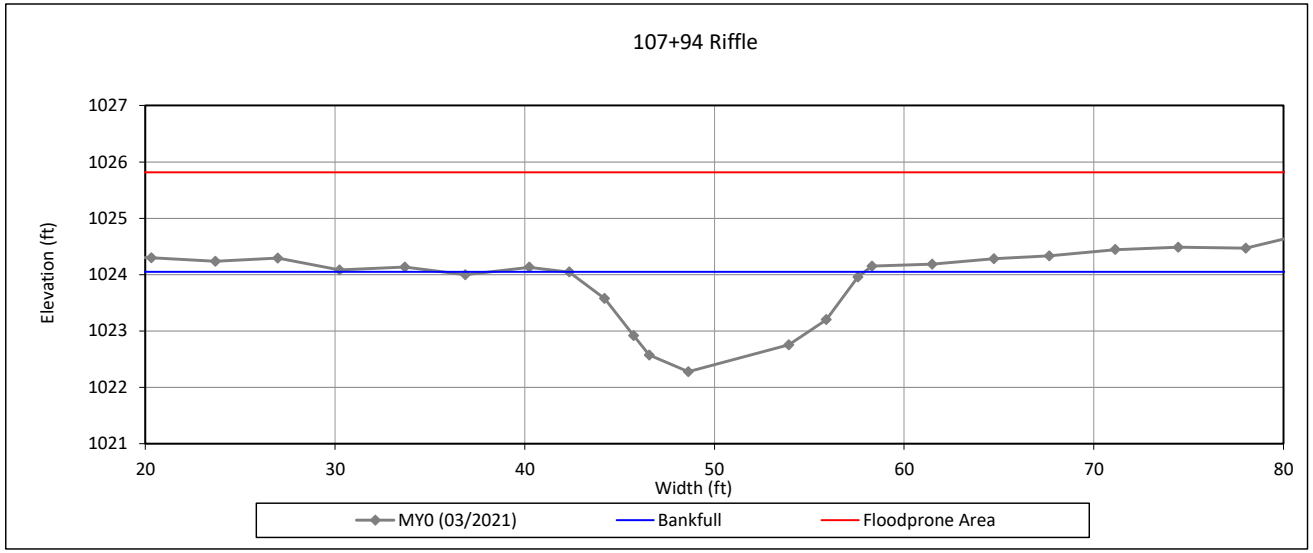
Survey Date: 03/2021
Field Crew: Turner Land Surveying

View Downstream

Cross-Section Plots

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021

Cross-Section 5-Venable Creek R3



Bankfull Dimensions

17.1	x-section area (ft.sq.)
15.6	width (ft)
1.1	mean depth (ft)
1.8	max depth (ft)
16.1	wetted perimeter (ft)
1.1	hydraulic radius (ft)
14.2	width-depth ratio
103.9	W flood prone area (ft)
6.7	entrenchment ratio
1.0	low bank height ratio

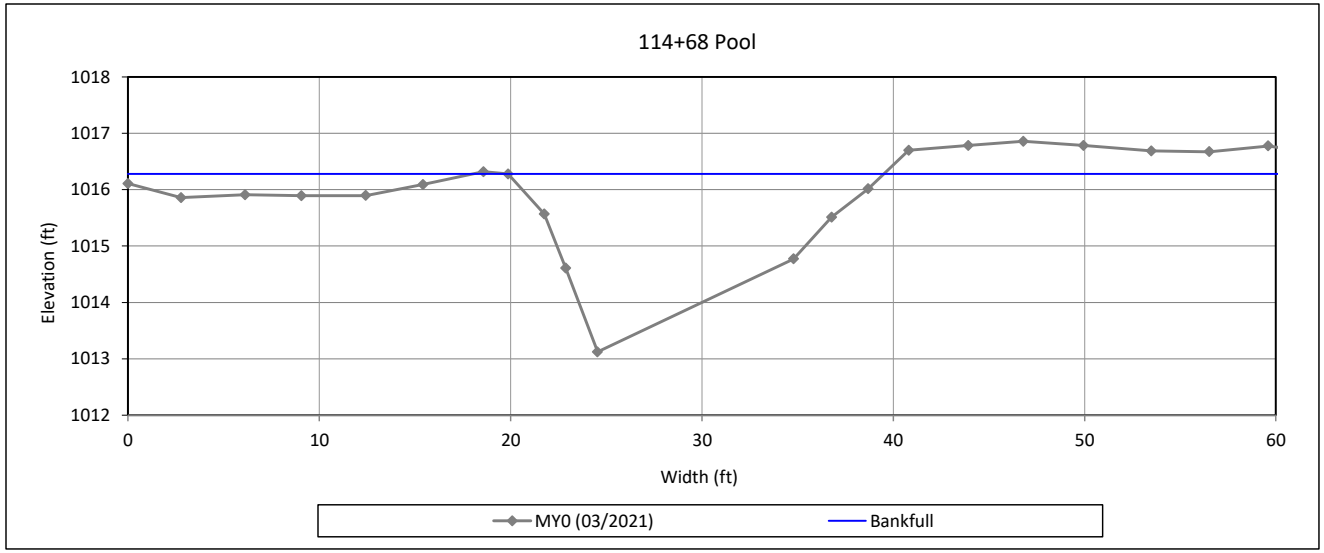
Survey Date: 03/2021
Field Crew: Turner Land Surveying

View Downstream

Cross-Section Plots

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021

Cross-Section 6-Venable Creek R3



Bankfull Dimensions	
33.3	x-section area (ft.sq.)
19.6	width (ft)
1.7	mean depth (ft)
3.2	max depth (ft)
21.1	wetted perimeter (ft)
1.6	hydraulic radius (ft)
11.6	width-depth ratio

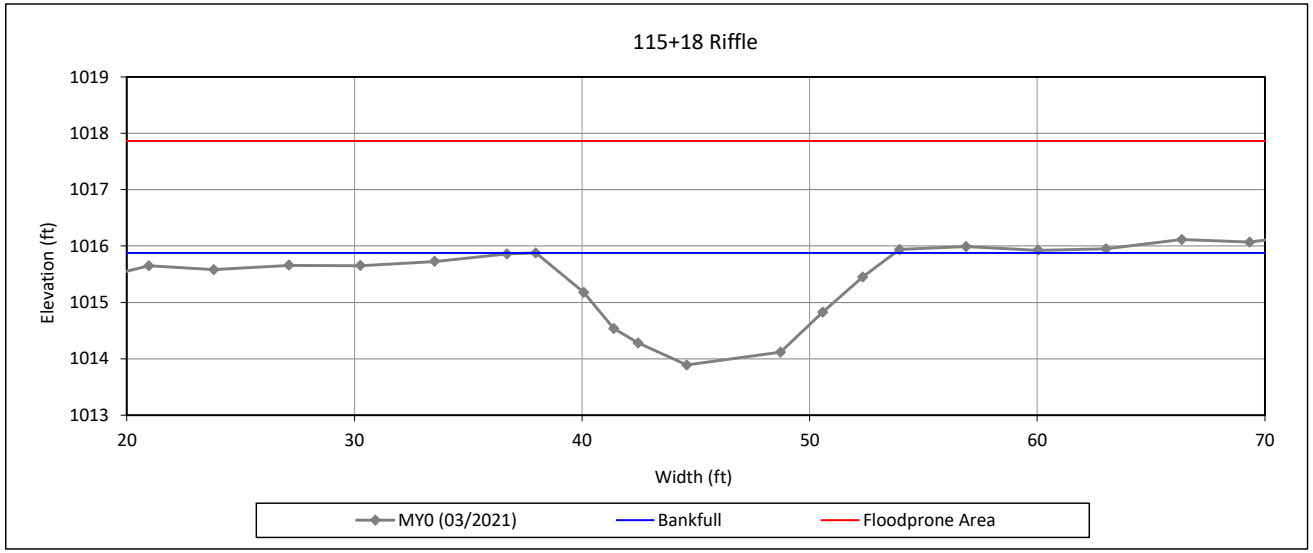
Survey Date: 03/2021
Field Crew: Turner Land Surveying

View Downstream

Cross-Section Plots

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021

Cross-Section 7-Venable Creek R3



Bankfull Dimensions

19.4	x-section area (ft.sq.)
15.8	width (ft)
1.2	mean depth (ft)
2.0	max depth (ft)
16.4	wetted perimeter (ft)
1.2	hydraulic radius (ft)
12.8	width-depth ratio
93.8	W flood prone area (ft)
6.0	entrenchment ratio
1.0	low bank height ratio

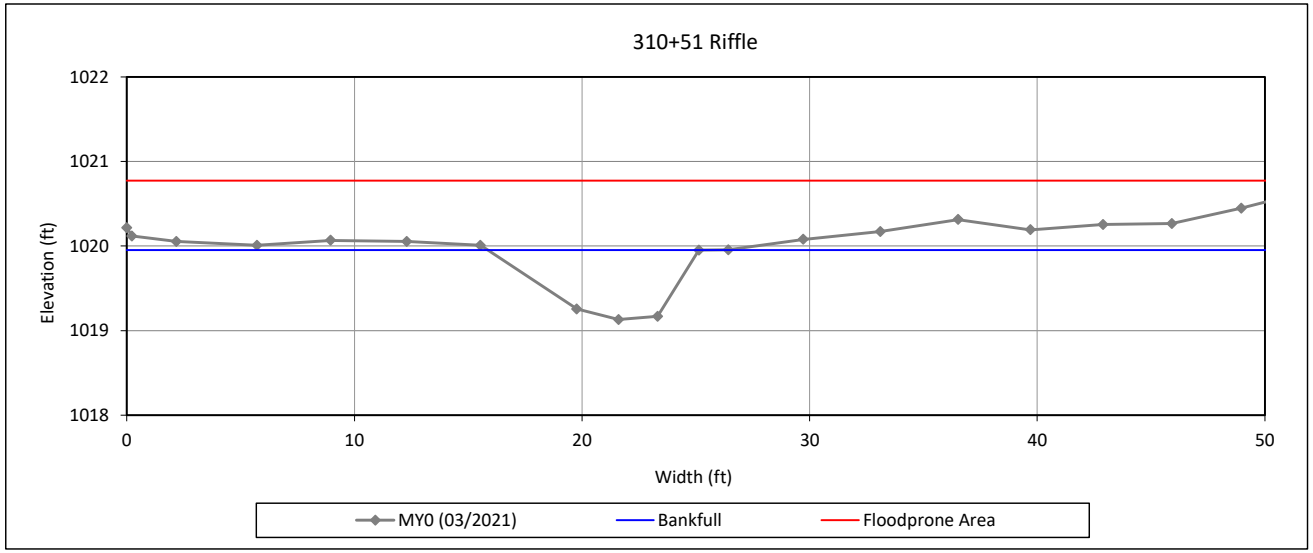
Survey Date: 03/2021
Field Crew: Turner Land Surveying

View Downstream

Cross-Section Plots

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021

Cross-Section 8-UT2 R2



Bankfull Dimensions

4.8	x-section area (ft.sq.)
9.3	width (ft)
0.5	mean depth (ft)
0.8	max depth (ft)
9.5	wetted perimeter (ft)
0.5	hydraulic radius (ft)
17.8	width-depth ratio
56.6	W flood prone area (ft)
6.1	entrenchment ratio
1.0	low bank height ratio

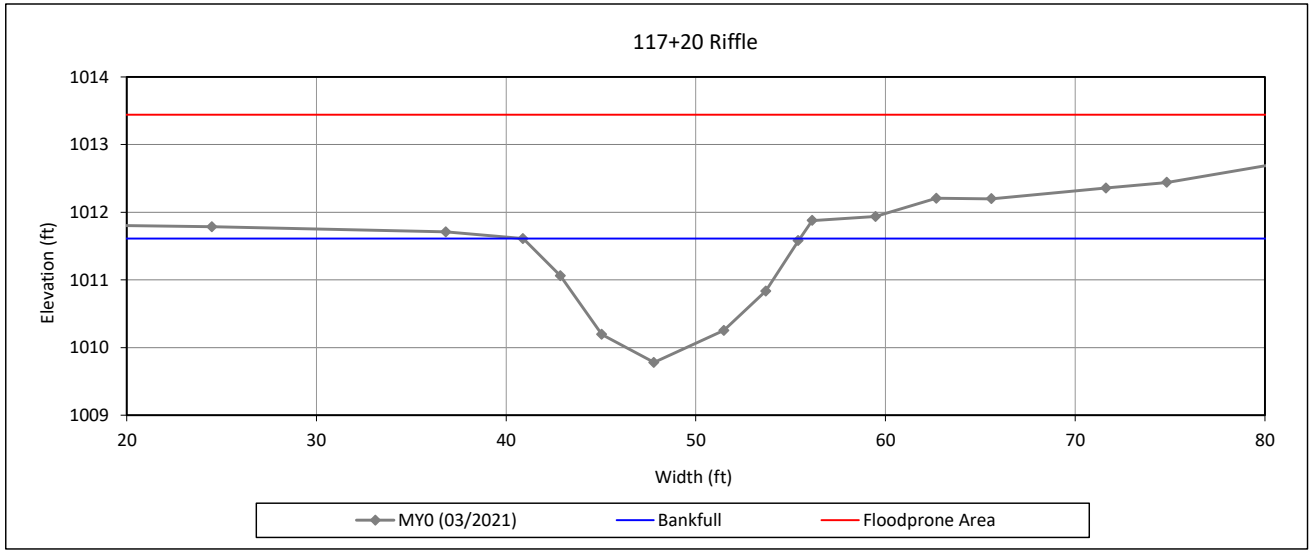
Survey Date: 03/2021
Field Crew: Turner Land Surveying

View Downstream

Cross-Section Plots

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021

Cross-Section 9-Venable Creek R3



Bankfull Dimensions

16.0	x-section area (ft.sq.)
14.6	width (ft)
1.1	mean depth (ft)
1.8	max depth (ft)
15.1	wetted perimeter (ft)
1.1	hydraulic radius (ft)
13.2	width-depth ratio
93.2	W flood prone area (ft)
6.4	entrenchment ratio
1.0	low bank height ratio

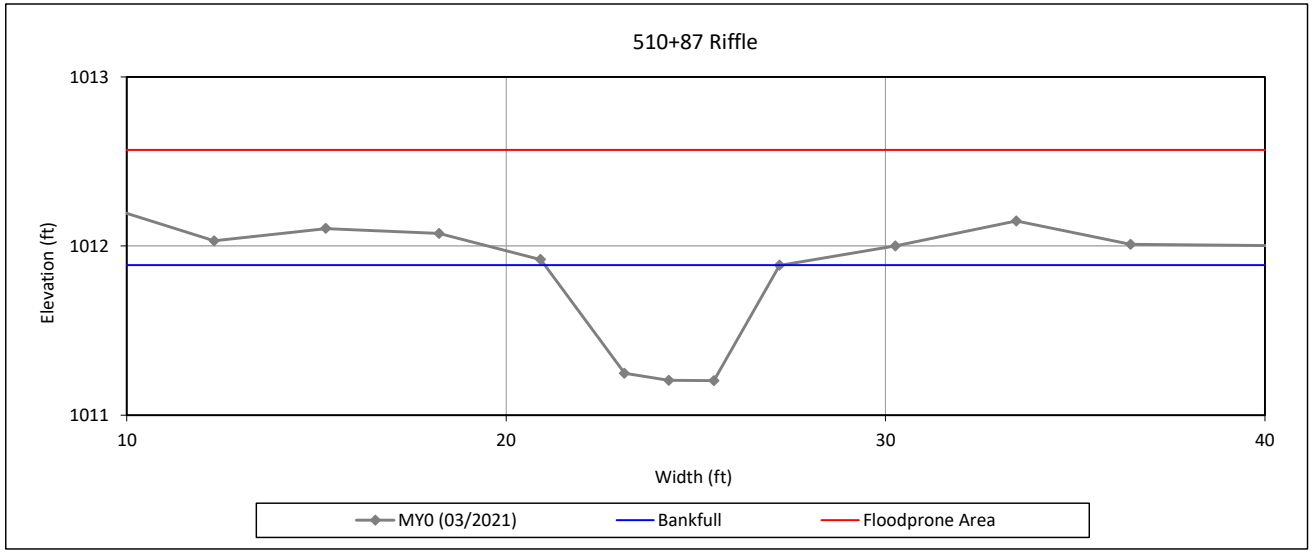
Survey Date: 03/2021
Field Crew: Turner Land Surveying

View Downstream

Cross-Section Plots

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021

Cross-Section 10-UT3 R2



Bankfull Dimensions

2.8	x-section area (ft.sq.)
6.2	width (ft)
0.5	mean depth (ft)
0.7	max depth (ft)
6.4	wetted perimeter (ft)
0.4	hydraulic radius (ft)
13.5	width-depth ratio
50.6	W flood prone area (ft)
8.2	entrenchment ratio
1.0	low bank height ratio

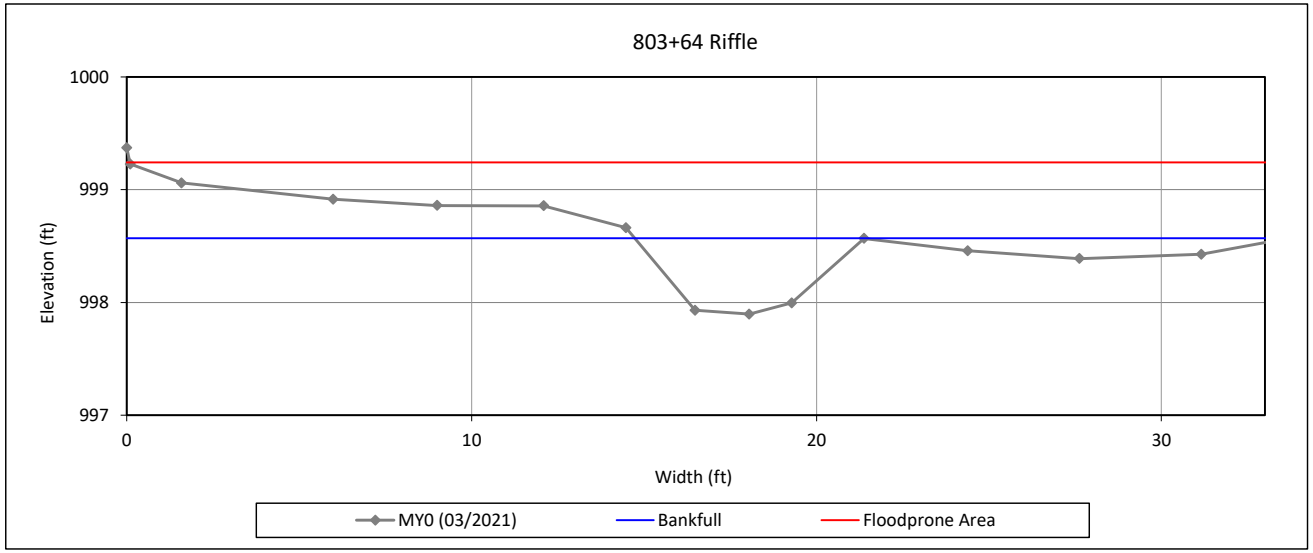
Survey Date: 03/2021
Field Crew: Turner Land Surveying

View Downstream

Cross-Section Plots

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021

Cross-Section 11-UT6 R2



Bankfull Dimensions

3.0	x-section area (ft.sq.)
6.6	width (ft)
0.4	mean depth (ft)
0.7	max depth (ft)
6.8	wetted perimeter (ft)
0.4	hydraulic radius (ft)
15.0	width-depth ratio
33.2	W flood prone area (ft)
5.0	entrenchment ratio
1.0	low bank height ratio

Survey Date: 03/2021
Field Crew: Turner Land Surveying

View Downstream

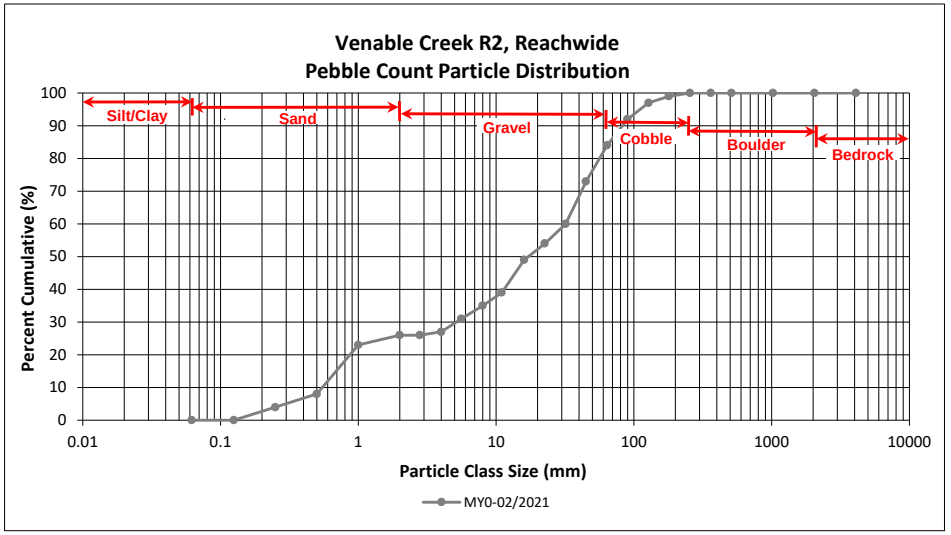
Reachwide and Cross-Section Pebble Count Plots

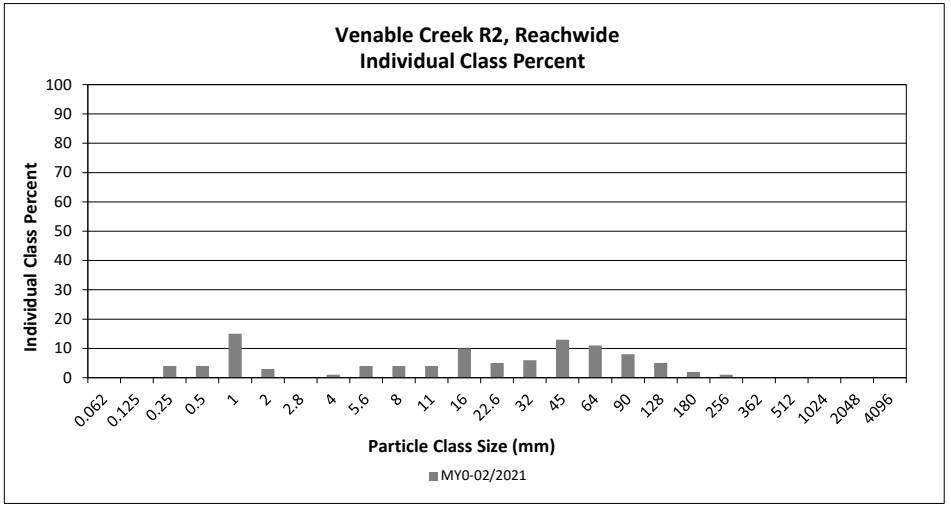
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021

Venable Creek 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					0
SAND	Very fine	0.062	0.125					0
	Fine	0.125	0.250		4	4	4	4
	Medium	0.25	0.50		4	4	4	8
	Coarse	0.5	1.0		15	15	15	23
	Very Coarse	1.0	2.0		3	3	3	26
GRAVEL	Very Fine	2.0	2.8					26
	Very Fine	2.8	4.0		1	1	1	27
	Fine	4.0	5.6		4	4	4	31
	Fine	5.6	8.0		4	4	4	35
	Medium	8.0	11.0	1	3	4	4	39
	Medium	11.0	16.0	4	6	10	10	49
	Coarse	16.0	22.6	4	1	5	5	54
	Coarse	22.6	32	4	2	6	6	60
	Very Coarse	32	45	13		13	13	73
	Very Coarse	45	64	11		11	11	84
COBBLE	Small	64	90	6	2	8	8	92
	Small	90	128	4	1	5	5	97
	Large	128	180	2		2	2	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} =	0.7
D_{35} =	8.0
D_{50} =	17.1
D_{84} =	64.0
D_{95} =	111.2
D_{100} =	256.0





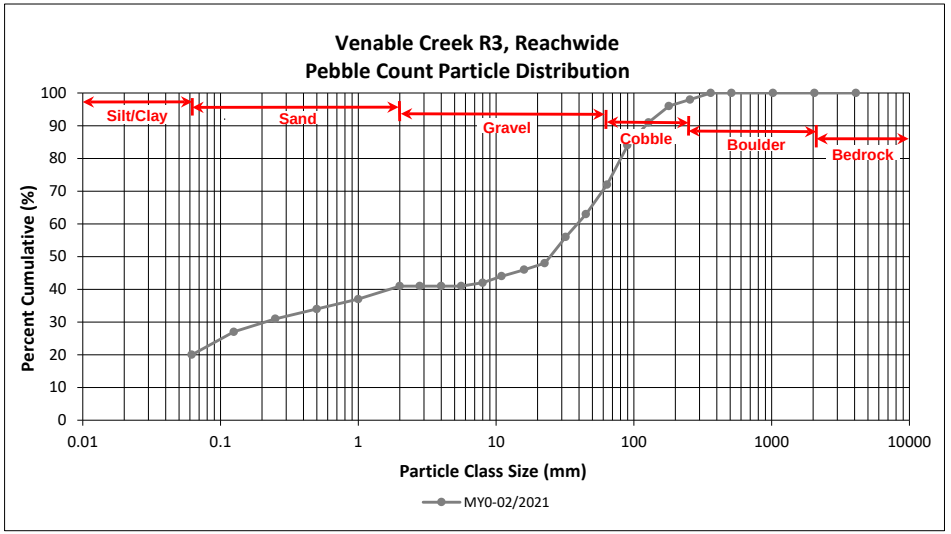
Reachwide and Cross-Section Pebble Count Plots

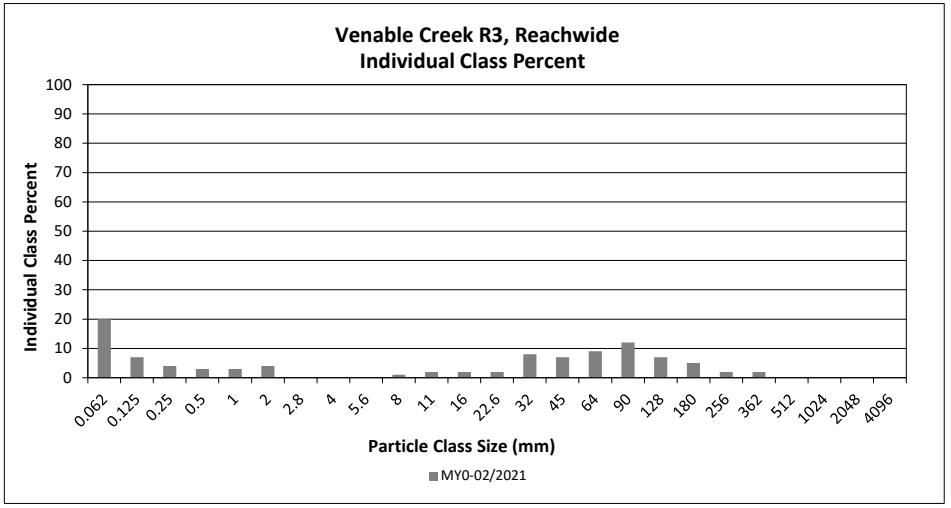
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021

Venable Creek R3, 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		7	7	7	27
	Fine	0.125	0.250		4	4	4	31
	Medium	0.25	0.50		3	3	3	34
	Coarse	0.5	1.0		3	3	3	37
	Very Coarse	1.0	2.0		4	4	4	41
GRAVEL	Very Fine	2.0	2.8					41
	Very Fine	2.8	4.0					41
	Fine	4.0	5.6					41
	Fine	5.6	8.0		1	1	1	42
	Medium	8.0	11.0		2	2	2	44
	Medium	11.0	16.0	1	1	2	2	46
	Coarse	16.0	22.6	1	1	2	2	48
	Coarse	22.6	32	6	2	8	8	56
	Very Coarse	32	45	5	2	7	7	63
	Very Coarse	45	64	9		9	9	72
COBBLE	Small	64	90	12		12	12	84
	Small	90	128	7		7	7	91
	Large	128	180	5		5	5	96
	Large	180	256	2		2	2	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} =	0.6
D_{50} =	24.7
D_{84} =	90.0
D_{95} =	168.1
D_{100} =	362.0





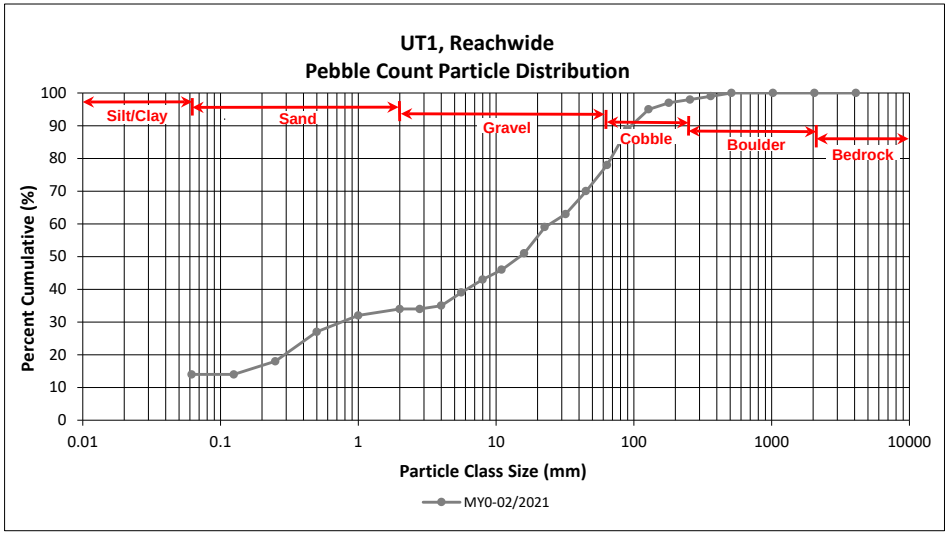
Reachwide and Cross-Section Pebble Count Plots

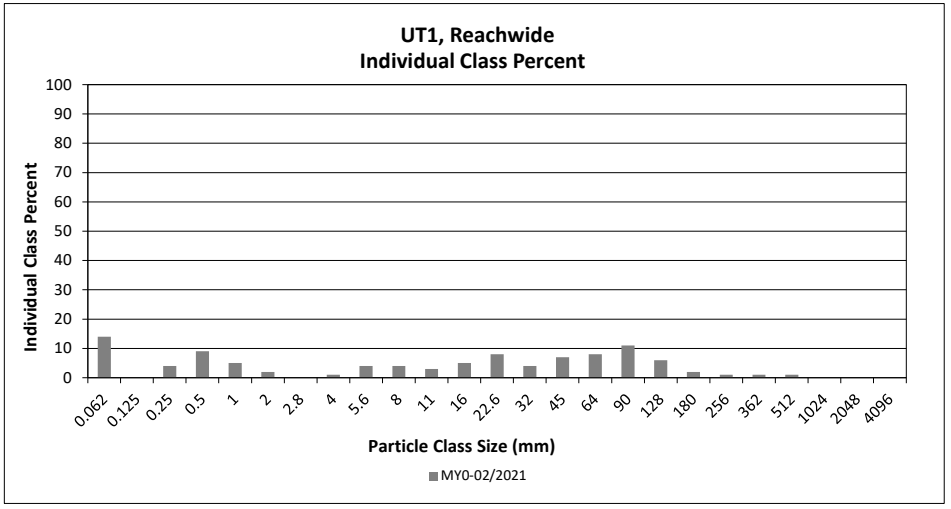
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021

UT1, 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		14	14	14	14
SAND	Very fine	0.062	0.125					14
	Fine	0.125	0.250		4	4	4	18
	Medium	0.25	0.50		9	9	9	27
	Coarse	0.5	1.0		5	5	5	32
	Very Coarse	1.0	2.0		2	2	2	34
GRAVEL	Very Fine	2.0	2.8					34
	Very Fine	2.8	4.0		1	1	1	35
	Fine	4.0	5.6		4	4	4	39
	Fine	5.6	8.0		4	4	4	43
	Medium	8.0	11.0		3	3	3	46
	Medium	11.0	16.0	4	1	5	5	51
	Coarse	16.0	22.6	6	2	8	8	59
	Coarse	22.6	32	4		4	4	63
	Very Coarse	32	45	6	1	7	7	70
	Very Coarse	45	64	8		8	8	78
COBBLE	Small	64	90	11		11	11	89
	Small	90	128	6		6	6	95
	Large	128	180	2		2	2	97
	Large	180	256	1		1	1	98
BOULDER	Small	256	362	1		1	1	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} =	0.2
D_{35} =	4.0
D_{50} =	14.8
D_{84} =	77.1
D_{95} =	128.0
D_{100} =	512.0





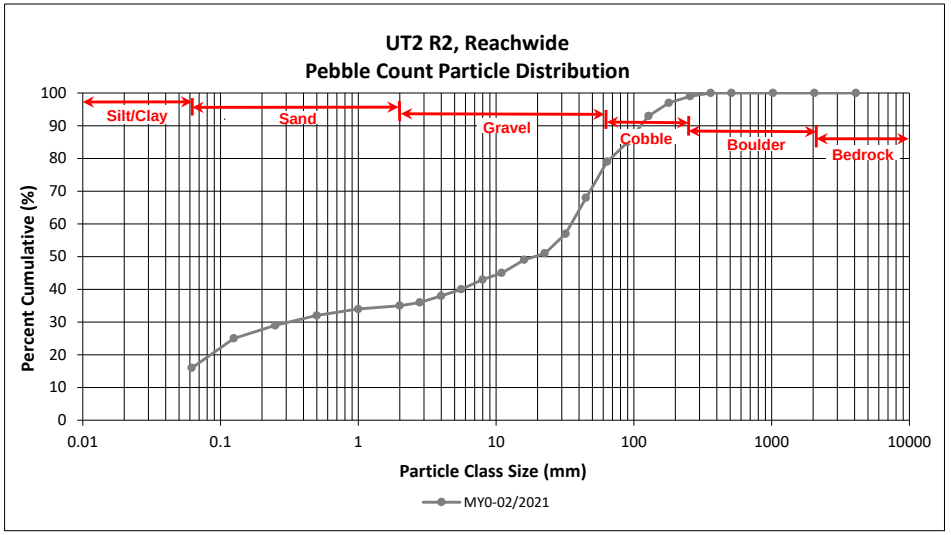
Reachwide and Cross-Section Pebble Count Plots

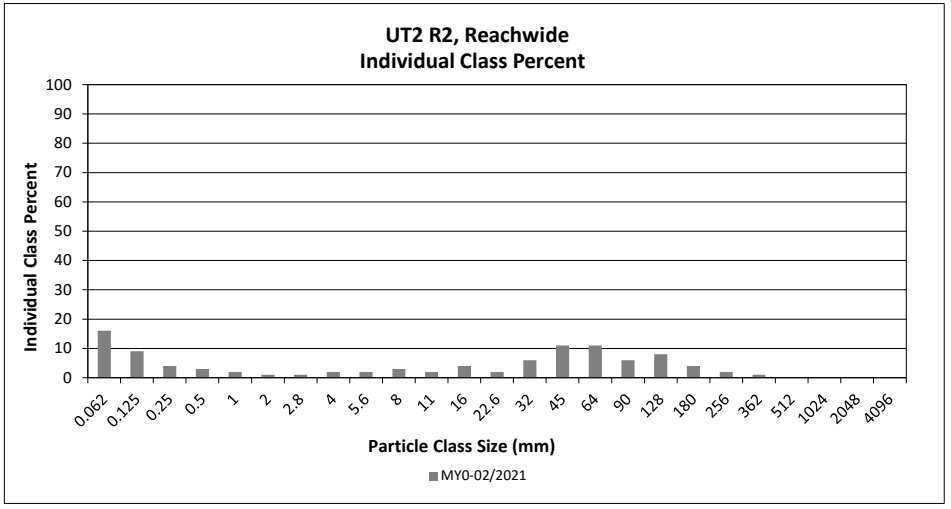
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021

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		16	16	16	16
SAND	Very fine	0.062	0.125		9	9	9	25
	Fine	0.125	0.250	1	3	4	4	29
	Medium	0.25	0.50		3	3	3	32
	Coarse	0.5	1.0		2	2	2	34
	Very Coarse	1.0	2.0		1	1	1	35
GRAVEL	Very Fine	2.0	2.8		1	1	1	36
	Very Fine	2.8	4.0		2	2	2	38
	Fine	4.0	5.6	2		2	2	40
	Fine	5.6	8.0	1	2	3	3	43
	Medium	8.0	11.0		2	2	2	45
	Medium	11.0	16.0		4	4	4	49
	Coarse	16.0	22.6	2		2	2	51
	Coarse	22.6	32	5	1	6	6	57
	Very Coarse	32	45	9	2	11	11	68
	Very Coarse	45	64	9	2	11	11	79
COBBLE	Small	64	90	6		6	6	85
	Small	90	128	8		8	8	93
	Large	128	180	4		4	4	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} =	2.0
D_{50} =	19.0
D_{84} =	85.0
D_{95} =	151.8
D_{100} =	362.0





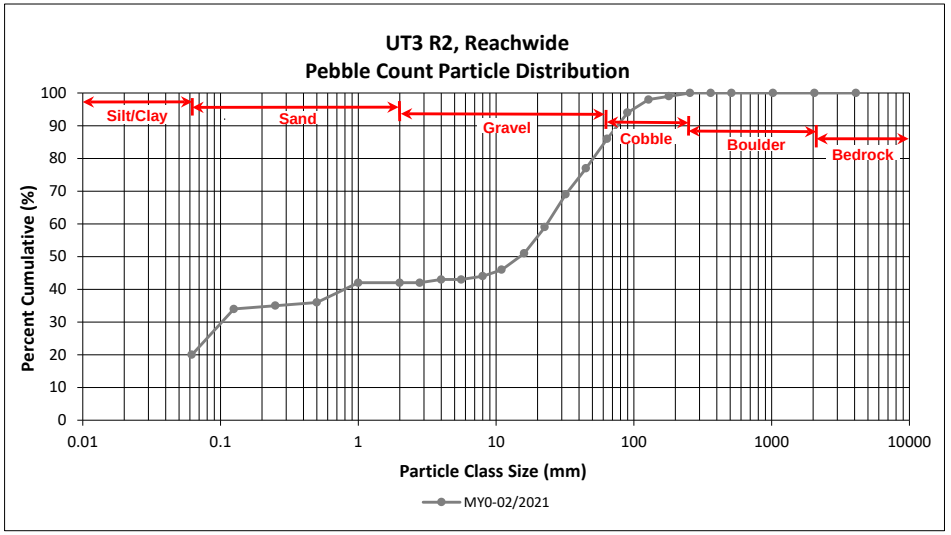
Reachwide and Cross-Section Pebble Count Plots

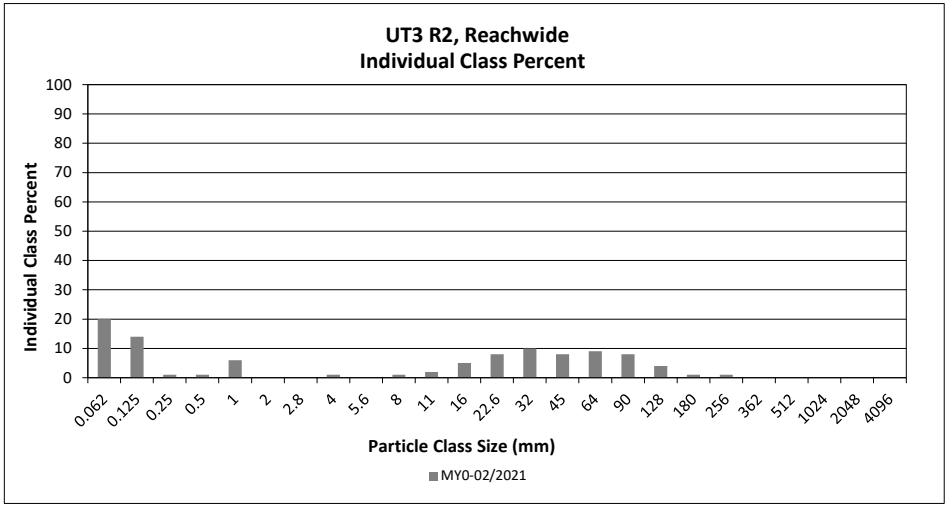
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021

UT3 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		20	20	20	20
SAND	Very fine	0.062	0.125		14	14	14	34
	Fine	0.125	0.250		1	1	1	35
	Medium	0.25	0.50		1	1	1	36
	Coarse	0.5	1.0		6	6	6	42
	Very Coarse	1.0	2.0					42
GRAVEL	Very Fine	2.0	2.8					42
	Very Fine	2.8	4.0		1	1	1	43
	Fine	4.0	5.6					43
	Fine	5.6	8.0		1	1	1	44
	Medium	8.0	11.0	1	1	2	2	46
	Medium	11.0	16.0	3	2	5	5	51
	Coarse	16.0	22.6	5	3	8	8	59
	Coarse	22.6	32	10		10	10	69
	Very Coarse	32	45	8		8	8	77
	Very Coarse	45	64	9		9	9	86
COBBLE	Small	64	90	8		8	8	94
	Small	90	128	4		4	4	98
	Large	128	180	1		1	1	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} =	0.3
D_{50} =	14.8
D_{84} =	59.2
D_{95} =	98.3
D_{100} =	256.0





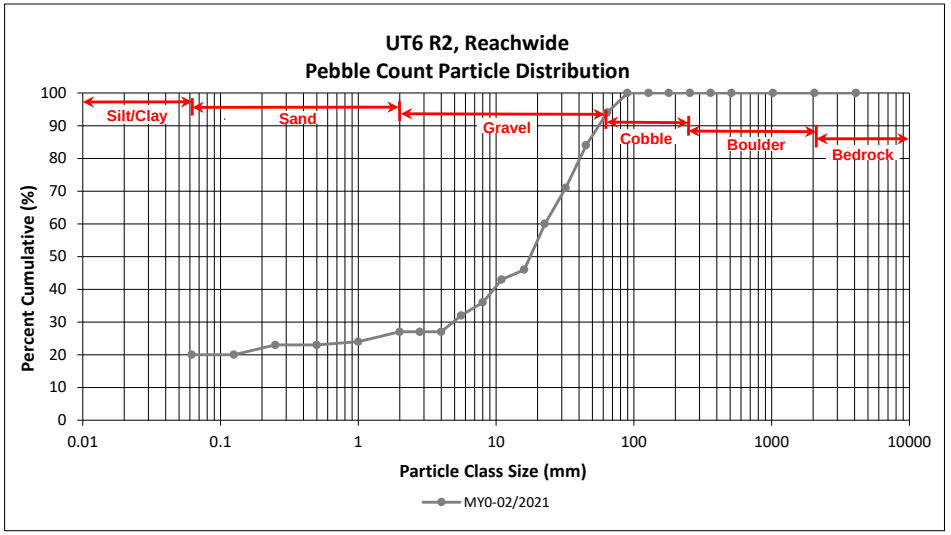
Reachwide and Cross-Section Pebble Count Plots

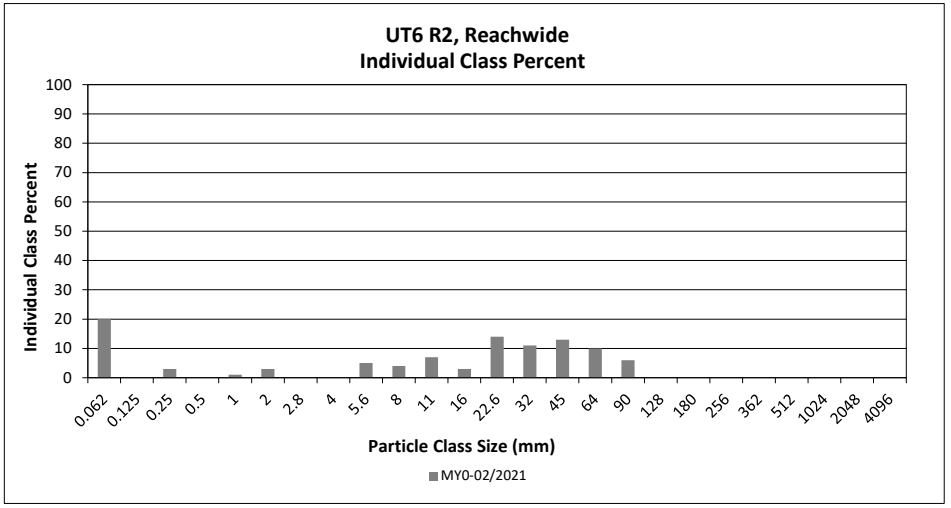
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021

UT6 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		20	20	20	20
SAND	Very fine	0.062	0.125					20
	Fine	0.125	0.250		3	3	3	23
	Medium	0.25	0.50					23
	Coarse	0.5	1.0		1	1	1	24
	Very Coarse	1.0	2.0		3	3	3	27
GRAVEL	Very Fine	2.0	2.8					27
	Very Fine	2.8	4.0					27
	Fine	4.0	5.6	1	4	5	5	32
	Fine	5.6	8.0	3	1	4	4	36
	Medium	8.0	11.0	2	5	7	7	43
	Medium	11.0	16.0	1	2	3	3	46
	Coarse	16.0	22.6	7	7	14	14	60
	Coarse	22.6	32	8	3	11	11	71
	Very Coarse	32	45	12	1	13	13	84
	Very Coarse	45	64	10		10	10	94
COBBLE	Small	64	90	6		6	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**	**50**	**100**	**100**	**100**

Reachwide	
Channel materials (mm)	
D_{16} =	Silt/Clay
D_{35} =	7.3
D_{50} =	17.7
D_{84} =	45.0
D_{95} =	67.7
D_{100} =	90.0





