Clean Water Act Section 401 Water Quality Certification Application

Please refer to the "Clean Water Act Section 401 Water Quality Certification Application Guidance" document for assistance with completing this application.

A. Pre-Filing Meeting	
Please provide the date that a pre-filing meeting was requested from Nevada Division of Environmental Protection (NDEP) Bureau of Water Quality Planning (BWQP). *Note: If a pre-filing meeting has not been requested, please schedule a pre-filing meeting with NDEP BWQP.*	**4/8/2025**

B. Contact Information		
Project Proponent Information		
Company Name: Nevada Tahoe Conservation District		Address: PO Box 915
Applicant Name: Meghan Kelly		City: Zephyr Cove
Phone: 775-584-3481	Fax:	State: NV
Email: mkelly@ntcd.org		Zip Code: 89448
Agent Information		
Company Name:		Address:
Agent Name:		City:
Phone:	Fax:	State:
Email:		Zip Code:

C. Project General Information			
Project Location			
Project/Site Name: Marlette Creek at SR 28		Name of receiving waterbody: Marlette Creek, Lake Tahoe	
Address: SR28 near Chimney Beach Parking Area		Type of waterbody present at project location (*select all that apply*): ☒ Perennial River or Stream ☐ Intermittent River or Stream ☐ Ephemeral River or Stream ☐ Lake/Pond/Reservoir ☐ Wetland ☐ Other: ________________________	
City: N/A			
County: Washoe County			
State: Nevada			
Zip Code: 89103			
Latitude (UTM or Dec/Deg): 39.170591		Longitude (UTM or Dec/Deg): -119.925211	
Township: 15 North	Range: 18 East	Section: 14	¼ Section: NE

Project Details	
Project purpose:	To restore and enhance Marlette Creek and the South Fork of Malette Creek in the vicinity of SR 28 to improve in-channel aquatic habitat, provide additional habitat access, expand riparian areas, reduce degradation of nearby infrastructure, and improve water quality.
Describe current site conditions: Attachments can include, but are not limited to, relevant site data, photographs that represent current site conditions, or other relevant documentation.	Marlette Creek and its South Fork have been impacted by uses such as logging, water diversions and dams, and construction of roads over the past 150 years, resulting in channel incision and narrow riparian widths. Additionally, the Main Fork of Marlette Creek is crossed by a large road and associated fill prism at SR 28. Upstream of the culvert, the creek is eroding the road embankment, resulting in degraded water quality and jeopardizing essential infrastructure. At the downstream end of the culvert, there is a 4.5-foot drop impeding aquatic organism passage. On the South Fork of Marlette Creek, a dirt road crossing restricts streamflow into a 40” corrugated metal pipe which also restricts aquatic organism passage.
Describe the proposed activity including methodology of each project element:	**Main Fork of Marlette Creek** • Install coffer dams and diversion pipe to dewater active work areas for components described within the Main Fork of Marlette Creek. • Realign and restore a 250 linear foot section of the main fork of Marlette Creek upstream of SR 28 using excavation and appropriate natural grade controls made of wood or rock and native vegetation to reconnect the creek with an inset floodplain. **South Fork of Marlette Creek** • Install coffer dams and diversion pipe to dewater active work areas for up to 1,300 linear feet of the South Fork of Marlette Creek. • Realign and restore up to 900 linear feet of the South Fork of Marlette Creek using excavation and appropriate natural grade controls made of wood or rock. Utilize native vegetation to stabilize the eroding bed and banks to reconnect the creek with an inset floodplain. • Remove an existing corrugated metal culvert crossing Mine Shaft Road and construct a new ford using rock to improve hydraulic connectivity. **Culvert and Downstream Reach** • Install coffer dams and diversion pipe to dewater active work areas for components described here. • Create riffle-pool fish habitat downstream of the SR 28 culvert outlet on Marlette Creek for 125

	linear feet using large rock and stream bed material consisting of sands, gravels, and cobbles. • Restore fish passage at culvert outlet by raising base level and creating plunge pool at culvert outlet in accordance with Aquatic Organism Passage (Natural Resources Conservation Service, Conservation Practice Standard, USDA NRCS 2022) and Guidelines for Salmonid Passage at Stream Crossings (NMFS 2023). Fish passage is designed for adult Lahontan cutthroat trout during spring months when flows are expected to be highest. • Modify and extend the existing box culvert at SR 28 for up to 15 feet upstream to reduce road embankment erosion and allow for juvenile trout passage.
Estimate the nature, specific location, and number of discharge(s) expected to be authorized by the proposed activity:	The Proposed project includes temporary fill cut of native soils and fill of native soils, wood, rock, gravel stream substrate. The project also includes temporary fills as coffer dams to dewater construction areas. Throughout the Project Area, the proposed restoration activities are designed to improve the channel morphology and flood plain connectivity of both Marlette Creek channels and expand the overall extent of potential aquatic resources, The re-alignment of the channels upstream and downstream of the SR 28 crossing requires the use of excavation and the installation of appropriate natural grade controls made of wood or rock and native vegetation to stabilize the eroding bed and banks, reconnect the creek with an inset floodplain, and create riffle-pool aquatic habitat. Proposed fill materials are primarily native and included sand/stream gravel, rock/boulders, wood/beaver dam analogs, native earthwork fill, and concrete. Total proposed fill within the potential Wetlands and Waters of the U.S. of the Marlette Creek channels is 1,116 cubic yards (CY).
Provide the date(s) on which the proposed activity is planned to begin and end and the approximate date(s) when any discharge(s) may commence:	August 11, 2025 – October 15, 2025
Provide a list of the federal permit(s) or license(s) required to conduct the activity which may result in a discharge into regulated waters (see mandatory attachments):	USACE 404, USACE NWP 27, USACE NWP 33, USDA Forest Service Categorical Exclusion for Habitat Restoration
Provide a list of all other federal, state, interstate, tribal, territorial, or local agency authorizations required for the proposed activity and the current status of each authorization:	Tahoe Regional Planning Agency Environmental Improvement Project Permit

Total area of impact to regulated waterbodies (acres):	3.8 acres, Net Cut will occur in 0.11 acres (4,300 SF) Net Fill will occur in 0.21 acres (9,300 SF)	
Total distance of impact to regulated waterbodies (linear feet):	1,670 LF	
Amount excavation and/or fill discharged within regulated waters (acres, linear feet, and cubic yards):	Temporary: 266 CY	Permanent: 1,116 CY Total 151 CY (stream bed material) 952 CY (native earthwork fill) 31 CY (Concrete)
Amount of dredge material discharged within regulated waters (acres, linear feet, and cubic yards):	Temporary: 0	Permanent: 0
Describe the reason(s) why avoidance of temporary fill in regulated waters is not practicable (if applicable):	Temporary fill must be placed to conduct dewatering and diversion for resource protection during construction.	
Describe the Best Management Practices (BMPs) to be implemented to avoid and/or minimize impacts to regulated waters: Examples include sediment and erosion control measures, habitat preservation, flow diversions, dewatering, hazardous materials management, water quality monitoring, equipment or plans to treat, control, or manage discharges, etc.	• Prior to starting work, the contractor shall install temporary BMP measures at locations where needed to control erosion and water pollution during the construction of the project. The BMP measures shall remain in place and shall be maintained in a functional condition for the duration of the construction. Silt fence is required at all cross drain outlets. Silt fence or sediment logs will be required at other locations as shown on the drawings or staked in the field by the engineer. All erosion control measures shall meet or exceed requirements of the Tahoe Regional Planning Agency (TRPA). • All existing vegetation shall be preserved unless specifically identified by the engineer for removal. BMPs to protect vegetation shall be installed by the contractor if required by TRPA. Contractor to revegetate any areas outside the disturbed area shown on the plans with plants approved by TRPA. • All trees and natural vegetation to remain on the site shall be protected per TRPA. • Soil and construction material shall not be tracked off the construction site. Grading operations shall cease in the event that a danger of violating this condition exists. • During construction environmental protection devices, such as erosion control, dust control, and vegetation protection devices shall be maintained at all times.	

	• Loose soil mounds or surfaces shall be protected from wind or water erosion by being appropriately covered when construction is not in active progress or when required by TRPA. • Excavated material shall be stored up-gradient from the excavated area whenever possible. No material shall be stored in any stream environment zone (SEZ) or wet area. • Excess cut is to be off hauled outside the Tahoe Basin or coordinated with TWIG (Tahoe Watershed Improvement Group) to be utilized in other local projects. • Only equipment of a size and type that will do the least amount of damage, under prevailing site conditions, and considering the nature of the work to be performed, will be used. • At a minimum, the contractor or his agent shall inspect all disturbed areas, areas used for storage of materials and equipment that are exposed to precipitation, vehicle entrance and exit locations, and all BMPs weekly, prior to a forecasted rain event and within 24 hours after any actual rain event. Some exceptions to weekly inspections may apply, such as frozen ground conditions of suspension of land disturbance activities. • Dewatering and diversion plan shall be followed to minimize discharges in running water.
Describe how the activity has been designed to avoid and/or minimize adverse effects, both temporary and permanent, to regulated waters:	The Project has been designed to minimize adverse effects to WOUS through the phasing and timing of the project as well as the dewatering plan. The Project will have coffer dams and diversions in place as necessary and also conduct work in the dry when conditions are too wet in existing riparian areas. The project has a robust revegetation plan.
Describe any compensatory mitigation planned for this project (if applicable):	The project will result in a net gain of 0.53 acres of aquatic resources and therefore no compensatory mitigation is necessary.

D. Signature		
Name and Title (Print): Meghan Kelly	Phone Number: (775)524-3481	Date: 4/8/2025

X

Signature of Responsible Official

Mandatory Attachments:

- **Federal Permit or License Application** - A copy of the federal permit or license application and any readily available water quality-related materials that informed the development of the federal license or permit application.
- **Site Map** - A map or diagram of the proposed project site including project boundaries in relation to regulated waters, local streets, roads, and highways.
- **Engineered Drawings** - Engineered drawings are preferred to be submitted at the 70% design level. If only conceptual designs are available at the time of application, plans for construction should be submitted prior to the start of the project. Specific locations of the proposed activities and details of specific work elements planned for the project should be identified (e.g., staging areas, concrete washouts, perimeter controls, water diversions, or other BMPs).

Submit the completed application materials to NDEP (ndep401@ndep.nv.gov) with the appropriate U.S. Army Corps of Engineers Regulatory Office copied on the communication (http://www.spk.usace.army.mil/Missions/Regulatory/Contacts/Contact-Your-Local-Office/).

MARLETTE CREEK RESTORATION AND SR28 CROSSING IMPROVEMENT PROJECT– DESIGN BASIS MEMO

INTRODUCTION

The Marlette Creek SR28 Crossing Realignment and Water Quality Improvement Project (Marlette Creek Project) will restore areas of Marlette Creek and the South Fork of Marlette Creek in the vicinity of State Route 28 (SR-28) and the Chimney Beach Parking Area. The Nevada Tahoe Conservation District (NTCD) is leading the design of this project in conjunction with the USDA Forest Services (USFS) and the Nevada Department of Transportation (NDOT). The Marlette watershed has a long history of environmental human impacts going back to the 1800s and these impacts have degraded the condition of both the Main and South Forks of Marlette Creek. The proposed project will improve fish passage and habitat, repair head cuts, restore floodplain connectivity and address water quality and erosion issues affecting the creek along SR-28. The Project is in Washoe County, Nevada, near SR-28 and is located on USFS lands and in the NDOT Right-Of-Way. Construction activities for the project are anticipated to occur from July to September 2025. The project is classified as an Environmental Improvement Project (EIP) by the Tahoe Regional Planning Agency with EIP number 01.01.01.0177.

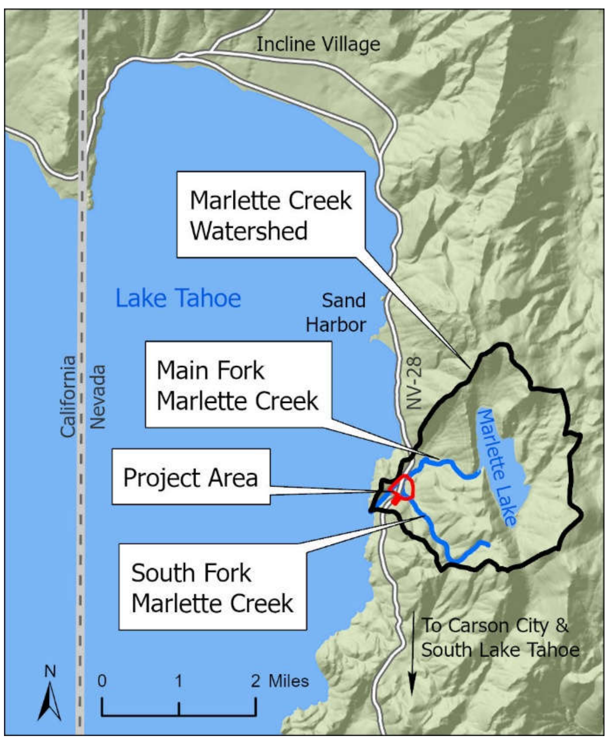

Figure 1 Project Location Map

BACKGROUND

The Marlette Creek watershed is located on the east side of the Lake Tahoe Basin. The headwaters of the watershed start in the Carson Range and initially flow into a narrow north-south running valley in which the dammed Marlette Lake is located. Initially impounded by an earthen dam that was constructed in 1873 and subsequently raised to its present day 45-foot height in 1959, Marlette Lake is the water supply for several communities east of the Carson Range, and therefore much of the water originating in the upper reaches of the Marlette Creek watershed is impounded in Marlette Lake and diverted out of the Lake Tahoe Basin and does not reached the proposed project area.

Downstream of the Marlette Lake Dam, Marlette Creek runs through steep granitic slopes for about two-thirds of a mile before reaching a lower-sloped area of forested lands above SR-28 through which the creek runs for about half a mile before reaching the highway and the confluence with the South Fork of Marlette Creek. The total catchment of the Main Fork of Marette Creek above SR-28 is 3.9 square miles, with 2.9 square miles above the Marlette Lake dam and 1 square mile below the dam. The South Fork drains a smaller catchment of 0.85 miles that originates on a ridge of the Carson Range to the Southwest of Marlette Creek and does not presently have any manmade impoundments constraining natural flows. Like the North Fork, it also flows through steep granitic soils before reaching the lower sloped forested areas above SR-28

According to geological maps, this lower sloped area is associated with two faults that intersect above the highway that are overlaid with colluvial soils. The Main Fork approximately follows the northern of these faults, while the South Fork approximately follows the southern one. The proposed project area lies at the western edge of this lower-grade area, with the western edge approximately demarked by SR-28. The confluence of the Main and South Forks of Marlette Creek is just above a large concrete box culvert that runs below the highway. The downstream end of this box culvert has an artificial 4’ drop and below this drop Marlette Creek continues to run in a southwestern direction through a steep granitic canyon for another half mile before reaching Lake Tahoe at Chimney Beach. The western edge of the proposed project area is approximately 200 feet downstream from the SR-28 box culvert.

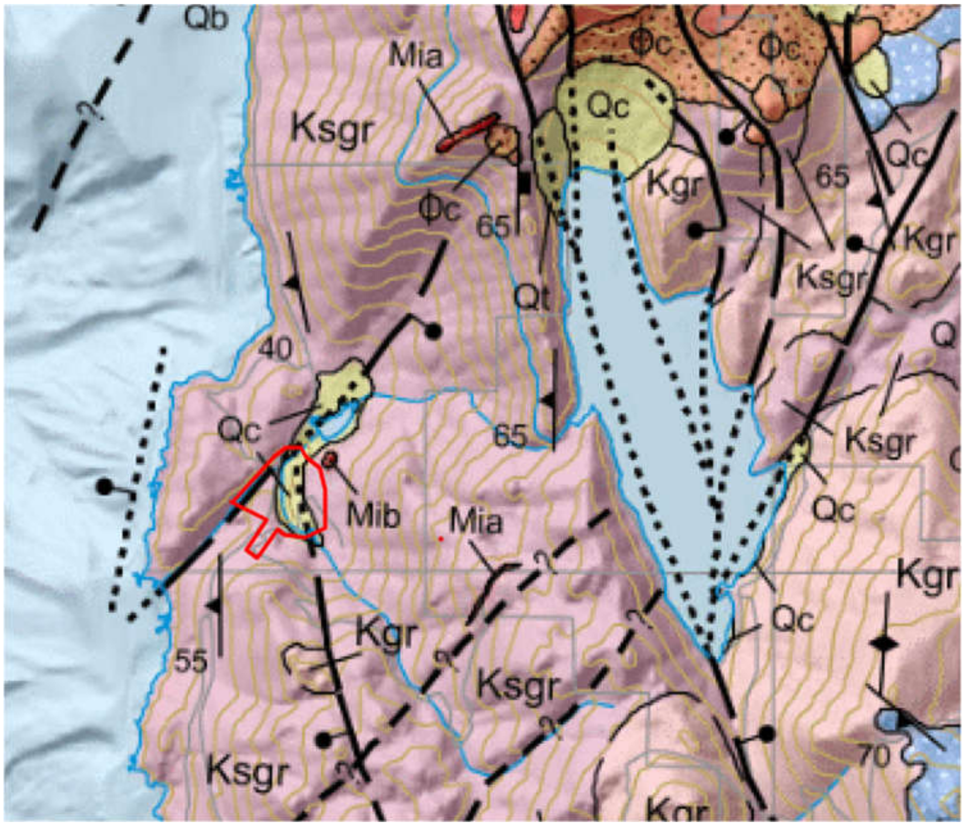

Figure 2 – Geological map of Marlette Creek watershed (project area in red)

The Marlette Creek watershed is on the ancestral homelands of the Washoe people, who likely passed through and used the watershed during summers prior to European-American settlement in the Tahoe Basin. The watershed began seeing significant degradation in the 1860s after the discovery of the Comstock Lode in Virginia City. The watershed was logged heavily to supply lumber for Virginia City and its mines, and the initial dam that impounded Marlette Lake was constructed to supply water to Virginia City. Grazing of sheep and cattle may have occurred in the forests and meadows along the East Shore of Lake Tahoe, roads were constructed to facilitate transportation and flumes were constructed to transport lumber.

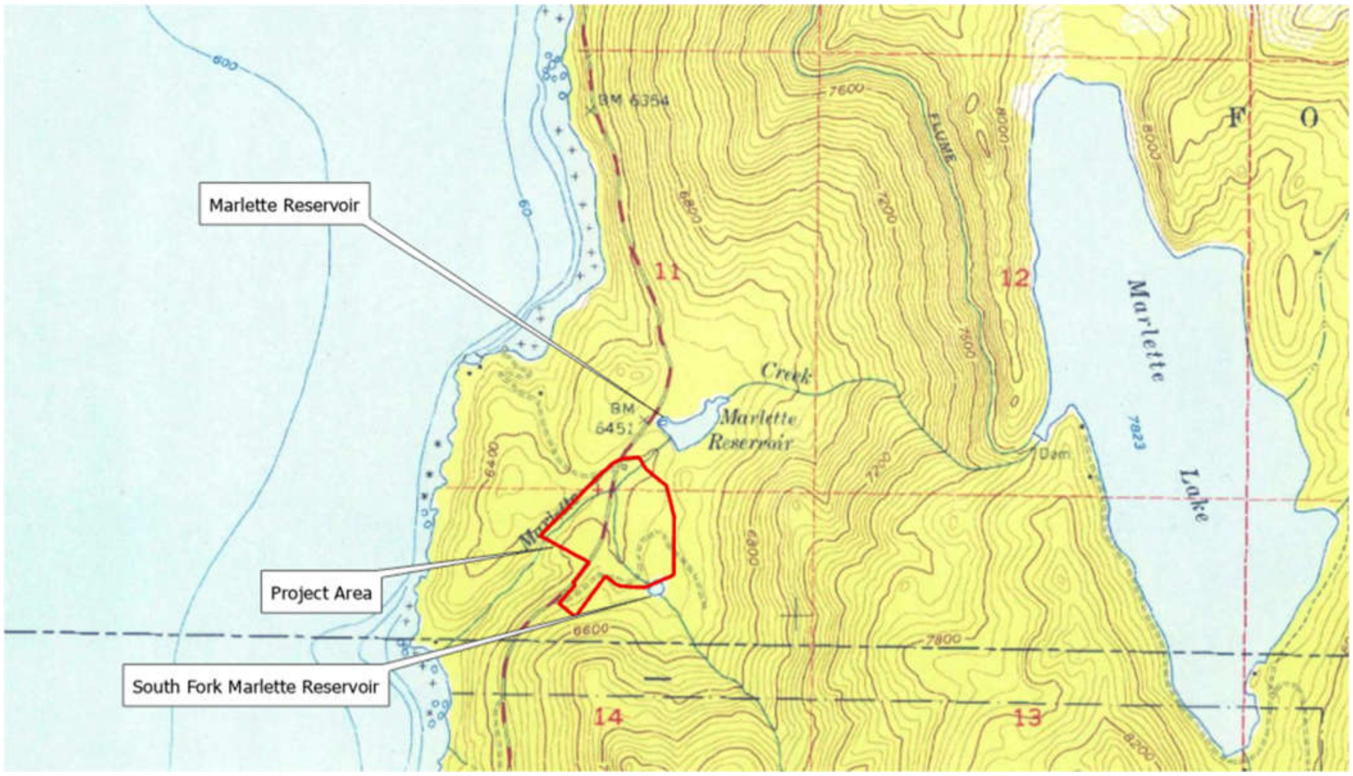

Figure 3 - 1955 USGS Topo Map showing reservoirs constructed upstream of project area

Later, in the 1920s and 1940s, small reservoirs were constructed on both the Main and South Fork of Marlette creek, retaining and diverting water out of the creek for domestic use and power. While both of these reservoirs were later removed, their footprints still remain, affecting watershed hydrology to this day. In the mid-20th century the present alignment of State Route 28 was constructed, with its embankment located in the riparian area along the creek and its large box culvert creating a barrier to fish passage. As well additional logging of secondary growth forests occurred in the watershed in the 20th century.

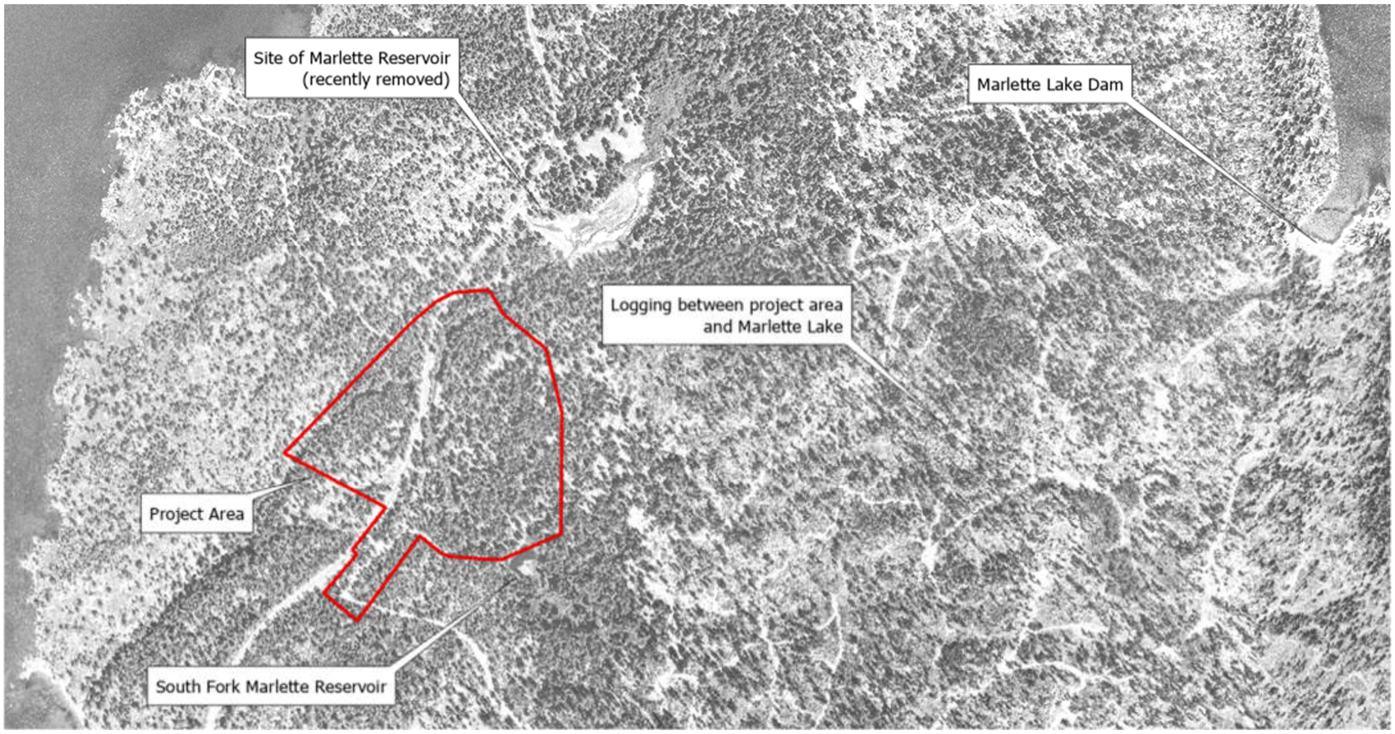

Figure 4 - 1969 Aerial imagery showing extensive logging in Marlette Creek watershed

EXISTING CONDITIONS

All the impacts in the area since the mid-1800s have significantly affected the hydrology of the Marlette Watershed, by changing hydrologic patterns, affecting flow volumes, increasing erosion, changing channel geomorphology and changing the ecosystems of the Marlette riparian corridor. One of the most significant impacts is the construction of Marlette Dam and Marlette Lake which diverts a significant volume of water originating in the upper watershed out of the drainage. The Marlette Dam operates with the intent of supplying a water supply to communities to the east and, based on conversations with natural resource managers, does not have any requirements for minimum releases to maintain stream flow in Marlette Creek.

The dam and its diversions effectively reduces the free-flowing catchment of the creek above SR-28 by 60%. As well it significantly affects the flow hydrograph on the Main Fork of Marlette Creek. Throughout much of the year, and in many dry years, the dam releases very low volumes of water from the upper watershed (less than 0.1 CFS). Then, in select times during wet years, very large extended releases are made from the dam. The releases are often between 20 to 30 CFS and can last for over a month in duration.

This change to the flow hydrograph has several implications for the hydrology and geomorphology of the Main Fork of Marlette Creek. First, the diversion of water out of the watershed means that there is a significant loss in water volume in the creek downstream of the dam, which not only means there is less water to sustain riparian ecosystems but also means that there is a loss in the total stream power that can contribute to channel and floodplain dynamics. As well, this loss in volume also means that any areas of channel below the dam that maintains their pre-1800s geomorphology may not overbank as frequently as they did prior to construction of the dam. Finally, the large releases from the dam are now likely the events that contribute the vast majority of stream power in the downstream channel and are the main contributors to channel-changing dynamics, sediment transport and floodplain deposition. Unlike natural flow events with a very short duration at peak flow, these large flow events have very long durations. For example, in 2023 NTCD staff monitoring the creek noted overbanking due to a large discharge from the dam for a 2-month long period from March to May.

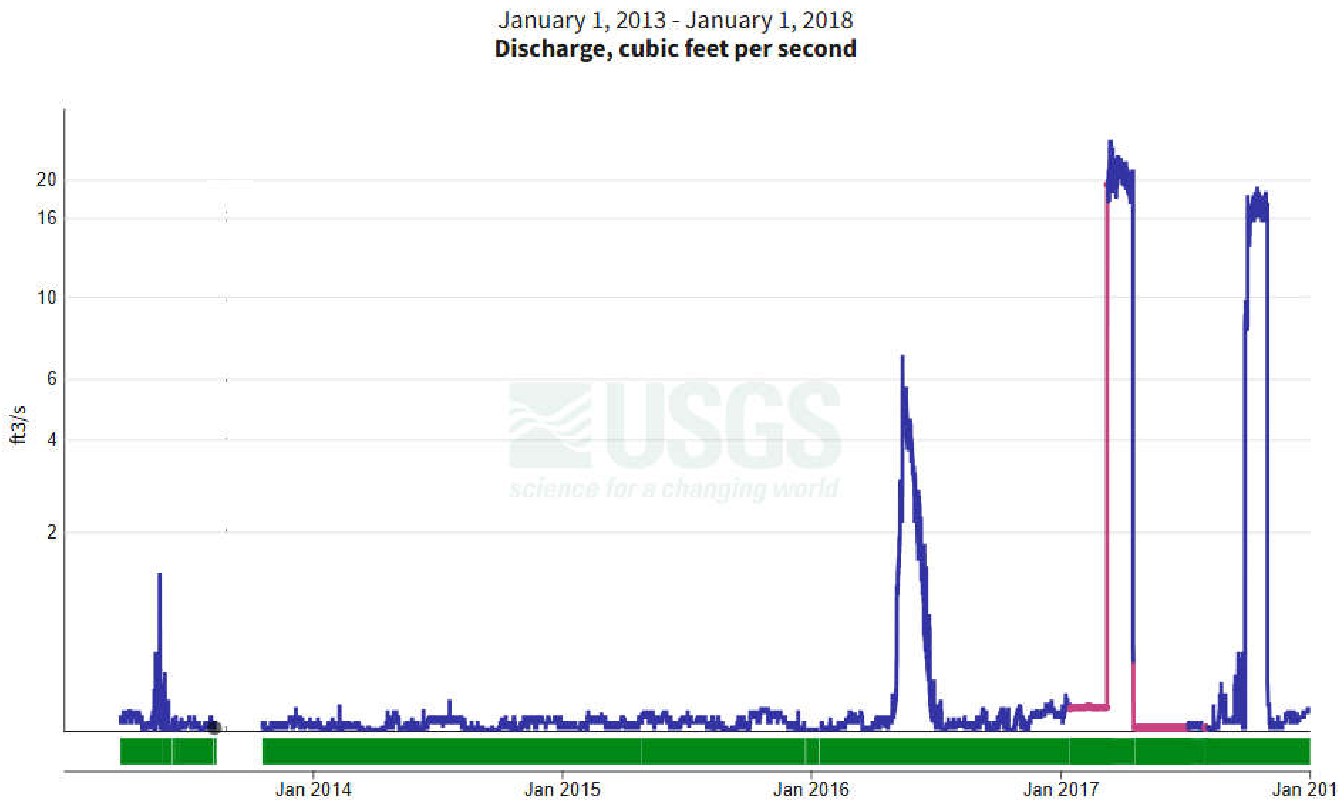

Figure 5 – Flow hydrograph of the Main Fork of Marlette Creek below the Marlette Lake Dam over a 5 year period from 2013 to 2018. In the first three years, discharge from the dam only exceeded 1 CFS for a brief moment. In the last two years of the period large month long discharges from the dam occurred.

While the South Fork does not have an active reservoir affecting its hydrology, the reservoir that operated on it upstream of the proposed project area during the 1900s contributed to the heavy incision that exists along the South Fork today. This heavily incised area is downstream of a culvert below a forest road, and large discharges from the reservoir that were then conveyed through this culvert likely caused scour that led to the present-day channel conditions. While the reservoir was removed by the US Forest Service in the 2000s, post-monitoring reports from the project found that incision continued to worsen post-project likely due to the construction of a large, incised channel at the site of the old reservoir during that project. This heavily incised area runs for about 400 feet downstream of the culvert on the South Fork, and in this area the channel resembles a trench that drops up to 4 feet below the adjacent floodplain. At this level of incision, the channel does not overbank, even during large flows. Because of this, during high-flow events, this area of channel likely continues to erode and downcut. Downstream of this heavy incision, the creek is in a better condition, however there are still a number of incised areas, as well as several headcuts. It appears there have been previous attempts to contain these areas of incision, using items like check dams and even a tire.

Another major impact on the condition of Marlette Creek are existing and historic road grades in the project area. Currently, State Route 28 runs directly adjacent to both the Main and South Forks of Marlette Creek above the confluence of the two branches. The construction of the large highway embankment likely impacted and reduced the riparian areas along the creek and may have also required alterations to the course of the creek, which may contribute to degraded conditions within the stream channel, such as a large headcut on the South Fork of Marlette Creek just above its confluence with the Main Fork. On the Main Fork, the channel is running against and eroding the highway embankment, leading to increased sediment loading into the creek and potentially creating a long-term risk to stability of the highway along the creek. The close proximity of the highway to the creek also likely leads to the conveyance of roadway pollutants to the creek. While a recent NDOT stormwater project has rerouted pipes that previously directly discharged to the creek to stormwater basins, the creek is likely to still receive discharge of pollutants during large storm events or from plowing which may push sediment-laden snow from the highway into the creek.

Another major influence on the creek and its ecosystems from Highway 28 is the large box culvert the conveys flows below the highway just downstream of the confluence of the Main and South Forks of Marlette Creek. This large culvert has a large drop of around 4 feet at its downstream end that is a barrier to upstream movement of aquatic species in the creek. As well, the large drop has likely contributed to scour and erosion in the creek downstream of the highway. An NTCD analysis of the culvert found that the culvert is in suitable condition from a highway engineering perspective, however the flow capacity of the culvert is well in excess of flows likely to ever be seen in Marlette Creek. Because the bottom of the culvert is concrete without any channel, it likely means that flows in the culvert do not provide enough depth for fish passage through it, even if the 4-foot drop at the downstream end of the culvert were to be eliminated.

Other roads in the projects area are also having similar effects on the creek. Prior to the construction of Highway 28 along its existing alignment, a road existed along the east side of the South Fork of Marlette Creek that then crossed the Main Fork near the confluence. This road grade was likely also was built over historic wetland, thereby impacting and reducing the riparian area along the creek and may have also led to changes in the channel of the creek to facilitate its construction. Remnants of this road grade still exist along the creek. As well, an existing dirt forest road crosses the South Fork of Marlette Creek in the eastern part of the project area. This road reduces the riparian width upstream and downstream of the road and also utilizes a corrugated metal pipe to convey flows below the road. This culvert is another barrier to aquatic organism passage and it also contributes to the significant scour and erosion seen on the South Fork directly downstream of the road crossing.

The project area was also analyzed for existing and potential future uses. With State Route 28 running through the project area, transportation is a major existing use in the vicinity. The project area is also located adjacent to the USFS-owned Chimney Beach parking lot. This is a popular recreational parking location which was expanded by the USFS in 2024. However most recreators parking at this location are using the lot to access trails to Lake Tahoe on the west side of State Route 28 or to access the Chimney Downhill mountain bike trail. Very little recreation use is seen in the project area along Marlette Creek. As well, through discussions with the USFS, it was determined that maintaining Mine Shaft Road, which crosses the South Fork of Marlette Creek is priority to maintain access to the forests on the east side of the creek.

