

Appendix E

Biological Resources

E1. Revised Draft Biological
Assessment (GEI
Consultants, Inc.,
May 2016)

Revised Draft Biological Assessment
for the
Permanente Creek Restoration Project



Prepared for:
Lehigh Southwest Cement Company



May 2016

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for the
Permanente Creek Restoration Project



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ACRONYMS AND OTHER ABBREVIATIONS

BA	biological assessment
BO	biological opinion
CFR	Code of Federal Regulations
CRLF	California red-legged frog
ESA	Endangered Species Act
FR	<i>Federal Register</i>
Lehigh	Lehigh Southwest Cement Company
MMP	mitigation and monitoring plan
NMFS	National Marine Fisheries Service
Project	Permanente Creek Restoration Project
RWQCB	Regional Water Quality Control Board
Service	U.S. Fish and Wildlife Service
SWPPP	storm water pollution prevention plan
USACE	U.S. Army Corps of Engineers
USC	U.S. Code

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1 BACKGROUND

1.1 INTRODUCTION

The purpose of this draft biological assessment (BA) is to review the Permanente Creek Restoration Project (Project) in sufficient detail to determine the extent to which it may affect any of the federally listed species described in Section 1.3, “Species Evaluated in the Biological Assessment.” The species evaluated in this BA were derived from the federal endangered species list for species that may occur in the Action Area, as provided by the U.S. Fish and Wildlife Service (Service) on April 26, 2016 (Appendix A).

This BA has been prepared in accordance with requirements set forth under Section 7 of the federal Endangered Species Act (ESA) (16 U.S. Code [USC] 1536[c]). It initiates consultation with the Service and the National Marine Fisheries Service (NMFS) regarding effects of the Project on federally listed species.

Under provisions of ESA Section 7(a)(2), a federal agency that permits, licenses, funds, or otherwise authorizes activities must consult with NMFS and/or the Service, as appropriate, to prevent its action from jeopardizing the continued existence of any listed species or adversely modifying critical habitat (16 USC 1536[c]). A federal agency is required to consult if an action “may affect” listed species or designated critical habitat.

As defined in 50 Code of Federal Regulations (CFR) 402.2, the term “biological assessment” refers to the information prepared by, or under the direction of, the federal agency regarding listed species, species proposed for listing, and the designated and proposed critical habitat that may be present in the Action Area (see Section 1.2, “Action Area”), and the evaluation of a project’s potential effects on those species and habitat. A BA must be prepared if listed species or critical habitat may be present in an area that would be affected by a “major construction activity.” When a federal agency determines, through a BA or other review, that its action is “likely to adversely affect” a listed species or designated critical habitat, the agency must submit a request for formal consultation to NMFS and/or the Service. This consultation must take place within 90 days, then NMFS and the Service must prepare biological opinions (BOs) within the subsequent 45 days. The BOs present determinations by NMFS and the Service regarding whether the project would be likely to jeopardize the species or adversely modify its critical habitat. If a “jeopardy” or “adverse modification” determination is made, the BO must identify any reasonable and prudent alternative actions that could satisfy the purpose of and need for the project.

1.2 ACTION AREA

As defined by ESA guidelines, the “Action Area” is “all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action” (50 CFR 402.02). The Action Area includes all areas that would be directly or indirectly affected by project components. The Action Area for the Project consists of the 127.19-acre wetland delineation study area (see Exhibit 1), which is the area of potential direct effect, plus adjacent areas extending out to 500 feet, which compose the extent of potential indirect effects on water quality or wildlife dispersal that may occur outside of the construction area. The Action Area totals approximately 662.4 acres (see Exhibit 2). The Action Area focuses on a portion of Permanente Creek located south of the Lehigh Southwest Cement Company (Lehigh) Cement Plant, and is situated within the U.S. Geological Survey Mindego Hill and Cupertino Quadrangles. Elevations range from approximately 470 feet above mean sea level at the eastern boundary of the Action Area to 1,870 feet above mean sea level at the western boundary.

1.3 SPECIES AND HABITATS EVALUATED IN THE BIOLOGICAL ASSESSMENT

The Service provided an automated list to GEI Consultants on April 26, 2016, showing the federally listed and candidate species that potentially could be affected by the Project. All species on that list were analyzed for their potential occurrence within the Action Area and for the Project to affect those species. The species shown in Table 1 could be affected by the Project. The species listed in Table 2 are not anticipated to be affected by the Project. For the species in Table 2, a rationale for the “no effect” determination is provided.

1.3.1 SPECIES INCLUDED IN THE ANALYSIS

Based on the list provided by the Service (Appendix A) and the anticipated effects of the Project on listed species and their habitats in the Action Area, one species shown in Table 1—California red-legged frog (CRLF) (*Rana draytonii*), federally listed as threatened—is carried forward for effects analysis in this BA. This species is known to occur in the Action Area and may be affected by the Project.