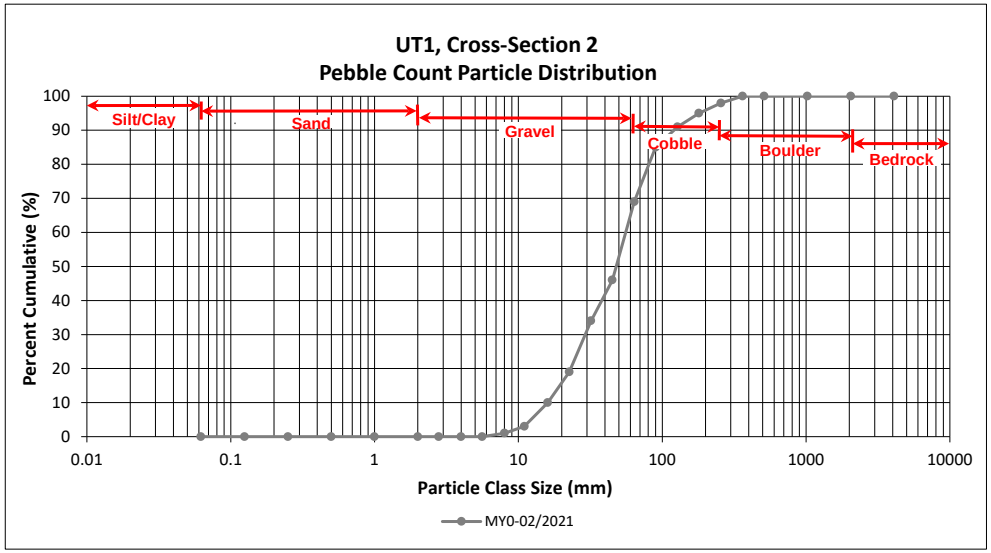
Reachwide and Cross-Section Pebble Count Plots

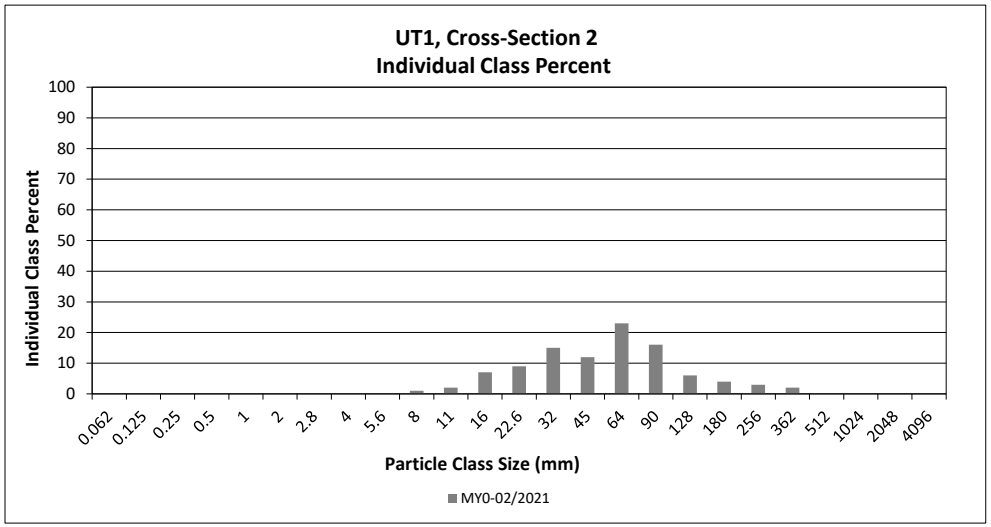
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021

UT1, Cross-Section 2

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			0
	Coarse	0.5	1.0			0
	Very Coarse	1.0	2.0			0
GRAVEL	Very Fine	2.0	2.8			0
	Very Fine	2.8	4.0			0
	Fine	4.0	5.6			0
	Fine	5.6	8.0	1	1	1
	Medium	8.0	11.0	2	2	3
	Medium	11.0	16.0	7	7	10
	Coarse	16.0	22.6	9	9	19
	Coarse	22.6	32	15	15	34
	Very Coarse	32	45	12	12	46
	Very Coarse	45	64	23	23	69
COBBLE	Small	64	90	16	16	85
	Small	90	128	6	6	91
	Large	128	180	4	4	95
	Large	180	256	3	3	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 2	
Channel materials (mm)	
D_{16} =	20.1
D_{35} =	32.9
D_{50} =	47.8
D_{84} =	88.1
D_{95} =	180.0
D_{100} =	362.0





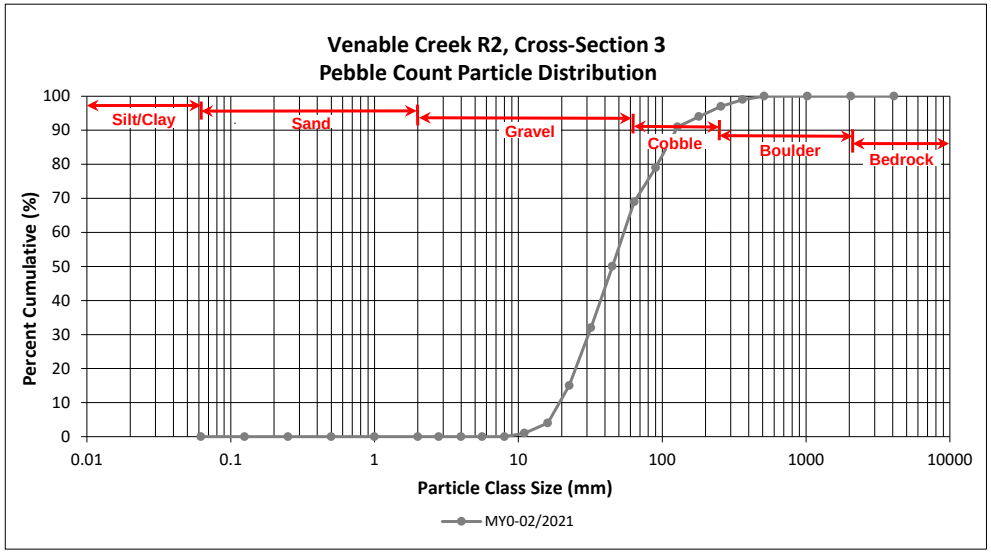
Reachwide and Cross-Section Pebble Count Plots

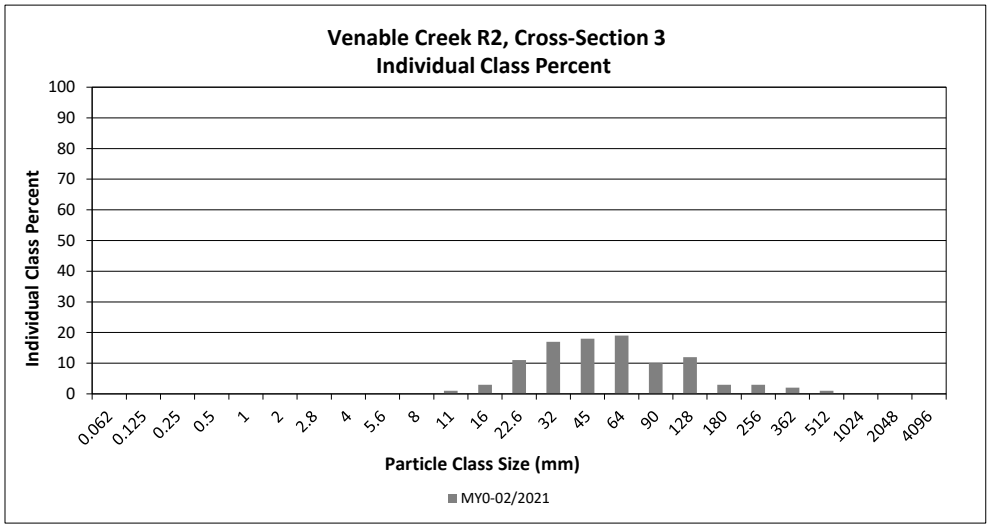
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021

Venable Creek R2, 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			0
SAND	Very fine	0.062	0.125			0
	Fine	0.125	0.250			0
	Medium	0.25	0.50			0
	Coarse	0.5	1.0			0
	Very Coarse	1.0	2.0			0
GRAVEL	Very Fine	2.0	2.8			0
	Very Fine	2.8	4.0			0
	Fine	4.0	5.6			0
	Fine	5.6	8.0			0
	Medium	8.0	11.0	1	1	1
	Medium	11.0	16.0	3	3	4
	Coarse	16.0	22.6	11	11	15
	Coarse	22.6	32	17	17	32
	Very Coarse	32	45	18	18	50
	Very Coarse	45	64	19	19	69
COBBLE	Small	64	90	10	10	79
	Small	90	128	12	12	91
	Large	128	180	3	3	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	**100**	**100**	**100**

Cross-Section 3	
Channel materials (mm)	
D_{16} =	23.1
D_{35} =	33.9
D_{50} =	45.0
D_{84} =	104.2
D_{95} =	202.4
D_{100} =	512.0





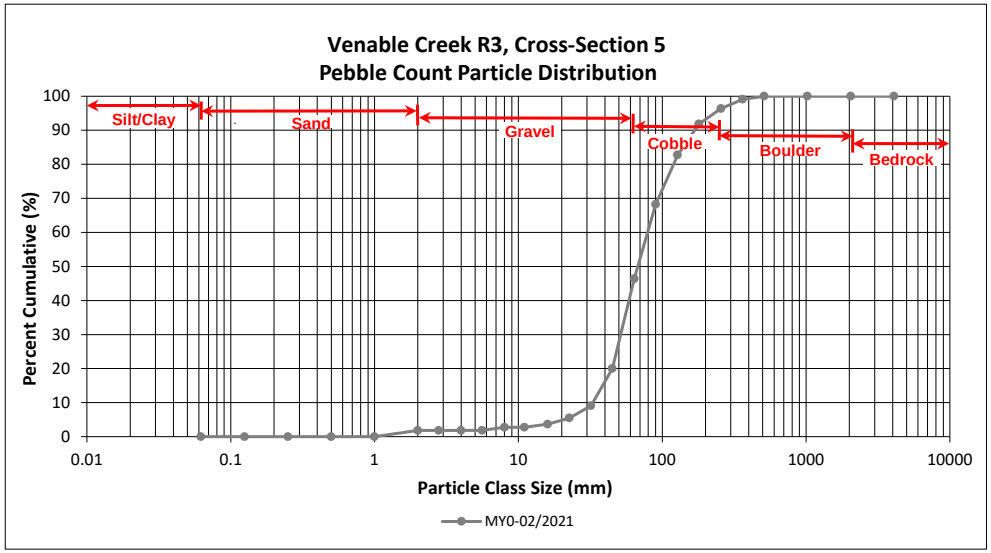
Reachwide and Cross-Section Pebble Count Plots

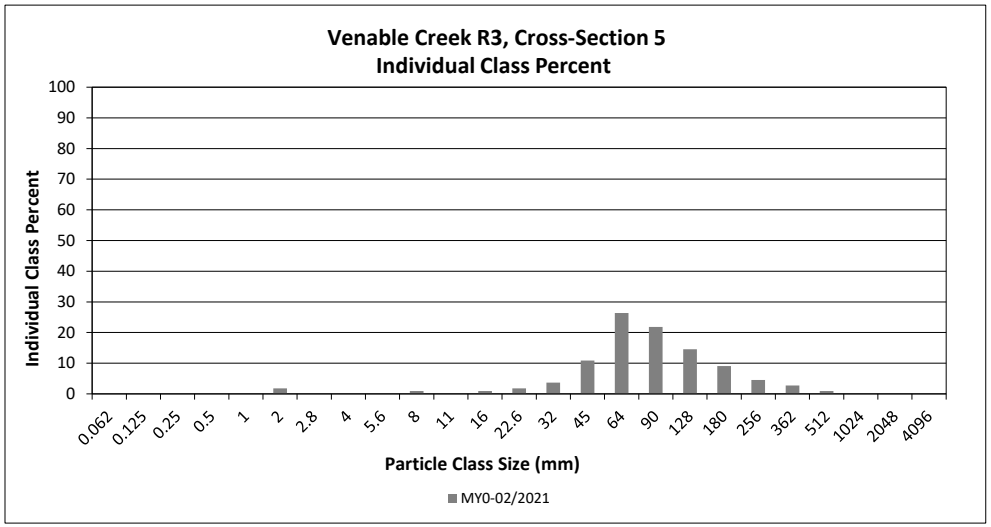
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021

Venable Creek R3, 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			0
	Coarse	0.5	1.0			0
	Very Coarse	1.0	2.0	2	2	2
GRAVEL	Very Fine	2.0	2.8			2
	Very Fine	2.8	4.0			2
	Fine	4.0	5.6			2
	Fine	5.6	8.0	1	1	3
	Medium	8.0	11.0			3
	Medium	11.0	16.0	1	1	4
	Coarse	16.0	22.6	2	2	5
	Coarse	22.6	32	4	4	9
	Very Coarse	32	45	12	11	20
	Very Coarse	45	64	29	26	46
COBBLE	Small	64	90	24	22	68
	Small	90	128	16	15	83
	Large	128	180	10	9	92
	Large	180	256	5	5	96
BOULDER	Small	256	362	3	3	99
	Small	362	512	1	1	100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
			Total	**110**	**100**	**100**

Cross-Section 5	
Channel materials (mm)	
D_{16} =	39.7
D_{35} =	55.0
D_{50} =	67.7
D_{84} =	134.3
D_{95} =	230.3
D_{100} =	512.0





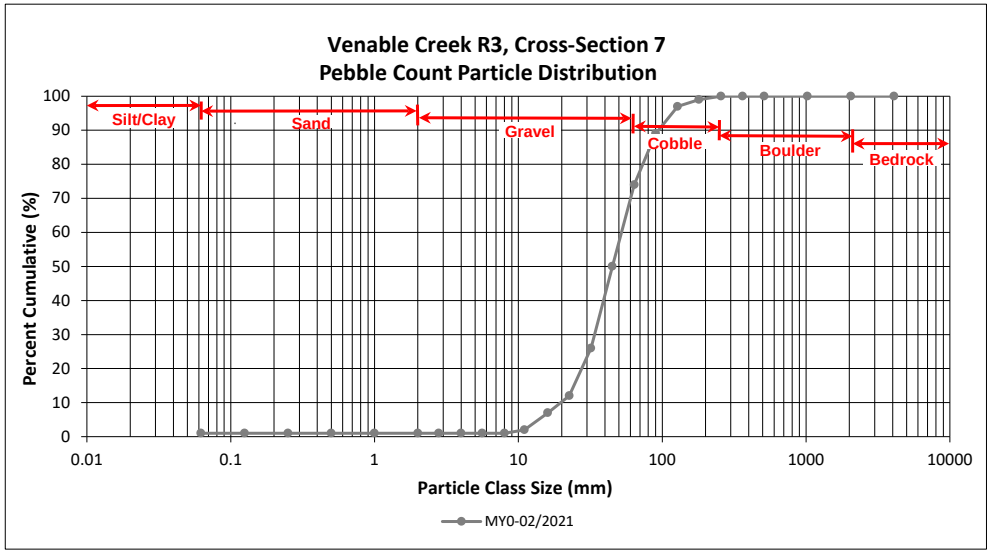
Reachwide and Cross-Section Pebble Count Plots

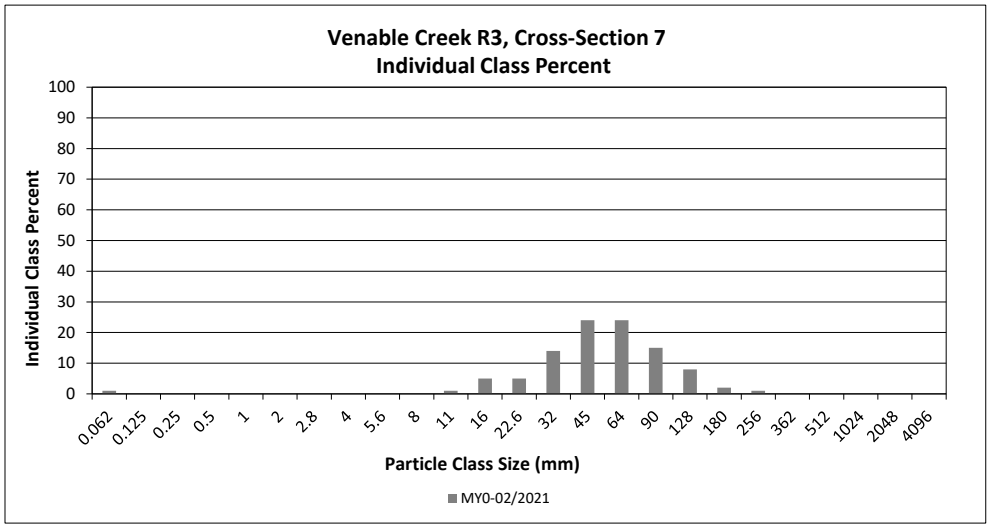
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021

Venable Creek R3, 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			1
	Medium	0.25	0.50			1
	Coarse	0.5	1.0			1
	Very Coarse	1.0	2.0			1
GRAVEL	Very Fine	2.0	2.8			1
	Very Fine	2.8	4.0			1
	Fine	4.0	5.6			1
	Fine	5.6	8.0			1
	Medium	8.0	11.0	1	1	2
	Medium	11.0	16.0	5	5	7
	Coarse	16.0	22.6	5	5	12
	Coarse	22.6	32	14	14	26
	Very Coarse	32	45	24	24	50
	Very Coarse	45	64	24	24	74
COBBLE	Small	64	90	15	15	89
	Small	90	128	8	8	97
	Large	128	180	2	2	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 7	
Channel materials (mm)	
D_{16} =	25.0
D_{35} =	36.4
D_{50} =	45.0
D_{84} =	80.3
D_{95} =	117.2
D_{100} =	256.0





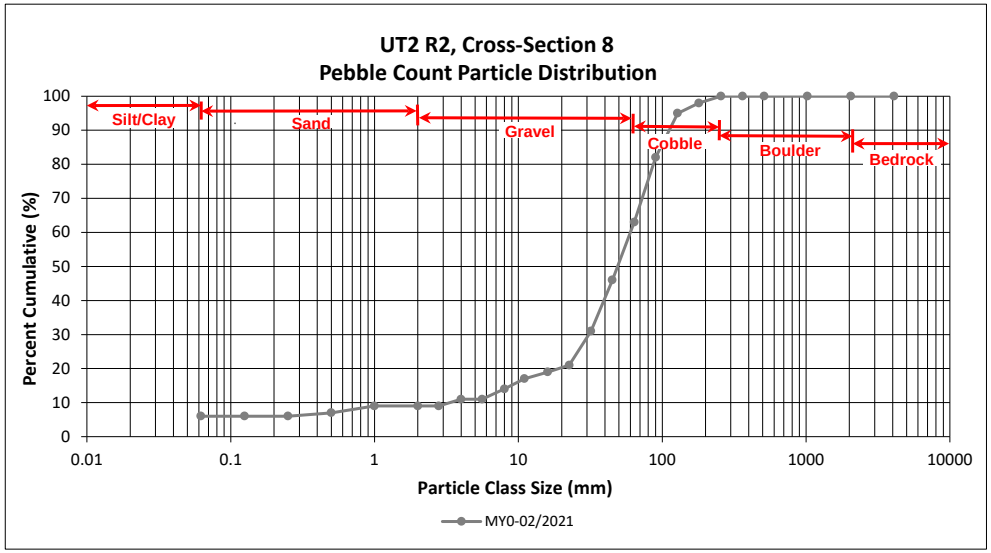
Reachwide and Cross-Section Pebble Count Plots

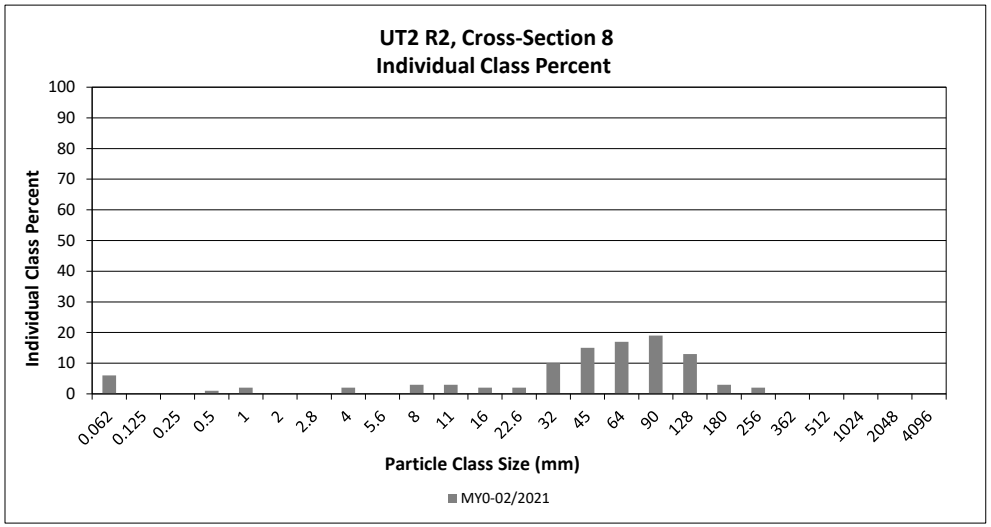
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021

UT2 R2, Cross-Section 8

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	6	6	6
SAND	Very fine	0.062	0.125			6
	Fine	0.125	0.250			6
	Medium	0.25	0.50	1	1	7
	Coarse	0.5	1.0	2	2	9
	Very Coarse	1.0	2.0			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	3	3	14
	Medium	8.0	11.0	3	3	17
	Medium	11.0	16.0	2	2	19
	Coarse	16.0	22.6	2	2	21
	Coarse	22.6	32	10	10	31
	Very Coarse	32	45	15	15	46
	Very Coarse	45	64	17	17	63
COBBLE	Small	64	90	19	19	82
	Small	90	128	13	13	95
	Large	128	180	3	3	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	**100**	**100**	**100**

Cross-Section 8	
Channel materials (mm)	
D_{16} =	9.9
D_{35} =	35.0
D_{50} =	48.9
D_{84} =	95.0
D_{95} =	128.0
D_{100} =	256.0





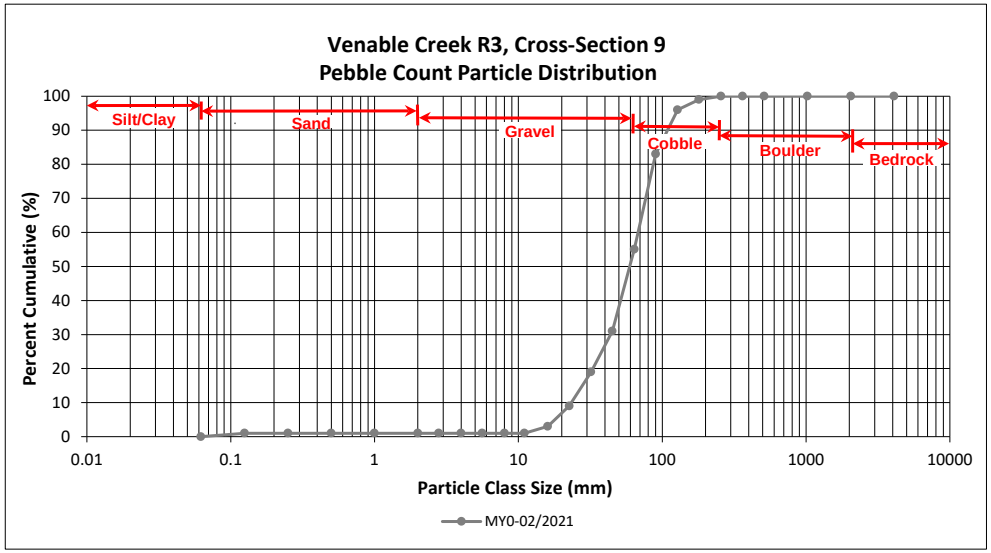
Reachwide and Cross-Section Pebble Count Plots

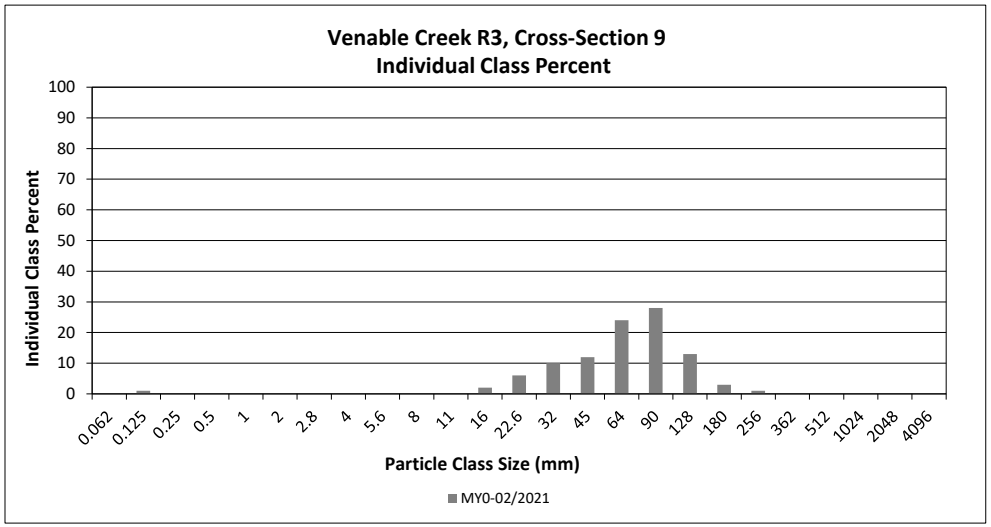
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021

Venable Creek R3, 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			0
SAND	Very fine	0.062	0.125	1	1	1
	Fine	0.125	0.250			1
	Medium	0.25	0.50			1
	Coarse	0.5	1.0			1
	Very Coarse	1.0	2.0			1
GRAVEL	Very Fine	2.0	2.8			1
	Very Fine	2.8	4.0			1
	Fine	4.0	5.6			1
	Fine	5.6	8.0			1
	Medium	8.0	11.0			1
	Medium	11.0	16.0	2	2	3
	Coarse	16.0	22.6	6	6	9
	Coarse	22.6	32	10	10	19
	Very Coarse	32	45	12	12	31
	Very Coarse	45	64	24	24	55
COBBLE	Small	64	90	28	28	83
	Small	90	128	13	13	96
	Large	128	180	3	3	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 9	
Channel materials (mm)	
D_{16} =	28.8
D_{35} =	47.7
D_{50} =	59.5
D_{84} =	92.5
D_{95} =	124.6
D_{100} =	256.0





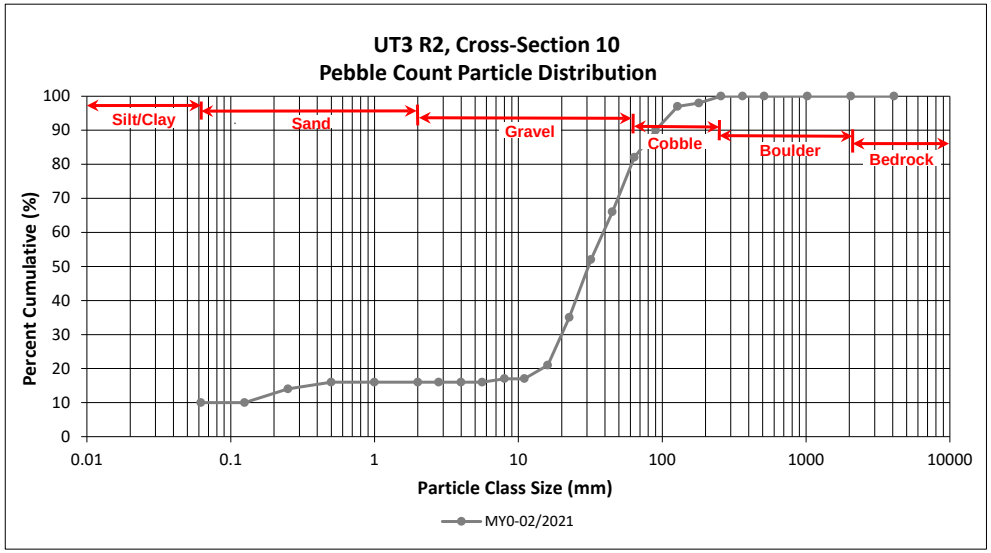
Reachwide and Cross-Section Pebble Count Plots

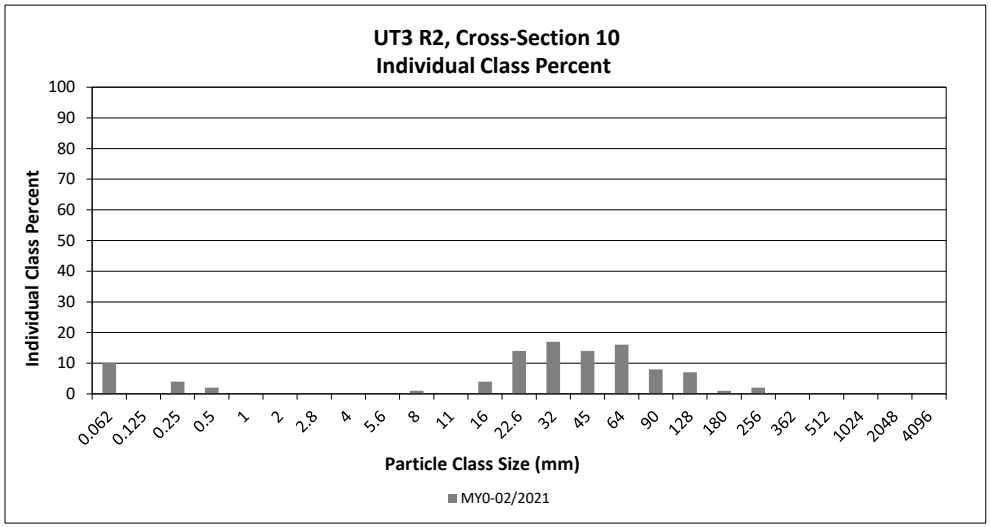
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021

UT3 R2, Cross-Section 10

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			10
	Fine	0.125	0.250	4	4	14
	Medium	0.25	0.50	2	2	16
	Coarse	0.5	1.0			16
	Very Coarse	1.0	2.0			16
GRAVEL	Very Fine	2.0	2.8			16
	Very Fine	2.8	4.0			16
	Fine	4.0	5.6			16
	Fine	5.6	8.0	1	1	17
	Medium	8.0	11.0			17
	Medium	11.0	16.0	4	4	21
	Coarse	16.0	22.6	14	14	35
	Coarse	22.6	32	17	17	52
	Very Coarse	32	45	14	14	66
	Very Coarse	45	64	16	16	82
COBBLE	Small	64	90	8	8	90
	Small	90	128	7	7	97
	Large	128	180	1	1	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	**100**	**100**	**100**

Cross-Section 10	
Channel materials (mm)	
D_{16} =	0.5
D_{35} =	22.6
D_{50} =	30.7
D_{84} =	69.7
D_{95} =	115.7
D_{100} =	256.0





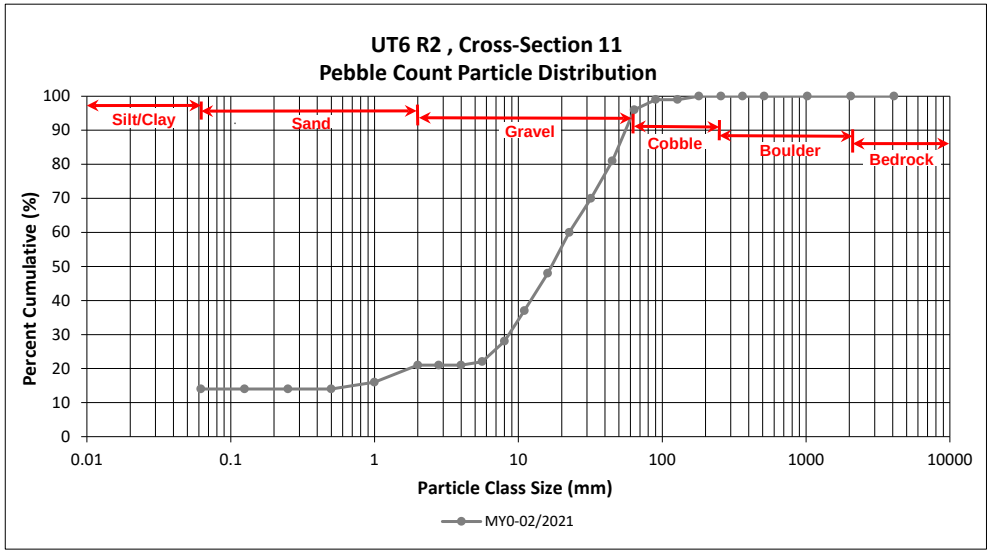
Reachwide and Cross-Section Pebble Count Plots

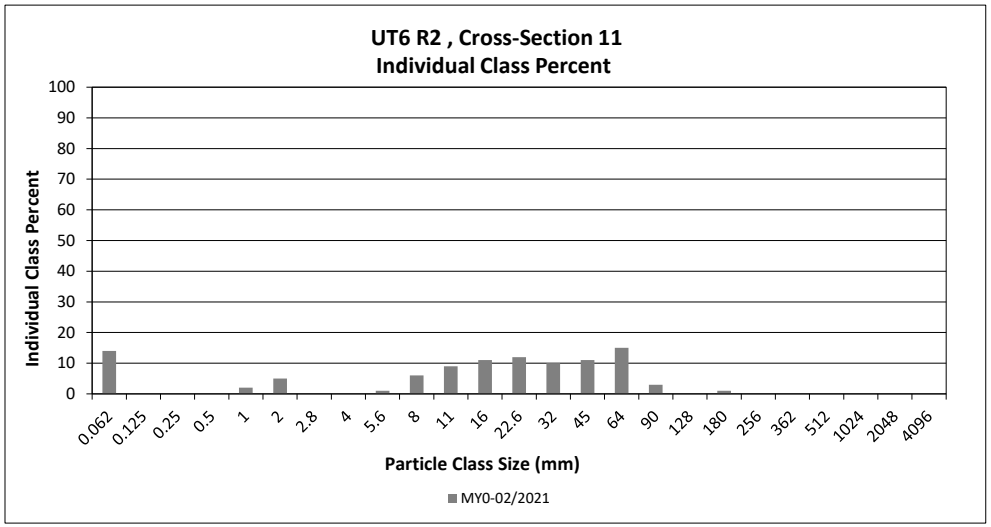
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021

UT6 R2 , Cross-Section 11

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	14	14	14
SAND	Very fine	0.062	0.125			14
	Fine	0.125	0.250			14
	Medium	0.25	0.50			14
	Coarse	0.5	1.0	2	2	16
	Very Coarse	1.0	2.0	5	5	21
GRAVEL	Very Fine	2.0	2.8			21
	Very Fine	2.8	4.0			21
	Fine	4.0	5.6	1	1	22
	Fine	5.6	8.0	6	6	28
	Medium	8.0	11.0	9	9	37
	Medium	11.0	16.0	11	11	48
	Coarse	16.0	22.6	12	12	60
	Coarse	22.6	32	10	10	70
	Very Coarse	32	45	11	11	81
	Very Coarse	45	64	15	15	96
COBBLE	Small	64	90	3	3	99
	Small	90	128			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 11	
Channel materials (mm)	
D_{16} =	1.0
D_{35} =	10.2
D_{50} =	16.9
D_{84} =	48.3
D_{95} =	62.5
D_{100} =	180.0





STREAM PHOTOGRAPHS

PHOTO POINT 1 Venable Creek R1 – upstream *(3/4/2021)*

PHOTO POINT 1 Venable Creek R1 – downstream *(3/4/2021)*

PHOTO POINT 2 UT1 – upstream *(3/4/2021)*

PHOTO POINT 2 UT1 – downstream *(3/4/2021)*

PHOTO POINT 3 Venable Creek R2 – upstream *(3/4/2021)*

PHOTO POINT 3 Venable Creek R2 – downstream *(3/4/2021)*

PHOTO POINT 4 Venable Creek R3 – upstream *(3/4/2021)*

PHOTO POINT 4 Venable Creek R3 – downstream *(3/4/2021)*

PHOTO POINT 5 Venable Creek R3 – upstream *(3/4/2021)*

PHOTO POINT 5 Venable Creek R3 – downstream *(3/4/2021)*

PHOTO POINT 6 Venable Creek R3 – upstream *(3/4/2021)*

PHOTO POINT 6 Venable Creek R3 – downstream *(3/4/2021)*

	
PHOTO POINT 7 Venable Creek R3 – upstream *(3/4/2021)*	**PHOTO POINT 7 Venable Creek R3 –** downstream *(3/4/2021)*
	
PHOTO POINT 8 UT2 R1 Headcut – upstream *(3/4/2021)*	**PHOTO POINT 8 UT2 R1 –** downstream *(3/4/2021)*
	
PHOTO POINT 9 UT2 R1 – upstream *(3/4/2021)*	**PHOTO POINT 9 UT2 R1 –** downstream *(3/4/2021)*

	
PHOTO POINT 10 UT2 R1 – upstream *(3/4/2021)*	**PHOTO POINT 10 UT2 R1 –** downstream *(3/4/2021)*
	
PHOTO POINT 11 UT2A – upstream *(3/4/2021)*	**PHOTO POINT 11 UT2A –** downstream *(3/4/2021)*
	
PHOTO POINT 12 UT2A – upstream *(3/4/2021)*	**PHOTO POINT 12 UT2A –** downstream *(3/4/2021)*

PHOTO POINT 13 UT2 R2 – upstream *(3/4/2021)*

PHOTO POINT 13 UT2 R2 – downstream *(3/4/2021)*

PHOTO POINT 14 UT2 R2 – upstream *(4/20/2021)*

PHOTO POINT 14 UT2 R2 – downstream *(4/20/2021)*

PHOTO POINT 15 UT2 R2 – upstream *(3/4/2021)*

PHOTO POINT 15 UT2 R2 – downstream *(3/4/2021)*

	
PHOTO POINT 16 UT3 R1 – upstream *(3/4/2021)*	**PHOTO POINT 16 UT3 R1 –** downstream *(3/4/2021)*
	
PHOTO POINT 17 UT3 R1 – upstream *(3/4/2021)*	**PHOTO POINT 17 UT3 R1–** downstream *(3/4/2021)*
	
PHOTO POINT 18 UT3 R2 – upstream *(3/4/2021)*	**PHOTO POINT 18 UT3 R2 –** downstream *(3/4/2021)*

	
PHOTO POINT 19 Venable Creek R3 – upstream *(3/4/2021)*	**PHOTO POINT 19 Venable Creek R3 –** downstream *(3/4/2021)*
	
PHOTO POINT 20 UT4 – upstream *(3/4/2021)*	**PHOTO POINT 20 UT4 –** downstream *(3/4/2021)*
	
PHOTO POINT 21 Venable Creek R4 – upstream *(3/4/2021)*	**PHOTO POINT 21 Venable Creek R4 –** downstream *(3/4/2021)*

	
PHOTO POINT 22 Venable Creek R4 – upstream *(3/4/2021)*	**PHOTO POINT 22 Venable Creek R4 –** downstream *(3/4/2021)*
	
PHOTO POINT 23 UT5 Headcut – upstream *(3/4/2021)*	**PHOTO POINT 23 UT5 –** downstream *(3/4/2021)*
	
PHOTO POINT 24 UT5 – upstream *(3/4/2021)*	**PHOTO POINT 24 UT5 –** downstream *(3/4/2021)*

	
PHOTO POINT 25 Venable Creek R4 – upstream *(3/4/2021)*	**PHOTO POINT 25 Venable Creek R4 –** downstream *(3/4/2021)*
	
PHOTO POINT 26 Venable Creek R4 – upstream *(3/4/2021)*	**PHOTO POINT 26 Venable Creek R4 –** downstream *(3/4/2021)*
	
PHOTO POINT 27 UT6 R2 – upstream *(3/4/2021)*	**PHOTO POINT 27 UT6 R2 –** downstream *(3/4/2021)*

	
PHOTO POINT 28 UT6 R1 – upstream *(3/4/2021)*	**PHOTO POINT 28 UT6 R1 –** downstream *(3/4/2021)*

MATURE TREE PHOTOGRAPHS

	
Mature Tree Photo Point 1 (Northeast) – Venable Creek Reach 3 *(03/04/2021)*	**Mature Tree Photo Point 2 (Northeast)** – Venable Creek Reach 4 *(03/04/2021)*

APPENDIX 3. Vegetation Plot Data

Table 8. Vegetation Performance Standards Summary Table

Honey Mill Mitigation Site

DMS Project No. 100083

Monitoring Year 0 - 2021

Vegetation Performance Standards Summary Table												
	Veg Plot 1 F				Veg Plot 2 F				Veg Plot 3 F			
	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3												
Monitoring Year 2												
Monitoring Year 1												
Monitoring Year 0	567	2	8	0	526	2	10	0	445	2	6	0
	Veg Plot 4 F				Veg Plot 5 F				Veg Plot 6 F			
	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3												
Monitoring Year 2												
Monitoring Year 1												
Monitoring Year 0	567	2	9	0	364	2	8	0	607	2	10	0
	Veg Plot 7 F				Veg Plot 8 F				Veg Plot 9 F			
	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3												
Monitoring Year 2												
Monitoring Year 1												
Monitoring Year 0	526	2	9	0	607	2	10	0	405	2	9	0
	Veg Plot 1 R				Veg Plot 2 R				Veg Plot 3 R			
	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3												
Monitoring Year 2												
Monitoring Year 1												
Monitoring Year 0	445	2	7	0	567	2	10	0	445	2	8	0
	Veg Plot 4 R				Veg Plot 5 R							
	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives				
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3												
Monitoring Year 2												
Monitoring Year 1												
Monitoring Year 0	567	2	10	0	688	2	8	0				

*Each monitoring year represents a different plot for the random vegetation plot "groups". Random plots are denoted with an R, and fixed plots with an F.

Table 9. Vegetation Plot Data
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 0 - 2021

Planted Acreage	4.97
Date of Initial Plant	2021-03-01
Date of Current Survey	2021-03-03
Plot size (ACRES)	0.0247

	Scientific Name	Common Name	Tree/Shrub	Indicator Status	Veg Plot 1 F		Veg Plot 2 F		Veg Plot 3 F		Veg Plot 4 F		Veg Plot 5 F		Veg Plot 6 F		Veg Plot 7 F		Veg Plot 8 F		Veg Plot 9 F		Veg Plot MP1 R	Veg Plot MP2 R	Veg Plot MP3 R	Veg Plot MP4 R	Veg Plot MP5 R
					Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Total	Total	Total	Total	Total
Species Included in Approved Mitigation Plan	Acer negundo	boxelder	Tree	FAC	1	1	1	1					1	1	1	1								1		1	
	Asimina triloba	pawpaw	Tree	FAC			1	1			1	1			1	1							1		1		
	Carpinus caroliniana	American hornbeam	Tree	FAC											1	1	1	1	1	1	1	1		1	1	1	
	Carya cordiformis	bitternut hickory	Tree	FACU			1	1	3	3	1	1	1	1									2	1			
	Cornus florida	flowering dogwood	Tree	FACU																							
	Diospyros virginiana	common persimmon	Tree	FAC	3	3	2	2	2	2			1	1			1	1	1	1	2	2	2	2	1	2	2
	Fagus grandifolia	American beech	Tree	FACU													1	1	2	2	1	1				1	1
	Hamamelis virginiana	American witchhazel	Tree	FACU	1	1									2	2	1	1	2	2						1	
	Lindera benzoin	northern spicebush	Tree	FAC											1	1			2	2	1	1			1	1	
	Liriodendron tulipifera	tuliptree	Tree	FACU			1	1			1	1	1	1	1	1	2	2	1	1	1	1	1		1	1	1
	Morus rubra	red mulberry	Tree	FACU	3	3			1	1	1	1	1	1	1	1	2	2	1	1	1	1		1			
	Nyssa sylvatica	blackgum	Tree	FAC													2	2	2	2				1		1	
	Oxydendrum arboreum	sourwood	Shrub	UPL			2	2							2	2							3	1			1
	Platanus occidentalis	American sycamore	Tree	FACW	1	1	2	2	2	2	3	3	1	1	2	2	2	2	1	1	1	1			3	2	4
	Prunus serotina	black cherry	Tree	FACU	2	2	1	1	1	1	2	2	1	1										1			
	Quercus alba	white oak	Tree	FACU	1	1			2	2	1	1	2	2	3	3					1	1		2	1		3
	Quercus rubra	northern red oak	Tree	FACU	2	2	1	1			3	3					1	1	2	2	1	1	1	2	2	3	4
	Ulmus rubra	slippery elm	Tree	FAC			1	1			1	1											1	1			1
Sum	Performance Standard				14	14	13	13	11	11	14	14	9	9	15	15	13	13	15	15	10	10	11	14	11	14	17
Mitigation Plan Performance Standard	Current Year Stem Count					14		13		11		14		9		15		13		15		10	11	14	11	14	17
	Stems/Acre					567		526		445		567		364		607		526		607		405	445	567	445	567	688
	Species Count					8		10		6		9		8		10		9		10		9	7	10	8	10	8
	Dominant Species Composition (%)					21		15		27		21		22		20		15		13		20	27	14	27	21	24
	Average Plot Height					2		2		2		2		2		2		2		2		2	2	2	2	2	2
	% Invasives					0		0		0		0		0		0		0		0		0	0	0	0	0	0
Post Mitigation Plan Performance Standard	Current Year Stem Count					14		13		11		14		9		15		13		15		10	11	14	11	14	17
	Stems/Acre					567		526		445		567		364		607		526		607		405	445	567	445	567	688
	Species Count					8		10		6		9		8		10		9		10		9	7	10	8	10	8
	Dominant Species Composition (%)					21		15		27		21		22		20		15		13		20	27	14	27	21	24
	Average Plot Height					2		2		2		2		2		2		2		2		2	2	2	2	2	2
	% Invasives					0		0		0		0		0		0		0		0		0	0	0	0	0	0

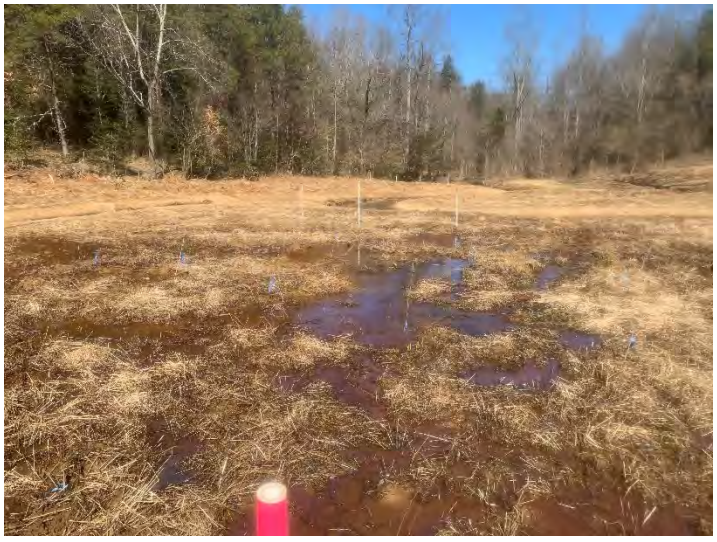
1). Bolded species are proposed for the current monitoring year, italicized species are not approved, and a regular font indicates that the species has been approved.
2). The "Species Included in Approved Mitigation Plan" section contains only those species that were included in the original approved mitigation plan. The "Post Mitigation Plan Species" section includes species that are being proposed through a mitigation plan addendum for the current monitoring year (bolded) , species that have been approved in prior monitoring years through a mitigation plan addendum (regular font), and species that are not approved (italicized).
3). The "Mitigation Plan Performance Standard" section is derived only from stems included in the original mitigation plan, whereas the "Post Mitigation Plan Performance Standard" includes data from mitigation plan approved, post mitigation plan approved, and proposed stems.