DESIGN DEVELOPMENT

NTCD is leading the design team for this project and has worked with the US Forest Service and the Nevada Department of Transportation to plan a comprehensive restoration for both the Main and South Fork of Marlette Creek in the project area.

Based on the existing conditions in the project area, the planned restoration will aim to address and improve the following issues that were identified with Marlette Creek and its surrounding area in the project area:

1. Channel Incision

The Marlette Creek channel is incised and disconnected from its floodplain in numerous areas, especially on the South Fork. In these incised areas, the channel is unlikely to overbank at a 1-year frequency and in the heavily incised areas, the channel is unlikely to overbank in very large flow events. If this incision is not addressed, banks will likely continue to erode and the incised channel will expand laterally.

2. Loss of Floodplain and Riparian Extent

Due to the previously mentioned incision, which has lowered the water table adjacent to the creek, and the construction of roads along Marlette Creek in the last 150 years in the project area, significant areas of wetland surrounding the creek have been removed or degraded. Riparian areas are highly important biodiversity hot spots and also provide other benefits such as a natural barrier to fire and a carbon sink and the loss of these benefits scales with the loss of wetland areas along creeks such as Marlette.

3. Aquatic Organism Passage Barriers

The box culvert below SR-28, the CMP culvert on the South Fork, several headcuts on the South Fork, and several anthropogenic features in the creek such as gabions and a flume create barriers to aquatic organism passage that inhibit species such as the endangered native Lahontan cutthroat trout and other aquatic species from accessing and inhabiting aquatic ecosystems in the project area. Not only are these species important to the greater ecosystems of Lake Tahoe, the loss of these species from the creek disrupts local food webs, negatively affecting the health and ecology of the local riparian ecosystem. As well, small streams such as Marlette Creek may be a suitable place for Lahontan cutthroat trout to spawn in, so reestablishing their access to the Creek may help support greater goals of restoring spawning populations of the specie to the Lake Tahoe Basin.

4. Pollutant and Sediment Sources

Where the Creek runs along State Route 28, its close proximity to the highway means it may receive pollutants from the highway such as when plowing operations push sediment laden snow towards the creek. The loss of floodplain along the creek may also lead to less capacity for the riparian corridor to filter these pollutants prior to their conveyance to the creek. As well, the creek is eroding the highway embankment, creating a sediment source that increases sediment load in the creek. Heavily incised areas of creek where banks erode rather than overbank during high flows also lead to increased sediment loads in the creek.

5. Highway Embankment Stability

The erosion of the highway embankment by the stream may eventually cause stability issues that could adversely affect SR-28. Addressing these stability issues prior to them worsening will likely allow these issues to be addressed at a much lower cost and well before they become an issue that could affect highway stability and safety.

With the goal of addressing these identified issues, NTCD began working on a design to restore Marlette Creek while maintaining existing uses in the project area.

Overall project design also focused on balancing cut and fill earthwork quantities throughout the entire project area. Transporting cut and fill is costly and increases pollution from trucks transporting these materials. Several of the proposed project actions require significant cut, while other actions require significant fill. Combining these actions into one project allows excess cut generated in one area of the project to be used as fill in another area of the project thus minimizing the import and export of materials from the project area.

Another significant consideration in design was minimizing the adverse environmental impacts of project construction. Construction access roads through riparian habitat can cause significant damage to riparian ecosystems that may take several years to return to existing undisturbed conditions and also increase project costs. Therefore, restoration actions that require heavy machinery were limited to locations with the heaviest degradation, while lower-intensity restoration actions that can be done with hand crews were chosen for areas degradation is less severe. As well, areas with existing disturbance such as old road grades were identified as good locations for access roads to the project area.

The project area, including the proposed restoration area has many conifers. Many of these conifers are likely growing in historic areas of floodplain that were lost as the creek was degraded. However, some of these conifers are of a very large diameter (>36”), and may be beneficial to keep in the project area. Therefore, proposed grading was adjusted when possible to avoid disturbance to large diameter conifers. To minimize required offhaul of trees, the project will also use large woody debris to increase floodplain roughness in restored areas, which allows removed trees to be utilized on site.

Using the preceding design criteria, the proposed project actions were determined as well as the desired future conditions that restoration activities aim to achieve.

PROPOSED ACTIONS AND PROJECT DESIGN

The project proposes actions to address each of the issues identified with existing conditions that currently contribute to environmental and hydrologic issues in the project area.

Existing vs Proposed Improvements				
Reach	Existing Channel Length (LF)	Proposed Channel Length (LF)	Existing Floodplain Area (SF)	Proposed Floodplain Area (SF)
South Fork Marlette	1,290	1,340	13,076	39,308
Main Fork Marlette	380	380	10,112	6,925
Net Total	+50		+23,115	

1. <u>Main Fork Channel Restoration</u>

Addresses issues: 1,2,3,4,5

A new channel and floodplain will be constructed for the Main Fork of Marlette Creek upstream of the SR-28 box culvert. This channel will have increased sinuosity and decreased incision compared to the existing channel. The channel will be sized to overbank at the 1-year recurrence interval, including in dry years when there are minimal releases from the Marlette Lake dam. When there are large releases, the channel will overbank and excess flows will run in the adjacent floodplain. The slopes from the floodplain to the upland will be graded at a minimum of 3:1 which will lead to stability of these slopes even when large discharges from the Marlette Lake dam are occurring. The new location of the channel will be further from the highway than the existing alignment of the channel, so there will be much less direct pollutant loading from the highway into the stream.

2. SR-28 Embankment Stabilization

Addresses issues: 4, 5

The restoration and relocation of the Main Fork channel will allow a steep eroding section of the SR-28 embankment to be reconstructed and regraded at a 3:1 slope, creating a stable slope that will support SR-28.

3. SR-28 Box Culvert Extension and Retrofit

Addresses issues: 3, 4, 5

The concrete box culvert below SR-28 will be extended on it upstream end. This will allow the SR-28 embankment to be stabilized as discussed in (2) and will allow for the repair of steep eroding slopes above the existing culvert that deposit sediment into the creek. As well, a series of concrete weirs will be installed in the existing box culvert that will create flows and depths in the box culvert that will allow aquatic organisms to pass through the culvert.

4. Main Fork Step Pool Construction

Addresses issues: 1, 2, 3

A series of rock and cobble step pools will be constructed downstream of the SR-28 box culvert. These step pools will eliminate the existing 4' drop at the downstream end of the box culvert, and will be designed to allow fish passage up the pools and into the culvert. As well, step pools will fill in incised areas of channel and reconnect adjacent floodplain terraces.

5. South Fork Channel Restoration

Addresses issues: 1, 2, 3

A severely incised portion of the South Fork of Marlette creek will be filled and a new channel will be constructed with increased sinuosity and connectivity with its adjacent floodplain. The channel will be designed to overbank at a 1.2 year frequency and will also provide depths and flows that allow aquatic organism passage through this reach of the creek.

6. South Fork Step Pool Construction

Addresses issues: 1, 2, 3

Several headcuts exist on the South Fork of Marlette Creek above the confluence with the North Fork, and a series of rock and cobble step pools will be installed on this section of creek to eliminate these headcuts and allow aquatic organism passage up the creek. These step pools will also increase connectivity with adjacent floodplain.

7. South Fork Floodplain Restoration

Addresses issues: 2, 4

In several areas where the riparian extent along the South Fork of Marlette is limited, grading will increase the size of the adjacent floodplain by removing historic fill, such as a road grade that runs along the east side of the creek. As well, anthropogenic features like flumes and pipes that exist along the creek will be removed, returning the floodplain to a more natural state.

8. Mine Shaft Road Culvert Removal and Ford Crossing Construction

Addresses issues: 1,2,3

The existing road crossing of the South Fork of Marlette creek and the corrugated metal pipe culvert below the road will be removed and replaced with a rock ford. This ford will allow vehicles to safely cross the creek. A small low-flow channel will be constructed in the ford that will allow depth and flows to be maintained that allow fish passage throughout most summers, while allowing vehicles to safely pass over the channel. While vehicles are not anticipated to use the ford during high-flow events, the water depth in the ford should generally allow safe passage of vehicles even during higher flow events.

9. Beaver Dam Analog installation

Benefits: 1, 2

Beaver dam analogs (BDAs) and post-assisted log structures will be installed in the channel in select areas on both the main and south forks of Marlette Creek. Because BDAs are low-cost and low-impact, they will allow restoration efforts to extend into areas of the creek that may not have a level of degradation that justifies a total channel reconstruction. The BDAs will increase overbanking and increase channel complexity, benefiting overall ecological health in the riparian corridor.

Additional Design Considerations

Preliminary cut and fill estimates for the project are a total cut of 2,350 CY and a fill of 1,080 CY. All disturbed areas will be revegetated using native plants and seed. Standard BMPs will be installed during construction, and plans will minimize disturbance by construction vehicles outside of paved areas and the area of grading disturbance.

Access to the various sites upstream of the SR28 culvert will be via Mine Shaft Road (15N09A), an abandoned forest road paralleling the South Fork. Mine Shaft Road splits after the existing CMP culvert crossing and an abandoned no name road continues to parallel the South Fork. The abandoned road cut narrows and becomes less defined as it approaches the confluence. All construction access to the east side of SR28 will be from the abandoned road and the road will need to be widened and cleared to gain access to the Main Fork. As well, tree and brush removal will be required to access the SR28 culvert. Short access points from the abandoned road will be established to gain direct access to the channel and additional clearing and grubbing will be required to remove brush and small diameter (<14” DBH) conifers. Access to the Main Fork downstream of the SR-28 culvert will be from a low sloping access point along the southwest side of the SR28 embankment. Areas disturbed by construction access routes will be restored and revegetated at the end of the project, and temporary construction roads will be decommissioned.

Temporary staging areas will be established for construction equipment and machinery, downed trees, and excavated earthwork. Three staging areas have been identified; however, it will be left to the contractor to decide which sites will be used. The first site is located just beyond the Forest Service gate at the Chimney Beach parking lot, the next is located in a clearing on the north side of Mine Shaft Road, and the third site is located towards the end of Mine Shaft Road. Construction BMPs such as straw waddles will be installed and maintained around all staging areas. Any disturbance in staging areas will be restored prior to the end of construction using soil decompaction methods and native seeding.

During project planning, it was discovered that planning and design was also underway for a major rehabilitation and safety improvement project at Marlette Dam. Construction for this project would require releasing significant flows from Marlette Lake for an extended period of time. Because these large flows could disrupt the restored channel on the Main Fork before it was revegetated and stabilized, it was determined that the restoration project should not be constructed until this release occurred. With construction on the dam occurring in 2025, the releases from that dam would begin early that winter and would be done by the summer construction season. Therefore, construction on the restoration project was scheduled to occur no earlier than summer of 2025.

PROJECT BENEFITS AND DESIRED FUTURE CONDITIONS

The proposed restoration actions look to achieve the following set of future conditions in the Marlette Creek watershed in the project area:

1. <u>Increased water quality and decreased fine-sediment transport to Lake Tahoe.</u>

Restoration Actions

All nine proposed actions contribute to this goal.

Benefits

Increased water quality will benefit flora and fauna in the Marlette Creek watershed, will benefit the health and clarity of Lake Tahoe and will benefit downstream water users.

Monitoring

On-going monitoring of this desired future condition can be done through water quality monitoring within, upstream and downstream of the project area.

2. <u>Increased Riparian area</u>

Restoration Actions

All nine proposed actions contribute to this goal.

Benefits

An increase in meadow and riparian areas will increase water quality by filtering runoff, will provide additional habitat for riparian species, will increase base-flows through groundwater recharge and will attenuate high flows through the watershed. As well, wet meadow vegetation acts as a fire break. Thus, all five environmental benefits are achieved with this condition.

Monitoring

On-going monitoring of this desired future condition can be done by monitoring areas of riparian vegetation through field visits and aerial imagery.

3. <u>An increase in habitat and hydraulic complexity in riparian areas</u>

Restoration Actions

All nine actions contribute to this goal

Benefits

Increased hydraulic complexity leads to an increase in biodiversity (Amoros and Bornette, 2002), (Thorp et al, 2006). As well, increased hydraulic complexity retains water within a meadow, thus leading to increased filtration, increased groundwater recharge, increased vegetation health, increased late season base-flows and the attenuation of high flows. Thus all five environmental benefits are achieved with this condition.

Monitoring

On-going monitoring of this project objective can be done by monitoring future channel evolution through site visits and aerial imagery to quantify total channel length and number of wetted channels in cross-sections of Marlette Creek.

4. <u>Increased populations of aquatic species in the project area</u>

Restoration Actions

All nine actions contribute to this goal

Benefits

Increased biodiversity and populations of aquatic species, including the endangered Lahontan Cutthroat Trout

Monitoring

On-going monitoring and surveys of aquatic species populations.

5. <u>Increased drought resiliency by increasing stream baseflows, attenuating high flows, increasing groundwater recharge, and by providing resilience to fire.</u>

Restoration Actions

All nine actions contribute to this goal

Benefits

Increased riparian extent during the will provide quality riparian habitat, increase riparian vegetation health, and increase resiliency to fire. As well, a properly sized channel that is connected to its adjacent floodplain will promote overbanking that attenuates high-flow events and promotes groundwater recharge. In doing so, the water table surrounding the creek will rise, and will release higher base flows in the dry season with cooler water temperatures.

Monitoring

Riparian extent can be monitored and mapped with field visits during late summer and early fall. As well NDVI can be tracked using remote sensing data sources like those provided by UNR's ClimateEngine.

6. <u>Increased infrastructure resiliency.</u>

Restoration Actions

All nine actions contribute to this goal.

Benefits

Addressing existing issues with infrastructure in the area during this project will allow erosion issues to be fixed and long-term solutions to be implemented that will prevent future erosion and degradation of infrastructure. By doing these actions as part of the project, implementing these fixes will be cheaper than doing them as part of a separate individual project. As well, by addressing these erosion and stability issues now, it will ensure that they do not become larger and more costly problems in the future. This will save taxpayer dollars both today and in the future.

Monitoring

Monitoring of the stability and erosion of the SR-28 highway embankment can be done during site visits. As well, the ford crossing of Mine Shaft Road can also be monitored to track its ongoing stability and functionality.

CONCLUSION

The Marlette Creek Restoration and SR-28 Crossing Project will have numerous benefits. It will increase water quality, decrease fine-sediment runoff to Lake Tahoe, increase riparian habitat, increase populations of riparian species and will increase drought and infrastructure resiliency. In doing so, the project will play an important role in the ongoing efforts to protect Lake Tahoe, to increase biodiversity, to provide clean and safe water to downstream users in the Truckee River watershed and to promote cost-effective infrastructure resiliency that will save taxpayer dollars.

APPENDICES

1. Project Overview
2. Project Civil Plans

REFERENCES

Amoros C, Bornette G. 2002. Connectivity and biocomplexity in waterbodies of riverine floodplains. Freshwater Biology 47: 761.

Cooper and Merritt. 2012. Assessing the Water Needs of Riparian and Wetland Vegetation in the Western United States. USDA Forest Service Rocky Mountain Research Station. General Technical Report RMRS-GTR-282. September 2012. https://www.fs.fed.us/rm/pubs/rmrs_gtr282.pdf

Thorp JH, Thoms MC, Delong MD. 2006. The riverine ecosystem synthesis: biocomplextity in river networks across space and time. River Research and Applications 22: 123–147.

Tolley T, Loupe T, Norman S. March 2009. Final Monitoring Report for Marlette Creek Dam Removal and Restoration Project, Period of Record 2002-2008. USDA Forest Service, Lake Tahoe Basin Management Unit.

USDA Forest Service Lake Tahoe Basin Management Unit. July 2019. SR-28 Shared Use Path, Parking, Safety and Environmental Improvements Project, Draft Environmental Assessment.

Wheaton, Joseph & Bennett, Stephen & Bouwes, Nick & Maestas, Jeremy & Shahverdian, Scott. 2019. Low-Tech Process-Based Restoration of Riverscapes: Design Manual. Version 1.0. 10.13140/RG.2.2.19590.63049/2.

PRELIMINARY DEWATERING AND DIVERSION PLAN

Marlette Creek SR28 Crossing Realignment and Water Quality Improvement Project

Prepared For:

Prepared By:

July 2024

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1.0 BACKGROUND AND OBJECTIVES

The Marlette Creek SR28 Crossing Realignment and Water Quality Improvement Project (Project) is located in Washoe County, Nevada , adjacent to State Route 28 in the vicinity of the Chimney Beach Parking Area. The majority of Project activities will occur on land managed by the US Forest Service (USFS) Lake Tahoe Basin Management Unit (LTBMU), with a smaller proportion in the right-of-way managed by the Nevada Department of Transportation (NDOT). The Project is being designed and managed by the Nevada Tahoe Conservation District (NTCD) under a participating agreement with the LTBMU and NDOT.

The Project will restore and enhance Marlette Creek and the South Fork of Marlette Creek in the vicinity of State Route 28. The restoration will include the following major components:

Main Fork of Marlette Creek

- Install coffer dams and diversion pipe to dewater active work areas for all components described above.
- Realign and restore a 250 linear foot section of the main fork of Marlette Creek upstream of SR28 using excavation and appropriate natural grade controls made of wood or rock and native vegetation to reconnect the creek with an inset floodplain.
- Create riffle-pool fish habitat downstream of the SR 28 culvert outlet on Marlette Creek for 125 linear feet using large rock and stream bed material consisting of sands, gravels, and cobbles.
- Modify and extend the existing box culvert at SR 28 for up to 15 feet upstream to reduce road embankment erosion and allow for juvenile trout passage.

South Fork of Marlette Creek

- Install coffer dams and diversion pipe to dewater active work areas for up to 1,300 linear feet of the South Fork of Marlette Creek.
- Realign and restore up to 900 linear feet of the South Fork of Marlette Creek using excavation and appropriate natural grade controls made of wood or rock and native vegetation to stabilize the eroding bed and banks and reconnect the creek with an inset floodplain, where possible.
- Remove an existing corrugated metal culvert crossing Mine Shaft Road and construct a new ford using rock to improve future vehicle access.

Construction activities for the project are anticipated to primarily take place between July 1 and October 15, 2025. The project is classified as an Environmental Improvement Project (EIP) by the Tahoe Regional Planning Agency with EIP number 01.01.01.0177.

The purpose of this Dewatering and Diversion Plan (DDP) is to detail the control of intercepted creek flows, groundwater flows, and seepage flows during the construction of proposed improvements described above. Dewatering and discharge processes and monitoring described in the following sections will allow the system to operate at an acceptable level while protecting water quality until construction is completed.

The Contractor shall submit a detailed Dewatering and Diversion Plan to the Engineer for distribution to Nevada Division of Environmental Protection (NDEP) and the Lake Tahoe Basin Management Unit (LTBMU) prior to the initiation of construction activities, and in accordance with the project plans, standard specifications, the special technical specifications, the Stormwater Pollution Protection Plan (SWPPP), the Forest Service Resource Protection Measures, and this plan. These entities will review and comment on the Plan within fifteen (15) working days and provide comments to the Engineer who will then provide the comments to the Contractor. The Contractor will update the plan based on the comments, if needed, and re-submit to the Engineer for review and acceptance. No work on the Project will be allowed to be performed until an accepted plan has been provided and certified.

The detailed dewatering plan shall include the Contractor's approach for dewatering including but not limited to: the dewatering location(s), number and size of pumping units (if applicable), power source for pumping units (if applicable), size and materials for pipes, materials for damming, piping discharge point(s), fuel storage location (if applicable), location of emergency or back up detention system, settling basin (if applicable), gravel bags, baker tank (if applicable), dirt bag filter (s) and location of dewatering infiltration area. The Contractor shall include the manufacturer's specifications where applicable.

The detailed diversion plan shall include the Contractors approach for diverting the natural flow of Marlette Creek during construction of in-channel work including but not limited to: diversion method and materials, number and size of pumping units, power source for pumping units, piping discharge point(s), access and installation methodologies, protection methods for discharge point(s), fuel storage (if applicable), design flow rates, and final method for gradually introducing natural flow into the newly constructed channel while concurrently meeting all applicable regulatory water quality standards for discharge. The Contractor shall include the manufacturer's specifications where applicable.

Alternatively, the Contractor may adopt this plan and list the following information: diversion method and materials, number and size of pumping units, power source for pumping units, piping discharge point(s), access and installation methodologies, protection methods for discharge point(s), fuel storage (if applicable), and design flow rates.

2.0 REGULATORY REQUIREMENTS

2.1 Effluent Requirements

The diversion and dewatering operations as well as the introduction of flow into the newly constructed channel are required to meet the permit requirements of Nevada Division of Environment Protection (NDEP), and the Tahoe Regional Planning Agency (TRPA). The NDEP standards for tributaries in the Lake Tahoe Basin reference the Nevada Administrative Code - Chapter 445A – NAC 445A.1628. The TRPA standards are specified in Chapter 81 – Water Quality Control of the TRPA Code of Ordinances. The more stringent NDEP standard for turbidity governs. NDEP Standards for discharge to tributaries of Lake Tahoe are in Appendix C.

Operations will be required to fully accommodate all in-channel flows and intercepted groundwater for the entire duration of the Project to assure Project success and to protect the downstream reaches of Marlette Creek and Lake Tahoe from any discharge exceeding 10 NTUs, or the baseline turbidity value established prior to construction, whichever is higher. Per NDEP NAC445A.1628, single value turbidity cannot exceed 10 NTU in more than 10 percent of samples taken. Samples must be taken daily at Marlette Creek and Lake Tahoe. See Section 3.3 for additional information on introduction of water to newly restored areas.

2.1 Aquatic Species Requirements

Prior to any dewatering or diversion activities, salvage/recovery of aquatic species will be conducted by LTBMU Fisheries Staff within anticipated construction dewatering or diversion zones operations by electro-shocking or other suitable means as developed through consultation with the LTBMU fisheries staff. Aquatic species will be moved approximately 500 -700 feet upstream or downstream of project activities, as determined by USFS fisheries staff. Block nets will be installed to ensure fish do not move back into the Action Area. Nets will be cleaned one to two times daily to ensure the nets are functioning by LTBMU Staff or the Nevada Tahoe Conservation Staff.

3.0 DIVERSION REQUIREMENTS

3.1 Summary

The project area is at the downstream end of the Marlette Creek watershed, approximately ½ mile upstream from its outlet at Lake Tahoe and includes the State Route 28 crossing. Dewatering and diversion of the flows of Marlette Creek and the South Fork of Marlette Creek will be required as part of this project. As well, it is anticipated that groundwater will be encountered during grading activities which will also necessitate pumped dewatering. Various sub-elements of this project will be constructed at different times from August-October. See Appendix A for project dewatering phasing requirements. Exact project timetables may be adjusted by the engineer based on permitting, precipitation, and hydrologic conditions in Marlette and South Fork Marlette Creeks.

3.2 Installing Diversion

Installation of each diversion dam shall only be initiated after approval from NTCD and the LTBMU. The diversion dam shall be built with sandbags no larger than 14” x 26.” This will enable the transport of bags by hand in wet or sensitive areas. Plastic-lined diversion must be lined in 6 mil (min) tear resistant plastic. See plans and specifications for additional information on installing the diversion. The diversion dam shall be installed in a manner as to not create turbidity and shall be done all by hand (no use of equipment).

3.3 Channel and Pond Flushing and Diversion Decommissioning

Flushing of newly constructed restoration improvements must occur before any diversions are decommissioned. For flushing of new Marlette and South Fork Marlette Creek channel sections, the diversion and associated coffer dams shall remain in place while the contractor pumps no more than 50 gallons per minute into the new channel, taking care to wash and spray sections of loose dirt and sediment if possible. A pump shall be present upstream of the downstream coffer dam to pump flushing flows to upland at least 50 feet away from any active flow paths. NTCD will sample these flushing flows and notify the contractor when water quality standards have been met and additional flows can be directed into the new channel. Additional flow may be directed using a pump or the partial lowering of the diversion dam after one iteration of flushing flows have been completed. Lowering of the diversion dam shall remove no more than one sandbag at a time with testing and water quality standards being met between each sandbag removal at a minimum. Flushing flows for the channel could take up to two full days to meet water quality standards. Once flushing is completed and meets water quality standards, the upstream coffer dam can be fully removed. After this removal, testing shall occur upstream of the downstream coffer dam to ensure that standards are still being met. When standards are met, the downstream coffer dam can be removed.

Decommissioning of each diversion dam shall only be initiated after acceptance of the completion of grading by the Engineer, NTCD, NDEP, and LTBMU. The decommissioning shall start with the shutdown of the diversion pump, if required, and then proceed with the slow and careful removal of portion(s) of the diversion dam. The portion(s) of the diversion dam to be removed shall only be the top layers of the dam in order to minimize the downstream forces of the water on the new grading. The maximum allowable sandbag size for the diversion within Marlette Creek and South Fork Marlette Creek is 14” x 26” to better control the decommissioning of the diversion. The diversion dam shall be removed in a manner as to not create turbidity and shall be done all by hand (no use of equipment). Once the diversion dam has been removed, the diversion area will be restored or regraded per Engineer with appropriate water quality protection measures in place.

3.4 Diversion Flow Rates

Groundwater flows are expected to be encountered due to the project’s proximity to creeks. Marlette Creek is a dam controlled system where summer time flows are expected to be lower than 0.25 cfs. Gaging is available at USGS station 10336715. South Fork Marlette Creek does not have gaging available but NTCD took flow measurements in 2023 at three separate times during May and June. The results are available in Table 2.

Table 2: 2023 Flows Measured using Marsh McBirney Flow Mate in 2023. 2023 was one of the largest winter on record since recording began nearby in 1880.

Date	XS1 (cfs)	XS2 (cfs)	Average for Date (cfs)
5/24/23	3.30	4.07	3.69
6/22/23	1.00	1.00	1.00
6/29/23	1.34	1.32	1.33

The USFS also took flow measurements on the SF of Marlette Creek between 2002-2006 shown in Table 3 below.

Table 3: USFS flow measurements did not exceed 3.66 cfs and average flow was less than 1 cfs most years.

		Above Dam			Below Dam		
		Flow cfs	**Turbidity** NTU	**TSS** mg/L	**Flow** cfs	**Turbidity** NTU	**TSS** mg/L
2002	Min	0.04	0.43	1.48	0.05	0.53	0.00
	Max	0.43	3.47	7.20	0.49	2.99	40.68
	median	0.21	0.96	3.03	0.29	1.52	2.49
	mean	0.22	1.21	3.37	0.27	1.54	4.55
	std err	0.03	0.21	0.34	0.03	0.13	2.15
2003	Min	0.03	0.34	0.21	0.15	1.13	2.50
	Max	0.43	7.20	3.47	0.38	2.39	6.70
	median	0.21	3.03	0.96	0.25	1.21	3.65
	mean	0.19	3.08	1.26	0.25	1.63	4.00
	std err	0.07	1.16	0.58	0.03	0.29	0.70
2005	Min	0.25	0.73	1.80	0.21	0.68	1.80
	Max	1.75	57.60	162.00	2.08	91.20	71.67
	median	0.55	10.39	14.20	0.71	12.30	5.40
	mean	0.76	12.52	27.73	0.88	18.45	15.83
	std err	0.12	3.29	23.82	0.15	6.30	6.57
2006	Min	0.11	0.37	0.62	0.17	0.36	1.20
	Max	3.49	22.70	49.02	3.66	36.30	130.00
	median	0.73	1.67	3.00	0.69	1.85	2.60
	mean	1.14	3.51	7.53	1.20	6.56	17.99
	std err	0.21	1.11	2.55	0.23	2.40	7.79

We expect peak flows at both forks of Marlette Creek to not exceed 1.5 cfs between August and October and this is what the diversion will be designed to.

4.0 DEWATERING REQUIREMENTS

4.1 Summary

In addition to the flow from Marlette and SF Marlette Creeks being routed downstream of the construction area as described in Section 3.0, planned excavation for the new channel construction and other improvements may introduce additional flow from groundwater into the system. Groundwater and seepage flows will be removed from construction and excavation areas as necessary and discharged to land at a location at least 50 feet from Marlette Creek. It is assumed that the Contractor will use flexible hoses to carry the sediment-laden water from portable sump pumps to sprinklers, a dirtbag, or a natural depression to prevent surface flow to Marlette Creek and soil erosion. A check valve should be placed on this line to assure no backflow into the construction area. The effluent may be reused for construction purposes as described in section 4.3. Coffer dams will be installed upstream and downstream of all dewatered areas prior to pumping. It is anticipated that standard coffer dams for dewatering Marlette Creek will require 14” x 26” sandbags. Examples of sandbags will be submitted by the contractor to the engineer for approval.

4.2 Dewatering Flow Rates

Flow from groundwater and seepage into the construction area for in-channel work, culvert placement, and grading may be encountered. No direct aquifer testing has been completed to accurately estimate the maximum rate of groundwater flow which will need to be pumped in order maintain a dewatered construction area during construction of the new channel.

The Contractor is responsible for appropriately dewatering the construction site in order to construct the Project improvements as described in this plan, the SWPPP and the Special Technical Specifications.

Therefore, to convey streamflows and groundwater with an added safety factor, pumps shall be present on site in size and quantity to convey a minimum of 1.5 CFS (~680 GPM). Contractors will be required to submit pump specifications to the project engineer for approval. At least one 3” pump must be on site at all times. Additional pumps may be of 1” and 2” size.

4.3 Discharge and Treatment Options

Treatment options may include the use of dirt bag filters or use of existing water quality infrastructure such as the water quality basins on SR28. The effluent that discharges from any dirt bag filter on the Project site will meet groundwater quality discharge standards before being allowed to infiltrate into the soil in a location that can appropriately accommodate it. The groundwater discharge standard used will be the TRPA Standard of 200 NTU since NDEP Standards only require best management practices and daily monitoring for erosion. TRPA Standards are listed in Appendix D. Discharge locations shall be accepted by the Engineer prior to placement and use by the Contractor. NTCD will take the discharge samples as daily grab samples.

If the treated decant is unable to meet requirements for direct release to the creek downstream of the work area (equal to or less than 10 NTU Turbidity), then it may be applied to the vegetation within a location at least 50 feet from Marlette and South Fork Creeks for infiltration or pumped to a water truck and used as applied dust control. All discharged effluent water used for irrigation will occur at least 50 feet away from Marlette Creek and will be immediately discontinued upon evidence of runoff. The effluent shall not be discharged into sanitary sewers. The contractor shall have hoses of 600 LF in length to enable adequate pumping distance from project areas and Marlette Creek. No overnight pumping without construction personnel on site is allowed.

If the treated water is unable to meet quality requirements and the volume of water is too large to be consumed by use for construction purposes, a sedimentation tank may be necessary to treat the water. If necessary, a sedimentation tank would be used to bring the water to effluent standards (equal or less than 10 NTU Turbidity) before being discharged to Marlette Creek.

4.4 Contractor Requirements

Contractors for this project are required to follow all guidelines in this plan and may not deviate from the plan without approval from the engineer. A fine for work done without engineer's approval of up to $2500 per violation will pertain to any failure to follow the guidelines in this dewatering plan. As well the contractor will be subject to an hourly fine of $250 for turbidity violations.

5.0 OPERATIONS AND MAINTENANCE

All temporary sumps and pumping systems necessary for dewatering activities shall be designed, operated, and maintained to avoid pumping of fine sediments from the subsurface. Monitoring of sumps and pump systems shall be conducted by the contractor at a minimum of every two hours to ensure that subsurface fine sediments are not being removed by the dewatering operation. Dewatering fluids and debris shall be disposed of in a suitable manner in compliance with the requirements of the SWPPP. Sedimentation tanks used on the project site, if required, shall only be flushed and cleaned outside of the project area at an approved facility. Disposal of material shall meet all federal, state, and local requirements. No runoff waters or stormwater shall be allowed to drain into excavated areas, except where specifically identified in the project plans.

Routine monitoring of all diversion and dewatering systems will be conducted daily by the Contractor during active construction. If it is discovered that any portion of the system is not functioning properly, the Contractor shall shut down operations until the problem is evaluated and the necessary repairs to the system are made.

6.0 MONITORING

6.1 Water Quality Monitoring

When discharging construction water to the creek, the discharge effluent water quality must not exceed the upstream turbidity by 10 NTU at a location 200’ downstream from the discharge point. See Appendices C and D for discharge requirements. Discharge effluent water quality will be measured for turbidity at a location 200’ downstream from active construction utilizing daily grab samples by NTCD. When diversions, dewatering, or rewatering operations are occurring within 200 feet of Lake Tahoe, hourly turbidity grab samples will occur. Decommissioning diversions and rewatering new sections of channel shall not proceed to the next phase until turbidity standards are met in the previous phase. Additionally, visual inspection data will be collected at any diversion or dewatering discharge points on a daily basis. If turbidity levels fall outside the limits in Appendix C or if the discharge exhibits any odors, discoloration or oily sheen, the Contractor shall shut down operations until the problem is evaluated and the necessary repairs to the system are made.

6.2 Visual Inspections

When functioning, the Contractor will perform a visual inspection of the entire dewatering and diversion systems from intake to discharge point and note any problems or deficiencies in the system at least every two hours. Any deficiencies shall be corrected immediately and reported to the Engineer for inspection. If there is an issue with the fish screens or fish within the dewatering areas, the Contractor shall report this to the Engineer or LTBMU Fisheries crew immediately.

