

## **Request for Proposals**

### **Cottonwood Creek Stream Restoration – Phase 1**

### **Lyndon B. Johnson National Grassland, Texas**

**Background and Statement of Work:** Prior to European settlement, the Cross Timbers Ecoregion was a hydrologically rich and disturbance-maintained system driven by landscape-scale fire and grazing by large herbivores. However, historic land disturbance and agricultural practices have led to extreme degradation of the Cottonwood Creek watershed. Severe incision and entrenchment are present along Cottonwood Creek, its tributaries, and along ephemeral lateral conveyances. Headcuts are actively migrating up the valleys causing increased incision and lateral instability. Grade control is largely absent and where it does occur, it is primarily temporary in nature and is composed of debris jams or roots. The Project contains some limited stream areas that are cut down to bedrock, therefore, further incision is unlikely in these locations.

The main goals of the project are to improve the stability of the Cottonwood Creek watershed and to reduce downstream sediment loading. This goal will be met by stabilizing select headcuts, and this restoration goal will be observable after construction. The vision for this restoration project is to increase sustainability at the Project; which will be implemented through activities such as the stabilization of additional headcuts and the utilization of native vegetation. The design strategy is to reduce disturbance to the existing, stable, and vegetated areas as much as possible. By supporting natural design and restoring the whole ecosystem through the usage of native vegetation, stream and ecosystem resilience will be enhanced, which will further reinforce Project stability. The Project will utilize rocked step-down structures to stabilize headcuts, slow water velocity, and allow for pooling and subsequent infiltration of water into groundwater.

#### **Information Requested**

If interested in submitting a bid for this project, please provide a proposal for the above statement of work by providing:

- technical approach
- work experience
- cost
- capacity for this project
- experience in similar projects

Specific requirements are detailed below.



## I. PROJECT OVERVIEW AND REQUIREMENTS

### General Specifications

- (a) Description of Work – This Request for Proposals is for restoration services related to stream restoration activities on the Cottonwood Creek Stream Restoration – Phase 1 Project, including the following:
1. Restoration activities described in Appendix A: Technical Specifications and Draft Design Plan Set for Locations: #1, #6, #13, #14, and #26.

The Contractor shall identify what they can supply in terms of materials, labor, equipment, supplies, supervision, quality control, and incidentals required to complete the work described. The Contractor shall perform all work in a safe and conscientious manner.

- (b) Project Location – LBJ National Grasslands; Wise County, Texas
- (c) Work Schedule – Implementation is expected to begin in January 2024 and completed by March 31, 2024.

### Other Project Requirements and Specifications

- I. Utilities – In many locations there will be no or limited sanitation, water, electrical or housing services available. The Contractor shall make its own arrangements for temporary facilities if needed.
- (b) Specifications – Project work shall be accomplished in accordance with the following:
- Appendix A: Technical Specifications and Draft Design Plan Set

### Insurance Requirements

Upon selection of the winning bid, the Contractor agrees that it has and shall maintain the following insurance coverage indicated below. The effective date of all coverage shall precede the start of any work.

- a. State minimum workers' compensation insurance coverage for its employees, if any.
- b. Broad form general liability, property damage, and automotive liability insurance in the minimum amount of \$1,000,000 for bodily injury, death, or damage to property of any person and \$2,000,000 for bodily injury, death, or damage to property of more than one person. The Contractor shall name NFF an Additional Named Insured and provide NFF with a certificate of insurance evidencing such coverages, prior to the initiation of the Scope of Services.
- c. If the Scope of Services includes professional services as identified herein, Contractor shall also provide professional errors and omissions liability insurance. Professional services for purposes of this section include, but are not limited to performing architecture, engineering, landscape architecture, land surveying or planning, preparation and signing or stamping of drawings, maps, surveys or construction specifications, or design and development of computer software,



programs or websites by the Contractor or by subcontractors on behalf of the Contractor, for which professional liability insurance would typically be required. The minimum coverage limits required are \$1,000,000 for each claim and \$1,000,000 annual aggregate.

### **Prohibited Telecommunications Services and Equipment**

The Contractor is responsible for compliance with the prohibition on certain telecommunications and video surveillance services or equipment identified in 2 CFR 200.216.

### **Payment/Performance Security**

Contractor shall post cash, a letter of credit, bond, or other financial security that is easily convertible into cash in a form acceptable to the NFF, in its sole determination, to assure completion of the work required under any subsequent agreement and payment of all amounts lawfully due to all persons supplying or furnishing to the Contractor or Contractor's subcontractors with labor, laborers, materials, rental machinery, tools or equipment used or to perform the work. Contractor may incorporate required associated costs into mobilization costs or other approved expenses.

- a. Work that is classified as construction in accordance with the Miller Act or Little Miller Act or if required per conditions of the funding source, payment and performance bonding will be required in the full amount of any Agreement. For the purposes of this Request for Proposal, construction is defined as "any contract greater than \$100,000 for the construction, alteration, or repair of any public building or public work where the federal government is the owner", or
- b. If Contractor is not self-performing at least 85% of the total contract value or if the cost of materials is in excess of the larger of \$100,000 or 50% of the contract total, payment and performance bonding will be required in the full amount of the agreement, or
- c. If the value of the agreement is in excess of \$250,000, Contractor will be required to post financial security in a form acceptable to the NFF in the amount of 5% of the total agreement value up to \$250,000 in total financial security.

**American Made Products.** The work associated with this RFP is subject to Build America, Buy America Act. P.L. 117-58, Secs 70911-70917, and as such, domestic content procurement preference requires all iron and steel, manufactured products and construction materials used within the scope of this Agreement, be produced in the United States.

### **Federal Exclusion Verification**

The selected Contractor will be required to affirm that neither it nor its principals are presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

### **Federal Flowdown Provisions**

Flowdown Requirements: Any Agreement associated with this RFP may be subject to flowdown requirements under associated federal or state funding agreements, which are included and



made part of by this reference.

## II. REQUIRED COMPONENTS

### Technical Proposal

Please provide a detailed technical approach to the work.

### Contractor Qualifications

- I. Past Experience – Please provide a brief explanation of previous work experience with land management agencies.
- II. References – Please provide three professional references that can speak to past performance.

### Pricing Schedule

Contractor shall price work according to the schedule below. Prevailing wages are required per conditions of funding sources.

	Task/Item	Units	Unit Cost	Extended Cost
(a)	Location #1	1		
(b)	Location #6	1		
(c)	Location #13	1		
(d)	Location #14	1		
(e)	Location #26	1		
			<b>Total Bid</b>	

## III. SUBMISSION, EVALUATION, AND CONTACTS

### Contractor Selection Process

This is a request for proposals only and bids furnished are not offers from the National Forest Foundation. This request does not commit the National Forest Foundation to pay any costs incurred in the preparation or submission of the proposal or to contract for supplies or services.

The NFF will use the Evaluation Factors below to review each submitted bid. Based on the outcomes of that selection process, the NFF will notify successful and unsuccessful bidders by February 2, 2024, and will prepare a separate contract document.



## Evaluation Factors and Relative Importance

The following criteria will be used in the evaluation of submitted proposals, ordered from highest weighting (level 3) to lowest weighting (level 1).

### Level 3 Criteria

- Price / cost
- Equipment and contractor capability
- Timing of when contractor can begin and/or finish the project
- Past performance, references, and USFS feedback

### Level 2 Criteria

- Technical proposal / proposed approach to project
- Overall strategic benefits to meeting NFF goals and grant needs, requirements, and timelines

### Level 1 Criteria

- Benefits to the local community
- Relationship to local community

## Point of Contact

Please submit any questions about the project in writing to the Point of Contact.

Evan Ritzinger  
National Forest Foundation, Conservation Finance Program Manager  
[eritzinger@nationalforests.org](mailto:eritzinger@nationalforests.org)

Responses will be shared with known interested parties by email or otherwise posted at <https://www.nationalforests.org/rfp>.

## Bid Submission

Submit bids via email to [eritzinger@nationalforests.org](mailto:eritzinger@nationalforests.org) by January 24, 2024.

## Equal Opportunity Provider

In accordance with Federal law and U.S. Department of Agriculture policy, the National Forest Foundation is prohibited from discriminating on the basis of race, color, national origin, sex, age, religion, political beliefs, or disability.



# APPENDIX A

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## Cottonwood Creek Project

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### TECHNICAL SPECIFICATIONS

Wise County, Texas

NFF Contract Number: RP-806

NFF Project Codes: 1599023, 4034504. 4034506

Prepared for:

**National Forest Foundation**

Building 27, Suite 3, Fort Missoula Road  
Missoula Montana 59804  
406.542.2805

Prepared by:



Ecosystem Planning & Restoration, PLLC  
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Tomball, Texas 77377

December 2023

**ISSUED FOR BID**



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# 1 Technical Specifications

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## 1.1 Mobilization and Demobilization

### Description

The work shall consist of the mobilization and demobilization of the Contractor's forces and equipment necessary for performing the work required under the construction contract. This work shall not include mobilization and demobilization for specific items of work for which payment is provided elsewhere in the contract. Mobilization will not be considered as work in fulfilling requirement for commencement of work.

### Materials and Methods

Mobilization shall include all activities and costs for transportation of personnel, equipment, and operating supplies and facilities to the site; establishment of offices, and other necessary facilities for the Contractor's operations at the site; premiums paid for performance and payment bonds, including co-insurance and re-insurance agreements as applicable; and other items as specified in this specification.

Demobilization shall include all activities and costs for transportation of personnel, equipment, and supplies not included in the contract from the site; including the disassembly, removal and site cleanup and repair of any facilities assembled on the site for this contract.

This work includes mobilization and demobilization required by the contract at the time of the award. If additional mobilization and demobilization activities and costs are required during the performance of the contract as a result of the changed, deleted, or added items of work for which the Contractor is entitled to an adjustment in contract price, compensation for such costs will be included in the price adjustment for the item or items of work changed or added.

Items of work to be performed by the Contractor and included under mobilization and demobilization:

- All work necessary to mobilize and demobilize construction personnel, equipment, and operating supplies and facilities as described herein.
- Properly and safely identifying and securing the construction accesses, staging areas, stockpile areas, and material handling areas. Prior to construction activities, the Contractor shall identify and mark boundaries of the staging areas and stockpile areas as directed by the Engineer. Acceptable materials for identifying the construction areas include highly visible tape, road signs, barricades, cables, safety fencing, etc.
- Stockpiling all construction materials, including, but not limited to, stone, riprap, gravel, erosion and sedimentation control devices and materials, etc. in the staging area. Any soil materials that are stockpiled shall have a silt fence properly installed to ensure soil materials are contained.
- Do not stockpile soil materials within tree protection zones if applicable.
- Providing watertight tanks or barrels, sealed with plastic sheeting, to be used to dispose of chemical pollutants, such as drained lubricating or transmission oils, greases, soaps, concrete mixer wash water, asphalt, etc., produced as a by-product of the construction work. At the completion of construction, facilities shall be disposed of off-site.



- Providing chemical toilets, which shall be placed in the staging area away from heavy equipment, and a minimum of 100 feet from waterways. At the completion of construction, facilities shall be demobilized.
- Identifying all utilities, including underground and aboveground utilities. The Contractor is responsible for ensuring that these utilities are not damaged or otherwise interrupted during construction. The Contractor will promptly notify the Owner if there is discovery of any conflicts between the utilities and the design.
- Installing specified construction entrances, in accordance with the approved permits, and as shown on the construction plans.
- Complying with all regulatory requirements and provide and/or coordinate traffic controls as necessary. The Contractor shall protect existing site features to remain including curb and gutter, pavement, and utilities. The Contractor shall maintain access for fire-fighting equipment and access to fire hydrants. Any damage to existing features must be replaced by the Contractor at his expense and as required and approved by the appropriate regulatory authorities and Owner.
- Properly removing and discarding of all debris and trash at the project site in accordance with all applicable local, state, and federal regulations.
- Installation and removal of temporary fencing of sufficient strength to exclude livestock from the work areas.

#### **Method of Measurement and Payment**

***Mobilization and Demobilization: Lump Sum (LS)***

### **1.2 Required Construction Equipment**

#### **Description**

Industry standard trackhoe with hydraulic thumb, of sufficient specification, condition, and design, as required to perform the work. Additional equipment may include dump trucks, loaders, or skid steers.

#### **Methods and Materials**

The Contractor is required to install structures using a trackhoe with a hydraulic thumb of sufficient specification, condition, and design, to move specified stone, logs, wood mats, and other required construction materials.

#### **Method of Measurement and Payment**

***Required Construction Equipment: Incidental to Mobilization and Demobilization***

### **1.3 Construction Surveys, Field Engineering, and Field Measurement**

#### **Description**

The construction surveys and layout services will be performed by the Contractor's Surveyor (Surveyor). All construction surveys and layout shall be performed under the responsible charge of a licensed Professional Land Surveyor (PLS). Information sufficient to lay out and construct the proposed project shall be provided to the Contractor/Surveyor by the Engineer one time prior to beginning construction.



Two acceptable options for construction surveys and layout are presented below. The contractor may use either or a combination of both.

Option 1 - Contractor shall utilize the contract documents to build a three-dimensional digital model of the work and utilize construction equipment with real-time GPS survey equipment equipped that can be used to accurately establish locations and grades. Contractor shall engage a professional land surveyor as necessary to establish benchmarks and control points and to lay out the Work where GPS survey equipment cannot function properly, and to regularly verify, document, and certify the accuracy of the work installed by the Contractor's equipment-mounted real-time GPS survey equipment.

Option 2- Contractor will engage a professional land surveyor to layout the work using traditional methods and accepted surveying practices. The construction survey provided will include the following, at a minimum:

- Proposed thalweg (centerline) points with all stakes showing the centerline station number.
- All proposed stream bed features (heads of riffles, runs, pools, and glides, and maximum (max) pools, with all stakes showing the centerline station number, proposed elevation, and proposed cut/fill depth.
- All proposed in-stream structures at the proposed thalweg, with all stakes showing the centerline station number, proposed invert elevation, and proposed cut/fill depth.

The Surveyor shall label and flag all stakes and control points with survey flagging to make them clearly visible and distinguishable. The Surveyor shall provide to the Contractor the location and elevation of the control points and benchmarks to be used by the Contractor during construction.

The Contractor is required to provide initial construction surveying or layout services, and shall also conduct all field measurement services as required to ensure, demonstrate, and document that the work is installed in accordance with the construction contract documents. The Contractor is required to conduct all field engineering and field measurements to measure, verify and record daily, as construction progresses:

- The proposed stream dimensions (depths and widths of structures), pattern (horizontal location), and profile (elevations).
- Proposed floodplain and terrace dimensions, locations and elevations.
- All in-stream structure geometry, dimensions, locations, and elevations.

The Contractor shall use extra caution to avoid disturbance of all construction surveying, staking and survey control points at all times. If the Owner determines that an unacceptable or unreasonable number of stakes and/or survey control points are disturbed by the Contractor during construction, the Contractor, at his own cost, will be required to perform re-staking of such points to the minimum requirements listed above, all under the responsible charge of a licensed Professional Land Surveyor (PLS), and to the satisfaction of the Owner. The Contractor shall promptly report to the Owner the disturbance, loss, destruction, or relocation of any reference or survey control point caused by construction, changes in grade, or other reasons. All disturbed survey control points shall be replaced based on the original survey control and such replacement shall not be conducted without prior written notice from the Owner.



### **Methods and Materials**

The Contractor shall use industry standard equipment and practices for conducting all surveying, field engineering and field measurement services. At a minimum, the contractor shall have a laser level for checking grade in support of field engineering and field measurement services. Such equipment shall be kept on-site in working order at all times, including certified calibration. The Contractor shall maintain a current log of all such work as indicated herein. The Contractor shall record deviations from required lines and levels. The log shall include beginning and ending dates and times of surveys, weather conditions, name and duty of each field engineering and field measurement party member, and types of instruments, tapes, devices, and equipment used. The log shall be available to the Owner for review upon request.

If there are any questions or discrepancies pertaining to the survey work and/or field engineering and field measurement work, the Contractor shall immediately notify the Owner for clarification, including the need for additional survey control, prior to doing the construction work. The Contractor shall furnish all stakes, templates, straightedges, and other devices necessary for checking, marking, and maintaining points, lines and grades in support of all field engineering and field measurement services. All field engineering and field measurement made by the Contractor, as provided above, shall be properly recorded in duplicate field notebooks satisfactory to the Owner. All pages shall be furnished to the Owner at the intervals requested. The instruments and other equipment used in surveying, field engineering and field measurement by the Contractor, as provided in this Section, shall be suitable and maintained in proper condition and adjustment for such use. Such field engineering and field measurements shall be performed by personnel qualified and experienced in such work.

### **Method of Measurement and Payment**

***Construction Surveys, Field Engineering and Field Measurements: Incidental to Mobilization and Demobilization***

## **1.4 Erosion and Sedimentation Control Measures**

### **Description**

The work shall consist of installing and maintaining structural measures and performing work to control erosion and minimize the production of sediment and other pollutants to downstream waters during construction operations. This item shall consist of all work necessary to control soil erosion and minimize the introduction of sediment and other pollutants to waterways.

The Contractor is required to:

- Perform weekly inspection of erosion and sedimentation control devices and documentation of their condition. Erosion and sedimentation control devices shall also be inspected within 24 hours following any rainfall event greater than 0.5 inches of rain per 24 hour period. Any devices which are not functioning adequately and/or properly shall be documented and immediately reported to the Owner and repaired.
- Install and maintain a rainfall gage at the site and shall maintain a written record of rainfall amounts and dates.
- Stabilization provided by temporary seeding and mulching shall be conducted on all disturbed areas within 24 hours. In addition, all slopes steeper than 3:1 shall be stabilized in similar manner



as soon as practicable, and within 7 calendar days, at the latest. All other disturbed areas and slopes flatter than 3:1 shall be stabilized within 14 calendar days from the last land-disturbing activity.

The Contractor is responsible for following the erosion and sedimentation control plan for the site and assumes liability for any fines or regulatory actions that may be imposed by the Contractor's failure to do so. All erosion and sedimentation control measures shall be adequately maintained in a functional condition during construction and until the site is stabilized, as determined by the Owner. All temporary erosion and sedimentation control measures shall be removed once the site is stabilized and accepted by the Owner, and the site is restored to original conditions, or better, as determined by the Owner.

### **Methods and Materials**

**Non-woven Geotextile Fabric** - Work under this section consists of furnishing all labor, materials, equipment, supplies, supervision and tools, and performing all work necessary for installation of non-woven geotextile fabric "filter fabric" as shown on the construction plans and as described herein.

The non-woven geotextile fabric (also referred to as "filter fabric" herein and on the construction plans) shall be Type 2 non-woven, stabilized to provide resistance to ultra-violet degradation and meet the following specifications for flow rates, strength, and permeability:

Property	Test Method	Minimum Specifications	
		English	Metric
Weight	ASTM D3776	8.0 oz/yd	248.03 g/m
Grab Tensile	ASTM D4632	200.0 lb	90.72 kg
Puncture	ASTM D4833	130.0 lb	58.97 kg
Flow Rate	ASTM D4491	80.0 gal/min	0.47 l/s/sm
Permittivity	ASTM D4491	1.5 l/sec	
UV Resistance	ASTM D4355	70%	

**Stone** - The work covered by this section consists of furnishing, stockpiling, placing and maintaining approved stone materials to be utilized to construct and maintain erosion and sedimentation control measures, and for use in other practices specified herein and/or as directed by the Engineer. This work includes all labor, materials, equipment, supplies, supervision, tools, etc. necessary for the installation of stone as shown on the construction plans.

All stone shall be composed of clean, tough, durable materials, free from fragments, fines, organic matter and deleterious substances. The stone shall be sound, tough, dense, resistant to the action of air and water, and suitable in all other respects for the purpose intended. All stone shall be native to the area and of natural colors(s) approved by the Owner. The size of an individual stone particle will be determined by measuring its long dimension.