Species	ESA Listing Status	Critical Habitat Designated in the Action Area (Yes/No)	Potential to Occur in the Action Area
Wildlife			
California red-legged frog <i>Rana draytonii</i>	Threatened	No	This species is found in permanent and semi-permanent ponds or backwaters of streams. California red-legged frog is known to occur in Ponds 9, 21, and 22 (and adjacent to the Action Area at Pond 14), based on a series of focused surveys (WRA 2011). Permanente Creek in the Action Area contains suitable aquatic and upland habitat.
Notes: BA = biological assessment; ESA = federal Endangered Species Act; Project = Permanente Creek Restoration Project Source: Data compiled by AECOM in 2015			

1.3.2 SPECIES ELIMINATED FROM FURTHER ANALYSIS

The species shown in Table 2 were eliminated from further analysis in this BA because their known range does not overlap with the Action Area, the Action Area does not contain suitable habitat for the species, or Project activities are not expected to affect the species or its habitat in the Action Area.

Species	ESA Listing Status	Reasoning for No Effect Determination
Plant Species		
San Mateo woolly sunflower <i>Eriophyllum latilobum</i>	Endangered	San Mateo woolly sunflower is restricted to shaded moist sites on steep grassy or sparsely wooded slopes of serpentine soils in San Mateo County. There is marginally suitable habitat for this species in the Action Area; however, the species was not detected during 2008 protocol floristic surveys and no occurrences are documented within 4.5 miles. Thus, this species is not expected to be affected by the Project.

Table 2. Federally Listed or Candidate Species that Are Not Expected to be Affected by the Project

Species	ESA Listing Status	Reasoning for No Effect Determination
Fish and Wildlife Species		
Tidewater goby <i>Eucyclogobius newberryi</i>	Endangered	Tidewater goby is found in the Sacramento and San Joaquin Rivers and associated tributaries. Permanente Creek does not provide suitable habitat for this species and the species is not known to occur in the Action Area.
San Bruno elfin butterfly <i>Incisalia mossii bayensis</i>	Endangered	San Bruno elfin butterfly is found in coastal mountains near San Francisco Bay, in the fog belt of steep north-facing slopes that receive little direct sunlight. There is no suitable habitat for this species in the Action Area, and thus, this species is not expected to be affected by the Project.
California clapper [Ridgway's] rail <i>Rallus longirostris obsoletus</i>	Endangered	California clapper rail occurs in emergent marsh habitat in the San Francisco Bay region. The Action Area does not contain suitable habitat for this species. Therefore, this species is not expected to be affected by the Project.
California least tern <i>Sternula antillarum</i> (= <i>Sterna</i> , = <i>albifrons</i>) <i>browni</i>	Endangered	California least tern occurs in beach and scrub habitats along the Pacific Coast from San Francisco to Baja California, Mexico. The Action Area does not contain suitable habitat for this species. Therefore, this species is not expected to be affected by the Project.
San Francisco garter snake <i>Thamnophis sirtalis tetrataenia</i>	Endangered	San Francisco garter snake occurs in pond habitats and feeds primarily on California red-legged frogs. The species' historical range was the San Francisco Peninsula south to Santa Cruz County. This species is not known to occur in the Action Area. Therefore, this species is not expected to be affected by the Project.
California tiger salamander <i>Ambystoma californiense</i>	Threatened	California tiger salamander breeds in vernal pool habitat and spends the majority of the year in upland refugia habitat (burrows) up to 1.5 miles from breeding ponds. There is no suitable breeding habitat for this species in the Action Area and the Action Area is not within 1.5 miles of known breeding locations. The nearest known occurrences of tiger salamander to the Action Area are approximately 12 miles to the southeast. Therefore, this species is not expected to be affected by the Project.
Marbled murrelet <i>Brachyramphus marmoratus</i>	Threatened	Marbled murrelet breeds in coniferous forests near coasts, nesting on large horizontal branches high up in trees. This species is not known to occur in the Action Area and is not expected to be affected by the Project.
Bay checkerspot butterfly <i>Euphydryas editha bayensis</i>	Threatened	Bay checkerspot butterfly is found in areas with serpentine soils. There is no suitable habitat for this species in the Action Area, and thus, this species is not expected to be affected by the Project.
Delta smelt <i>Hypomesus transpacificus</i>	Threatened	Delta smelt is found in the Sacramento–San Joaquin Delta and associated tributaries. Permanente Creek does not provide suitable habitat for this species and the species is not known to occur in the Action Area.
Central California Coastal steelhead DPS <i>Oncorhynchus mykiss</i>	Threatened	Central California coastal steelhead are found in coastal drainages from the Russian River south to Aptos Creek, including drainages of San Francisco and San Pablo Bays east to the confluence of the Sacramento and San Joaquin Rivers. Although steelhead occur in Stevens Creek, which is hydrologically connected to Permanente Creek by the Permanente Creek Diversion Channel, the diversion channel is impassable for steelhead, which do not occur in Permanente Creek. Further, depending on rainfall and drought conditions, flows in upper Permanente Creek may not reach Stevens Creek through the diversion channel (Permanente Creek is typically dry upstream of the diversion structure). In addition, Stevens Creek is over 4 miles downstream of the Action Area and is unlikely to experience increased sedimentation or other adverse conditions as a result of the proposed action. Therefore, this species is unlikely to be affected by the Project.