6.3 Recorded Data

Water Quality data will be collected by NTCD and the data shall include the following:

- Date and time
- Location
- Distance from Active Work Site
- Upstream Turbidity in NTU
- Downstream Turbidity in NTU
- Weather conditions
- Presence of waterfowl or aquatic wildlife
- Color and clarity of discharge effluent
- Erosion or ponding downstream of discharge site
- Photographs taken

APPENDIX A:

DEWATERING SUMMARY TABLE

Marlette Creek Restoration Project - Dewatering Action Summary

Action	Year	Anticipated Start Month	Anticipated End Month	Activity	Anticipated Hydrology Concerns	Dewatering/Mitigation measures	Diversion Length (ft)	Diversion Description	Pumps required on-site	Min. Hose Length (LF)
1	2025	May	September	Remove existing CMP culvert and replace with low flow ford crossing, realign south fork segment 1 and regrade floodplain.	Creek Flows	Dewater exsintg Marlette south fork channel segment around proposed improvements using gravity flow diversion.	650	Construct coffer dam at upstream end and divert flows thorugh 10" HDPE pipe. Construct coffer dam at downstream end and armoured outlet	1	50
2	2025	May	September	Realign south fork segment 2, regrade floodplain, construct step pools at upstream end of SR28 crossing.	Creek Flows	Dewater exsintg Marlette south fork channel segment around proposed improvements using gravity flow diversion.	475	Construct coffer dam at upstream end and divert flows thorugh 10" HDPE pipe. Construct coffer dam at downstream end and armoured outlet	1	50
3	2025	May	September	Realign upstream Marlette main fork	Located adjacent to existing Marlette Creek main fork	Maintain existing channel alignemt flows during proposed alignment construction. Leave unexcavted channel plugs in place at the intersections of the proposed channel and existing channel. Once proposed channel is complete remove plugs at channel intersections, install coffer dams in existing channel to divert flows into proposed channel and backfill existing channel	NA	Construct coffer dams in existing channel at channel intersections	1	50
4	2025	May	September	SR28 culvert extension	Creek flows	Pump creek flows over SR28 to bypass culvert during extension installation	105	Pump from existing pool at culvert entrance. Min 4" pump capable of 1300 GPM at 100 ft TDH.	2	105
5	2025	May	September	Main fork downstream step pool construction	Creek flows	Install coffer dam in existing culvert outlet, gravity flow around construction area.	120	Gravity flow pipe diversion from culvert outlet around construction area. Min 15 inch HDPE pipe	2	120

Rev 10/2024

APPENDIX B:

EXAMPLE DEWATERING AND DIVERSION DAILY INSPECTION FORM

SWPPP INSPECTION REPORT	Approx. Temperature: ___________	Storm Start: _____________ (date)
Project: ____	PPT: _____Y / N_____	Storm Duration: _________________
Inspector: _____________________________________	PPT Amount at time of inspection: ________ in.	Time since last storm: ____________

DATE: ______________________ TIME: ___________	DAY:	M	T	W	TH	F	SA	SU

Construction Stage: ______________________________

Area of site exposed to storm water runoff: ______________

Construction Activities: ____

____

Inspection Type

Daily	☐	Prior to Predicted Rain	☐	Following Rain Event	☐
Weekly	☐	During Rain Event	☐		

Blank=No Inspection NC=Needs Correction, See Observations OK or Check Mark=Meets Standards NA=Not Applicable

1)	Damage to containment dikes or erosion control fencing?	
2)	Improperly installed or ineffective erosion control fencing?	
3)	Unauthorized vehicle access, vehicles accessing designated non-construction areas not subject to disturbance?	
4)	Boundary fence damage or removal?	
5)	Disturbed areas with inadequate erosion prevention and sediment control protection?	
6)	Evidence of any sediment leakage through erosion control fencing or containment dikes?	
7)	Soil piles and other earthen materials which are unprotected or located in a drainage way?	
8)	Spilled and improperly stored chemicals, paint, fuel, oil, solvents, sealants, etc.?	
9)	Upstream runoff diversion structures (are in place and operational)?	
10)	Any evidence of sediment tracking from construction equipment?	
11)	Any signs of soil erosion or deposition down gradient from runoff discharges?	
12)	Sediment accumulation within onsite storm water drainage control facilities, and facilities in need of maintenance?	
13)	Any evidence of non-storm water discharges from the project site? Authorized, illicit, BMP condition?	
14)	Does SWPPP or WPCP require revisions?	
15)	Notable observation at relevant discharge points and downstream locations of the receiving water?	
16)	Observed impacts to the receiving water?	
17)	Photographs taken?	

Date = Defeciency to be addressed O = Observation

Date added	Observation/Inspection	WPCD #	Photo	Date Completed

SIGNATURE: ____ **TITLE:** ______________________________

APPENDIX C:

NDEP WATER QUALITY STANDARDS FOR LAKE TAHOE TRIBUTARIES

STANDARDS OF WATER QUALITY

Lake Tahoe Tributaries

PARAMETER	REQUIREMENTS TO MAINTAIN EXISTING HIGHER QUALITY	WATER QUALITY CRITERIA TO PROTECT BENEFICIAL USES	Beneficial Uses[a]										
			Livestock	Irrigation	Aquatic	Contact	Noncontact	Municipal	Industrial	Wildlife	Aesthetic	Enhance	Marsh
Beneficial Uses			X	X	X	X	X	X	X	X		X	
Aquatic Life Species of Concern			Cold-water fishery.										
Temperature - °C		S.V. Oct-May ≤ 10.0 S.V. Jun-Sep ≤ 20.0			*								
pH - SU		S.V. 6.5 - 9.0			*								
Dissolved Oxygen - mg/L		S.V. ≥ 6.0			*								
Total Phosphorus (as P) - mg/L		A-Avg. ≤ 0.05			*	*							
Nitrate (as N) - mg/L		S.V. ≤ 10.0						*					
Nitrite (as N) - mg/L		S.V. ≤ 0.06			*								
Unionized Ammonia - mg/L		S.V. ≤ 0.004			*								
Total Suspended Solids - mg/L		S.V. ≤ 25.0			*								
Turbidity - NTU		S.V. ≤ 10.0			*								
Color - PCU		S.V. ≤ 75.0						*					
Total Dissolved Solids - mg/L		A-Avg. ≤ 500.0						*					
Chloride - mg/L		S.V. ≤ 250.0						*					
Sulfate - mg/L		S.V. ≤ 250.0						*					
Sodium - SAR		A-Avg. ≤ 8.0		*									
E. coli - cfu/100 mL[b]		S.V. ≤ 126.0				*							
Toxic Materials		[c]											

* = The most restrictive beneficial use.

X = Beneficial use.

[a] Refer to NAC 445A.122 and 445A.1622 for beneficial use terminology.

[b] The single value must not be exceeded in more than 10 percent of the samples collected within any 30-day period.

APPENDIX D:

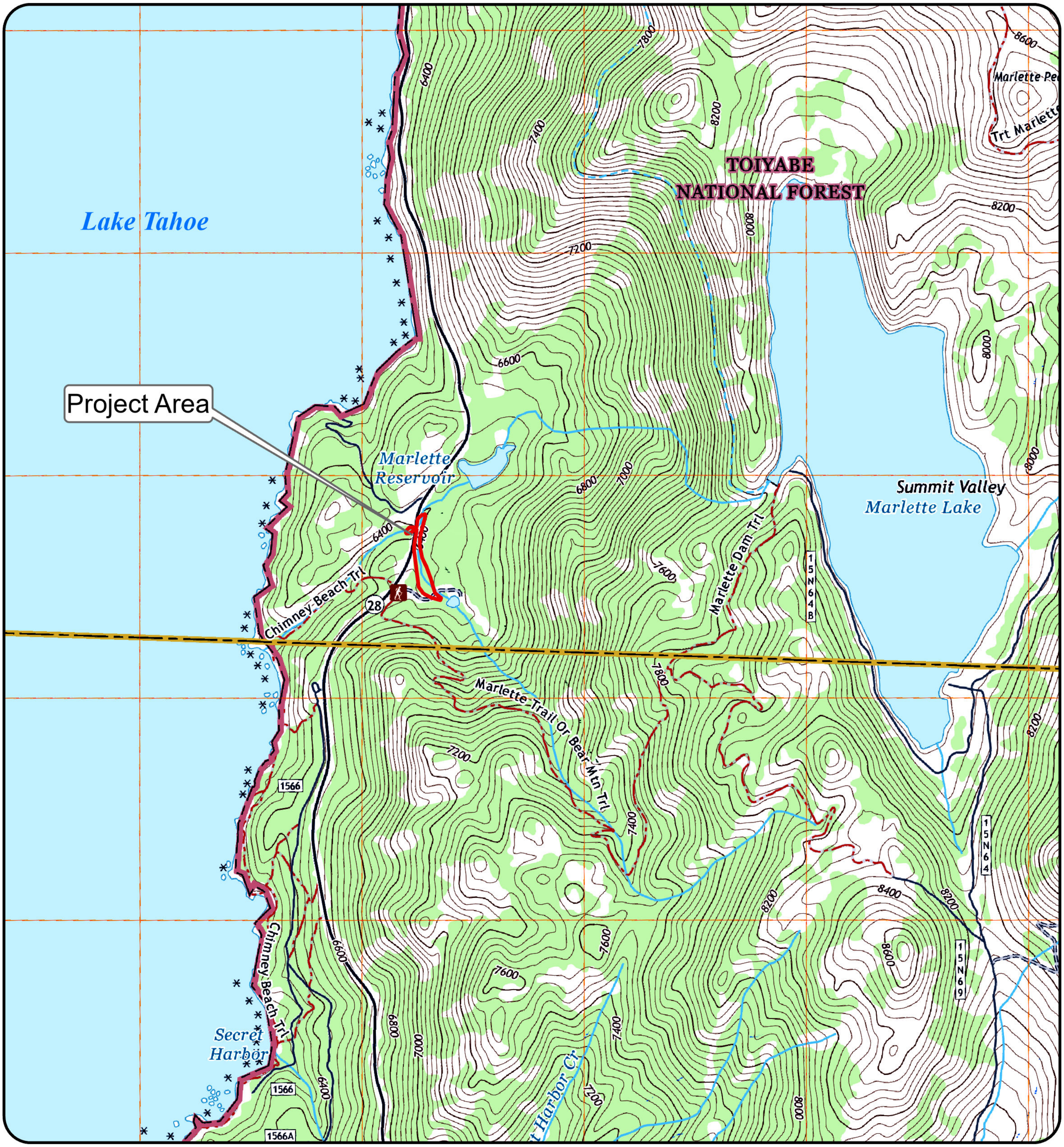
TRPA STANDARDS FOR SURFACE DISCHARGE

Table 3.10-2 TRPA Discharge Limits for Surface Runoff and Discharge to Groundwater

Constituent	Maximum Concentration
Surface Runoff	
Dissolved Inorganic Nitrogen as N	0.5 mg/l
Dissolved Phosphorus as P	0.1 mg/l
Dissolved Iron as Fe	0.5 mg/l
Grease and Oil	2.0 mg/l
Suspended Sediment	250 mg/l
Discharge to Groundwater	
Total Nitrogen as N	5 mg/l
Total Phosphate as P	1 mg/l
Iron as FE	4 mg/l
Turbidity	200 NTU[1]
Grease and Oil	40 mg/l

Source: TRPA 2012a

[1] NTU = Nephelomteric Turbidity Unit



Legend

Project/Study Area (3.8 Acres)

Basemap is USGS 7.5 minute quadrangle sheet for Marlette Lake, NV 2014

Project Location

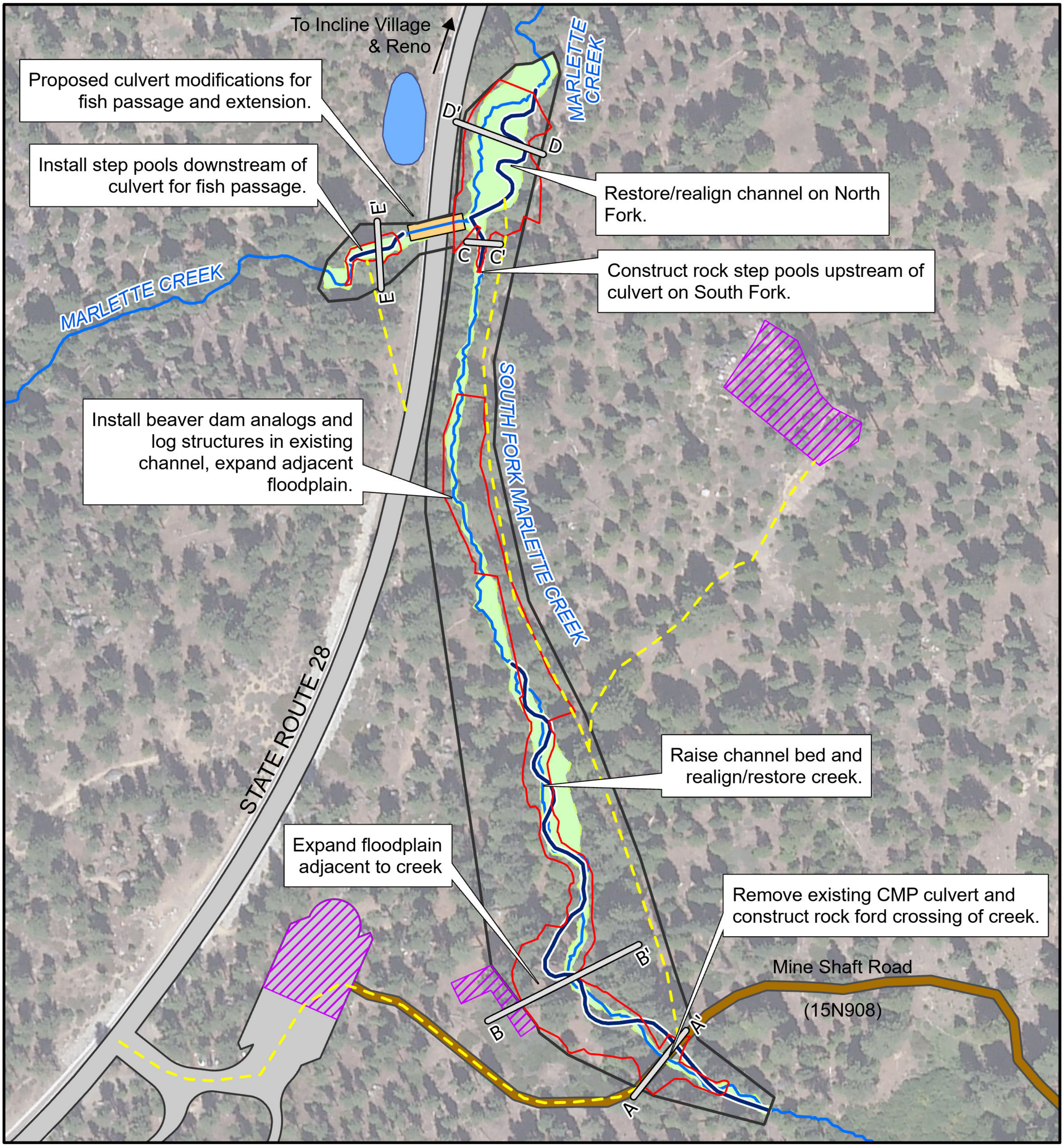
Marlette Creek Restoration and State Route 28 Crossing Improvement Project
Washoe County, NV

0 1,000 2,000 3,000 4,000 Feet

Scale - 1:24,000

N

UTM Zone 11 N	Horiz: NAD 83, Vert:NAVD88	Prepared/Revised: 1/23/2025
Prepared by: P. Johnson, NTCD	Nevada Tahoe Conservation District	Page 1 of 6



Legend

- Project Area (3.8 Acres)
- Ex. Stream
- Ex. Box Culvert
- Ex. NDOT Stormwater Basin
- Ex. Paving
- Ex. Dirt Road
- Cross-Section
- Ex. OHWM Extent (29,798 SF)
- P. Channel Modification
- Construction Staging
- Proposed Grading (1.3 Ac.)
- Construction Access Route

Imagery Source: TRPA, 2018

Project Overview

Marlette Creek Restoration and State Route 28 Crossing Improvement Project
Washoe County, NV

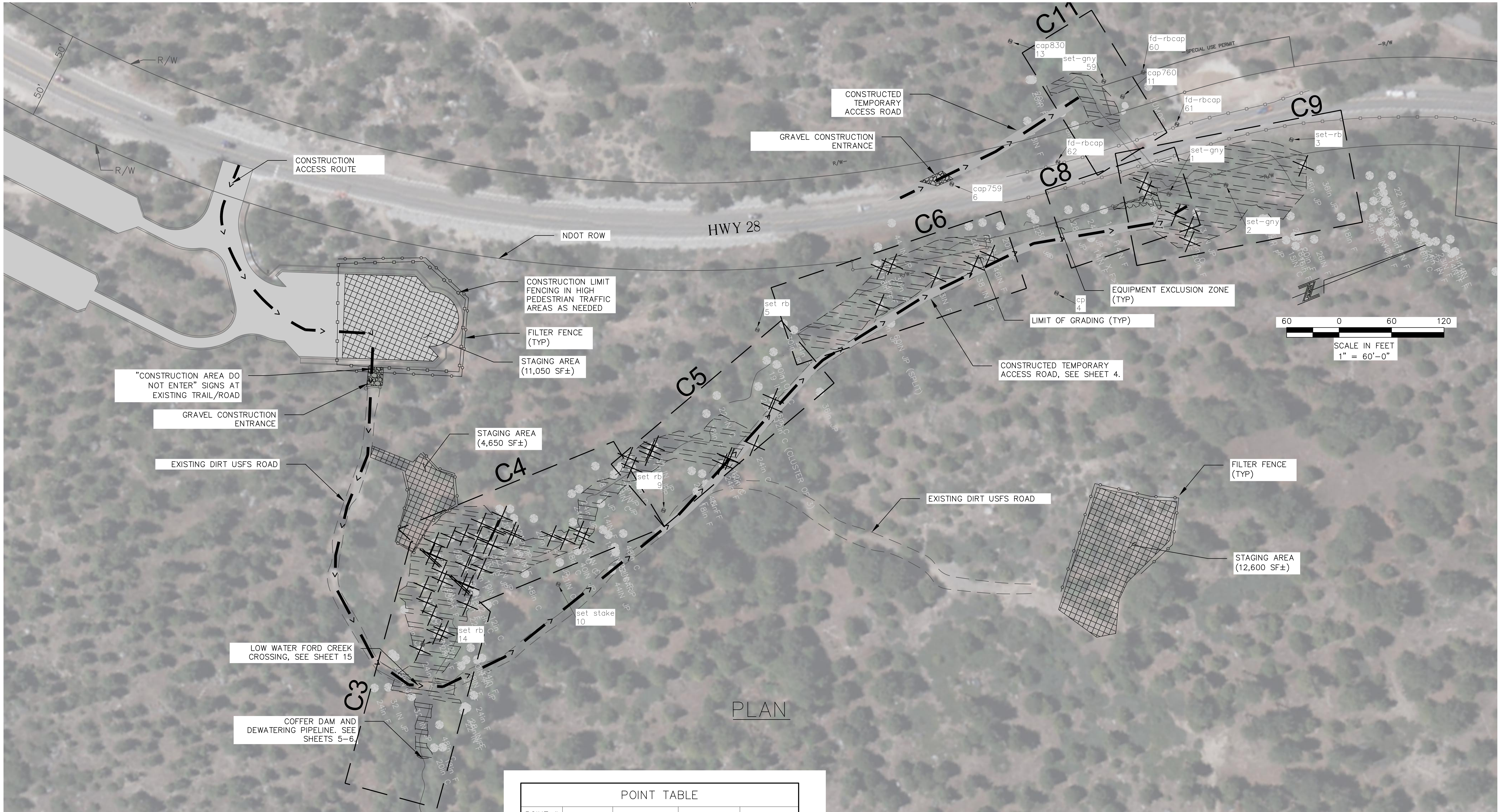
Map Scale - 1:1,920 Engr. Scale: 1"=160 Feet

0 80 160 240 320 400 Feet

N

coord. sys.:	horiz. datum:	vert. datum:
NV West State Plane	NAD 83	NAVD88

Prepared by:		Map Updated:	Page:
PJ, NTCD	Nevada Tahoe Conservation District	1/24/2025	5 of 6



POINT TABLE				
POINT #	ELEVATION	NORTHING	EASTING	DESCRIPTION
1	6388.40	14739316.390	2244736.570	set-gny
2	6391.88	14739380.860	2244751.161	set-gny
3	6397.27	14739469.430	2244730.492	set-rb
4	6418.58	14739155.080	2244794.071	cp
5	6416.23	14738821.610	2244706.629	set rb
6	6408.82	14739089.960	2244633.851	cap759
9	6421.34	14738645.450	2244858.834	set rb
10	6427.21	14738502.410	2244892.725	set stake
11	6385.50	14739308.200	2244613.426	cap760
13	6384.20	14739212.510	2244506.873	cap830
14	6432.12	14738332.970	2244899.472	set rb
59	6382.54	14739294.788	2244589.218	set-gny
60	6395.33	14739340.415	2244596.096	fd-rbcap
61	6403.37	14739354.370	2244665.755	fd-rbcap
62	6404.46	14739212.010	2244655.510	fd-rbcap

TREE REMOVAL	
SPECIES (DBH)	QTY
PINE (12"-29")	9
PINE (30"-36")	6
PINE (38")	1
FIR (12"-29")	36
FIR (30"-36")	3
FIR (46")	1
TOTAL	56

GRADING SUMMARY - MARLETTE SOUTH FORK REALIGNMENT
CUT (BANK) = 1,320 CY
FILL = 750 CY
NET = 570 CY FILL
GRADING DISTURBANCE = 40,000 SF

GRADING SUMMARY - MARLETTE MAIN FORK UPSTREAM OF CULVERT
CUT (BANK) = 1,030CY
FILL = 260 CY
NET = 770 CY CUT (BANK)
GRADING DISTURBANCE = 15,500 SF

GRADING SUMMARY - MARLETTE DOWNSTREAM STEP POOLS
CUT (BANK) = 5 CY
FILL = 70 CY
NET = 65 CY FILL
GRADING DISTURBANCE = 1,220 SF

GRADING SUMMARY - ENTIRE PROJECT
GRADING QUANTITIES (TO FG):
CUT (BANK) = 2,355 CY
FILL = 1,080 CY
NET = 1,275 CY CUT

GRADING DISTURBANCE = 56,700 SF

BID SET

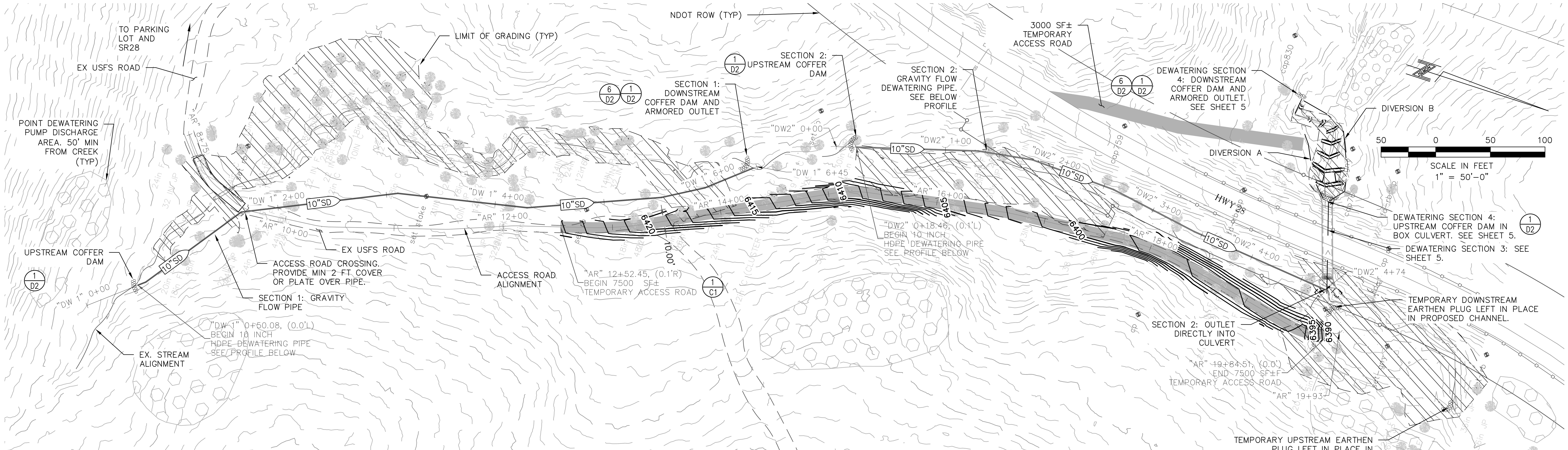
Know what's below. Call before you dig.

Nevada Tahoe Conservation District

CONSTRUCTION STAGING AND CLEARING
MARLETTE CREEK RESTORATION PROJECT

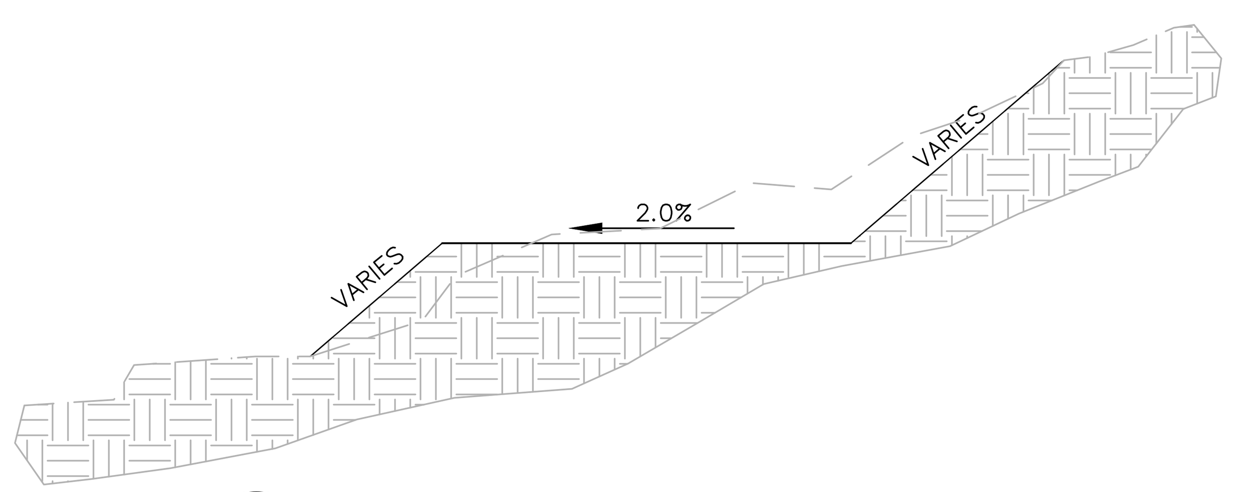
PROFESSIONAL ENGINEER - STATE OF NEVADA
MEGHAN C. KELLY
Exp: 6/30/25
CIVIL
4/8/2025
No. 20851

DESIGNED/DRAWN	EK
CHECKED	MK
DATE	4/2025
SCALE	AS SHOWN
PROJECT	MARLETTE CREEK RESTORATION
SHEET	iii



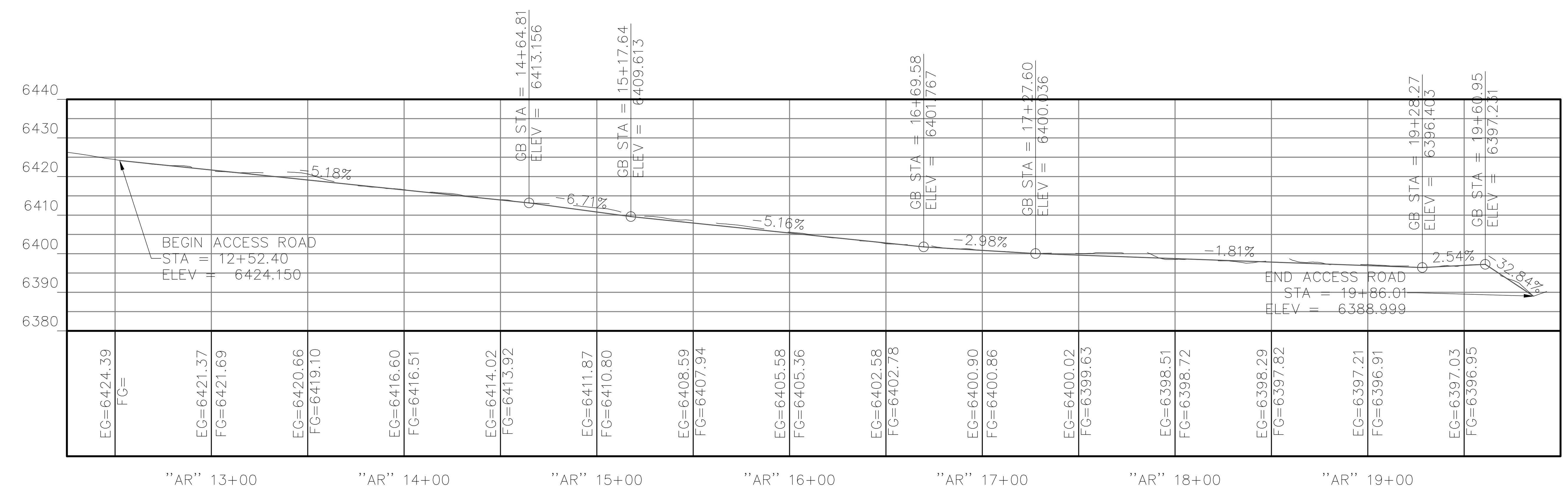
NOTES:
1. IF PLANNED DEWATERING METHODS DIFFER FROM THE PLANS OR SPECIFICATIONS THE CONTRACTOR SHALL SUBMIT A DEWATERING DIVERSION PLAN PRIOR TO START OF CONSTRUCTION.
2. SEDIMENT LOGS AND SILT FENCE SHALL BE INSTALLED IN ACCORDANCE WITH TRPA AND THE RPMS TO PROTECT AREAS DOWN GRADIENT OF MATERIALS STORAGE AND ACTIVE GRADING AREAS. STABILIZE SOIL AFTER DISTURBANCE TO MINIMIZE SEDIMENT DISCHARGE.
3. FISH RESCUE IS REQUIRED TO BE COMPLETED PRIOR TO THE START OF ANY DEWATERING OR IN CHANNEL WORK. THE CONTRACTOR SHALL COORDINATE WORK WITH NTCD AND FISH RESCUE SUBCONSULTANT NTCD EMPLOYS.

PLAN



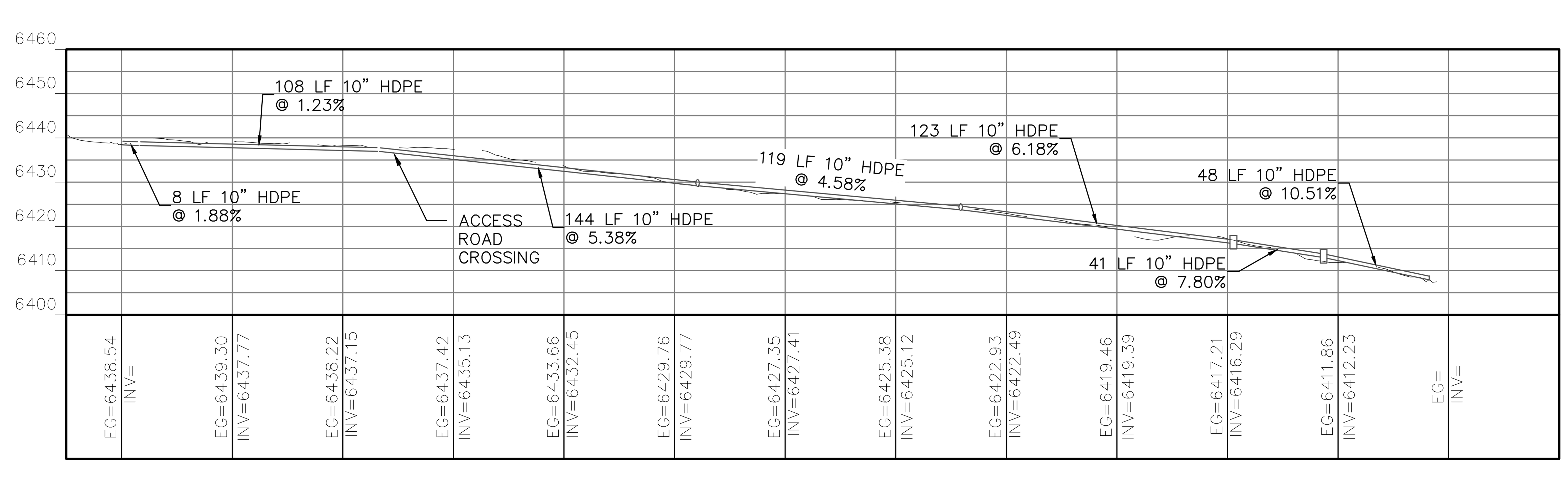
1 C1 ACCESS ROAD TYPICAL SECTION
1"=1.5'

NOTES:
1. ROAD SECTION IS A SUGGESTED TYPICAL DETAIL, CONTRACTOR CAN DETERMINE AT THEIR DISCRETION NECESSARY ACCESS ROAD IMPROVEMENTS AND EXTENTS. ACCESS ROAD IMPROVEMENT LIMITS SHOWN ARE AN ESTIMATE BASED ON THE TYPICAL SECTION ABOVE AND ACCESS ROAD PROFILE.
2. CONTRACTOR SHALL RESTORE ALL EXISTING DISTURBED DIRT ROADS AND CONSTRUCTED TEMPORARY ACCESS ROADS TO THE ORIGINAL GRADES AND CONDITION PRIOR TO FINAL COMPLETION.

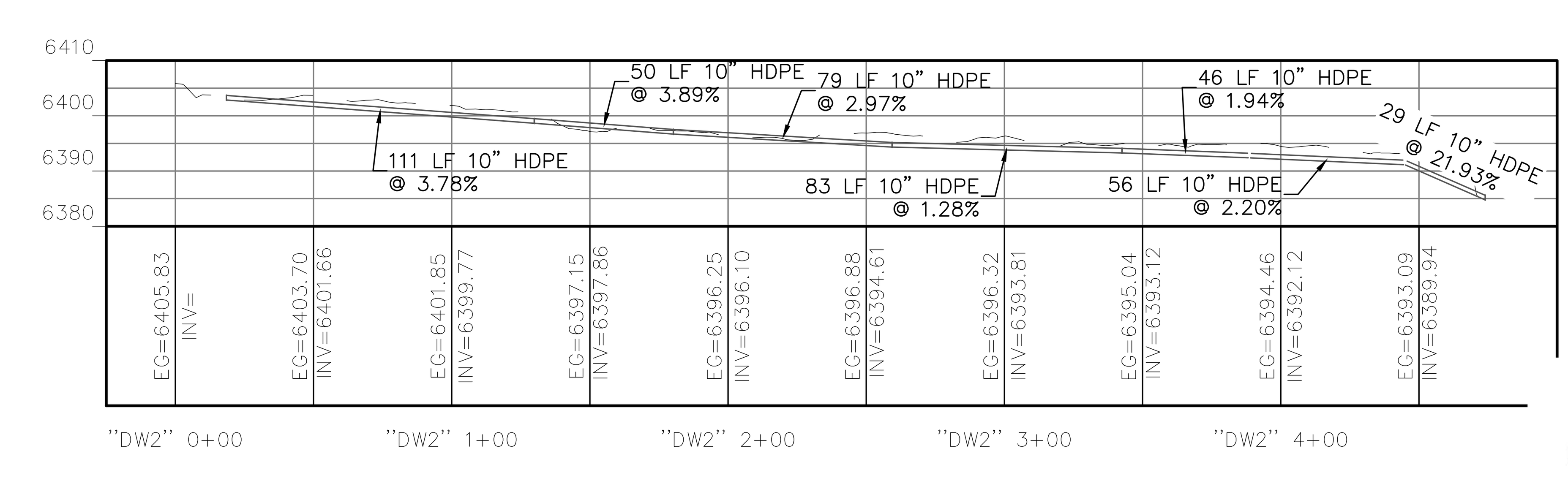


"AR" PROFILE–ACCESS ROAD

SCALE:
HORIZONTAL: 1"=50'
VERTICAL: 1" = 25'



"DW1" PROFILE–SECTION 1 DEWATERING



"DW2" PROFILE–SECTION 2 DEWATERING

Know what's below. Call before you dig.