Stone shall be placed in locations shown on the construction plans or as directed by the Engineer, to the thickness, widths, and lengths as shown on the construction plans and described herein or directed by the Engineer. All stone shall be placed in accordance with the construction plans, neatly and uniformly, and shall meet the approval of the Engineer.

The scheduling of the delivery of stone should be carefully coordinated to ensure that adequate supplies of stone are on site at all times such that construction progress is not delayed. Contractor is responsible for making all necessary arrangements with the source of supply in order to ensure an adequate supply of stone such that the work will not be unnecessarily delayed due to insufficient supply of such materials on site. Delivery of a large excess of stone is discouraged, as Contractor shall be responsible for disposal of all stone not incorporated into the project as directed by Owner. Contractor shall not be granted an extension of time or extra compensation due to delay caused by supply, delivery, or provision of, or sampling, testing, approval or disapproval of stone under the requirements of these specifications.

All stone shall be safely delivered, stockpiled, stored, and handled such that at no times the stockpiles are unstable or subject to collapse, rolling, or other movement that might pose threat to the safety of those in the vicinity of such stockpiles.

Stone should not be delivered, stockpiled, or otherwise handled when weather or site conditions are such that equipment delivering or handling the stone causes excessive rutting, pumping, erosion or other damage to the soils, site construction entrances, haul roads, staging and stockpile areas, or other site features.

**Gravel Construction Entrance** - A gravel construction shall be used to access the project site for the duration of construction. These entrances are temporary and shall be removed and the area restored to its original state when they are no longer needed or permanent measures are installed. The locations for the gravel construction entrances are shown on the construction plans.

The non-woven geotextile fabric used to construct the gravel construction entrance shall be as specified herein under "Non-woven Geotextile Fabric".

The stone used to construction the gravel construction entrance shall be washed and shall be 4-6 inches as measured along its longest axis.

Construct the gravel construction entrance as follows:

- Locate and construct entrances as shown on the construction plans, excavating to the minimum required depth to accommodate the washed stone and non-woven geotextile fabric depth.
- Clear the entrance and exit area of all vegetation, roots, and other objectionable materials and complete required final grading.
- Install culvert(s) in existing roadway ditches located under the proposed entrance if required.
- Install non-woven geotextile fabric and washed stone to the specific grade and dimensions shown on the construction plans.
- Install and smoothly place stone to provide positive drainage to drain stormwater to a suitable outlet.
- Maintain entrance in a condition to prevent mud and sediment from leaving the construction site. This may require periodic top dressing and/or replacement with new stone.
- Inspect entrances after each rainfall event and clean, maintain, and adjust as needed.



**Temporary Silt Fence** - Geotextile sediment fences (also referred to as "temporary silt fence" or "silt fence" herein and on the construction plans) shall be used to trap sediment from areas of limited runoff. Silt fence shall be properly anchored to prevent erosion under the bottom edges. Temporary silt fence shall be removed and the area restored to its original state when it is no longer needed or permanent measures are installed, all as directed by the Engineer. Locations for temporary silt fence are shown on the construction plans.

The woven geotextile fabric used to construct the temporary silt fence shall be industry standard polypropylene silt fence fabric, resistant to common soil chemicals, mildew, and insects; non-biodegradable; and in the longest continuous lengths possible.

Posts for temporary silt fence shall be a minimum of 5 feet long and shall be "U" or "T" section steel, with a minimum mass of 1.33 pounds per linear foot, with industry standard projections to facilitate secure attachment of silt fence fabric and wire mesh backing.

Wire mesh backing for temporary silt fence shall be considered industry standard for the purpose specified.

Install temporary silt fence as follows:

- Ensure height of temporary silt fence does not exceed dimensions shown on construction plans to avoid temporary silt fence failure.
- Construct temporary silt fence from continuous roll of fabric and mesh backing to avoid need for and to minimize number of joints. Overlap joints to next post in each direction when joints are required.
- Support temporary silt fence fabric with wire mesh backing fastened securely to the upslope side of the posts using heavy duty, industry standard wire staples or wire ties. Extend wire mesh support to the bottom of excavated trench.
- Space temporary silt fence posts a maximum of 6 feet apart.
- Temporary silt fence posts shall be driven into the ground a minimum of 24 inches.
- Staple or wire the temporary silt fence fabric and wire mesh backing concurrently together, directly to each post, in at least 3 locations, evenly spaced, at each post.
- Excavate trench to install bottom edge of temporary silt fence approximately 4 inches wide and 8 inches deep along proposed fence line upslope from the proposed temporary silt fence location.
- Backfill trench with compacted soil or gravel placed over the fabric to anchor temporary silt fence.
- Do not attach temporary silt fence to existing trees.
- Inspect temporary silt fence at least weekly and after every rainfall event, maintaining and repairing as needed.
- Remove temporary silt fencing after area has been stabilized and removal is approved by Owner. Bring area to grade and remove all unstable sediment deposits.

#### **Method of Measurement and Payment**

***Non-woven Geotextile Fabric: Incidental to Each Practice (Incidental)***

***Stone: Incidental to Each Practice (Incidental)***

***Gravel Construction Entrance: Each (EA)***



**Temporary Silt Fence: Linear Foot (LF)****1.5 Coir Fiber Matting****Description**

Coir fiber matting will consist of C-7 or comparable coir fiber matting to be installed in locations and as specified on the construction plans. Locations will primarily be on disturbed or graded streambanks and terrace slopes. Other areas may also require the installation of coir fiber matting as shown on the construction plans or as directed by the Owner. Both netting and thread material must be biodegradable.

**Methods and Materials**

**Coir Fiber Matting** - The coir fiber matting shall be a machine-produced mat or erosion control blanket of 100% coconut fiber intended for use as a channel lining with the following specifications and properties:

Matrix	100% Coconut Fiber (w/ biodegradable netting and thread)
Weight	20 oz/SY (678 gm/m <sup>2</sup> )
Open Area (measured)	50%
Max Flow Velocity	11.0 ft/sec (3.35 m/s)
Functional Longevity	24 Months
Size	6.67 ft x 164 ft (120 SY) or (100 SM)
"C" Factor	0.002

Property	Test Method	Typical
Thickness	ASTM D5199	0.28 in. (7.11 mm)
Resiliency	ECTC Guidelines	85%
Mass per Unit Area	ASTM D5261	10.72 oz/yd <sup>2</sup> (360 g/m <sup>2</sup> )
Water Absorption	ASTM D1117/ECTC	155%
Swell	ECTC Guidelines	40%
Stiffness/Flexibility	ASTM D1388	0.11 oz-in (1,218 mg-cm)
Light Penetration	ECTC Guidelines	16.40%
Smolder Resistance	ECTC Guidelines	Yes
MD Tensile Strength	ASTM D6818	342.0 lbs/ft (4.98 kN/m)



MD Elongation	ASTM D6818	7.60%
TD Tensile Strength	ASTM D6818	211.00 lbs/ft (3.08 kN/m)
TD Elongation	ASTM D6818	11.10%

**Small Anchors** - Small anchors shall be made from hardwood and not less than 12 inches in length with a notch cut 1 inch from the top. Small anchors shall be used to stake and secure the surface of the coir fiber matting to the underlying restored soil surface and shall typically be installed on a spacing approximately two (2) foot apart across the surface of the coir fiber matting in the pattern(s) or arrangement(s) as shown on the construction plans and as described herein.

**Large Anchors** - Large anchors shall be made from hardwood and shall have a minimum 1.5-inch by 1.5-inch cross-section, shall taper to a point, and shall be a minimum length of two (2) feet. The large anchors shall have a 2.5 inch galvanized roofing nail driven horizontally and perpendicularly through the square end of the stake so that 0.5 inches of nail is extruding from both sides of the stake. The nail is to be installed in the large stakes so the coir fiber matting will not slide past the exposed end of the stake once installed. Large anchors shall be used to secure the coir fiber matting at the toe of slope, top of the slope, and along all matting seams. Large anchors shall also be used to secure the center of the coir fiber matting blanked when full-width rolls (6.67 feet wide) of coir matting are required. Large anchors shall typically be installed on a spacing approximately three (3) foot apart along the surface of the coir fiber matting in the pattern(s) or arrangement(s) as shown on the construction plans and as described herein.

**Installation** - Prior to beginning of coir fiber matting installation, complete finished grading activities in area to receive matting installation in order to provide a smooth soil surface free from stones, clods, or debris that will prevent the contact of the coir fiber matting with the underlying soil. Install coir fiber matting immediately upon final grading. Take care to preserve the required line, grade, and cross section of the area to receive coir fiber matting. Apply all soil amendments, fertilizer, temporary and permanent seed, and mulch immediately prior to installing coir fiber matting.

Unroll the coir fiber matting onto the prepared soil surface without stretching the coir fiber matting such that the matting will lie smoothly but loosely on the entire soil surface. Fold, stake, and secure the upper or top edge of the coir fiber matting using large anchors installed at a maximum of three (3) feet apart. Where one roll of coir fiber matting ends and a second roll begins, overlap the end of the upper roll over the end of the second roll so there is an overlap of at least 6 inches. Overlap coir fiber matting edges at least 6 inches where 2 or more widths of matting are installed side by side.

Install large anchors at a maximum of three (3) feet apart along the toe of each length of coir fiber matting. Install large anchors at a maximum of three (3) feet apart along the coir fiber matting at matting ends, along all lapped coir fiber matting edges or seams, and at all coir fiber matting junctions. Large anchors shall also be installed at a maximum of three (3) feet apart along the center of each length of coir fiber matting when full-width rolls (6.67 feet wide) of coir matting are required.

Install small anchors at a maximum spacing of two (2) feet, in a row, evenly spaced in between each row of the installed large anchors along the entire length of each length of coir fiber matting.



The Owner may require adjustments to the coir fiber matting trenching and/or staking requirements to fit individual site conditions.

**Method of Measurement and Payment**

***Coir Fiber Matting: Square Yard (SY)***

***Small Anchors: Incidental to Coir Fiber Matting (Incidental)***

***Large Anchors: Incidental to Coir Fiber Matting (Incidental)***

## **1.6 Clearing and Grubbing**

**Description**

Clearing and grubbing shall consist of the cutting, digging up, and other required removal of, and satisfactory disposal of all unusable vegetation, as well the cutting, digging up, and other required removal, satisfactory harvest, handling and storage of all usable vegetation, all to include single and multi-trunked trees, shrubs, herbaceous vegetation, invasive species vegetation, and underbrush, as well as all associated roots mass from each type of vegetation. Clearing and grubbing shall also include removal and disposal of all other unspecified existing debris such as fencing, piping, and abandoned equipment, tires, structures, utilities, etc., as required by the Owner. Clearing and grubbing consists of furnishing all labor, materials, equipment, supplies, supervision and tools, and performing all work necessary to clear and grub the project areas as needed for construction and as shown on the construction plans and as described herein.

**Methods and Materials**

Unless otherwise allowed by the Owner, clearing and grubbing operations shall be conducted using the same mechanized equipment utilized for the other required project restoration construction activities. Clearing and grubbing on this project shall be performed only to the extent and to the limits necessary to construct and install the measures as shown on the construction plans and as described herein.

The quantity of clearing and grubbing shall be limited to that needed for the progress of daily construction activities, unless otherwise directed by the Engineer. All debris resulting from clearing and grubbing activities, not otherwise suitable vegetation transplants, in-stream structure construction materials, for backfill or other project applications, becomes the property of the Contractor and is to be satisfactorily disposed of off-site in a lawful manner.

**Method of Measurement and Payment**

***Clearing and Grubbing: Lump Sum (LS)***

## **1.7 Earthwork**

**Description**

Earthwork shall consist of all of the necessary earth moving operations required to construct the project to the lines and levels specified in the construction plans and described herein. Earthwork may include, but may not be limited to excavation, filling, grading, handling, and stockpiling of excess material, plugging



and filling channels and ditches, removing pond dams, removing existing roads, berm building, removing spoil berms and levees, and placement and compaction or satisfactory disposal of all materials encountered within the limits of the work necessary for the construction of the project. Removal of material, regardless of its nature or composition, is considered earthwork and may include, rock, soil materials, concrete, debris and obstructions. No changes in the contract sum or the contract time will be authorized for rock excavation or removal of concrete or other obstructions.

### **Methods and Materials**

Earthwork operations shall be conducted to construct the project to the lines and grades indicated on the construction plans with a horizontal and vertical tolerance of +/- 0.1 foot. All grading and excavation shall be conducted within the Limits of Disturbance as shown on the construction plans.

All topsoil to be excavated shall be stripped to whatever depths are encountered in a manner to prevent intermingling with underlying subsoil or other waste materials. The excavated topsoil materials shall be salvaged and used within the immediate work area to achieve final grades, hauled to another project area for use, or hauled to a disposal area. Topsoil shall be stockpiled separately from other materials. Excavated topsoil shall be used to achieve final grades. Topsoil shall be placed and spread evenly to a depth of at least 6 inches on top of subsoil materials to achieve final grades. Soil backfill used in areas to meet finished grade shall be relatively clean and free of debris. Soil backfill shall be compacted in horizontal lifts not exceeding 10 inches and placed at a 0 percent slope. All soil backfill material should be compacted with heavy equipment and shall be placed and compacted to a compaction standard of at least that of the surrounding/abutting undisturbed project soils.

Any areas to be filled with on-site soil materials shall be compacted with construction equipment. Areas which have been filled shall have additional soil fill material mounded over the top of the fill to a depth of approximately 6 inches to offset future settling. Under no circumstances shall trash be placed or disposed of into filled stream channel sections.

All project areas shall be graded evenly and smoothly to the slopes and elevations indicated on the construction plans and as described herein. The proposed grades shall be extended and connected to the surrounding undisturbed grades so that upon compaction and subsequent settlement, the resulting grades will be at the proper elevations specified on the construction plans.

### **Method of Measurement and Payment**

***Earthwork: Lump Sum (LS)***

## **1.8 In-Stream Structures**

### **Description**

The work shall consist of constructing and installing permanent structural measures, constructed primarily of natural stone materials, to stabilize the project stream channel systems, including streambed, streambanks, and floodplain, and to improve aquatic habitats and bedform diversity. In-stream structures include constructed cascade step pools. The quantity of in-stream structures to be constructed will be affected by actual conditions that occur during the construction of the project. The type and quantity of



structures may be increased or decreased at the direction of the Owner. Such variations in quantity will not be considered as alterations in the details of construction or a change in the character of the work.

### **Methods and Materials**

***Non-woven Geotextile Fabric*** – Non-woven geotextile fabric is installed, as described herein, to prevent sediment loss and stream flow through the structures that could otherwise compromise the structure. The work covered by this section consists of furnishing, stockpiling, placing and maintaining approved non-woven geotextile fabric to be utilized to construct in-stream structures, and for use in other practices specified herein and/or as directed by the Owner. This work includes all labor, materials, equipment, supplies, supervision, tools, etc. necessary for the installation of non-woven geotextile fabric as shown on the construction plans.

The non-woven geotextile fabric (also referred to as "filter fabric" herein and on the construction plans) shall be Type 2 non-woven, stabilized to provide resistance to ultra-violet degradation and meet the following specifications for flow rates, strength, and permeability:

Property	Test Method	Minimum Specifications	
		English	Metric
Weight	ASTM D3776	8.0 oz/yd	248.03 g/m
Grab Tensile	ASTM D4632	200.0 lb	90.72 kg
Puncture	ASTM D4833	130.0 lb	58.97 kg
Flow Rate	ASTM D4491	80.0 gal/min	0.47 l/s/sm
Permittivity	ASTM D4491	1.5 l/sec	
UV Resistance	ASTM D4355	70%	

***Stone*** – Various sizes and types of stone materials, each intended to serve specific functions, are to be used for the construction of in-stream structures. The work covered by this section consists of furnishing, stockpiling, placing and maintaining approved stone materials to be utilized to construct in-stream structures, and for use in other practices specified herein and/or as directed by the Engineer. This work includes all labor, materials, equipment, supplies, supervision, tools, etc. necessary for the installation of stone as shown on the construction plans.

All stone shall be composed of clean, tough, durable materials, free from fragments, fines, organic matter and deleterious substances. The stone shall be sound, tough, dense, resistant to the action of air and water, and suitable in all other respects for the purpose intended. All stone shall be native to the area and of natural colors(s) approved by the Owner.

The size of an individual stone particle will be determined by measuring its long dimension.



Stone shall be placed in locations shown on the construction plans or as directed by the Owner, to the thickness, widths, and lengths as shown on the construction plans and described herein or directed by the Owner. All stone shall be placed in accordance with the construction plans, neatly and uniformly, and shall meet the approval of the Owner.

The scheduling of the delivery of stone should be carefully coordinated to ensure that adequate supplies of stone are on site at all times such that construction progress is not delayed. Contractor is responsible for making all necessary arrangements with the source of supply in order to insure an adequate supply of stone such that the work will not be unnecessarily delayed due to insufficient supply of such materials on site. Delivery of a large excess of stone is discouraged, as Contractor shall be responsible for disposal of all stone not incorporated into the project as directed by Owner. Contractor shall not be granted an extension of time or extra compensation due to delay caused by supply, delivery, or provision of, or sampling, testing, approval or disapproval of stone under the requirements of these specifications.

All stone shall be safely delivered, stockpiled, stored, and handled such that at no times the stockpiles are unstable or subject to collapse, rolling, or other movement that might pose threat to the safety of those in the vicinity of such stockpiles.

Stone should not be delivered, stockpiled, or otherwise handled when weather or site conditions are such that equipment delivering or handling the stone causes excessive rutting, pumping, erosion or other damage to the soils, site construction entrances, haul roads, staging and stockpile areas, or other site features.

**Stone Backfill** – Stone backfill is specified for the construction of in-stream structures. The work covered by this section consists of furnishing, stockpiling, placing and maintaining approved stone backfill materials to be utilized to construct in-stream structures, and for use in other practices specified herein and/or as directed by the Owner. This work includes all labor, materials, equipment, supplies, supervision, tools, etc. necessary for the installation of stone backfill as shown on the construction plans.

Stone backfill shall be a well graded mix of 6", 12" and 2" crushed stone.

**Constructed Cascade Material** – Stone backfill is specified for the construction of in-stream structures. The work covered by this section consists of furnishing, stockpiling, placing and maintaining approved stone backfill materials to be utilized to construct in-stream structures, and for use in other practices specified herein and/or as directed by the Owner. This work includes all labor, materials, equipment, supplies, supervision, tools, etc. necessary for the installation of stone backfill as shown on the construction plans.

Stone backfill shall be a well graded mix of 6", 12", and 24" crushed stone.

**In-stream Structures (General)** –Prior to beginning the construction and installation of in-stream structures, the Contractor shall:

- Use an excavator with a hydraulic thumb for the installation of in-stream structures. The excavator and all appurtenances shall be of sufficient size and condition to perform the work.
- Verify that all materials, including non-woven geotextile fabric, stone, stone backfill, on-site alluvium backfill, coir fiber matting and anchors, temporary and permanent seed, all specified soil



amendments, and mulching, are on site prior to beginning the construction of any in-stream structures.

- Identify and quantify, where feasible, the existing materials at the project site specified for in-stream structure construction, if any, prior to beginning construction, as well as throughout construction, including stone, stone backfill, on-site alluvium, and vegetation transplants, that meet the requirements specified above and are otherwise suitable for use in the construction of in-stream structures.
- Verify weather conditions and proceed with installation of in-stream structures only when existing and/or predicted weather conditions permit.
- Verify the suitability of existing substrates where the in-stream structures are to be installed.
- Verify with the Owner that the in-stream structures are at the location and grade indicated on the construction plans.
- Verify each in-stream structure type, size, orientation, location, and elevation by field measurements and surveying prior to and during installations.
- In the situation where installation of an in-stream structure may damage existing tree roots, excavation shall be minimized. This may include reducing the length of the structure. The decision to minimize or otherwise adjust said excavation shall be field determined and directed by the Owner.
- Non-woven geotextile fabric shall be installed between soil material and placed stone on each in-stream structure to create a "sealed" structure to prevent sediment loss and stream flow through the structure and thus prevent compromise of the structure.
- Place stone backfill to the proposed invert/thalweg elevations as shown on the construction plans.