Notes: DPS = Distinct Population Segment; ESA = federal Endangered Species Act; Project = Permanente Creek Restoration Project
Source: Data compiled by AECOM in 2015

1.3.3 CRITICAL HABITAT IN THE ACTION AREA

ESA Section 3(5)A defines “critical habitat” as the specific areas in the geographical area occupied by the species where physical or biological features are found that are essential to the conservation of the species and may require special management considerations or protection. Designations of critical habitat also may include specific areas outside the geographical area occupied by the species, based on a determination that such areas are essential to the conservation of the species.

The Action Area does not contain designated critical habitat for any federally listed species. The closest designated critical habitat to the Action Area is for Central California Coastal Steelhead, approximately 4 miles downstream of the Action Area, in Stevens Creek. Critical habitat for CRLF in Unit SNM-2, is present approximately 2 miles southwest of the Action Area.

1.3.4 ESSENTIAL FISH HABITAT IN THE ACTION AREA

Section 305(b)(2) of the Magnuson Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104 267), requires that Essential Fish Habitat (EFH) be identified and described in federal fishery management plans and that federal agencies consult with NMFS on any activity that they fund, permit, or carry out that may adversely affect EFH for federally managed fish species. EFH includes those waters and substrate necessary for fish spawning, breeding, feeding, or growth to maturity.

The Pacific Fishery Management Council has identified and described EFH, adverse impacts, and recommended conservation measures for salmon in Amendment 14 to the Pacific Coast Salmon Plan. Freshwater EFH for Pacific salmon includes all currently viable waters and most of the habitat historically accessible to salmon. The Action Area is within the Coyote Creek U.S. Geologic Survey Hydrologic Unit, which is designated EFH for Chinook Salmon (*Oncorhynchus tshawytscha*). Permanente Creek is not currently viable habitat for Chinook Salmon, because it is inaccessible to salmon.

1.3.5 CONSULTATION TO DATE

Table 3 summarizes consultation that has occurred to date between the U.S. Army Corps of Engineers (USACE) and the Service.

Date	Consultation	Summary of Topics
November 18, 2014	Meeting at SFBRWQCB office	Interagency meeting at the SFBRWQCB office to discuss the project. USFWS, as well as CDFW and RWQCB staff were in attendance.
June 3, 2015	Federal species list	AECOM received automated list from the Service of federally listed species that may occur in the Action Area.
July 8, 2015	Pre-application meeting (USACE)	Pre-application meeting with USACE and USFWS to discuss the proposed action.
April 26, 2016	Federal species list update	GEI Consultants received automated list from the Service of federally listed species that may occur in the Action Area.
Note: Service = U.S. Fish and Wildlife Service Source: Data compiled by GEI in 2016		

2 PROJECT DESCRIPTION

2.1 PROJECT LOCATION

The Project site is located in unincorporated Santa Clara County west of Cupertino and in the eastern foothills of the Santa Cruz Mountains, a part of the California Coast Ranges between the San Francisco Bay Area and the Pacific Ocean (Exhibit 1). The Action Area consists of Permanente Creek and its floodplain adjacent to the southern boundary of the Permanente Quarry. Exhibit 2 depicts the Project location next to the Permanente Quarry. Most of the area around the creek is undeveloped and includes natural areas such as the Rancho San Antonio Open Space to the north. Areas downstream of the Action Area are highly urbanized and include the cities of Cupertino, Los Altos, Palo Alto, and Saratoga.

2.2 PROJECT PURPOSE AND OBJECTIVES

Pursuant to a negotiated consent decree in *Sierra Club v. Lehigh Southwest Cement Company and Hanson Permanente Cement, Inc.* (U.S. District Court, Northern District, Case No. 5:11-cv-06392-HRL) and a cleanup and abatement order issued by the San Francisco Bay Regional Water Quality Control Board (RWQCB) (CAO No. 99-018:Section 9), Lehigh, the current facility operator, and Hanson Permanente Cement, Inc., the landowner, propose to restore portions of the Permanente Creek streambed, banks, and floodplain.