Nevada Tahoe Conservation District

DEWATERING AND ACCESS 1
MARLETTE CREEK RESTORATION PROJECT

PROFESSIONAL ENGINEER – STATE OF NEVADA
MEGHAN C. KELLY
Exp: 6/30/25
CIVIL
No. 20851

BID SET

DESIGNED/DRAWN	EK
CHECKED	MK
DATE	4/2025
SCALE	AS SHOWN
PROJECT	MARLETTE CREEK RESTORATION
SHEET	C1

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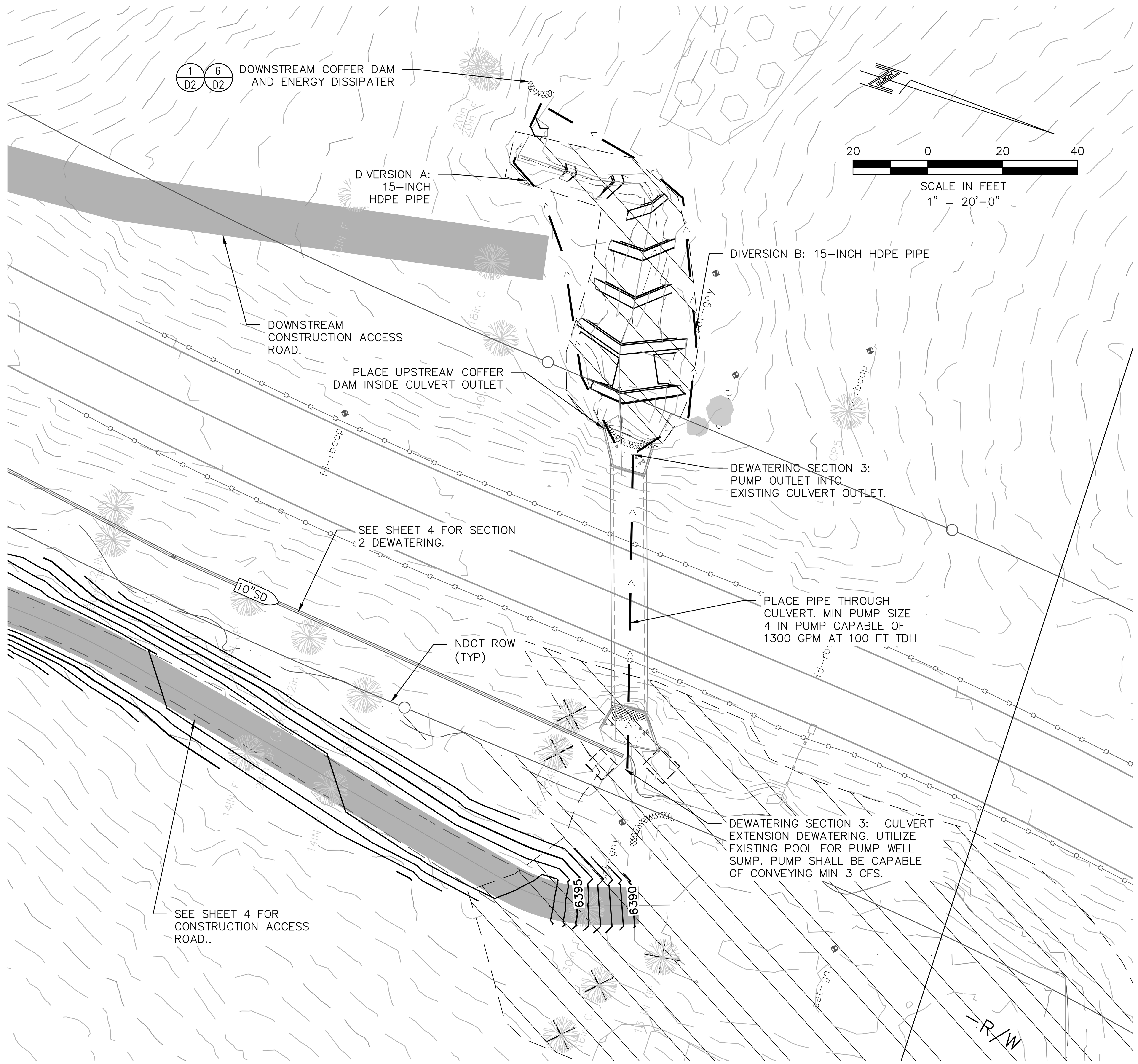


PLAN

NOTES: .
1. DEWATERING DURING THE DOWNSTREAM CHANNEL IMPROVEMENTS MAY REQUIRE RELOCATING DEWATERING PIPES TO THE OPPOSITE SIDE OF THE CHANNEL (DEWATERING A AND B) TO GAIN UNOBSTRUCTED ACCESS TO EACH SIDE. CONTRACTOR SHALL FINALIZE IMPROVEMENTS ON ONE SIDE PRIOR TO RELOCATING DEWATERING PIPES.
2. THE CONTRACTOR MAY PROPOSE ALTERNATIVE DEWATERING METHODS, ALL DEWATERING METHODS SHALL BE APPROVED BY THE ENGINEER PRIOR TO START OF CONSTRUCTION.
3. SEDIMENT LOGS AND SILT FENCE SHALL BE INSTALLED IN ACCORDANCE WITH TRPA AND THE RPMS TO PROTECT AREAS DOWN GRADIENT OF MATERIALS STORAGE AND ACTIVE GRADING AREAS. STABILIZE SOIL AFTER DISTURBANCE TO MINIMIZE SEDIMENT DISCHARGE.
4. FISH RESCUE IS REQUIRED TO BE COMPLETED PRIOR TO THE START OF ANY DEWATERING OR IN CHANNEL WORK. THE CONTRACTOR SHALL COORDINATE WORK WITH NTCD AND FISH RESCUE SUBCONSULTANT NTCD EMPLOYS.

Know what's below. Call before you dig. 811

BID SET

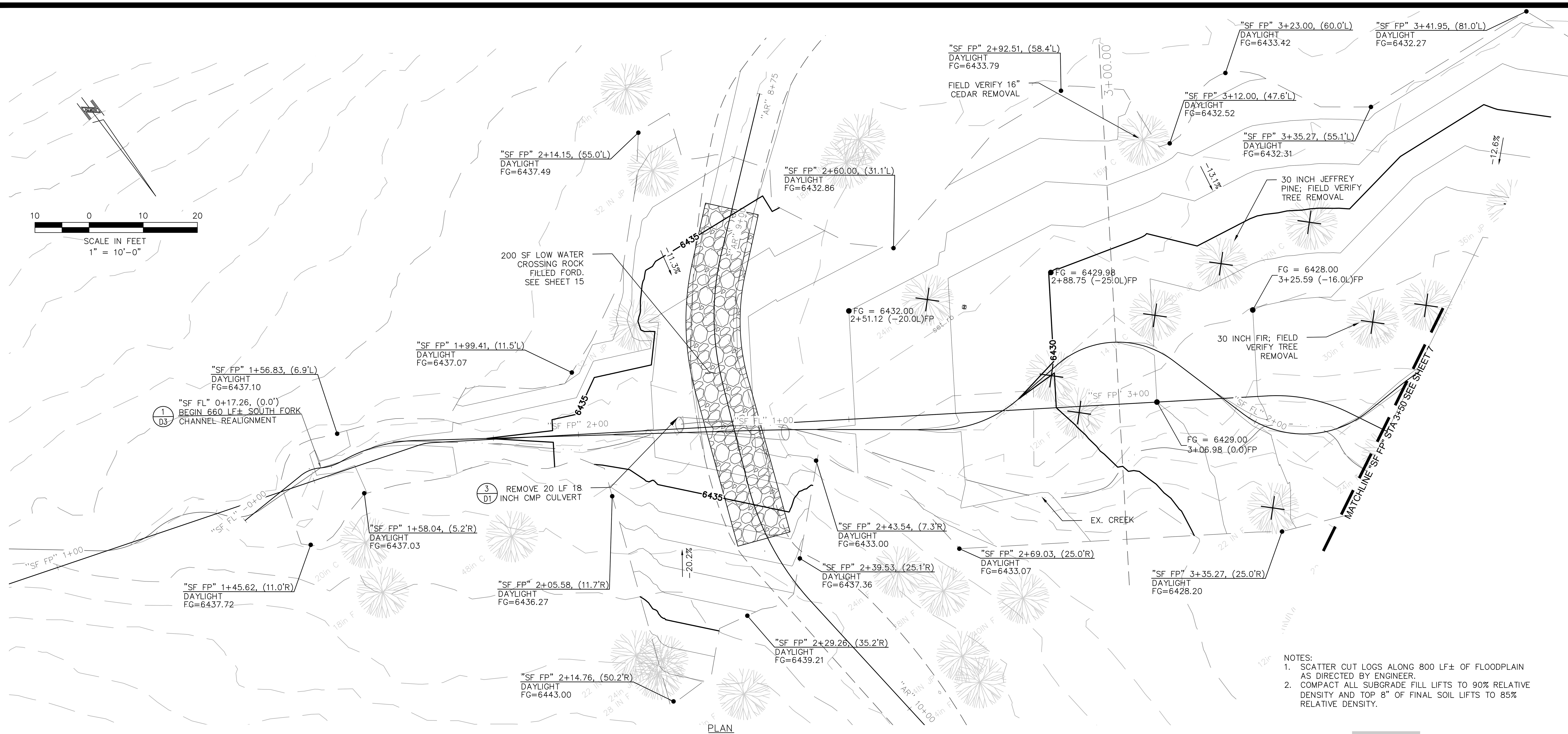
Nevada Tahoe Conservation District

DEWATERING AND ACCESS 2

MARLETTE CREEK RESTORATION PROJECT

PROFESSIONAL ENGINEER - STATE OF NEVADA
MEGHAN C. KELLY
Exp: 6/30/25
CIVIL
No. 20851

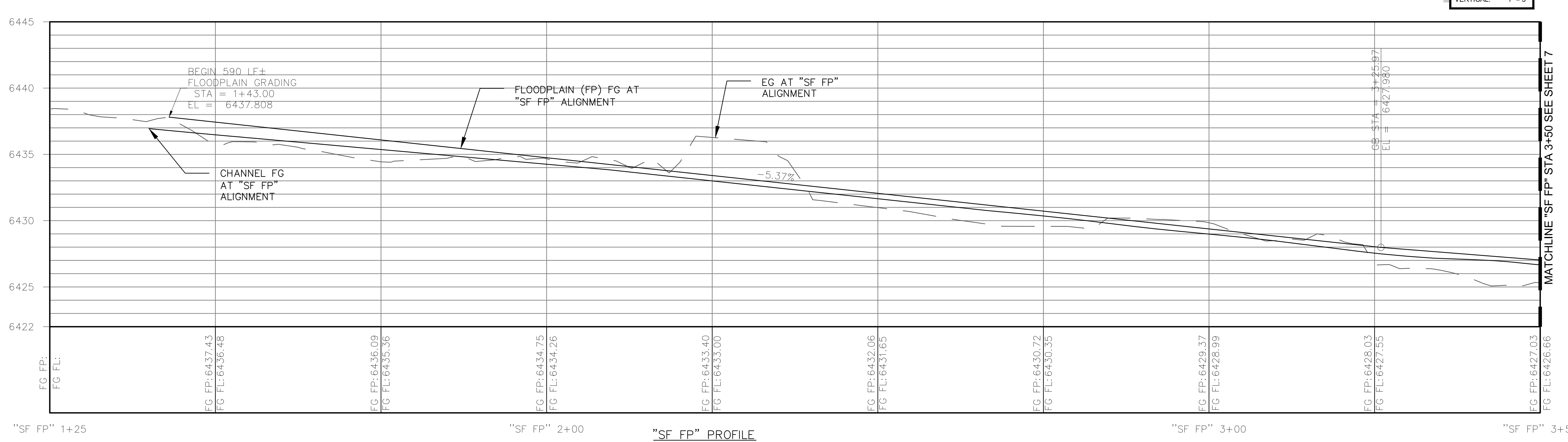
DESIGNED/DRAWN	EK
CHECKED	MK
DATE	4/2025
SCALE	AS SHOWN
PROJECT	MARLETTE CREEK RESTORATION
SHEET	C2



PLAN

NOTES:
1. SCATTER CUT LOGS ALONG 800 LF± OF FLOODPLAIN AS DIRECTED BY ENGINEER.
2. COMPACT ALL SUBGRADE FILL LIFTS TO 90% RELATIVE DENSITY AND TOP 8" OF FINAL SOIL LIFTS TO 85% RELATIVE DENSITY.

SCALE:
HORIZONTAL: 1"=10'
VERTICAL: 1" = 5'



"SF FP" PROFILE

BID SET

Nevada Tahoe Conservation District

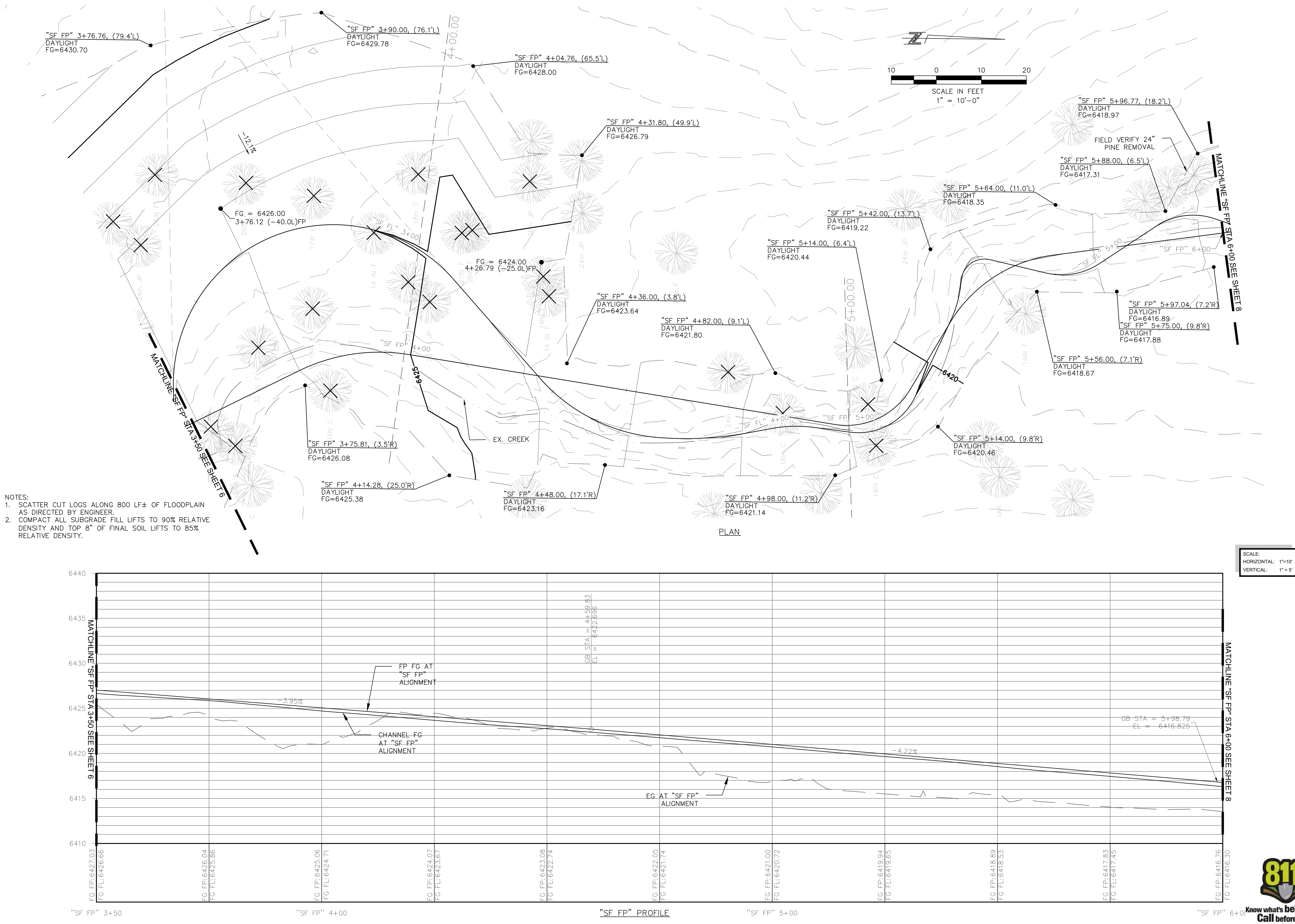
SOUTH FORK 1 - PLAN AND PROFILE
MARLETTE CREEK RESTORATION PROJECT

PROFESSIONAL ENGINEER - STATE OF NEVADA
MEGHAN C. KELLY
Exp: 6/30/25
CIVIL
No. 20851

DESIGNED/DRAWN	EK
CHECKED	MK
DATE	4/2025
SCALE	AS SHOWN
PROJECT	MARLETTE CREEK RESTORATION
SHEET	C3

6 OF 25

811 Know what's below. Call before you dig.



NOTES:
1. SCATTER CUT LOGS ALONG 800 LF± OF FLOODPLAIN AS DIRECTED BY ENGINEER.
2. COMPACT ALL SUBGRADE FILL LIFTS TO 90% RELATIVE DENSITY AND TOP 8" OF FINAL SOIL LIFTS TO 85% RELATIVE DENSITY.

Nevada Tahoe Conservation District

SOUTH FORK 2 - PLAN AND PROFILE
MARLETTE CREEK RESTORATION PROJECT

PROFESSIONAL ENGINEER - STATE OF NEVADA
MEGHAN C. KELLY
Exp: 6/30/25
CIVIL
No. 20851

BID SET

DESIGNED/DRAWN	EK
CHECKED	MK
DATE	4/2025
SCALE	AS SHOWN
PROJECT	MARLETTE CREEK RESTORATION
SHEET	C4

7 OF 25

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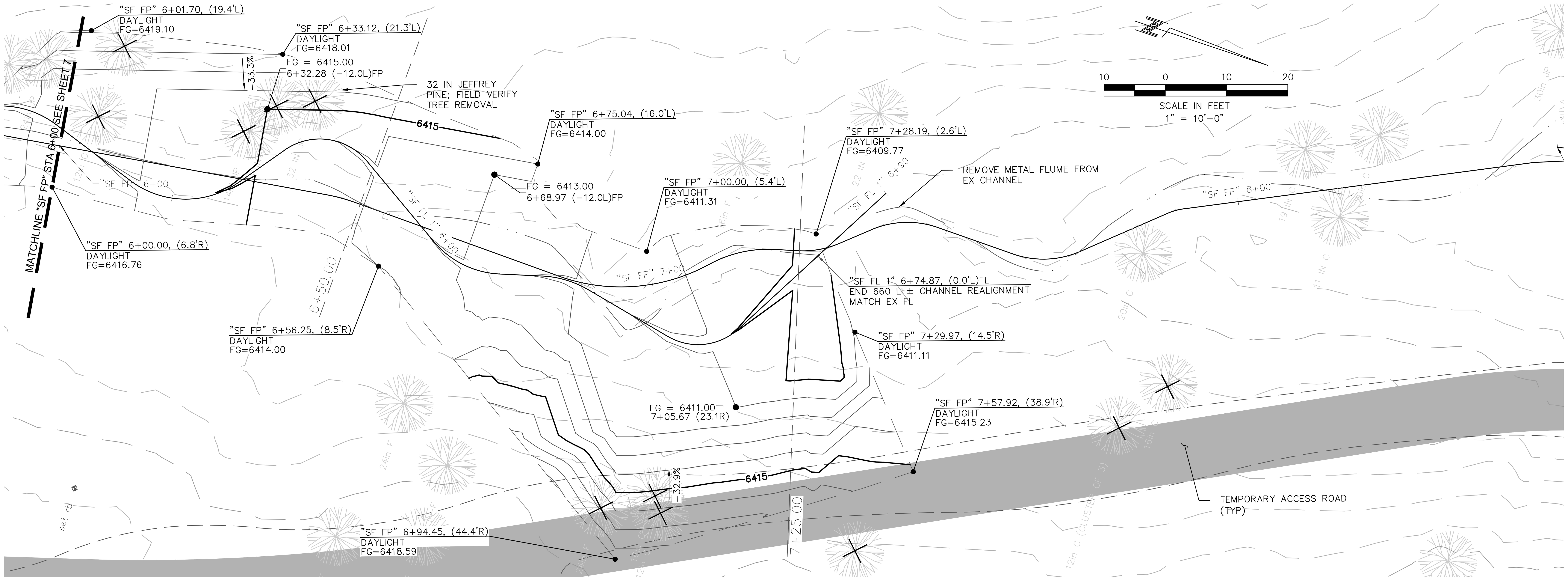
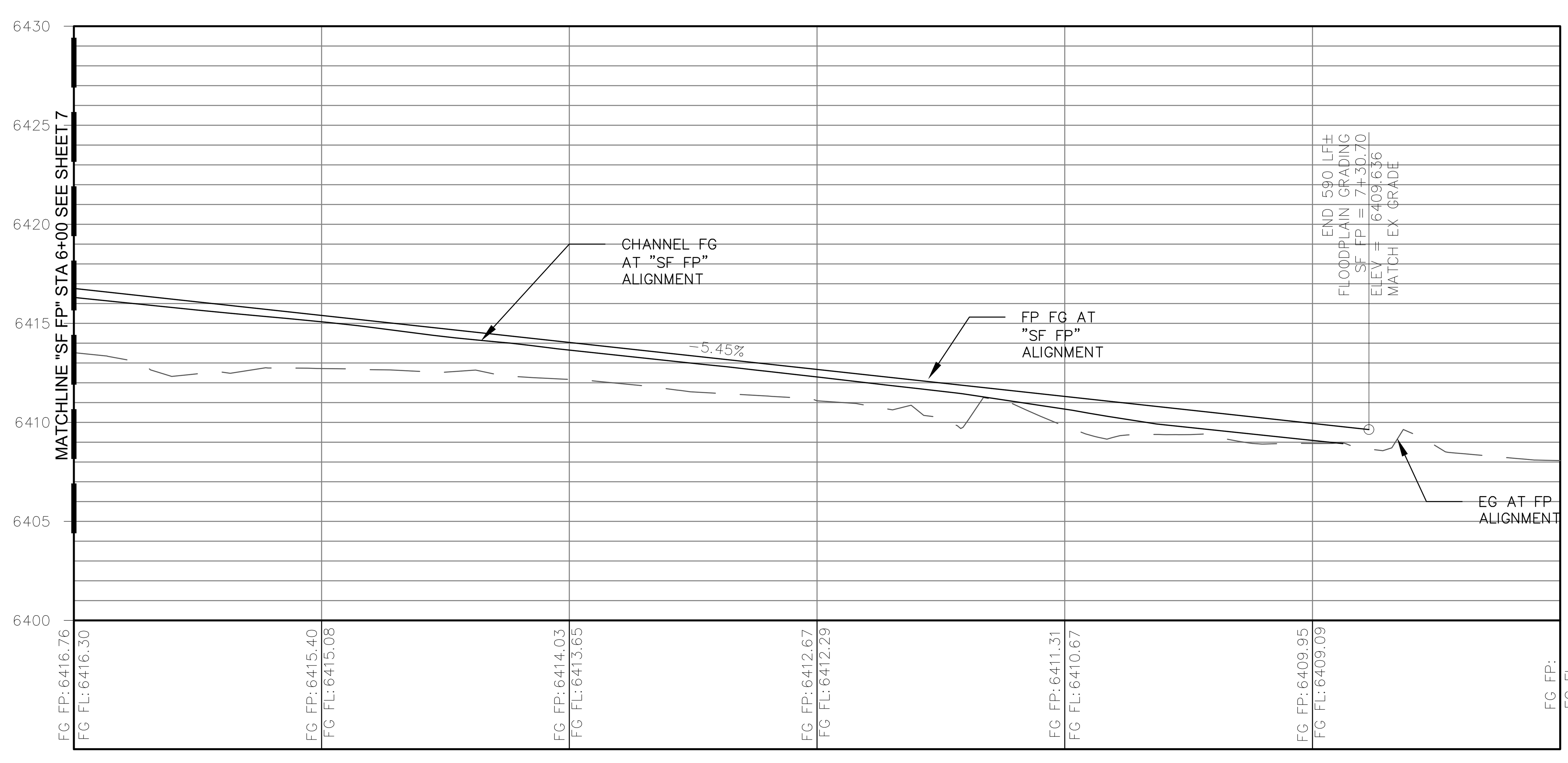


PLAN

NOTES:
1. SCATTER CUT LOGS ALONG 800 LF± OF FLOODPLAIN AS DIRECTED BY ENGINEER.
2. COMPACT ALL SUBGRADE FILL LIFTS TO 90% RELATIVE DENSITY AND TOP 8" OF FINAL SOIL LIFTS TO 85% RELATIVE DENSITY.

SCALE:
HORIZONTAL: 1"=10'
VERTICAL: 1"=5'



"SF-FP" PROFILE

Nevada Tahoe Conservation District

SOUTH FORK 3 - PLAN AND PROFILE

MARLETTE CREEK RESTORATION PROJECT

PROFESSIONAL ENGINEER - STATE OF NEVADA
MEGHAN C. KELLY
Exp: 6/30/25
CIVIL
No. 20851

BID SET

DESIGNED/DRAWN	EK
CHECKED	MK
DATE	4/2025
SCALE	AS SHOWN
PROJECT	MARLETTE CREEK RESTORATION
SHEET	C5

8 OF 25

811
Know what's below. Call before you dig.

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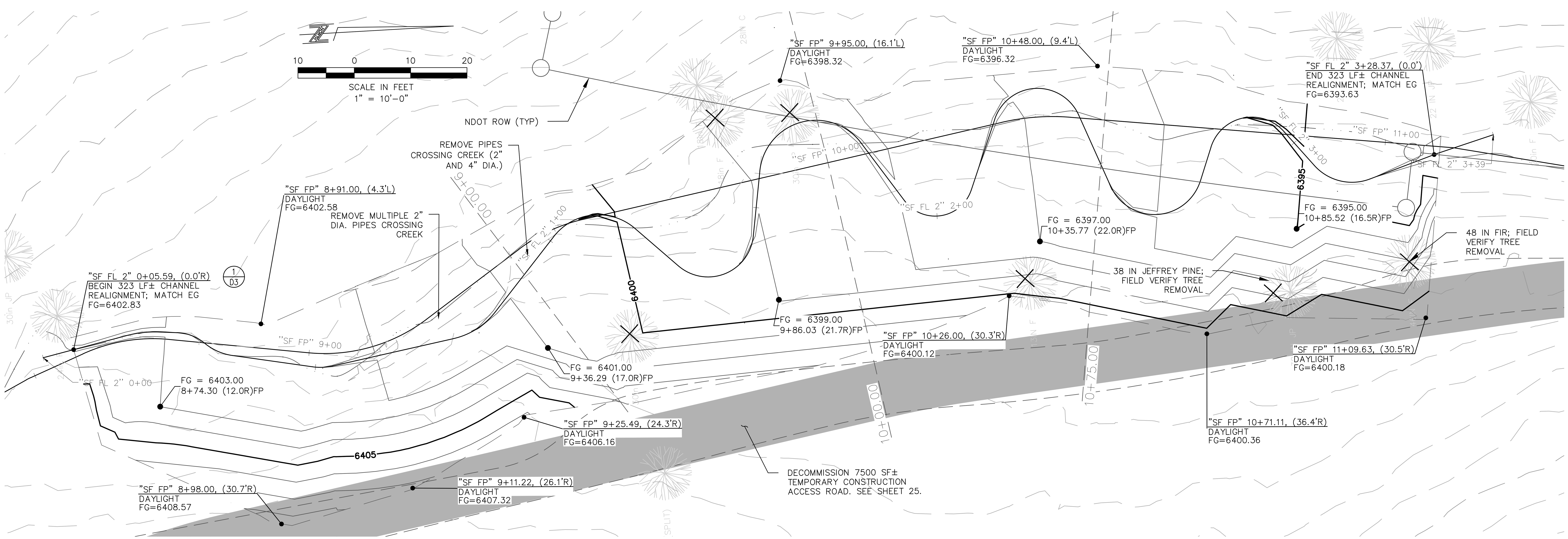
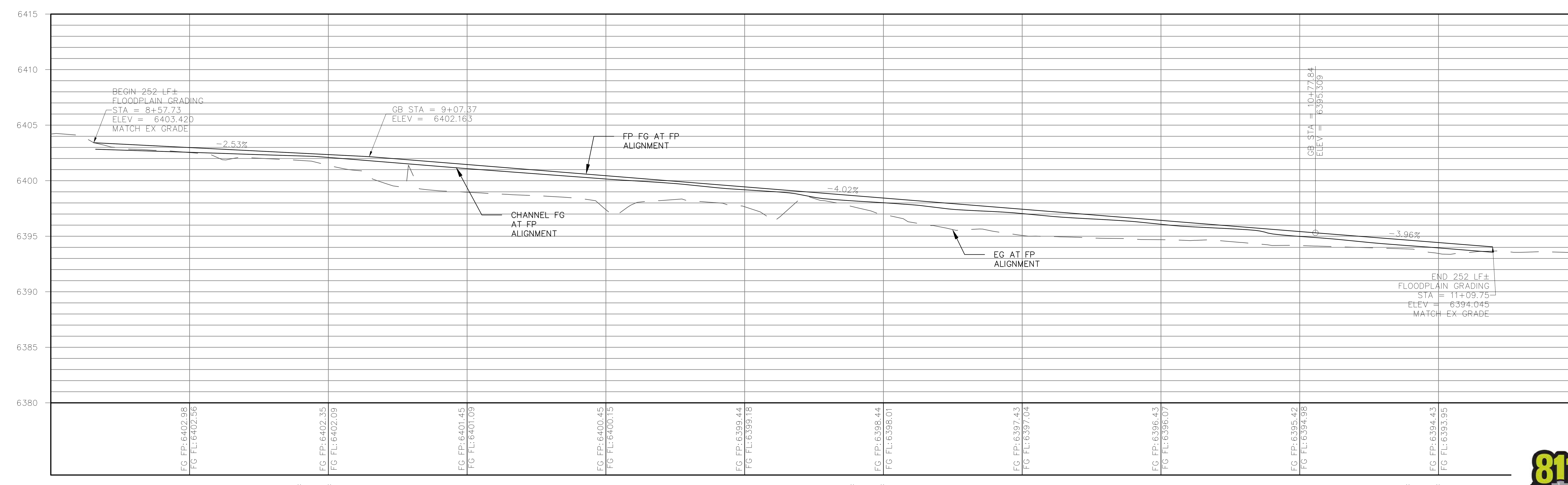


PLAN

NOTES:
1. SCATTER CUT LOGS ALONG 800 LF± OF FLOODPLAIN AS DIRECTED BY ENGINEER.
2. COMPACT ALL SUBGRADE FILL LIFTS TO 90% RELATIVE DENSITY AND TOP 8" OF FINAL SOIL LIFTS TO 85% RELATIVE DENSITY.