**Cascade Step Pool (Types 1, 2, and 3)** – Cascade Step Pools shall be constructed by building a series of rock cascades with downstream plunge pools lined with stone backfill between each cascade. Soil material shall be placed in the channel bed as needed to bring the channel bed up to approximately 2-feet below the finished channel bed elevation of the pool sections. This soil material shall be well compacted using heavy machinery including the bucket of the excavator. Filter fabric shall be placed on top of the soil material. Any seams shall overlap a minimum of 4'. Stone backfill consisting of a well graded mix of 6" and 12" stone shall be placed to a depth of at least 2' thick on top of the filter fabric. Stone backfill material will be thicker in the locations at the heads of the constructed riffles as shown on the detail. Cascade material consisting of a well graded mix of 6", 12", and 24" crushed stone shall be placed on top of the stone backfill as shown on the plans and detail. The contractor shall ensure that this material is packed and extends to the edges of the channel and up the channel banks slightly. Below each constructed cascade, a pool 1.0 feet deep will be maintained and lined with stone backfill. The upstream most constructed cascade shall be constructed starting at the top of the headcut elevation to prevent further upstream bed degradation and the downstream most cascade shall tie into the existing channel bed. Pool side slopes shall be lined with even mix of 6" and 12" stone. Type 1 Cascade Step Pools are constructed by placing material within an existing headcut while not disturbing the adjacent banks where mature trees and vegetation are growing. The Cascade Step Pool material is placed within the existing channel from the channel bed if possible.

Type 2 Cascade Step Pools are constructed in the same manner with the exception that the adjacent banks are excavated to provide benching sloping to improve stability. Bench areas shall be 5' wide. Slopes of 5:1 (H:V) shall be excavated from the back of the bench to natural ground. All bench and slope areas shall



be brought up to finish grade with 6" of excavated and segregated topsoil and seeded, mulched, and matted with coir fiber matting.

Type 3 Cascade Step Pools are constructed in the same manner as Type 1 with the exception that a stone sill is constructed at the step of each cascade step to tie the structure into the existing streambanks and provide additional stability. The stone sill shall extend 6' into the banks and will be constructed as deep as the constructed cascade/stone backfill is at each location. A trench shall be excavated at the location of each sill to the required depth, but no other existing streambanks upstream or downstream of the trench will be disturbed. The trench will be lined with filter fabric and the required amount of stone backfill and constructed cascade material will be used to fill the trench. The trench will then be backfilled to match the existing grade, seeded, mulched, and matted with coir fiber matting.

#### **Method of Measurement and Payment**

***Non-woven Geotextile Fabric: Incidental to Each Structure (Incidental)***

***Stone: Incidental to Each Structure (Incidental)***

***Stone Backfill: Incidental to Each Structure (Incidental)***

***Cascade Step Pool Type 1: Linear Foot (LF)***

***Cascade Step Pool Type 2: Linear Foot (LF)***

***Cascade Step Pool Type 3: Linear Foot (LF)***

## **1.9 Seeding**

### **Description**

The work shall consist of all temporary and permanent seeding activities. Temporary and permanent seeding will be used on all disturbed areas, areas susceptible to erosion, including, but not limited to streambanks, ditch banks, access areas, cut and fill slopes, staging and stockpile areas. Temporary and permanent seeding shall be conducted to control erosion and to establish permanent herbaceous stream buffer vegetation. Seeding will take place immediately after construction activities and final grading are completed in the disturbed areas. The work shall consist of preparing the area, furnishing and placing temporary and permanent seed, applying soil amendments, and mulch and anchoring mulch in the designated areas as specified. Temporary and permanent seeding shall take place immediately before coir fiber matting is installed.

A satisfactory seeded area is defined as follows:

- Where, at the end of the maintenance period (1 year), a healthy, uniform, close stand of the desired permanent and temporary herbaceous vegetation has been established, free of undesirable weeds and surface irregularities, with coverage exceeding 80 percent over any 10 square feet and bare spots not exceeding one square foot in size each.
- The Contractor shall re-establish areas not meeting these requirements at the direction of the Engineer until such requirements are met. If the Contractor is required to re-seed, the maintenance period starts over.



### **Methods and Materials**

For each seed or seed mixture, a certificate of analysis stating the botanical name and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed must be obtained from the respective seed vendor and provided to the Engineer. Include the production date and location and the packaging date and location. All seed and seed mixes shall be free from commonly known State and Federal prohibited noxious weed seeds. The Engineer must approve all seed and seed mixtures prior to the start of construction.

Seed shall be certified that the Pure Live Seed (PLS) percentage is equal to or greater than that which is specified on the Plant Schedules. If the PLS is less than specified, the Contractor shall increase the seeding rate to compensate for the PLS difference at his/her own expense.

All seed and seed varieties shall be free from State and Federal prohibited noxious weed seeds and the following:

<i>Annual bluegrass</i>	<i>Corn cockle</i>	<i>Spurred anoda</i>
<i>Bermuda grass</i>	<i>Dodder</i>	<i>Wild garlic</i>
<i>Bindweed</i>	<i>Giant foxtail</i>	<i>Wild onion</i>
<i>Cocklebur</i>	<i>Horse nettle</i>	

Proceed with seeding only when existing and forecasted weather conditions have been deemed suitable. Extreme periods of heat, drought, cold, or rainfall shall be reviewed and discussed with the Owner.

**Temporary Seeding** - For temporary seeding, apply the following vegetation at the listed rates and times. For each seed or seed mixture, a certificate of analysis stating the botanical name and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed must be obtained from the respective seed vendor and provided to the Engineer. Include the production date and location and the packaging date and location. All seed and seed mixes shall be free from commonly known State and Federal prohibited noxious weed seeds. The Engineer must approve all seed and seed mixtures prior to the start of construction.

The following lists temporary seed mix for the project site. All disturbed areas will be stabilized using mulch and temporary seed. Apply the following vegetation at the listed rates.

<b>SCIENTIFIC NAME</b>	<b>COMMON NAME</b>	<b>APPLICATION RATE</b>	<b>Dates</b>
Wheat	<i>Triticum aestivum</i>	20 LBS/ACRE	May 15 to September 15

**Permanent Seeding** - For permanent seeding, apply the following vegetation at the listed rates and times. Species may be substituted or removed from the specified mixtures upon approval of the Engineer. Permanent Riparian seed mixtures for the project site shall be planted throughout the conservation easement boundary and on all restored stream banks, floodplains, benches, and terraces. Permanent



non-riparian seed mixtures shall be applied to all disturbed areas outside of the conservation easement boundary. Permanent seed and temporary seed shall be applied simultaneously.

To ensure germination, planting should occur from September 15 through May 15. In the event that planting occurs before September 15 or after May 15, a cover crop must be planted. From May 15 – September 15 the cover crop will be wheat planted at a rate of 20 lbs. per acre. In the event a cover crop is planted, native seed must then be planted during the first sixty (60) days of the next available native seed planting season. In order to ensure a clean seedbed, prior to planting the native seed, the cover crop or any weeds must be terminated by shredding if directed by the authorized Forest Officer. The native seed mix shall be planted as directed within the area of the dead cover crop. In the event that after twenty-four (24) months the seeded land shall have less than sixty (60) percent vegetation cover of the adjacent, undisturbed land, the seeded land must be reseeded using the same methods described in this Section.

PERMANENT SEEDING – 6.25 lbs/acre		
SCIENTIFIC NAME	COMMON NAME	TOTAL POUNDS PER ACRE
<i>Bouteloua hirsuta</i>	Hairy gramma "Chaparral"	0.25
<i>Panicum virgatum</i>	Switchgrass – Blackwell or Cave in Rock	0.25
<i>Schizachyrium scoparium</i>	Little Blue Stem – OK Select	1.00
<i>Bouteloua curtipendula</i>	Sideoats gramma – Haskell	0.50
<i>Chloris cucullata</i>	Hooded Windmill Grass – Burnet	0.10
<i>Leptochloa dubia</i>	Green Spangletop – Van Horn	0.25
<i>Nassella leucotricha</i>	Texas Wintergrass	0.50
<i>Andropogon gerardii</i>	Big Blue Stem – Kenedy	0.30
<i>Sorghastrum nutans</i>	Indian Grass - Lometa	0.75
<i>Bouteloua rigidiseta</i>	Texas Grama – Atacosta	0.50
<i>Sporobolus cryptandrus</i>	Sand Dropseed – Taylor	0.10
<i>Engelmannia peristenia</i>	Engelmann's Daisy – Eldorado	0.75
<i>Acacia augustissima</i>	Prairie Acacia – Plains	0.25
<i>Chamaecrista fasciculata</i>	Partridge pea – Inoculated – Riley or Commanche	0.75
	<b>Total</b>	<b>6.25</b>

**Seedbed Preparation** - Prepare all seedbeds by adequately loosening to a minimum depth of 4 inches by ripping and/or disking. In areas where ripping and/or disking cannot be safely conducted, prepare compacted seedbeds by roughening, either by hand scarifying or by equipment, depending on site conditions. If seeding is done immediately following construction, seedbed preparation may not be required except on compacted, polished or freshly cut areas. The Owner will determine seedbed preparation condition and needs on-site.

**Soil Amendments** - The Contractor shall apply lime and fertilizer as specified by soil test results.

**Seeding** - Seed shall consist of seed varieties specified in the composition and vegetation planting schedules shown on the plans. Due to the small size of some permanent seed species and the low application rates, it may be necessary to mix the permanent seed with temporary seed or sand to distribute the seed at the stated application rate. If permanent seed is mixed with temporary seed, the temporary seed shall not be applied at a greater application rate than stated above.



Sow seed at the specified rates with spreader, seeding machine, seed drill, or by hydroseeding. Hydroseeding is the preferred method.

**Mulching** - Mulching is used to provide temporary protection of soil surfaces from erosion. Mulching application should be performed directly after seeding. Grain straw mulch should be applied on temporary seeded areas at a rate of 3 bales per 1,000 sq ft (130 bales per acre). Mulch shall be applied on streambanks along with the temporary and permanent seeding operations, under the coir fiber matting, immediately prior to the matting. Apply mulch uniformly by mechanical or chemical tacking methods.

**Maintenance** - Begin maintenance immediately after seeding and continue until seeded vegetation is well established and exhibits a vigorous growing condition. Maintenance includes:

- Watering
- Fertilizing and/or liming
- Weeding
- Replanting
- Re-mulching

**Repairs** – Any disturbances to areas outside the work areas such as hauls roads, etc., shall be re-vegetated with temporary and permanent seeding as specified herein, and/or per direction of the Owner.

Areas not disturbed shall not be seeded. All areas to be seeded shall conform to the finished grades as specified on the plans and be free of all weeds, trash, debris, brush, clods, loose rocks and other foreign materials larger than 3" in diameter or length that would interfere with seeding. All gullies, washes or disturbed areas that develop subsequent to final dressing shall be repaired prior to seeding.

No seeding shall be performed on frozen ground or when the temperature is 32°F/0°C or lower.

Seeding shall be accomplished by using a broadcast spreader, or as approved by the Engineer. All seeding equipment shall be calibrated before application to the satisfaction of the Engineer so that the material is applied accurately and evenly to avoid misses and overlaps. Seed installed by a broadcast spreader shall be capable of placing seed at the specified rate.

Seed shall be applied within the top ¼ inch of the soil in two different directions. The Contractor shall maximize the seed/soil contact by firming soil around the seed with a cultipacker, other similar equipment, or by hand raking.

#### **Method of Measurement and Payment**

***Temporary Seeding: Acre (AC)***

***Permanent Seeding: Acre (AC)***

### **1.10 Invasive Species Vegetation Control**

#### **Description**

The work shall consist of removing invasive species vegetation for the purpose of establishing native species buffer vegetation. Invasive species vegetation shall be removed from areas inside the limits of disturbance and inside the conservation easement. Removal shall be primarily accomplished mechanically through grading and clearing/grubbing activities along the streambank and riparian buffer



areas, and in conjunction with cutting and treating using appropriate herbicides within wooded or problematic areas.

### **Methods and Materials**

The Contractor shall be required to remove, treat, and control invasive species vegetation located within the conservation easement boundaries as encountered during construction, as directed by the Engineer. The cost of invasive species vegetation control will be considered incidental, which will include all material, labor, equipment, and related expenses associated to complete this task.

Prior to plant community restoration, invasive species vegetation, which exists within the easement, in the riparian areas, and along the streambanks, will be identified and treated according to the table below. Invasive species vegetation may be cleared by methods including, but not limited to, mechanically, mowing or cutting with a bush axe, saw, or other device that will not uproot existing native vegetation. Care should be taken to avoid exposure of surficial soils during the clearing of existing vegetation. Invasive species vegetation shall be treated in the fall before the planting of live stakes and again before the end of next the growing season.

SCIENTIFIC NAME	COMMON NAME	SUGGESTED REMOVAL TECHNIQUES
<i>Ligustrum sinense</i>	Chinese Privet	Cut, paint, and spray
<i>Lonicera japonica</i>	Japanese Honeysuckle	Spray
<i>Rosa multiflora</i>	Multiflora Rose	Cut, paint, and spray
<i>Hedera helix</i>	English Ivy	Spray
<i>Ailanthus altissima</i>	Tree-of-heaven	Cut, paint, and spray
<i>Paulownia tomentosa</i>	Princess Tree	Cut, paint, and spray
<i>Pueraria lobata</i>	Kudzu	Cut, paint, and spray
<i>Lygodium japonicum</i>	Japanese climbing fern	Spray
<i>Triadica sebifera</i>	Chinese tallow	Cut, paint, and spray
<i>Albizia julibrissin</i>	Mimosa tree	Cut, paint, and spray

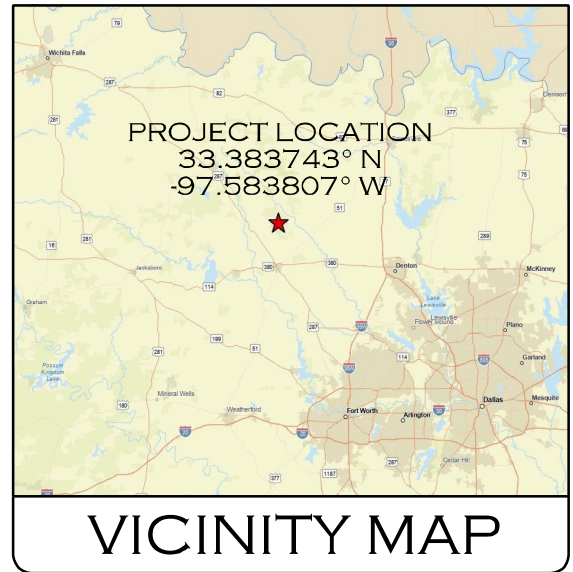
For woody invasive species vegetation, stems shall be cut by chainsaw or brush saw, handsaws or cutting blades as appropriate. Sawdust from stumps shall be removed before treatment to minimize deactivation of the herbicide. The Contractor shall treat cuts with backpack sprayer or utility spray bottle for spray applications or a wick applicator, lab wash bottle, or paintbrush (for small stems) with herbicide.

The Contractor shall take precautions to keep persons away from pesticide and herbicide-treated areas until the applied material is fully dry and the treated area is safe for entry. The Contractor shall follow the recommendations of the pesticide manufacturer and all applicable governmental and industry regulations.

### **Method of Measurement and Payment**

#### ***Invasive Species Vegetation Control: LS***



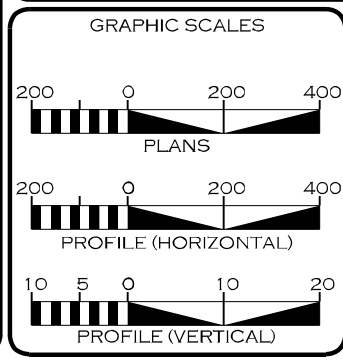
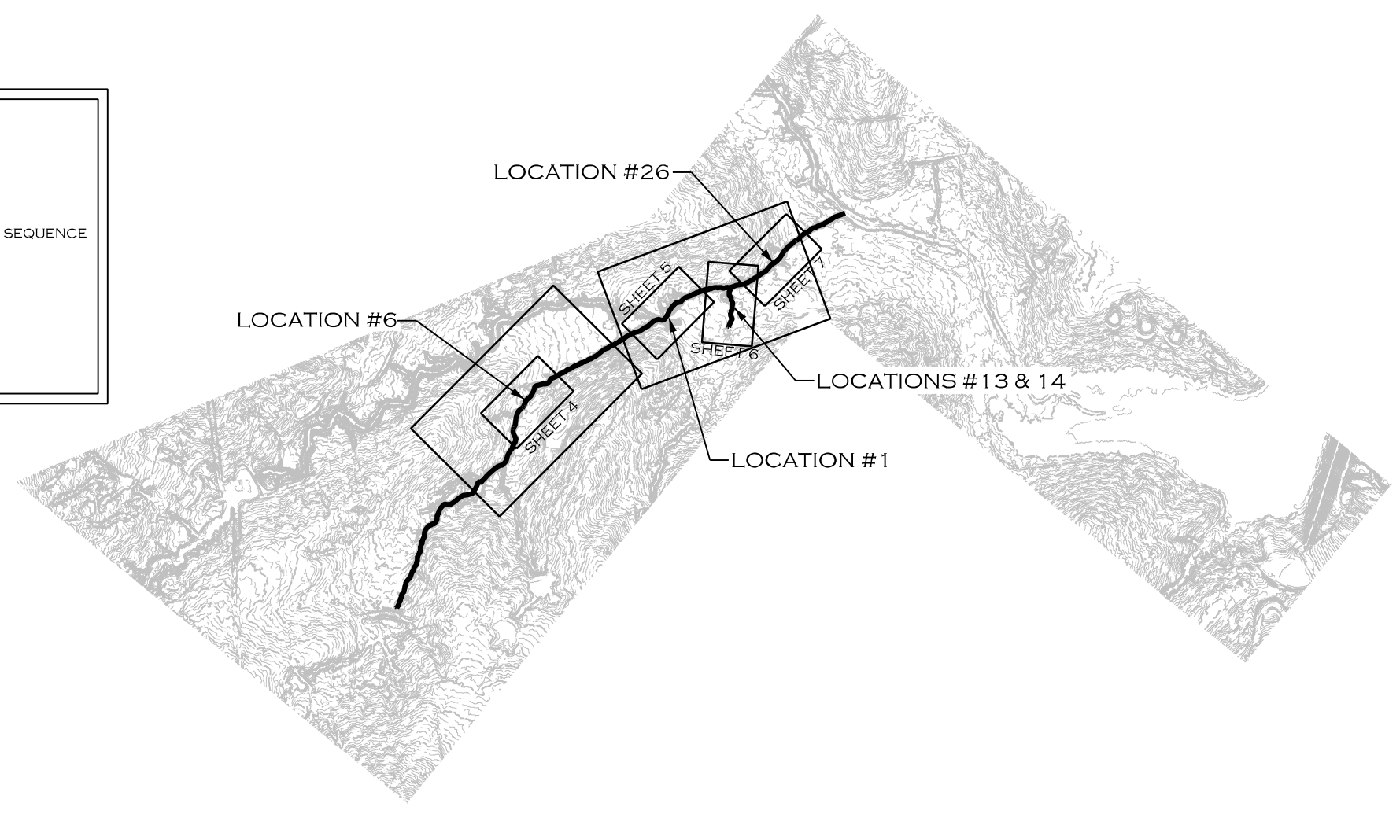