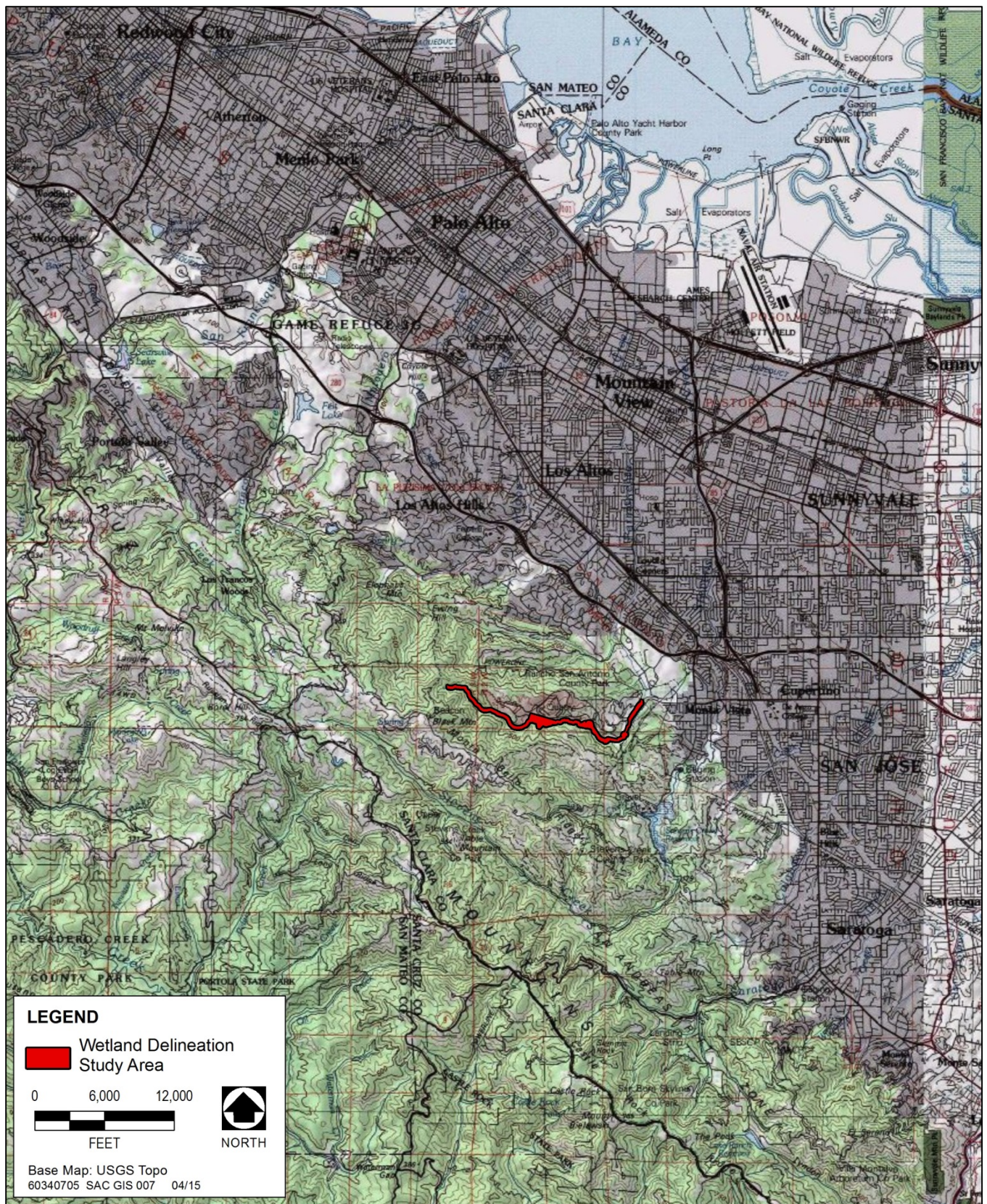
As part of the Project, Lehigh would remove a substantial volume of rock material (e.g., riprap, soil, debris) from specified areas in and/or adjacent to the creek, restore adjacent floodplain areas, and contour the stream to recreate meanders and match elevation controls created by bedrock. This may require removing an existing instream settling pond (Pond 13) and associated dam infrastructure. Second, to address additional downstream areas, Lehigh would remove culverts to create additional “daylighted” stream reaches, remove other concrete structures, remove an adjacent rock pile to provide additional space for meanders, and plant riparian vegetation along an existing concrete channel. Additional details regarding the restoration activities are provided below.

The proposed restoration of Permanente Creek has the following objectives:

- Remove mine-related materials from banks, and adjacent slopes of Permanente Creek.
- Restore streambed and floodplain hydraulics.
- Restore streambed hydrology and geomorphology, including stream meanders within the floodplain.
- Increase the quantity and quality of resident rainbow trout habitat.
- Improve and maintain riparian habitat on the banks and floodplain.
- Layback creek banks and adjacent hill slopes to provide stable slopes sufficient to prevent fill from entering the creek
- Remove or alter culverts and concrete structures to expose and create new streambed habitat.