SCALE:
HORIZONTAL: 1"=10'
VERTICAL: 1" = 5'



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Nevada Tahoe Conservation District

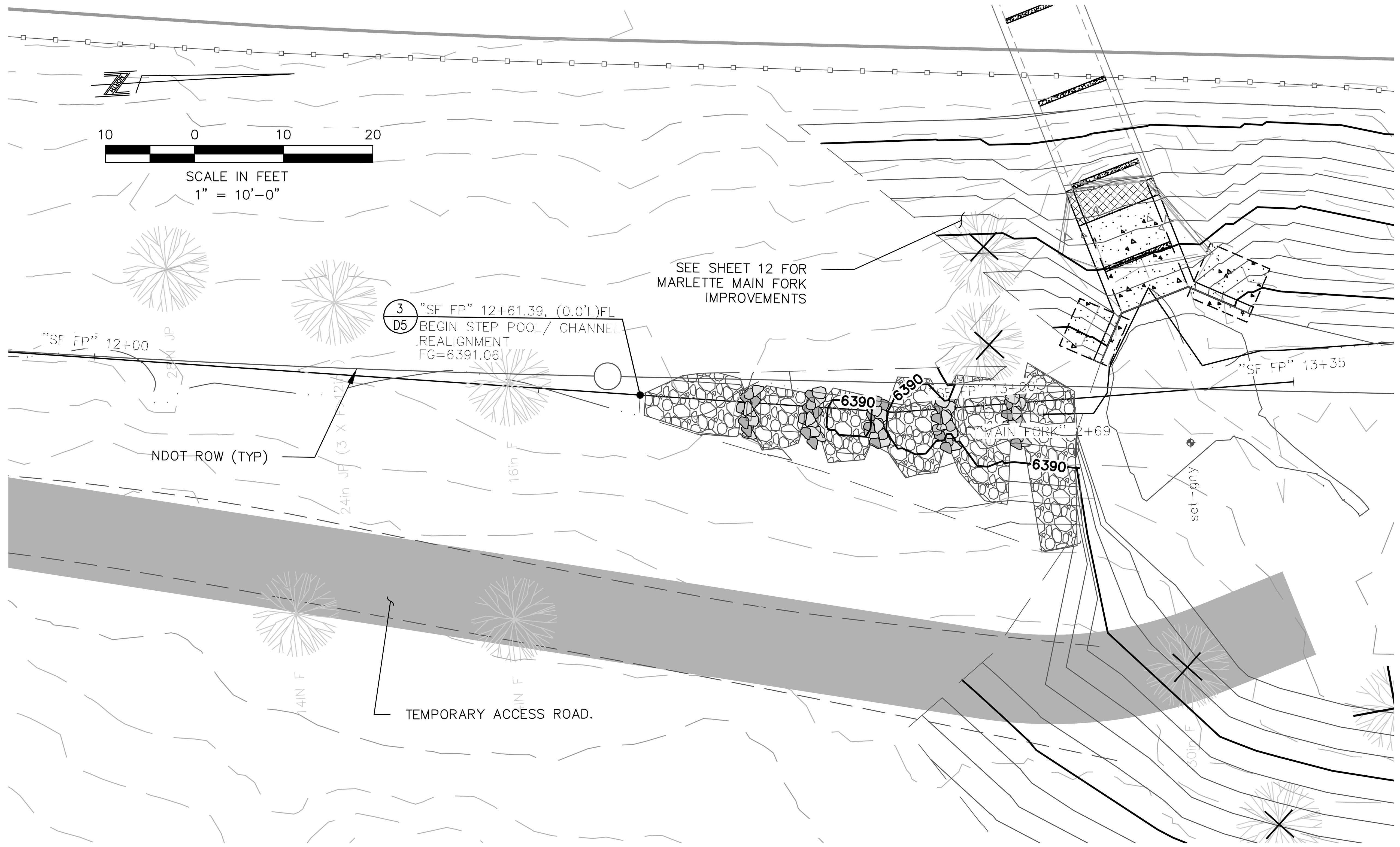
SOUTH FORK 4 - PLAN AND PROFILE
MARLETTE CREEK RESTORATION PROJECT

PROFESSIONAL ENGINEER - STATE OF NEVADA
MEGHAN C. KELLEY
Exp: 6/30/25
CIVIL
No. 20851

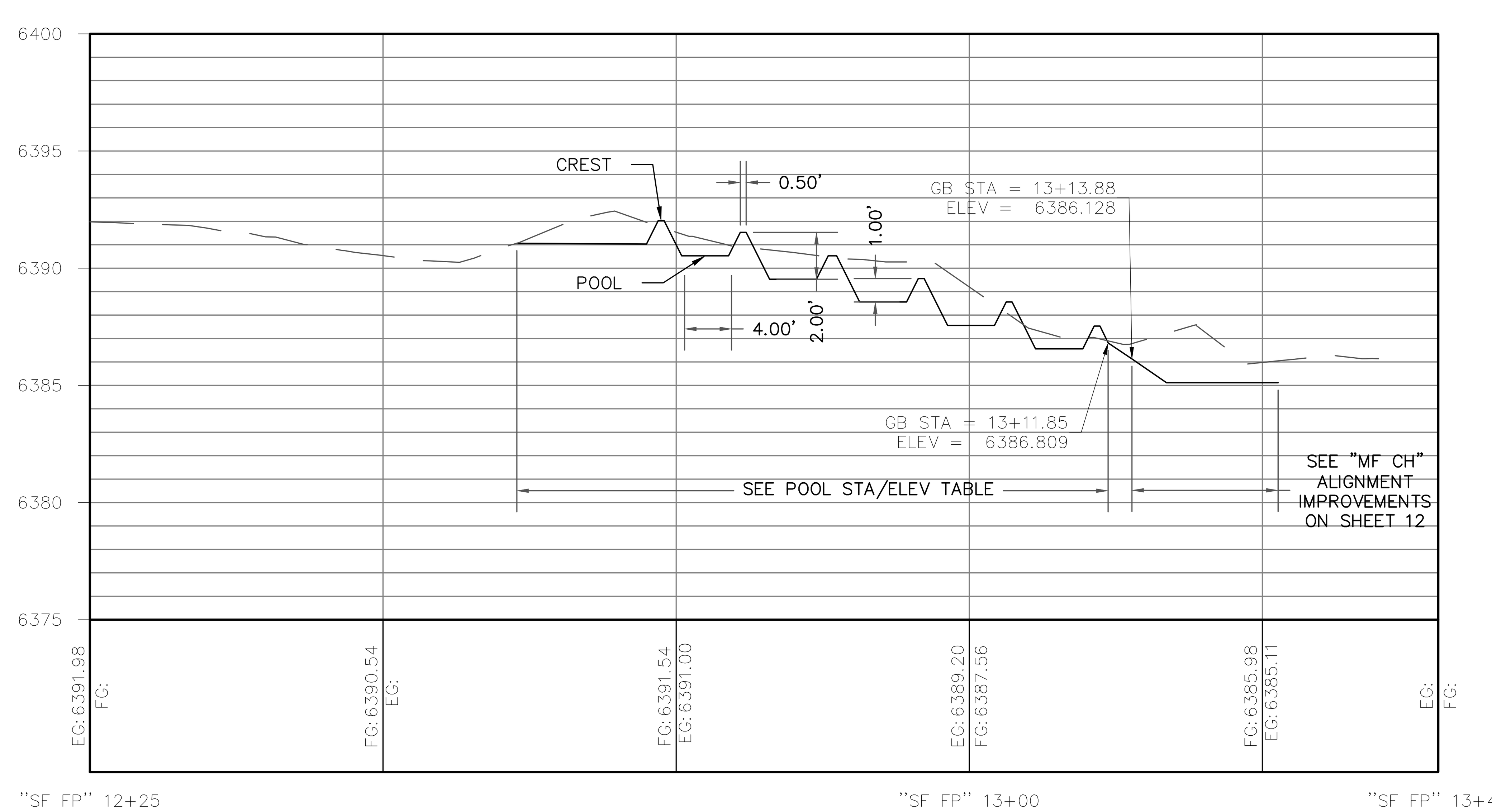
BID SET

DESIGNED/DRAWN	EK
CHECKED	MK
DATE	4/2025
SCALE	AS SHOWN
PROJECT	MARLETTE CREEK RESTORATION
SHEET	C6

811 Know what's below. Call before you dig.



PLAN



"SF FP" PROFILE

POOL STA/ELEV TABLE

GRADE BREAK STA	GRADE OUT	ELEVATION	DESCRIPTION
12+61.40	0.33%	6390.56	MATCH EG
12+72.47	−100.00%	6391.03	
12+73.47	0.00%	6392.03	CREST
12+73.97	100.00%	6392.03	
12+75.47	−0.00%	6390.53	POOL
12+79.47	−100.00%	6390.53	
12+80.47	0.00%	6391.53	CREST
12+80.97	100.00%	6391.53	
12+82.97	−0.00%	6389.53	POOL
12+86.97	−100.00%	6389.53	
12+87.97	0.00%	6390.53	CREST
12+88.68	100.11%	6390.53	
12+90.65	0.00%	6388.56	POOL
12+94.65	−100.00%	6388.56	
12+95.65	0.00%	6389.56	CREST
12+96.15	100.00%	6389.56	
12+98.15	−0.00%	6387.56	POOL
13+02.15	−100.00%	6387.56	
13+03.15	0.00%	6388.56	CREST
13+03.65	100.00%	6388.56	
13+05.65	0.00%	6386.56	POOL
13+09.68	−100.00%	6386.56	
13+10.65	0.00%	6387.53	CREST
13+11.15	158.12%	6387.53	

NOTES:
1. SCATTER CUT LOGS ALONG 800 LF± OF FLOODPLAIN AS DIRECTED BY ENGINEER.
2. COMPACT ALL SUBGRADE FILL LIFTS TO 90% RELATIVE DENSITY AND TOP 8" OF FINAL SOIL LIFTS TO 85% RELATIVE DENSITY.

BID SET

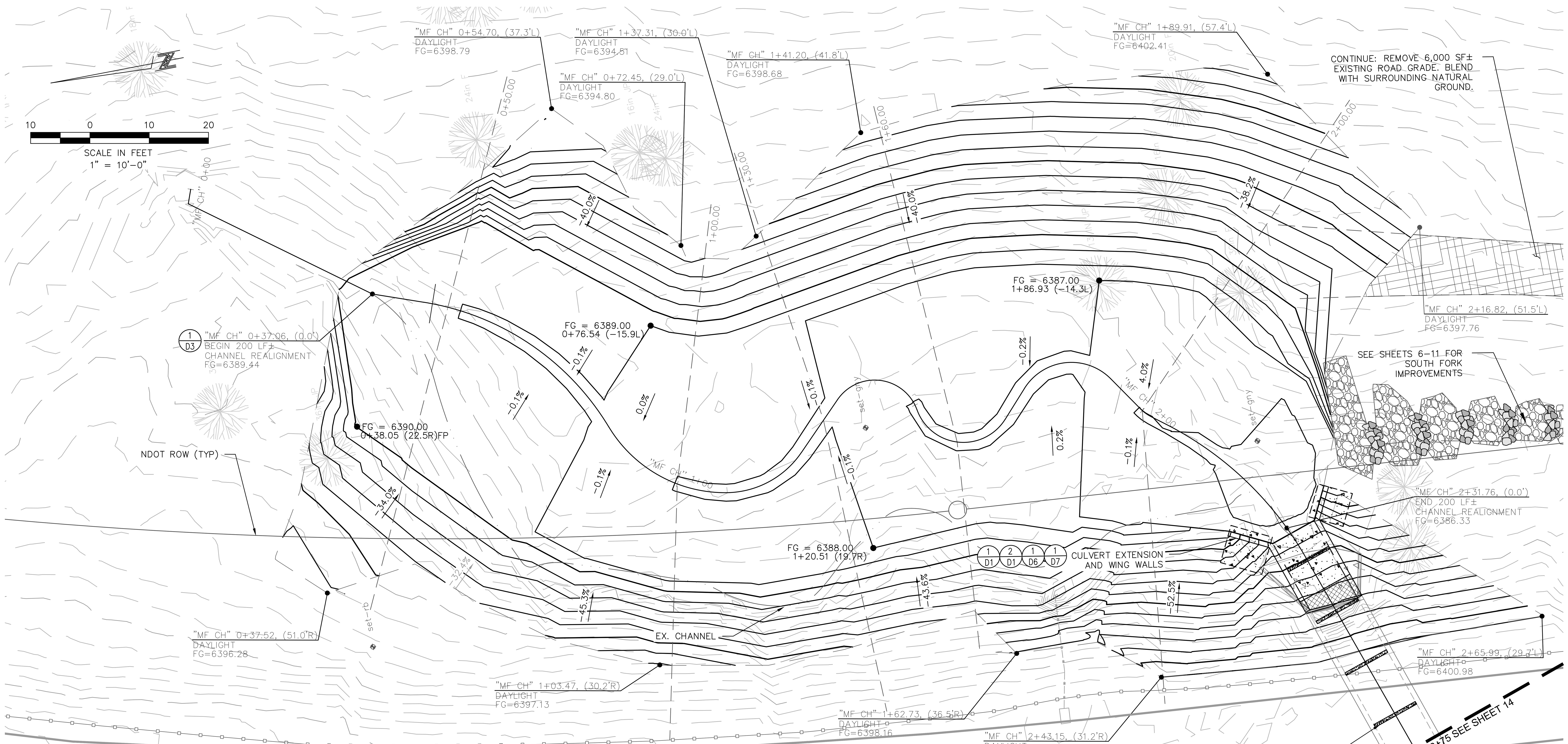
Know what's below. Call before you dig. 811

Nevada Tahoe Conservation District

SOUTH FORK 6 - PLAN AND PROFILE
MARLETTE CREEK RESTORATION PROJECT

PROFESSIONAL ENGINEER - STATE OF NEVADA
MEGHAN C. KELLY
Exp: 6/30/25
CIVIL
No. 20851

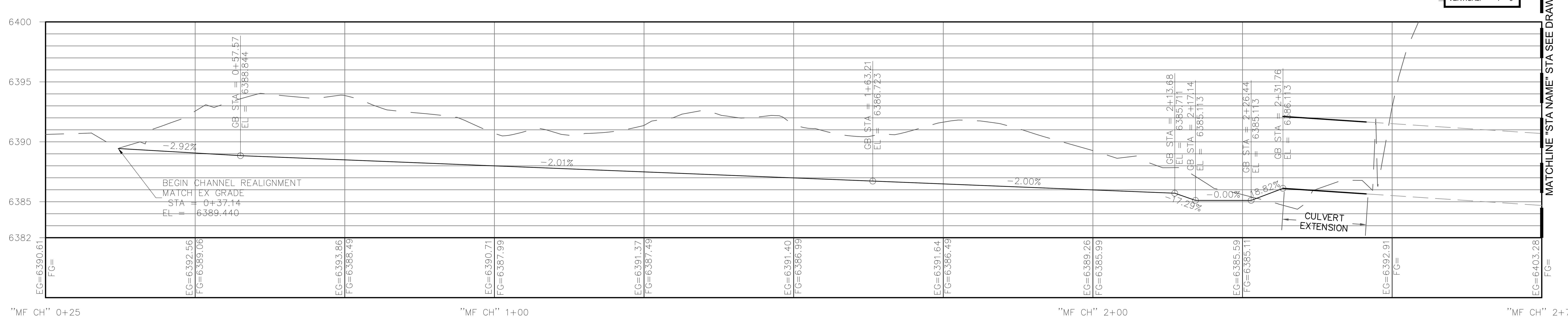
DESIGNED/DRAWN	EK
CHECKED	MK
DATE	4/2025
SCALE	AS SHOWN
PROJECT	MARLETTE CREEK RESTORATION
SHEET	C8



NOTES:
1. SCATTER CUT LOGS ALONG 800 LF± OF FLOODPLAIN AS DIRECTED BY ENGINEER.
2. COMPACT ALL SUBGRADE FILL LIFTS TO 90% RELATIVE DENSITY AND TOP 8" OF FINAL SOIL LIFTS TO 85% RELATIVE DENSITY.

PLAN

SCALE:
HORIZONTAL: 1"=10'
VERTICAL: 1" = 5'



"MF CH" PROFILE

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BID SET

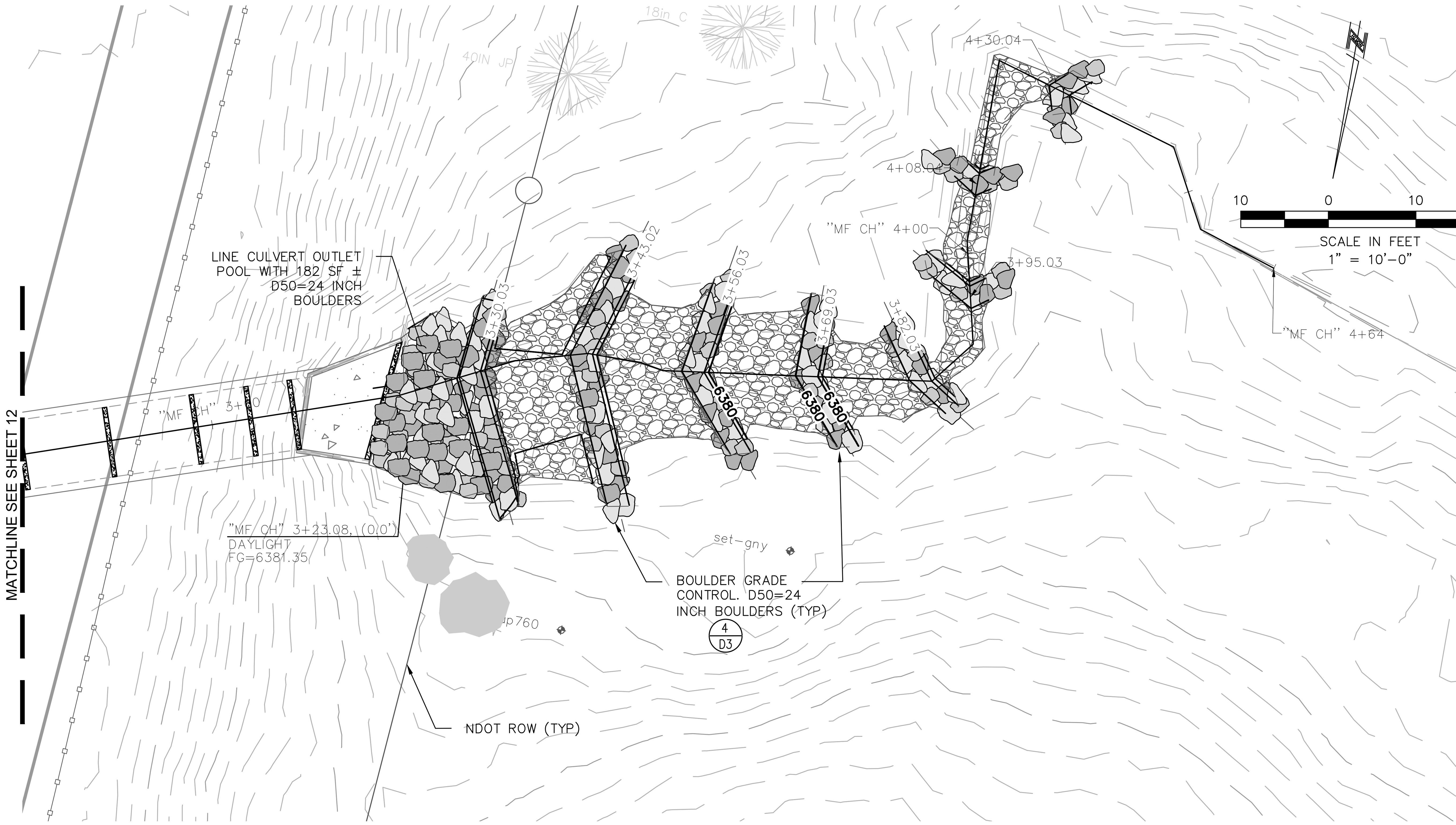
Nevada Tahoe Conservation District

MAIN FORK 1 - PLAN AND PROFILE
MARLETTE CREEK RESTORATION PROJECT

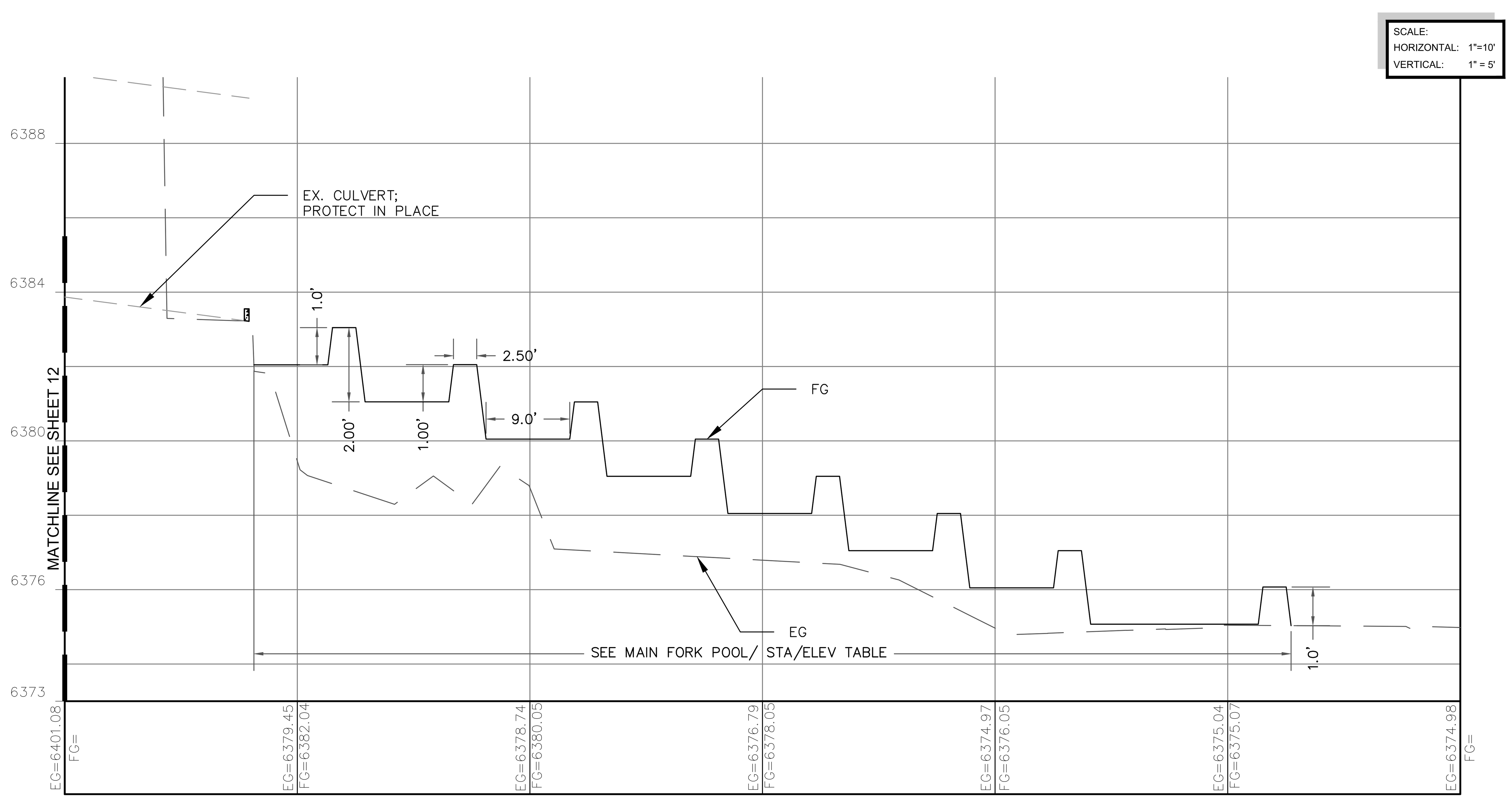
PROFESSIONAL ENGINEER - STATE OF NEVADA
MEGHAN C. KELLY
Exp: 6/30/25
CIVIL
No. 20851

DESIGNED/DRAWN	EK
CHECKED	MK
DATE	4/2025
SCALE	AS SHOWN
PROJECT	MARLETTE CREEK RESTORATION
SHEET	C9

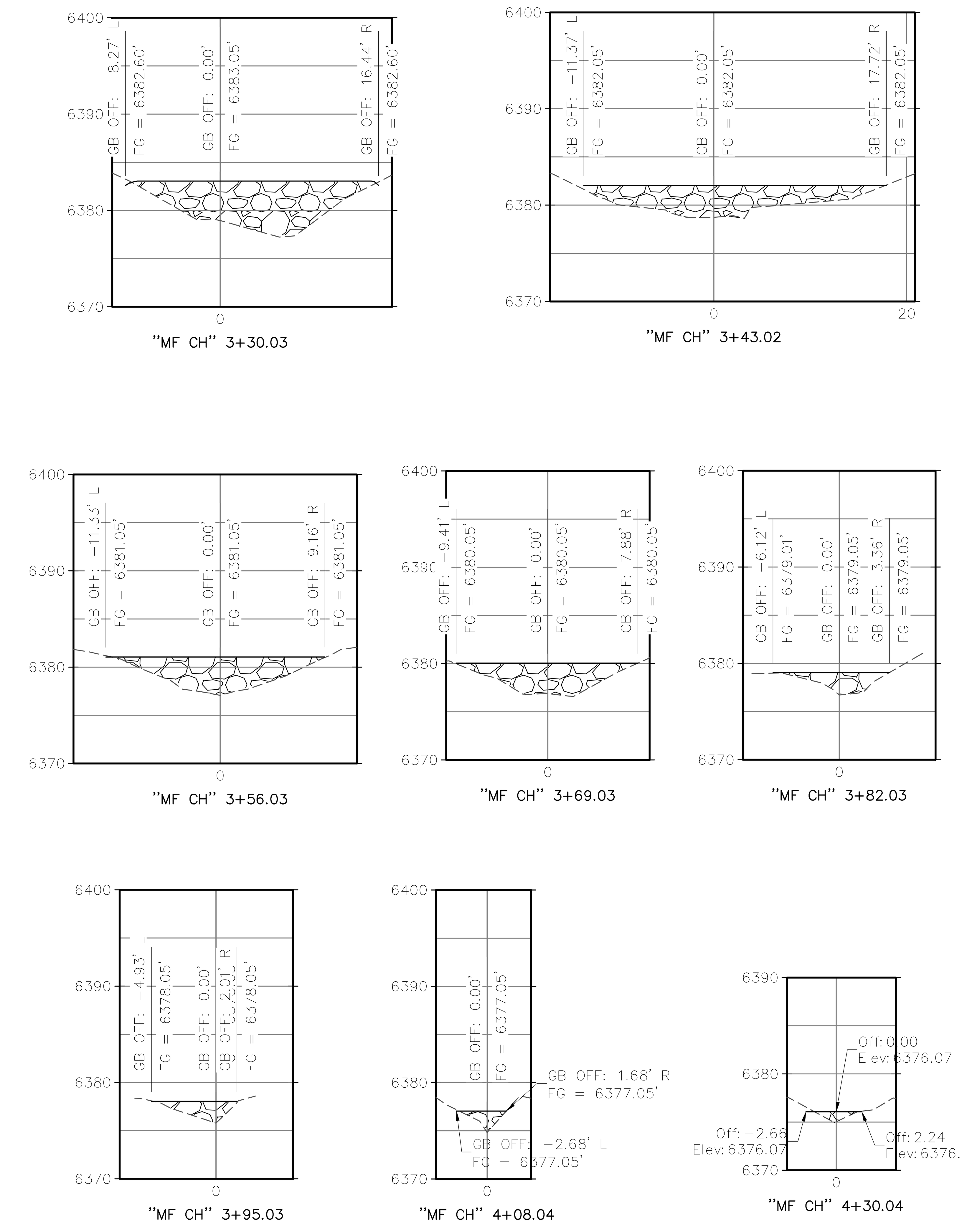
Know what's below. Call before you dig. 811



PLAN



"MF CH" PROFILE



"MF CH" CROSS SECTION – STEP POOLS

MAIN FORK POOL STA/ELEV TABLE			
STA	GRADE OUT	ELEVATION	DESCRIPTION
3+20.33	0.00%	6382.04	POOL
3+28.28	200.00%	6382.04	
3+28.78	0.00%	6383.04	CREST
3+31.29	−200.00%	6383.04	
3+32.28	0.00%	6381.05	POOL
3+41.28	200.00%	6381.05	
3+41.78	0.00%	6382.05	CREST
3+44.28	−200.00%	6382.05	
3+45.28	0.00%	6380.05	POOL
3+54.28	200.00%	6380.05	
3+54.78	0.00%	6381.05	CREST
3+57.28	−200.00%	6381.05	
3+58.28	0.00%	6381.05	POOL
3+67.28	200.00%	6379.05	
3+67.78	0.00%	6379.05	CREST
3+70.28	−200.00%	6380.05	

MAIN FORK POOL STA/ELEV TABLE			
STA	GRADE OUT	ELEVATION	DESCRIPTION
3+71.28	0.00%	6380.05	POOL
3+80.28	200.00%	6378.05	
3+80.78	0.00%	6378.05	CREST
3+83.28	−200.00%	6379.05	
3+84.28	0.00%	6379.05	POOL
3+93.28	200.00%	6377.05	
3+93.78	0.00%	6377.05	CREST
3+96.28	−200.00%	6378.05	
3+97.28	0.00%	6378.05	POOL
4+06.28	200.00%	6376.05	
4+06.78	0.00%	6376.05	CREST
4+09.28	−200.00%	6377.05	
4+10.27	0.00%	6377.05	POOL
4+28.29	200.00%	6375.07	
4+28.79	0.00%	6375.07	CREST
4+31.29	−200.00%	6376.07	
4+31.81		6375.03	MATCH EG

NOTES:
1. SCATTER CUT LOGS ALONG 800 LF± OF FLOODPLAIN AS DIRECTED BY ENGINEER.
2. COMPACT ALL SUBGRADE FILL LIFTS TO 90% RELATIVE DENSITY AND TOP 8" OF FINAL SOIL LIFTS TO 85% RELATIVE DENSITY.

Know what's below. Call before you dig.

Nevada Tahoe Conservation District

MAIN FORK 3 - PLAN, PROFILE, & CROSS-SECTIONS
MARLETTE CREEK RESTORATION PROJECT

PROFESSIONAL ENGINEER - STATE OF NEVADA
MEGHAN C. KELLY
Exp: 6/30/25
CIVIL
No. 20851

BID SET

DESIGNED/DRAWN: EK
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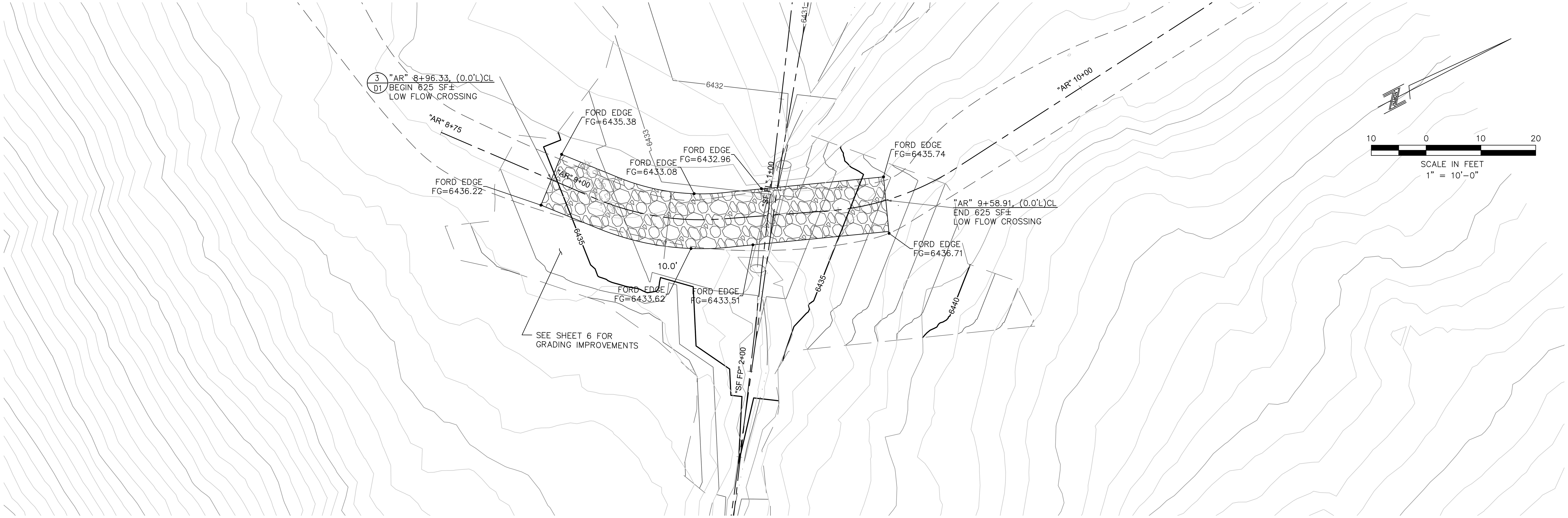
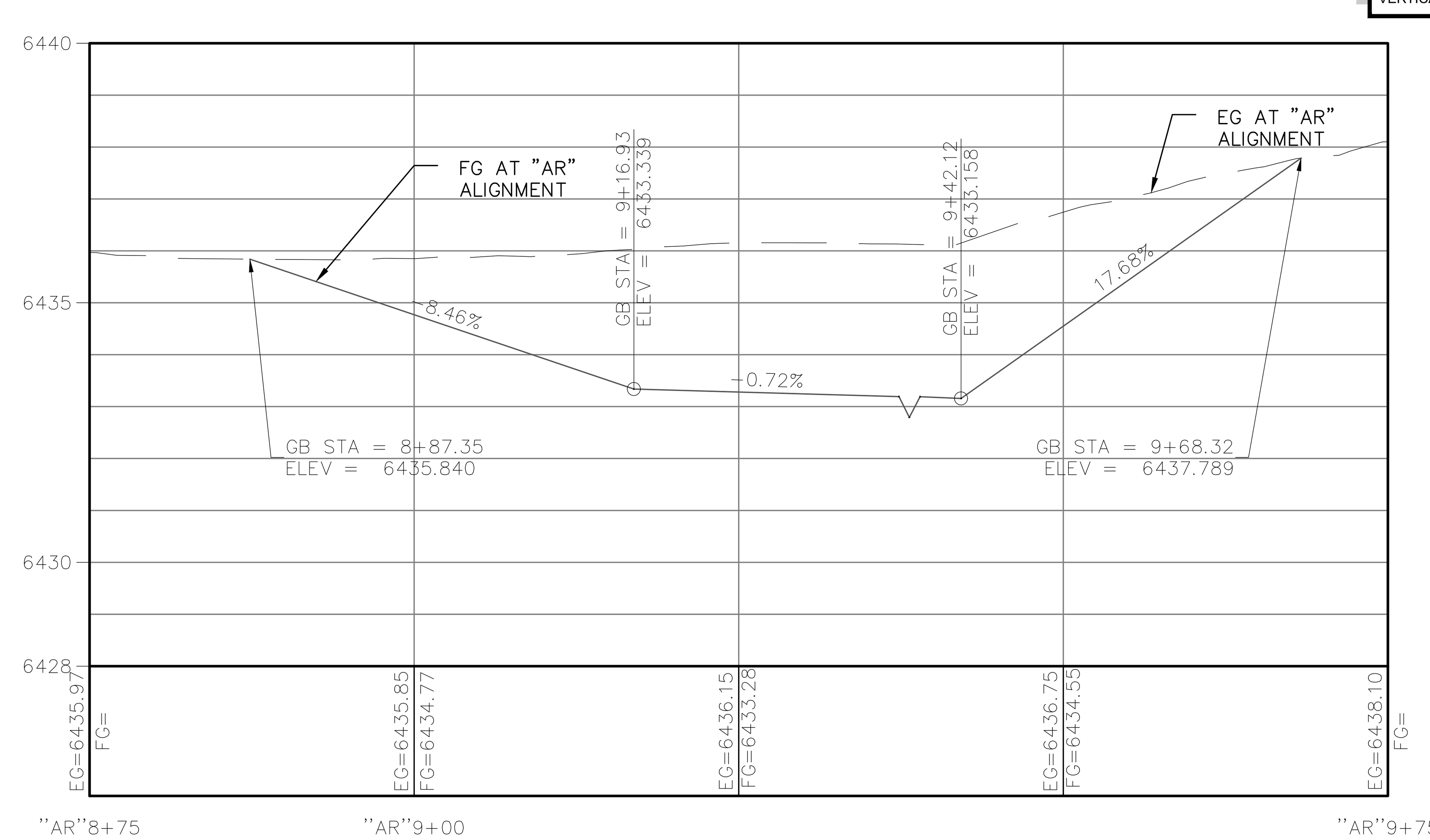
SCALE: AS SHOWN
PROJECT: MARLETTE CREEK RESTORATION
SHEET: C11



PLAN

SCALE:
HORIZONTAL: 1"=10'
VERTICAL: 1" = 2.5'



"AR" PROFILE

Nevada Tahoe Conservation District

SOUTH FORK FORD CROSSING

MARLETTE CREEK RESTORATION PROJECT

PROFESSIONAL ENGINEER - STATE OF NEVADA
MEGHAN C. KELLY
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CIVIL
4/8/2025
No. 20851