# NATIONAL FOREST FOUNDATION

## WISE COUNTY

LOCATION: WISE COUNTY, TX  
TYPE OF WORK: STREAM STABILIZATION

INDEX OF SHEETS	
1...	TITLE SHEET
2...	SYMBOLGY GENERAL NOTES
2A-2D...	DETAILS
3-3A...	VEGETATION SELECTION & CONSTRUCTION SEQUENCE
4-7...	PLAN & PROFILE
8-11...	VEGETATION PLAN
12-15...	EROSION CONTROL PLAN



REVISIONS				
NO.	DESCRIPTION	ENGR.	APPROV.	DATE
1	60% DESIGN PLANS	KLT	JB	11/30/23

PREPARED FOR:

NATIONAL FOREST FOUNDATION  
BUILDING 27, SUITE 3, FORT MISSOULA RD.  
MISSOULA, MT 59804

EVAN RITZINGER  
PROJECT MANAGER

PREPARED IN THE OFFICE OF:

ECOSYSTEM PLANNING & RESTORATION  
17575 N. ELDRIDGE PKWY.  
BUILDING C  
TOMBALL, TX 77377  
LICENSE #F-14997

TBD  
LETTING DATE:

KEVIN TWEEDY, PE  
PROJECT ENGINEER

PROJECT ENGINEER

PROGRESS DRAWING  
FOR REVIEW PURPOSES ONLY  
DO NOT USE FOR CONSTRUCTION

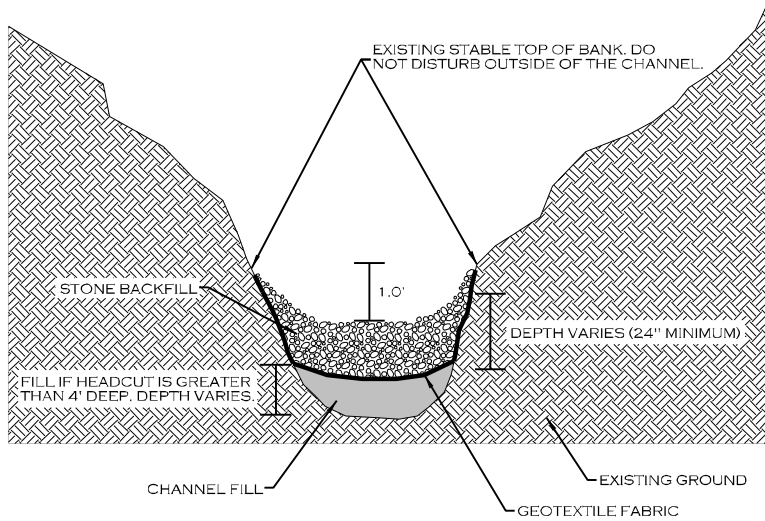
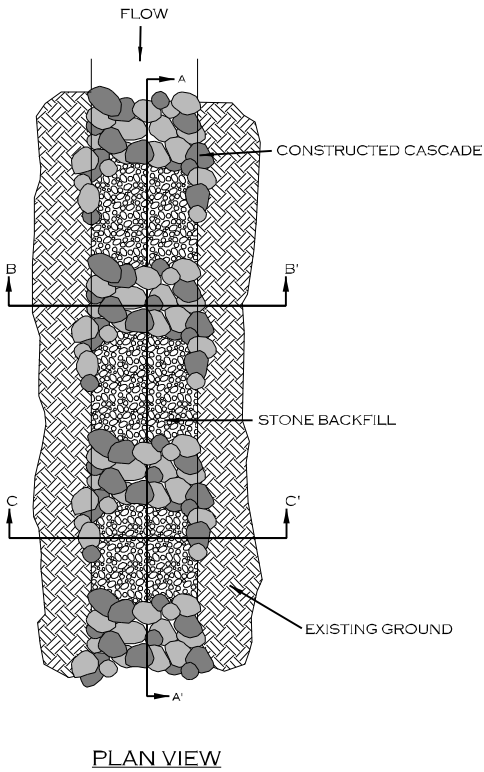
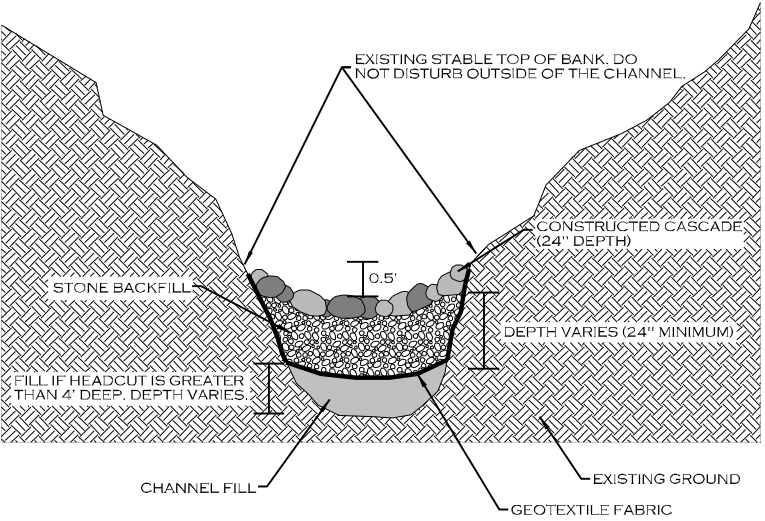
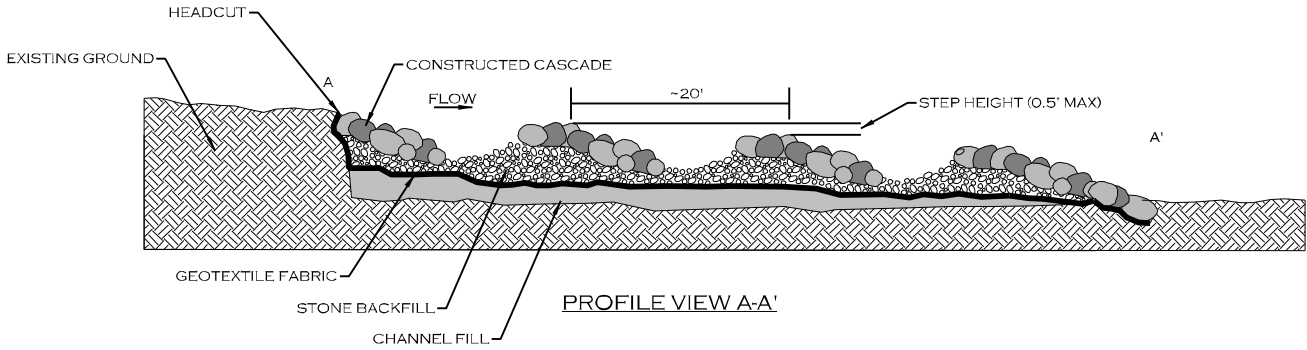
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CASCADE STEP POOL (TYPE 1)



GULLY STABILIZATION STEP POOL SPECIFICATIONS			
MATERIALS:		SPECIFICATIONS:	
CONSTRUCTED CASCADE MATERIAL	TYPE:	GRANITE OR COMPARABLE	
	SIZE:	EVEN MIX OF 6" CRUSHED STONE, 12" CRUSHED STONE, AND 24" RIP RAP	
	THICKNESS:	24" MIN.	
STONE BACKFILL	6" CRUSHED STONE, 12" CRUSHED STONE, AND 2" STONE (EVEN MIX)		
FILTER FABRIC	TYPE:	TYPE 2 NON-WOVEN	
	WIDTH UPSTREAM:	6 FT MINIMUM	
NOTES FOR GULLY STABILIZATION STEP POOL STRUCTURES:			
1. STONE BACKFILL MATERIAL SHALL BE WELL COMPACTED UNDERNEATH CONSTRUCTED CASCADE MATERIAL WITH BUCKET OF TRACK HOE.			
2. INSTALL GEOTEXTILE FILTER FABRIC AS SHOWN PRIOR TO INSTALLING STONE.			
3. INSTALL COIR FIBER MATTING ALONG COMPLETED BANKS SUCH THAT THE COIR FIBER MATTING AT THE TOE OF THE BANK EXTENDS DOWN TO THE UNDERCUT ELEVATION.			
4. FINAL CHANNEL BED SHAPE SHOULD BE ROUNDED, COMPACTED, AND CONCAVE, WITH THE ELEVATION OF THE BED APPROXIMATELY 0.5 FT DEEPER IN THE CENTER THAN AT THE EDGES.			
5. STEP HEIGHT (H) SHALL NOT EXCEED 0.5 FT.			
6. NUMBER OF REQUIRED STEPS WILL VARY DEPENDING ON HEADCUT DEPTH.			

REVISIONS				
NO.	DESCRIPTION	ENGR.	APPROV.	DATE
1	60% DESIGN PLANS	KLT	JB	11/30/23



COTTONWOOD CREEK PROJECT  
WISE COUNTY, TEXAS

PREPARED IN THE OFFICE OF:

 **ECOSYSTEM  
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RESTORATION**

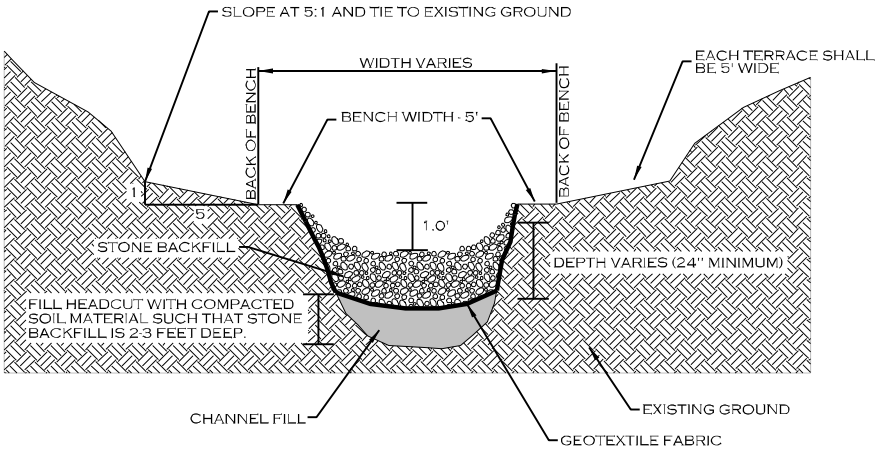
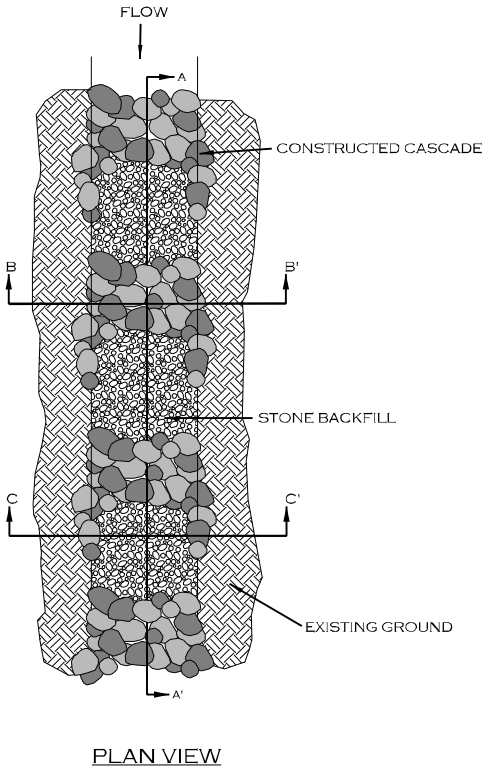
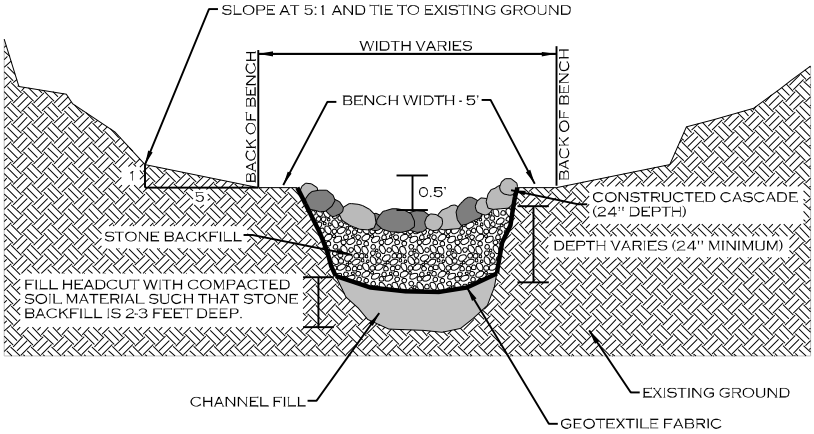
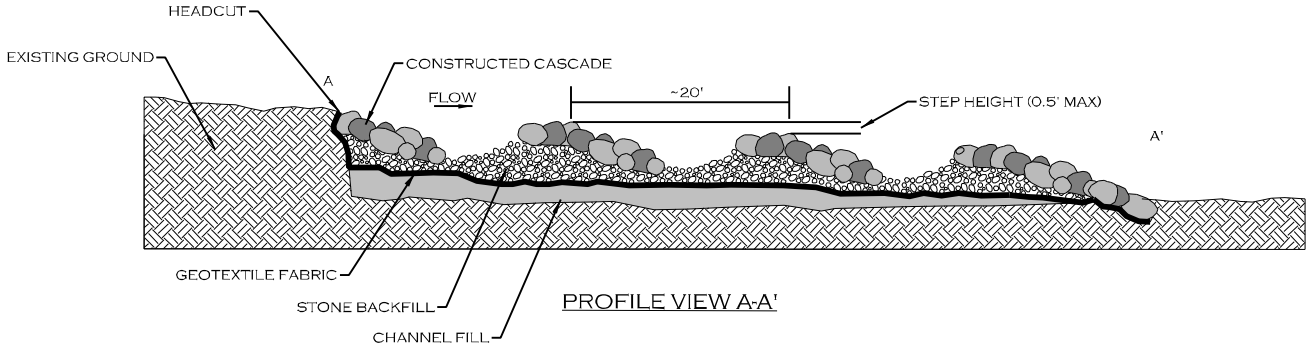
17575 N. ELDRIDGE PKWY.  
BUILDING C  
TOMBALL, TX 77377  
LICENSE #F-14997

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CASCADE STEP POOL (TYPE 2)



GULLY STABILIZATION STEP POOL SPECIFICATIONS		
MATERIALS:	SPECIFICATIONS:	
CONSTRUCTED CASCADE MATERIAL	TYPE:	GRANITE OR COMPARABLE
	SIZE:	EVEN MIX OF 6" CRUSHED STONE, 12" CRUSHED STONE, AND 24" RIP RAP
STONE BACKFILL	THICKNESS:	24" MIN.
		6" CRUSHED STONE, 12" CRUSHED STONE, AND 2" STONE (EVEN MIX)
FILTER FABRIC	TYPE:	TYPE 2 NON-WOVEN
	WIDTH UPSTREAM:	6 FT MINIMUM
<u>NOTES FOR GULLY STABILIZATION STEP POOL STRUCTURES:</u>		
1. STONE BACKFILL MATERIAL SHALL BE WELL COMPACTED UNDERNEATH CONSTRUCTED CASCADE MATERIAL WITH BUCKET OF TRACK HOE.		
2. INSTALL GEOTEXTILE FILTER FABRIC AS SHOWN PRIOR TO INSTALLING STONE.		
3. INSTALL COIR FIBER MATTING ALONG COMPLETED BANKS SUCH THAT THE COIR FIBER MATTING AT THE TOE OF THE BANK EXTENDS DOWN TO THE UNDERCUT ELEVATION.		
4. FINAL CHANNEL BED SHAPE SHOULD BE ROUNDED, COMPACTED, AND CONCAVE, WITH THE ELEVATION OF THE BED APPROXIMATELY 0.5 FT DEEPER IN THE CENTER THAN AT THE EDGES.		
5. STEP HEIGHT (H) SHALL NOT EXCEED 0.5 FT.		
6. NUMBER OF REQUIRED STEPS WILL VARY DEPENDING ON HEADCUT DEPTH.		

REVISIONS				
NO.	DESCRIPTION	ENGR.	APPROV.	DATE
1	60% DESIGN PLANS	KLT	JB	11/30/23



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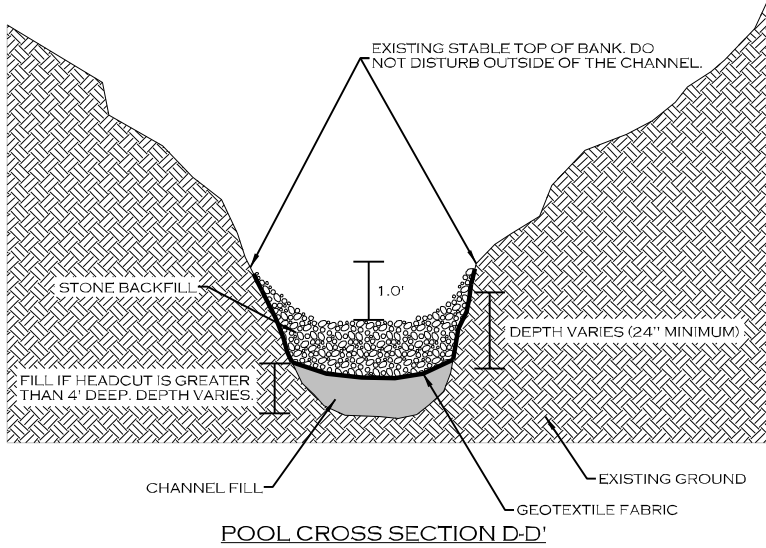
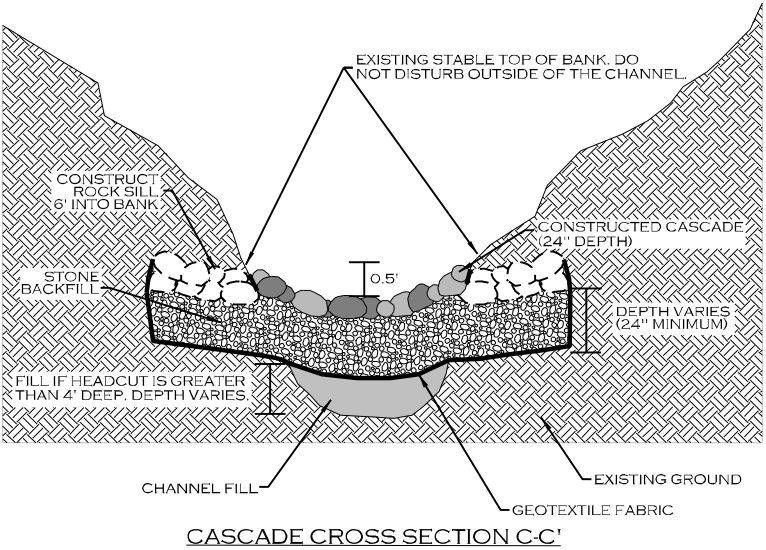
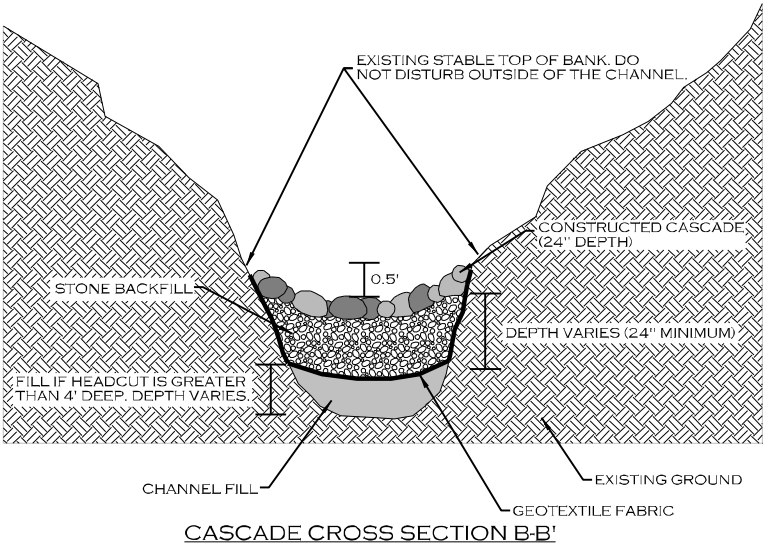
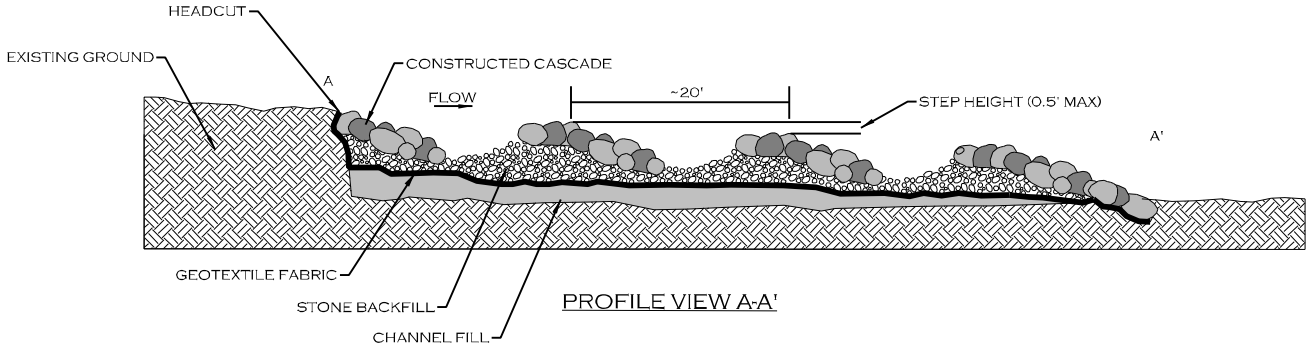
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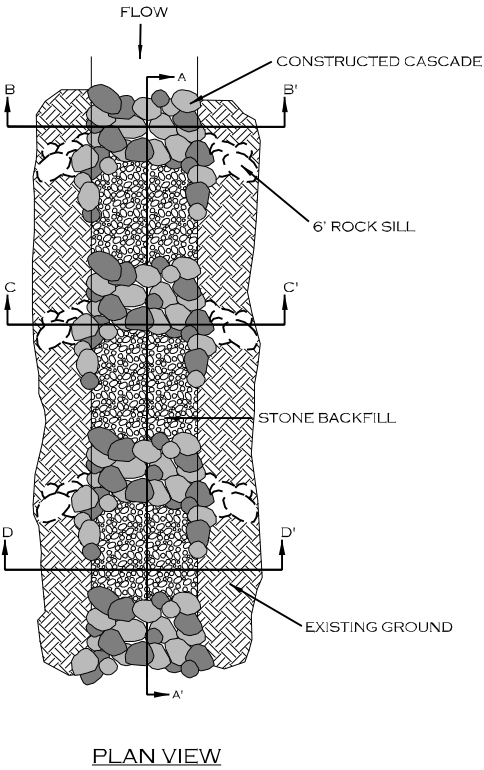
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CASCADE STEP POOL (TYPE 3)