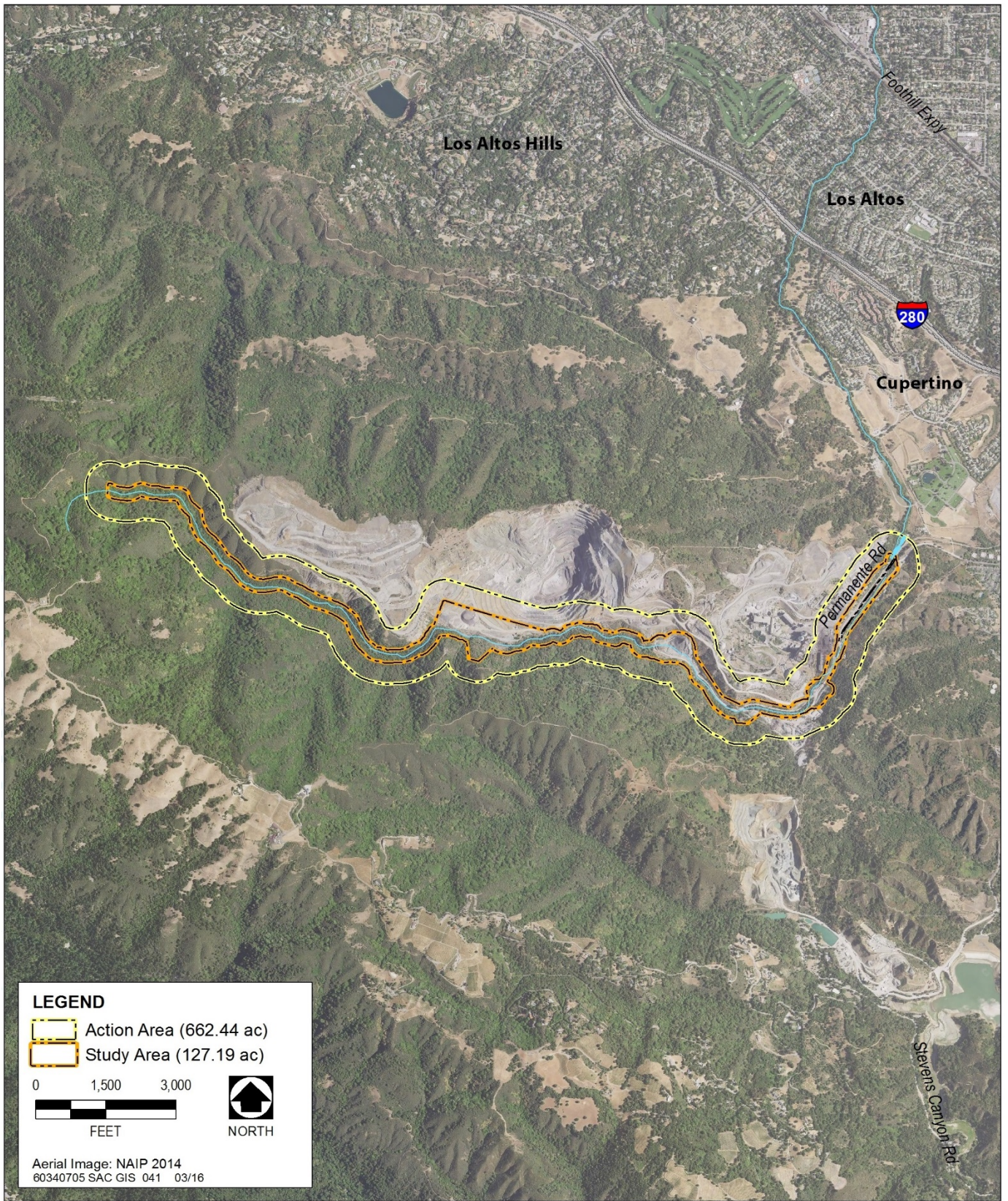
2.3 PROPOSED PROJECT

The Project would involve stream restoration on approximately 9,000 feet of Permanente Creek. In this length of the creek, portions of the streambed naturally achieve steep gradients (e.g., between 5% and >10%) and areas of exposed bedrock act as grade control points. The restoration would attempt to establish approximate pre-disturbance creek alignment and slopes in certain areas (e.g., Reaches 17 and 18), and improve riparian habitat, including improvement to channel and stream bank stability and ecological/geomorphic function, based on current stream restoration approaches and engineering.



Source: Data compiled by AECOM in 2015

Exhibit 1. Regional Location



Source: Data compiled by AECOM in 2015, adapted by GEI 2016

Exhibit 2. Action Area

The Project, as fully depicted in the Project Design Drawings (Appendix B), would include realignment of the creek in several areas affected by rock material (*e.g.*, riprap, soil, debris) from the adjacent mining operation. For example, rock material would be excavated in the “Material Removal Area” near Reach 17. The Project would involve removing this material, realigning the stream, and providing a floodplain bench area to restore natural geomorphic processes, allowing the stream to overtop its banks and meander within the stream corridor. Where Permanente Creek is incised in some areas, the restored streambed would be relatively shallow, allowing the stream to overflow its banks during substantial rainfall and inundate the floodplain. This beneficial stream process does not occur now in areas where the creek is channelized or constrained by fill or human-made structures in the floodplain. Restoring this process would provide natural removal of sediment and may provide some improvements in downstream water quality.

The proposed creek restoration plan has been developed over the last several years in consultation with the Sierra Club, and state, and federal agencies. In 2013, Lehigh and the Sierra Club signed a Consent Decree, outlining creek modifications that were based on certain assumptions. As actual design plans were prepared and consultation occurred with the California Department of Fish and Wildlife, the San Francisco Bay RWQCB, the U.S. Fish & Wildlife Service, and the U.S. Army Corps of Engineers, the project was modified as reflected in the enclosed design plans (Appendix B), and an amended Consent Decree was executed by the Sierra Club and Lehigh. Therefore, more recently, Lehigh and the Sierra Club developed a stream restoration plan that focuses on stream hydraulics, streambank and floodplain habitat, protection of resident/local fish populations, and improved wildlife habitat.