PERMANENT VEGETATION PLOT PHOTOGRAPHS

PERMANENT VEGETATION PLOT 1 *(03/03/2021)*

PERMANENT VEGETATION PLOT 2 *(03/03/2021)*

PERMANENT VEGETATION PLOT 3 *(03/03/2021)*



PERMANENT VEGETATION PLOT 4 *(03/03/2021)*

PERMANENT VEGETATION PLOT 5 *(03/03/2021)*

PERMANET VEGETATION PLOT 6 *(03/03/2021)*

PERMANENT VEGETATION PLOT 7 *(03/03/2021)*

PERMANENT VEGETATION PLOT 8 *(03/03/2021)*

PERMANENT VEGETATION PLOT 9 *(03/03/2021)*

MOBILE VEGETATION PLOT PHOTOGRAPHS

MOBILE VEGETATION PLOT 1 *(03/03/2021)*

MOBILE VEGETATION PLOT 2 *(03/03/2021)*

MOBILE VEGETATION PLOT 3 *(06/25/2021)*

MOBILE VEGETATION PLOT 4 *(03/03/2021)*

MOBILE VEGETATION PLOT 5 *(06/25/2021)*

APPENDIX 4. Record Drawings

July 2, 2021

Honey Mill Mitigation Site Record Drawings

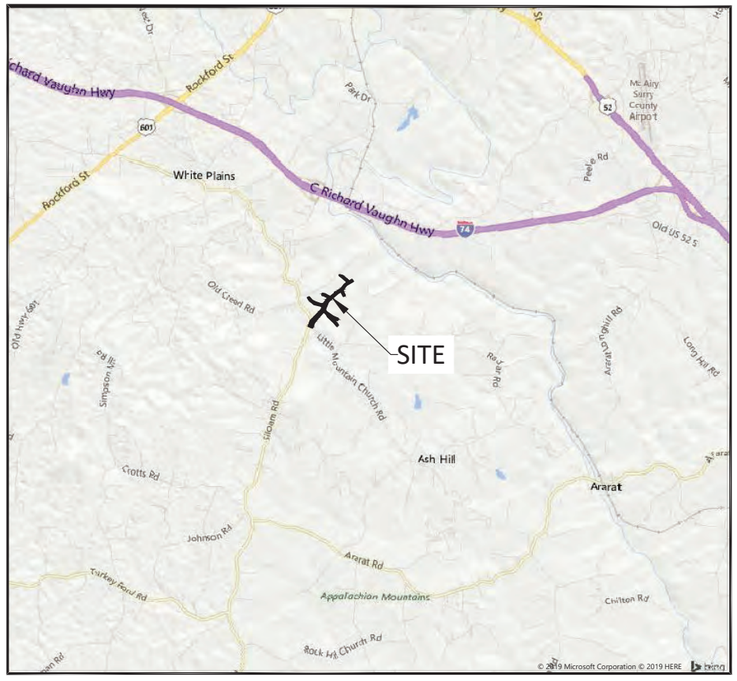
Surry County, NC

for

NCDEQ

Division of Mitigation Services

Yadkin River Basin 03040101



Vicinity Map
Not to Scale

CERTIFICATE OF SURVEY AND ACCURACY

I, DAVID S. TURNER, 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 TURNER LAND SURVEYING, PLLC AS SHOWN ON AN AS-BUILT SURVEY FOR "THE STATE OF NC, DIVISION OF MITIGATION SERVICES" DATED MAY 25, 2021 ; 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 OBTAIN BETWEEN THE DATES OF APRIL 21 - 30, 2021 ; 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 2nd DAY OF July, 20 21 .

OFFICIAL SEAL

NORTH CAROLINA PROFESSIONAL SEAL L-4551 LAND SURVEYOR DAVID S. TURNER
02-07-21

DAVID S. TURNER, PLS L-4551

Environmental Quality

RECORD DRAWINGS
ISSUED JULY 2, 2021

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:
Turner Land Surveying
P.O. Box 148
Swannanoa, NC 28778
David S. Turner, PLS
919-827-0745

Owner:
NC DEQ - Division of Mitigation Services
1652 Mail Service Center
Raleigh, NC 27699
Kelly Phillips
919-707-8291

NCDEQ Contract No. 7619

DMS Project No. 100083

USACE ID No. SAW-2018-01789

NC DWR No. 20181271

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

NORTH CAROLINA PROFESSIONAL SEAL 023401 ENGINEER AARON S. EARLEY 7-2-21

Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina

Title Sheet

Revisions:

Date:	JULY 2, 2021
Job Number:	095-02123
Project Engineer:	ASE
Drawn By:	HCC
Checked By:	ICK

Sheet 0.1

X:\shared\Projects\095-02178 Honey Mill Monitoring\Baseline Monitoring\Plans\02178 - Cover and general notes.dwg

June 30, 2021

STA: 500+00
BEGIN UT3
LAT: 36.4303
LONG: -80.6144

VENABLE FARM ROAD

N/F
CHARLES E. BROWNE &
LU ANN V. BROWN
D.B. 525, PG. 330
P.I.N. 5927-49-7075

SHEET 1.23

STA: 600+00
BEGIN UT4
LAT: 36.4307
LONG: -80.6118

N/F
LU ANN VENABLE BROWNE
D.B. 327, PG. 641
PIN: 5928-50-7069

N/F
JACK S. FLETCHER and wife,
GLENDA KAYE H. FLETCHER
D.B. 337, PG. 369
PIN: 5928-60-3034

STA: 200+00
BEGIN WORK UT1
LAT: 36.426
LONG: -80.6142

SILOAM ROAD

SHEET 1.11

SHEET 1.2

SHEET 1.3

SHEET 1.25

N/F
CHARLES E. BROWNE &
LU ANN VENABLE BROWN
D.B. 1209, PG. 520 (TRACT 2)
P.I.N. 5927-00-59-9301

UT3

SHEET 1.27

UT4

SHEET 1.29

SHEET 1.31

UT1

SHEET 1.5

STA: 799+77
BEGIN UT6
LAT: 36.4335
LONG: -80.6084

N/F
MONTY K. VENABLE ET AL.
D.B. 205, PG. 495
PIN: 5928-60-5518

SHEET 1.34

UT6

SHEET 1.36

STA: 100+00
BEGIN WORK VENABLE CREEK
LAT: 36.4257
LONG: -80.6136

SHEET 1.1

SHEET 1.4

UT2B

SHEET 1.37

VENABLE CREEK

SHEET 1.6

SHEET 1.7

SHEET 1.8

SHEET 1.9

LITTLE MOUNTAIN CHURCH RD

SHEET 1.22

SHEET 1.16

SHEET 1.20

SHEET 1.14

UT2

UT2A

SHEET 1.18

SHEET 1.12

UT5

SHEET 1.33

SHEET 1.32

SHEET 1.10

N/F
MONTY K. VENABLE ET AL.
D.B. 313, PG. 722
PIN: 5927-68-4669

STA: 139+90
END WORK VENABLE CREEK
LAT: 36.4327
LONG: -80.6064

STA: 700+00
BEGIN UT5
LAT: 36.4305
LONG: -80.6075

N/F
LU ANN V. BROWN
D.B. 1209, PG. 520 (TRACT 1)
PIN: 5928-70-6435

N/F
MICHAEL LEE VENABLE
and wife,
PHYLLIS ANN VENABLE
D.B. 612, PG. 686
D.B. 585, PG. 703
PIN: 5927-67-1505

STA: 400+00
BEGIN UT2A
LAT: 36.4261
LONG: -80.6088

STA: 300+00
BEGIN UT2
LAT: 36.4268
LONG: -80.6086

N/F
RANDY DEAN VENABLE and wife,
DAPHNE VENABLE
D.B. 1164, PG. 942
P.B. 23, PG. 109
and
UNRECORDED MAPS BY
ROBERT E. REIF, L-1516
C-368(A), C-368(D), & C-998(B)
c/o BOWMAN-BUNN, PC
MT. AIRY, NC
PIN: 5927-67-7679

N/F
BILLIE LEE WHITT
D.B. 1012, PG. 452
P.B. 30, PG. 172
PIN: 5927-78-7923

N/F
MONTY LEE SIMPSON and wife,
DELORES DAWN SIMPSON
D.B. 720, PG. 914
and
UNRECORDED MAP BY
ROBERT E. REIF, L-1516
C-368(E)
c/o BOWMAN-BUNN, PC
MT. AIRY, NC
PIN: 5927-78-4648

N

0' 150' 300' 450'
(HORIZONTAL)

X:\Shared Projects\005-02178 Honey Mill\Monitoring\Baseline Monitoring\Plans\02178 - Overview.dwg

WILDLANDS ENGINEERING
1430 South Mint Street, Suite 104
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Tel: 704.332.7754
License No. P-0831

NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER AARON S. EARLEY
7-2-21

Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina

Project Overview

Revisions:

Date:	JULY 2, 2021
Job Number:	005-02123
Project Engineer:	ASE
Drawn By:	HCC
Checked By:	JCK

Sheet 0.2

June 30, 2021

RECORD DRAWING NOTES:
Deviations from the Design will be shown in red.

Pre-Construction Features

- Parcel Line
- R/W — Right-of-Way
- OU — Pre-Construction Overhead Utility Line
- OUE — Pre-Construction Overhead Utility Easement
- Pre-Construction Utility Pole
- Pre-Construction Storm Pipe
- X — Pre-Construction Fence
- Pre-Construction Wetland
- Pre-Construction Rip Rap
- Pre-Construction Bedrock
- TOB — Pre- Construction Top of Bank

Design Features

- 10+00 — Design Thalweg Alignment
- 100 — Design Major Contour (5' Interval)
- Design Minor Contour

Design Structures

- Design Various Constructed Riffles
- Design Rock Cascade
- Design Brush Toe
- Design Vegetated Soil Lift
- Design BMP - Bioretention Cell
- Design BMP - SPSC
- Design Log Sill
- Design Lunker Log
- Design Log J-hook
- Design Rock Sill
- Design Boulder Cross Vane
- F — Design Ford Crossing
- Design Culvert Crossing

As-Built Features

- CE — Recorded Conservation Easement
- CE-IX — Recorded Internal Conservation Easement Break
- As-Built Thalweg Alignment
- As-Built Bankfull
- 100 — As-Built Major Contour (5' Interval)
- As-Built Minor Contour
- X — As-Built Fence
- As-Built Farm Road
- VEG / VP X / VEG — Permanent Vegetation Monitoring Plots
- Crest Gage
- Barotroll Gage
- Cross-Section
- Photo Point

As-Built Structures

- As-Built Various Constructed Riffles
- As-Built Rock Cascade
- As-Built Brush Toe
- As-Built Vegetated Soil Lift
- As-Built Debris Removal
- As-Built BMP - Bioretention Cell
- As-Built BMP - SPSC
- As-Built Log Sill
- As-Built Lunker Log
- As-Built Log J-hook
- As-Built Rock Sill
- As-Built Boulder Cross Vane
- As-Built Ford Crossing
- As-Built Culvert Crossing

PROJECT NOTES:
1. As-built survey was completed by Turner Land Surveying in May 2021.
2. Pre-construction topographic data outside of survey limits was supplemented with LiDAR data from 2016.
3. Parcel boundary survey was completed by Turner Land Surveying in December 2019.

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WILDLANDS ENGINEERING
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NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER AARON S. EARLEY
7-2-21

Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina

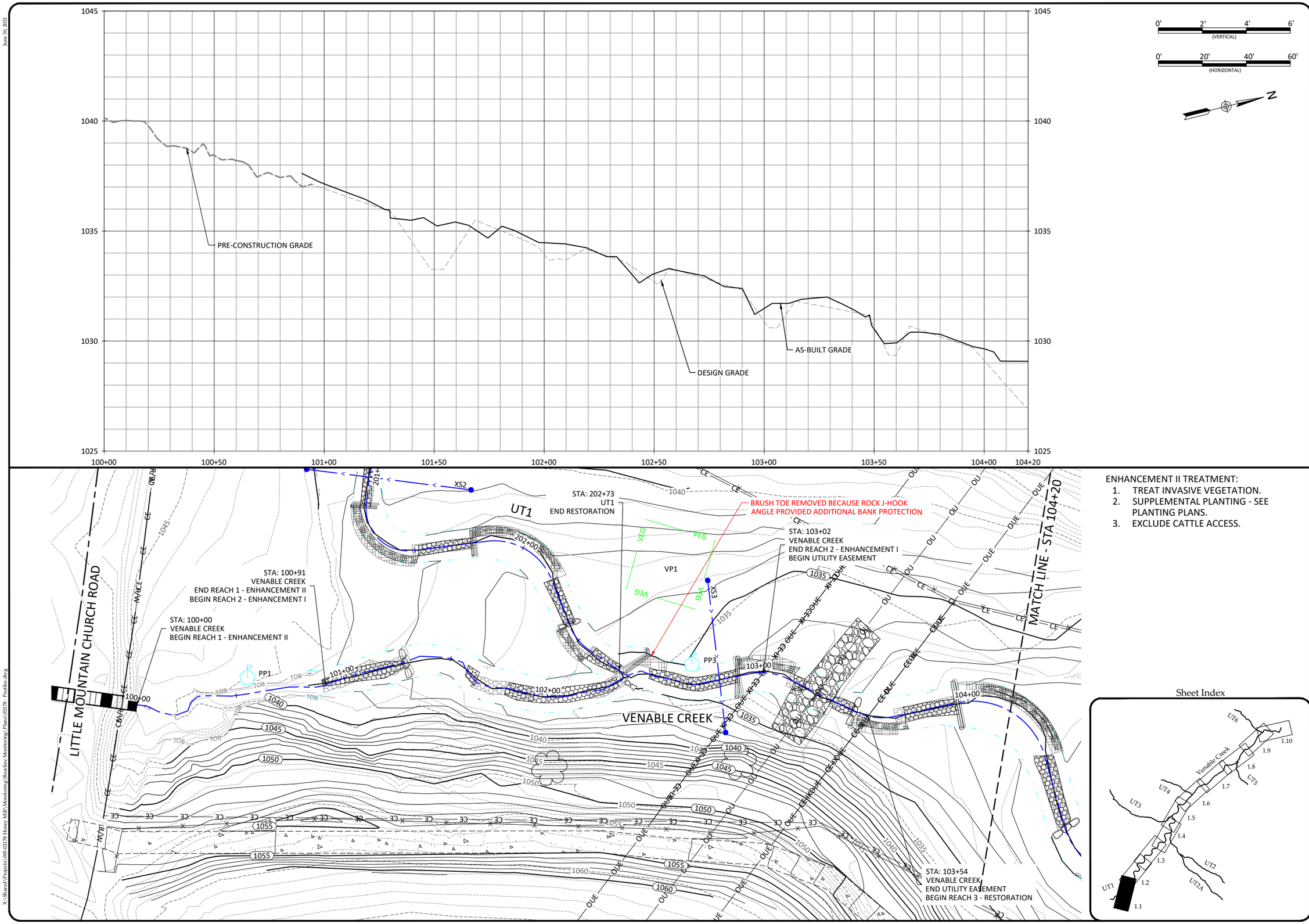
General Notes and Symbols

Revisions:

Date: JULY 2, 2021
Job Number: 005-02123
Project Engineer: ASE
Drawn By: HCC
Checked By: JCK

Sheet 0.3

June 30, 2021



ENHANCEMENT II TREATMENT:

1. TREAT INVASIVE VEGETATION.
2. SUPPLEMENTAL PLANTING - SEE PLANTING PLANS.
3. EXCLUDE CATTLE ACCESS.

Sheet Index

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License No. P-0831

NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER AARON S. EARLEY
7-2-21

Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina
Venable Creek
Stream Plan and Profile

Revisions:

Date:	JULY 2, 2021
Job Number:	005-02123
Project Engineer:	ASE
Drawn By:	HCC
Checked By:	JCK

Sheet 1.1

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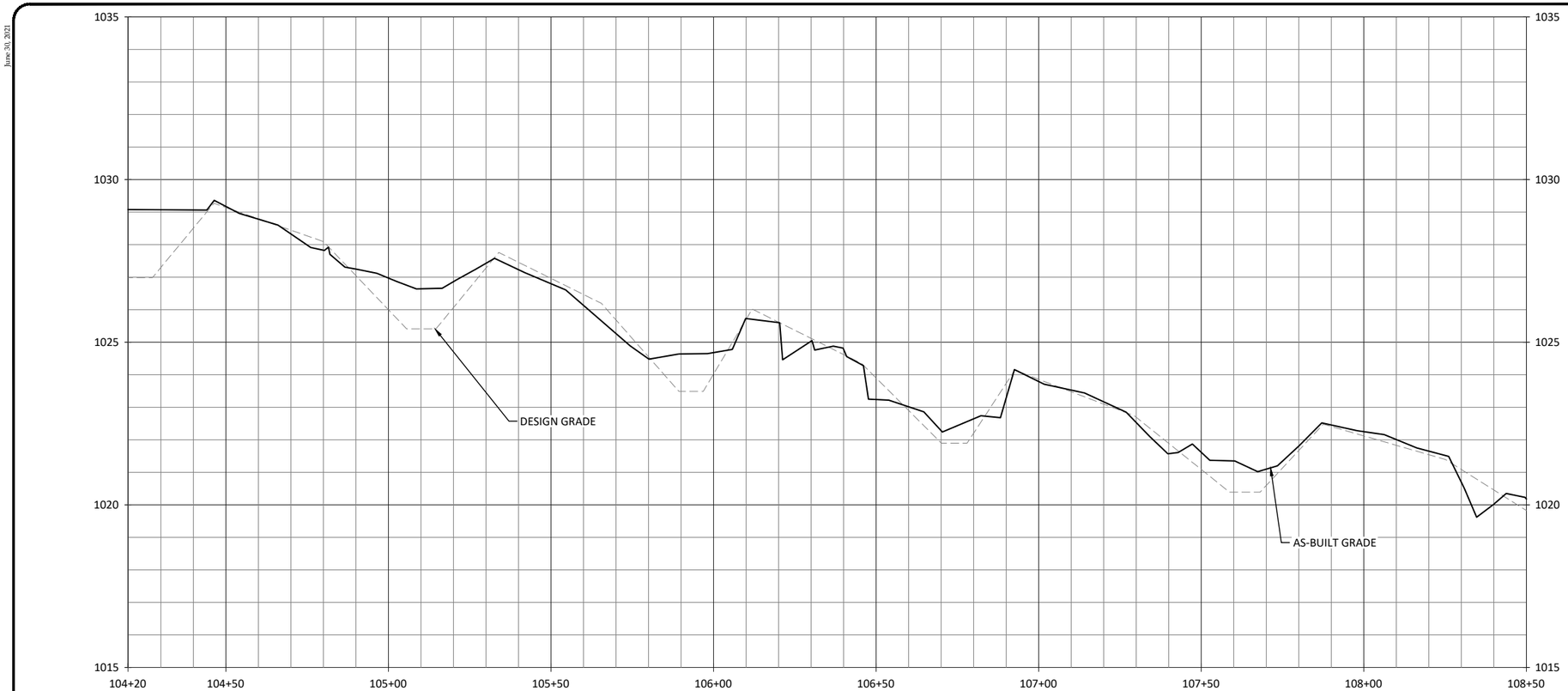
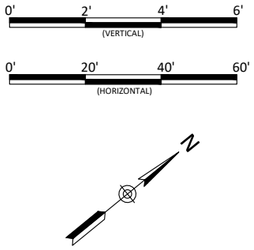
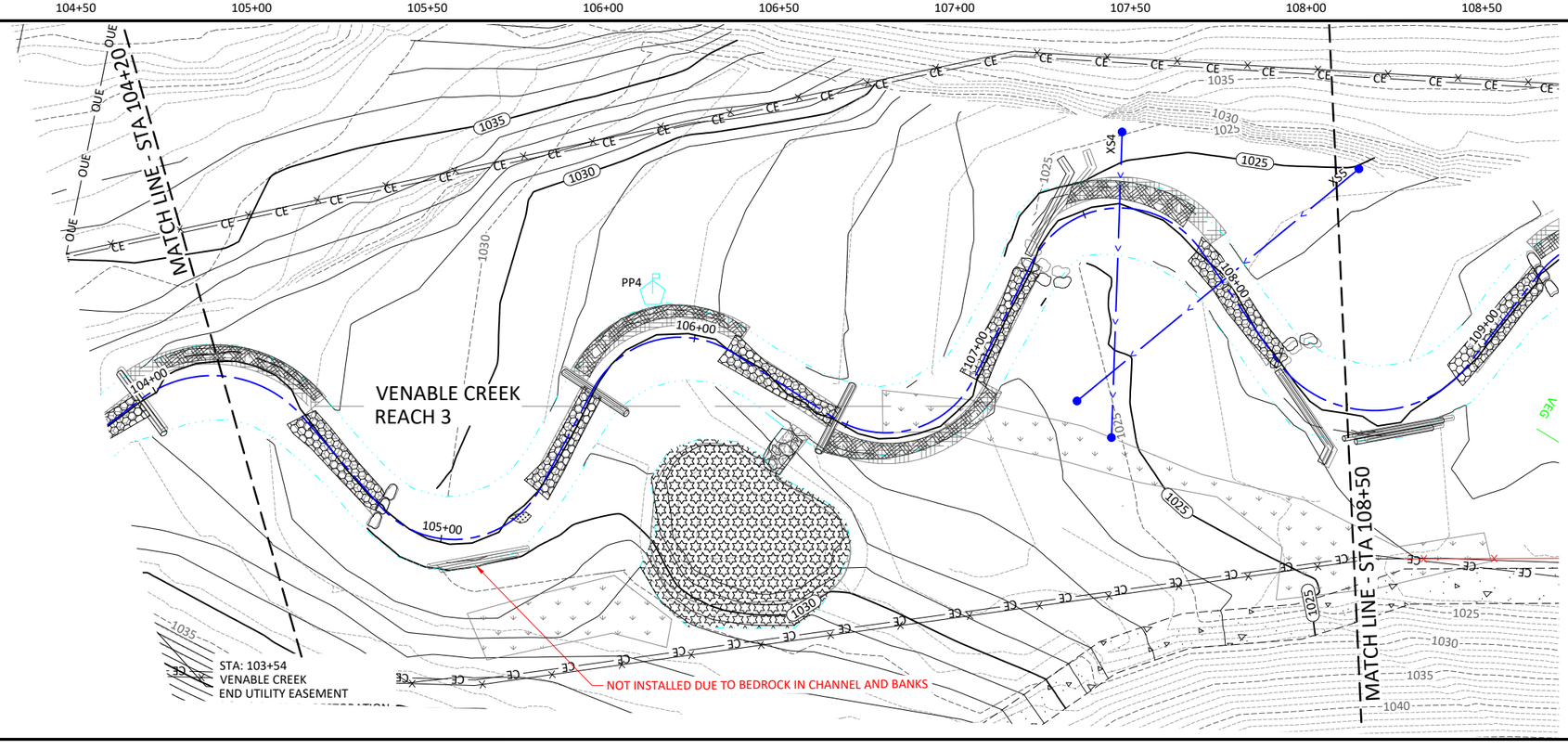
June 30, 2021







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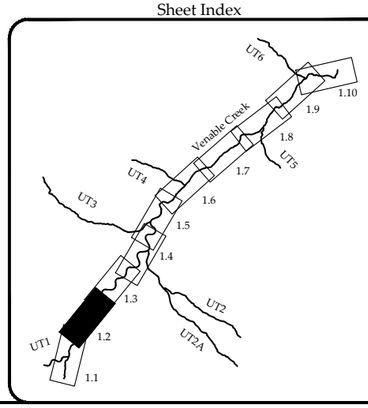

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NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER AARON S. EARLEY
7-2-21

Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina
Venable Creek
Stream Plan and Profile

Revisions:

Date:	JULY 2, 2021
Job Number:	005-02123
Project Engineer:	ASE
Drawn By:	HCC
Checked By:	JCK

Sheet 1.2

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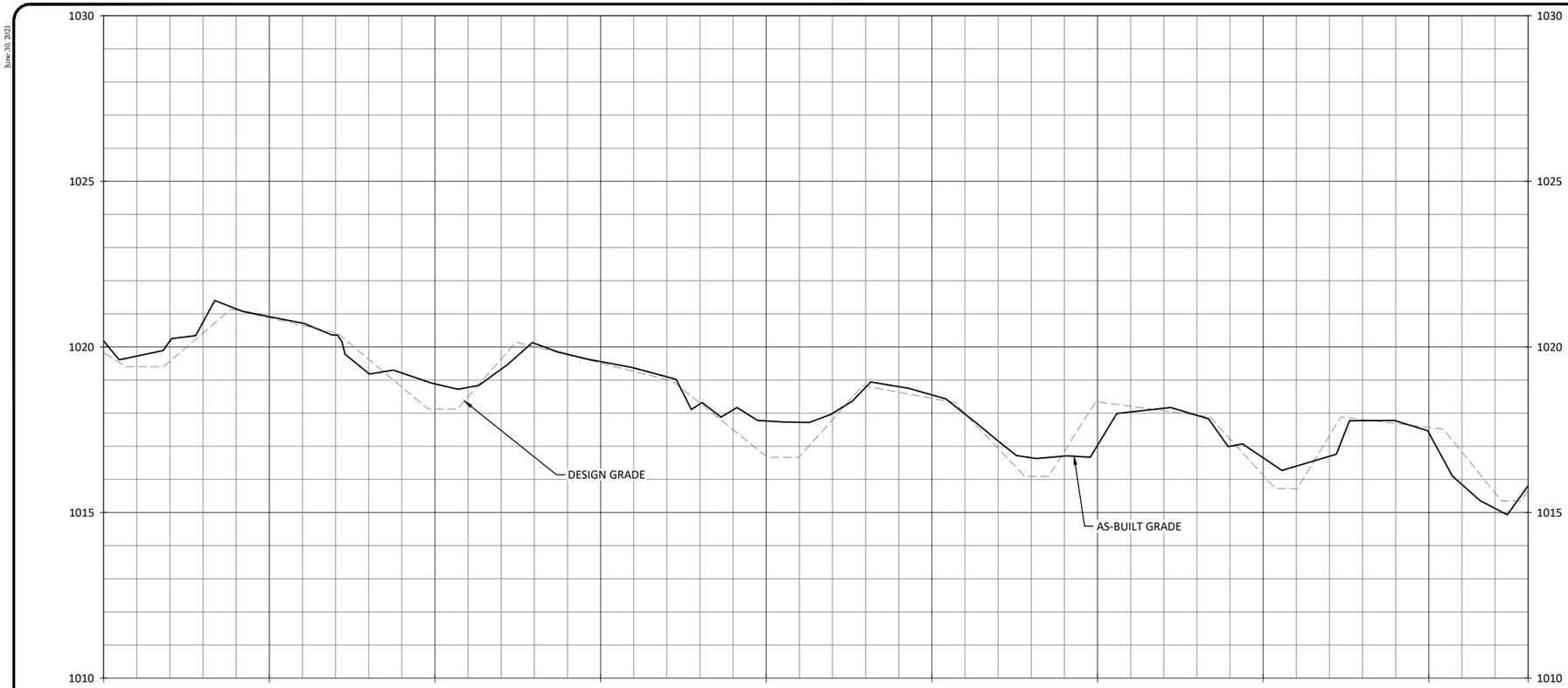
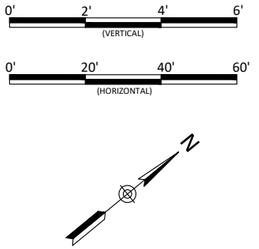
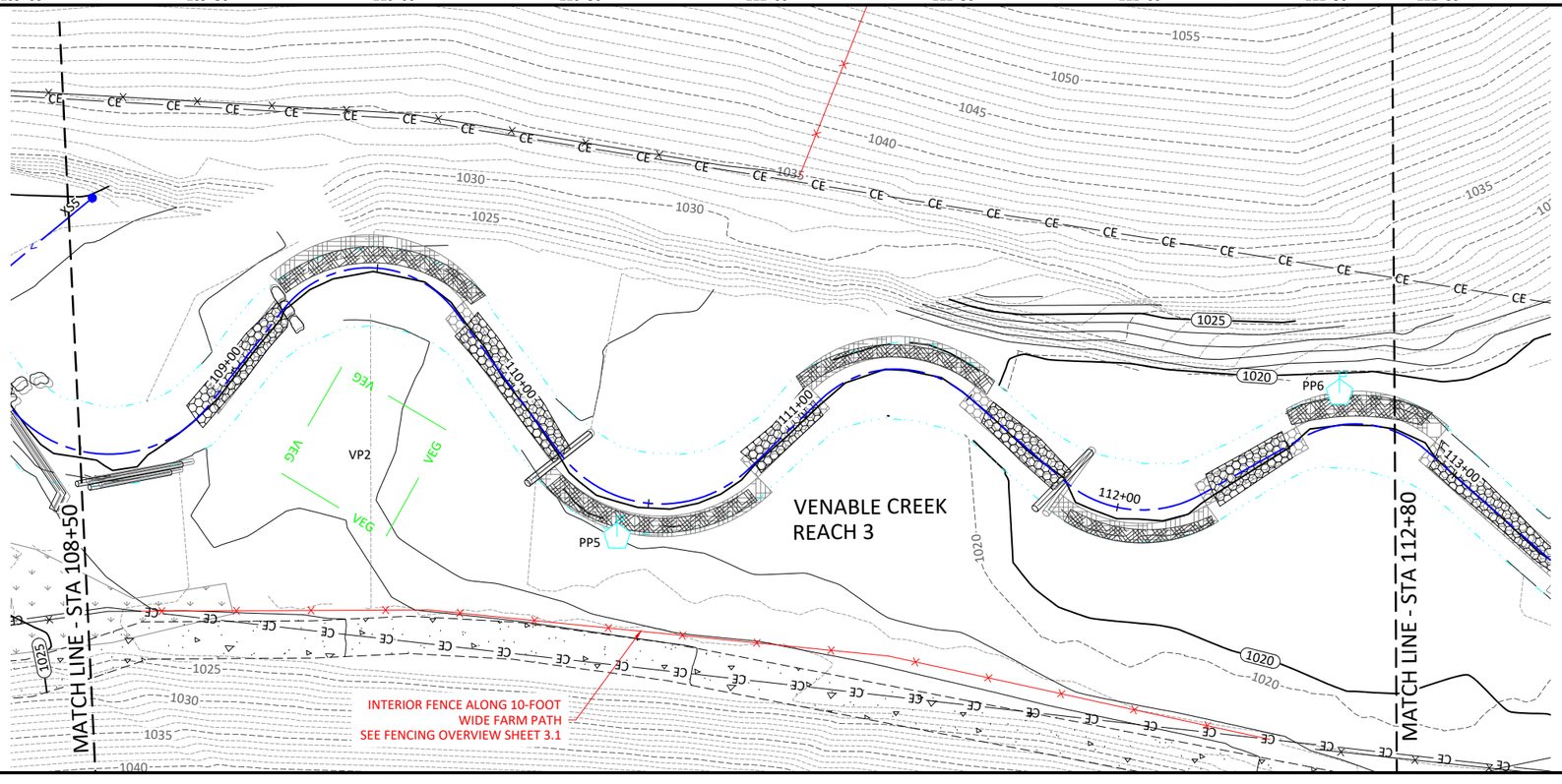
June 30, 2021







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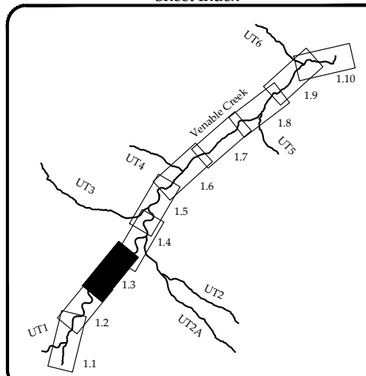

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NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER AARON S. EARLEY 7-2-21

Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina

Venable Creek
Stream Plan and Profile

Revisions:

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Job Number:	005-02123
Project Engineer:	ASE
Drawn By:	HCC
Checked By:	JCK

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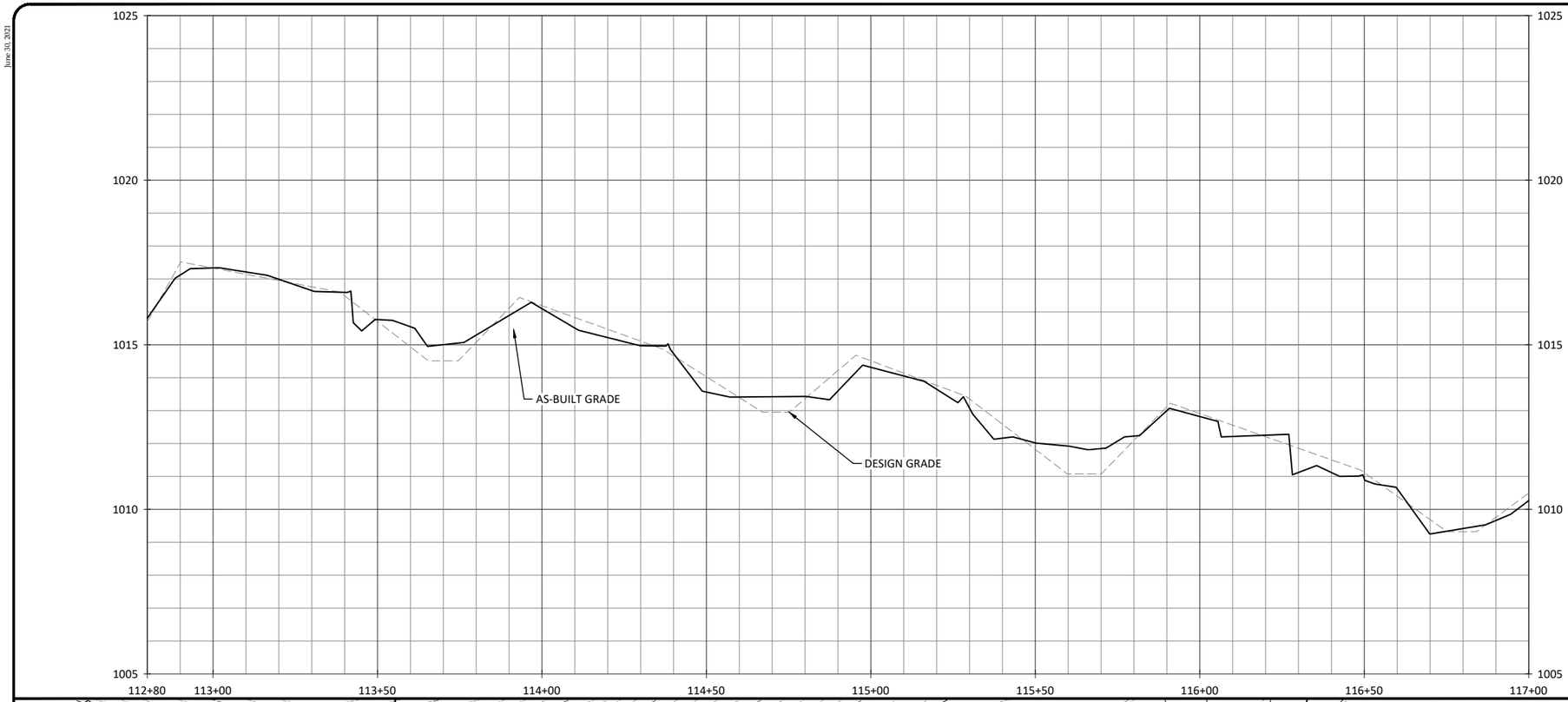
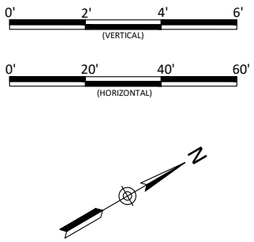
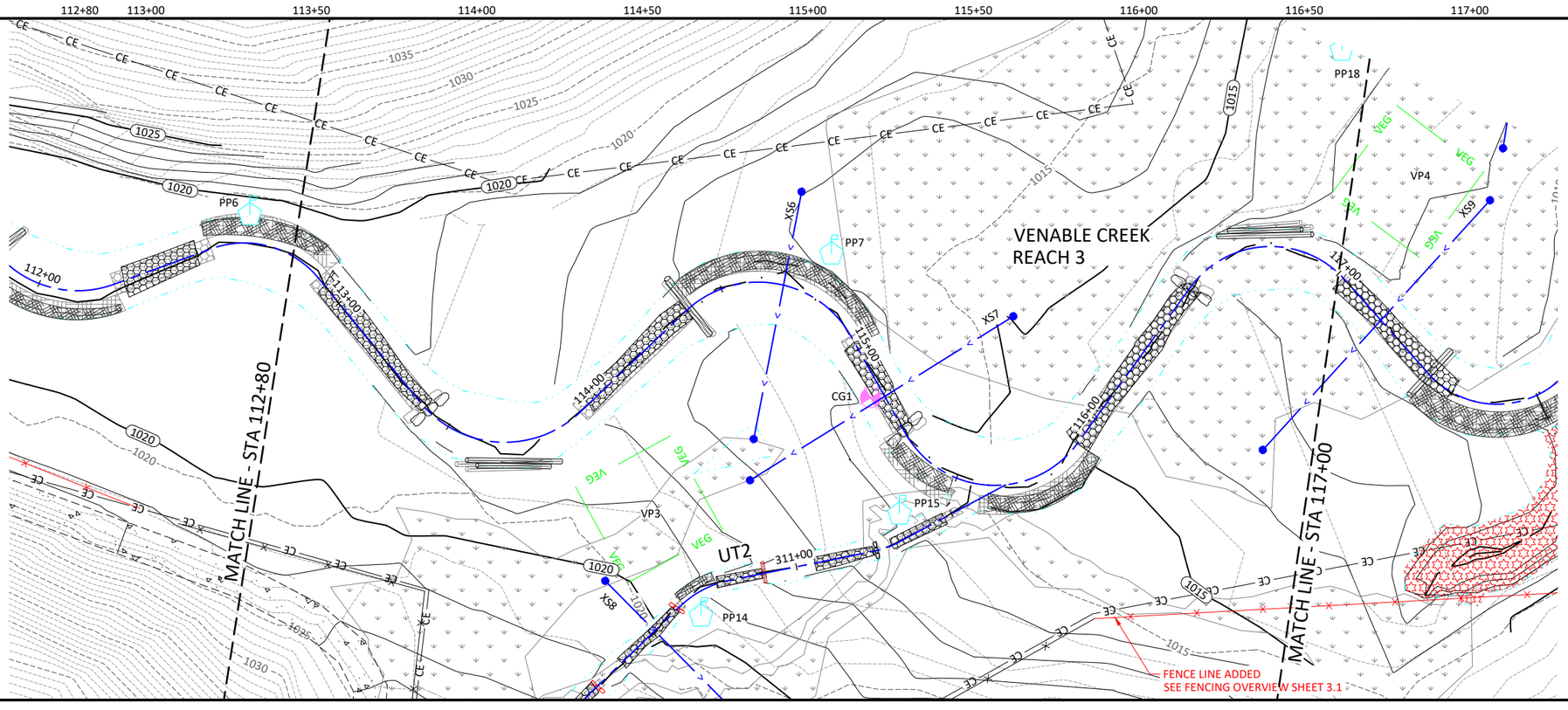
June 30, 2021







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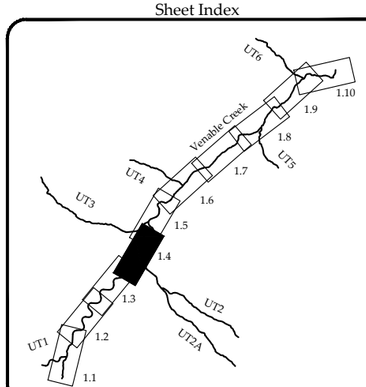

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7-2-21

Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina

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Date:	JULY 2, 2021
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Project Engineer:	ASE
Drawn By:	HCC
Checked By:	JCK

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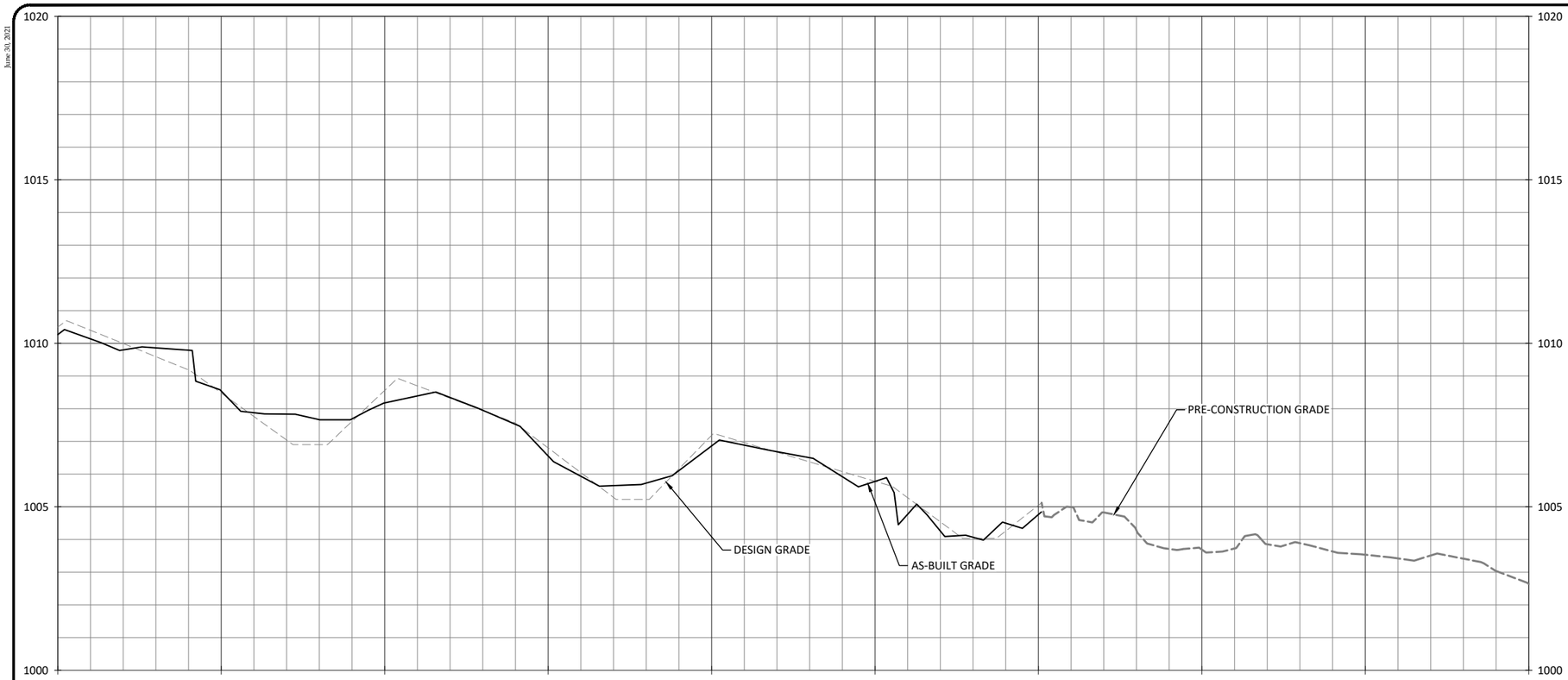
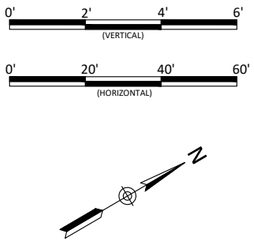
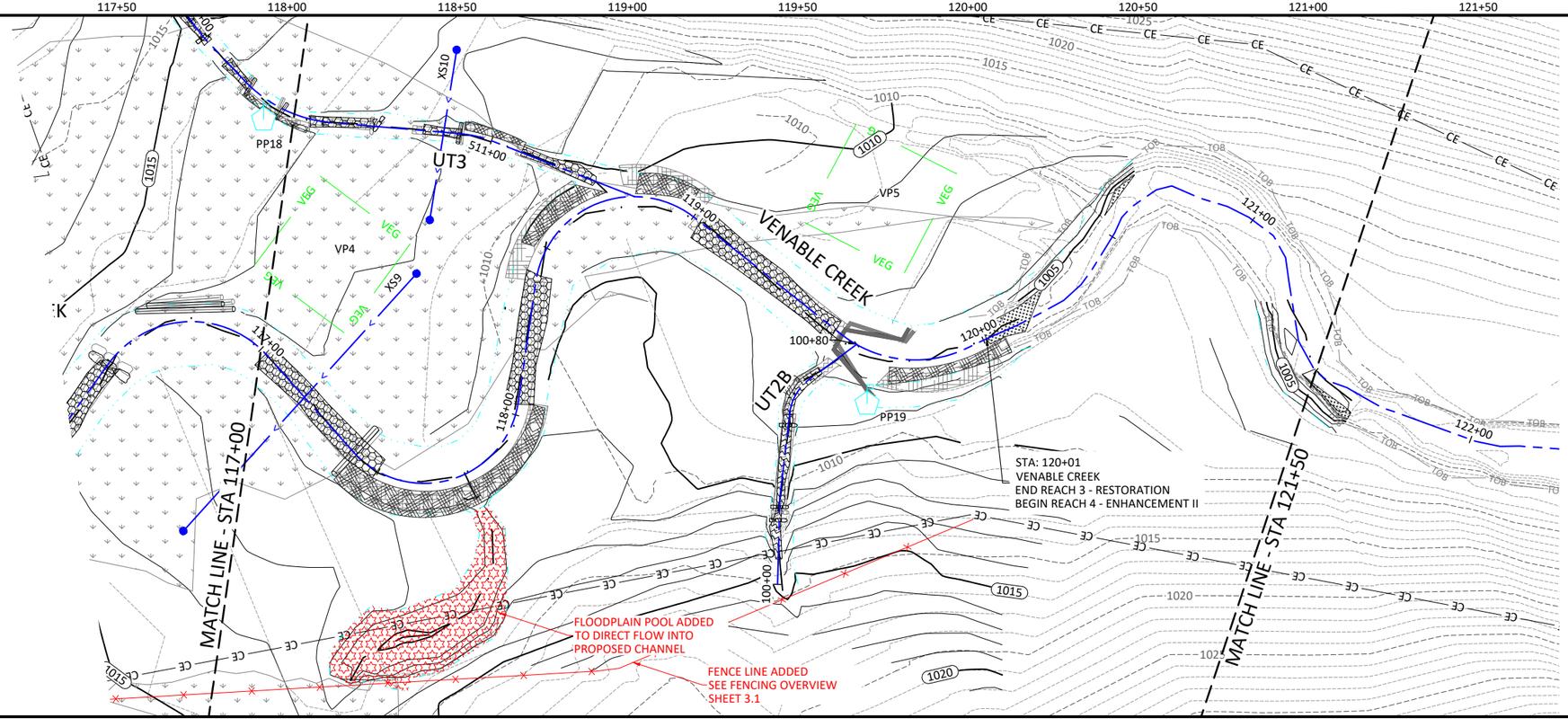
June 30, 2021