GULLY STABILIZATION STEP POOL SPECIFICATIONS		
MATERIALS:	SPECIFICATIONS:	
CONSTRUCTED CASCADE MATERIAL	TYPE:	GRANITE OR COMPARABLE
	SIZE:	EVEN MIX OF 6" CRUSHED STONE, 12" CRUSHED STONE, AND 24" RIP RAP
	THICKNESS:	24" MIN.
STONE BACKFILL	6" CRUSHED STONE, 12" CRUSHED STONE, AND 2" STONE (EVEN MIX)	
FILTER FABRIC	TYPE:	TYPE 2 NON-WOVEN
	WIDTH UPSTREAM:	6 FT MINIMUM
<u>NOTES FOR GULLY STABILIZATION STEP POOL STRUCTURES:</u>		
1. STONE BACKFILL MATERIAL SHALL BE WELL COMPACTED UNDERNEATH CONSTRUCTED CASCADE MATERIAL WITH BUCKET OF TRACK HOE.		
2. INSTALL GEOTEXTILE FILTER FABRIC AS SHOWN PRIOR TO INSTALLING STONE.		
3. INSTALL COIR FIBER MATTING ALONG COMPLETED BANKS SUCH THAT THE COIR FIBER MATTING AT THE TOE OF THE BANK EXTENDS DOWN TO THE UNDERCUT ELEVATION.		
4. FINAL CHANNEL BED SHAPE SHOULD BE ROUNDED, COMPACTED, AND CONCAVE, WITH THE ELEVATION OF THE BED APPROXIMATELY 0.5 FT DEEPER IN THE CENTER THAN AT THE EDGES.		
5. STEP HEIGHT (H) SHALL NOT EXCEED 0.5 FT.		
6. NUMBER OF REQUIRED STEPS WILL VARY DEPENDING ON HEADCUT DEPTH.		



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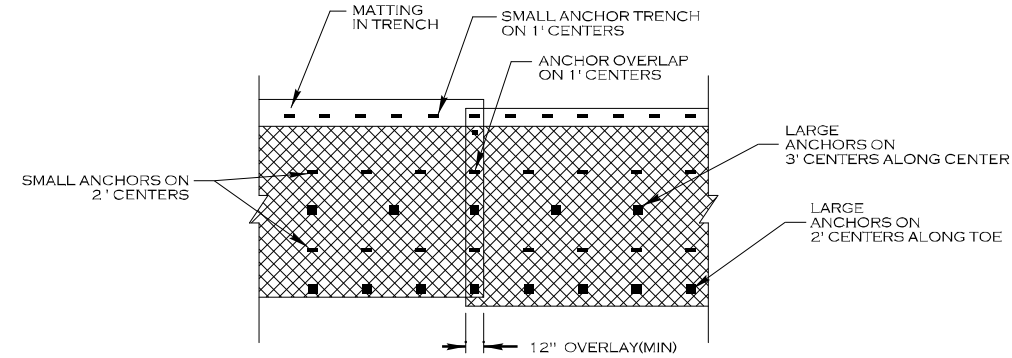
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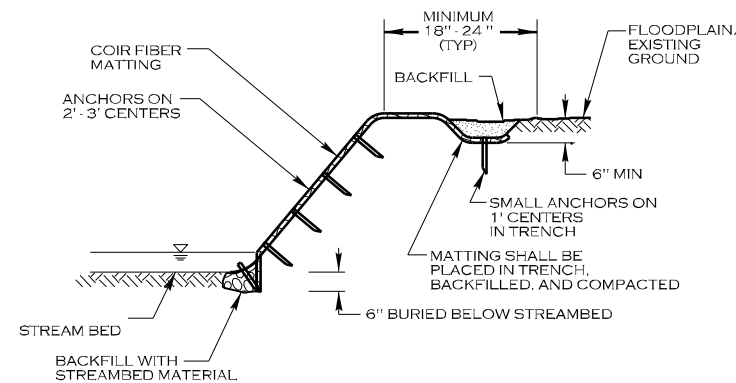


DETAILS

## COIR FIBER MATTING

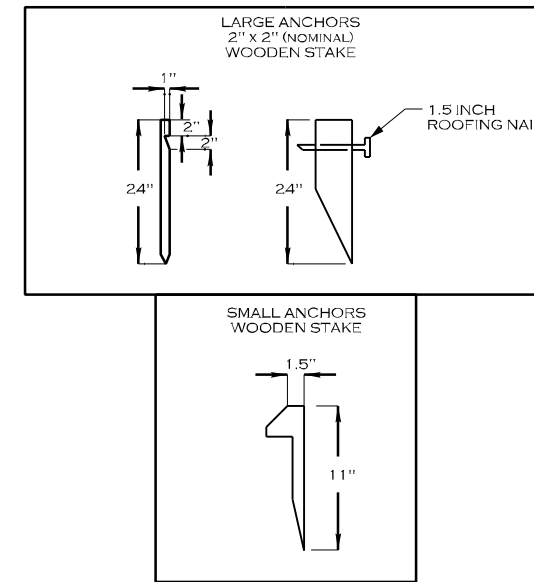


PLAN VIEW



TYPICAL CROSS SECTION

### ANCHOR OPTIONS



NOTES:

1. IN AREAS TO BE MATTED, ALL SEEDING, SOIL AMENDMENTS, AND SOIL PREPARATION MUST BE COMPLETED PRIOR TO PLACEMENT OF COIR FIBER MATTING.

[illegible]

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VEGETATION SELECTION

PERMANENT SEEDING – 6.25 lbs/acre		
The following table lists seeds mixtures to be dispersed in appropriate areas. Planting shall occur between September 15 and May 15. See Specifications for details.		
Total Seeding Area = 0.6 acre		
SCIENTIFIC NAME	COMMON NAME	TOTAL POUNDS PER ACRE
<i>Bouteloua hirsuta</i>	Hairy gramma "Chaparral"	0.25
<i>Panicum virgatum</i>	Switchgrass – Blackwell or Cave in Rock	0.25
<i>Schizachyrium scoparium</i>	Little Blue Stem – OK Select	1.00
<i>Bouteloua curtipendula</i>	Sideoats gramma – Haskell	0.50
<i>Chloris cucullata</i>	Hooded Windmill Grass – Burnet	0.10
<i>Leptochloa dubia</i>	Green Spangletop – Van Horn	0.25
<i>Nassella leucotricha</i>	Texas Wintergrass	0.50
<i>Andropogon gerardii</i>	Big Blue Stem – Kenedy	0.30
<i>Sorghastrum nutans</i>	Indian Grass - Lometa	0.75
<i>Bouteloua rigidiseta</i>	Texas Grama – Atacosta	0.50
<i>Sporobolus cryptandrus</i>	Sand Dropseed – Taylor	0.10
<i>Engelmannia peristenia</i>	Englemann's Daisy – Eldorado	0.75
<i>Acacia augustissima</i>	Prairie Acacia – Plains	0.25
<i>Chamaecrista fasciculata</i>	Partridge pea – Inoculated – Riley or Commanche	0.75
	Total	6.25

TEMPORARY SEED			
The following table lists temporary seed mix for the project site. All disturbed areas will be stabilized using mulch and temporary seed.			
Common Name	Scientific Name	Rate	Dates
Wheat	<i>Triticum aestivum</i>	20 LBS/ACRE	May 15 to September 15

CONSTRUCTION SEQUENCE

PHASE 1 – ENTIRE PROJECT  
MOBILIZATION AND GENERAL EROSION CONTROL

- LIMITS OF DISTURBANCE IS 1.02 ACRES.
- IDENTIFY AND LOCATE STAGING AREAS, STOCKPILE AREAS, CONSTRUCTION ENTRANCES, STREAM CROSSINGS REQUIRED FOR CONSTRUCTION ACCESS; LIMITS OF SILT FENCING, AND CONSTRUCTION ACCESS AND HAUL ROADS AS SHOWN ON PLANS.
- INSTALL CONSTRUCTION ENTRANCES.
- INSTALL CROSSINGS REQUIRED FOR CONSTRUCTION ACCESS.
- STOCKPILE MATERIALS IN DESIGNATED AREAS.
- INSTALL SILT FENCING TO THE LIMITS SHOWN ON THE PLANS AND AT ANY OTHER LOCATIONS AS DIRECTED BY THE ENGINEER. SILT FENCING WILL BE INSTALLED ALONG THE DOWNSLOPE/ STREAM SIDE LIMITS OF ALL STAGING AND STOCKPILE AREAS.
- UPON THE COMPLETION OF PHASE 1, THE CONTRACTOR SHALL SCHEDULE AN INSPECTION OF THE PHASE BY THE ENGINEER. THE CONTRACTOR MUST HAVE WRITTEN APPROVAL FROM THE ENGINEER THAT THE PHASE HAS BEEN COMPLETED TO SATISFACTORY STANDARDS BEFORE BEGINNING ANOTHER PHASE.
- EMERGENCY CONTACT FOR EROSION AND SEDIMENTATION CONTROL IS:

REESE SEWELL  
US FOREST SERVICE  
940-395-0042

NOTE: EACH PHASE WILL BE COMPLETED PRIOR TO BEGINNING WORK ON ANOTHER PHASE. UPON THE COMPLETION OF EACH PHASE, THE CONTRACTOR SHALL SCHEDULE AN INSPECTION OF THE PHASE BY THE ENGINEER. THE CONTRACTOR MUST HAVE WRITTEN APPROVAL FROM THE ENGINEER THAT THE PHASE HAS BEEN COMPLETED TO SATISFACTORY STANDARDS BEFORE BEGINNING ANOTHER PHASE.

ALL EXCAVATED SOIL MATERIALS NOT UTILIZED WILL BE STOCKPILED AND MAINTAINED ACCORDING TO THE PROJECT SPECIFICATIONS. WHILE ONSITE, UNUSED MATERIAL MUST BE LOCATED IN DESIGNATED STOCKPILE LOCATIONS AND MUST BE PROVIDED TEMPORARY OR PERMANENT STABILIZATION WITHIN 14 DAYS OF PLACEMENT.

AFTER THE COMPLETION OF CONSTRUCTION, ALL UNUSED SOIL MATERIALS SHALL BE SPREAD ONSITE, AT THE DIRECTION OF THE ENGINEER. SPREAD SOIL MUST BE STABILIZED USING SEEDING AND MULCH PER THE PROJECT SPECIFICATIONS WITHIN 14 DAYS OF PLACEMENT.

IF ANY EXCAVATED SOIL MATERIALS NEED TO BE, ARE SPECIFIED TO, AND ACTUALLY ARE DISPOSED OF OFF-SITE BY THE CONTRACTOR, THE CONTRACTOR IS RESPONSIBLE FOR DISPOSAL OF SUCH SOIL MATERIALS IN A PERMITTED AREA, AS WELL AS FOR PROVIDING AND IMPLEMENTING AN EROSION AND SEDIMENTATION CONTROL PLAN AND PERMIT, OR ANY OTHER REQUIRED PERMIT(S), FOR THE LOCATION(S) OFF SITE WHERE SUCH MATERIALS ARE DISPOSED.

PHASE 2 – COTTONWOOD CREEK STA. 29+72.00 TO 30+32.00 (LOCATION #6) AND 42+66.00 TO 43+36.00 (LOCATION #1)  
CHANNEL STABILIZATION IN PLACE

- PERFORM CONSTRUCTION STAKING.
- WORK WILL BE CONDUCTED ALONG COTTONWOOD CREEK IN THE WET. ALL REASONABLE ATTEMPTS SHALL BE MADE TO PREVENT AND LIMIT SEDIMENTATION TO COTTONWOOD CREEK DURING CONSTRUCTION ACTIVITIES.
- LOCATE AND FLAG ANY VEGETATION TRANSPLANTS, INCLUDING INDIVIDUAL SPECIMENS AND VEGETATED MATS.
- PERFORM REQUIRED CLEARING AND GRUBBING. SEGREGATE AND STOCKPILE TOPSOIL AND OTHER SOIL MATERIAL IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
- BEGINNING AT THE UPSTREAM END OF THE AREA OF ACTIVE CONSTRUCTION, PROCEED IN THE DOWNSTREAM DIRECTION WITH FLOODPLAIN, CHANNEL AND IN-STREAM STRUCTURE CONSTRUCTION AS SPECIFIED ON THE PLANS.
- PERFORM ALL TOPSOIL REPLACEMENT, VEGETATION TRANSPLANTING, SEEDING (TEMPORARY AND PERMANENT), SOIL AMENDMENT, MULCHING, AND INSTALLATION OF ALL COIR FIBER MATTING AS SPECIFIED ON THE PLANS AND THE PROJECT SPECIFICATIONS. ASSOCIATED DISTURBED STREAM BANKS WILL HAVE TEMPORARY AND PERMANENT SEED, SOIL AMENDMENTS, MULCH, AND COIR FIBER MATTING APPLIED TO THEM AS WORK PROGRESSES AND BY THE END OF EACH DAY. COIR FIBER MATTING WILL BE INSTALLED ON TOP OF THE SEEDED, AMENDED, AND MULCHED STREAM BANKS ACCORDING TO THE PROJECT SPECIFICATIONS.
- REMOVE AND DISPOSE OF ALL UNUSED VEGETATION AND EXCAVATED MATERIALS.
- ALL REMAINING DISTURBED AREAS ARE TO BE AMENDED, SEEDED, MULCHED AND MATTED ACCORDING TO THE PROJECT PLANS AND SPECIFICATIONS AND AT A MINIMUM WITHIN 14 DAYS OF DISTURBANCE.
- UPON THE COMPLETION OF PHASE 2, THE CONTRACTOR SHALL SCHEDULE AN INSPECTION OF THE PHASE BY THE ENGINEER. THE CONTRACTOR MUST HAVE WRITTEN APPROVAL FROM THE ENGINEER THAT THE PHASE HAS BEEN COMPLETED TO SATISFACTORY STANDARDS BEFORE BEGINNING ANOTHER PHASE.

11/30/2023  
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REVISIONS				
NO.	DESCRIPTION	ENGR.	APPROV	DATE
1	60% DESIGN PLANS	KLT	JB	11/30/23

PREPARED FOR:



COTTONWOOD CREEK PROJECT  
WISE COUNTY, TEXAS

PREPARED IN THE OFFICE OF:



17575 N. ELDRIDGE PKWY.  
BUILDING C  
TOMBALL, TX 77377  
LICENSE #F-14997

PROJECT ENGINEER

PROGRESS DRAWING  
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CONSTRUCTION SEQUENCE

TABLES

PHASE 3 – UT to COTTONWOOD CREEK STA. 10+90.00 to 12+00.00  
(LOCATION #14) AND 12+74.00 to 13+18.00 (LOCATION #13)  
CHANNEL STABILIZATION IN PLACE

1. PERFORM CONSTRUCTION STAKING.
2. WORK WILL BE CONDUCTED ALONG COTTONWOOD CREEK IN THE WET. ALL REASONABLE ATTEMPTS SHALL BE MADE TO PREVENT AND LIMIT SEDIMENTATION TO COTTONWOOD CREEK DURING CONSTRUCTION ACTIVITIES.
3. LOCATE AND FLAG ANY VEGETATION TRANSPLANTS, INCLUDING INDIVIDUAL SPECIMENS AND VEGETATED MATS.
4. PERFORM REQUIRED CLEARING AND GRUBBING. SEGREGATE AND STOCKPILE TOPSOIL AND OTHER SOIL MATERIAL IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
5. BEGINNING AT THE UPSTREAM END OF THE AREA OF ACTIVE CONSTRUCTION, PROCEED IN THE DOWNSTREAM DIRECTION WITH FLOODPLAIN, CHANNEL AND IN-STREAM STRUCTURE CONSTRUCTION AS SPECIFIED ON THE PLANS.
6. PERFORM ALL TOPSOIL REPLACEMENT, VEGETATION TRANSPLANTING, SEEDING (TEMPORARY AND PERMANENT), SOIL AMENDMENT, MULCHING, AND INSTALLATION OF ALL COIR FIBER MATTING AS SPECIFIED ON THE PLANS AND THE PROJECT SPECIFICATIONS. ASSOCIATED DISTURBED STREAM BANKS WILL HAVE TEMPORARY AND PERMANENT SEED, SOIL AMENDMENTS, MULCH, AND COIR FIBER MATTING APPLIED TO THEM AS WORK PROGRESSES AND BY THE END OF EACH DAY. COIR FIBER MATTING WILL BE INSTALLED ON TOP OF THE SEEDED, AMENDED, AND MULCHED STREAM BANKS ACCORDING TO THE PROJECT SPECIFICATIONS.
7. REMOVE AND DISPOSE OF ALL UNUSED VEGETATION AND EXCAVATED MATERIALS.
8. ALL REMAINING DISTURBED AREAS ARE TO BE AMENDED, SEEDED, MULCHED AND MATTED ACCORDING TO THE PROJECT PLANS AND SPECIFICATIONS AND AT A MINIMUM WITHIN 14 DAYS OF DISTURBANCE.
9. UPON THE COMPLETION OF PHASE 2, THE CONTRACTOR SHALL SCHEDULE AN INSPECTION OF THE PHASE BY THE ENGINEER. THE CONTRACTOR MUST HAVE WRITTEN APPROVAL FROM THE ENGINEER THAT THE PHASE HAS BEEN COMPLETED TO SATISFACTORY STANDARDS BEFORE BEGINNING ANOTHER PHASE.