The Project would include the following components:

- ▶ establishing temporary access roads and staging areas for construction equipment and materials,
- ▶ completing a geotechnical investigation to support final design of the stream alignment,
- ▶ removing rock material from the adjacent quarry operation from the creek banks and bed,
- ▶ constructing new stream channel and floodplain areas,
- ▶ preparing stable side slopes,
- ▶ planting streambank and floodplain areas with riparian vegetation,
- ▶ removing human-made structures adjacent to the creek, and
- ▶ generally restoring the site.

The construction contractor would access the site through the main entrance off Permanente Road and would establish temporary access roadways that complement existing roadways in the area. This access would allow the contractor to drill geotechnical borings needed to inform the channel design, and to access the floodplain and stream channel during construction and habitat restoration. The construction contractor also would establish several construction staging areas for equipment storage, materials laydown, office trailers, and employee parking. During restoration, these areas would be used to store and prepare containerized plants before planting. Both the construction access roadways and the staging areas would be located to minimize erosion and loss of trees and other vegetation. It is anticipated that restoration activities would occur during the dry season, approximately May through September, over approximately five (5) consecutive seasons immediately after receipt of all necessary permits and approvals.

2.3.1 PROPOSED RESTORATION COMPONENTS

The subsections below describe the proposed features, construction methods, and measures Lehigh would use to minimize construction effects, and the required permits and approvals. Appendix B provides several design drawings and shows the overall layout of the proposed features and upgrades: the construction access roads and

staging area, culverts and other structures to be removed, locations of rock removal and slope stabilization, location and topographical design of the stream channel and floodplain improvements, and vegetation restoration location and components.

2.3.2 PROJECT CONSTRUCTION

Construction would be completed in the following steps as described in greater detail below:

- ▶ establishment of temporary access roads and staging areas for construction equipment and materials,
- ▶ geotechnical investigations to support final design of the stream alignment,
- ▶ removal of fallen rock material from the adjacent quarry,
- ▶ construction of new stream channel and floodplain areas,
- ▶ preparation of stable side slopes,
- ▶ planting of streambank and floodplain areas with riparian vegetation,
- ▶ removal of human-made structures adjacent to the creek, and
- ▶ general site restoration.

SITE PREPARATION—ACCESS ROADS AND STAGING AREAS

Before construction, crews would establish access roads and staging areas at the Project site. The crews would access the site through the main entrance and would establish temporary construction-access roadways that would be designed to be a minimum of 14 feet wide. Establishing these roadways would allow the contractor to drill the geotechnical borings needed to inform final channel design and would provide access to the Project site during construction. The staging areas are required for storage of equipment and construction materials, office trailers, and employee parking. Seven staging areas are proposed. From west to east, two staging areas would be located near Culvert 10/11, one at Culvert 9, two at Culvert 8, one at Culvert 2, and one at Culvert 1. The access roads and staging areas would be located to minimize erosion and loss of trees and other vegetation.

ROCK MATERIAL REMOVAL

The contractor would excavate rock material from affected stream reaches to move the toe of the slope to the north and restore the floodplain. Rock material would be removed within Reaches 8–12 (see the Project Design Drawings in Appendix B) by reducing the width of the adjacent roadway and removing rock material. Additional rock material would be removed within Reaches 17 and 18, and the toe of the north slope would be moved approximately 25 feet to the north. The material would be loaded into dump trucks, transported to an area within the adjacent Permanente Quarry, and used to support the future quarry reclamation process. Trees or stumps removed during excavation would be stored and used for habitat creation and restoration. The excavated areas would be graded to provide a level surface for channel excavation and planting. Brush, timber, and removed stumps not used for habitat restoration would be disposed of in accordance with local restrictions and regulatory requirements. Non-limestone rock would be used for streambank stabilization.

CONSTRUCTION OF STREAM CHANNEL

The principal restoration action would be construction of a new stream channel within the newly restored floodplain areas created by removing rock material. The new channel would be designed to use the underlying bedrock where present to guide the channel's alignment and profile. The stream restoration would be designed to protect water quality by diverting stream flow around the construction area. The contractor would then excavate

the new stream channel within the floodplain area according to design specifications for channel depth that would allow overbanking at the desired interval while providing bank stability and adequate cover and shading. The stream channel would be excavated by heavy equipment such as excavators. The walls of the new channel would be shored or sloped to prevent collapse. The excavated material (non-limestone) would be used to backfill the old channel in areas where a new stream channel is constructed in a more desirable location. Generally, any removed limestone would be transported out of the stream channel and used in cement plant manufacturing and/or quarry reclamation. Based on current estimates, approximately 420,000 cubic yards of fill would be removed from the channel during rock removal and stream channel construction. The final volume is pending geotechnical excavations.

Pond 13 is an instream settling pond in Reach 13, created by a steel and concrete dam and associated steel half-culvert supported by concrete. These human-made structures would be removed. Based on bedrock locations to be determined during construction, the final design profile could allow Pond 13 to remain, and the dam would be replaced with a boulder grade control structure. However, if so dictated by bedrock, construction of the new channel would necessitate removal of the Pond 13 dam and the pond would be replaced by a new reach of the creek.

STREAM HABITAT RESTORATION

Before allowing flow in the new channel, the contractor would plant native vegetation to stabilize the streambanks and to provide shading and bank habitat. Woody debris and instream vegetation would be placed to enhance instream cover habitat. Barriers would be removed and/or new passage routes would be established to enhance movement by local fish.