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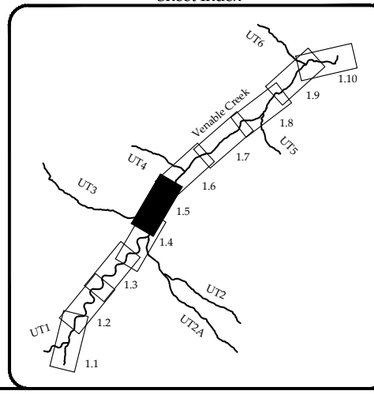

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NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER AARON S. EARLEY
7-2-21

Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina
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Drawn By:	HCC
Checked By:	JCK

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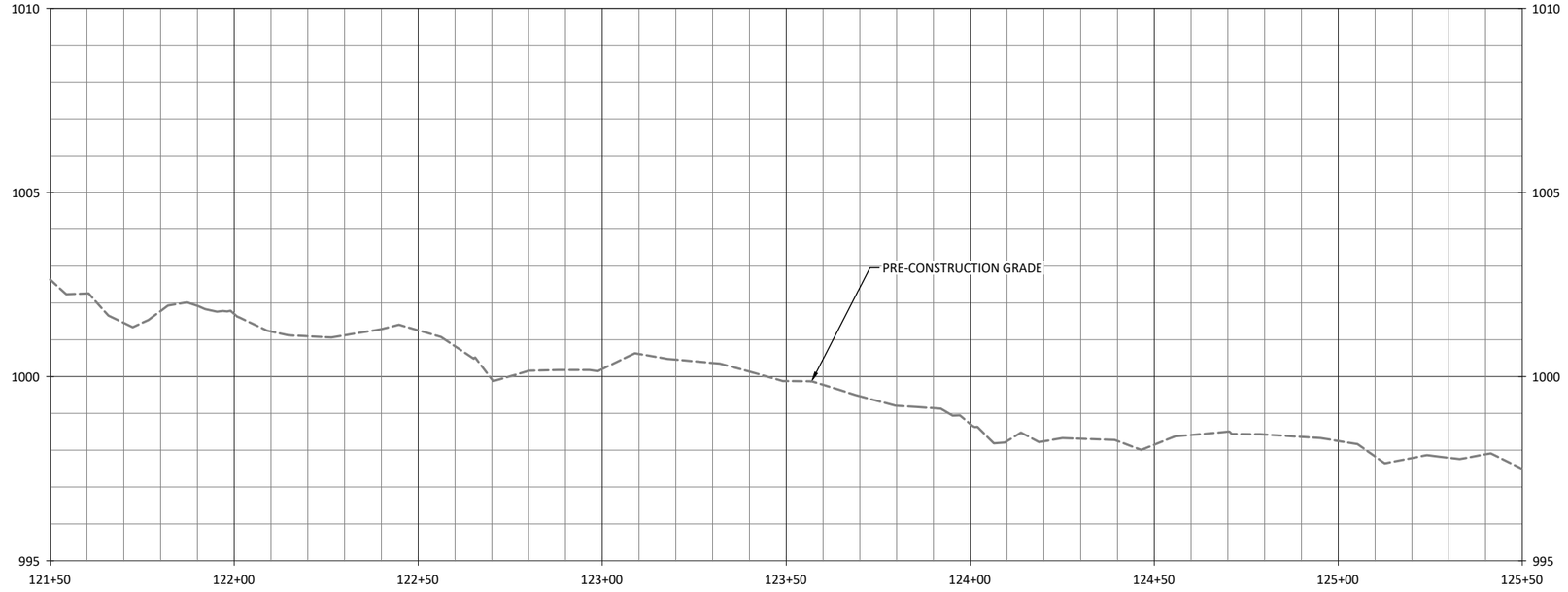

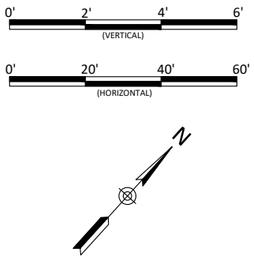

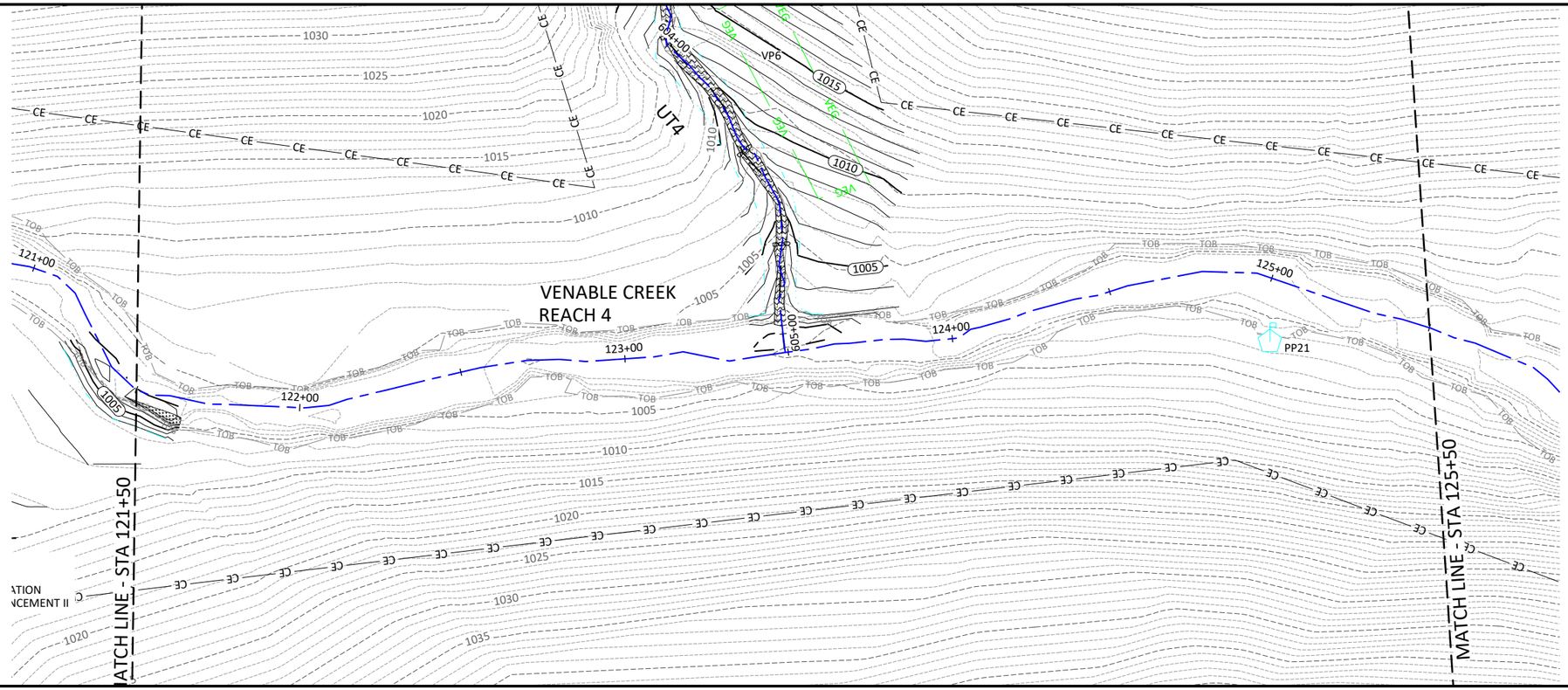

ENHANCEMENT II TREATMENT:

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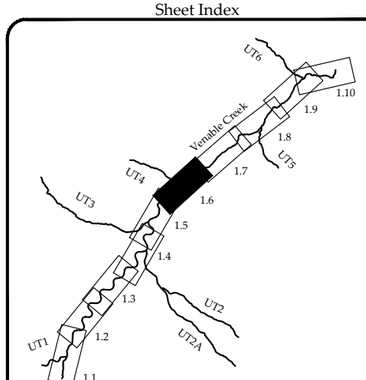

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NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER AARON S. EARLEY 7-2-21

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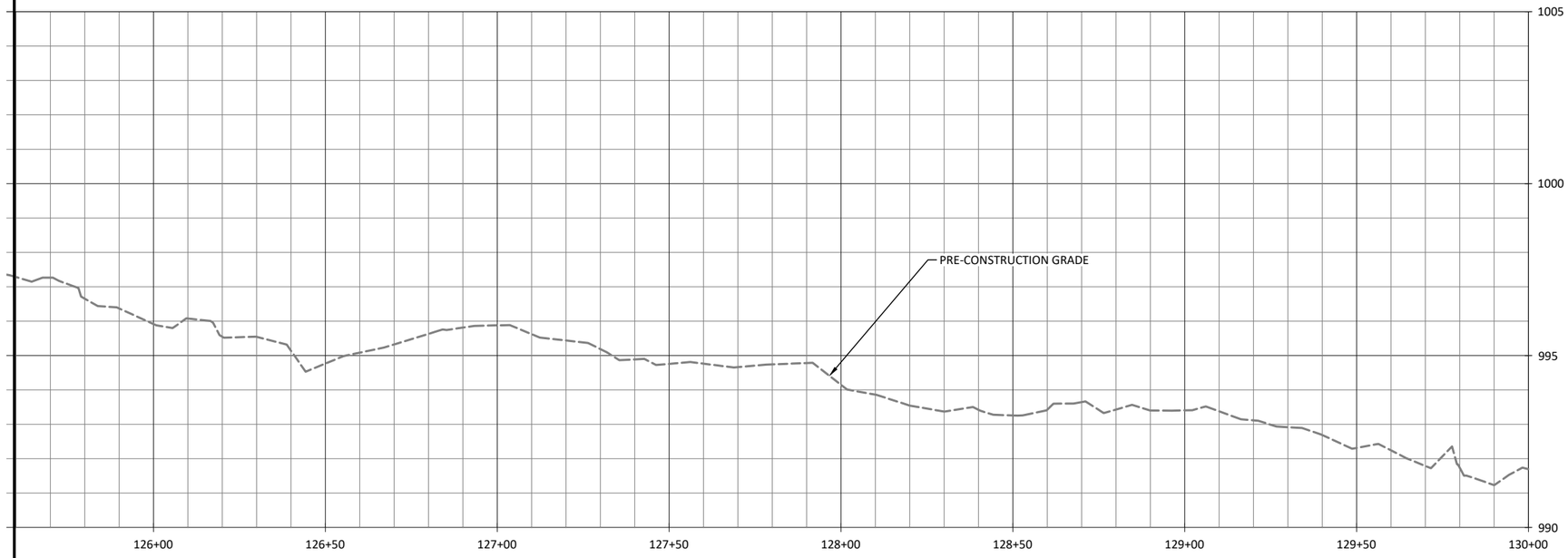

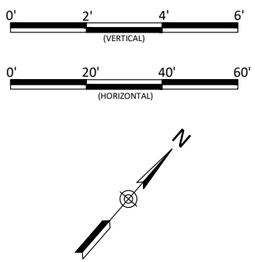

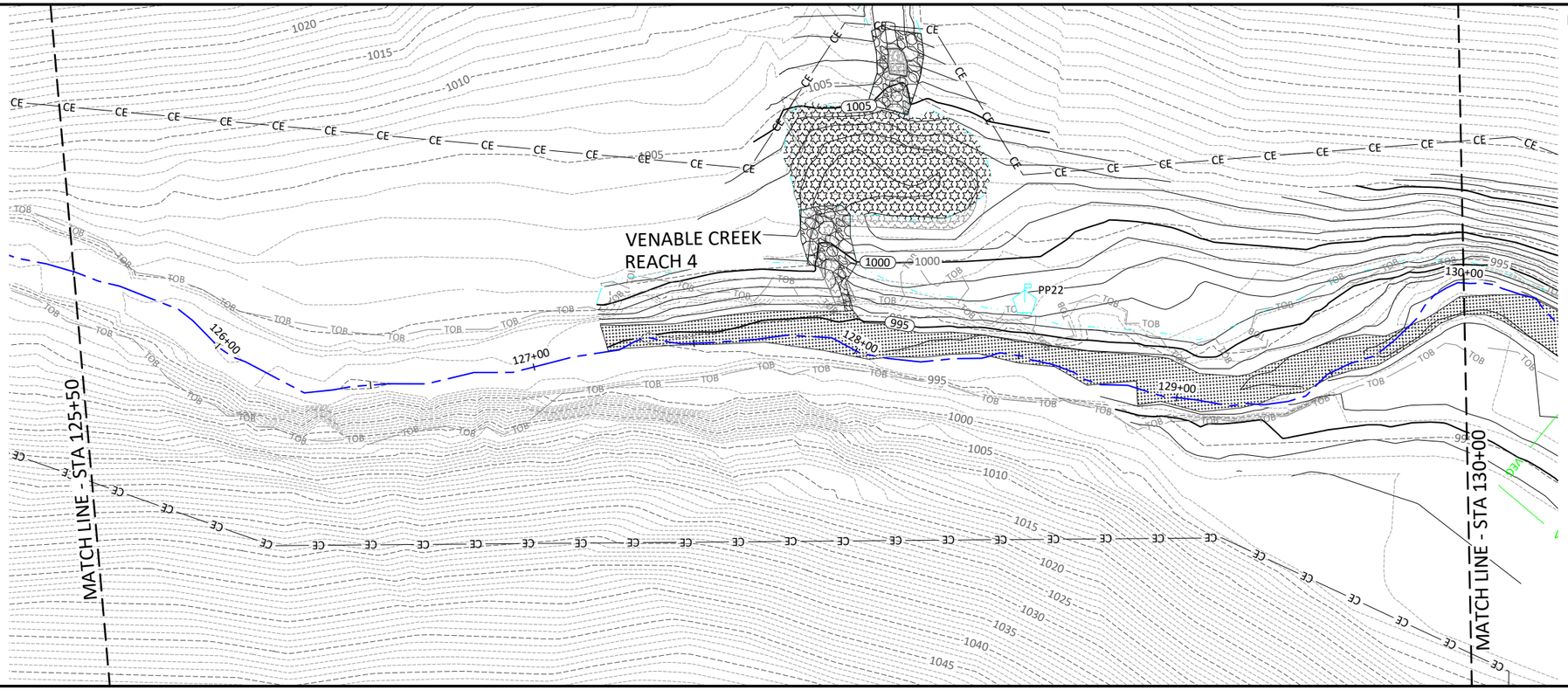

ENHANCEMENT II TREATMENT:

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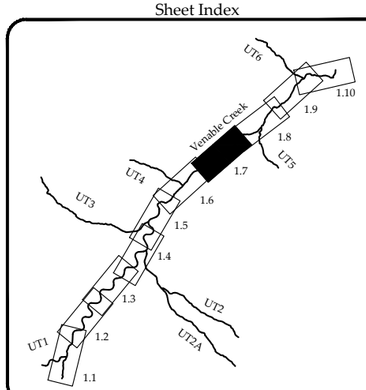

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Surry County, North Carolina

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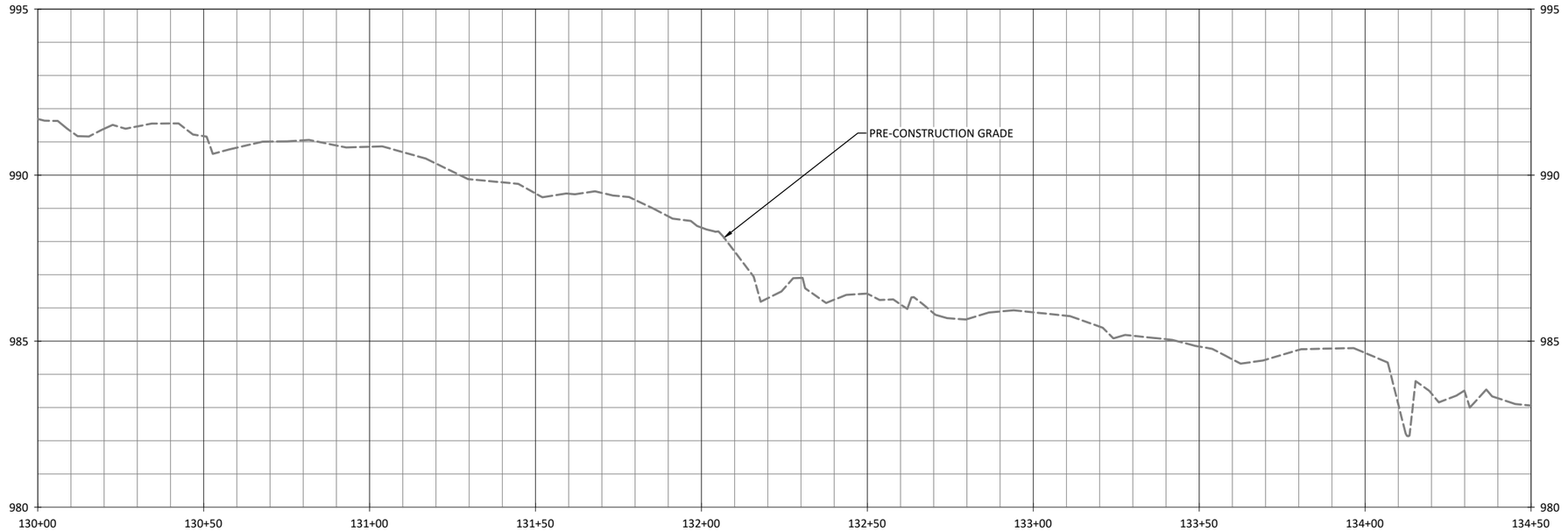

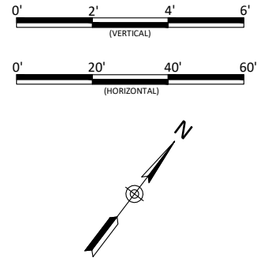

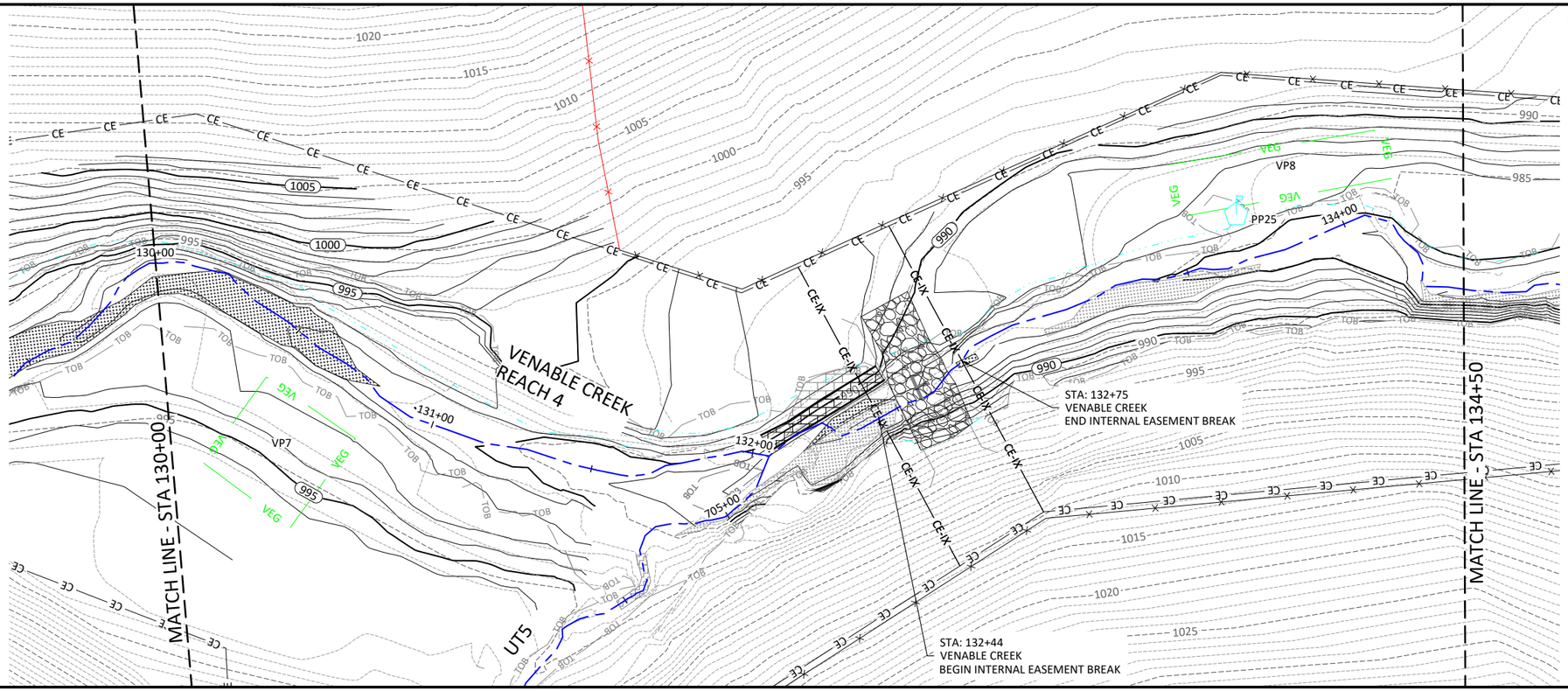

ENHANCEMENT II TREATMENT:

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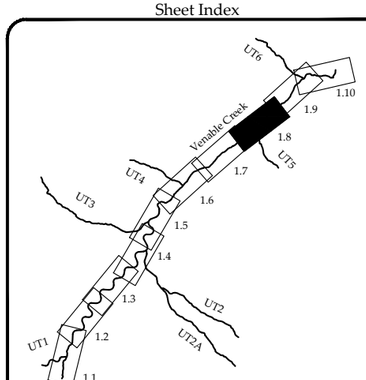

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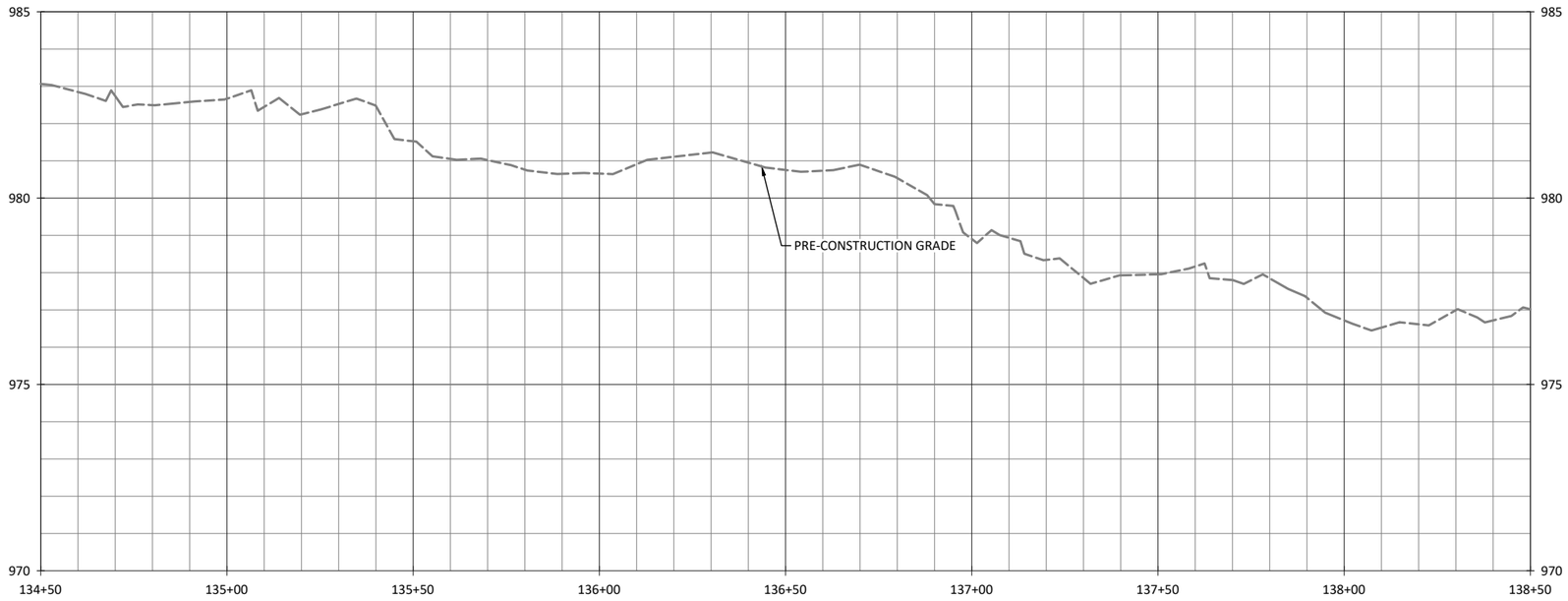

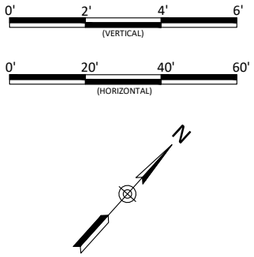

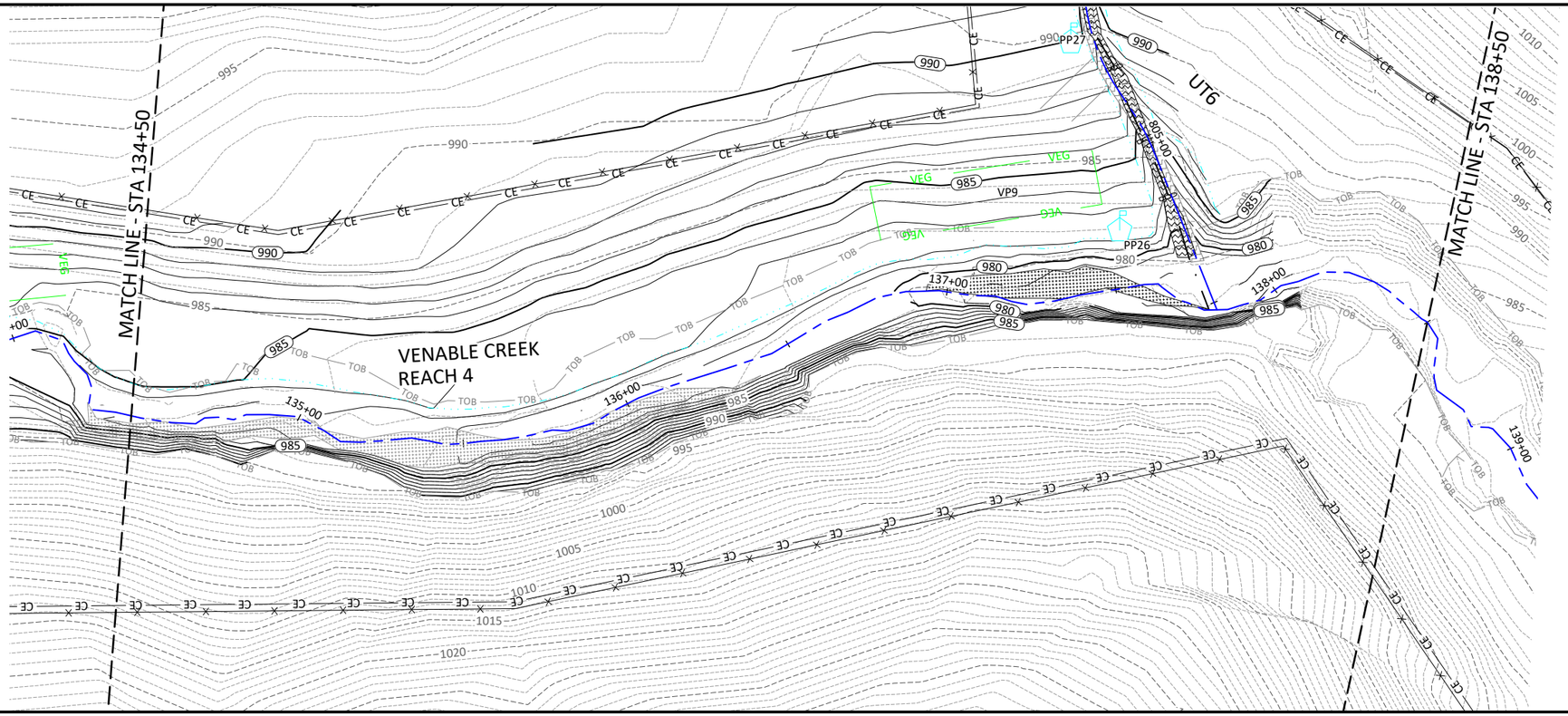

ENHANCEMENT II TREATMENT:

1. TREAT INVASIVE VEGETATION.
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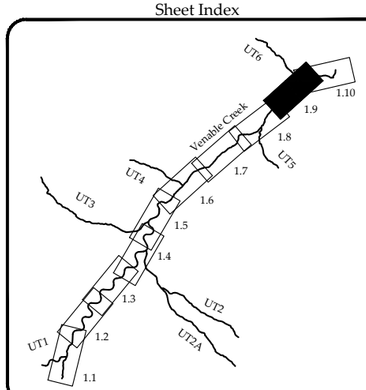

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Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina

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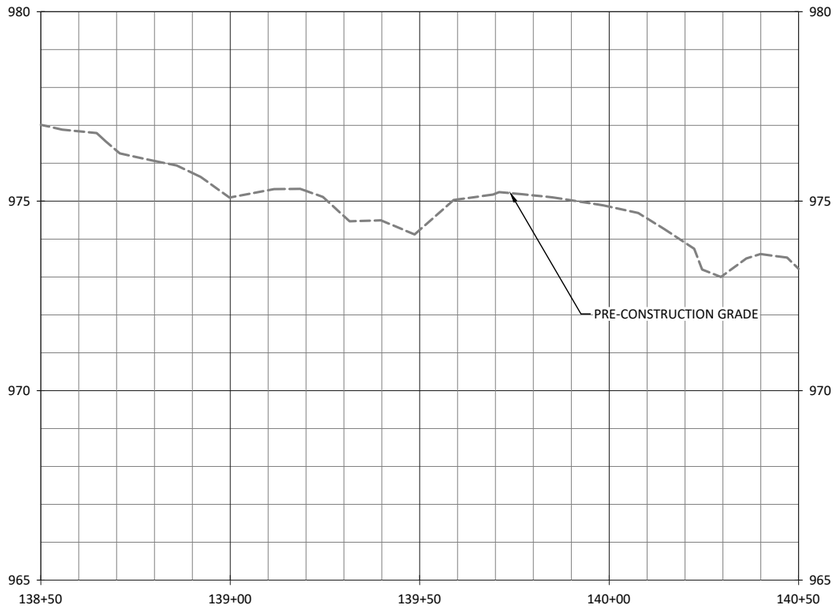

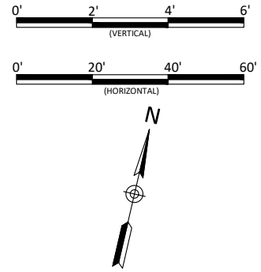

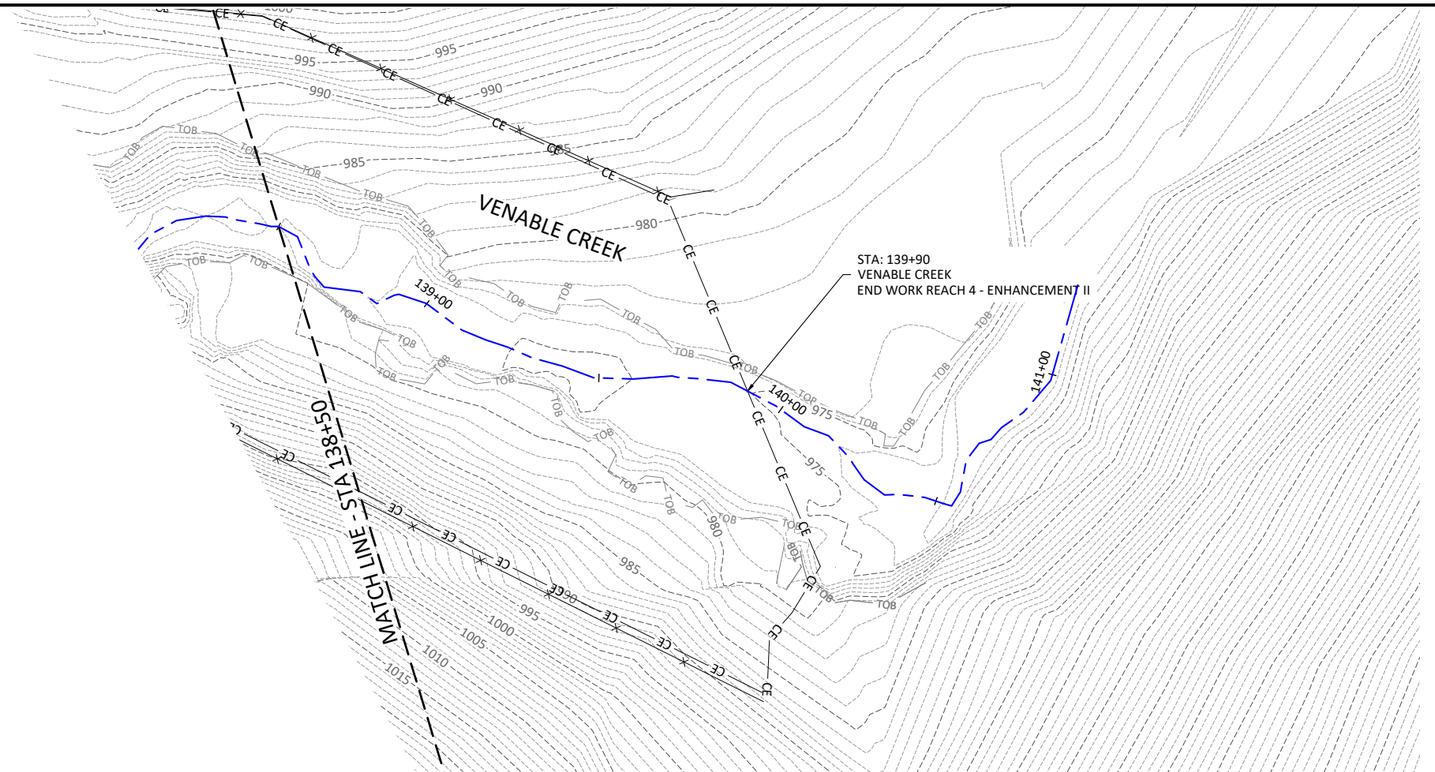

ENHANCEMENT II TREATMENT:

1. TREAT INVASIVE VEGETATION.
2. SUPPLEMENTAL PLANTING - SEE PLANTING PLANS.
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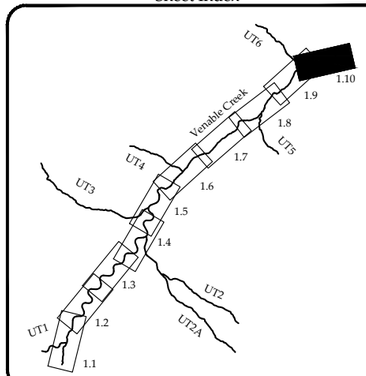

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Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina

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Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina
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Job Number: 005-02123
Project Engineer: ASE
Drawn By: HCC
Checked By: JCK

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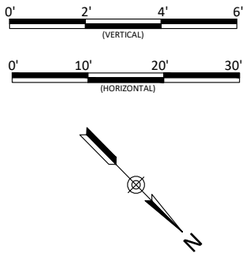

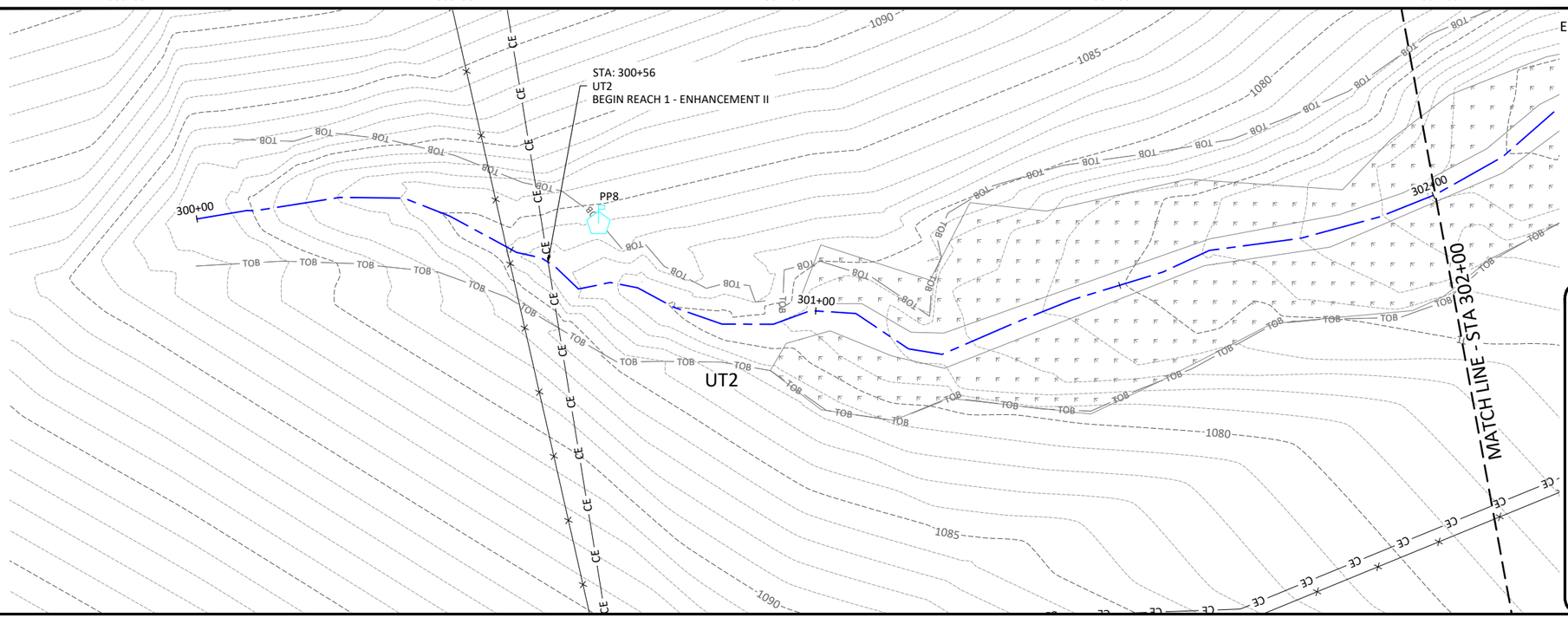

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2. EXCLUDE CATTLE ACCESS.

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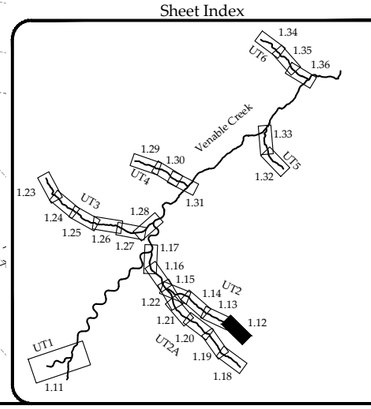

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Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina

UT2
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Job Number:	005-02123
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Checked By:	ICK

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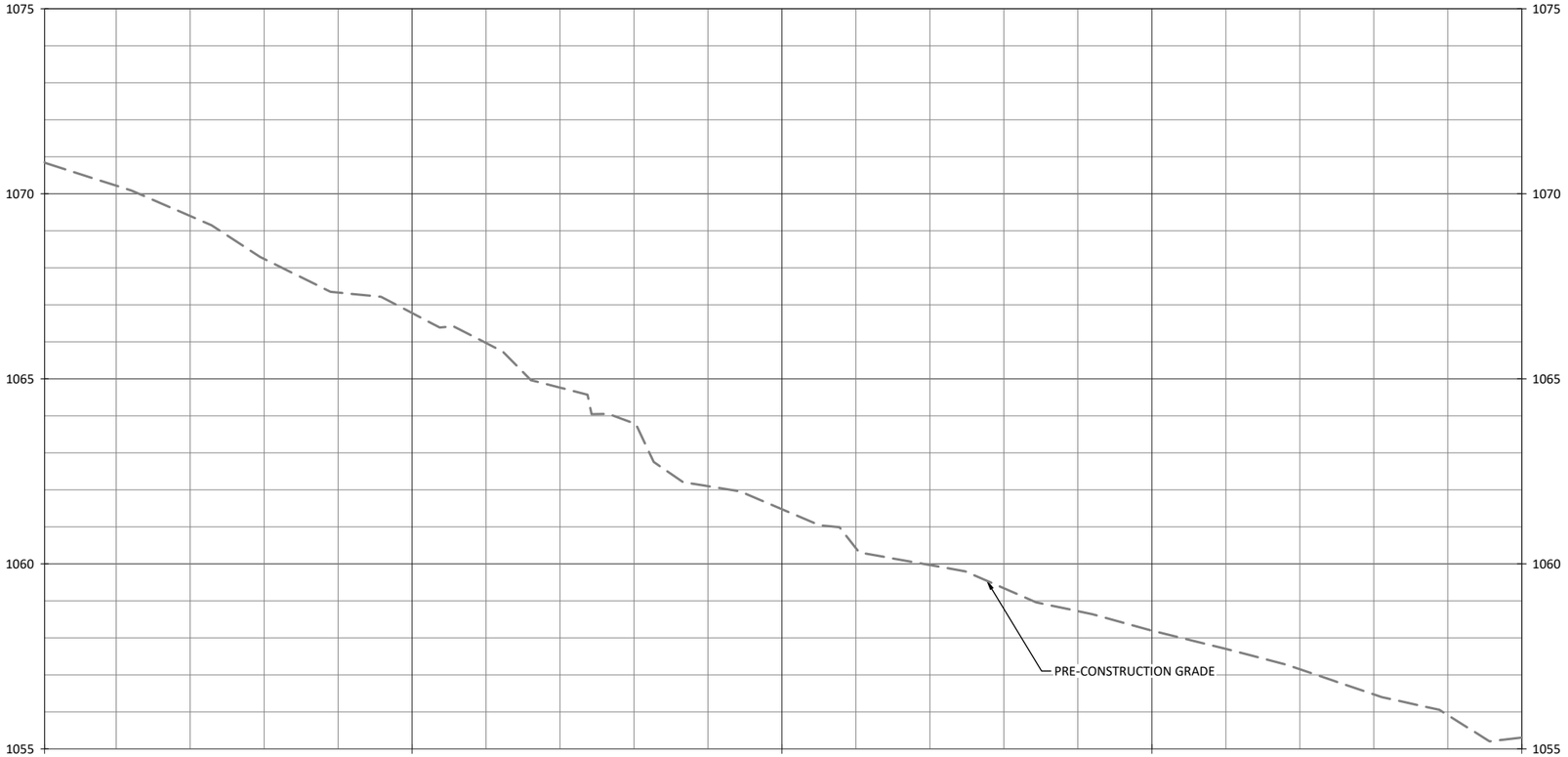

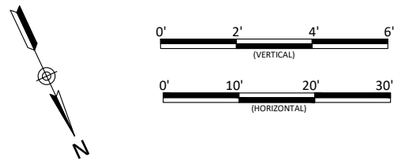

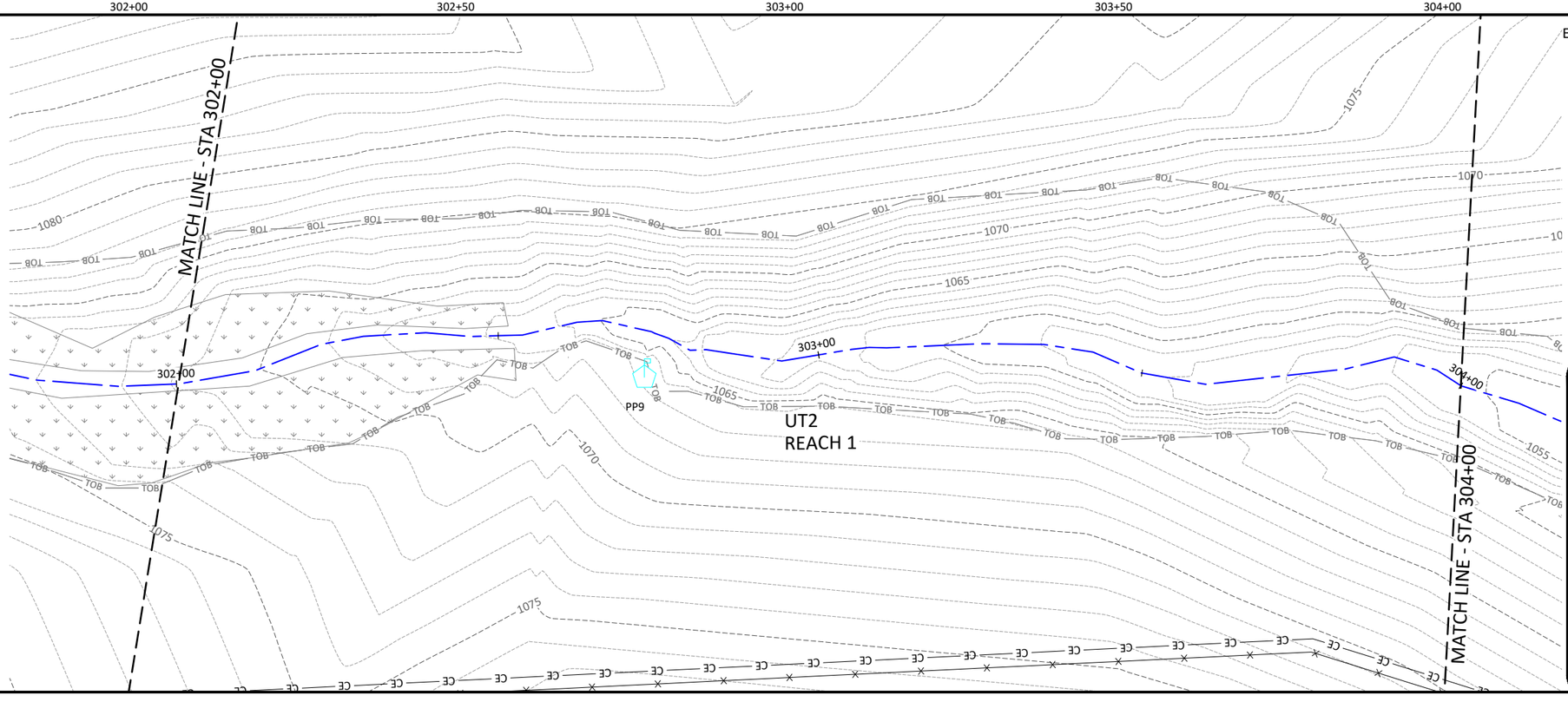

ENHANCEMENT II TREATMENT:
1. TREAT INVASIVE VEGETATION.
2. EXCLUDE CATTLE ACCESS.