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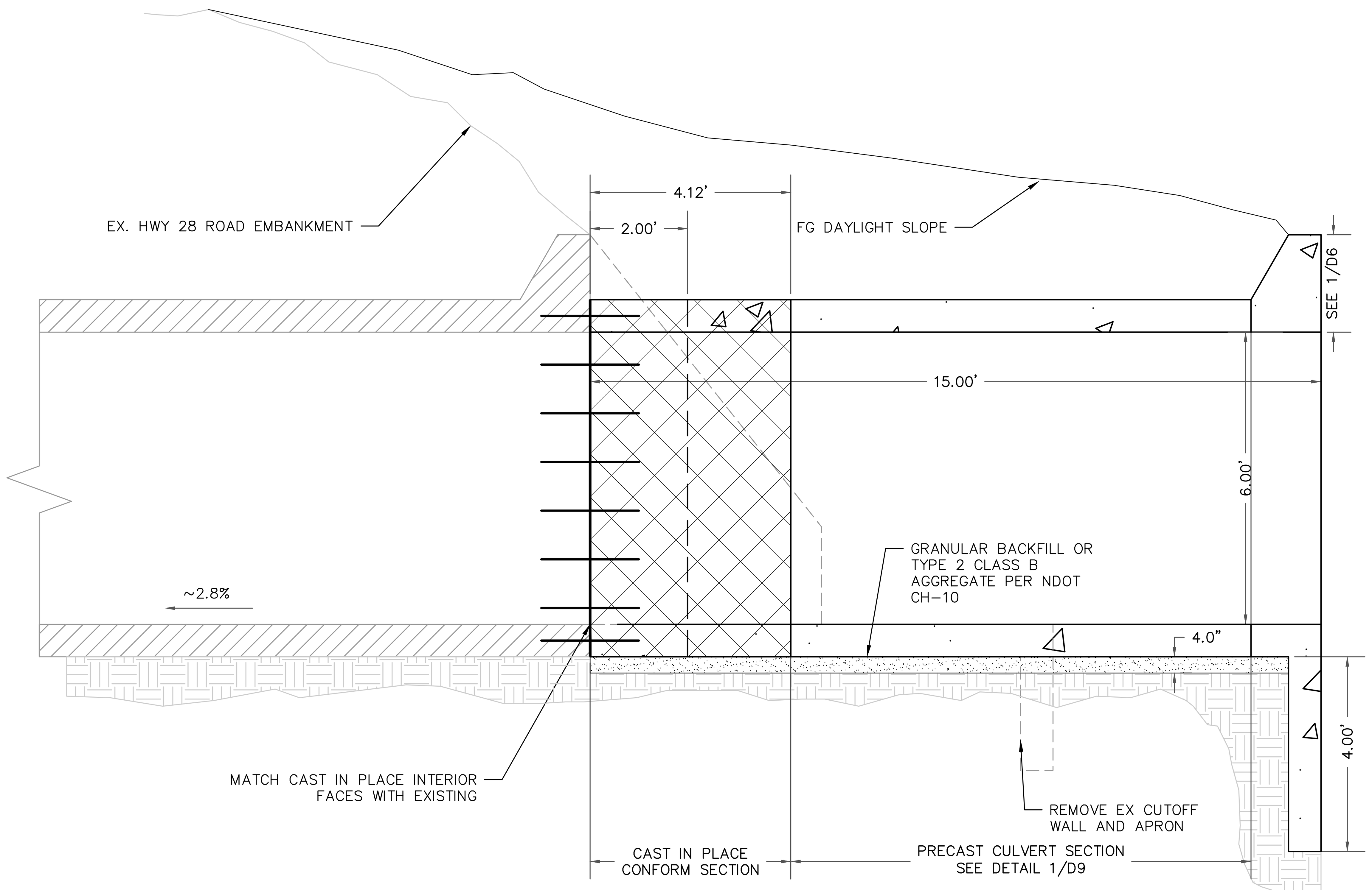
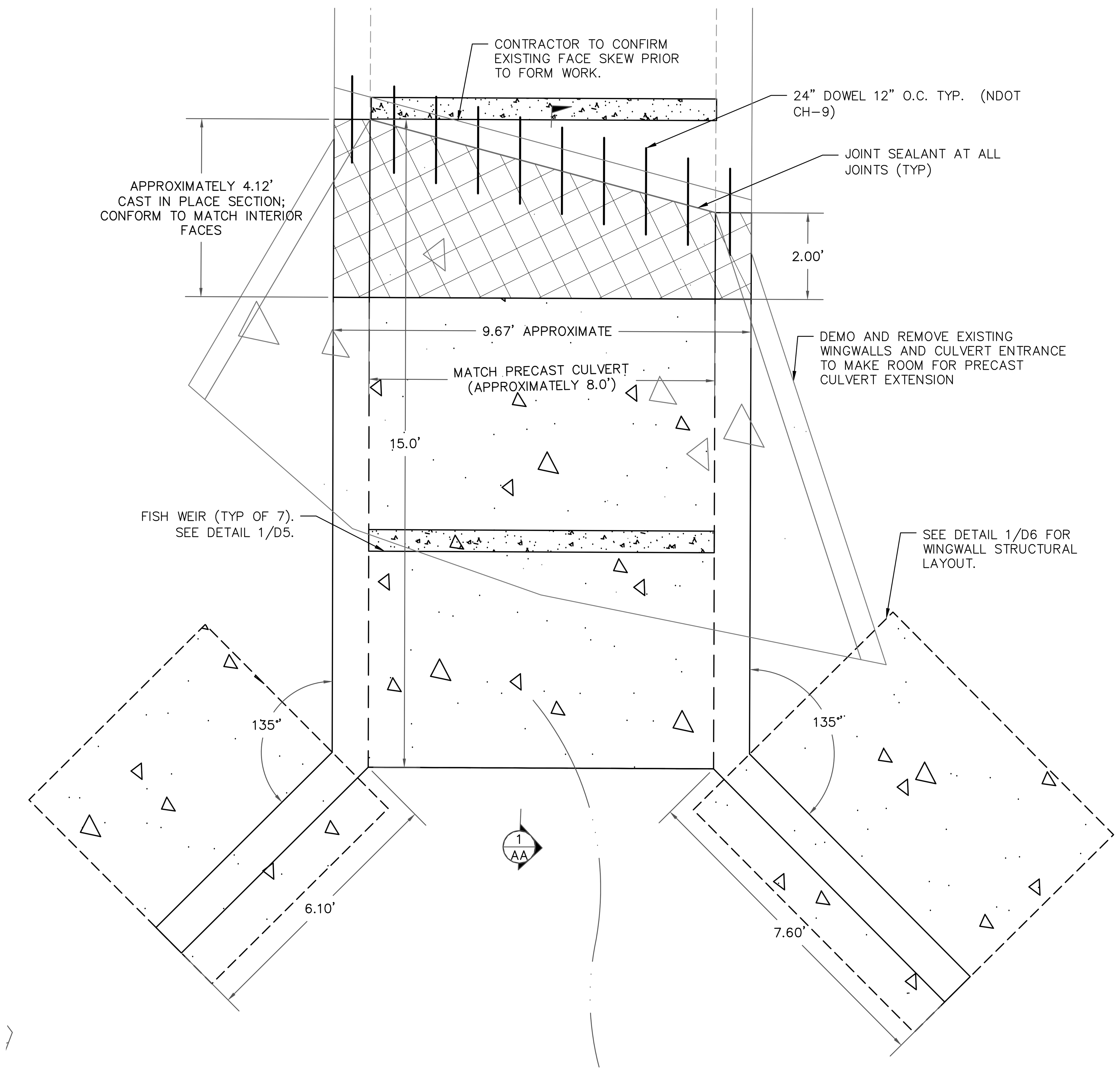
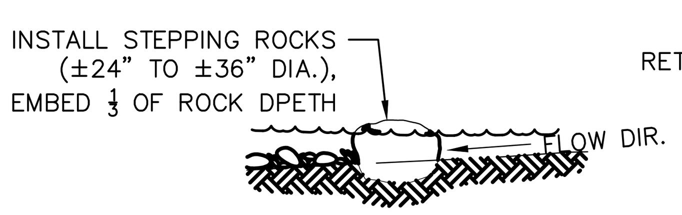


1 D1 SECTION A-A – CULVERT EXTENSION
1"=2'

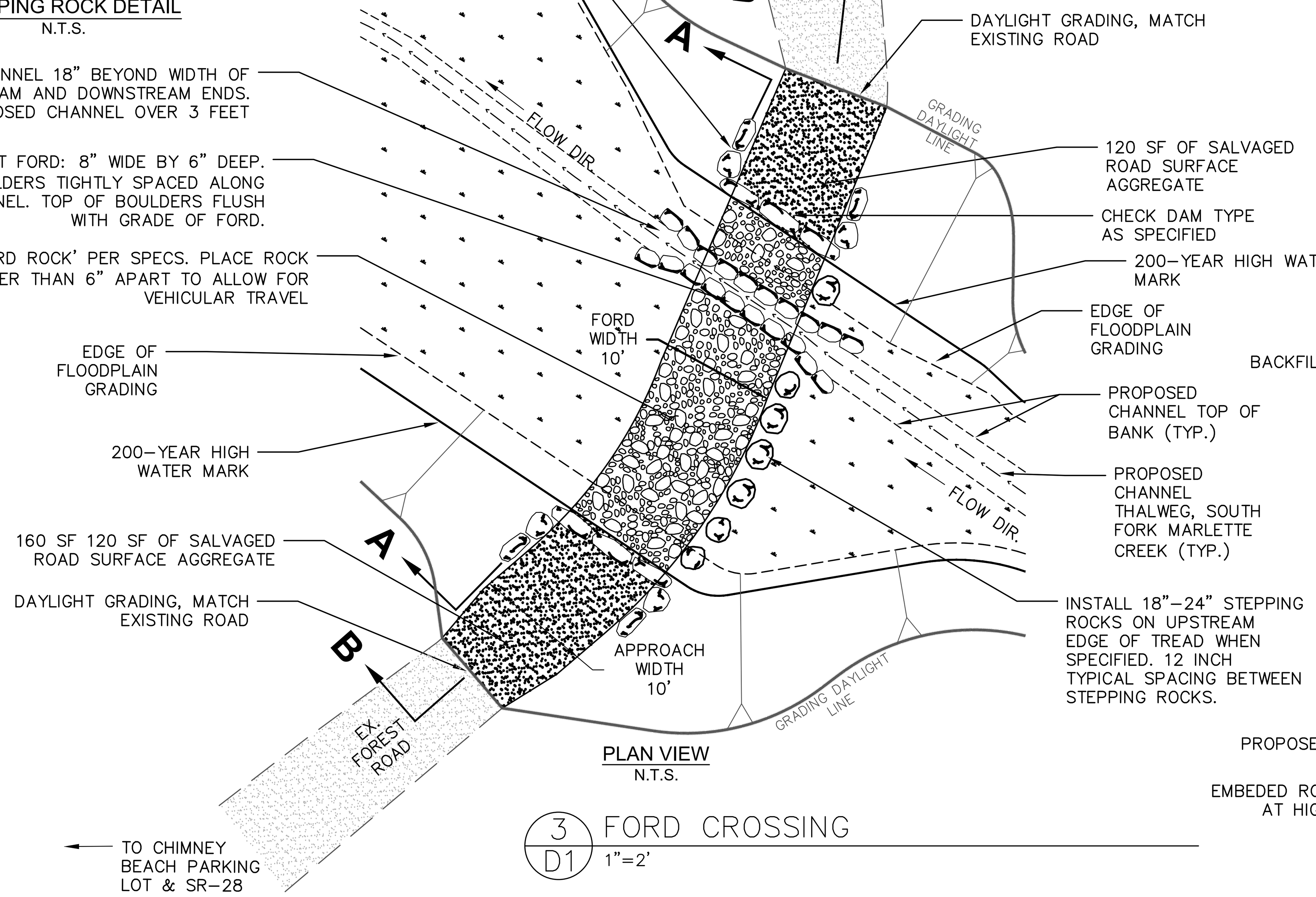
NOTE:
1. SEE 2/D1 FOR CULVERT EXTENSION PLAN VIEW
2. SEE DETAIL 1/D9 FOR PRECAST CULVERT SECTION



2 D1 PLAN VIEW–CULVERT EXTENSION
1"=2'

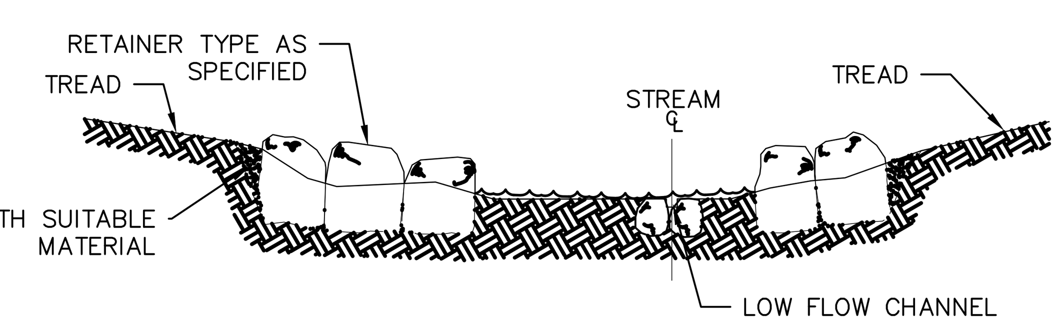


STEPPING ROCK DETAIL
N.T.S.

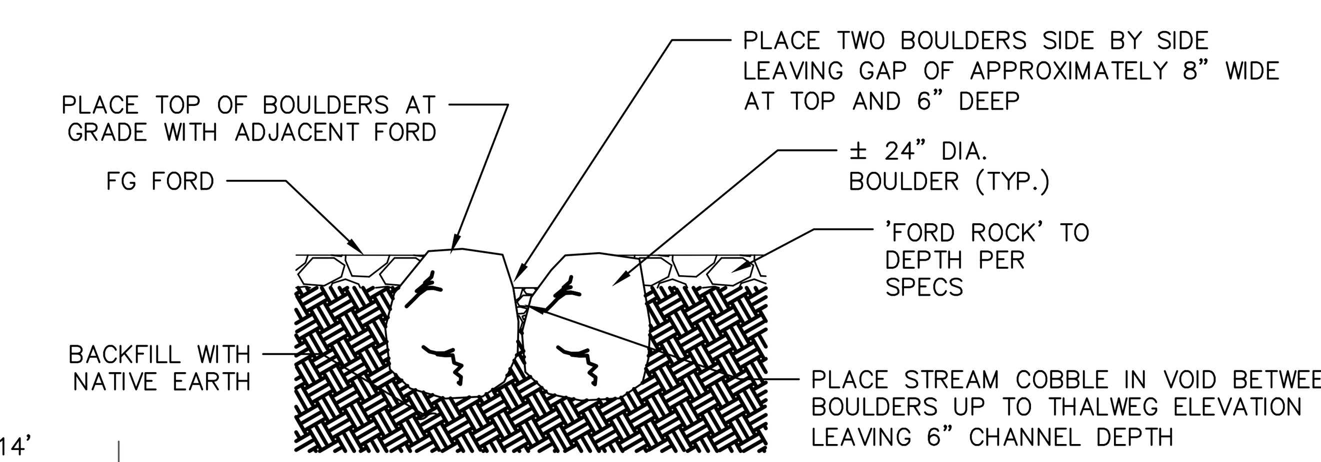


PLAN VIEW
N.T.S.

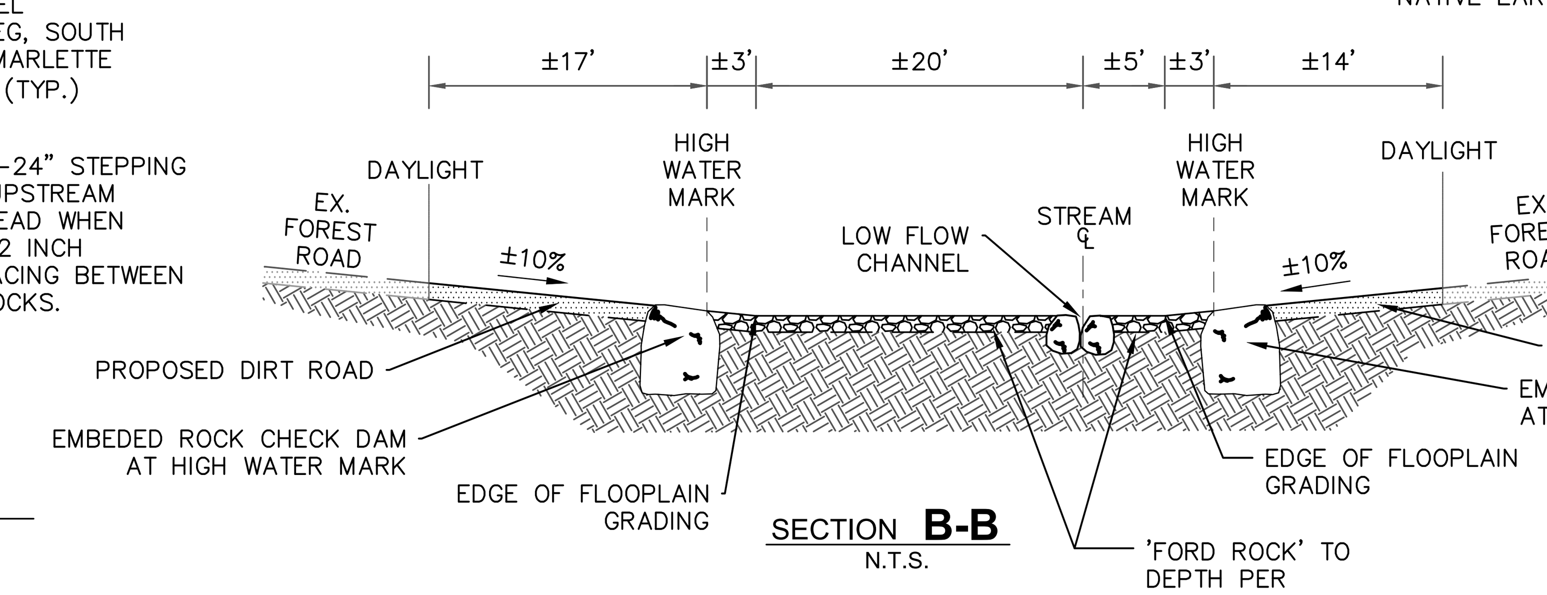
3 D1 FORD CROSSING
1"=2'



SECTION A-A
N.T.S.



LOW FLOW CHANNEL SECTION DETAIL
N.T.S.



SECTION B-B
N.T.S.

Nevada Tahoe Conservation District

DETAILS 1

MARLETTE CREEK RESTORATION PROJECT

PROFESSIONAL ENGINEER - STATE OF NEVADA
MEGHAN C. KELLY
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CIVIL
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PROJECT	MARLETTE CREEK RESTORATION
SHEET	D1

16 OF 25

811 Know what's below. Call before you dig.

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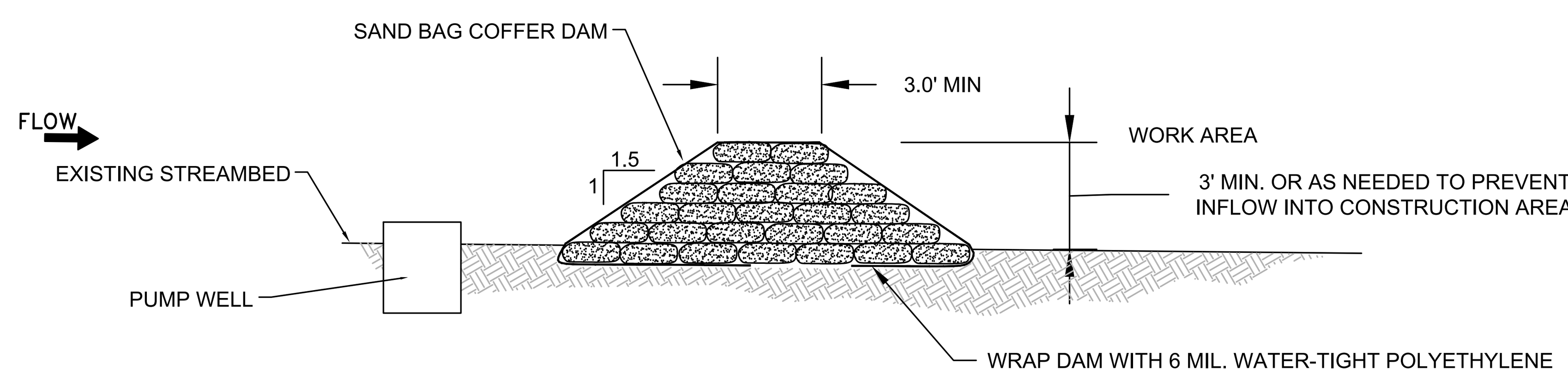
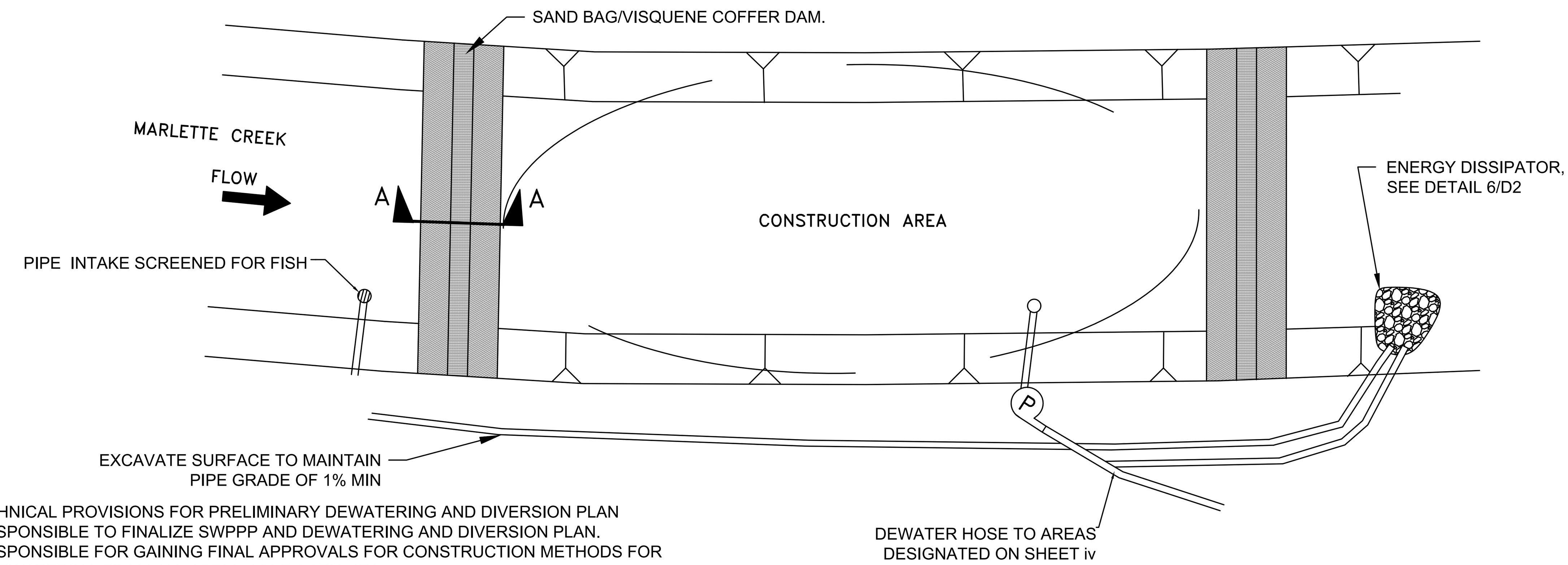
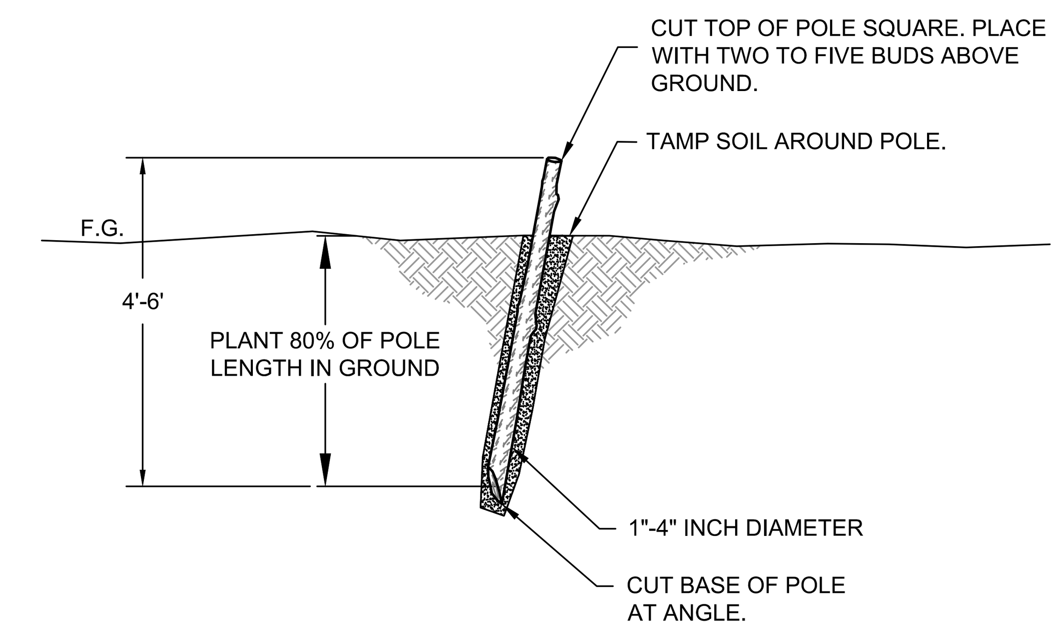


SECTION A–A



DIVERSION NOTES:
1. SEE SPECIAL TECHNICAL PROVISIONS FOR PRELIMINARY DEWATERING AND DIVERSION PLAN
2. CONTRACTOR RESPONSIBLE TO FINALIZE SWPPP AND DEWATERING AND DIVERSION PLAN. CONTRACTOR RESPONSIBLE FOR GAINING FINAL APPROVALS FOR CONSTRUCTION METHODS FOR DIVERSION AND DEWATERING FROM ALL APPLICABLE AGENCIES

1/D2 DEWATERING DIVERSION
NTS

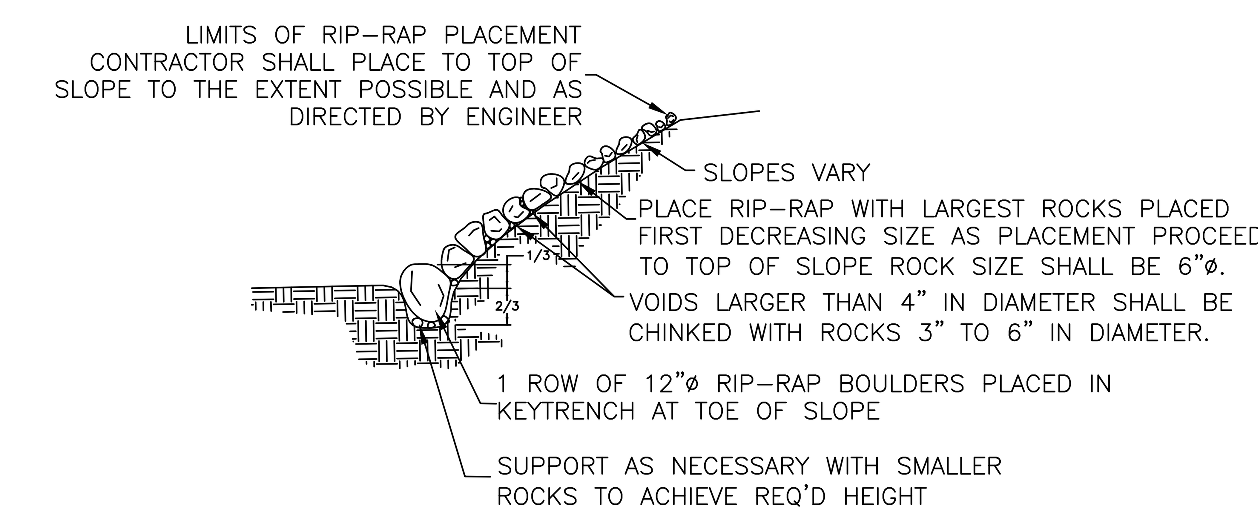


LIVE POLE NOTES
REVEGETATION AND REPLACEMENT PLANTINGS SHALL CONSIST OF LOCALLY-OBTAINED, NATIVE SPECIES, PER SPECIFICATIONS.

WILLOW PREPARATION
1. POLE CUTTINGS SHALL BE TAKEN WITH SHARP PRUNING SHEARS OR WITH A SHARP SAW BLADE, WITHOUT CAUSING INJURY TO THE BARK OR SPLITTING OF THE ENDS. THE BUTT END OF THE CUTTING SHALL BE ANGLED AND THE TOP END SHALL BE SQUARE.
2. POLES SHALL BE FROM 4 TO 6 FOOT IN LENGTH AND 1 TO 4 INCHES IN DIAMETER. POLES SHALL BE CUT SO THAT A TERMINAL BUD SCAR IS WITHIN 1 TO 4 INCHES OF THE TOP. AT LEAST 2 BUDS AND/OR BUD SCARS SHALL BE ABOVE THE GROUND AFTER PLANTING. SIDE BRANCHES SHALL BE CUT WITH SHARP PRUNING SHEARS, FLUSH WITH POLE, WITHOUT CAUSING INJURY TO BUDS.

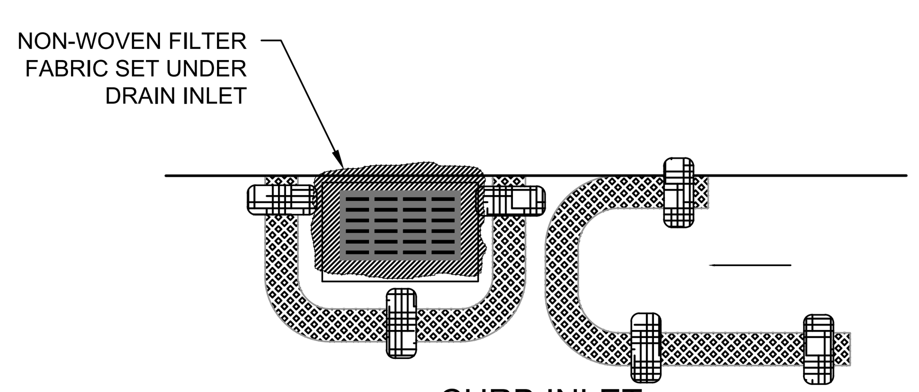
INSTALLATION
1. LIVE POLES SHALL BE INSTALLED ON THE SAME DAY AS CUT OR SOAKED FOR 24 HOURS, MIN. PRIOR TO INSTALLATION.
2. THE POLE SHALL BE INSTALLED AS DEEP AS POSSIBLE INTO THE SOIL, PREFERABLY WITH 80% OF ITS LENGTH IN CONTACT WITH NATIVE SOIL. USE OF A PILOT BAR MAY HELP WITH INSTALLATION.
3. SPECIAL CARE SHALL BE TAKEN TO NOT DAMAGE THE BUDS, SPLIT POLE ENDS, OR STRIP THE BARK DURING INSTALLATION.

2/D2 LIVE POLE STAKE
NTS

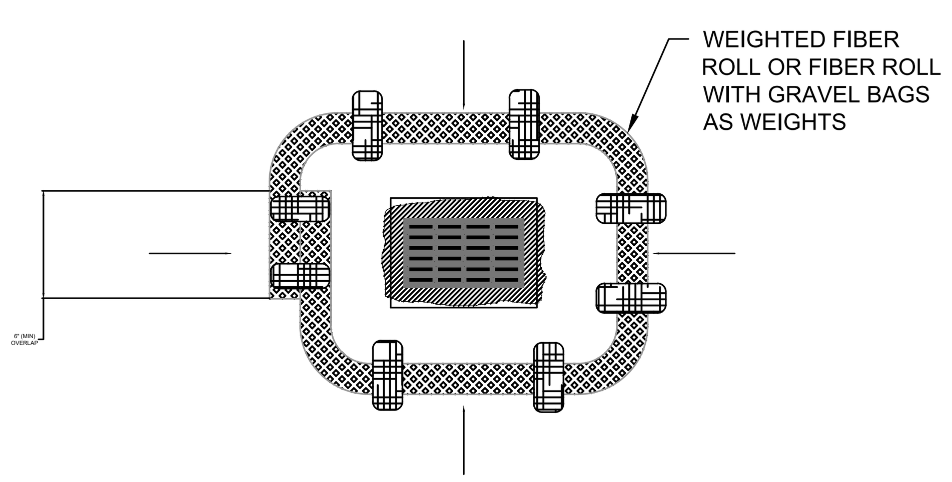


3/D2 ROCK SLOPE PROTECTION
NTS

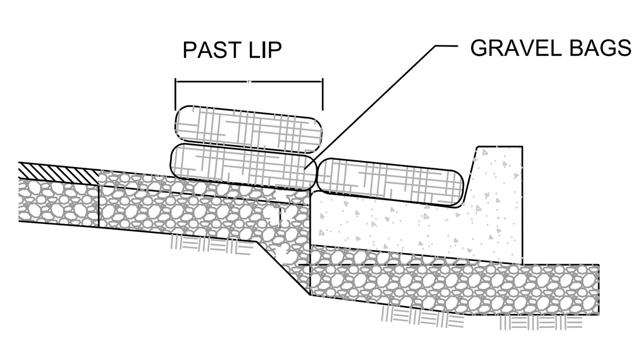
NOTES:
1. RIP–RAP SIZING MAY BE ALTERED BASED ON ROCK AVAILABLE ON SITE.