PHASE 4 – COTTONWOOD CREEK STA. 52+28.00 to 53+22.00 (LOCATION #26)  
CHANNEL STABILIZATION IN PLACE

1. PERFORM CONSTRUCTION STAKING.
2. WORK WILL BE CONDUCTED ALONG COTTONWOOD CREEK IN THE WET. ALL REASONABLE ATTEMPTS SHALL BE MADE TO PREVENT AND LIMIT SEDIMENTATION TO COTTONWOOD CREEK DURING CONSTRUCTION ACTIVITIES.
3. LOCATE AND FLAG ANY VEGETATION TRANSPLANTS, INCLUDING INDIVIDUAL SPECIMENS AND VEGETATED MATS.
4. PERFORM REQUIRED CLEARING AND GRUBBING. SEGREGATE AND STOCKPILE TOPSOIL AND OTHER SOIL MATERIAL IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
5. BEGINNING AT THE UPSTREAM END OF THE AREA OF ACTIVE CONSTRUCTION, PROCEED IN THE DOWNSTREAM DIRECTION WITH FLOODPLAIN, CHANNEL AND IN-STREAM STRUCTURE CONSTRUCTION AS SPECIFIED ON THE PLANS.
6. PERFORM ALL TOPSOIL REPLACEMENT, VEGETATION TRANSPLANTING, SEEDING (TEMPORARY AND PERMANENT), SOIL AMENDMENT, MULCHING, AND INSTALLATION OF ALL COIR FIBER MATTING AS SPECIFIED ON THE PLANS AND THE PROJECT SPECIFICATIONS. ASSOCIATED DISTURBED STREAM BANKS WILL HAVE TEMPORARY AND PERMANENT SEED, SOIL AMENDMENTS, MULCH, AND COIR FIBER MATTING APPLIED TO THEM AS WORK PROGRESSES AND BY THE END OF EACH DAY. COIR FIBER MATTING WILL BE INSTALLED ON TOP OF THE SEEDED, AMENDED, AND MULCHED STREAM BANKS ACCORDING TO THE PROJECT SPECIFICATIONS.
7. REMOVE AND DISPOSE OF ALL UNUSED VEGETATION AND EXCAVATED MATERIALS.
8. ALL REMAINING DISTURBED AREAS ARE TO BE AMENDED, SEEDED, MULCHED AND MATTED ACCORDING TO THE PROJECT PLANS AND SPECIFICATIONS AND AT A MINIMUM WITHIN 14 DAYS OF DISTURBANCE.
9. UPON THE COMPLETION OF PHASE 2, THE CONTRACTOR SHALL SCHEDULE AN INSPECTION OF THE PHASE BY THE ENGINEER. THE CONTRACTOR MUST HAVE WRITTEN APPROVAL FROM THE ENGINEER THAT THE PHASE HAS BEEN COMPLETED TO SATISFACTORY STANDARDS BEFORE BEGINNING ANOTHER PHASE.

PHASE 4 – ENTIRE PROJECT  
DEMOBILIZATION AND SEEDING

1. COMPLETE REMAINING MINOR GRADING AND SITE PLANTING PREPARATION WORK, INCLUDING RIPPING AND/OR DISKING, AS SPECIFIED IN THE PROJECT SPECIFICATIONS.
2. ALL REMAINING DISTURBED AREAS, INCLUDING AREAS THAT HAVE BEEN RIPPED AND/OR DISKED ARE TO BE AMENDED, SEEDED, MATTED AND/OR MULCHED ACCORDING TO THE PROJECT SPECIFICATIONS AND AT A MINIMUM WITHIN 14 DAYS OF DISTURBANCE.
3. COMPLETE ALL REMAINING PROPOSED PERMANENT VEGETATION PLANTING PER THE PLANS AND PROJECT SPECIFICATIONS.
4. REMOVE AND DISPOSE OF ALL TRASH, METAL, AND DEBRIS FROM THE SITE ACCORDING TO LOCAL, STATE, AND FEDERAL REGULATIONS.
5. RESTORE CONSTRUCTION ACCESS ROADS, STAGING AREAS, AND STOCKPILE AREAS. IMMEDIATELY REGRADE, REPLACE TOPSOIL, AND SEED, AMEND, AND MULCH AS SPECIFIED IN THE PROJECT SPECIFICATIONS. SILT FENCE SHALL BE REMOVED ONCE THE SITE HAS BEEN STABILIZED WITH VEGETATION. ANY SOIL WASTING OR STOCKPILE AREAS THAT ARE TO REMAIN SHALL BE STABILIZED WITH TEMPORARY AND PERMANENT SEEDING AND MULCHING.
6. THE CONTRACTOR SHALL ENSURE THAT THE SITE CONDITIONS, INCLUDING ACCESS, HAUL ROADS, ENTRANCES, FIELDS, ETC. THAT WERE AFFECTED BY CONSTRUCTION ACTIVITIES AREA RETURNED TO THE PREVIOUSLY EXISTING CONDITION OR BETTER.

REVISIONS				
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1	60% DESIGN PLANS	KLT	JB	11/30/23



COTTONWOOD CREEK PROJECT  
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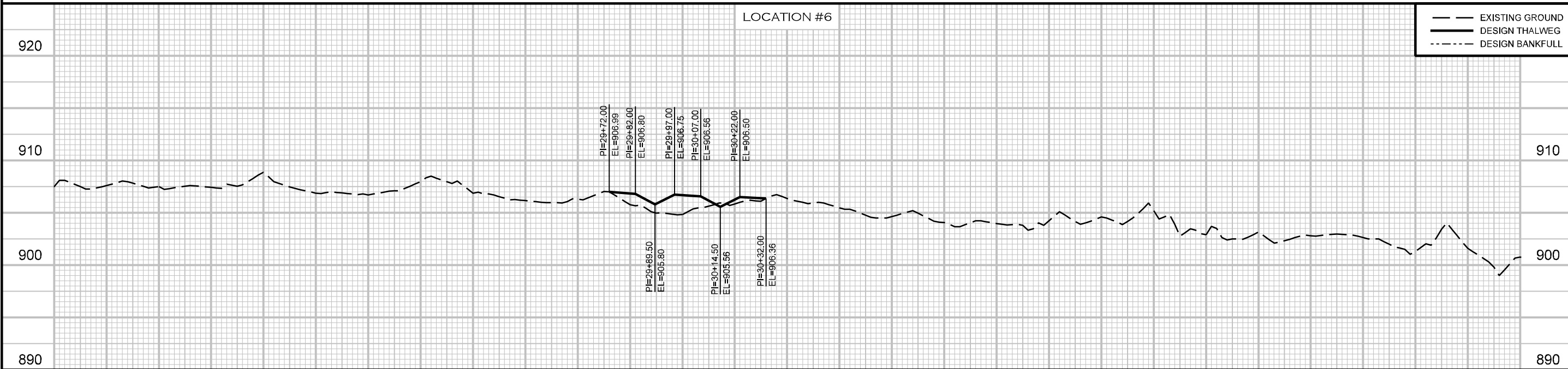
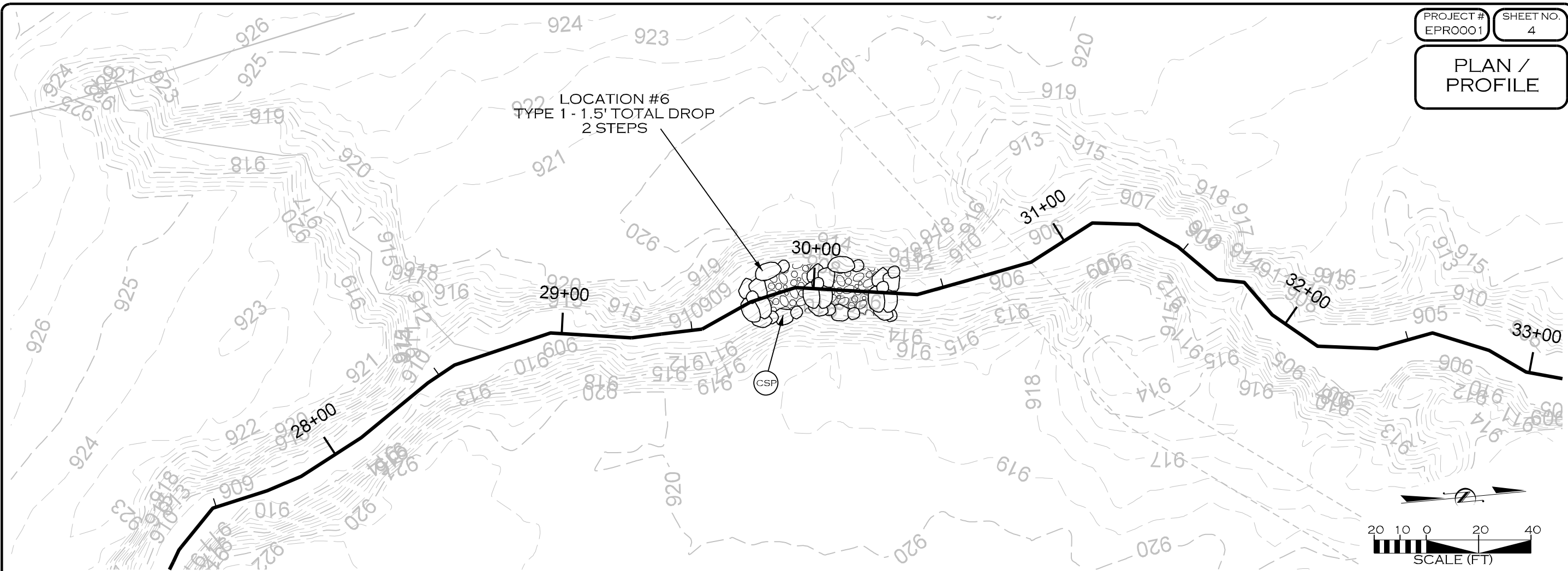
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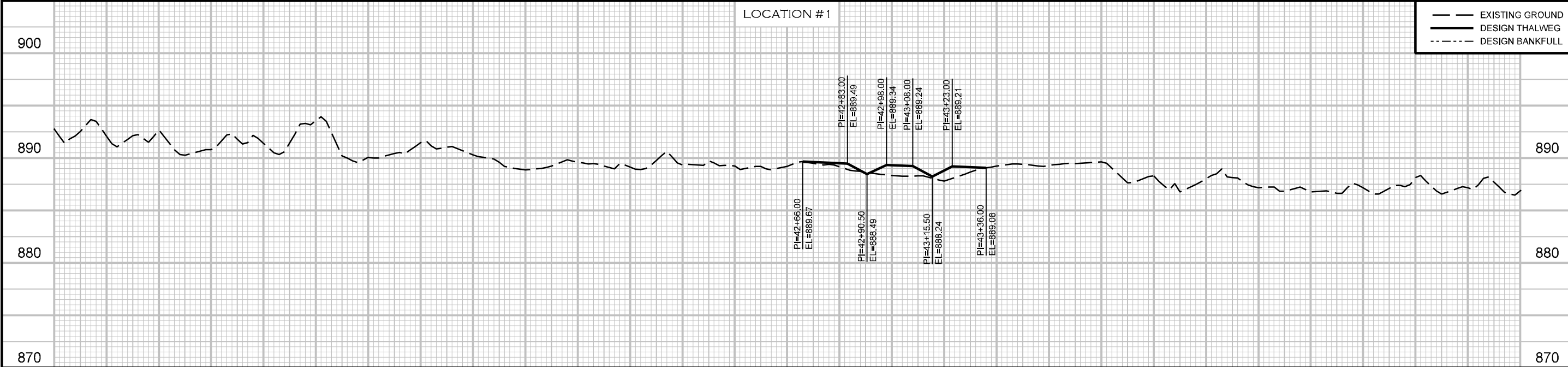
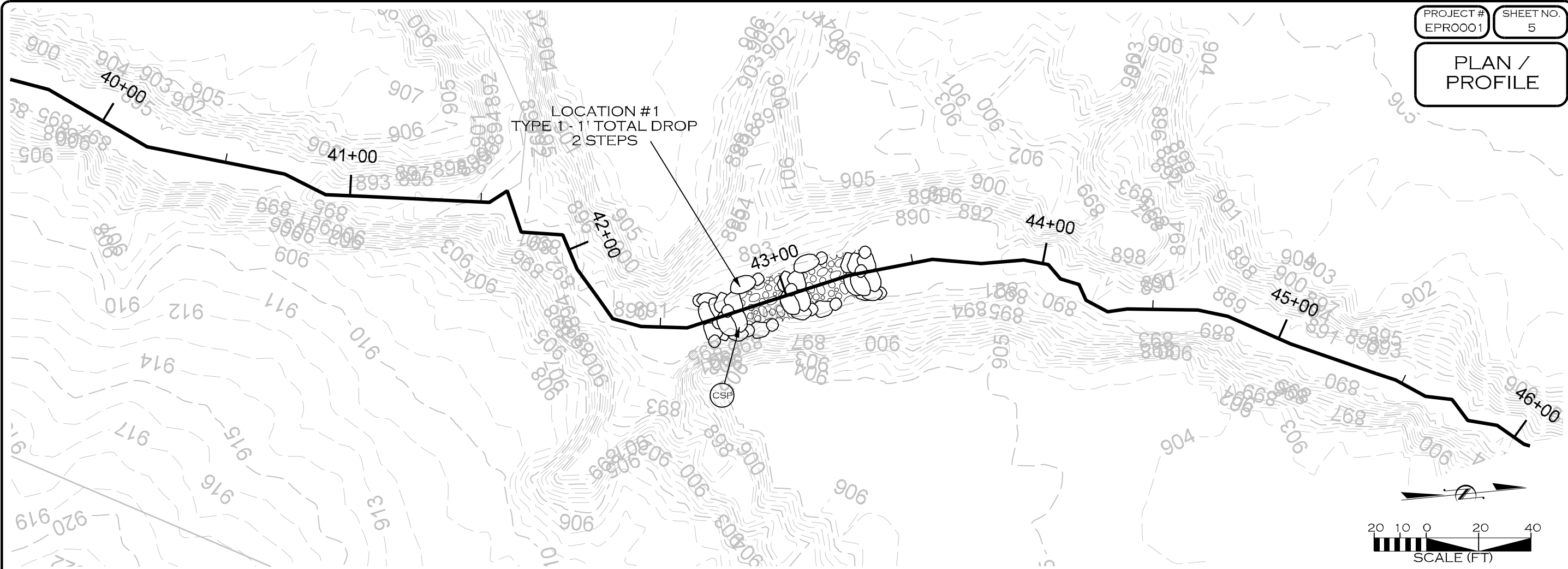
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PLAN /  
PROFILE



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41+00

42+00

43+00

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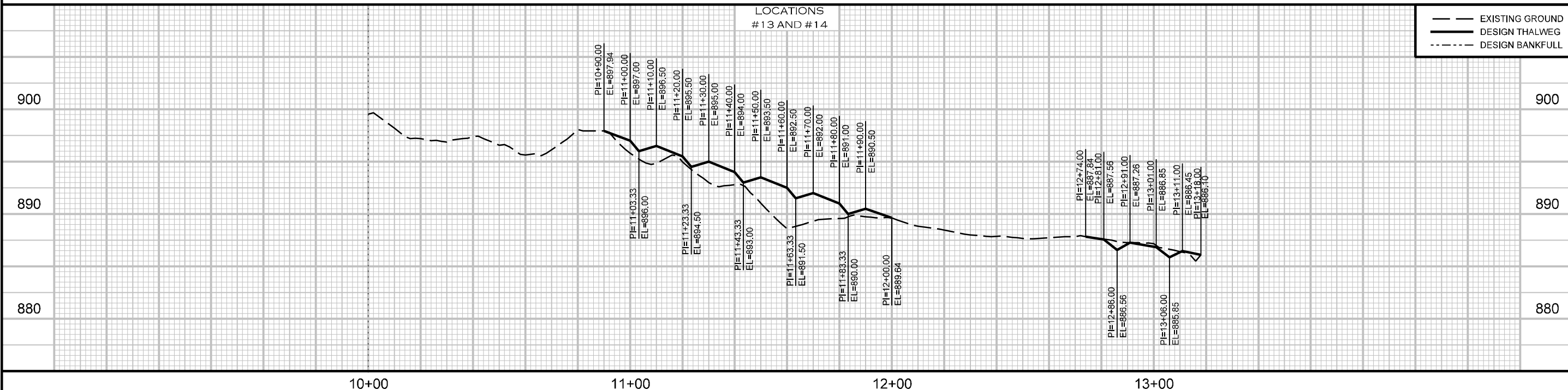
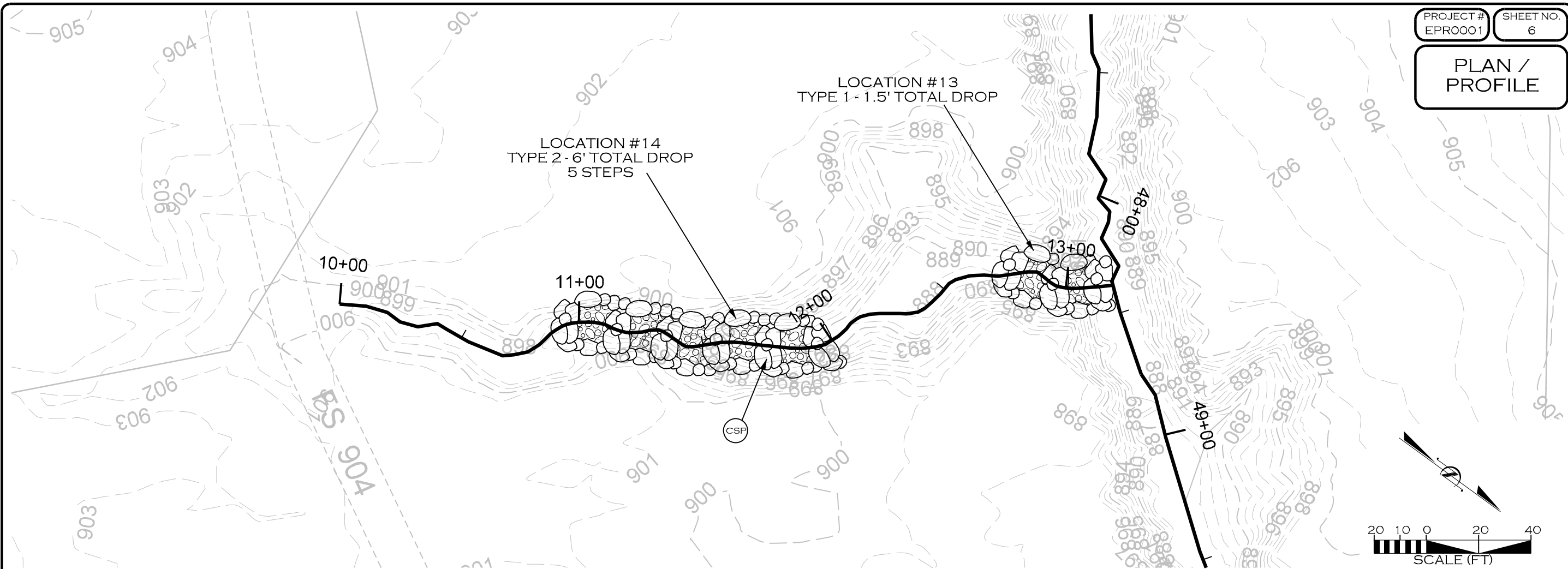
17575 N. ELDRIDGE PKWY.  
BUILDING C  
TOMBALL, TX 77377  
LICENSE #F-14997