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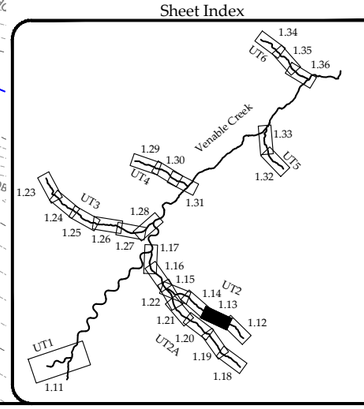

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Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina

UT2
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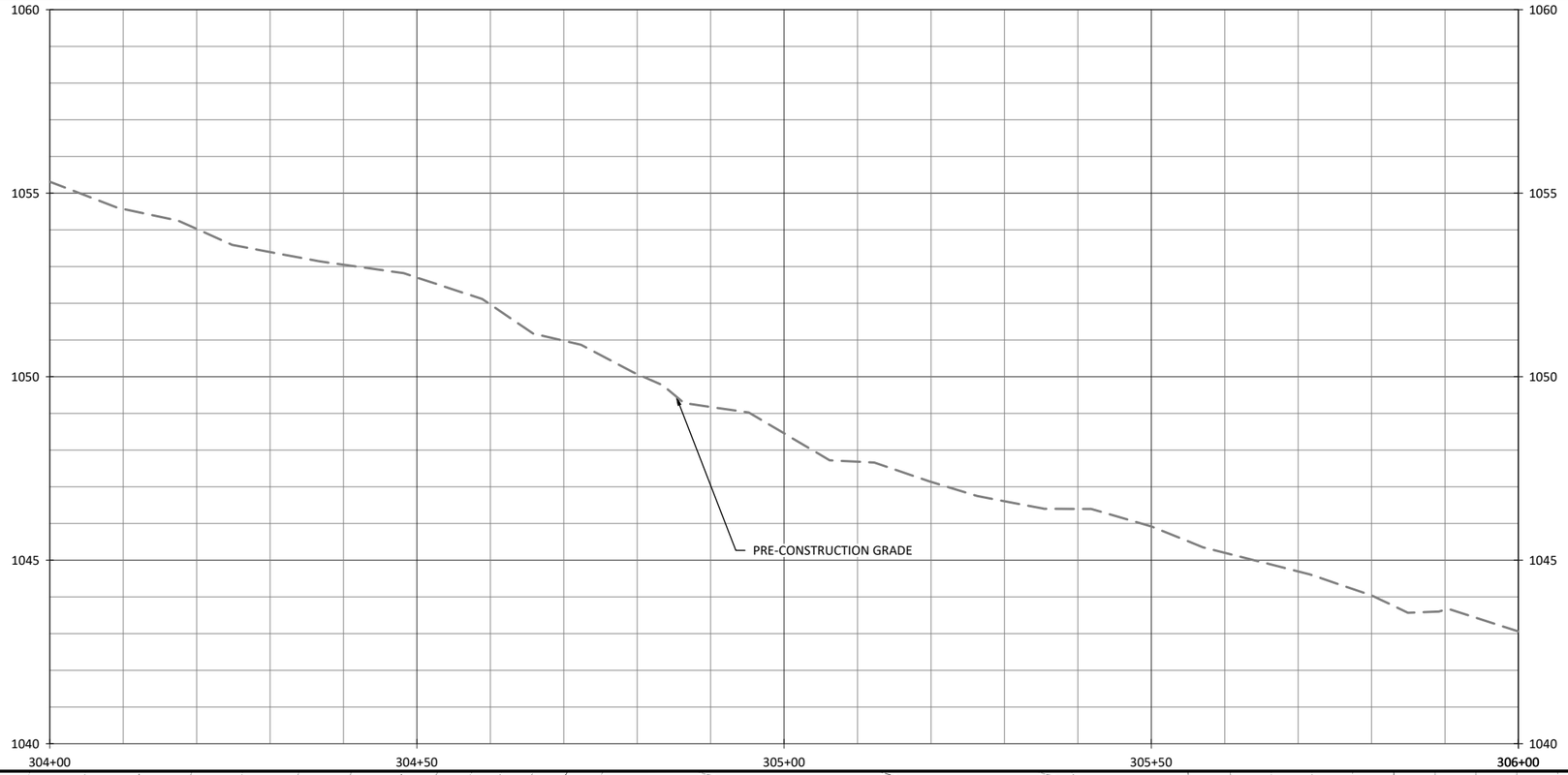

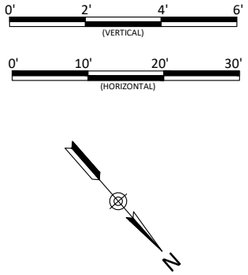

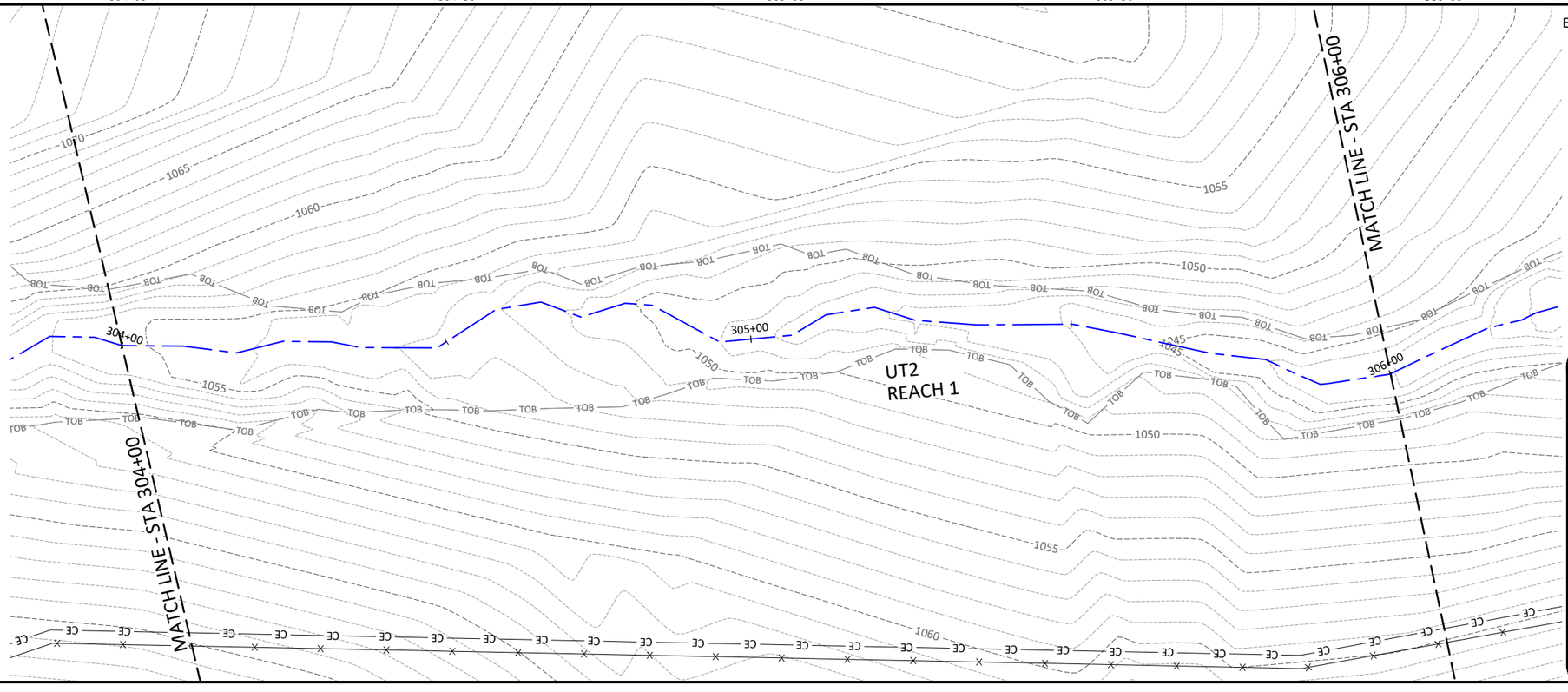

ENHANCEMENT II TREATMENT:

1. TREAT INVASIVE VEGETATION.
2. EXCLUDE CATTLE ACCESS.

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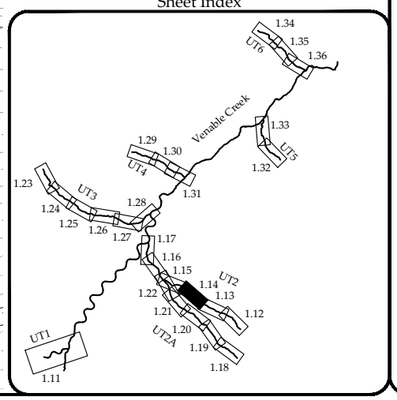

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Surry County, North Carolina

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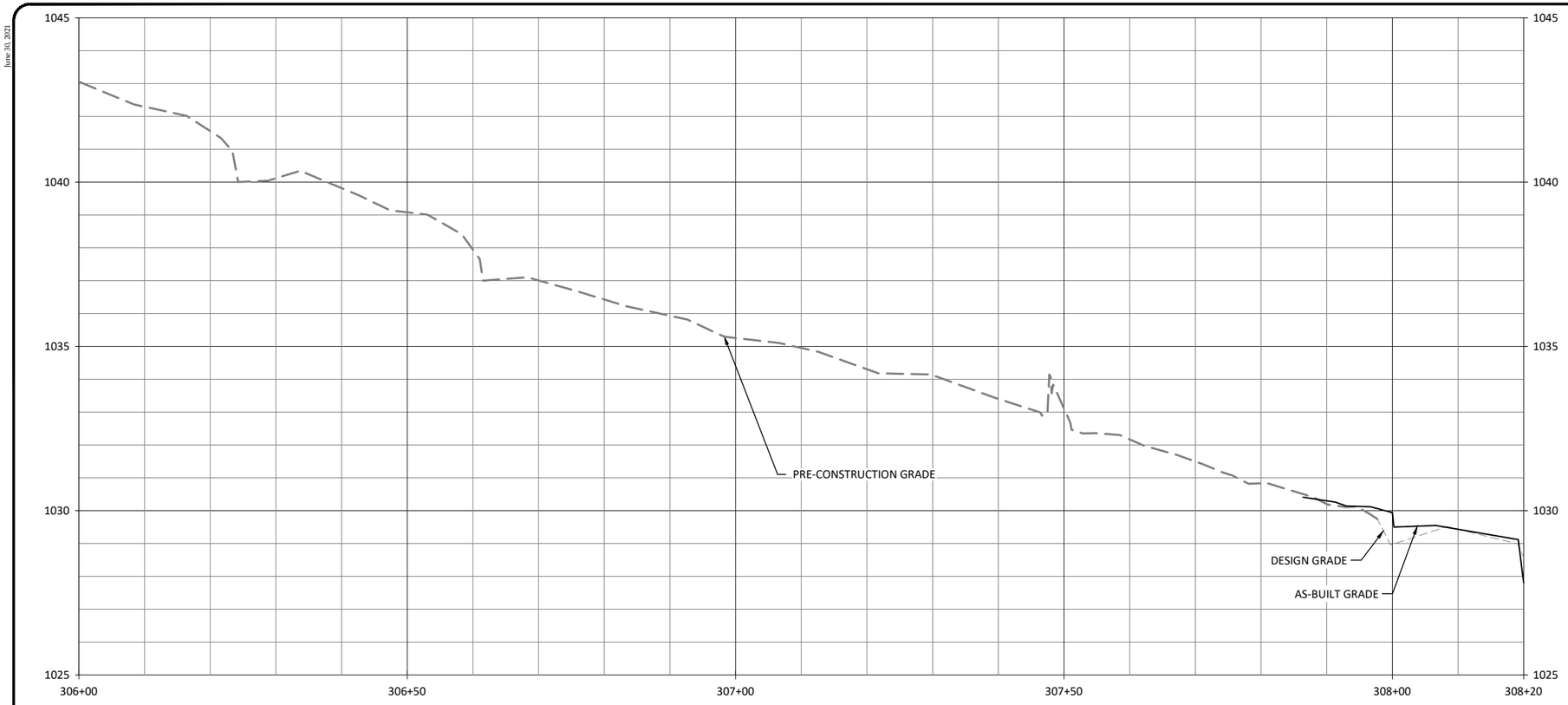

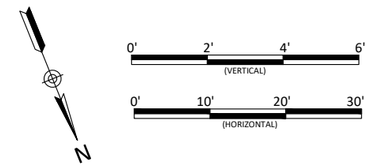

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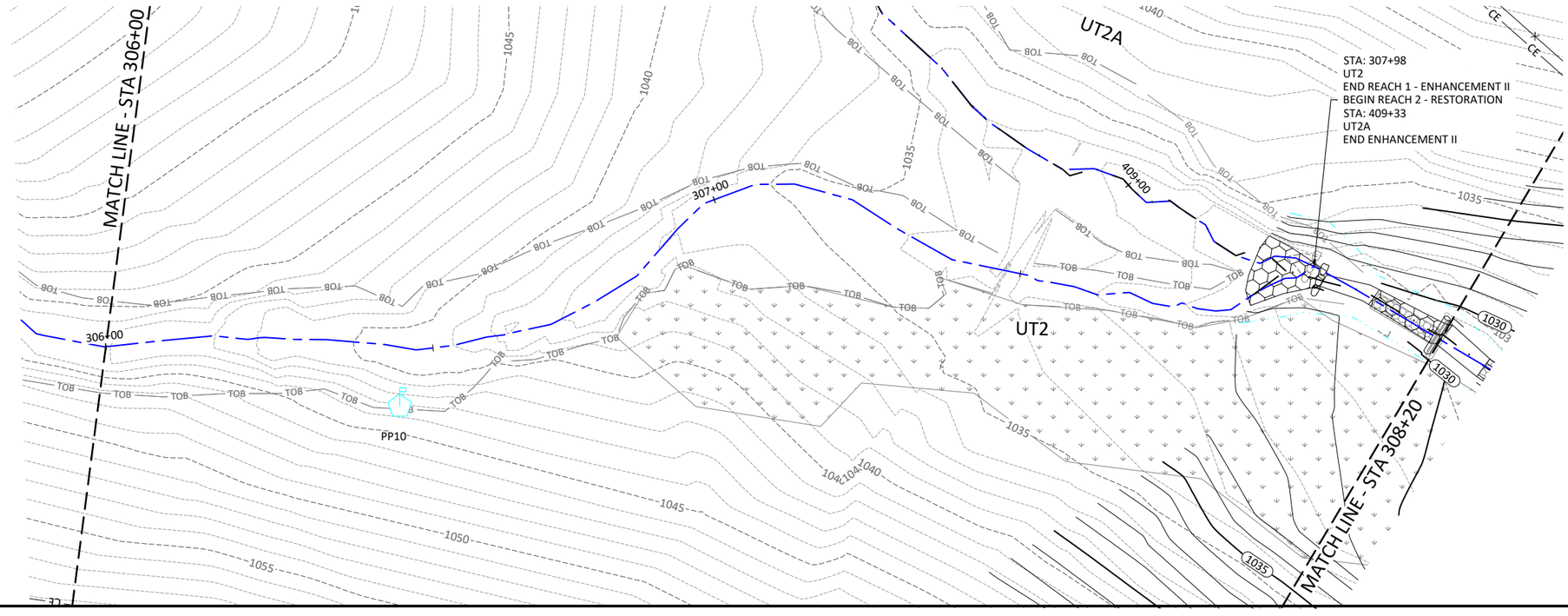

ENHANCEMENT II TREATMENT:
1. TREAT INVASIVE VEGETATION.
2. EXCLUDE CATTLE ACCESS.

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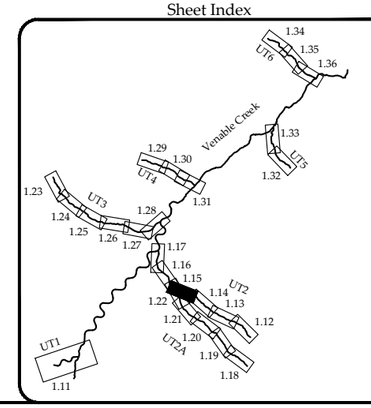

Revisions:

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Job Number:	005-02123
Project Engineer:	ASE
Drawn By:	HCC
Checked By:	ICK

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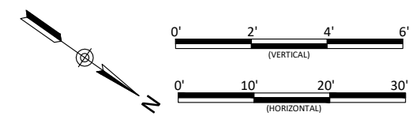

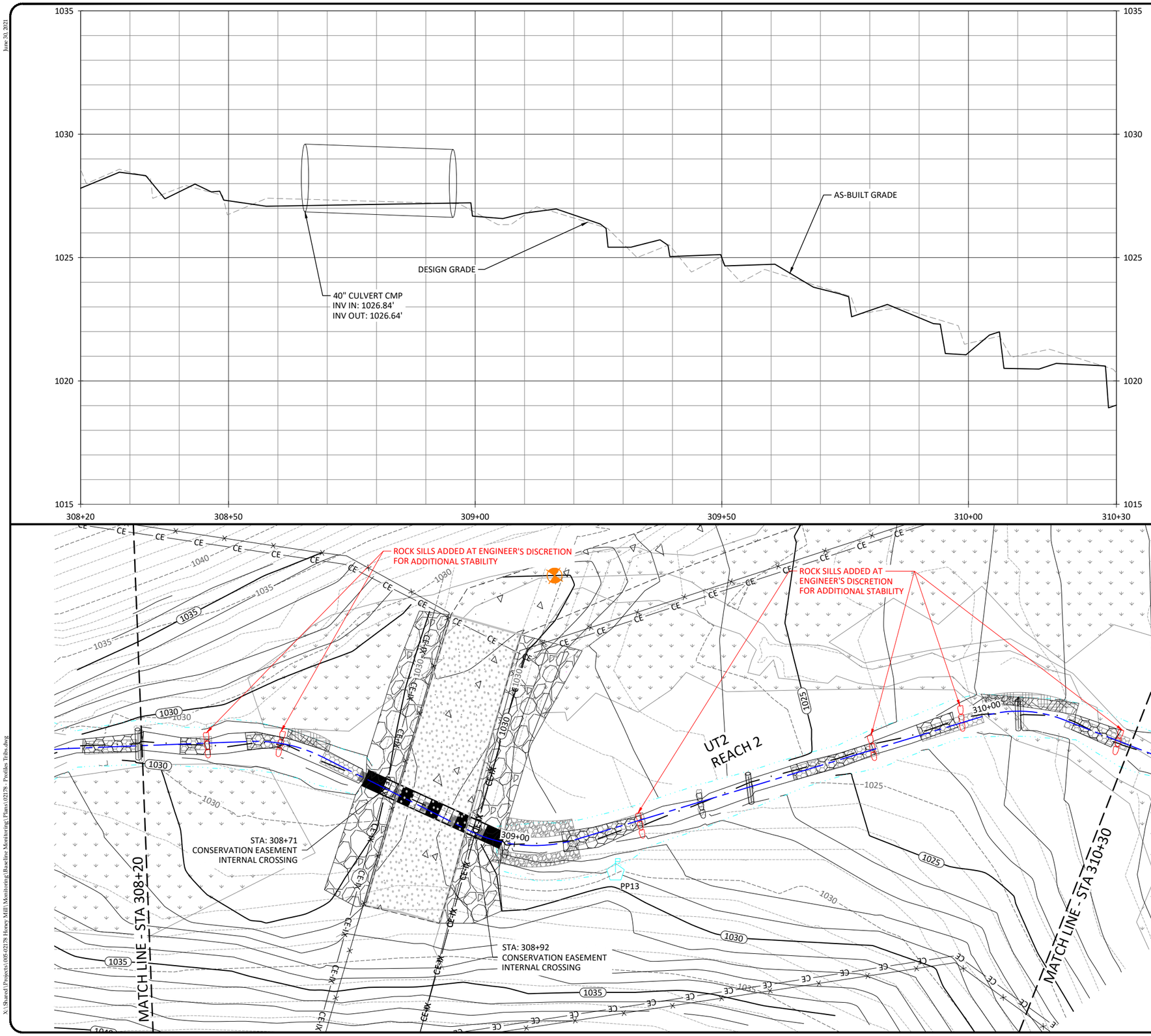

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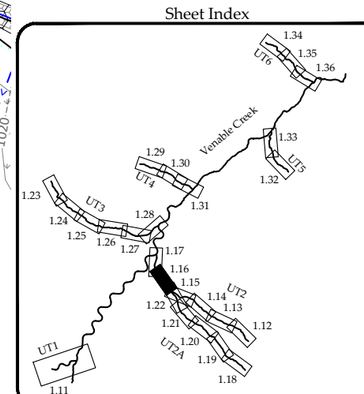

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NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER AARON S. EARLEY
7-2-21

Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina

UT2
Stream Plan and Profile

Revisions:

Date:	JULY 2, 2021
Job Number:	005-02123
Project Engineer:	ASE
Drawn By:	HCC
Checked By:	JCK

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Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina
UT2
Stream Plan and Profile

Revisions:

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Job Number:	005-02123
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ENHANCEMENT II TREATMENT:
1. TREAT INVASIVE VEGETATION.
2. EXCLUDE CATTLE ACCESS.

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NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER AARON S. EARLEY
7-2-21

Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina

UT2A
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Job Number:	005-02123
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Drawn By:	HCC
Checked By:	JCK

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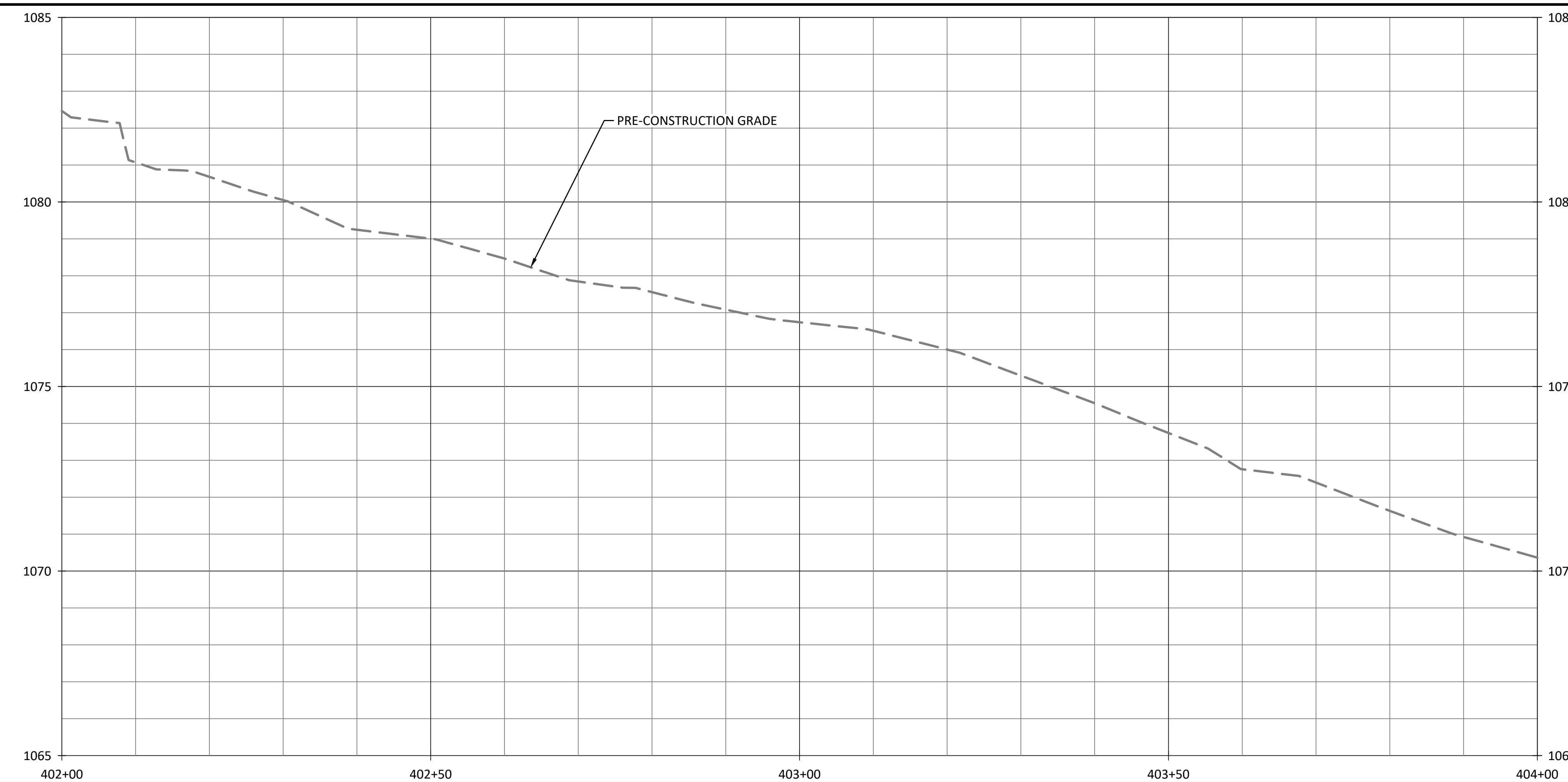

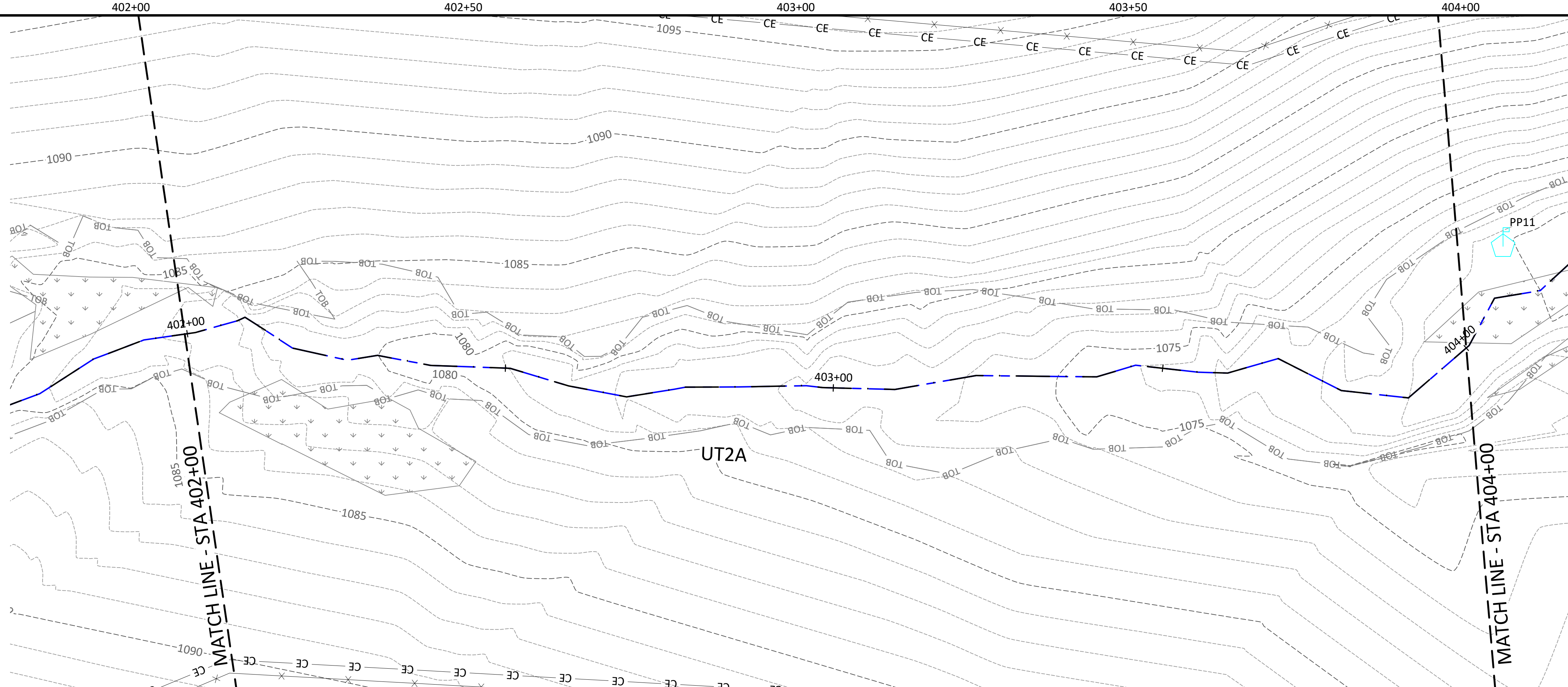

0' 2' 4' 6'
(VERTICAL)

0' 10' 20' 30'
(HORIZONTAL)

N

ENHANCEMENT II TREATMENT:
1. TREAT INVASIVE VEGETATION.
2. EXCLUDE CATTLE ACCESS.

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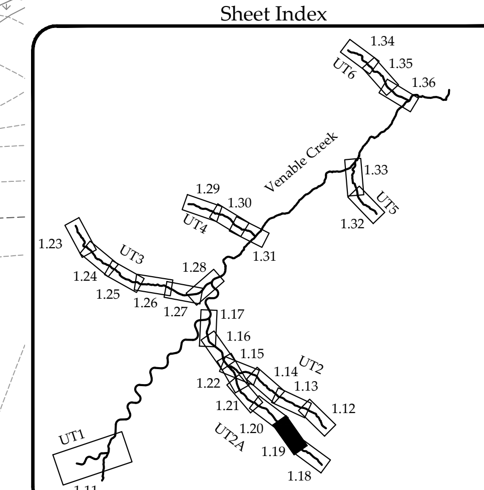

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7-2-21

Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina

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Job Number:	005-02123
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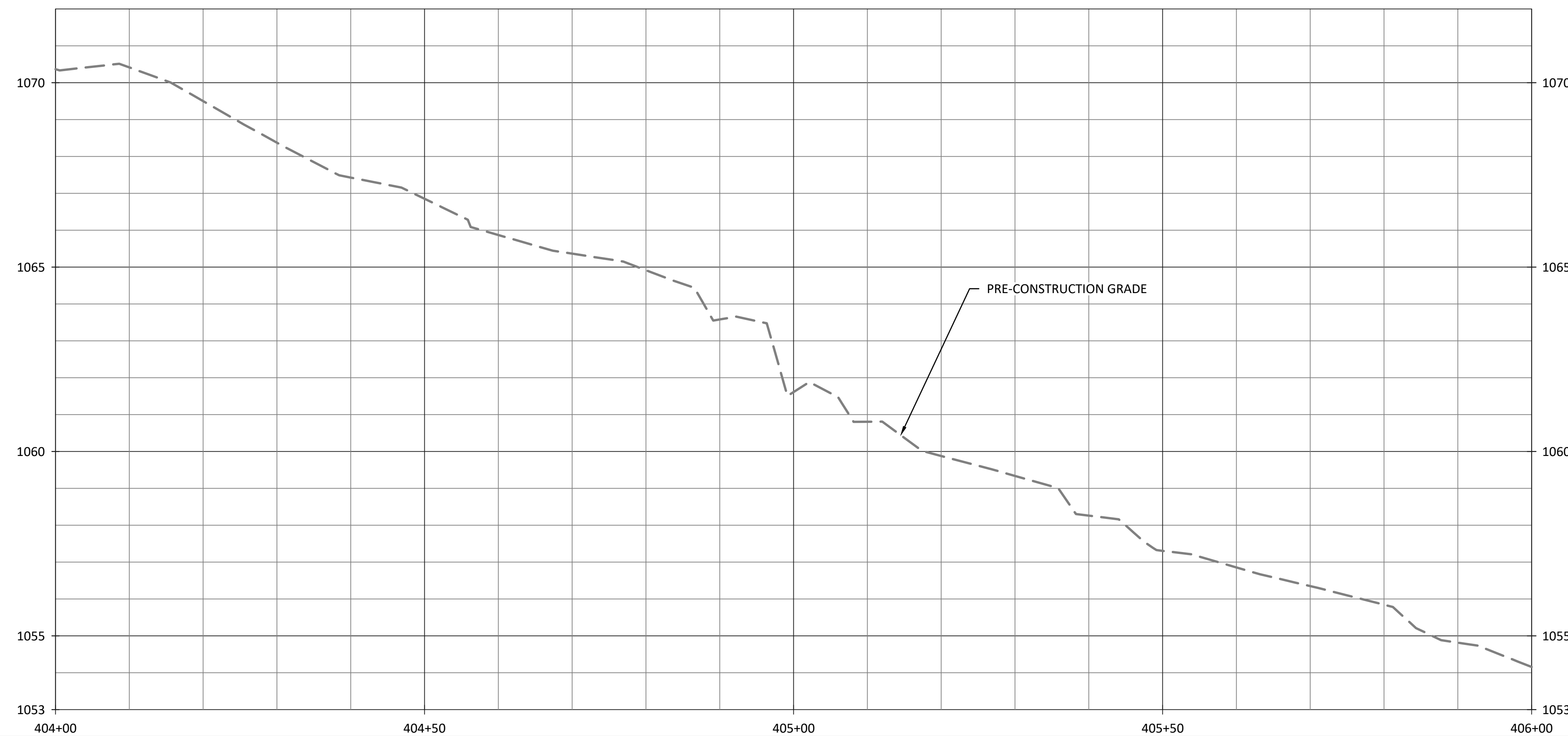

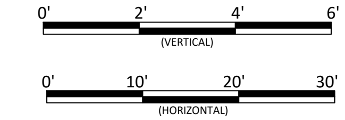

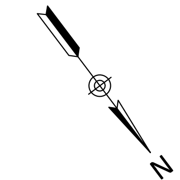

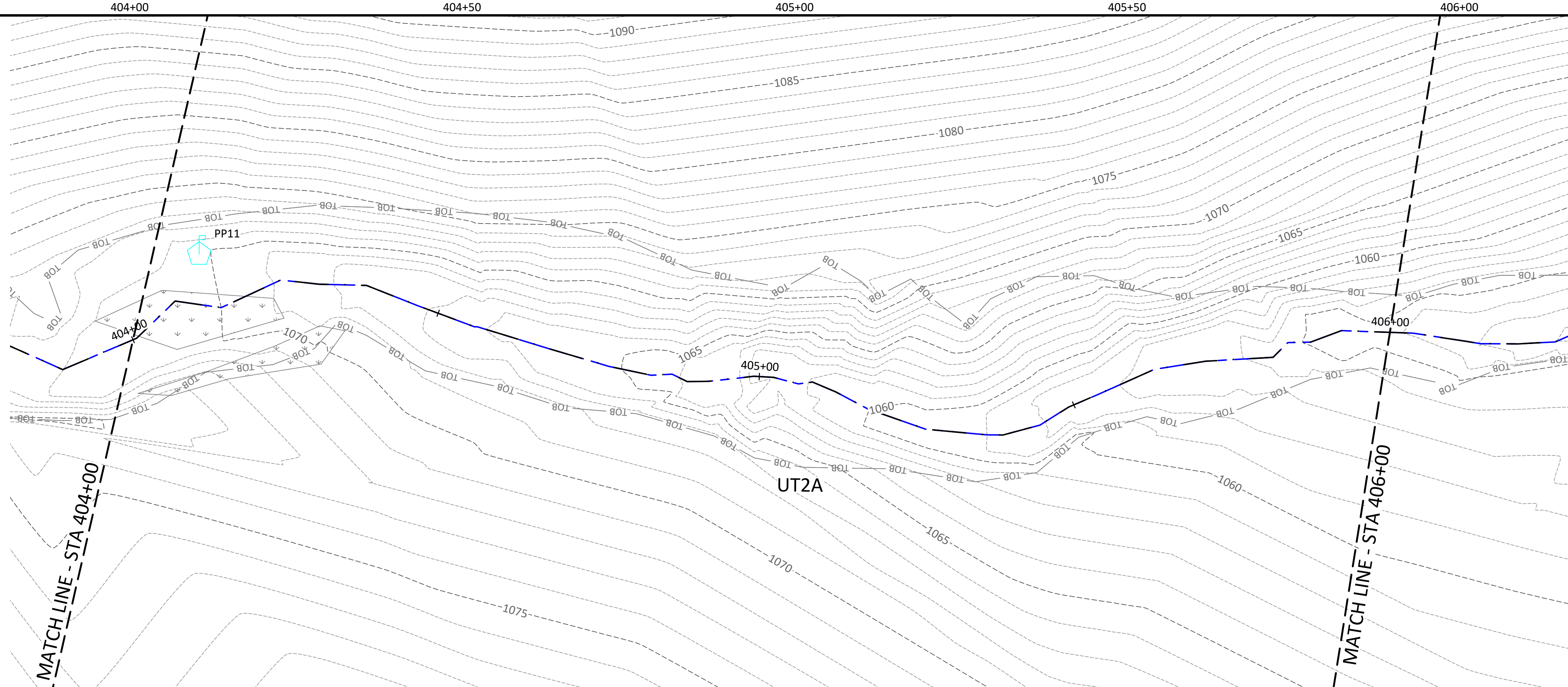

ENHANCEMENT II TREATMENT:

1. TREAT INVASIVE VEGETATION.
2. EXCLUDE CATTLE ACCESS.

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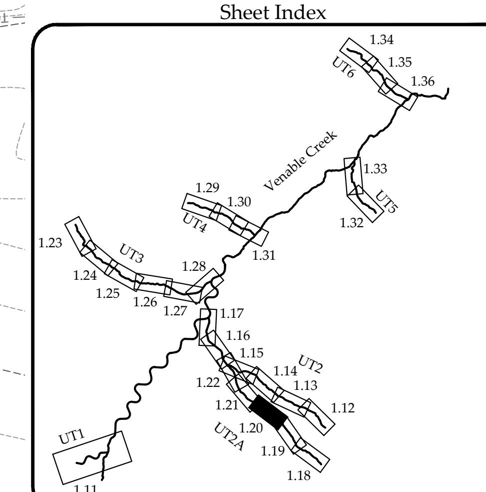

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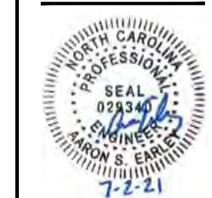

Honey Mill Mitigation Site Record Drawings

Surry County, North Carolina

UT2A
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Revisions:

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Job Number:	005-02123
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Checked By:	JCK

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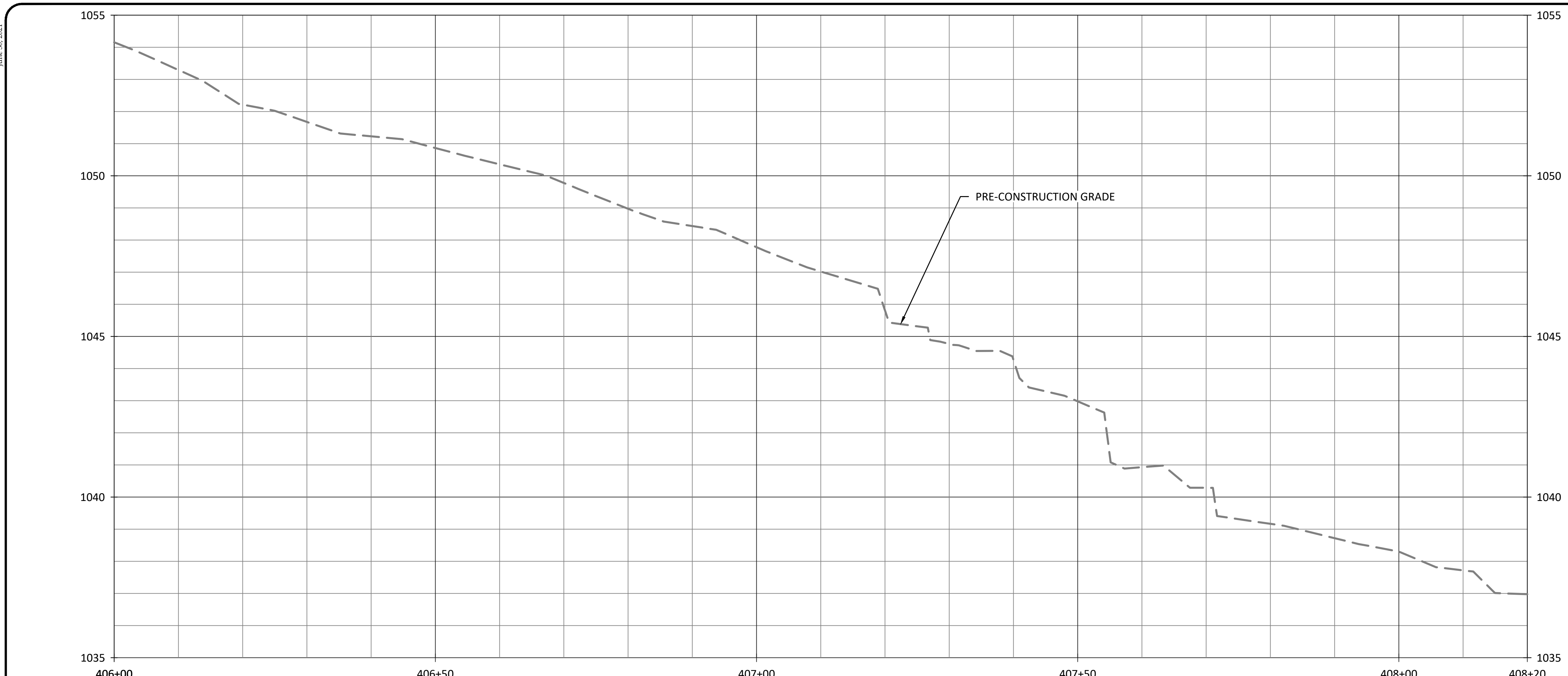

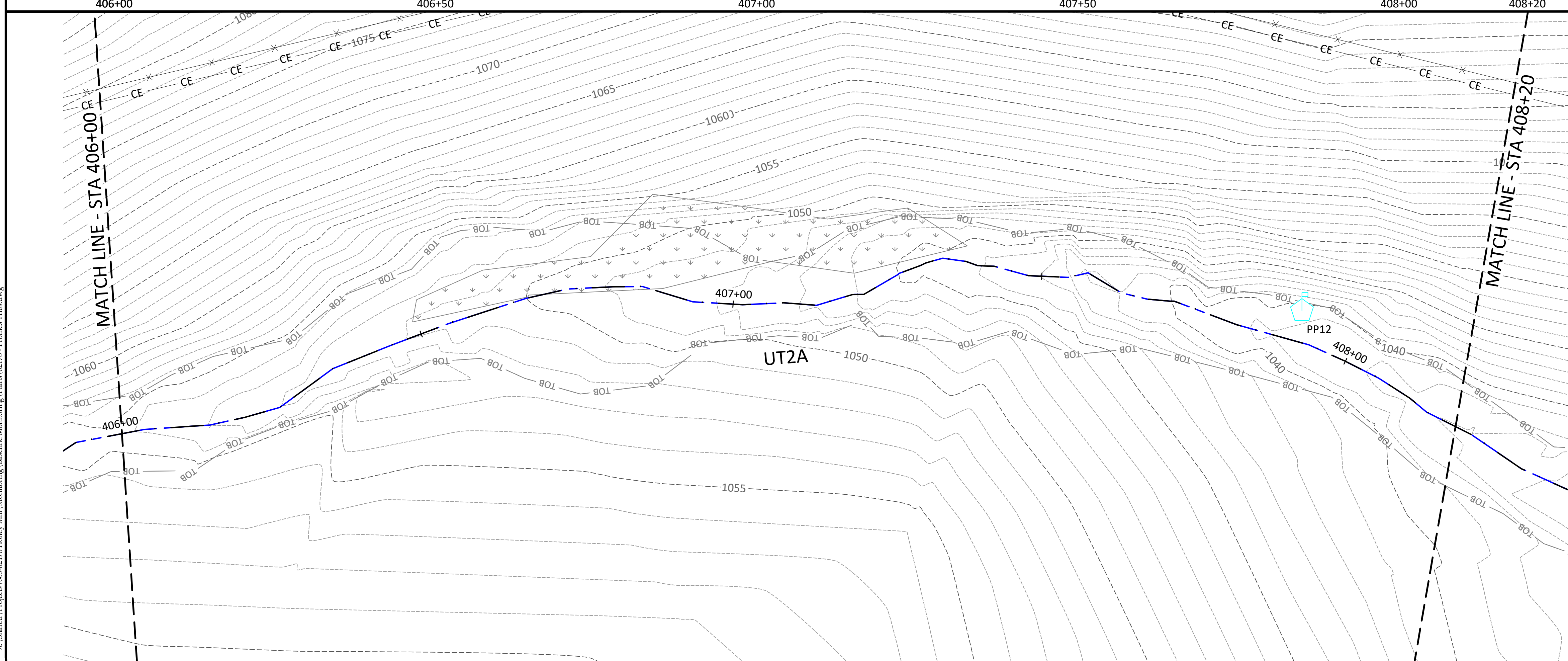

ENHANCEMENT II TREATMENT:

1. TREAT INVASIVE VEGETATION.
2. EXCLUDE CATTLE ACCESS.

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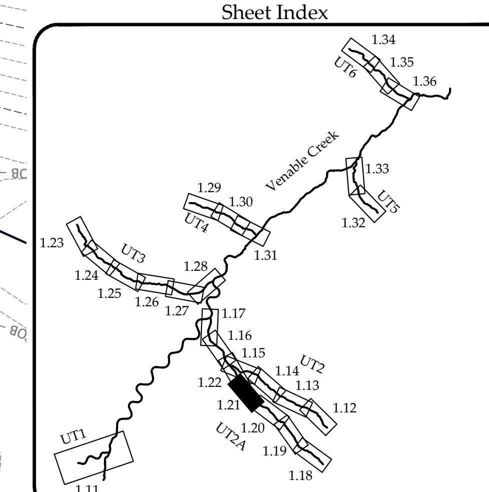

(VERTICAL) 0' 2' 4' 6'

(HORIZONTAL) 0' 10' 20' 30'

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Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina

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Job Number:	005-02123
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ENHANCEMENT II TREATMENT:
1. TREAT INVASIVE VEGETATION.
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7-2-21

Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina
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Checked By:	JCK

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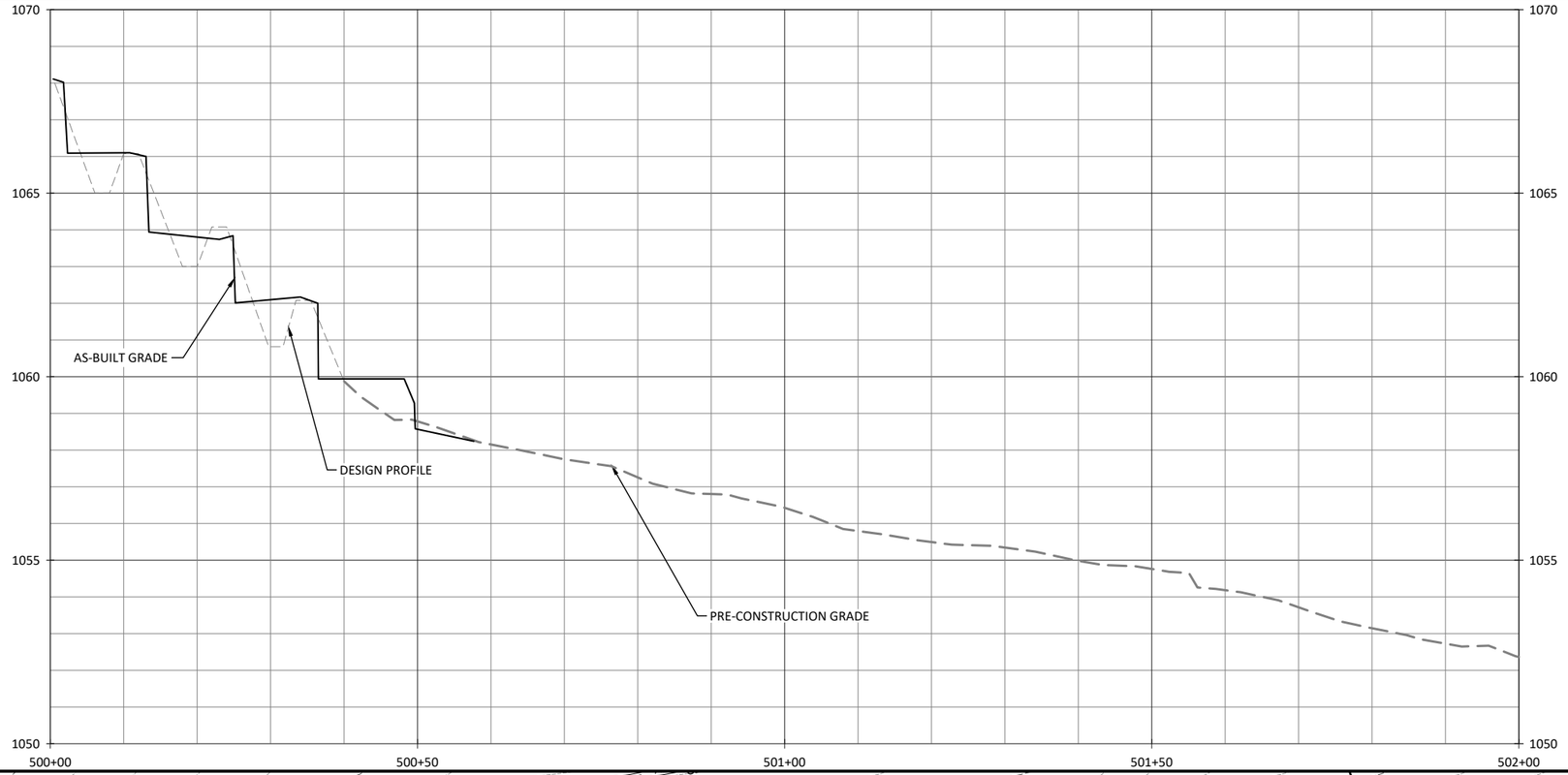
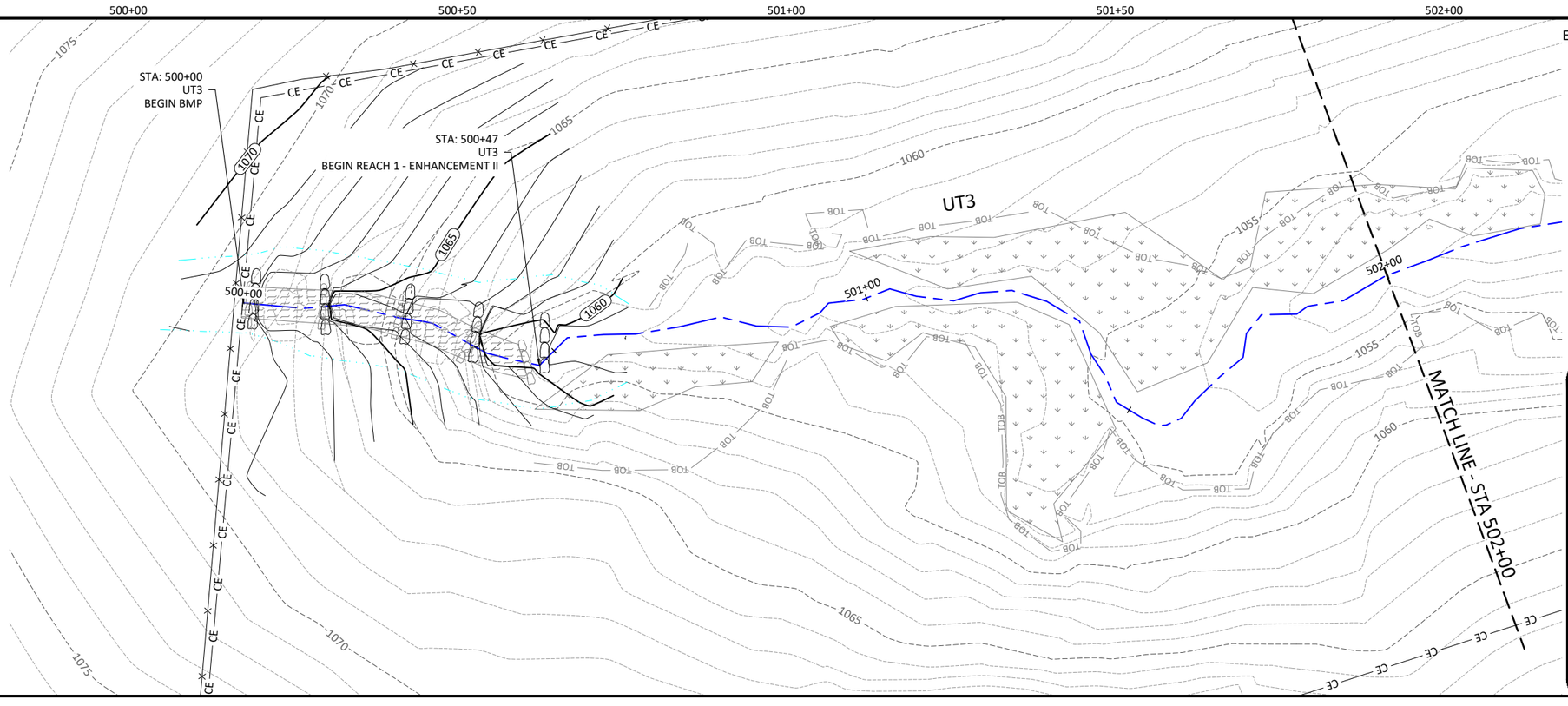


0' 2' 4' 6' (VERTICAL)

0' 10' 20' 30' (HORIZONTAL)



ENHANCEMENT II TREATMENT:

1. TREAT INVASIVE VEGETATION.
2. SUPPLEMENTAL PLANTING - SEE PLANTING PLANS.
3. EXCLUDE CATTLE ACCESS.

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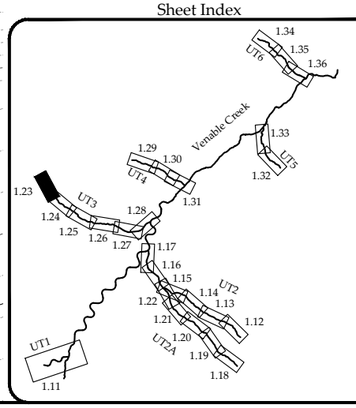

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Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina

UT3
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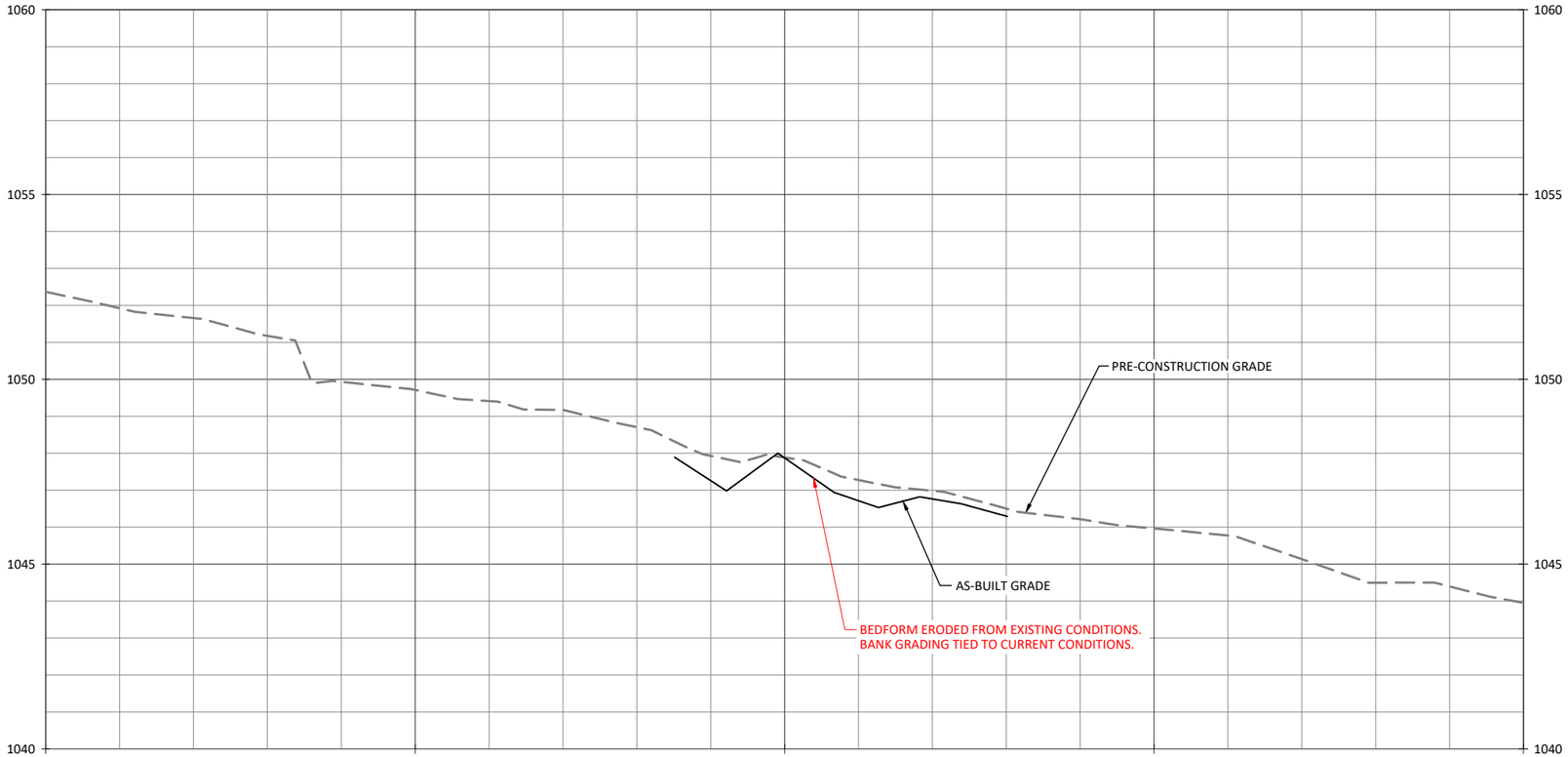

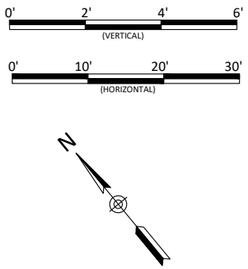

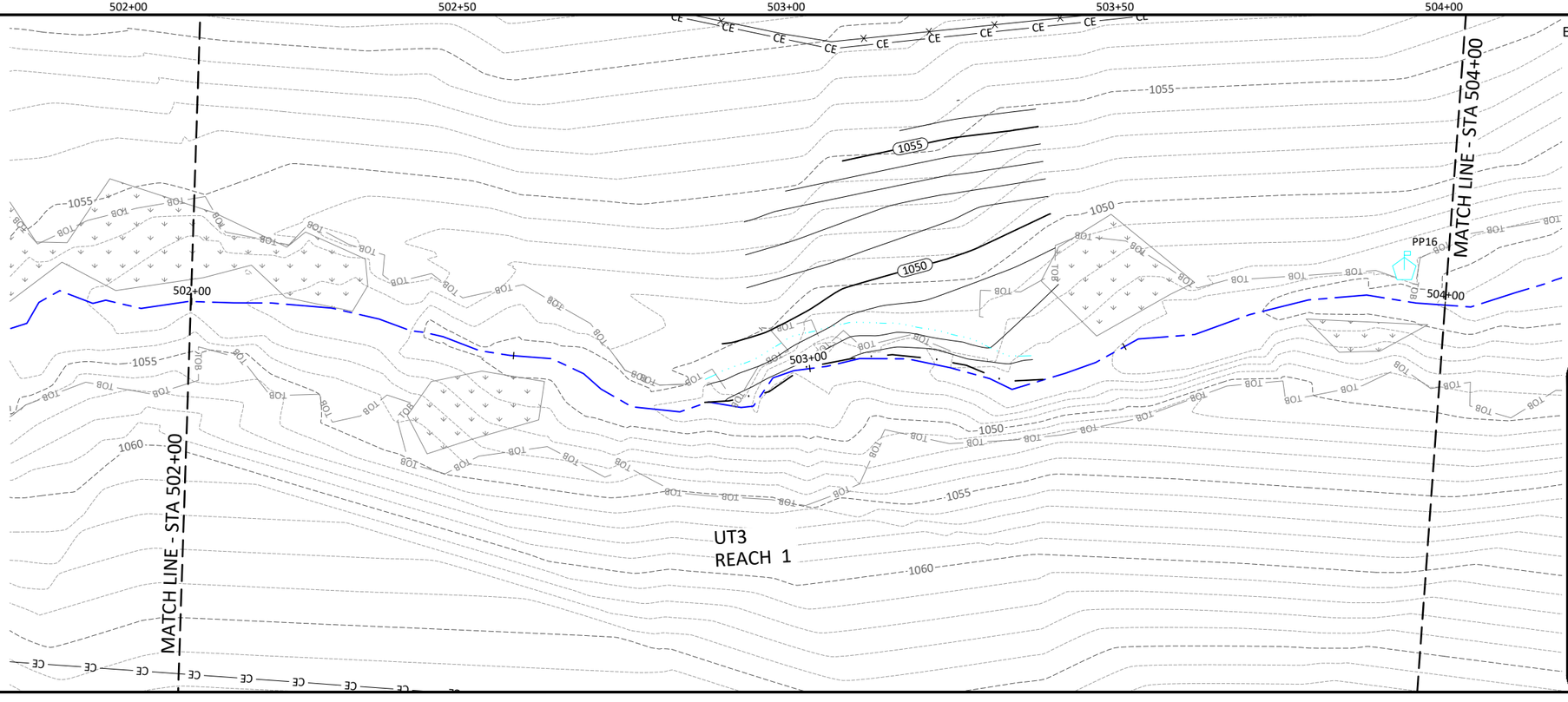

ENHANCEMENT II TREATMENT:

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2. SUPPLEMENTAL PLANTING - SEE PLANTING PLANS.
3. EXCLUDE CATTLE ACCESS.

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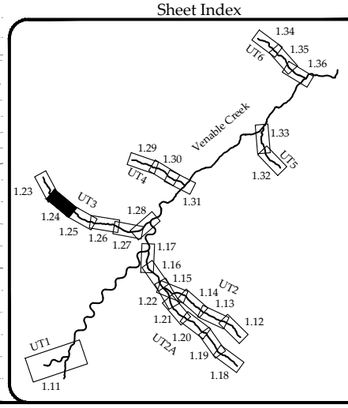

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7-2-21

Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina

UT3
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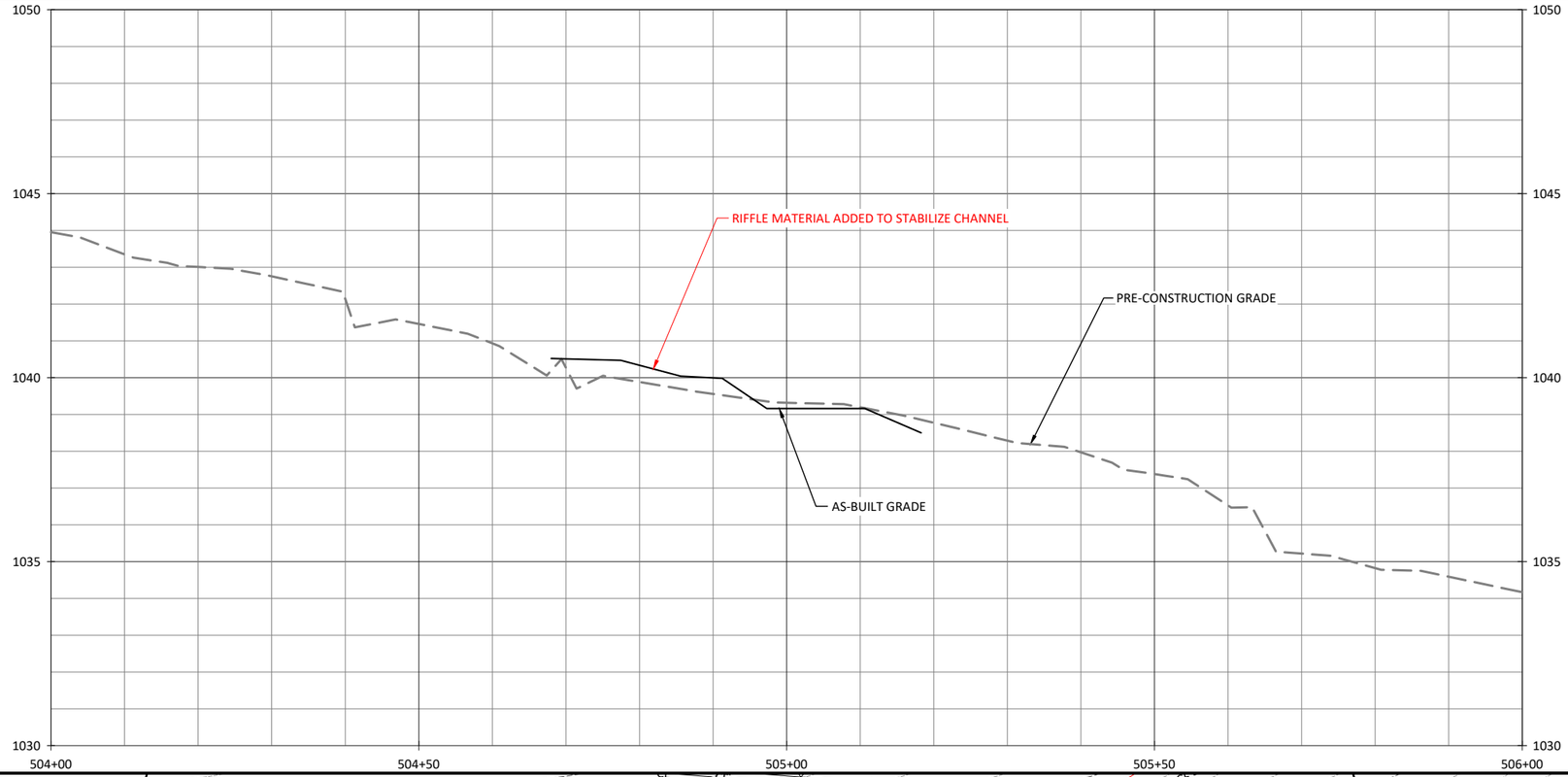

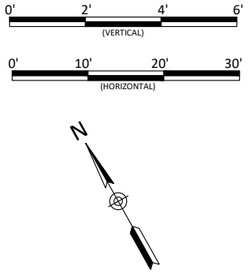

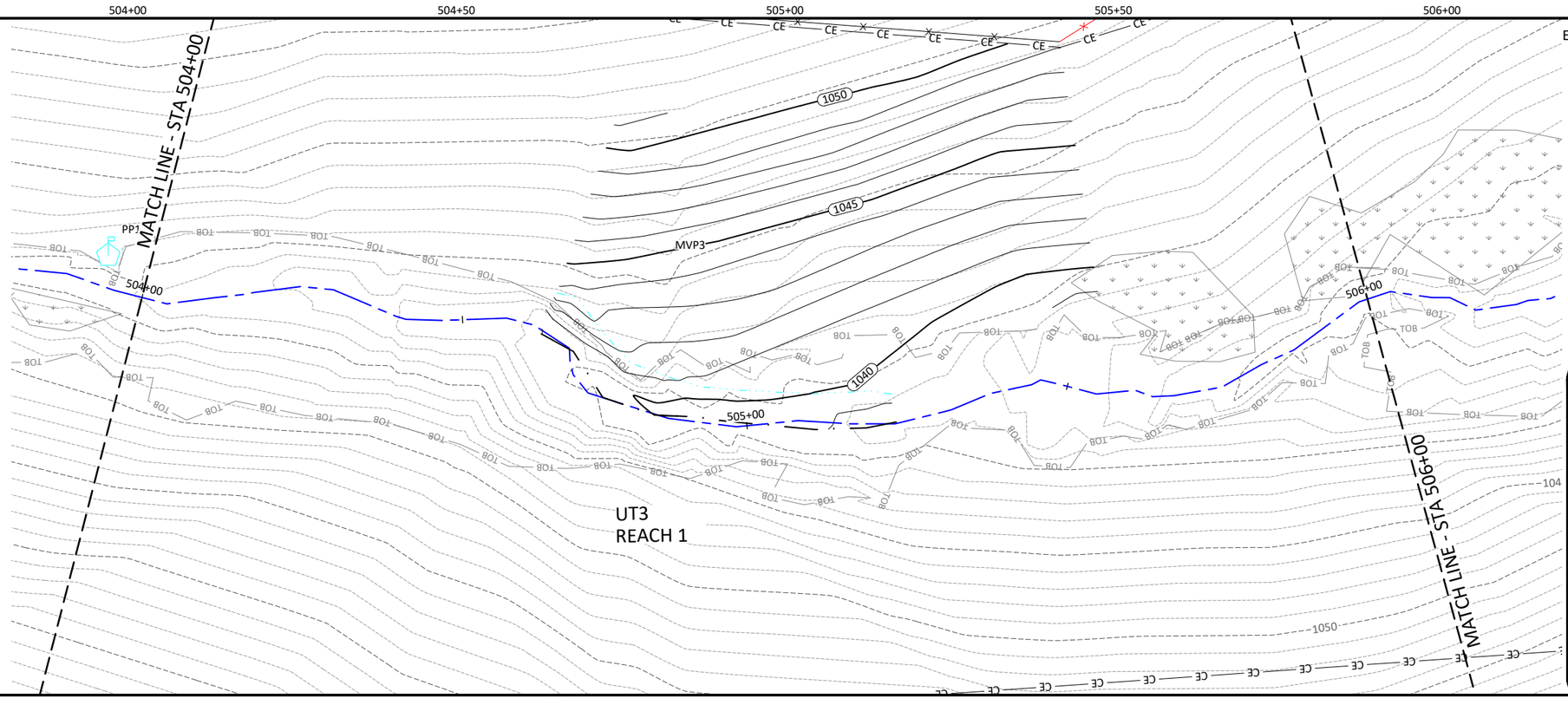

ENHANCEMENT II TREATMENT:

1. TREAT INVASIVE VEGETATION.
2. SUPPLEMENTAL PLANTING - SEE PLANTING PLANS.
3. EXCLUDE CATTLE ACCESS.

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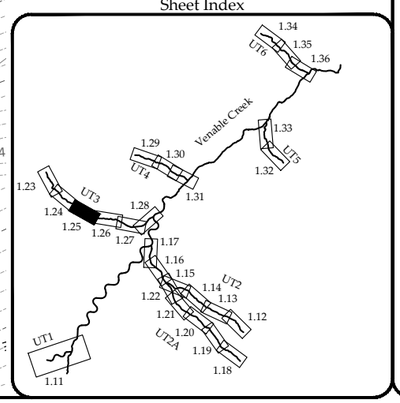

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7-2-21

Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina

UT3
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Checked By:	JCK

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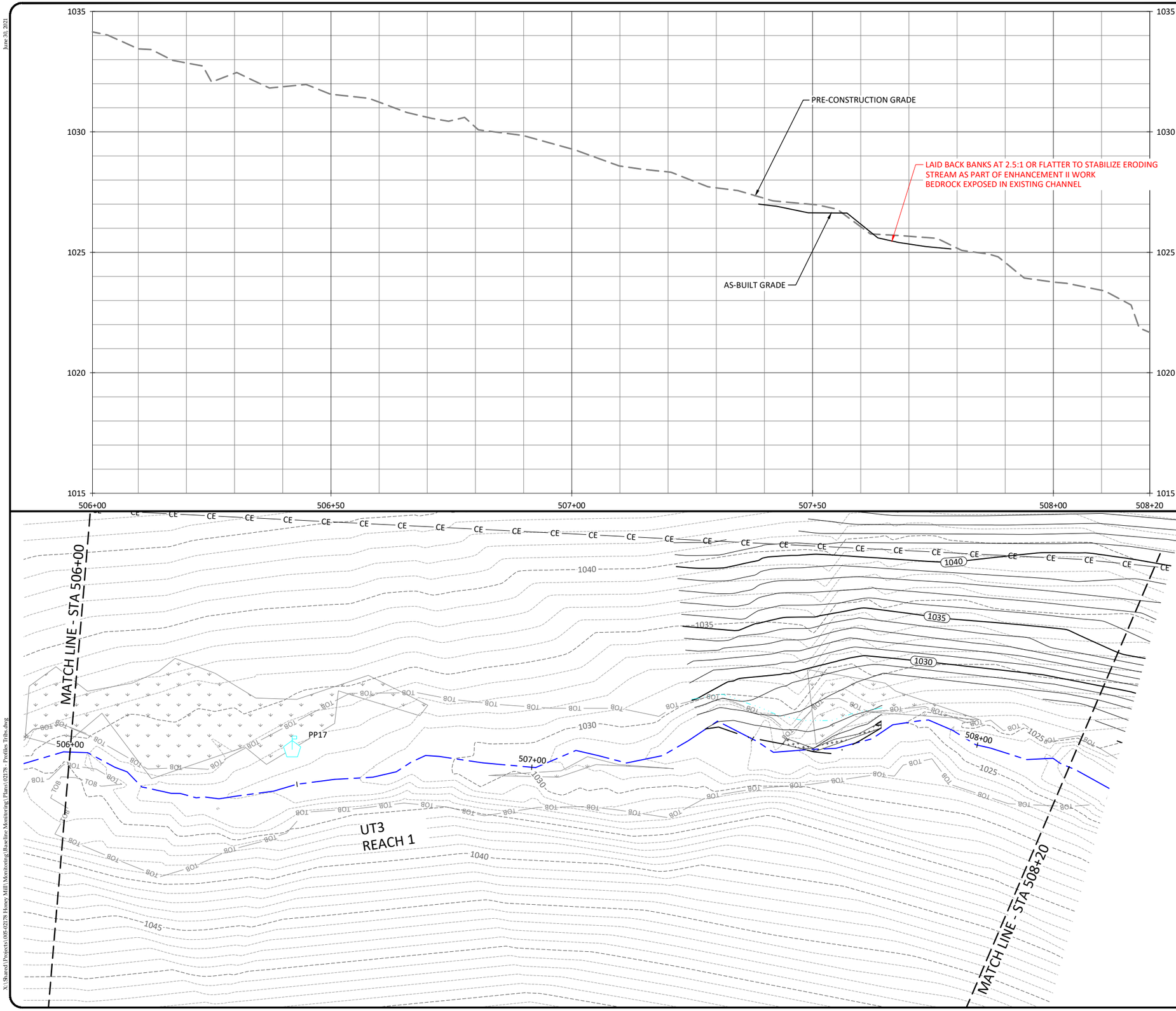

ENHANCEMENT II TREATMENT:

1. TREAT INVASIVE VEGETATION.
2. SUPPLEMENTAL PLANTING - SEE PLANTING PLANS.
3. EXCLUDE CATTLE ACCESS.
4. SELECTIVE BANK GRADING.

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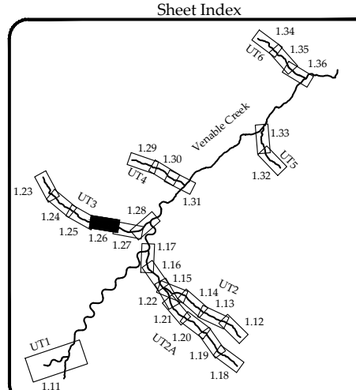

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Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina

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Checked By:	JCK

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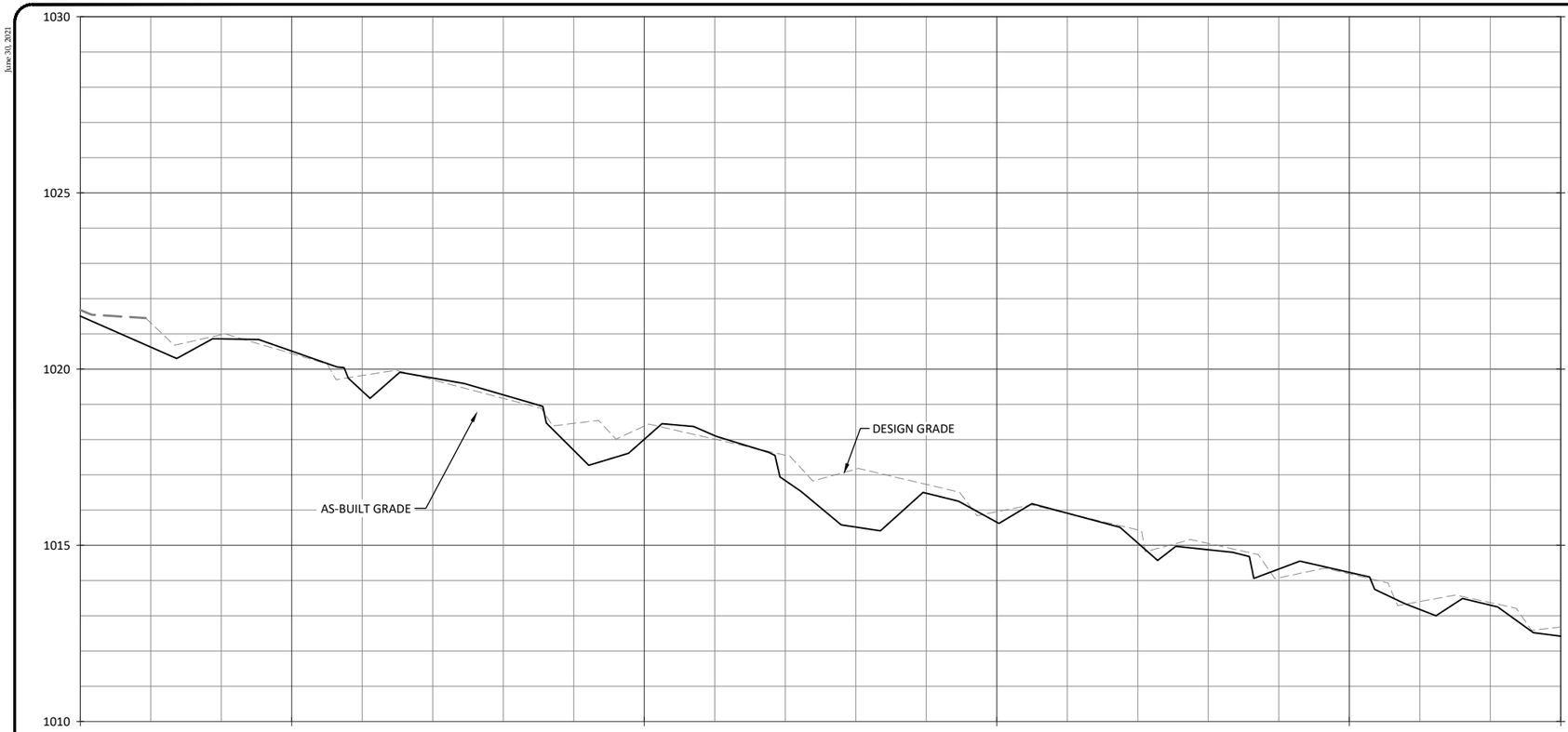

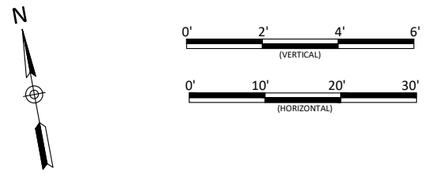

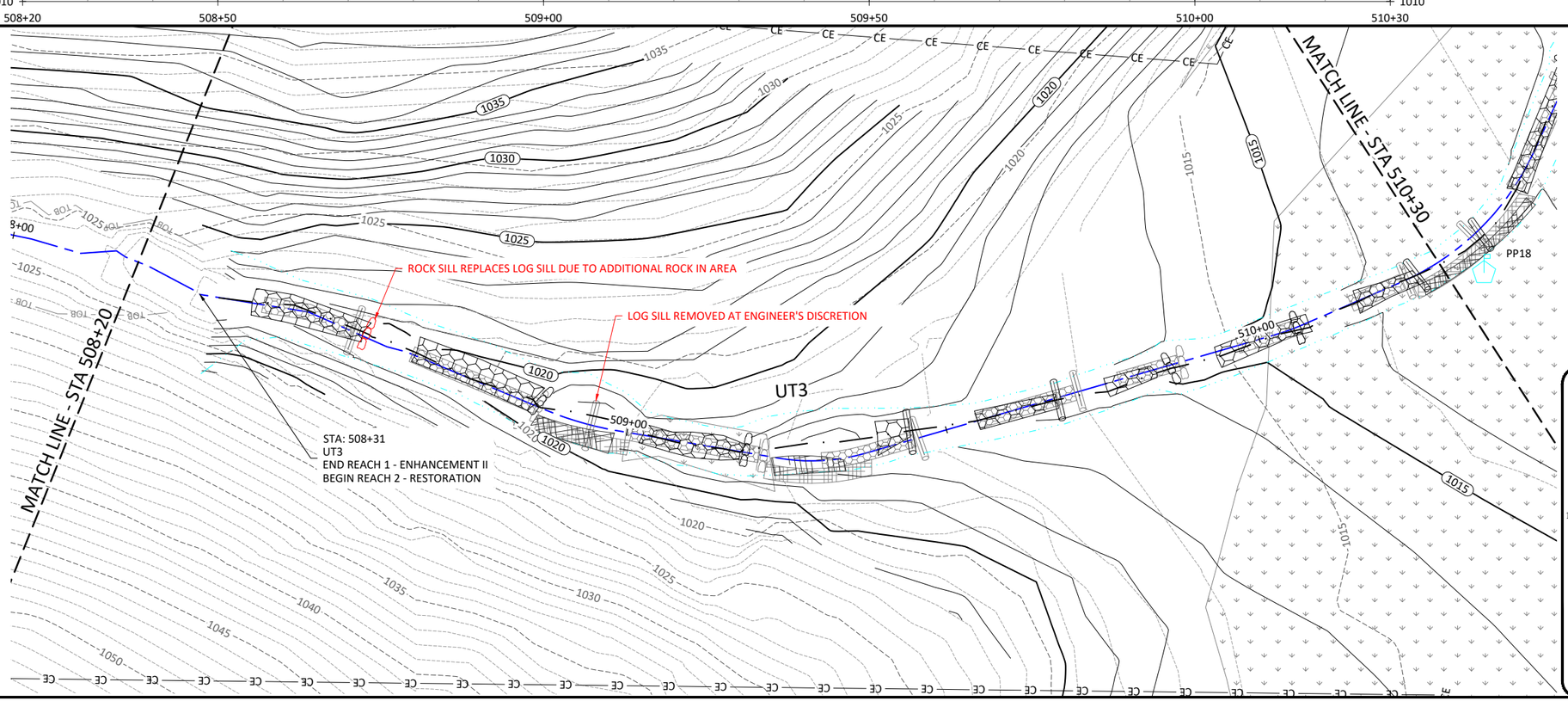

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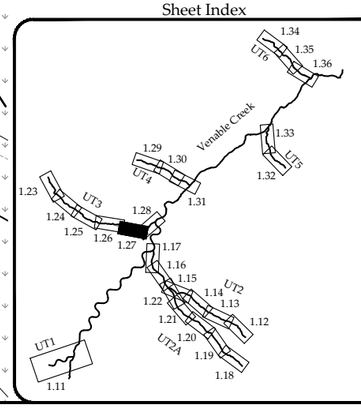

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7-2-21

Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina

UT3
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Job Number:	005-02123
Project Engineer:	ASE
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Checked By:	JCK

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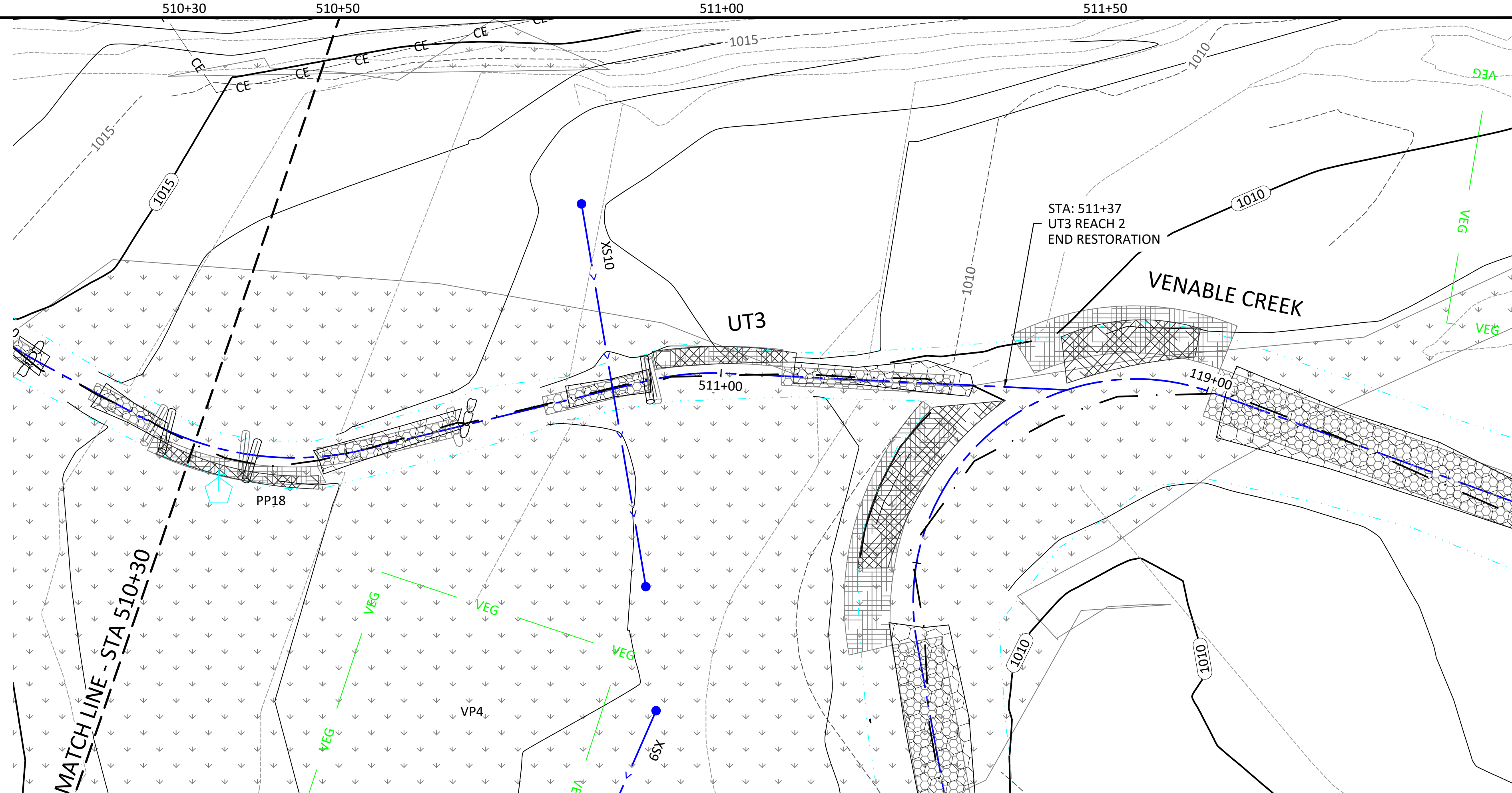
0' 2' 4' 6' (VERTICAL)

0' 10' 20' 30' (HORIZONTAL)



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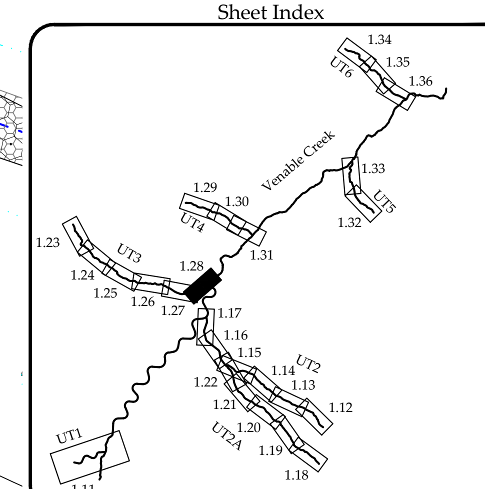

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 028340 AARON S. EARLEY 7-2-21

Honey Mill Mitigation Site Record Drawings

Surry County, North Carolina

UT3

Stream Plan and Profile

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Date:	JULY 2, 2021
Job Number:	005-02123
Project Engineer:	ASE
Drawn By:	HCC
Checked By:	JCK

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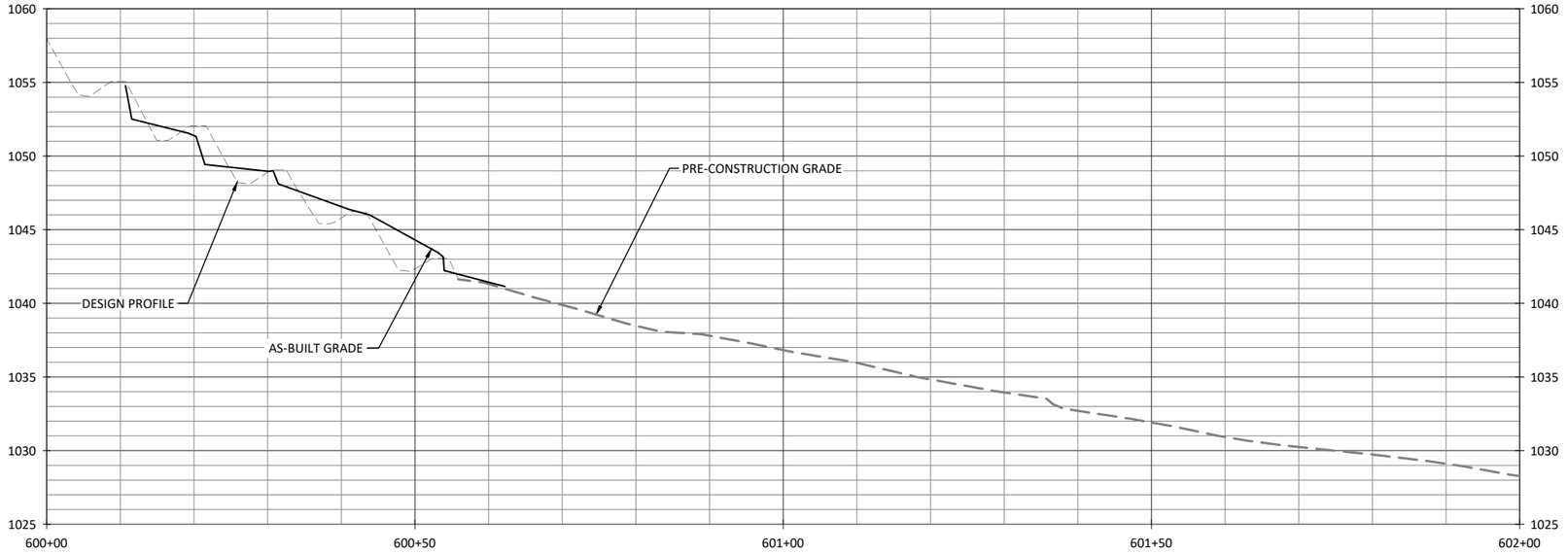