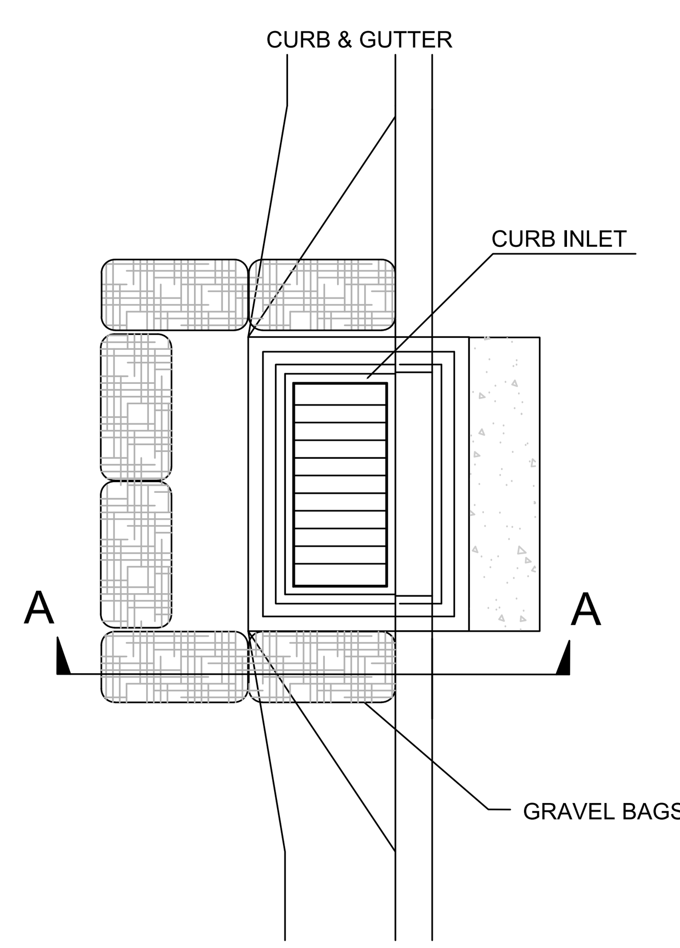
CURB INLET



SHEET FLOW INLET



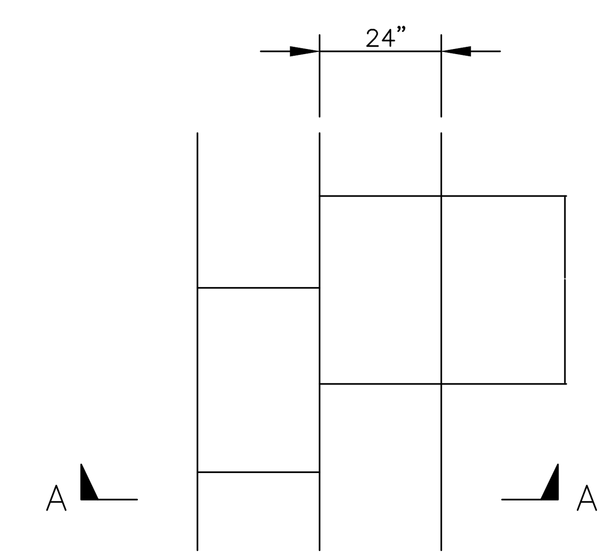
SECTION A-A



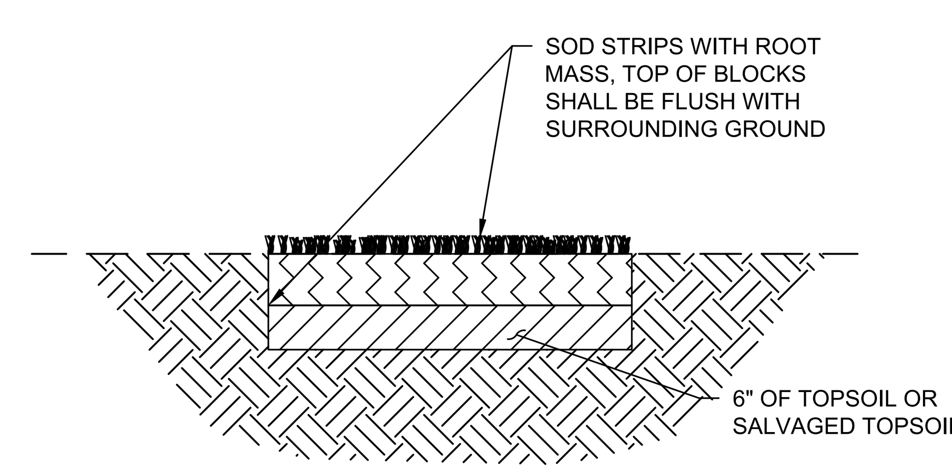
ALTERNATE CURB INLET

DI PROTECTION NOTES:
1. FIBER ROLLS SHALL NOT BE MADE FROM STRAW, WITH THE EXCEPTION OF WEED-FREE RICE STRAW. FIBER ROLLS SHALL HAVE A MINIMUM WEIGHT OF 2.5 LBS PER LINEAR FOOT. FIBER ROLLS SHALL BE REMOVED AT THE END OF CONSTRUCTION AS DIRECTED BY THE ENGINEER.
2. GRAVEL BAGS SHALL BE FILLED WITH ¾" DIA, CLEANED, WASHED GRAVEL. SAND BAGS ARE NOT AN ACCEPTABLE SUBSTITUTE.
3. INSPECT AND REPAIR FIBER ROLLS EACH DAY AND AFTER EACH STORM EVENT. REMOVE SEDIMENT WHEN ONE THIRD OF THE FILTER DEPTH HAS BEEN FILLED. REMOVED SEDIMENT SHALL BE DISPOSED OF PROPERLY.
4. SEDIMENT AND GRAVEL DEPOSITED ON ROADWAYS SHALL BE IMMEDIATELY REMOVED.
5. IN HIGH TRAFFIC AREAS, MARK DRAIN INLET PROTECTION WITH VISIBLE BARRIERS SUCH AS SAFETY CONES.
6. REMOVE DRAIN INLET PROTECTION AFTER THE SURROUNDING AREA HAS BEEN STABILIZED.
7. ADDITIONAL OR OVERLAPPING GRAVEL BAGS MAY BE NECESSARY AS DIRECTED BY ENGINEER FOR PROPER FUNCTIONING OF BMP.

4/D2 DRAINAGE INLET PROTECTION
NTS



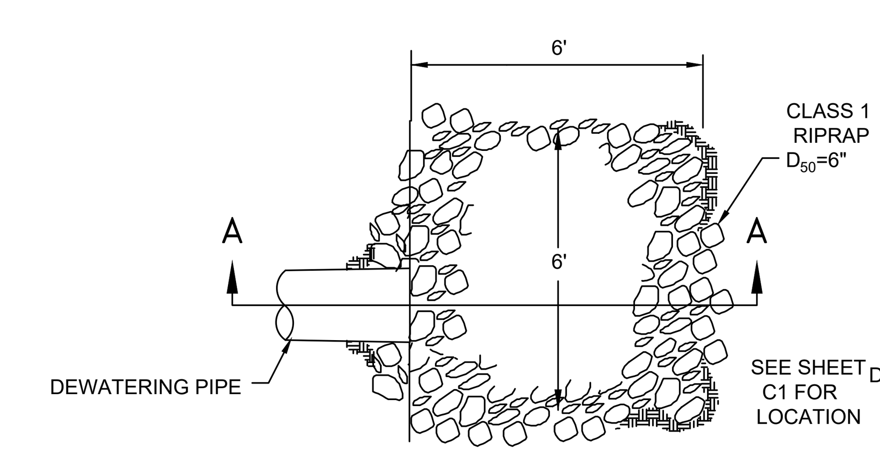
SOD STRIP LAYOUT PLAN



SECTION A-A

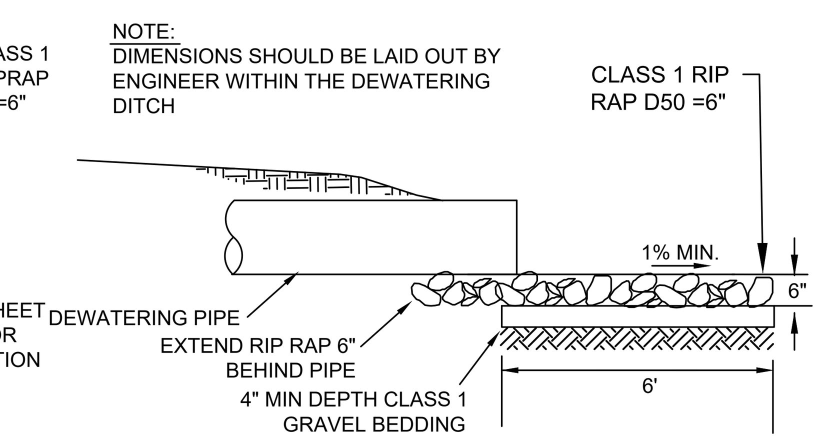
SOD STRIP NOTES:
REVEGETATION AND REPLACEMENT PLANTINGS SHALL CONSIST OF LOCALLY-OBTAINED, NATIVE SPECIES, PER SPECIFICATIONS.

5/D2 SALVAGE SOD
NTS



OUTLET PROTECTION PLAN VIEW

NOTE:
DIMENSIONS SHOULD BE LAID OUT BY ENGINEER WITHIN THE DEWATERING DITCH



SECTION A-A

6/D2 DEWATERING OUTLET PROTECTION
NTS

BID SET

Know what's below. Call before you dig.

Nevada Tahoe Conservation District

DETAILS 2

MARLETTE CREEK RESTORATION PROJECT

PROFESSIONAL ENGINEER – STATE OF NEVADA
MEGHAN C. KELLY
Exp: 6/30/25
CIVIL
4/8/2025
No. 20851

DESIGNED/DRAWN	EK
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PROJECT	MARLETTE CREEK RESTORATION
SHEET	D2

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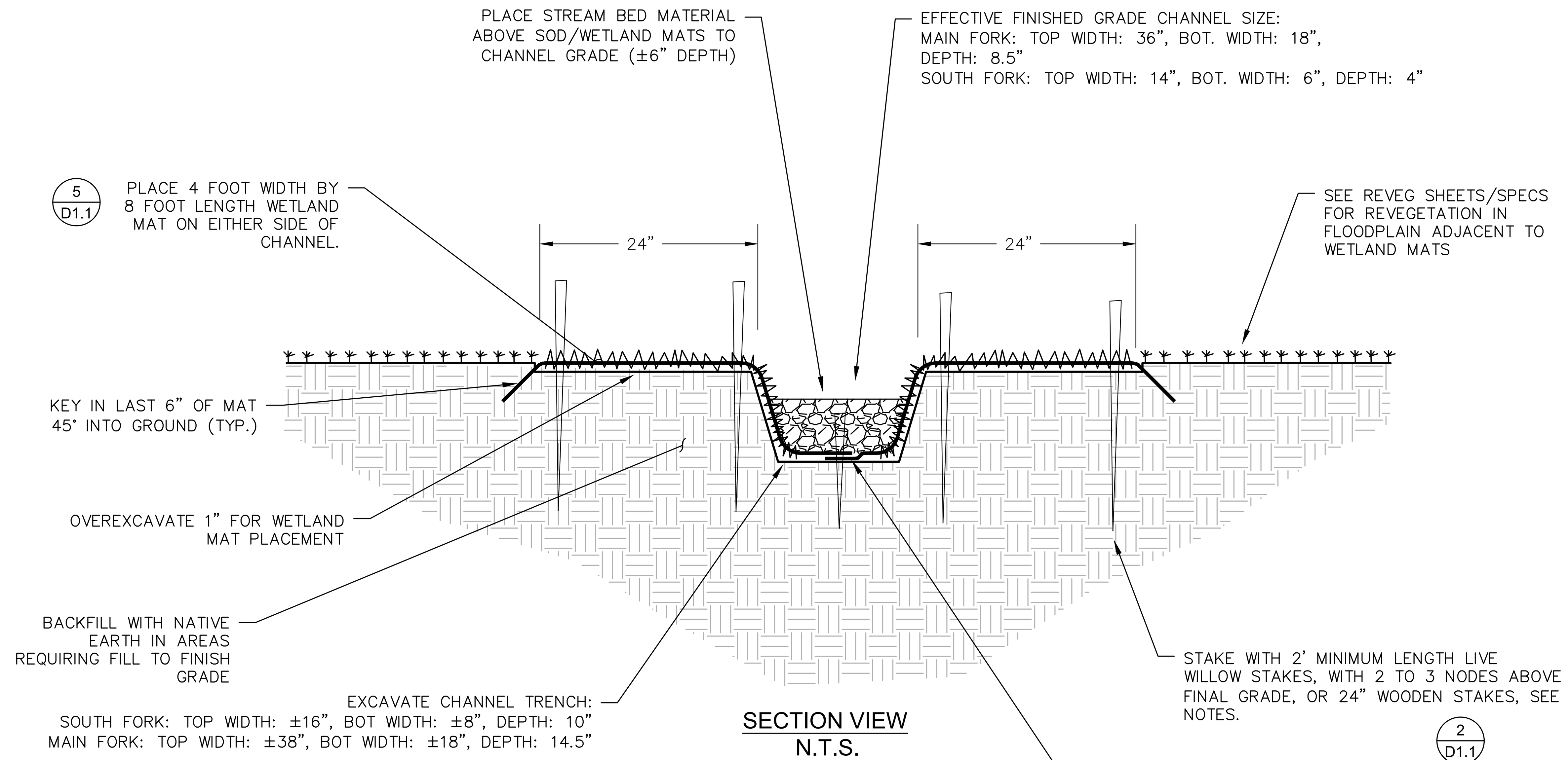
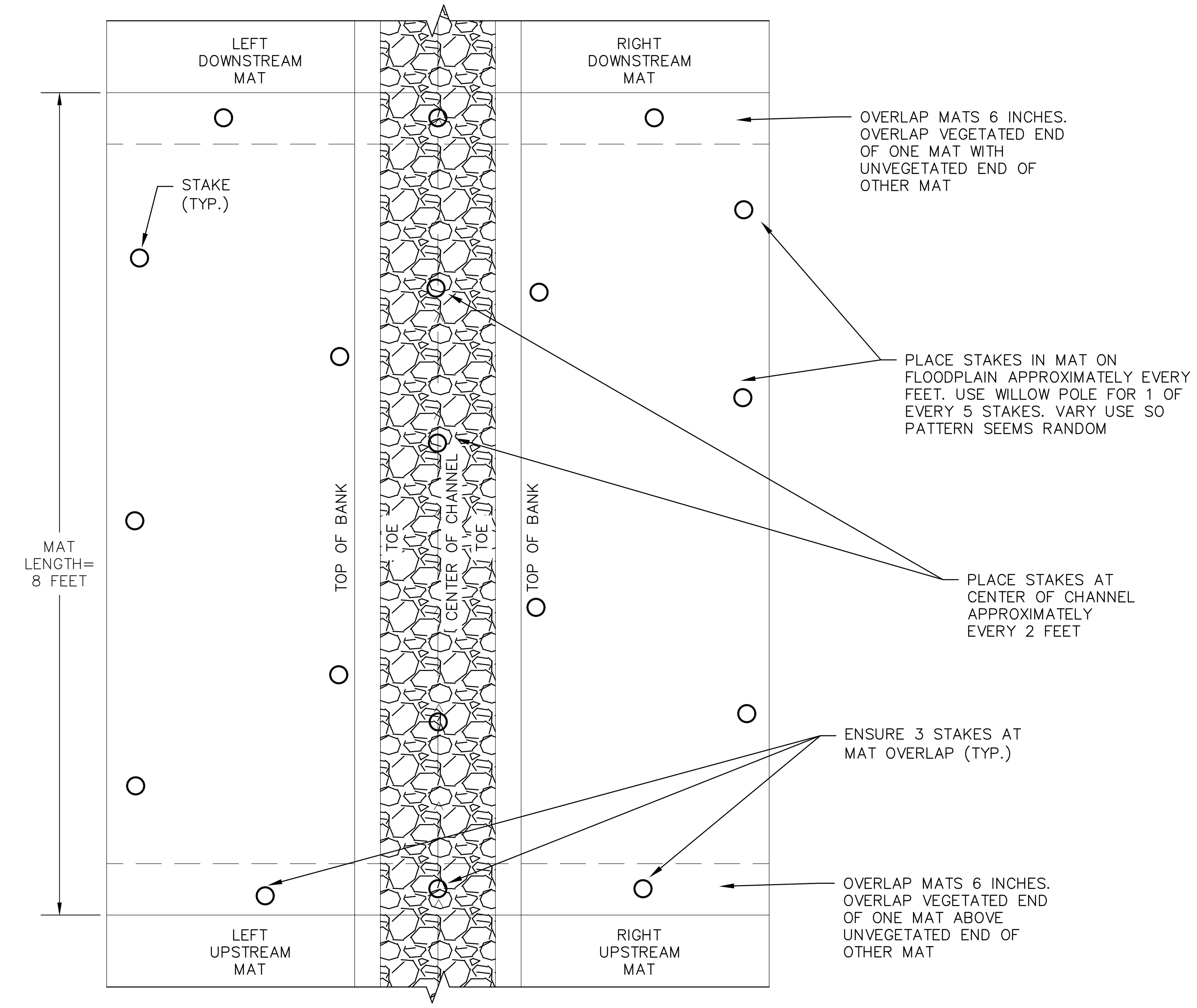


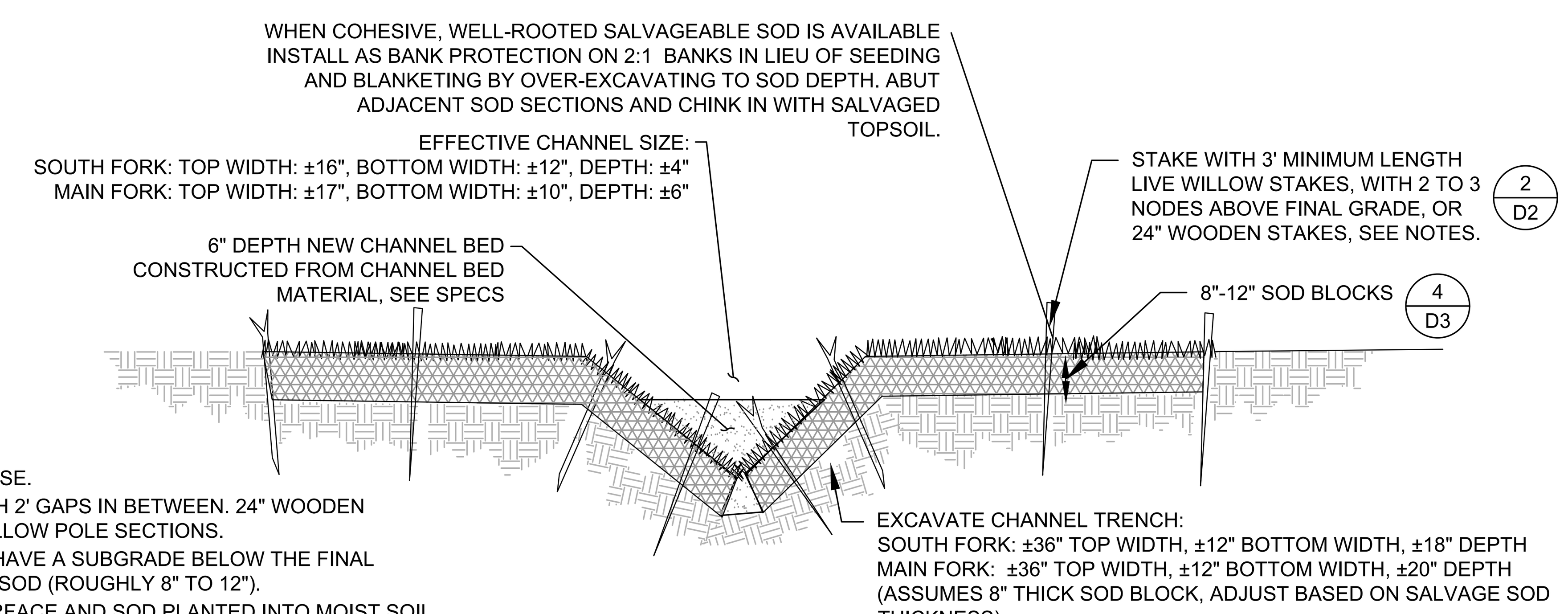
NOTES:

1. WILLOW POLES SHOULD BE USED WITH 2' GAPS IN BETWEEN. 24" WOODEN STAKES MAY BE CONSTRUCTED FROM UNTREATED 2" X 4"s CUT DIAGONALLY.
2. AREAS DESIGNATED FOR SOD SHALL HAVE A SUBGRADE BELOW THE FINAL GRADE THE SAME THICKNESS AS THE SOD (ROUGHLY 1").
3. SOIL SHALL BE LOOSENED AT THE SURFACE AND SOD PLANTED INTO MOIST SOIL SUCH THAT THE EDGES SNUGLY ADJOIN ADJACENT SECTIONS. NEXT CHINK WITH NATIVE TOPSOIL SO THAT THE EDGES OF THE SOD ARE WELL COVERED.
4. FINAL ELEVATION OF SOD CROWNS SHALL MATCH THE PLAN ELEVATION.
5. SOD TO BE THOROUGHLY WATERED AND MAINTAINED IN A MOIST, HEALTHY CONDITION UNTIL ESTABLISHED, FOR UP TO ONE YEAR FOLLOWING PLANTING.

1 D3 WETLAND MAT CHANNEL
NTS



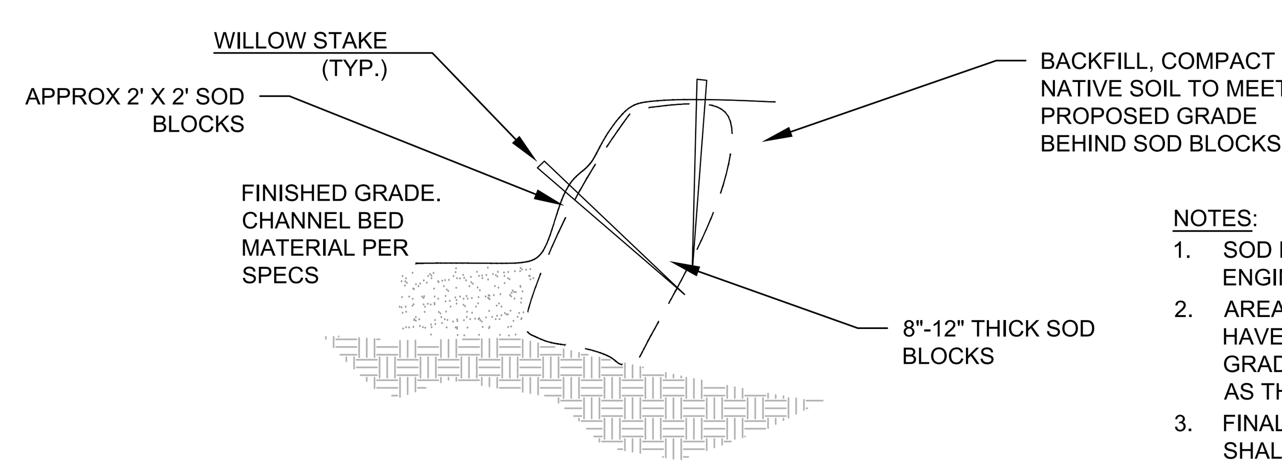
WETLAND MAT STAKING – PLAN VIEW
N.T.S.



NOTES:

1. ENGINEER TO FLAG LOCATIONS FOR USE.
2. WILLOW POLES SHOULD BE USED WITH 2' GAPS IN BETWEEN. 24" WOODEN STAKES SHALL BE USED BETWEEN WILLOW POLE SECTIONS.
3. AREAS DESIGNATED FOR SOD SHALL HAVE A SUBGRADE BELOW THE FINAL GRADE THE SAME THICKNESS AS THE SOD (ROUGHLY 8" TO 12").
4. SOIL SHALL BE LOOSENED AT THE SURFACE AND SOD PLANTED INTO MOIST SOIL SUCH THAT THE EDGES SNUGLY ADJOIN ADJACENT SECTIONS. NEXT CHINK WITH NATIVE TOPSOIL SO THAT THE EDGES OF THE SOD ARE WELL COVERED.
5. FINAL ELEVATION OF SOD CROWNS SHALL MATCH THE PLAN ELEVATION.
6. SOD TO BE THOROUGHLY WATERED AND MAINTAINED IN A MOIST, HEALTHY CONDITION UNTIL ESTABLISHED, FOR UP TO ONE YEAR FOLLOWING PLANTING.

2 D3 SOD BLOCK CHANNEL
NTS

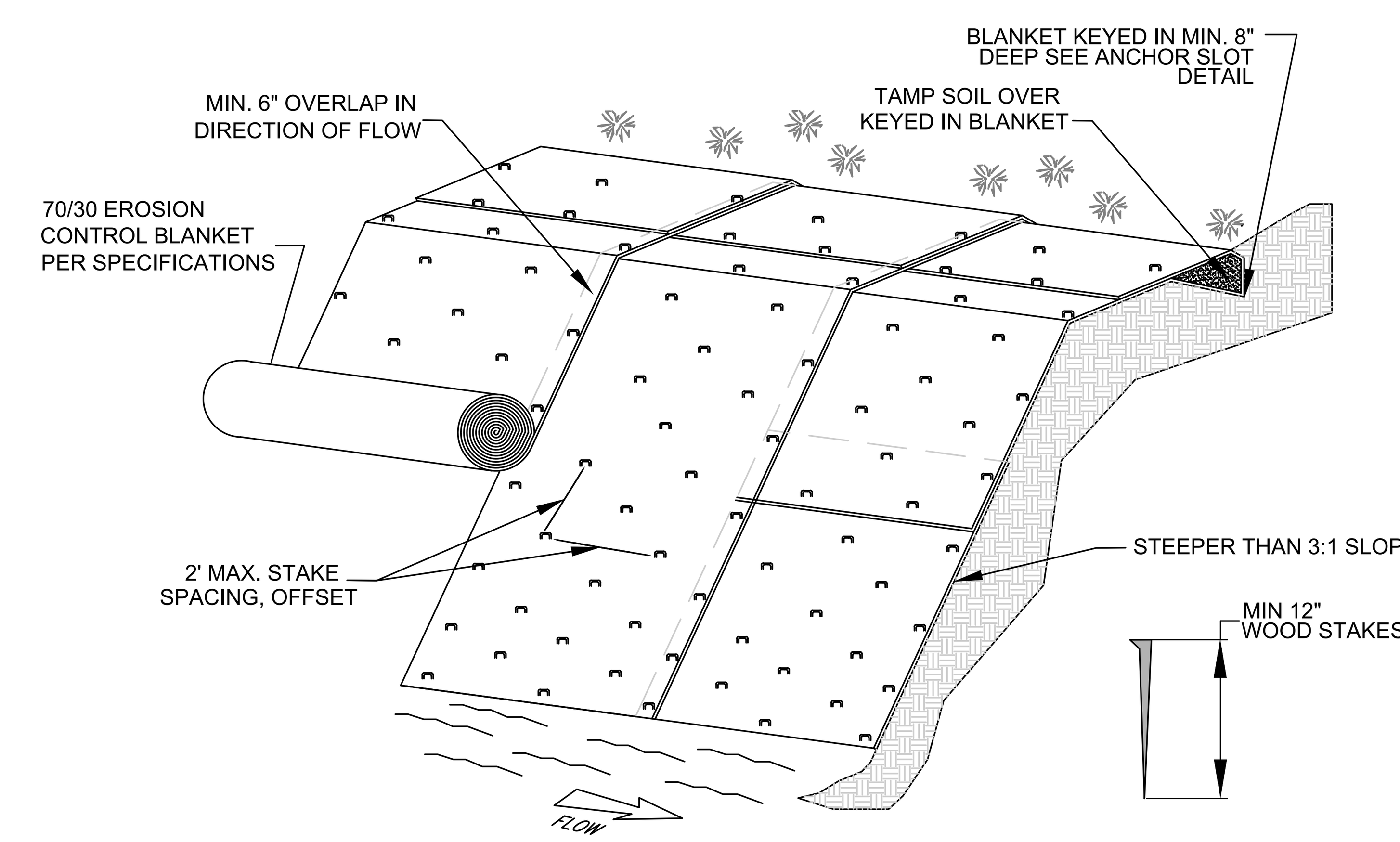


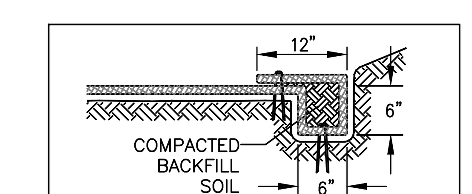
SECTION

NOTES:

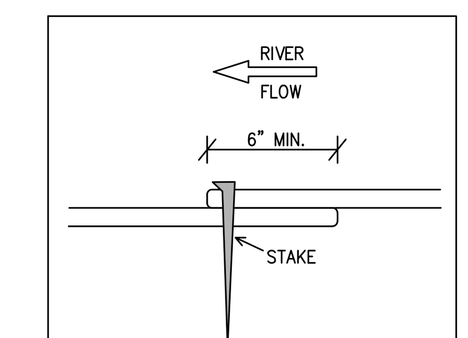
1. SOD BLOCK CHANNEL TO BE FLAGGED BY ENGINEER.
2. AREAS DESIGNATED FOR SOD SHALL HAVE A SUBGRADE BELOW THE FINAL GRADE THE SAME THICKNESS AND WIDTH AS THE SOD
3. FINAL ELEVATION OF SOD CROWNS SHALL MATCH THE PLAN ELEVATION.
4. SOD TO BE THOROUGHLY WATERED AND MAINTAINED IN A MOIST, HEALTHY CONDITION UNTIL ESTABLISHED, FOR UP TO ONE YEAR FOLLOWING PLANTING.

3 D3 SOD BLOCK CHANNEL BANKS
NTS

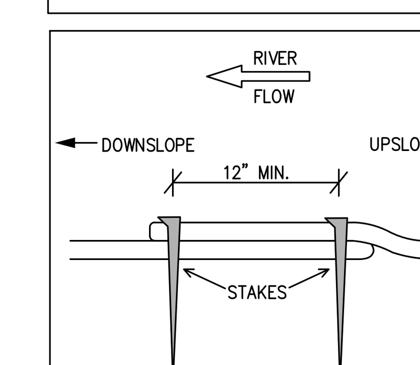




ANCHOR SLOT DETAIL
NTS



SIDE OVERLAP DETAIL
NTS



END OVERLAP DETAIL
NTS

NOTES
1. SLOPE SURFACE SHALL BE SMOOTH, AND FREE OF ROCKS, DIRT CLODS, AND STICKS.
2. APPLY SEEDING AND SOIL INOCULANT TO THE BANK BEFORE INSTALLING BLANKETS (SEE SPEC.).
3 LAY BLANKETS LOOSELY AND STAKE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH BLANKETS. (SEE SPEC.).
4. DRIVE STAKES FLUSH WITH BLANKET.