The contractor would then plant riparian vegetation along the new streambanks and in the floodplain in accordance with restoration design specifications. This would stabilize the new banks, reduce erosion, enhance riparian habitat, and enhance aquatic habitat. Planting locations would be selected to provide shade for the stream and cover for fish and other aquatic species. Table 4 provides a preliminary list of riparian plantings.

Table 4. Species List	
Scientific Name	Common Name
<i>Acer macrophyllum</i>	Big leaf maple
<i>Aesculus californica</i>	California buckeye
<i>Alnus rhombifolia</i>	White alder
<i>Baccharis pilularis</i>	Coyote brush
<i>Heteromeles arbutifolia</i>	Toyon
<i>Quercus agrifolia</i>	Coast live oak
<i>Rosa californica</i>	California wild rose
<i>Rubus ursinus</i>	California blackberry
<i>Salix laevigata</i>	Red willow
<i>Salix lasiolepis</i>	Arroyo willow
<i>Salvia mellifera</i>	Black sage
<i>Sambucus nigra</i> spp. <i>caerulea</i>	Blue elderberry
<i>Schoenoplectus californicus</i>	Tule

Source: Data provided by WRA, Inc. in 2011 and updated by AECOM 2015 site surveys

After construction, the contractor would restore the areas used for staging and access roads to approximate preconstruction conditions by applying a hydroseed mix and installing permanent erosion and sedimentation controls. Hydroseeding would occur between September 1 and December 1. The success of the hydroseeded habitat would be judged based on performance standards including percent cover and species richness. Surface soils would be stabilized with mulch consisting of straw or erosion-control fabric that complies with storm water pollution prevention plan (SWPPP) standards. This process would be completed approximately 1 month after final grading is complete.

2.3.3 CONSTRUCTION SCHEDULE

Stream restoration would be completed over a period of approximately five dry/work seasons years, after permit procurement. The physical setting, mitigation, and schedule constraints would prohibit work in the rainy season. The proposed construction schedule also incorporates work windows to avoid or minimize effects on sensitive species. Each year, the initial activity would be to construct site access roads, install stream diversions and sediment controls, and perform geotechnical investigations as needed for design. The second activity would be to excavate rock material, create a new stream channel in those areas, and truck the excavated material to the quarry. Next, the stream would be prepared to receive streamflow by planting bank vegetation and allowing the streambed sediments to consolidate. In the final phase, flow would be diverted into the new channel. These activities would likely occur in each year during the work season over the life of the project.

The phasing of restoration activities in discrete segments of the stream would be planned to allow mitigation of sediment transport that may be caused by the work. Consideration in phasing would also be given to minimize the amount of stream area undergoing active disturbance at any one time.

Lehigh hopes to initiate construction at the start of the first work season following receipt of all authorizations. Construction activities would comply with all applicable local ordinances and would remain within the constraints established during the permitting and California Environmental Quality Act processes.

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3 ENVIRONMENTAL BASELINE CONDITIONS

Permanente Creek in the Action Area begins in the west at higher elevations. The creek flows easterly to lower elevations through a narrow corridor for approximately 3.25 miles, with the quarry to the north and steep mountain slopes (Exhibit 3) to the south, until it reaches Pond 13. In May 2015, portions of this area were observed to be dry (Exhibit 4). The creek then becomes more channelized (Exhibit 5) and flows through flatter terrain (Exhibit 6) for the remaining 1.15 miles until it exits the Action Area. Most of the wetland features mapped in the 662.4-acre Action Area are in the lower third of the drainage.



Source: Photograph taken by AECOM in May 2015

Exhibit 3. Permanente Creek Drainage Upstream of Pond 13

Plant community names present in the Action Area conform to *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986), where applicable. Community names from *A Manual of California Vegetation* (Sawyer et al. 2009) are provided in the text where applicable. Wetland community names conforming to *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979) are also given where appropriate. Vegetation communities identified in the Action Area consist primarily of upland mixed oak woodland and forest, ruderal grasslands, and a mix of native and nonnative trees composing a riparian corridor along Permanente Creek.



Source: Photograph taken by AECOM in May 2015

Exhibit 4. Permanente Creek Canyon and Drainage in Middle Reaches of the Action Area



Source: Photograph taken by AECOM in May 2015

Exhibit 5. Channelized Portion of Permanente Creek Immediately Downstream of Pond 13



Source: Photograph taken by AECOM in May 2015

Exhibit 6. Lower Elevation Reaches of Permanente Creek, East of Pond 9

3.1 UPLAND HABITATS

3.1.1 OAK WOODLANDS AND FOREST

Oak woodlands and forest habitats (including California bay forest) make up the majority of the Action Area, and generally occur on the north-facing slopes above the Permanente Creek riparian zone. However, a narrow band of this habitat type also is present on the south-facing slope, above the riparian zone and below the chamise scrub habitat. The dominant tree species in this community include coast live oak (*Quercus agrifolia*), California bay (*Umbellularia californica*), and tanoak (*Notholithocarpus densiflorus*). Shrubs are prevalent and include poison oak (*Toxicodendron diversilobum*), western raspberry (*Rubus leucodermis*), creeping snowberry (*Symphoricarpos mollis*), and ocean spray (*Holodiscus discolor*). Forbs generally are sparse because little light penetrates to the forest floor; however, hillside woodland star (*Lithophragma heterophyllum*) was observed blooming during the May 2015 field reconnaissance survey. Approximately 0.80 acre of oak woodland forest and California bay forest is subject to potential direct effects as part of the Project (see Table 5 in Section 5, “Potential Project Effects”).