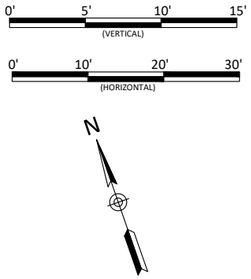

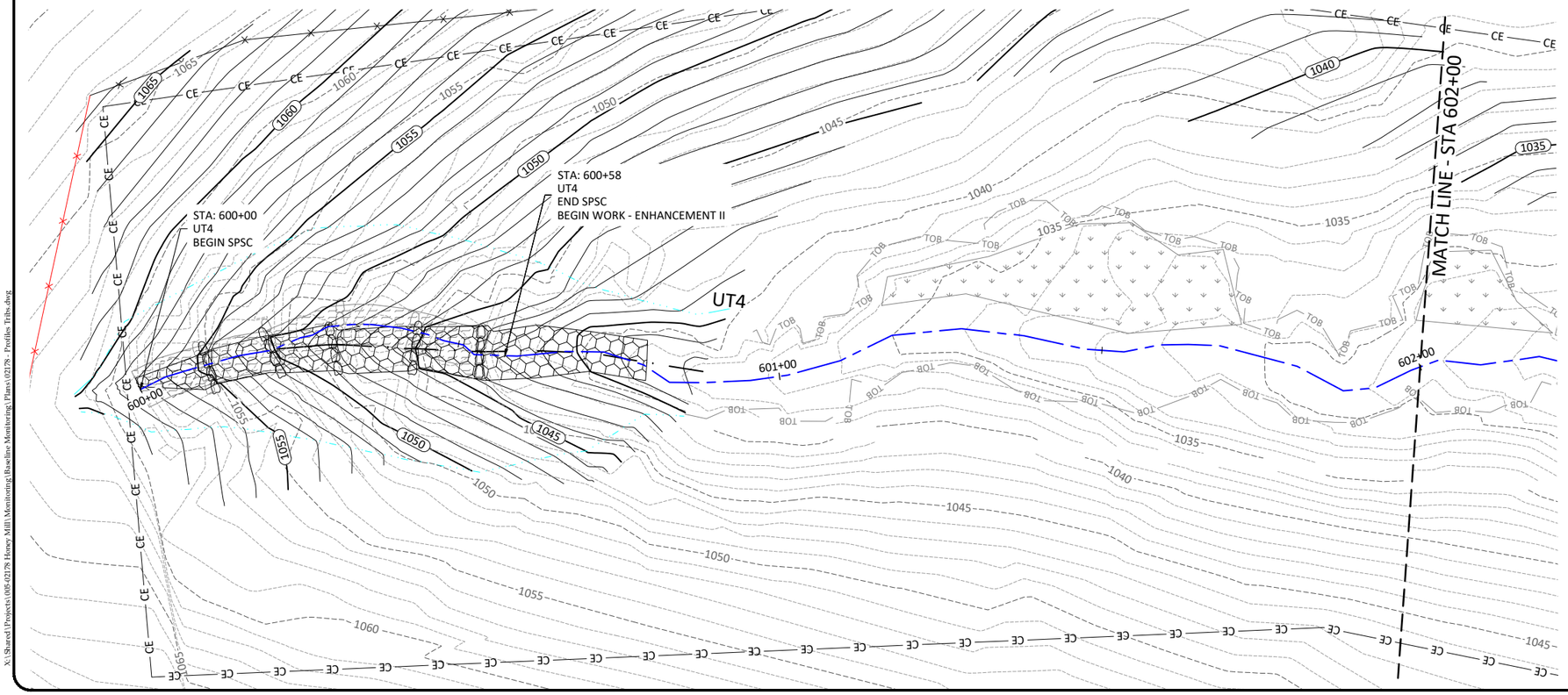

ENHANCEMENT II TREATMENT:

1. TREAT INVASIVE VEGETATION.
2. SUPPLEMENTAL PLANTING - SEE PLANTING PLANS.
3. EXCLUDE CATTLE ACCESS.

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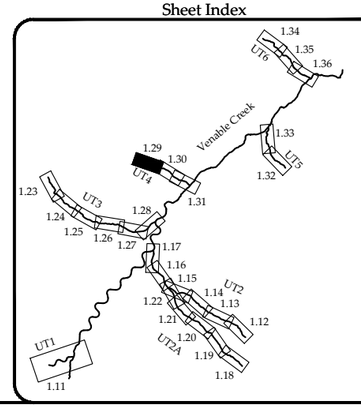

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NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER AARON S. EARLEY 7-2-21

Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina

UT4
Stream Plan and Profile

Revisions:

Date: JULY 2, 2021
Job Number: 005-02123
Project Engineer: ASE
Drawn By: HCC
Checked By: ICK

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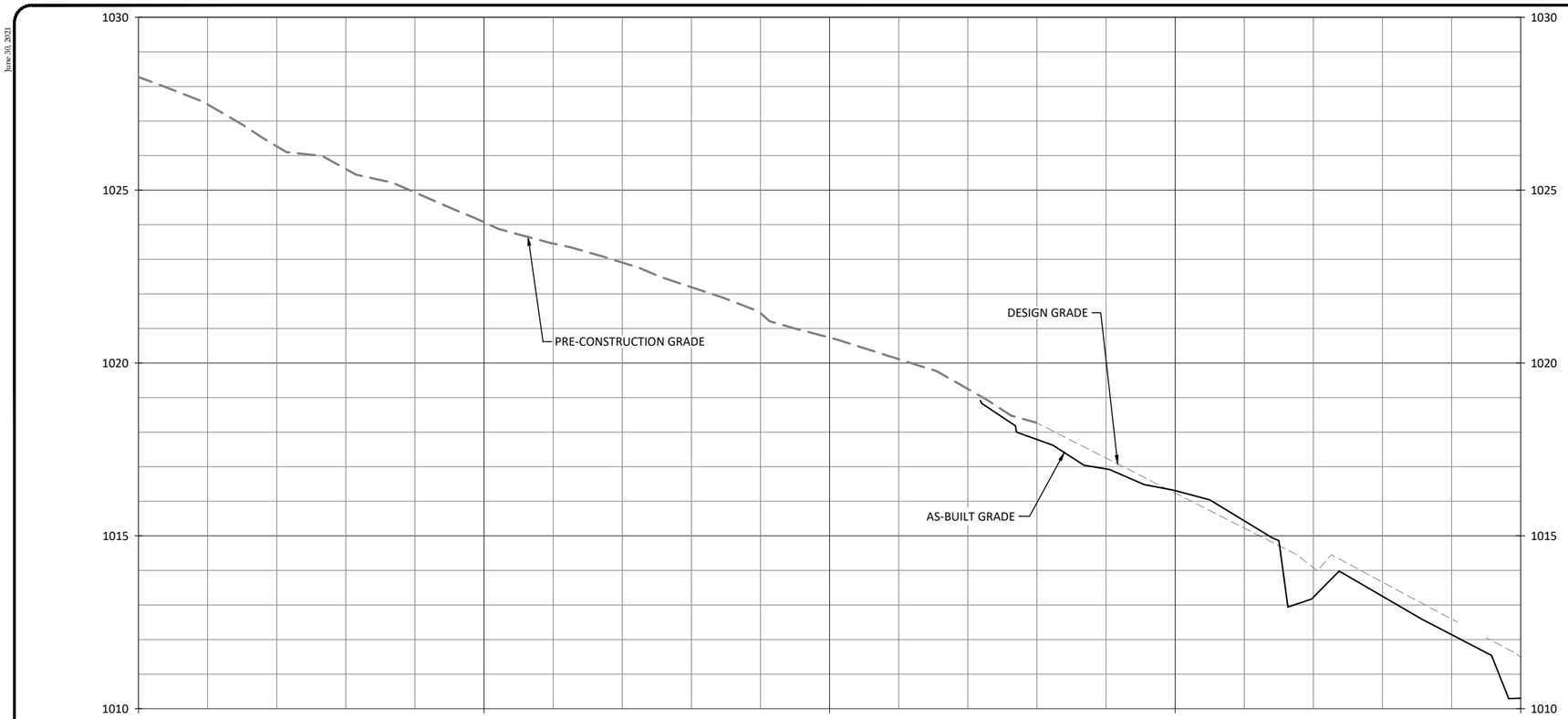

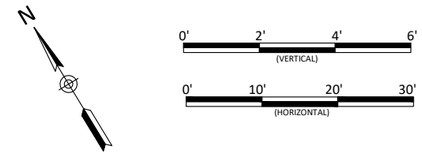

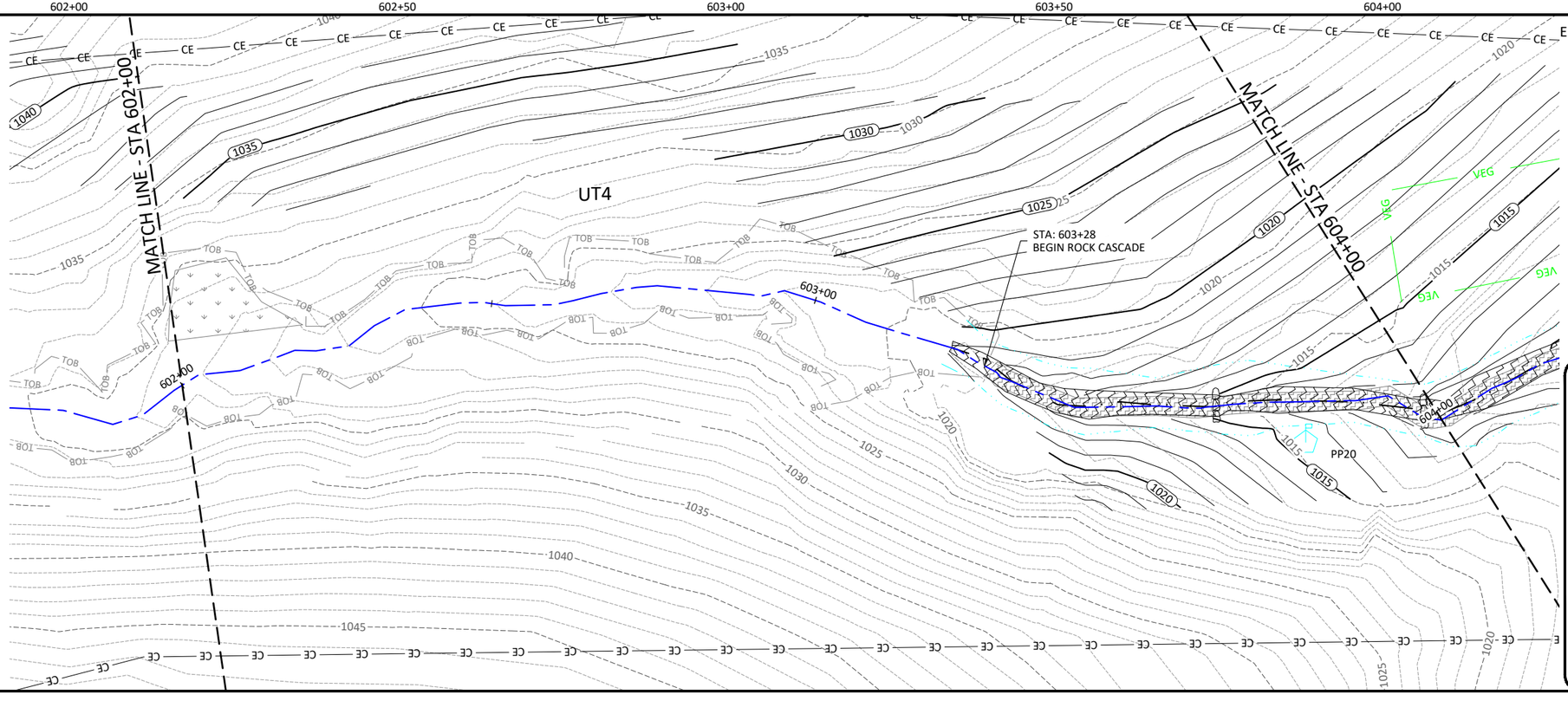

ENHANCEMENT II TREATMENT:

1. TREAT INVASIVE VEGETATION.
2. SUPPLEMENTAL PLANTING - SEE PLANTING PLANS.
3. EXCLUDE CATTLE ACCESS.
4. SELECTIVE BANK GRADING.

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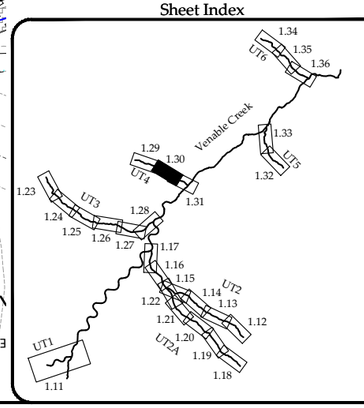

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Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina

UT4
Stream Plan and Profile

Revisions:

Date:	JULY 2, 2021
Job Number:	005-02123
Project Engineer:	ASE
Drawn By:	HCC
Checked By:	JCK

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June 30, 2021

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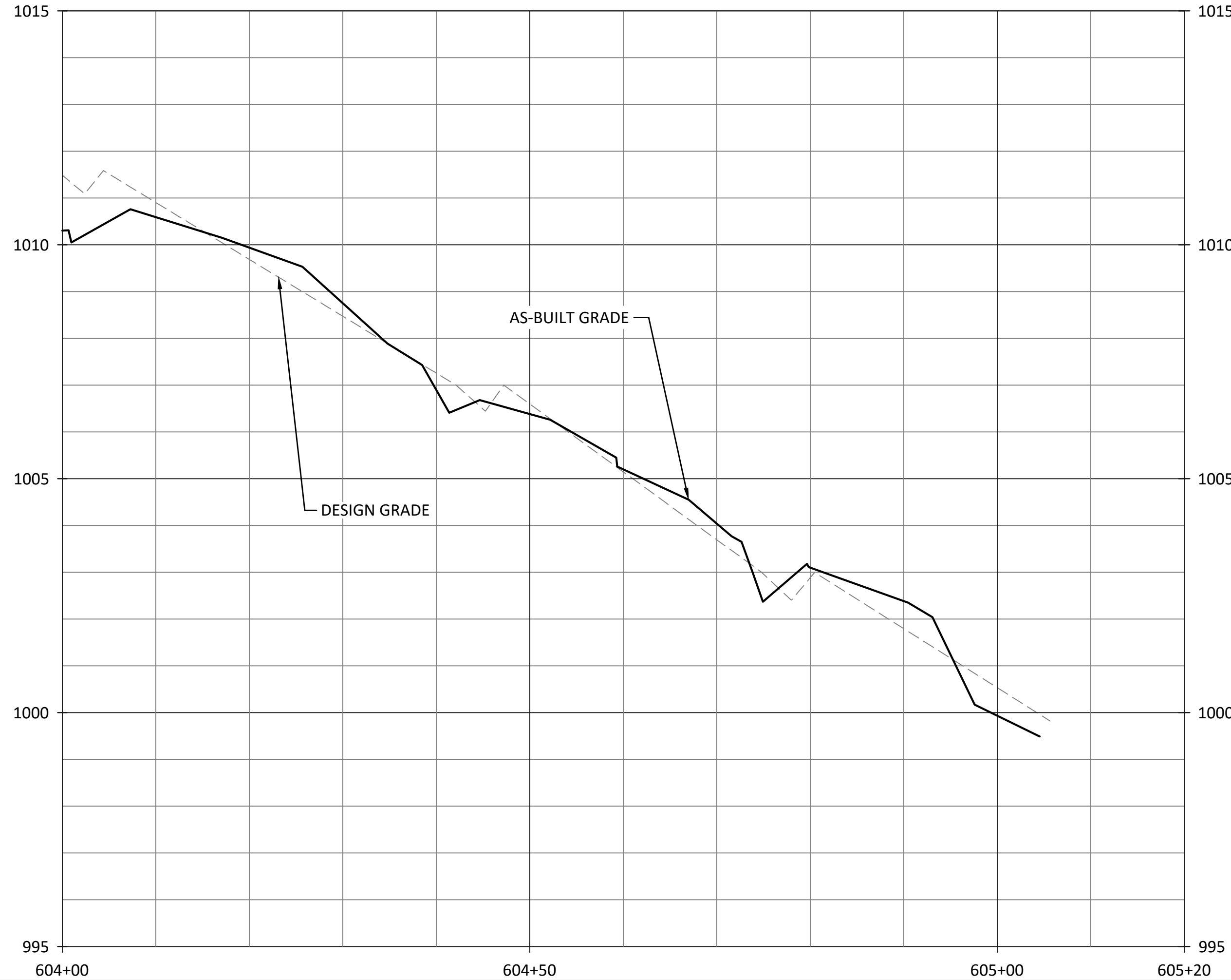
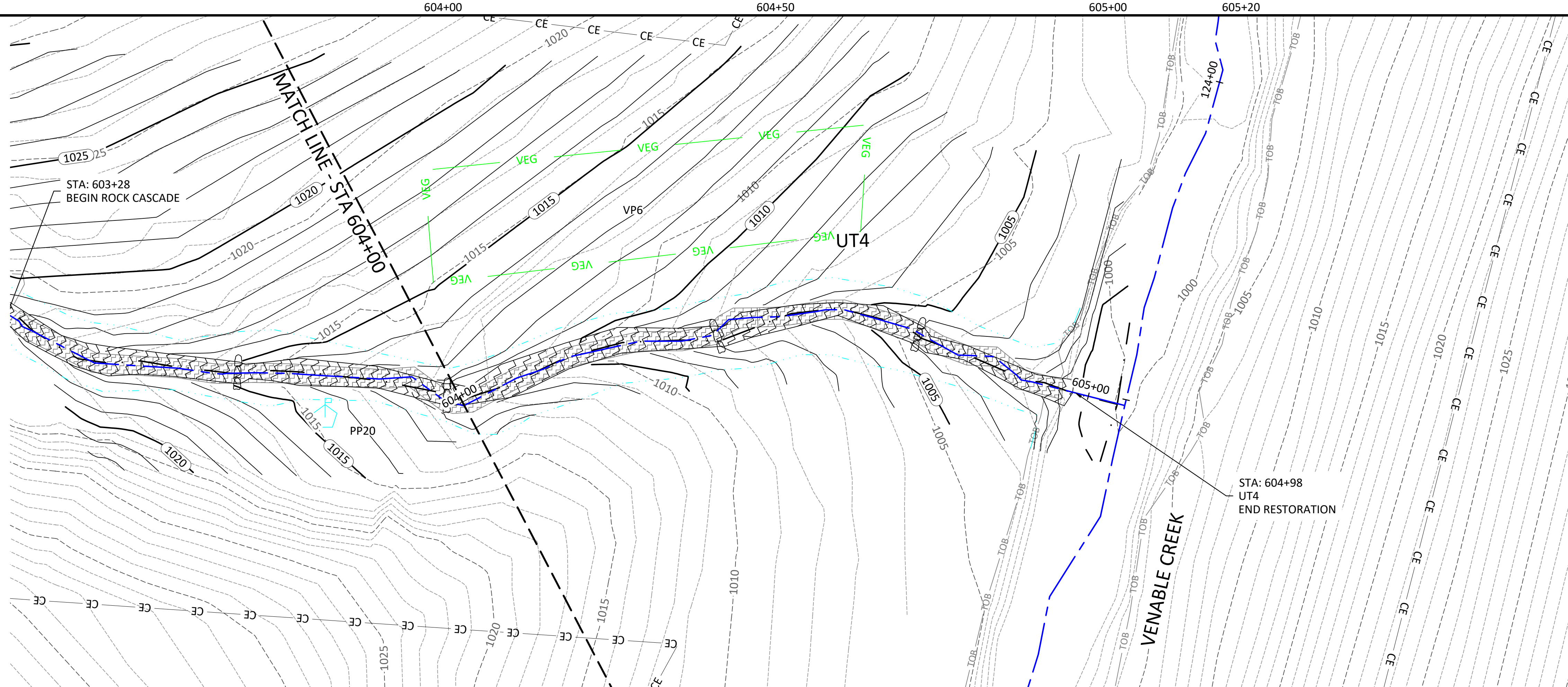
June 30, 2021





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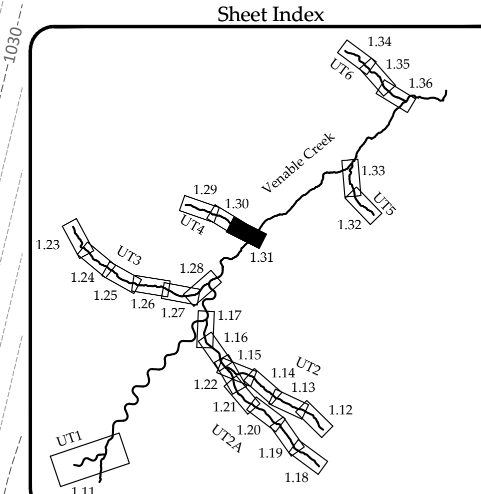

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7-2-21

Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina

UT4
Stream Plan and Profile

Revisions:

Date:	JULY 2, 2021
Job Number:	005-02123
Project Engineer:	ASE
Drawn By:	HCC
Checked By:	JCK

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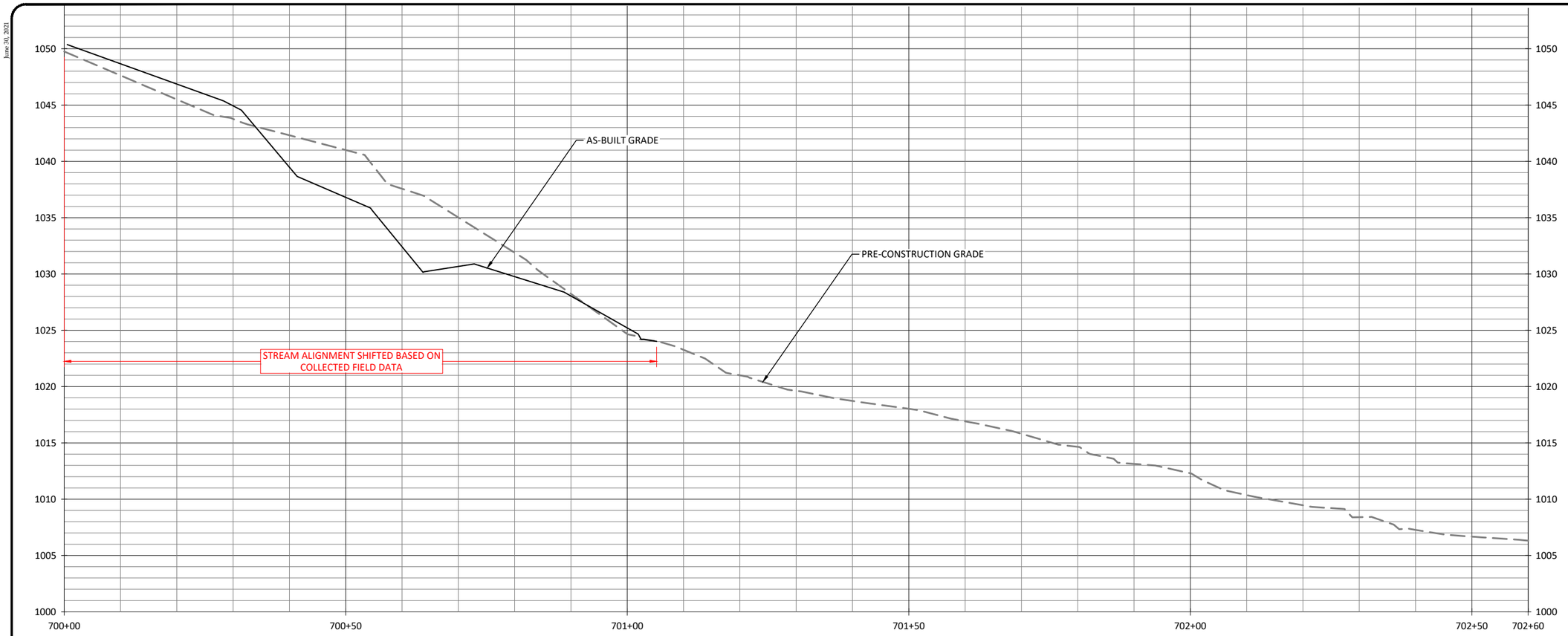
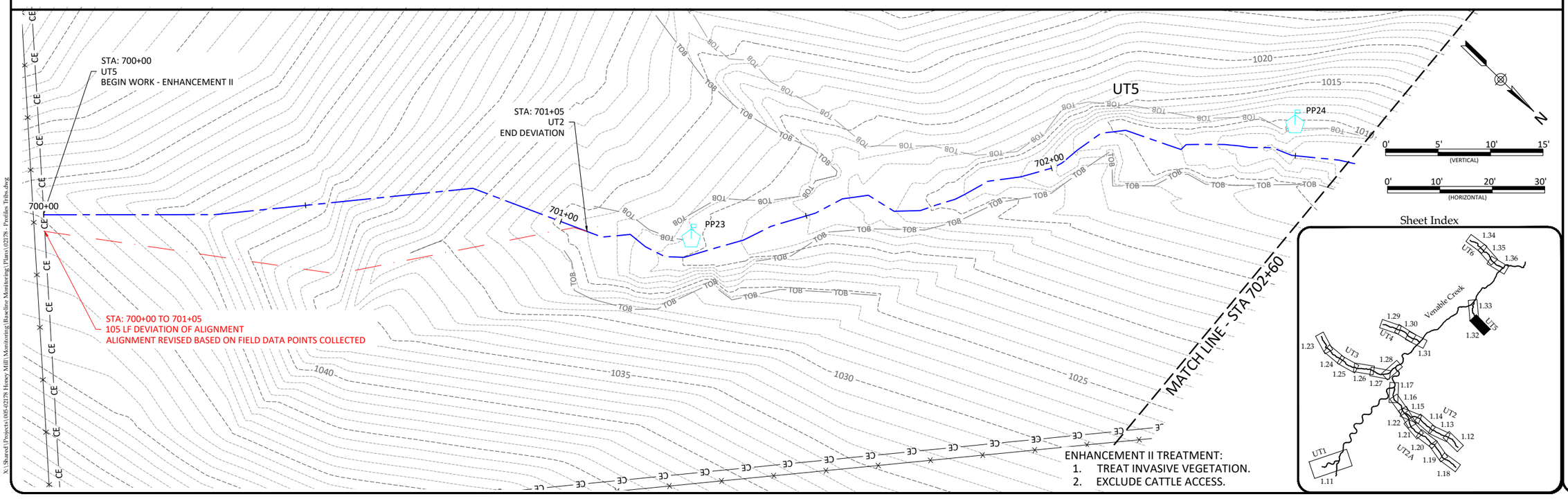
June 30, 2021





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Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina
UT5
Stream Plan and Profile

Revisions:

Date: JULY 2, 2021
Job Number: 005-02123
Project Engineer: ASE
Drawn By: HCC
Checked By: ICK

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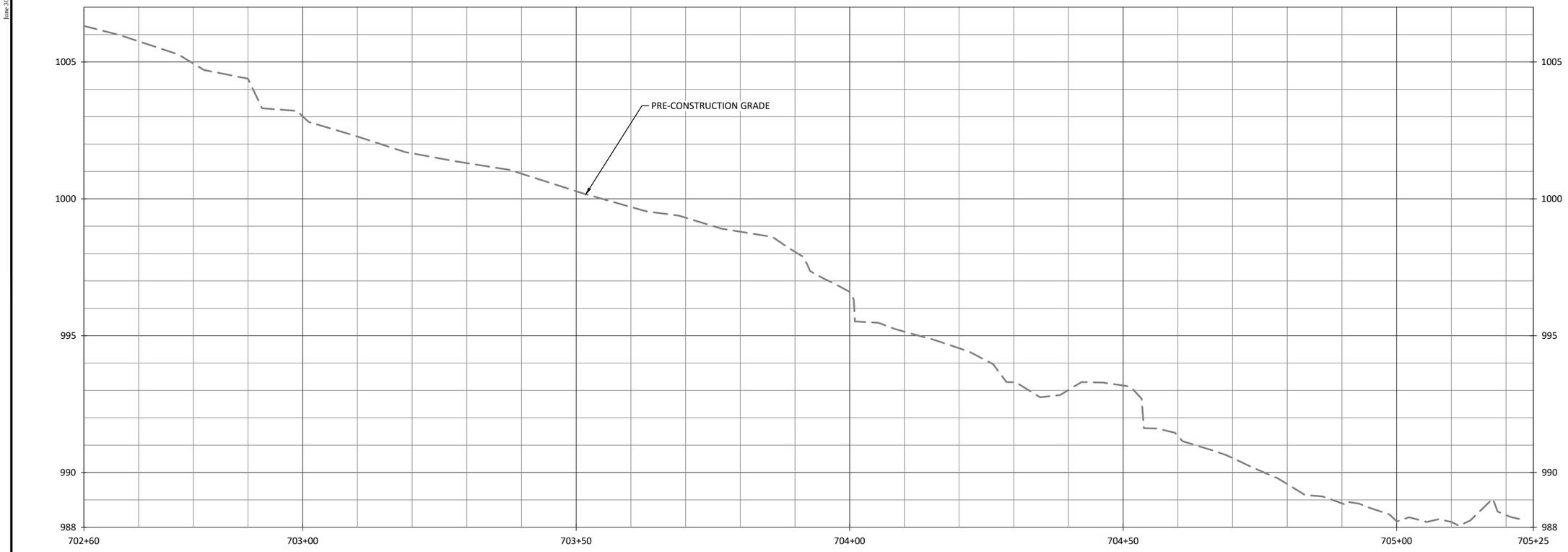

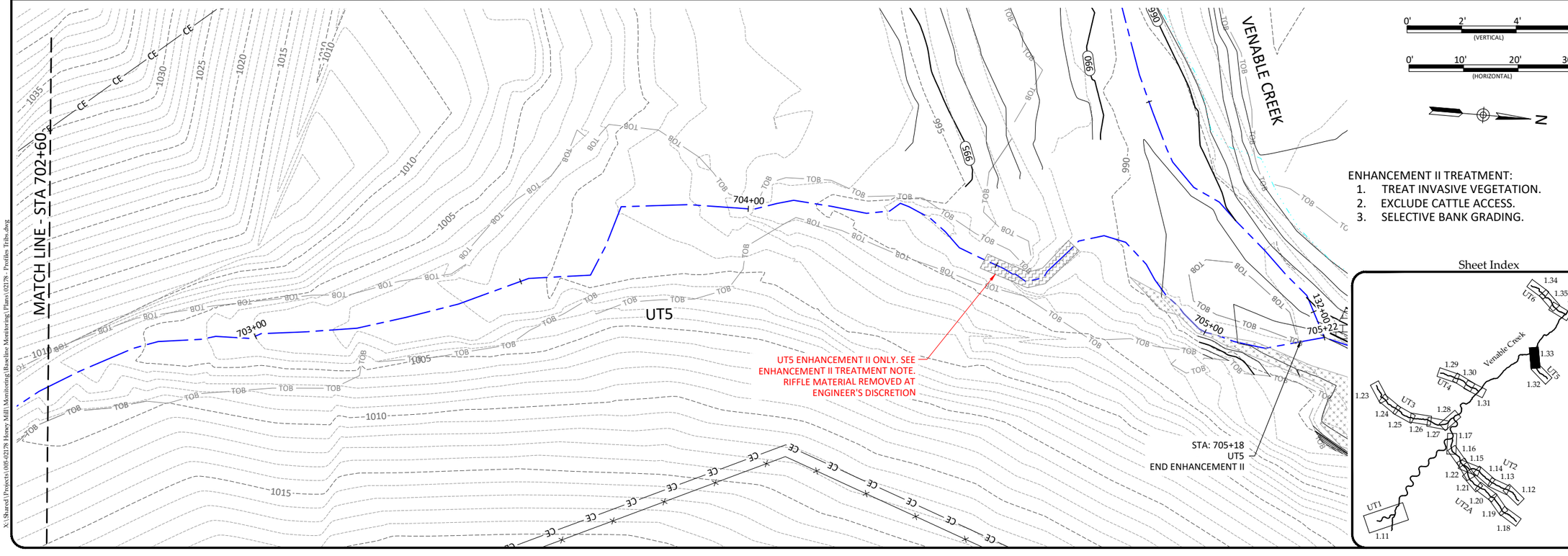

ENHANCEMENT II TREATMENT:
1. TREAT INVASIVE VEGETATION.
2. EXCLUDE CATTLE ACCESS.
3. SELECTIVE BANK GRADING.

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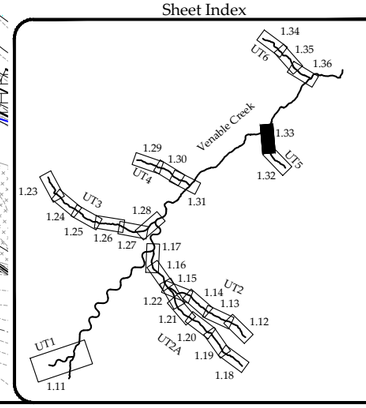

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Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina

UT5
Stream Plan and Profile

Revisions:

Date:	JULY 2, 2021
Job Number:	005-02123
Project Engineer:	ASE
Drawn By:	HCC
Checked By:	ICK

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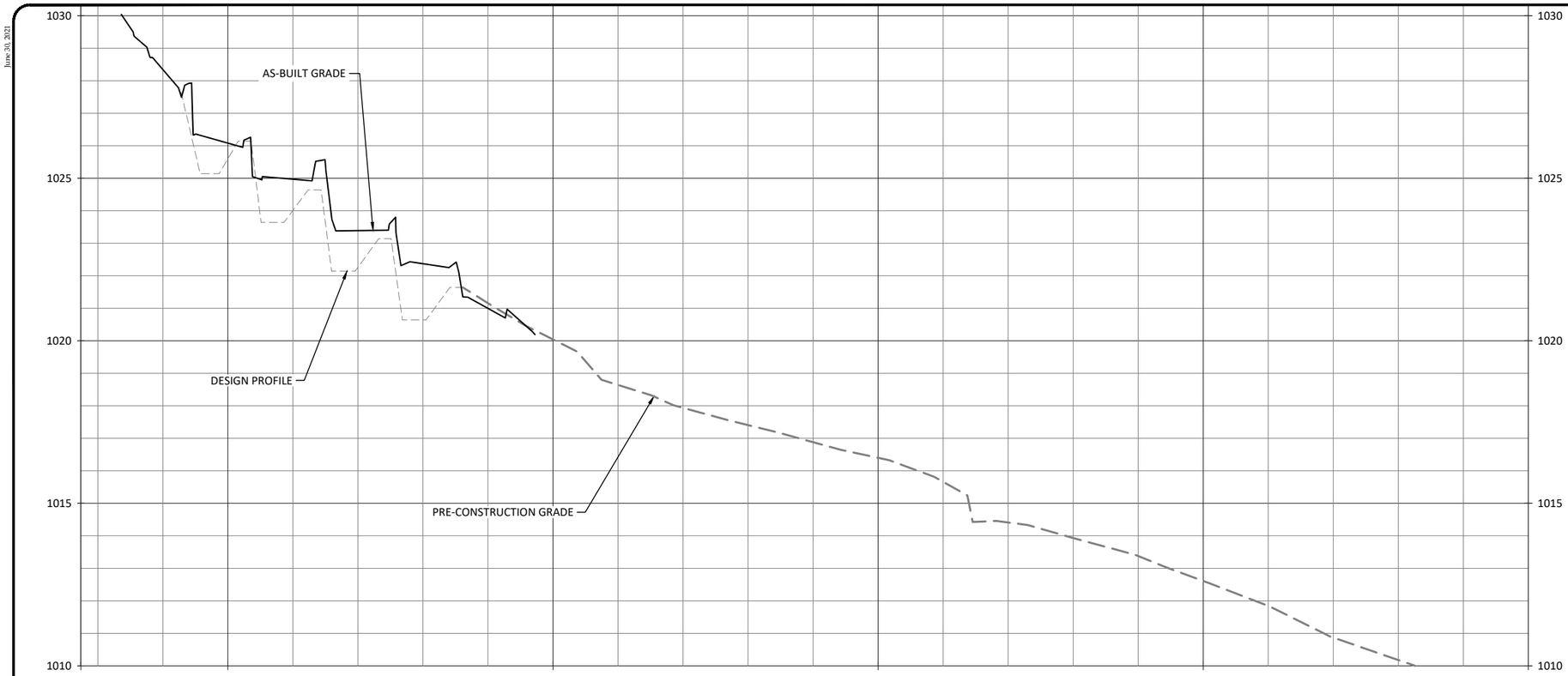

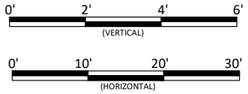

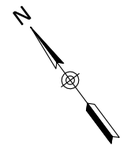

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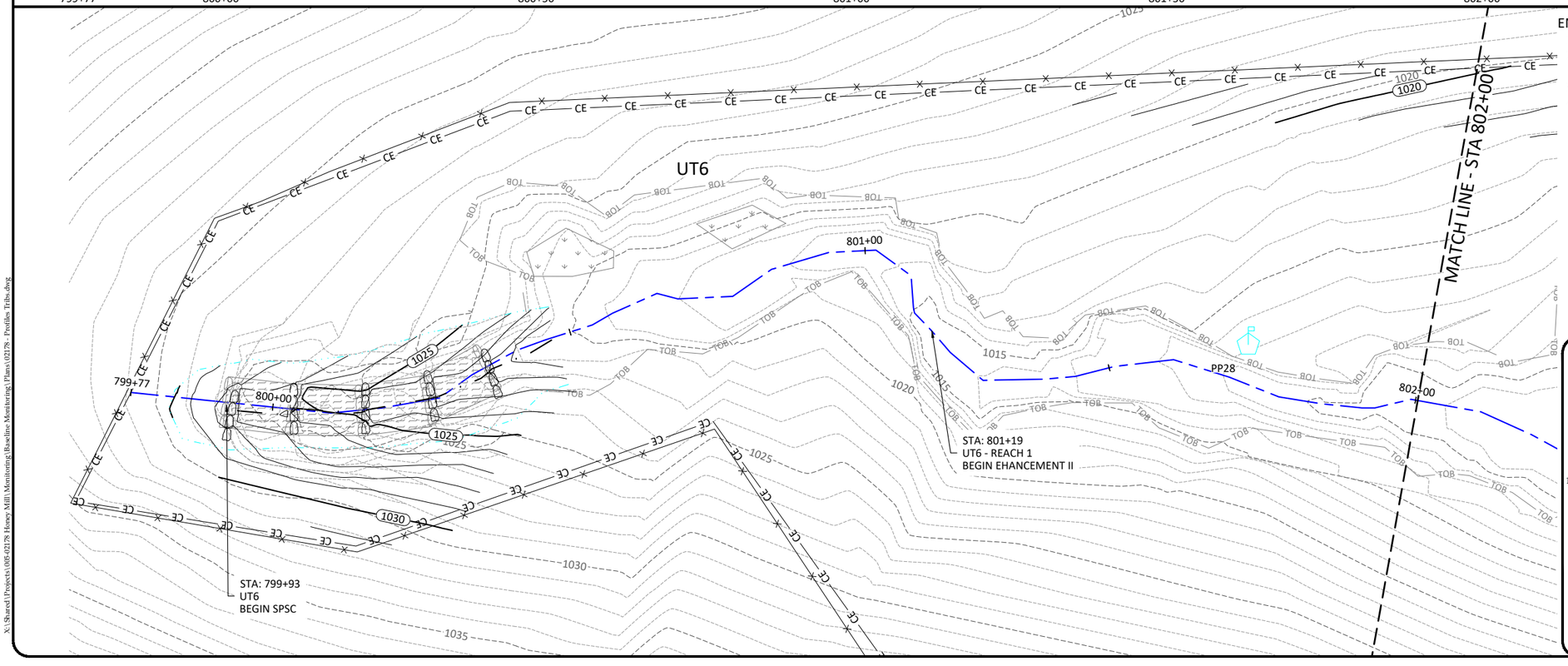
Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina

UT6
Stream Plan and Profile



ENHANCEMENT II TREATMENT:

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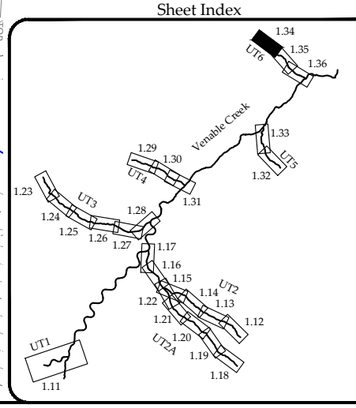

Revisions:	

Date:	JULY 2, 2021
Job Number:	005-02123
Project Engineer:	ASE
Drawn By:	HCC
Checked By:	JCK

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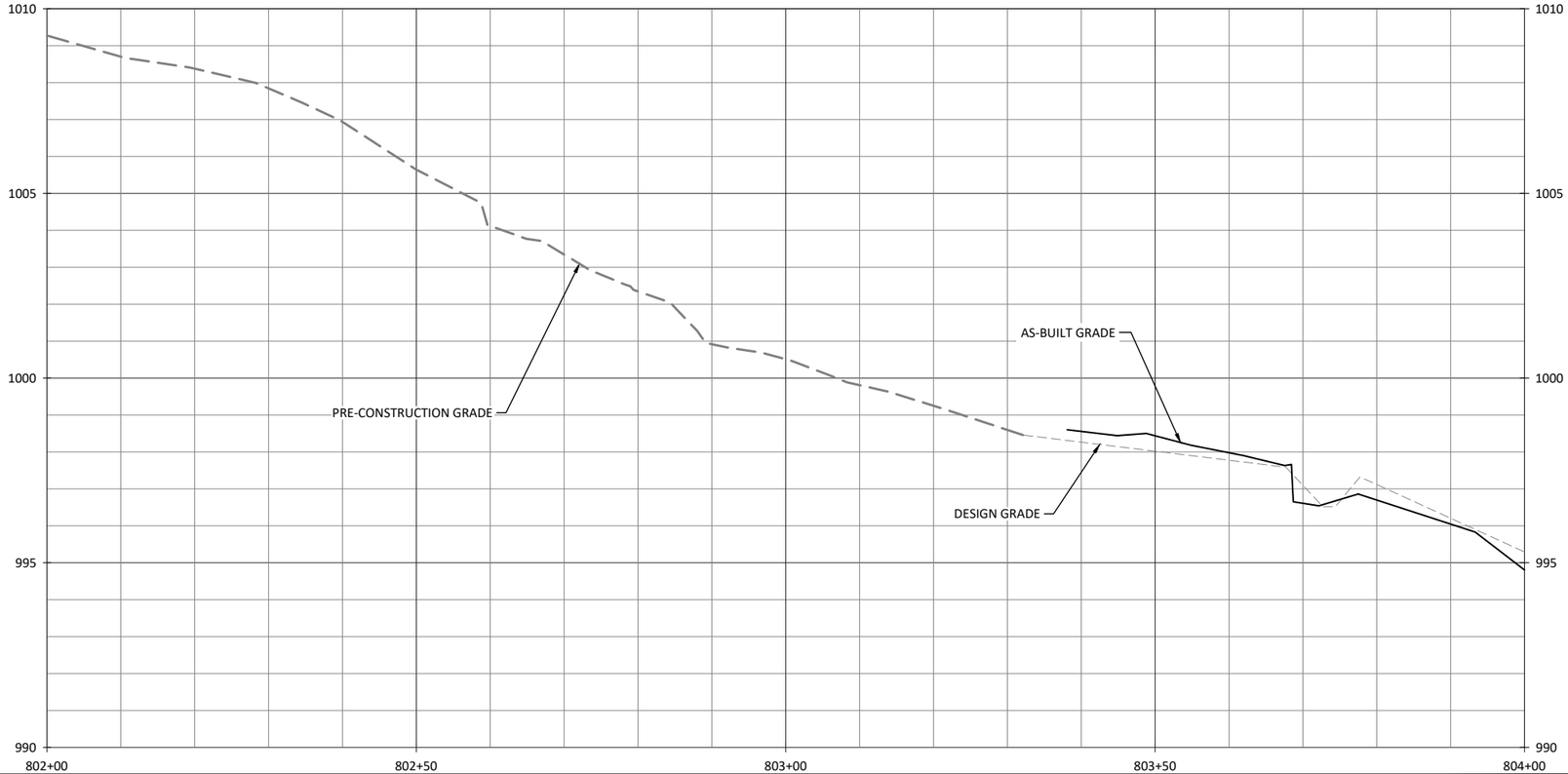