4 D3 EROSION CONTROL BLANKET
NTS

BID SET

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Nevada Tahoe Conservation District

DETAILS 3

MARLETTE CREEK RESTORATION PROJECT

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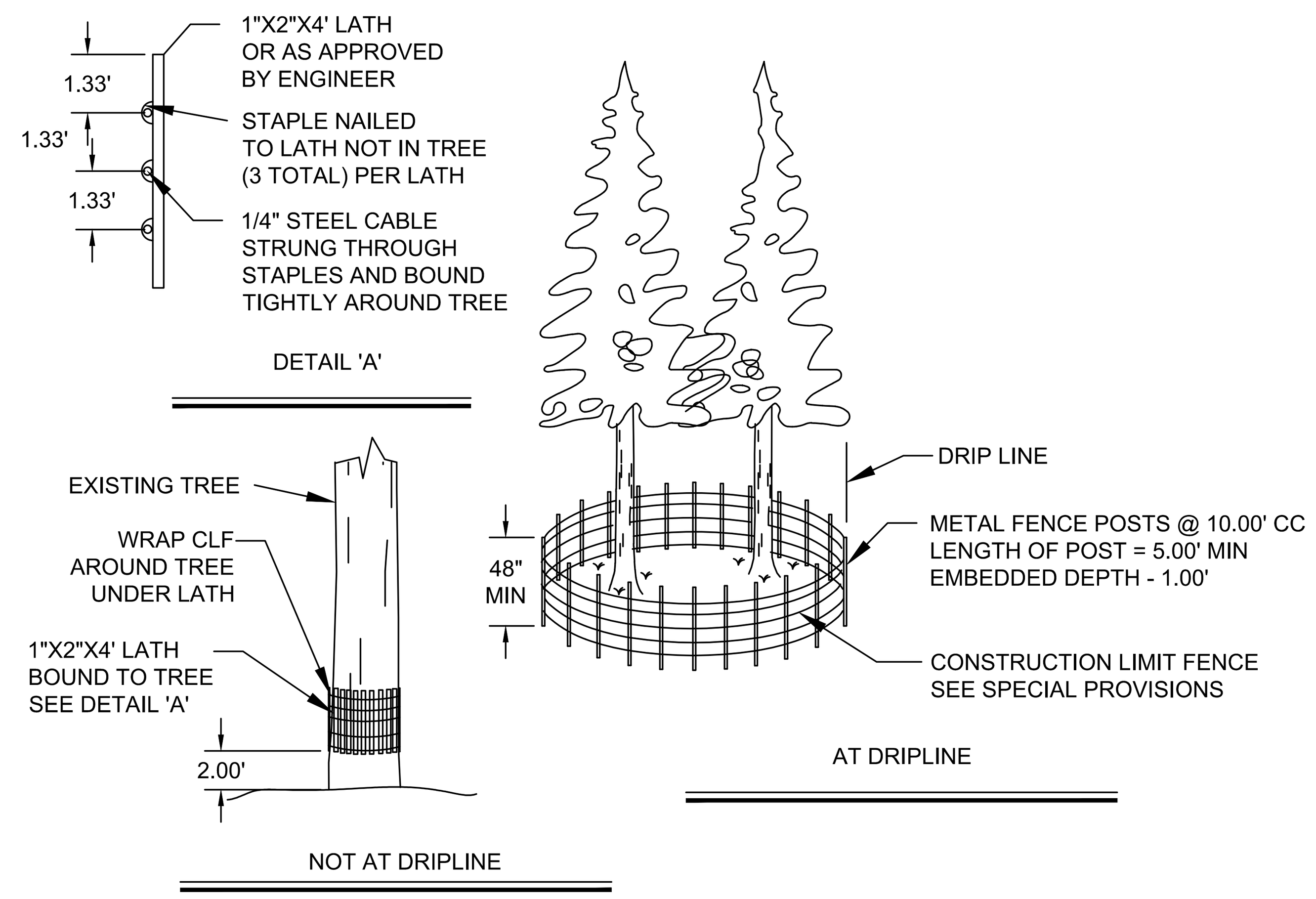
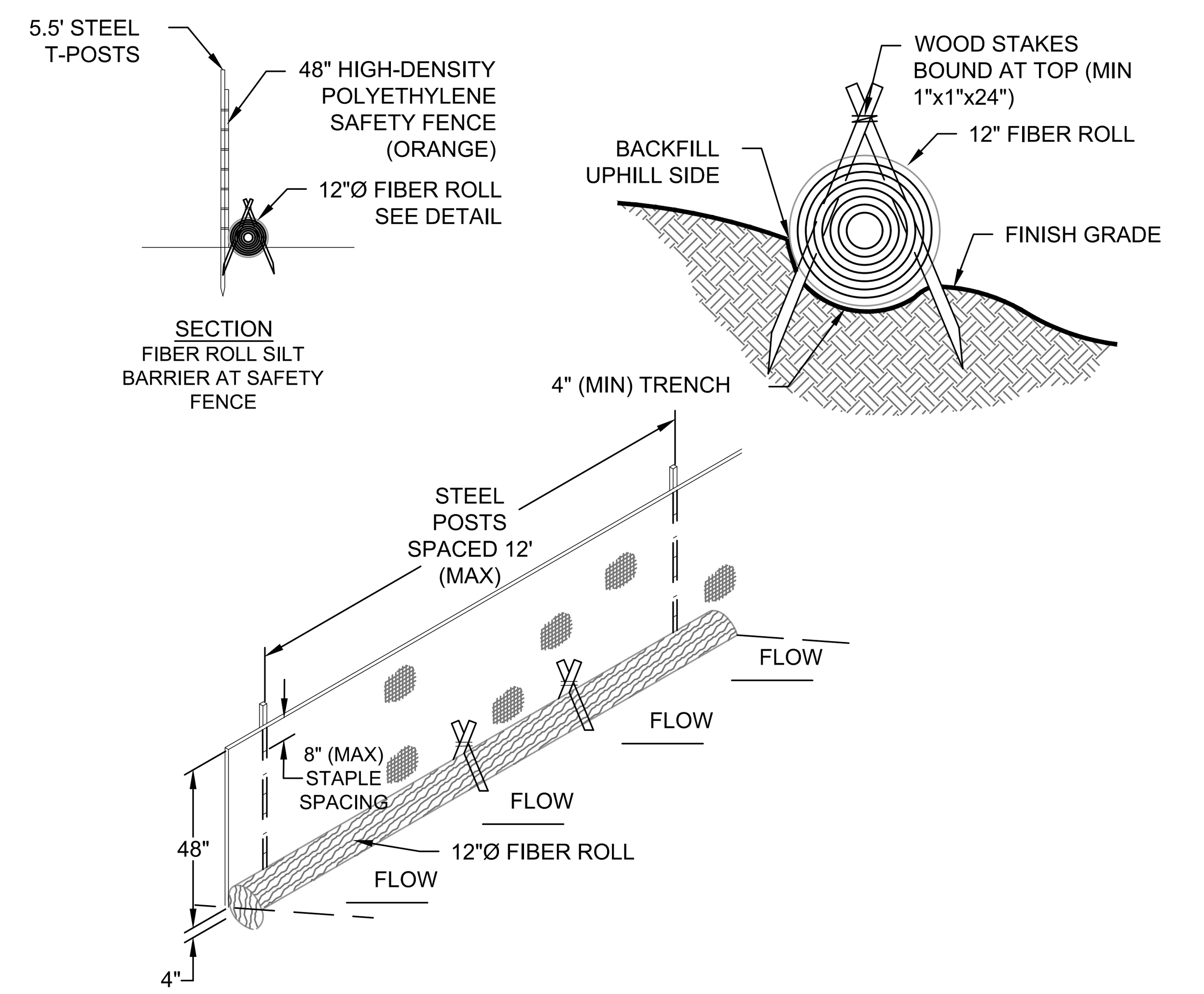
SHEET
D3
18 OF 25



NOTE:

1. CLF AND TREE PROTECTION FENCE SHALL BE A MINIMUM OF 48" HIGH. FOR TREES WITH DRIPLINES THAT OVERHANG THE CONSTRUCTION AREAS, THE LOCATION OF THE TREE PROTECTION FENCE SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER AND/OR THE TRPA AT THE PREGRADE MEETING.
2. THE DETAIL SHOWN IS FOR TREE PROTECTION. MATERIAL AND SPACING SHOWN ALSO APPLIES TO CLF.
3. QUANTITY OF FILTER FENCE AND CONSTRUCTION LIMIT FENCE DOES NOT INCLUDE MINIMUM LIMITS FOR TREE PROTECTION. TREE PROTECTION FENCING TO BE PER DETAIL THIS SHEET AND/OR AS DETERMINED IN THE FIELD.

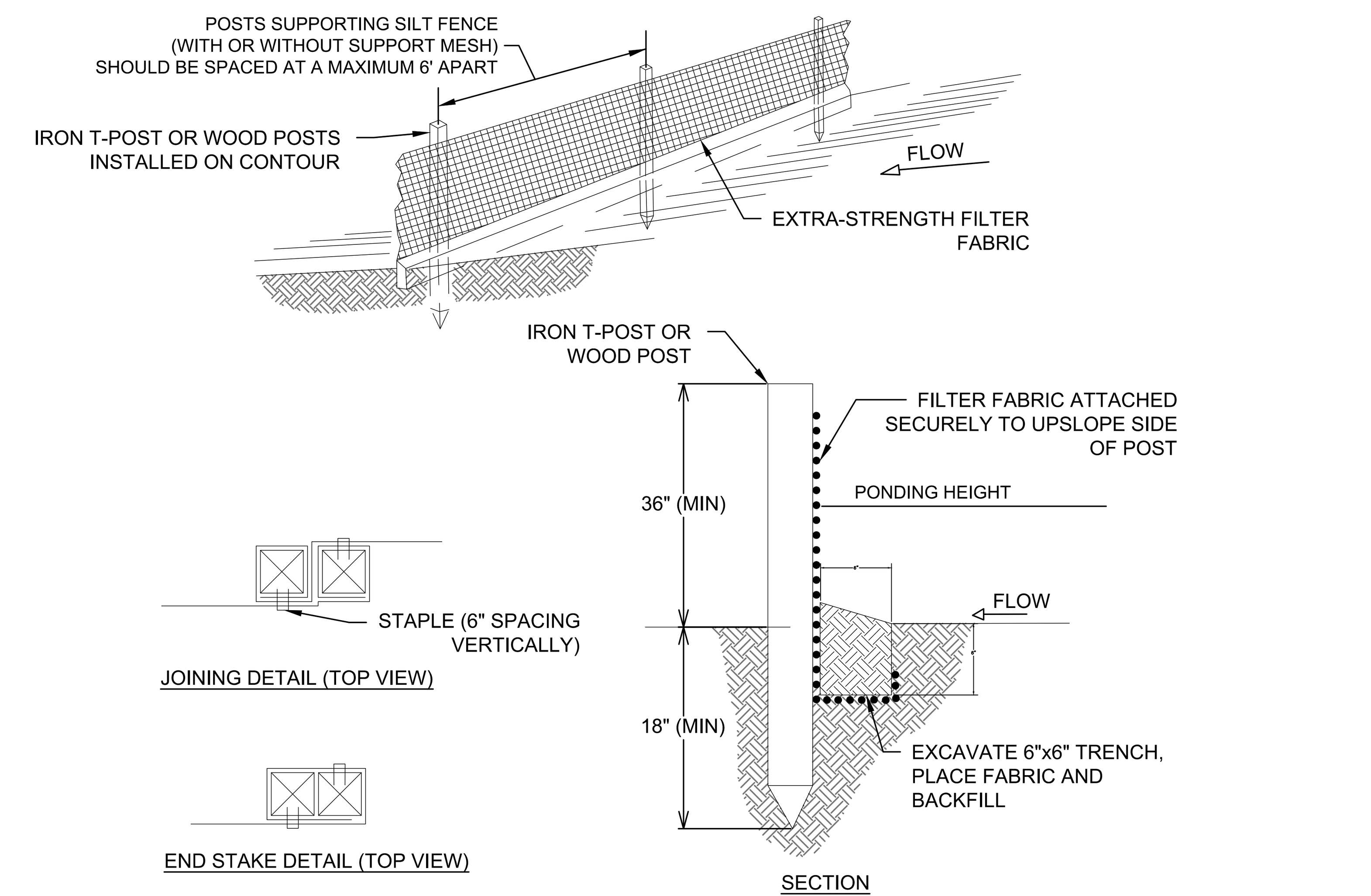
1/D4 CONSTRUCTION LIMIT FENCE & TREE PROTECTION
NTS



FIBER ROLL NOTES:

1. FIBER ROLL SHALL NOT BE MADE FROM STRAW. FIBER ROLLS SHALL BE BOUND BY HIGH STRENGTH COIR NETTING, AND HAVE A MINIMUM WEIGHT OF 5 LBS PER LINEAL FOOT.
2. ORANGE SAFETY FENCE IS INTENDED TO PROTECT FIBER ROLLS FROM COMPRESSION BY VEHICLES, CONSTRUCTION EQUIPMENT, EXT. FENCES SHALL BE HIGH DENSITY POLYETHYLENE WITH A MESH OPENING OF APPROXIMATELY 1 INCH BY 4 INCHES AND A MINIMUM HEIGHT OF 4 FEET. SAFETY FENCE MAY BE OMITTED IN LOW TRAFFIC AREAS.
3. FIBER ROLL SILT BARRIER SHALL BE INSTALLED ALONG CONTOUR AND ON SLOPES 5H:1V OR FLATTER UNLESS OTHERWISE APPROVED BY TRPA.
4. THE INSTALLATION CONFIGURATION SHALL PREVENT RUNOFF FROM LEAVING THE SITE OR ENTERING A WATERCOURSE WITHOUT PASSING THROUGH A SILT BARRIER.
5. THE MAXIMUM LENGTH OF SLOPE DRAINING TO THE SILT BARRIER SHALL BE 100 FEET.
6. FIBER ROLL SHALL BE INSTALLED BY SHAPING A 4 INCH DEEP FURROW TO MATCH THE SHAPE OF THE LOG, SECURING IN FURROW WITH WOOD STAKES, AND TAMPING THE GROUND AROUND THE FIBER ROLL TO FILL VOIDS BETWEEN THE LOG AND THE GROUND.

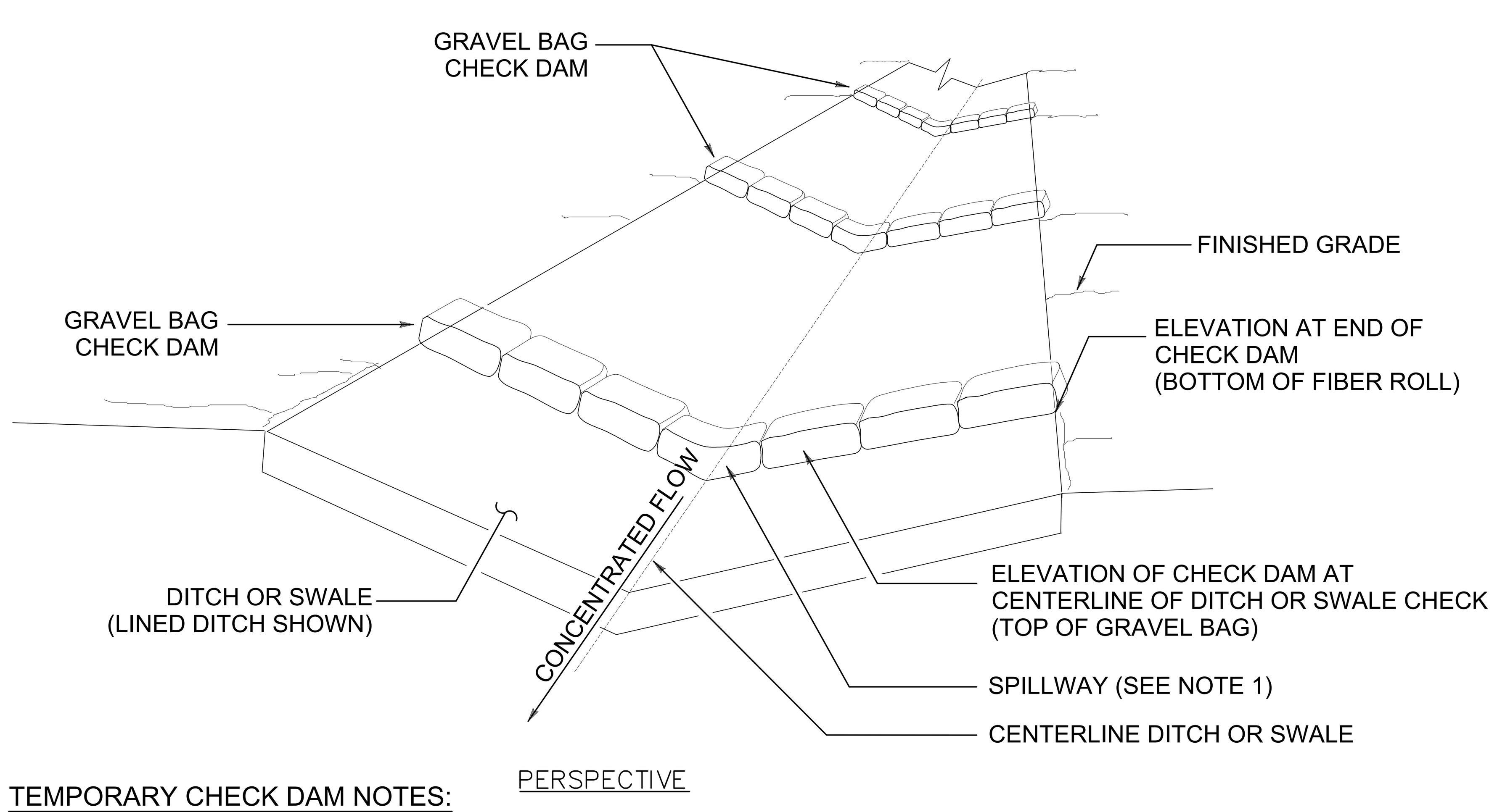
2/D4 FIBER ROLL SILT BARRIER
NTS



SILT FENCE NOTES:

1. USED IN AREAS WHERE SHEET FLOW OCCURS.
2. DO NOT USE IN STREAMS, CHANNELS, OR ANYWHERE FLOW IS CONCENTRATED. DO NOT USE SILT FENCES TO DIVERT FLOW.
3. DO NOT USE BELOW SLOPES SUBJECT TO CREEP, SLUMPING, OR LANDSLIDES.
4. SILT FENCE SHOULD BE WOVEN POLYPROPYLENE WITH A MINIMUM WIDTH OF 36 INCHES AND A MINIMUM TENSILE STRENGTH OF 100 LB FORCE.
5. INSTALL ALONG A LEVEL CONTOUR SO WATER DOES NOT POND MORE THAT 1.5 FEET AT ANY POINT ALONG THE SILT FENCE.
6. THE MAXIMUM LENGTH OF SLOPE DRAINING TO ANY POINT ALONG THE SILT FENCE SHOULD BE 200 FEET OR LESS.
7. THE MAXIMUM SLOPE PERPENDICULAR TO THE FENCE LINE SHOULD BE 1:1.
8. PROVIDE SUFFICIENT ROOM FOR RUNOFF TO POND BEHIND THE FENCE AND TO ALLOW SEDIMENT REMOVAL EQUIPMENT TO PASS BETWEEN THE SILT FENCE AND TOES OF SLOPES OR OTHER OBSTRUCTIONS.
9. TURN THE ENDS OF THE FILTER FENCE UPHILL TO CREATE A "J" SHAPE, TO PREVENT STORMWATER FROM FLOWING AROUND THE FENCE.
10. LEAVE AN UNDISTURBED OR STABILIZED AREA IMMEDIATELY DOWN SLOPE FROM THE FENCE WHERE FEASIBLE.
11. SILT FENCES SHOULD REMAIN IN PLACE UNTIL THE DISTURBED AREA IS PERMANENTLY STABILIZED.
12. REMOVE SEDIMENT WHEN DEPOSITS REACH APPROXIMATELY 1/3 HEIGHT OF BARRIER.

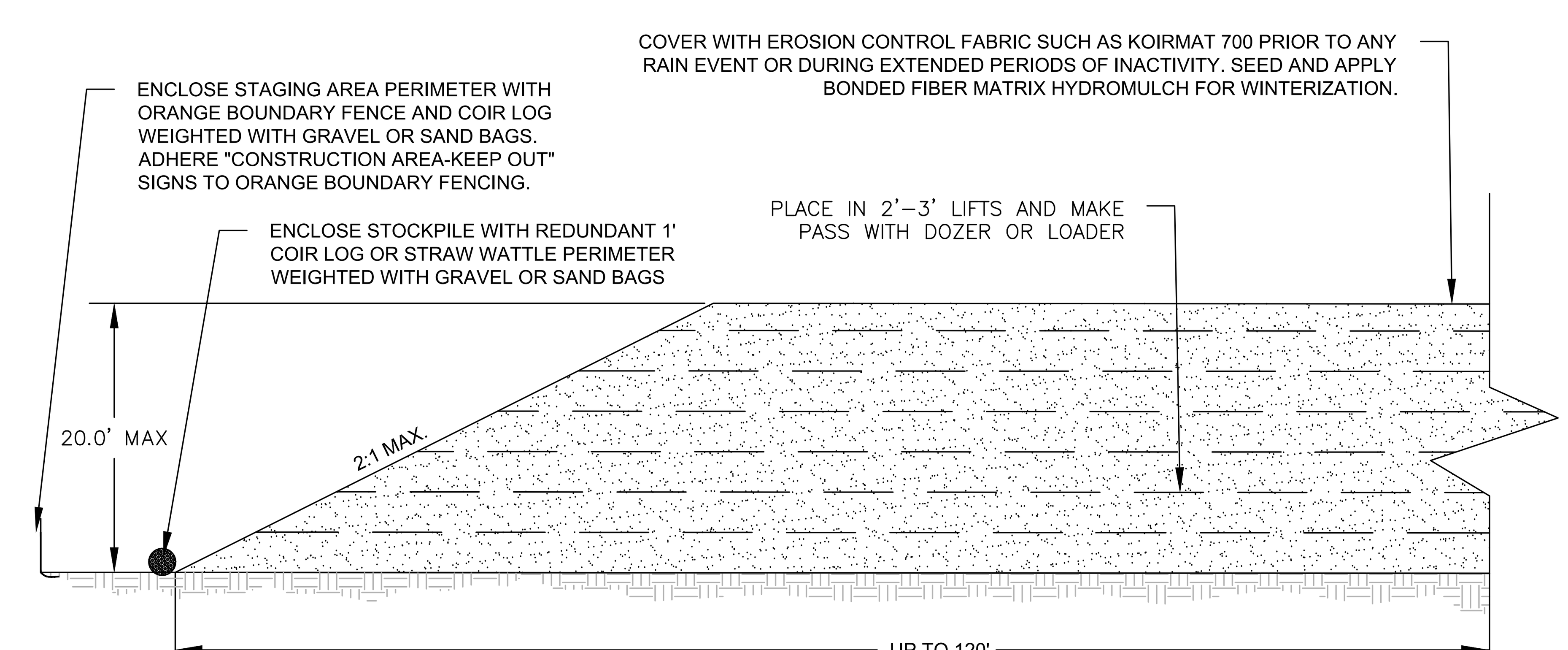
3/D4 FILTER FENCE SILT BARRIER
NTS



TEMPORARY CHECK DAM NOTES:

1. CHECK DAM DIMENSIONS TO BE VERIFIED BY CIVIL ENGINEER.
2. ONLY CLEAN/WASHED GRAVEL MUST BE USED IN BAGS

4/D4 HARDENED CONSTRUCTION ENTRANCE
NTS



5/D4 SOIL STOCKPILE
NTS

File Path: c:\Users\ekerl.desktop-gnu4d7n\nevada tahoe conservation district\nevada tahoe conservation district - documents\Projects\Marlette\CAD\Sheets\DETAIL D1-DX.DWG 5/7/2025 2:52 PM

Nevada Tahoe Conservation District

DETAILS 4

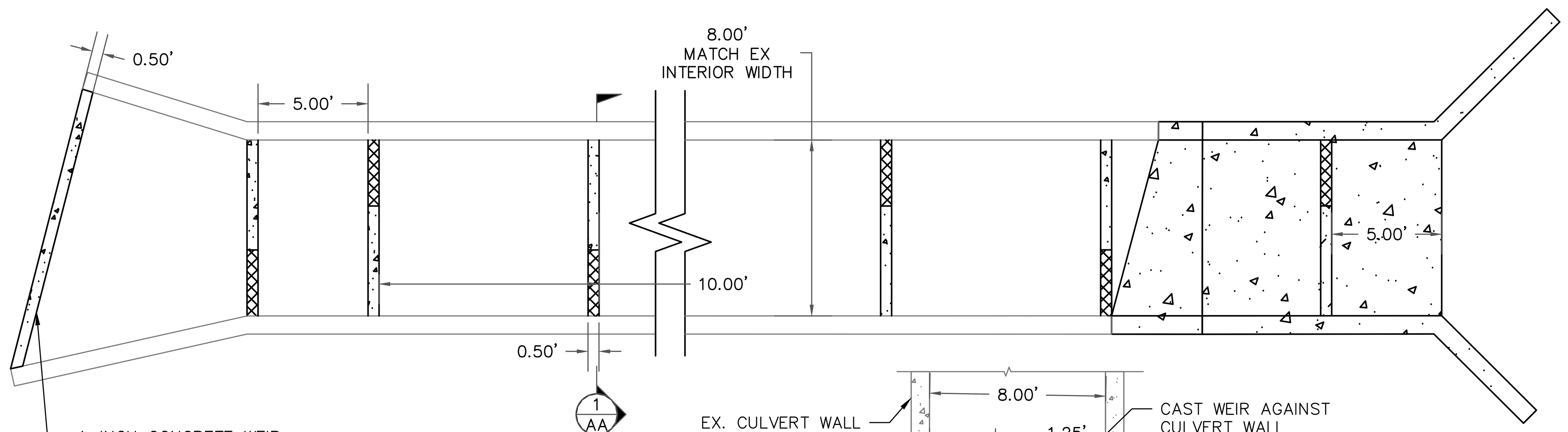
MARLETTE CREEK RESTORATION PROJECT

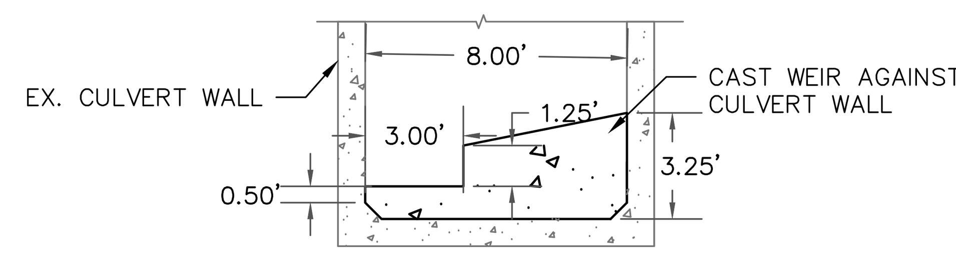
PROFESSIONAL ENGINEER - STATE OF NEVADA
MEGHAN C. KELLY
Exp: 6/30/25
CIVIL
No. 20851
4/8/2025

BID SET

DESIGNED/DRAWN	EK
CHECKED	MK
DATE	4/2025
SCALE	AS SHOWN
PROJECT	MARLETTE CREEK RESTORATION
SHEET	D4

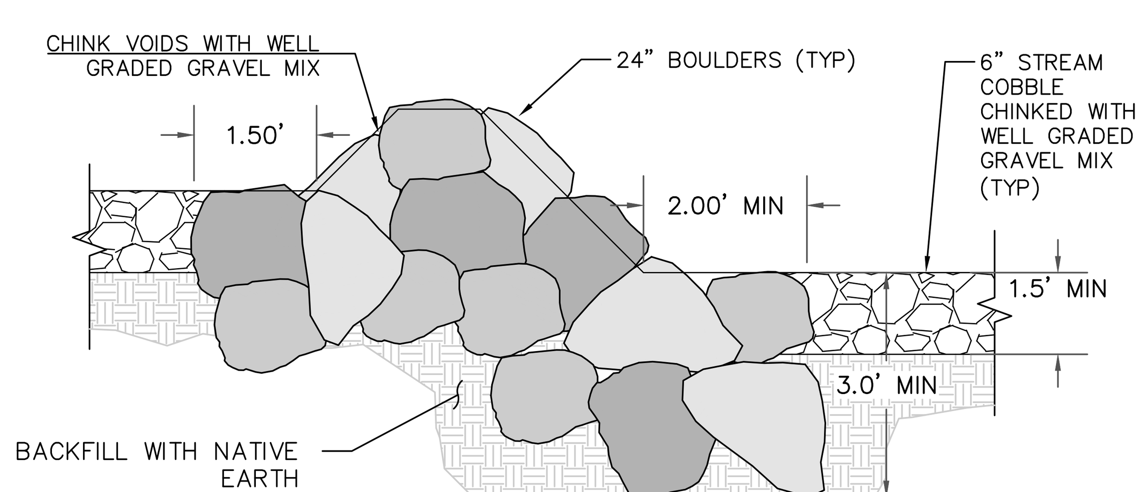
811 Know what's below. Call before you dig.





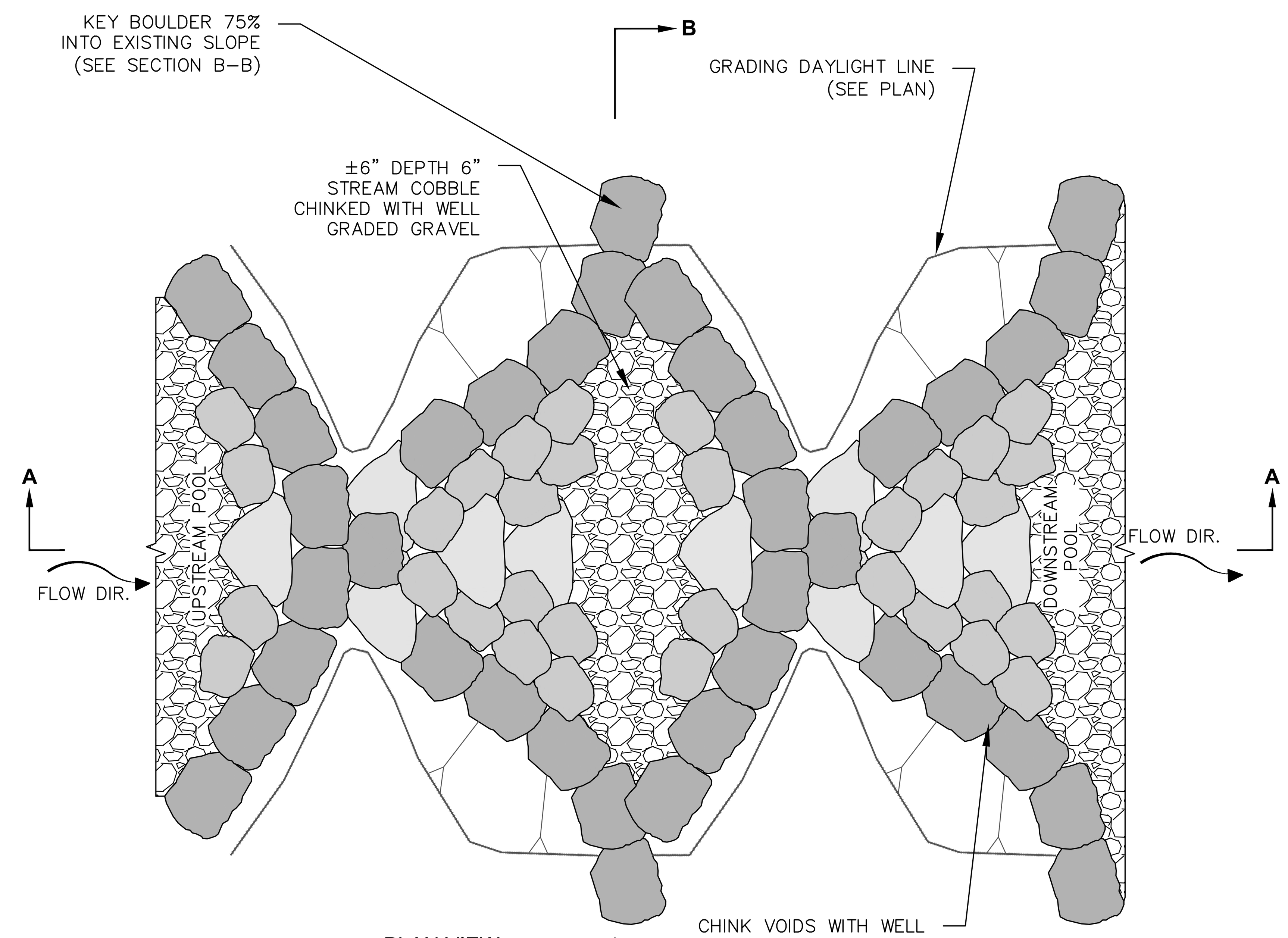
1 / AA TYPICAL FISH WEIR CROSS SECTION
NTS

1 / D5 CULVERT FISH WEIR LAYOUT
NTS

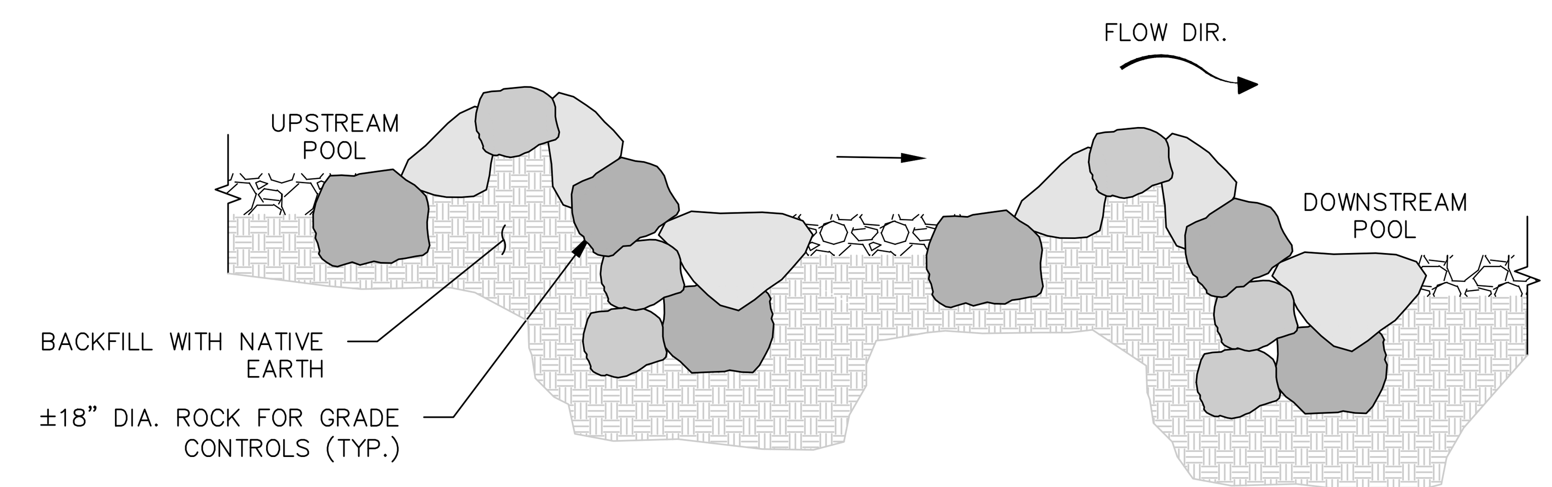


2 / D5 MAIN FORK BOULDER GRADE CONTROL
NTS

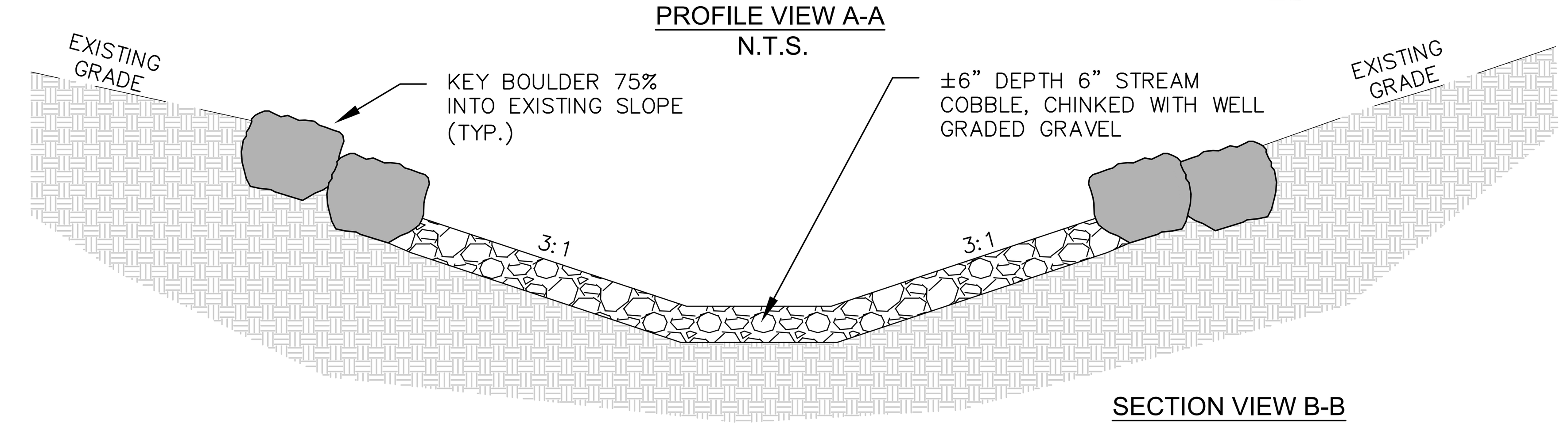
NOTE:
1. SEE SHEET 14 FOR PLAN VIEW



PLAN VIEW
N.T.S.



PROFILE VIEW A-A
N.T.S.



SECTION VIEW B-B
N.T.S.

3 / D5 SOUTH FORK BOULDER GRADE CONTROL
NTS

Nevada Tahoe Conservation District

DETAILS 5

MARLETTE CREEK RESTORATION PROJECT

PROFESSIONAL ENGINEER - STATE OF NEVADA
MEGHAN C. KELLY
Exp: 6/30/25
CIVIL
No. 20851

BID SET

Know what's below. Call before you dig.

DESIGNED/DRAWN	EK
CHECKED	MK
DATE	4/2025
SCALE	AS SHOWN
PROJECT	MARLETTE CREEK RESTORATION
SHEET	D5