PROJECT ENGINEER

PROGRESS DRAWING  
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1	60% DESIGN PLANS	KLT	JB	11/30/23

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COTTONWOOD CREEK PROJECT  
WISE COUNTY, TEXAS

PREPARED IN THE OFFICE OF:



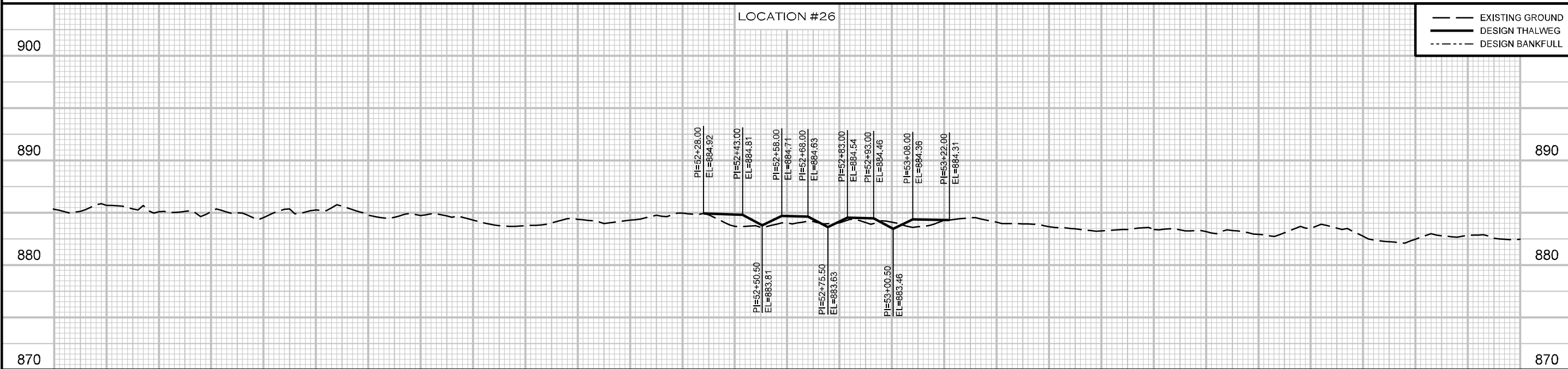
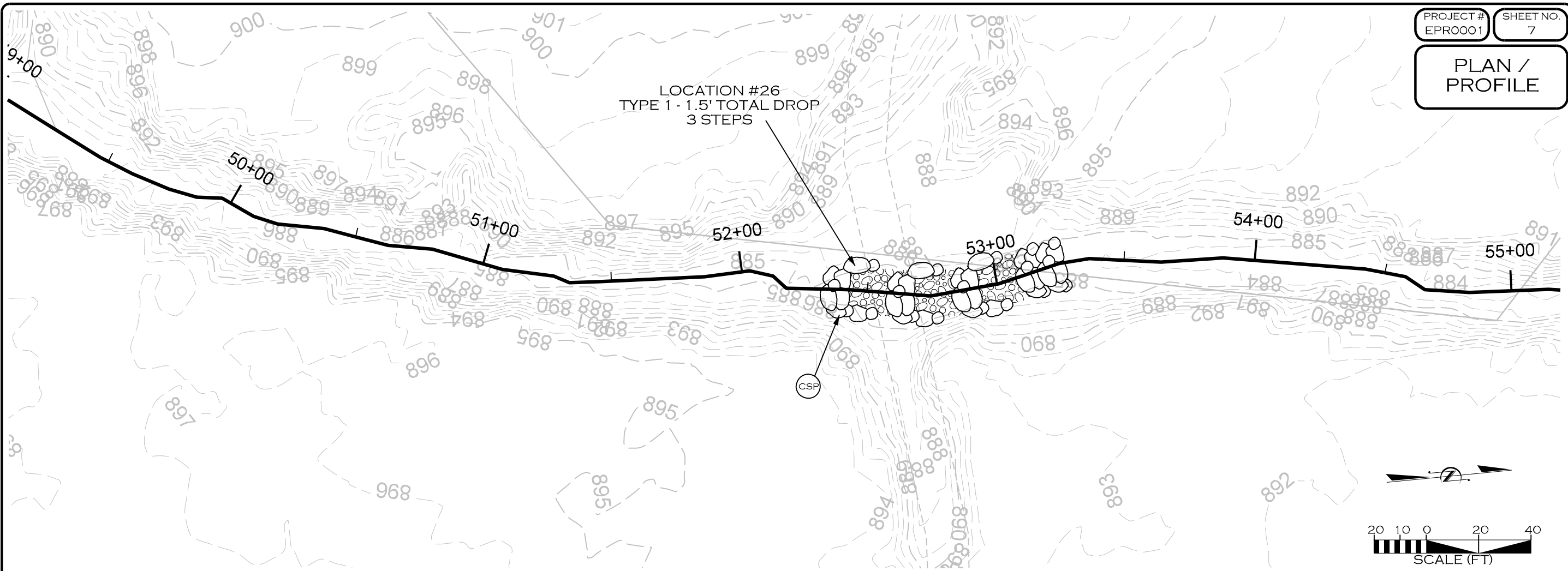
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PLAN /  
PROFILE



50+00

51+00

52+00


53+00

54+00

55+00

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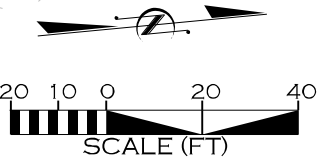
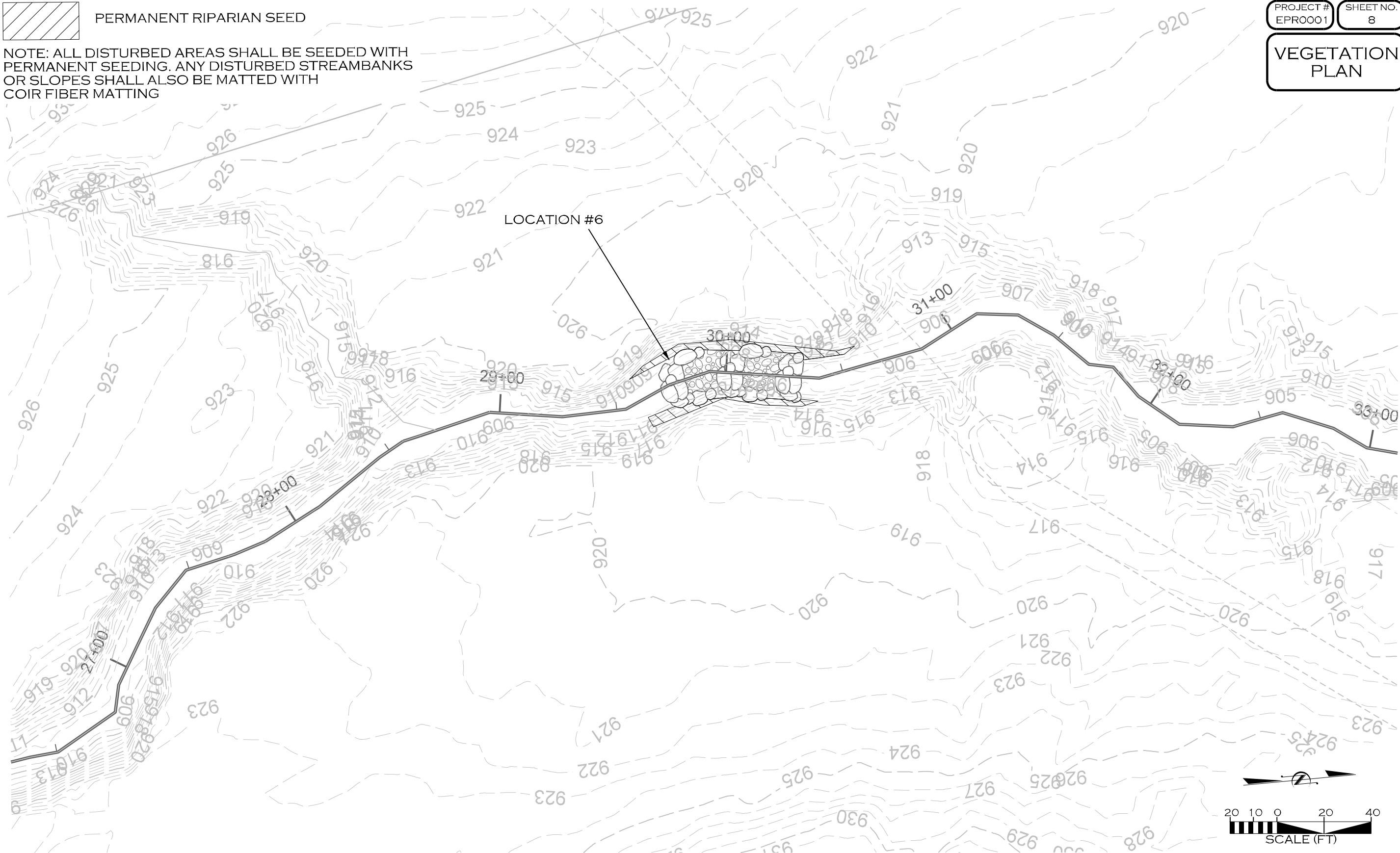
PERMANENT RIPARIAN SEED

NOTE: ALL DISTURBED AREAS SHALL BE SEEDED WITH PERMANENT SEEDING. ANY DISTURBED STREAMBANKS OR SLOPES SHALL ALSO BE MATTED WITH COIR FIBER MATTING

PROJECT #  
EPRO001

SHEET NO.  
8

VEGETATION  
PLAN



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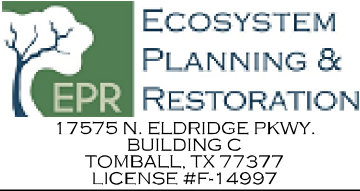
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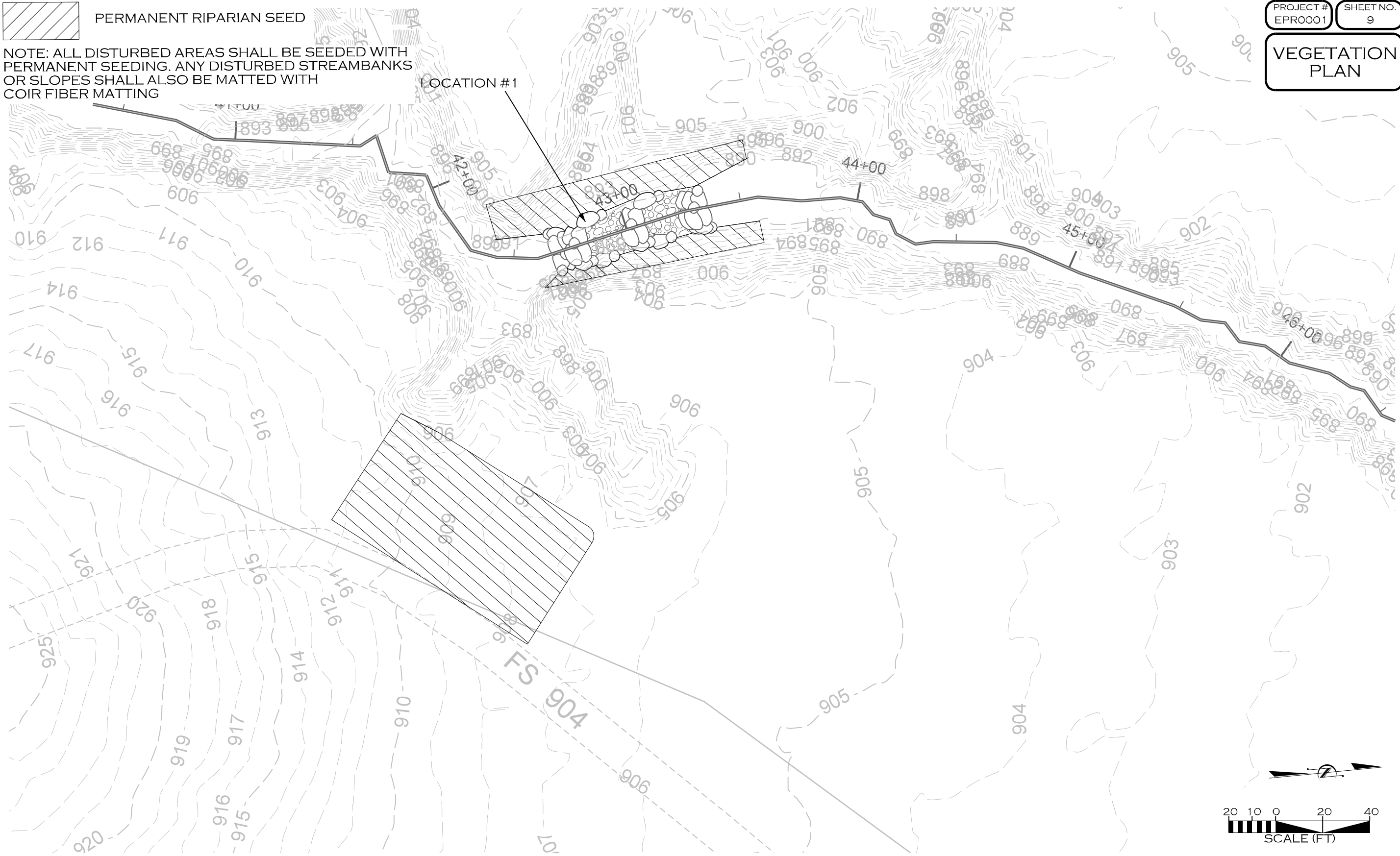
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LOCATION #1

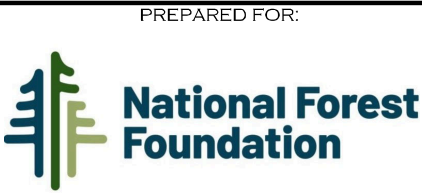
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EPRO001

SHEET NO.  
9

VEGETATION  
PLAN



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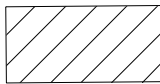
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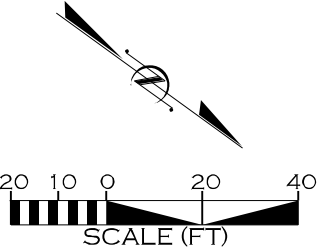
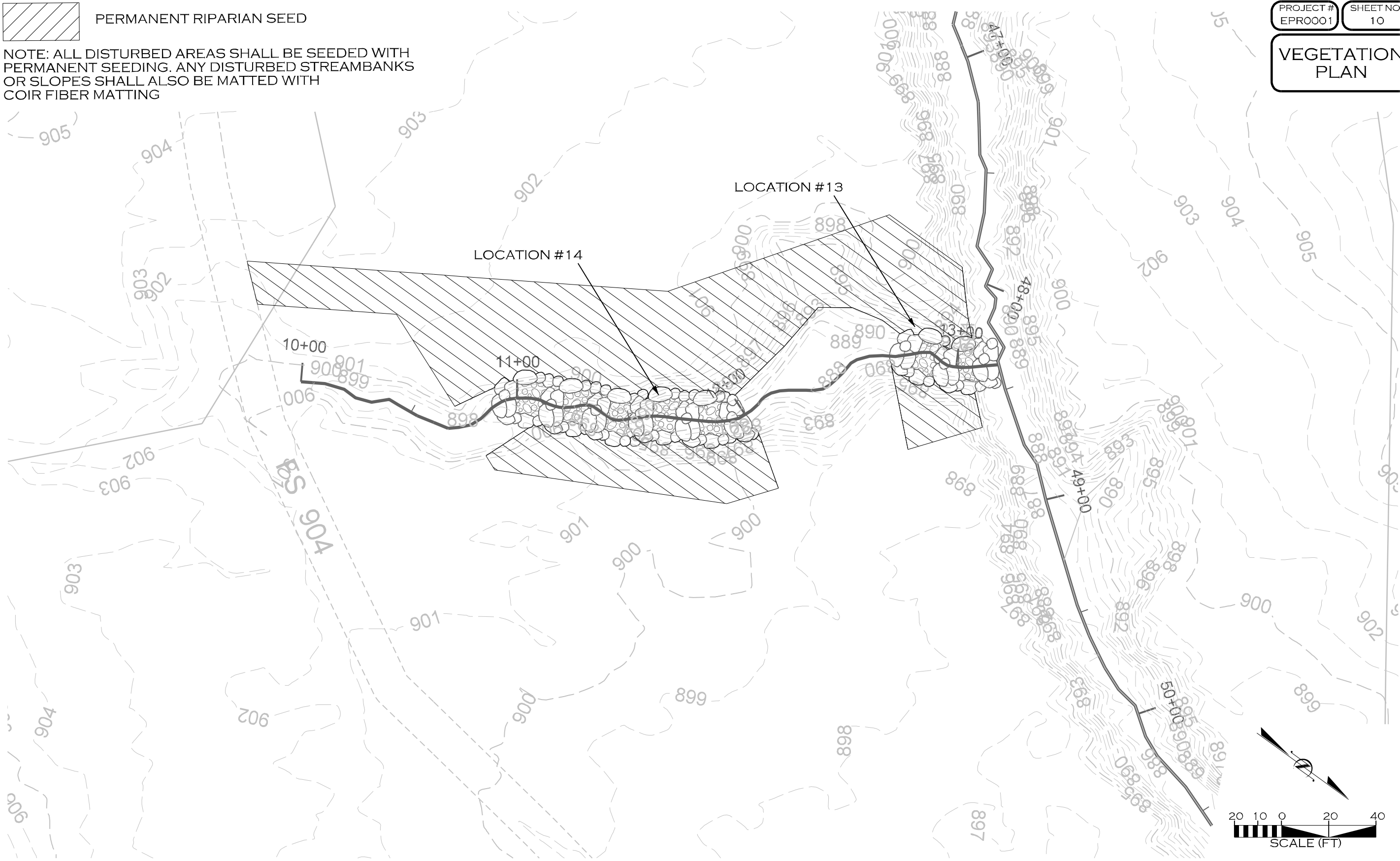
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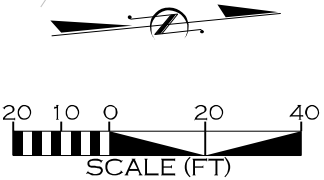
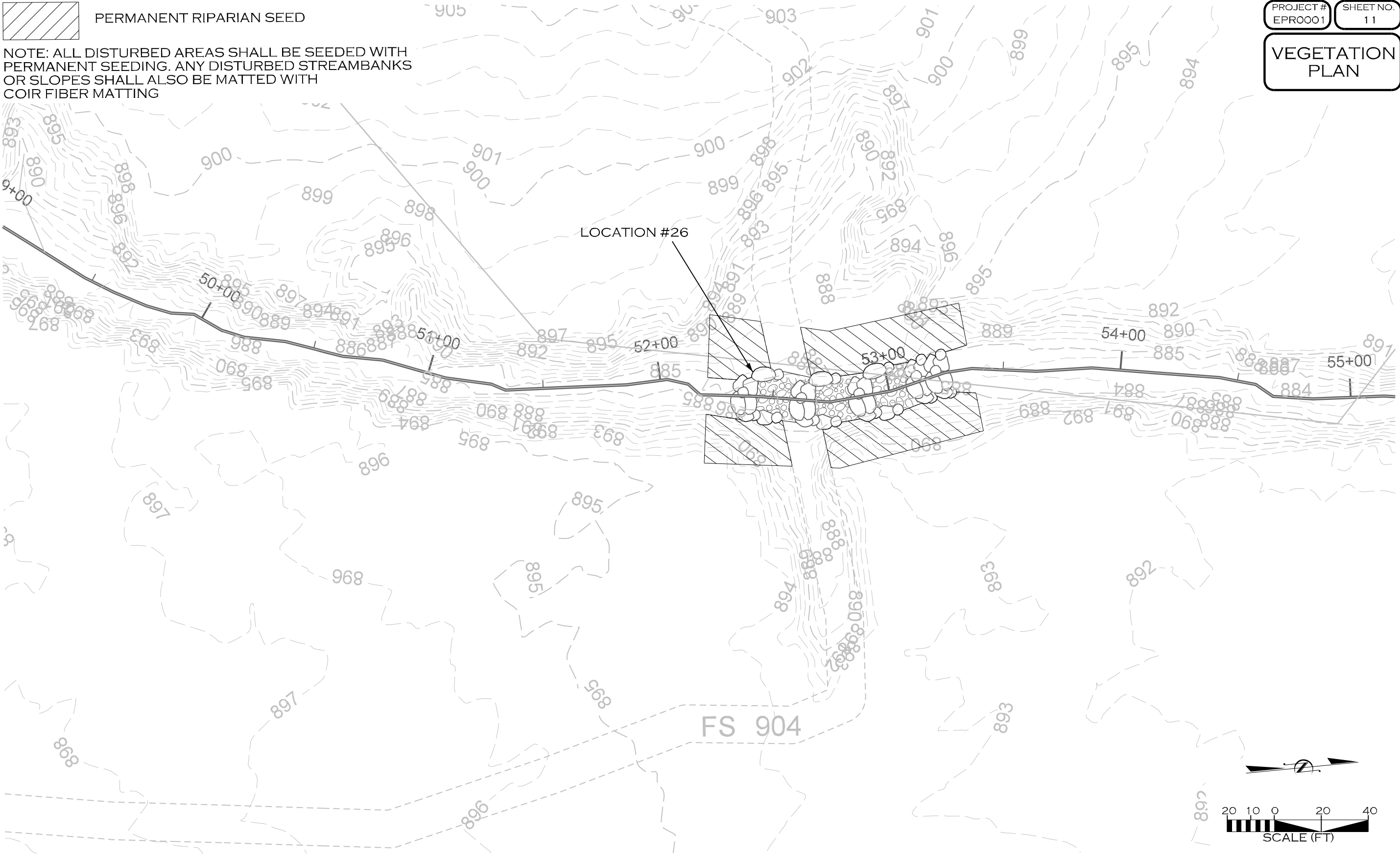
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EPRO001