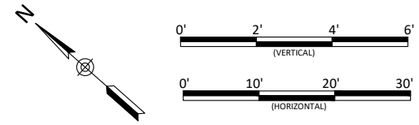

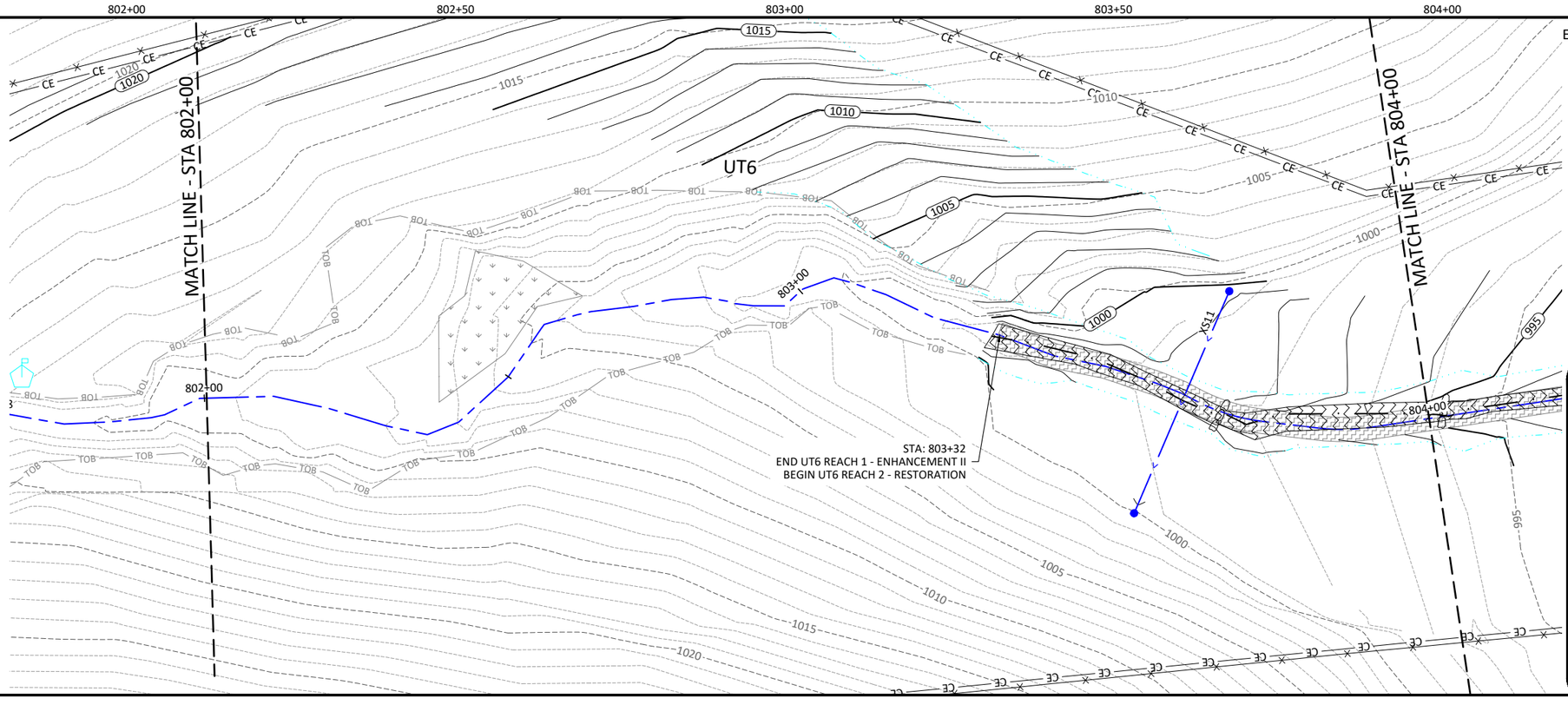

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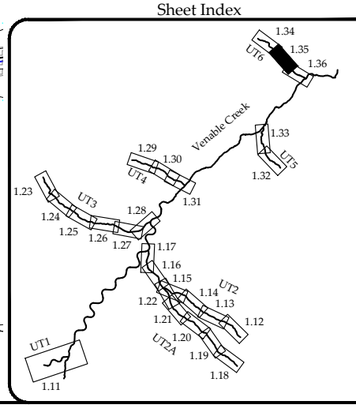

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7-2-21

Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina

UT6
Stream Plan and Profile

Revisions:

Date:	JULY 2, 2021
Job Number:	005-02123
Project Engineer:	ASE
Drawn By:	HCC
Checked By:	JCK

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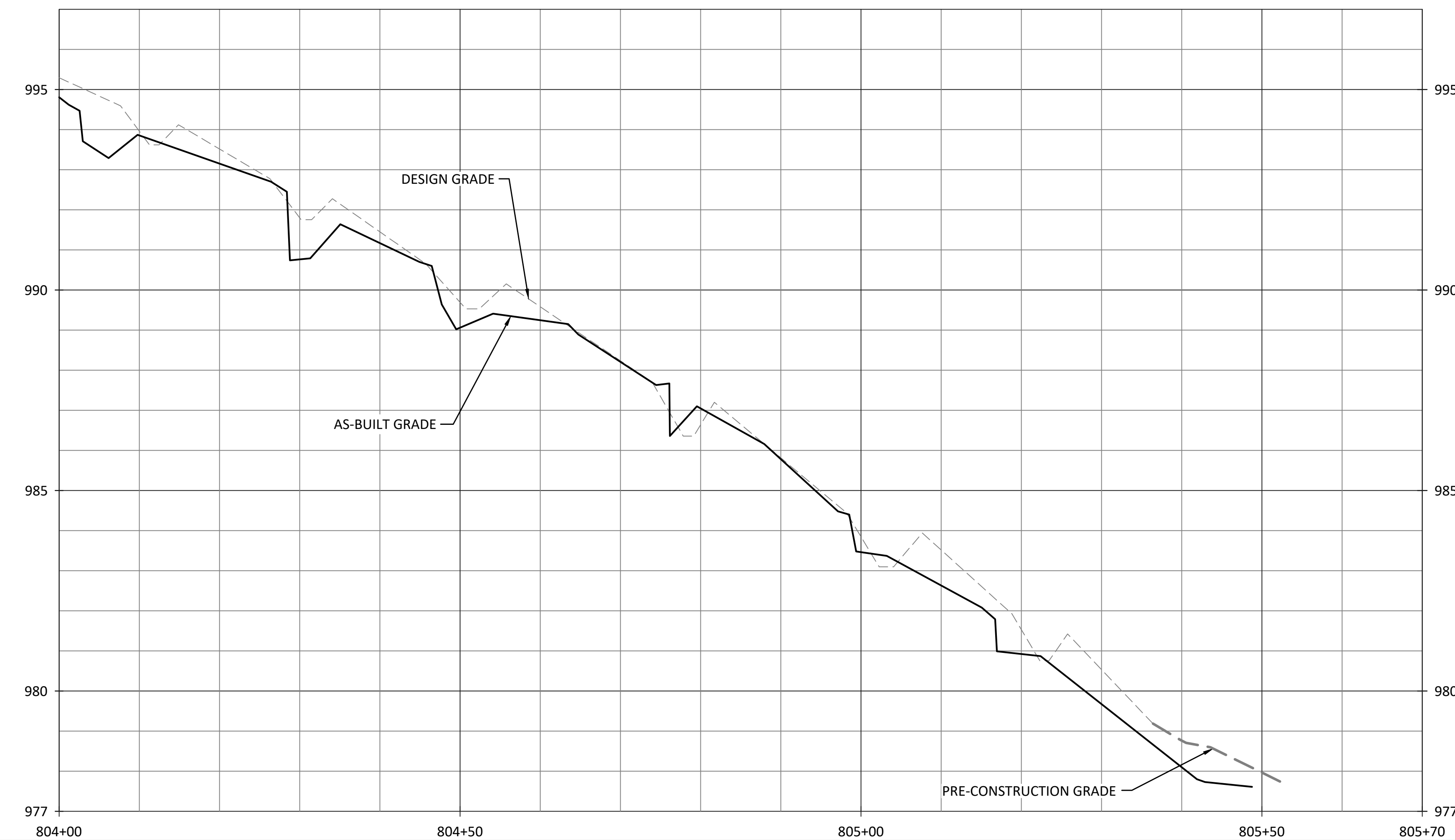
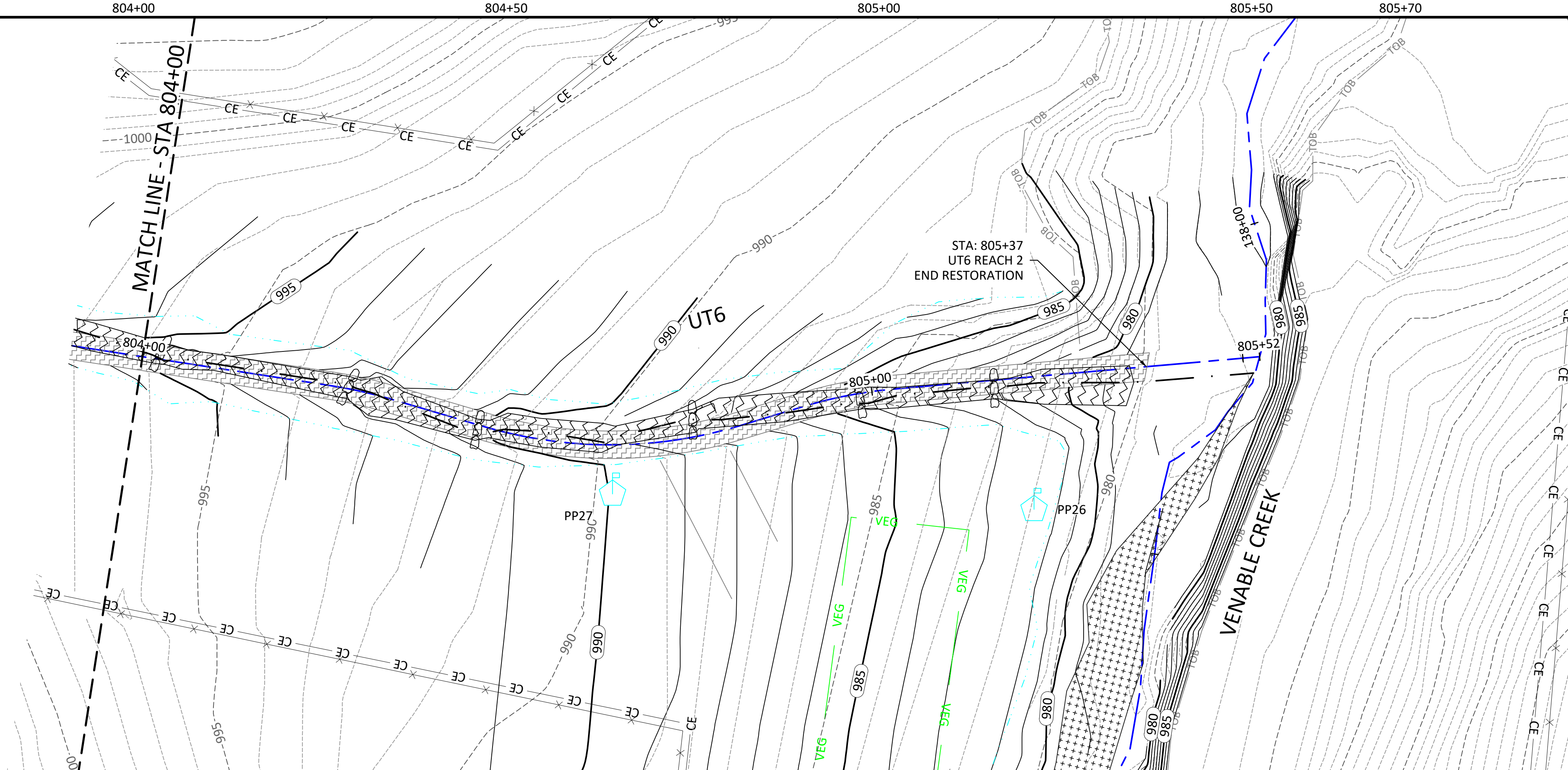
June 30, 2021



0' 2' 4' 6' (VERTICAL)

0' 10' 20' 30' (HORIZONTAL)



ENHANCEMENT II TREATMENT:

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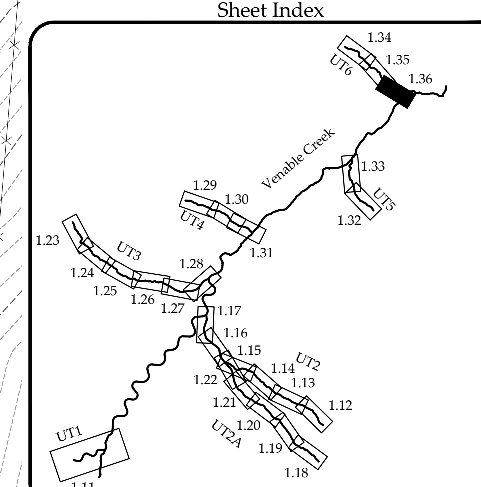

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Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina

UT6
Stream Plan and Profile

Date:	JULY 2, 2021
Job Number:	005-02123
Project Engineer:	ASE
Drawn By:	HCC
Checked By:	JCK

Revisions:

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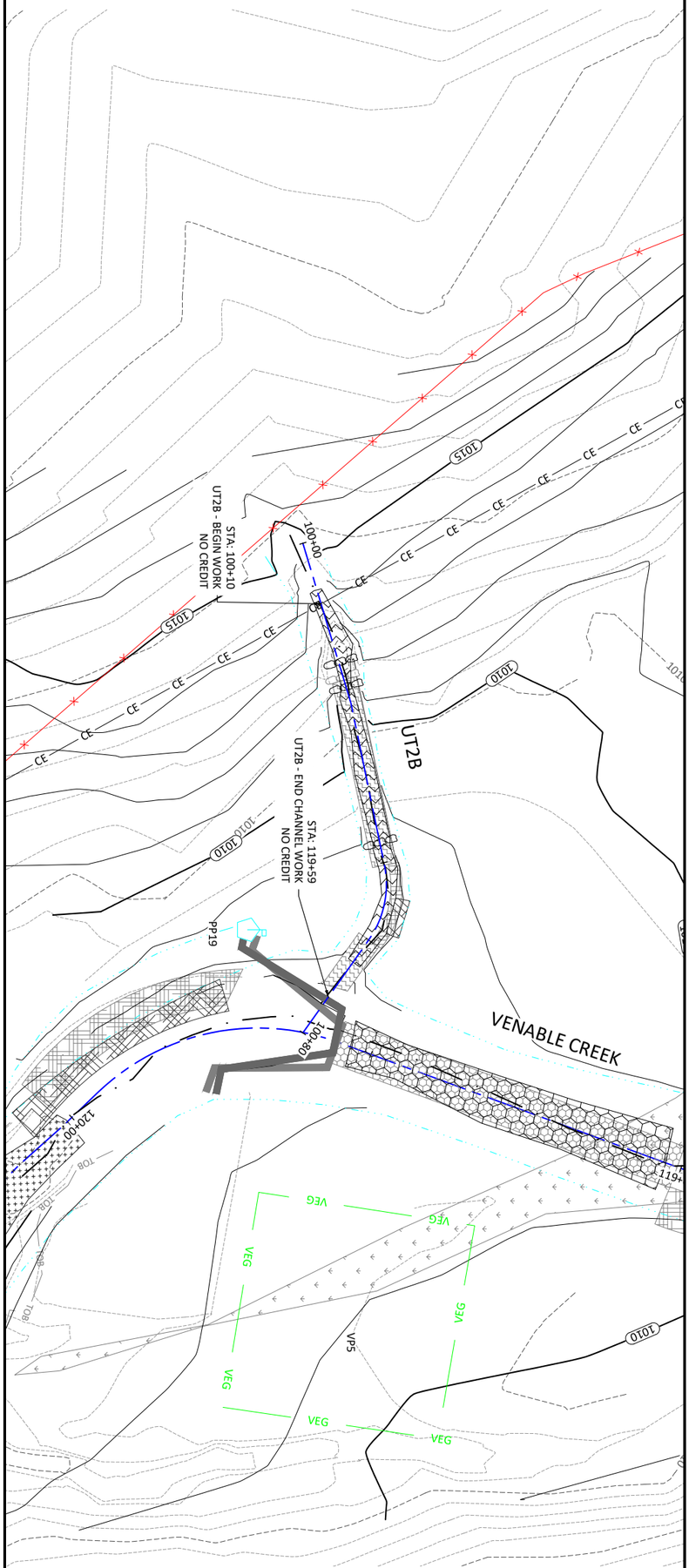

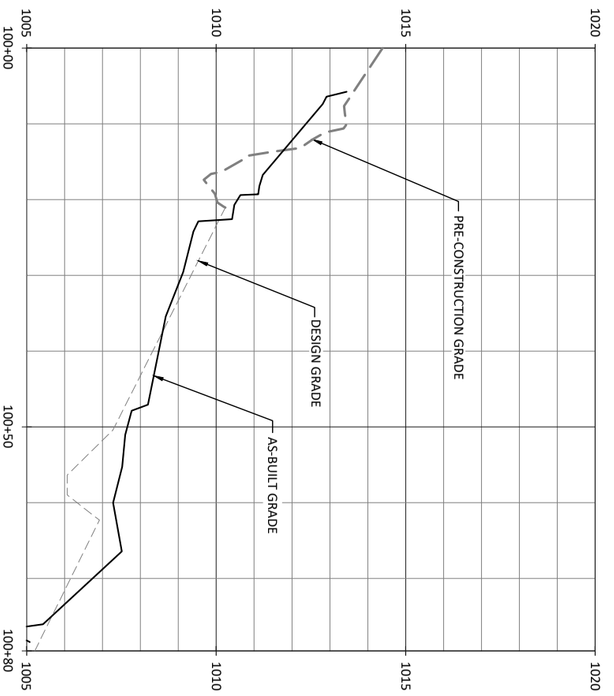

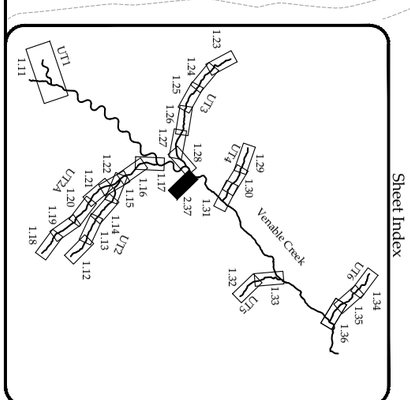

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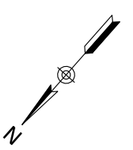

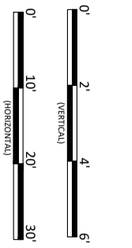

Date:	JULY 2, 2021
Job Number:	005-02123
Project Engineer:	ASE
Drawn By:	HCC
Checked By:	JCK

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Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina

UT2B
Stream Plan and Profile

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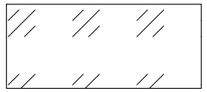
June 30, 2021

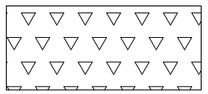
Riparian Planting



Designed and As-Built Planted Area

Riparian Planting Zone							
Species	**Common Name**	**Max Spacing (ft)**	**Indiv. Spacing (ft)**	**Min. Caliper**	**Stratum**	**Percentage**	**Wetland Indicator Code**
Platanus occidentalis	Sycamore	12	6-12	0.25"	Canopy	~~15%~~ 14%	FACW
*Morus rubra**	Red Mulberry	12	6-12	0.25"	Subcanopy	7%	FACU
Diospyros virginiana	Persimmon	12	6-12	0.25"	Canopy	~~10%~~ 9%	FAC
Prunus serotina	Black Cherry	12	6-12	0.25"	Canopy	~~10%~~ 11%	FACU
Quercus rubra	Northern Red Oak	12	6-12	0.25"	Canopy	~~10%~~ 11%	FACU
*Oxydendrum arboreum**	Sourwood	12	6-12	0.25"	Subcanopy	3%	UPL
Quercus alba	White Oak	12	6-12	0.25"	Canopy	10%	FACU
*Asimina triloba**	Paw Paw	12	6-12	0.25"	Subcanopy	~~4%~~ 5%	FAC
Ulmus rubra	Slippery Elm	12	6-12	0.25"	Canopy	5%	FAC
Acer negundo	Boxelder	12	6-12	0.25"	Canopy	10%	FAC
*Hamamelis virginiana**	Witch Hazel	12	6-12	0.25"	Subcanopy	~~4%~~ 5%	FACU
~~*Euonymus americanus**~~	~~American Strawberry Bush~~	~~12~~	~~6-12~~	~~0.25"~~	~~Shrub~~	~~3%~~	~~FAC~~
Liriodendron tulipifera	Tulip Tree	12	6-12	0.25"	Canopy	~~4%~~ 5%	FACU
Carya cordiformis	Bitternut Hickory	12	6-12	0.25"	Canopy	5%	FACU
* Subcanopy species - not held to monitoring height requirements							

Shaded Supplemental Planting

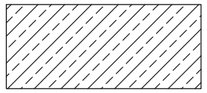


Designed and As-Built Planted Area

Designed Planted Area Not Planted

Shaded Bare Roots							
Species	**Common Name**	**Max Spacing (ft)**	**Indiv. Spacing (ft)**	**Min. Caliper Size**	**Stratum**	**Percentage**	**Wetland Indicator Code**
Platanus occidentalis	Sycamore	25	12-25	0.25" - 1.0"	Canopy	~~10%~~ 12%	FACW
Carya cordiformis	Bitternut Hickory	25	12-25	0.25" - 1.0"	Canopy	~~5%~~ 7%	FACU
Liriodendron tulipifera	Tulip Poplar	25	12-25	0.25" - 1.0"	Canopy	~~5%~~ 7%	FACU
*Carpinus caroliniana**	Ironwood	25	12-25	0.25" - 1.0"	Subcanopy	~~4%~~ 5%	FAC
Diospyros virginiana	Persimmon	25	12-25	0.25" - 1.0"	Canopy	~~10%~~ 11%	FAC
*Morus rubra**	Red Mulberry	25	12-25	0.25" - 1.0"	Subcanopy	~~5%~~ 7%	FACU
Nyssa sylvatica	Black Gum	25	12-25	0.25" - 1.0"	Canopy	~~5%~~ 7%	FAC
~~*Eunoymus americanus**~~	~~American Strawberry Bush~~	~~25~~	~~12-25~~	~~0.25" - 1.0"~~	~~Shrub~~	~~4%~~	~~FAC~~
~~*Calycanthus floridus**~~	~~Sweetshrub~~	~~25~~	~~12-25~~	~~0.25" - 1.0"~~	~~Shrub~~	~~4%~~	~~FACU~~
*Hamamelis virginiana**	Witch Hazel	25	12-25	0.25" - 1.0"	Subcanopy	~~7%~~ 9%	FACU
Quercus rubra	Northern Red Oak	25	12-25	0.25" - 1.0"	Canopy	~~10%~~ 11%	FACU
Fagus grandifolia	American Beech	25	12-25	0.25" - 1.0"	Canopy	~~5%~~ 7%	FACU
Quercus alba	White Oak	25	12-25	0.25" - 1.0"	Canopy	~~10%~~ 7%	FACU
*Lindera benzoin**	Spicebush	25	12-25	0.25" - 1.0"	Subcanopy	~~4%~~ 6%	FAC
*Cornus florida**	Flowering Dogwood	25	12-25	0.25" - 1.0"	Subcanopy	~~5%~~ 4%	FACU
~~*Oxydendron arboreum**~~	~~Sourwood~~	~~25~~	~~12-25~~	~~0.25" - 1.0"~~	~~Subcanopy~~	~~4%~~	~~UPL~~
~~*Ilex opaca**~~	~~American Holly~~	~~25~~	~~12-25~~	~~0.25" - 1.0"~~	~~Subcanopy~~	~~3%~~	~~FACU~~
* Subcanopy species - not held to monitoring height requirements							

Pasture Seeding



Designed and As-Built Planted Area

Pasture Seeding		
Pure Live Seeding (42 lbs/acre)		
Species Name	**Common Name**	**Density (lbs/acre)**
Dactylis glomerata	Orchard Grass	20
Trifolium pratense	Red Clover	5
Trifolium repens	Ladino Clover	5

Soil Amendments

Soil Amendments		
Zone	**Amendment**	**Rate (lbs/acre)**
All planting areas	Humic Plus	200
Areas with >0.5 feet of cut or fill	Tennessee Brown Phosphate*	50
* to be applied in addition to Humic Plus		

Temporary Seeding

Temporary Seeding and Mulch		
Approved Date	**Type**	**Planting Rate (lbs/acre)**
Jan 1 - May 1	Rye Grain (*Secale cereale*)	120
	Ladino Clover	5
	Crimson Clover	5
	Straw Mulch	4000
May 1 - Aug 15	German Millet (*Setaria italica*)	50
	Ladino Clover	5
	Crimson Clover	5
	4000	4000
Aug 15 - Dec 31	Rye Grain (*Secale cereale*)	120
	Crimson Clover	5
	4000	4000

Riparian Seeding

Permanent Riparian Seeding					
Pure Live Seed					
Approved Date	**Species Name**	**Common Name**	**Stratum**	**Density (lbs/acre)**	**Wetland Indicator Code**
All Year	*Schizachyrium scoparium*	Little Bluestem	Herb	1.5	FACU
All Year	*Panicum virgatum*	Switchgrass	Herb	1.0	FAC
All Year	*Sorghastrum nutans*	Indiangrass	Herb	1.5	FACU
All Year	*Panicum dichotimiflorum*	Smooth Pannicgrass	Herb	1.0	FACW
All Year	*Panicum anceps*	Beaked Panicgrass	Herb	1.0	FAC
All Year	*Panicum clandestinum*	Deertongue	Herb	2.0	FAC
All Year	*Elymus virginicus*	Virginia Wild Rye	Herb	2.0	FACW
All Year	*Tripsacum dactyloides*	Eastern Gammagrass	Herb	1.0	FACW
All Year	*Juncus tenuis*	Path Rush	Herb	0.6	FAC
All Year	*Juncus effusus*	Soft Rush	Herb	0.4	FACW
All Year	*Carex vulpinoidea*	Fox Sedge	Herb	1.0	OBL
All Year	*Coreopsis lanceolata*	Lanceleaf Coreopsis	Herb	1.0	FACU
All Year	*Bidens aristosa*	Bur-Marigold	Herb	1.0	FACW
All Year	*Rudbeckia hirta*	Blackeyed Susan	Herb	1.0	FACU
All Year	*Chamaecrista fasciculata var. fasciculata*	Partridge Pea	Herb	1.0	FACU
All Year	*Achillea millefolium*	Common Yarrow	Herb	1.0	FACU

Streambank Planting

Streambank Planting Zone							
Live Stakes: Streams with > 8' TOB width							
Species	**Common Name**	**Max Spacing (ft)**	**Indiv. Spacing (ft)**	**Min. Size**	**Stratum**	**Percentage**	**Wetland Indicator Code**
Salix nigra	Black Willow	6	3' - 6'	0.5" cal.	Canopy	~~35%~~ 37%	OBL
Salix sericea	Silky Willow	6	3' - 6'	0.5" cal.	Shrub	~~25%~~ 25%	OBL
Cornus amomum	Silky dogwood	6	3' - 6'	0.5" cal.	Shrub	20%	FACW
Sambucus canadensis	Elderberry	6	3' - 6'	0.5" cal.	Shrub	~~10%~~ 9%	FAC
Physocarpos opulifolius	Ninebark	6	3' - 6'	0.5" cal.	Shrub	~~10%~~ 9%	FACW
					Total	100%	
Live Stakes: Streams with < 8' TOB width							
Salix sericea	Silky Willow	8	6-8	0.5" cal.	Shrub	~~40%~~ 34%	OBL
Cornus amomum	Silky Dogwood	8	6-8	0.5" cal.	Shrub	~~20%~~ 22%	FACW
Sambucus canadensis	Elderberry	8	6-8	0.5" cal.	Shrub	~~20%~~ 22%	FAC
Physocarpos opulifolius	Ninebark	8	6-8	0.5" cal.	Shrub	~~20%~~ 22%	FACW
					Total	100%	
Herbaceous Plugs							
Juncus effusus	Common Rush	4	4	1.0" - 2.0" plug	Herb	50%	FACW
Carex lurida	Shallow Sedge	4	4	1.0" - 2.0" plug	Herb	20%	OBL
Carex crinita	Fringed Sedge	4	4	1.0" - 2.0" plug	Herb	15%	OBL
Cyperus strigosus	Straw-colored Flatsedge	4	4	1.0" - 2.0" plug	Herb	15%	FACW
					Total	100%	

Herbaceous Zone

Herbaceous Zone				
Species	**Common Name**	**Indiv. Spacing**	**Percentage**	**Wetland Indicator Code**
Juncus effusus	Common Rush	4 ft.	40%	FACW
Carex lurida	Lurid Sedge	4 ft.	15%	OBL
Carex crinita	Fringed Sedge	4 ft.	15%	OBL
Scirpus cyperinus	Woolgrass	4 ft.	15%	FACW
Sagittaria latifolia	Broadleaf Arrowhead	4 ft.	15%	OBL

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NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER AARON S. EARLEY
7-2-21

Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina

Planting Lists
Planting

Revisions:

Date: June 18, 2021
Job Number: 005-02123
Project Engineer: ASE
Drawn By: HCC
Checked By: JCK

Sheet 2.1

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June 30, 2021

SHEET 2.4

VENABLE FARM ROAD

N/F
CHARLES E. BROWNE &
LU ANN V. BROWN
D.B. 525, PG. 330
P.I.N. 5927-49-7075

N/F
CHARLES E. BROWNE &
LU ANN VENABLE BROWN
D.B. 1209, PG. 520 (TRACT 2)
P.I.N. 5927-00-59-9301

N/F
LU ANN VENABLE BROWNE
D.B. 327, PG. 641
PIN: 5928-50-7069

N/F
MONTY K. VENABLE ET AL.
D.B. 205, PG. 495
PIN: 5928-60-5518

SHEET 2.7

N/F
MONTY K. VENABLE ET AL.
D.B. 313, PG. 722
PIN: 5927-68-4669

N/F
LU ANN V. BROWN
D.B. 1209, PG. 520 (TRACT 1)
PIN: 5928-70-6435

SHEET 2.3

SILOAM ROAD

LITTLE MOUNTAIN CHURCH ROAD

VENABLE CREEK

UT1

UT2

UT2A

UT3

UT4

UT5

UT6

N/F
MONTY K. VENABLE ET AL.
D.B. 313, PG. 722
PIN: 5927-68-4669

SHEET 2.6

N/F
MONTY K. VENABLE ET AL.
D.B. 313, PG. 722
PIN: 5927-68-4669

SHEET 2.5

0' 150' 300' 450'
(HORIZONTAL)

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7-2-21

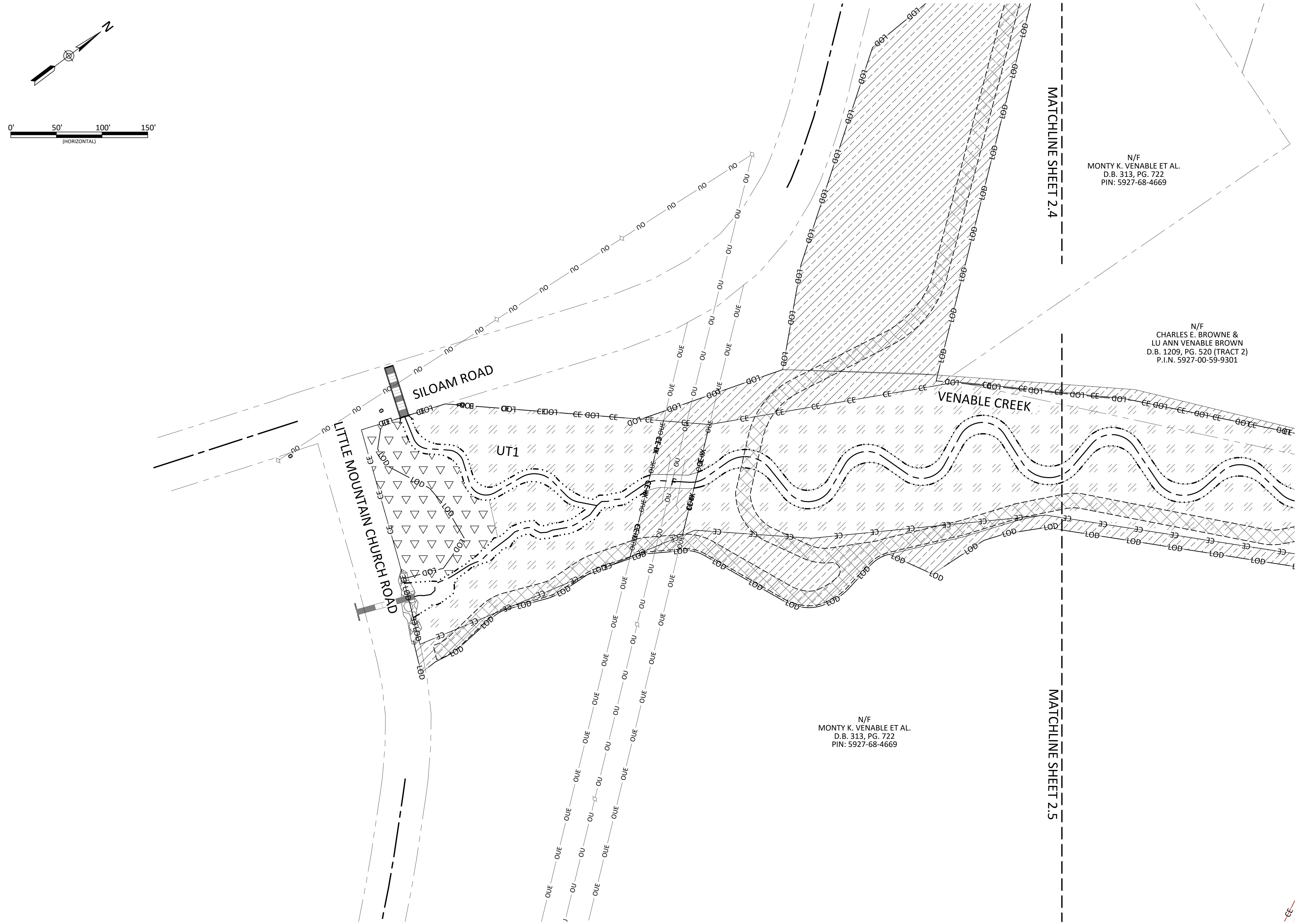
Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina

Planting Overview
Planting

Revisions:

Date: June 18, 2021
Job Number: 005-02123
Project Engineer: ASE
Drawn By: HCC
Checked By: JCK

Sheet 2.2



June 30, 2021

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7-2-21

Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina

Planting Plan

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Project Engineer: ASE
Drawn By: HCC
Checked By: JCK

Sheet 2.3

June 30, 2021

N

0' 50' 100' 150'
(HORIZONTAL)

MATCHLINE SHEET 2.6

N/F
CHARLES E. BROWNE &
LU ANN VENABLE BROWN
D.B. 1209, PG. 520 (TRACT 2)
P.I.N. 5927-00-59-9301

VENABLE FARM ROAD

VEN

UT3

MATCHLINE SHEET 2.5

N/F
CHARLES E. BROWNE &
LU ANN V. BROWN
D.B. 525, PG. 330
P.I.N. 5927-49-7075

SILOAM ROAD

MATCHLINE SHEET 2.3

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Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina

Planting Plan

Revisions:

Date:	June 18, 2021
Job Number:	005-02123
Project Engineer:	ASE
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Checked By:	JCK

Sheet 2.4

June 30, 2021

MATCHLINE SHEET 2.6

N/F
MONTY K. VENABLE ET AL.
D.B. 313, PG. 722
PIN: 5927-68-4669

VENABLE CREEK

UT2

UT2

UT2A

EXCLUDE SYCAMORE AND
BLACK CHERRY UPSTREAM
OF THIS LOCATION

N/F
CHARLES E. BROWNE &
LU ANN VENABLE BROWN
D.B. 1209, PG. 520 (TRACT 2)
P.I.N. 5927-00-59-9301

MATCHLINE SHEET 2.4

MATCHLINE SHEET 2.3

N

0' 50' 100' 150'
(HORIZONTAL)

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Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina

Planting Plan

Revisions:

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Drawn By:	HCC
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Sheet 2.5

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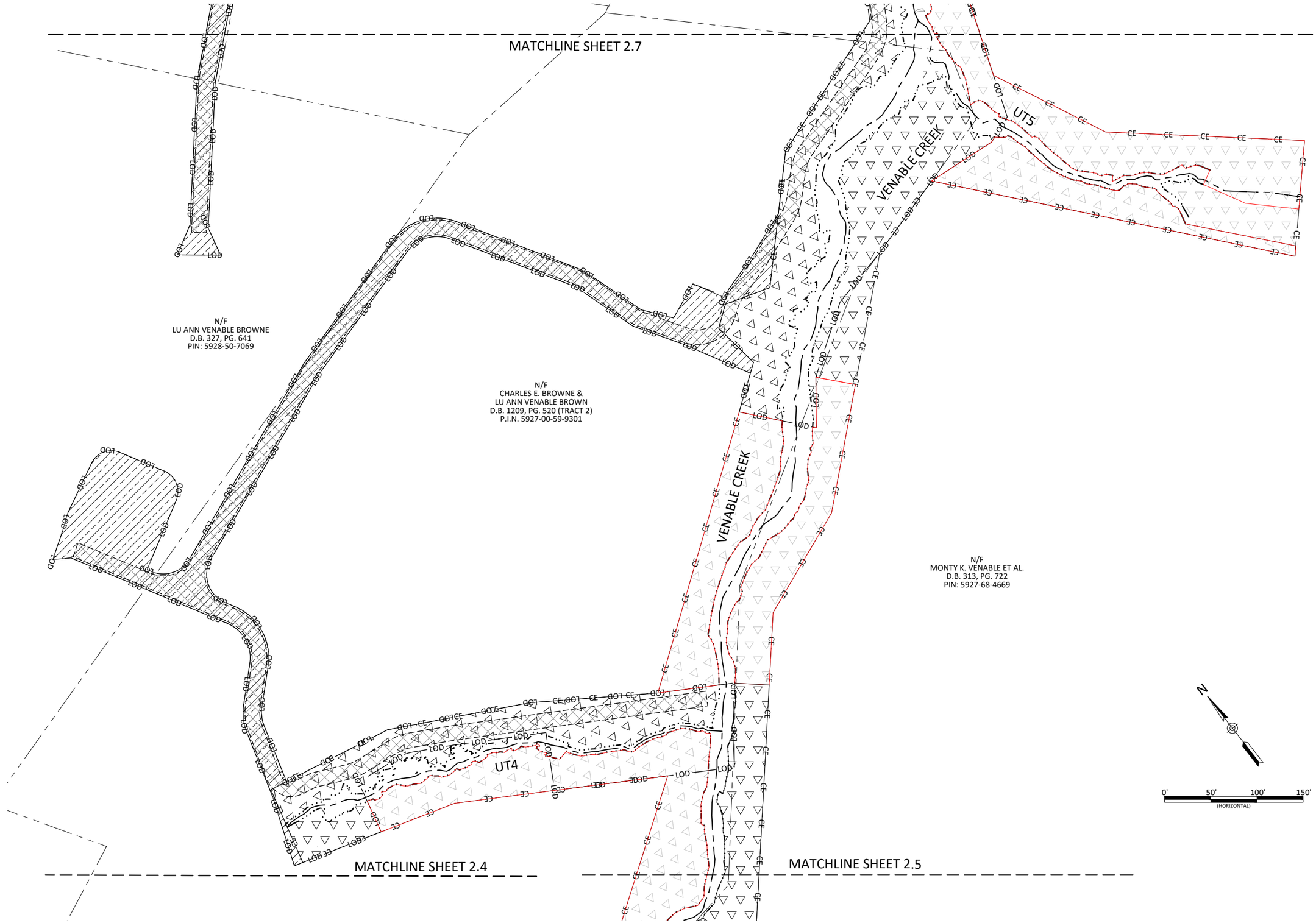

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Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina

Planting Plan

Date:	June 18, 2021
Job Number:	005-02123
Project Engineer:	ASE
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Sheet 2.6

June 30, 2021

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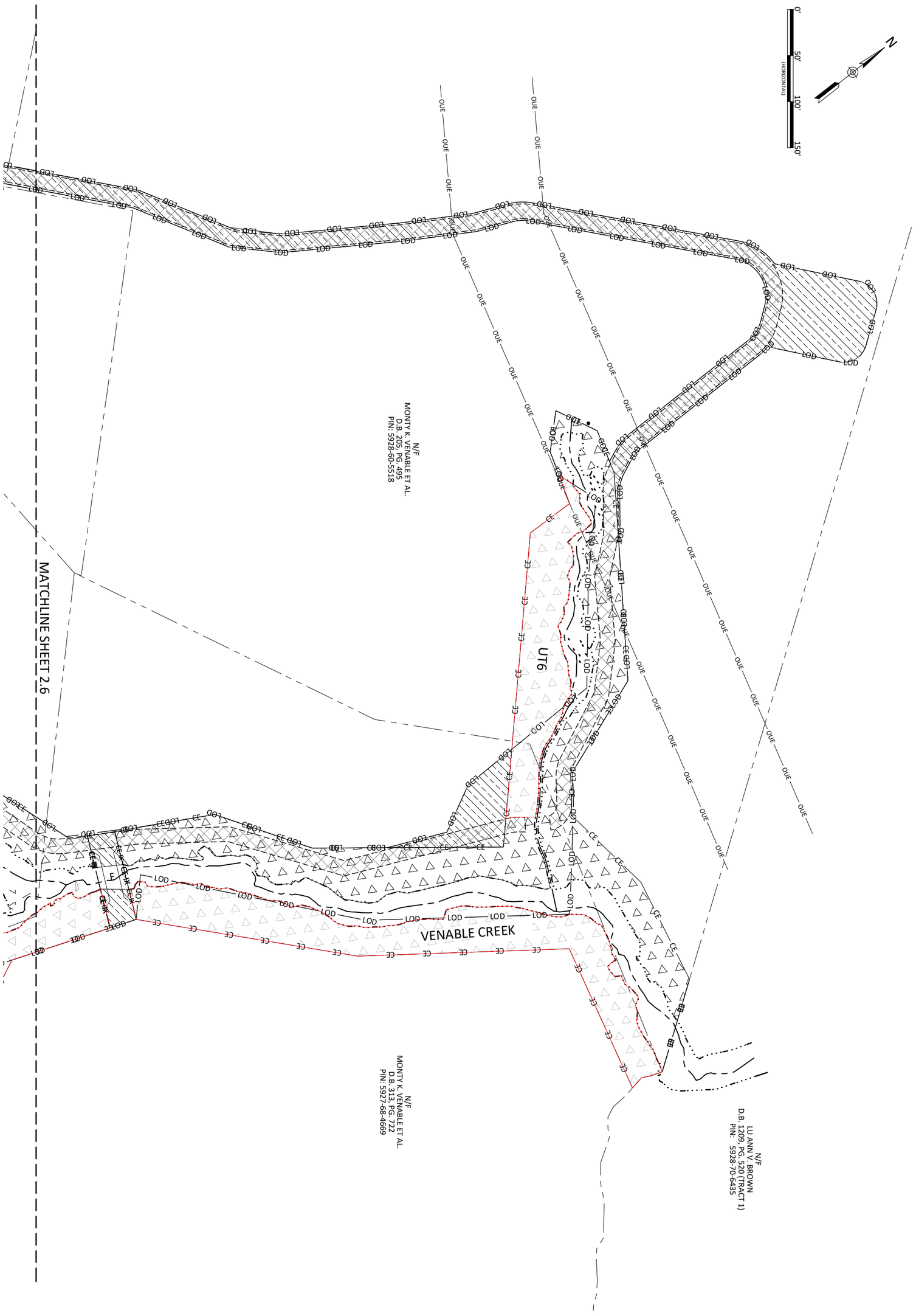

Date:	June 18, 2021
Job Number:	005-02123
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Drawn By:	HCC
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2.7
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Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina

Planting Plan

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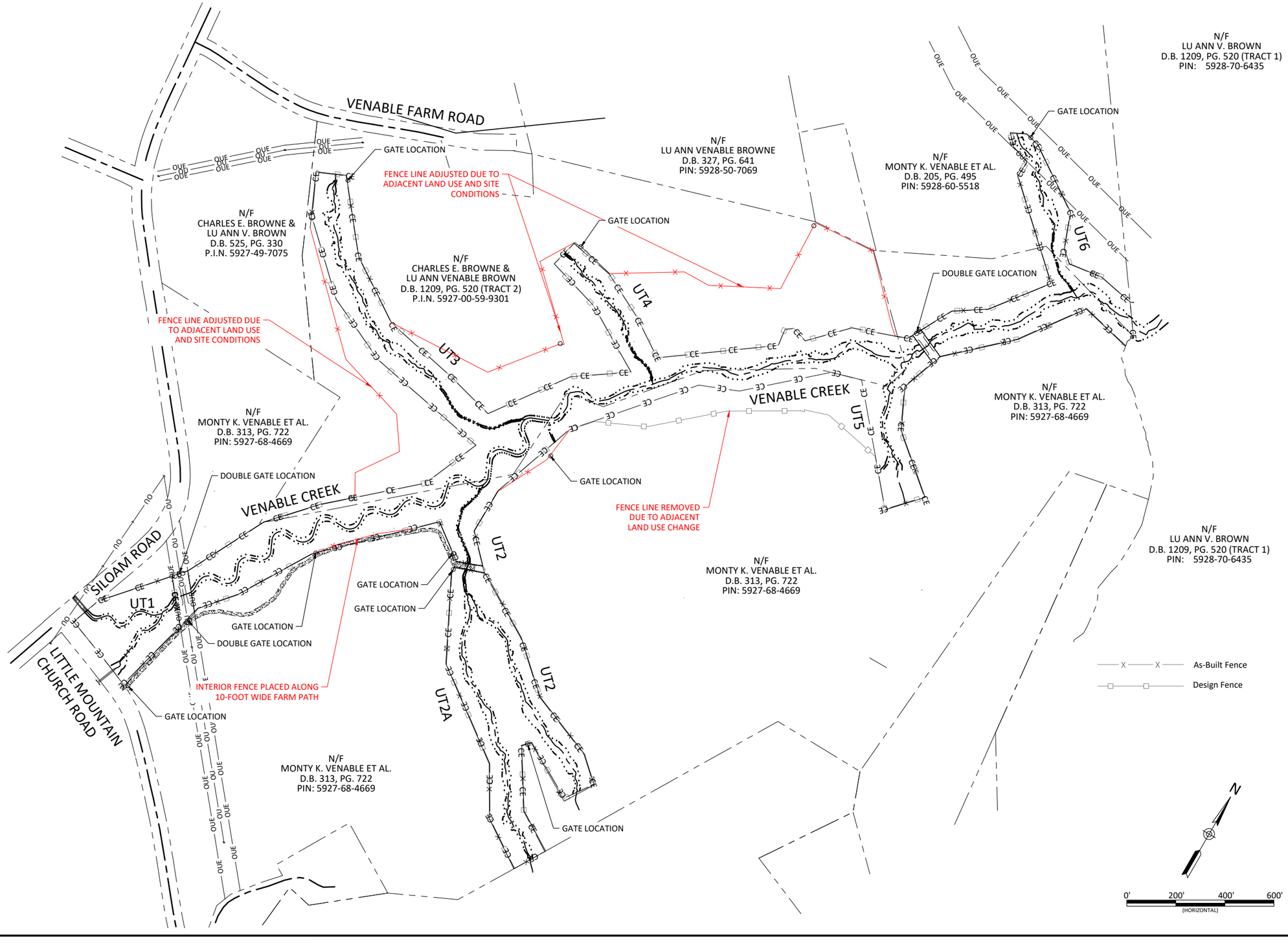

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7-2-21

Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina

Fencing Overview
Fencing

Revisions:

Date:	June 25, 2021
Job Number:	005-02123
Project Engineer:	ASE
Drawn By:	HCC
Checked By:	JCK

Sheet 3.1