SHEET NO.  
11

VEGETATION  
PLAN



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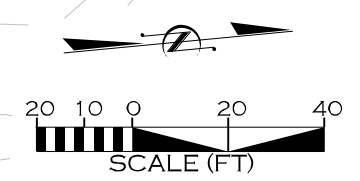
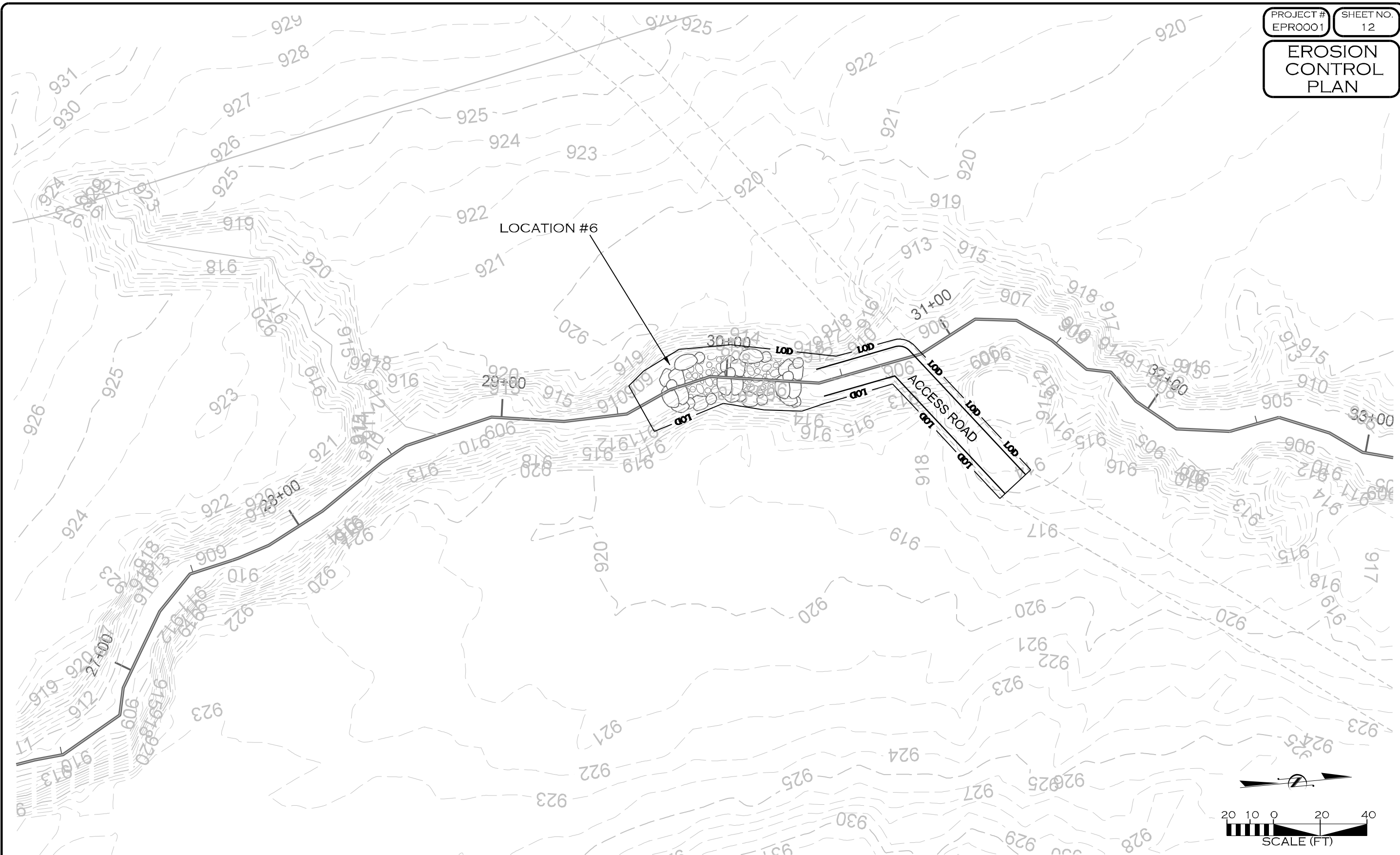
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WISE COUNTY, TEXAS

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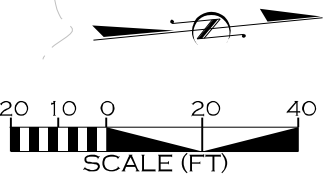
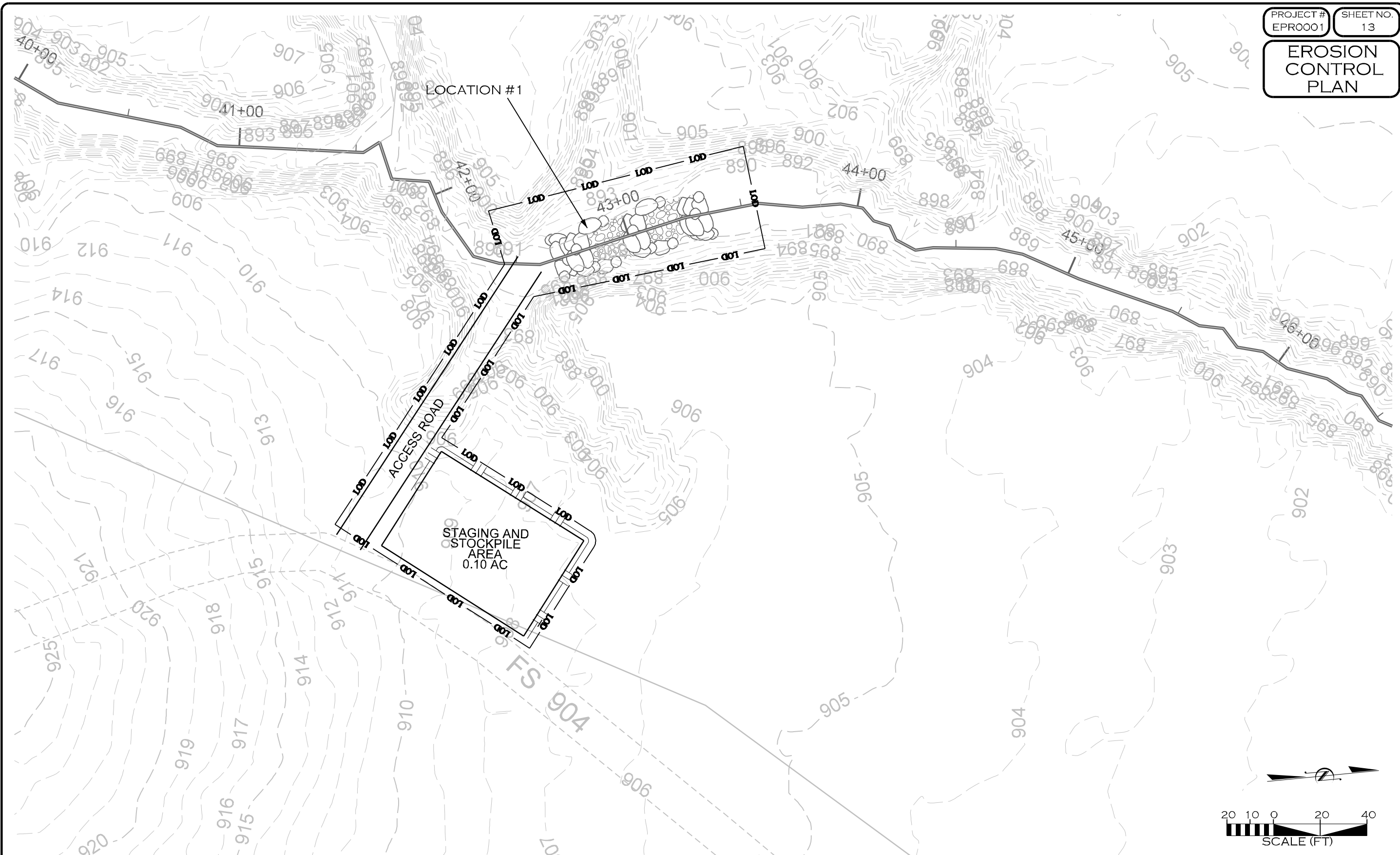
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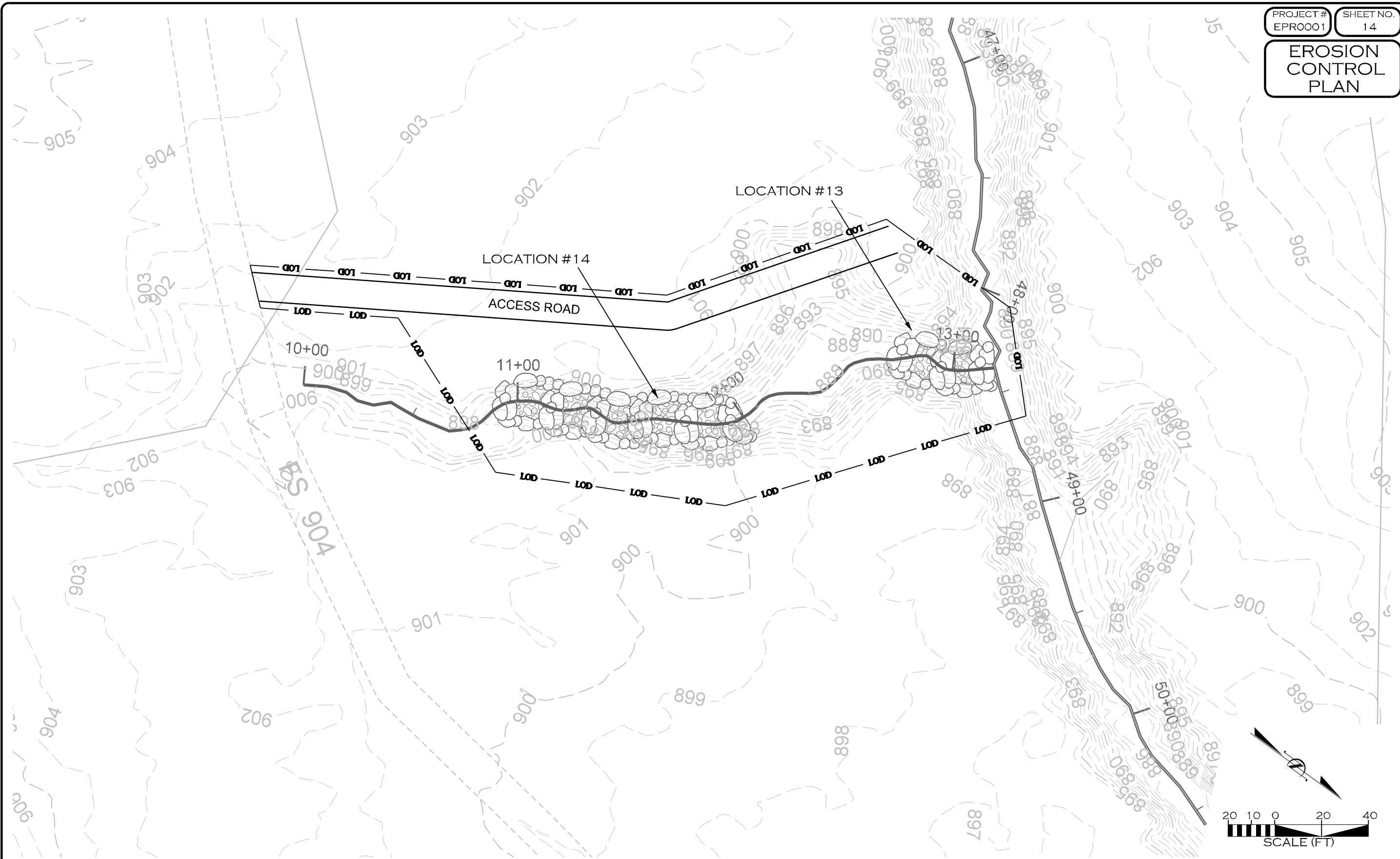
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WISE COUNTY, TEXAS

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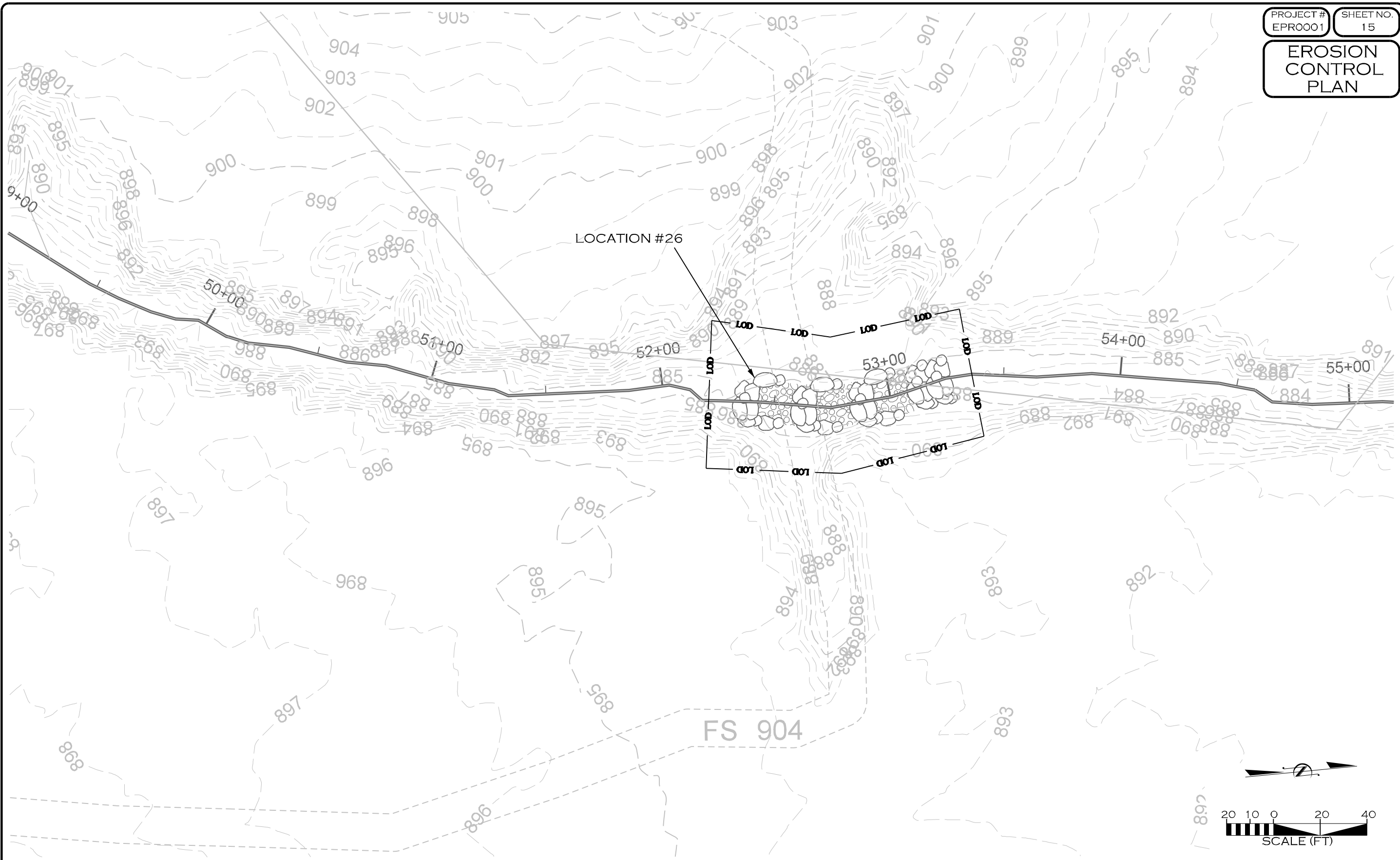
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Estimated Time & Materials List\*

Description	Estimated Quantity	Unit
<b><u>Site Preparation</u></b>		
Mobilization and Demobilization	1	LS
Construction Surveys, Field Engineering, and Field Measurement	1	LS
Clearing and Grubbing	1	LS
<b><u>Earthwork</u></b>		
Earthwork	1	LS
<b><u>In-Stream Structures</u></b>		
Constructed Cascade Step Pool (Type 1)(Approx. 260 tons 6" crushed stone, 260 tons 12" crushed stone, 90 tons 24" rip rap, and 145 tons 2" stone)	268	LF
Constructed Cascade Step Pool (Type 2)(Approx. 110 tons 6" crushed stone, 110 tons 12" crushed stone, 40 tons 24" rip rap, and 60 tons 2" stone in total)	110	LF
<b><u>Erosion and Sediment Control Measures</u></b>		
Temporary Silt Fence	250	LF
<b><u>Planting</u></b>		
Permanent Riparian Seeding and Mulching	0.6	AC
Temporary Seeding and Mulching	0.6	AC
Invasive Species Vegetation Control	1	LS

\*Provided for reference, only. Actual quantities may vary - Contractors are strongly encouraged to visit project locations and develop their own estimates.