3.1.2 RIPARIAN FOREST

Riparian forest habitat in the Action Area is restricted to a narrow band along Permanente Creek that includes California buckeye woodland, white alder riparian forest, and willow riparian forest. Dominant vegetation in the riparian forest communities along Permanente Creek includes Goodding’s willow (*Salix gooddingii*), red willow (*S. laevigata*), arroyo willow (*S. lasiolepis*), white alder (*Alnus rhombifolia*), big leaf maple (*Acer macrophyllum*), western creek dogwood (*Cornus sericea* ssp. *occidentalis*), and California buckeye (*Aesculus californica*). Stinging nettle (*Urtica dioica*) and poison oak are abundant close to the creek channel. False Solomon’s seal

(*Maianthemum racemosum*) and sweet cicely (*Osmorhiza berteroi*) were observed scattered along the creek channel in upstream areas of Permanente Creek. Approximately 3.57 acres of riparian forest are subject to potential direct effects as part of the Project (see Table 5 in Section 5, “Potential Project Effects”).

3.1.3 MIXED SCRUB AND CHAPARRAL

Mixed scrub and chaparral (including chamise chaparral, mixed scrub, northern mixed chaparral, oak chaparral, and poison oak scrub) habitats typically are present in the Action Area on the south-facing slopes. These habitats are dominated by species with thick, waxy leaves and include coyote brush (*Baccharis pilularis*), chamise (*Adenostoma fasciculatum*), California sagebrush (*Artemisia californica*), and white-leaf manzanita (*Arctostaphylos viscida*). Other species include California buckwheat (*Eriogonum fasciculatum*) and naked buckwheat (*E. nudum*). Approximately 0.12 acre of mixed scrub and chaparral is subject to potential direct effects as part of the Project (see Table 5 in Section 5, “Potential Project Effects”).

3.1.4 RUDERAL GRASSLAND/DISTURBED AND NONNATIVE ANNUAL GRASSLAND

Small portions of the eastern part of the Action Area are previously disturbed and support primarily ruderal (disturbance-related) species and nonnative grasses. These species include wild oats (*Avena* spp.), ripgut brome (*Bromus diandrus*), soft chess (*B. hordeaceus*), Italian ryegrass (*Festuca perennis*), filaree (*Erodium botrys* and *E. cicutarium*), small fescue (*Festuca microstachys*), California poppy (*Eschscholzia californica*), bird vetch (*Vicia cracca*), and birdsfoot trefoil (*Lotus corniculatus*) (WRA 2011). Approximately 5.12 acres of ruderal grassland and disturbed areas are subject to potential direct effects as part of the Project (see Table 5 in Section 5, “Potential Project Effects”).

3.1.5 ROCK OUTCROP AND ACTIVE QUARRY

A rock outcrop is located south of Permanente Creek and the active quarry pit. Approximately 12.81 acres of rock outcrop and active quarry are subject to potential direct effects as part of the Project (see Table 5 in Section 5, “Potential Project Effects”).

3.2 AQUATIC HABITATS

3.2.1 PERENNIAL STREAMS

Perennial waterways in the Action Area consist of approximately 5 miles of Permanente Creek. The creek’s headwaters are located approximately 0.6 mile west of the western boundary of the Action Area. Permanente Creek is located in the Santa Cruz Mountains, and steep slopes constrain the channel through much of the Action Area. In the western portion of the Action Area, the channel is relatively narrow as the channel flows east, then widens as ephemeral tributaries contribute flow to Permanente Creek. Historic quarry operations affected portions of Permanente Creek upstream of Pond 13. Downstream, the creek is affected by rock material (e.g., riprap, concrete debris), an alluvial fan of gravel, artificial fill narrowing the channel for roads, etc. In addition, portions of the Permanente Creek were realigned into a straight channel or placed into underground culverts. The creek flows east for approximately 5 miles and then north for approximately 8 miles until it enters Mountain View Slough, which drains directly into the southern portion of San Francisco Bay. Approximately 1.44 acre of perennial stream is subject to potential direct effects as part of the Project (see Table 5 in Section 5, “Potential Project Effects”).

3.2.2 EPHEMERAL STREAMS OR DRAINAGES

A total of 15 unnamed ephemeral drainages are present in the Action Area. All but two of these ephemeral drainages form outside of the Action Area, high in the surrounding mountains. Approximately 0.02 acre of ephemeral stream and drainage is subject to potential direct effects as part of the Project (Table 5).

3.2.3 OFF-CHANNEL SETTLING PONDS/SEDIMENTATION BASINS

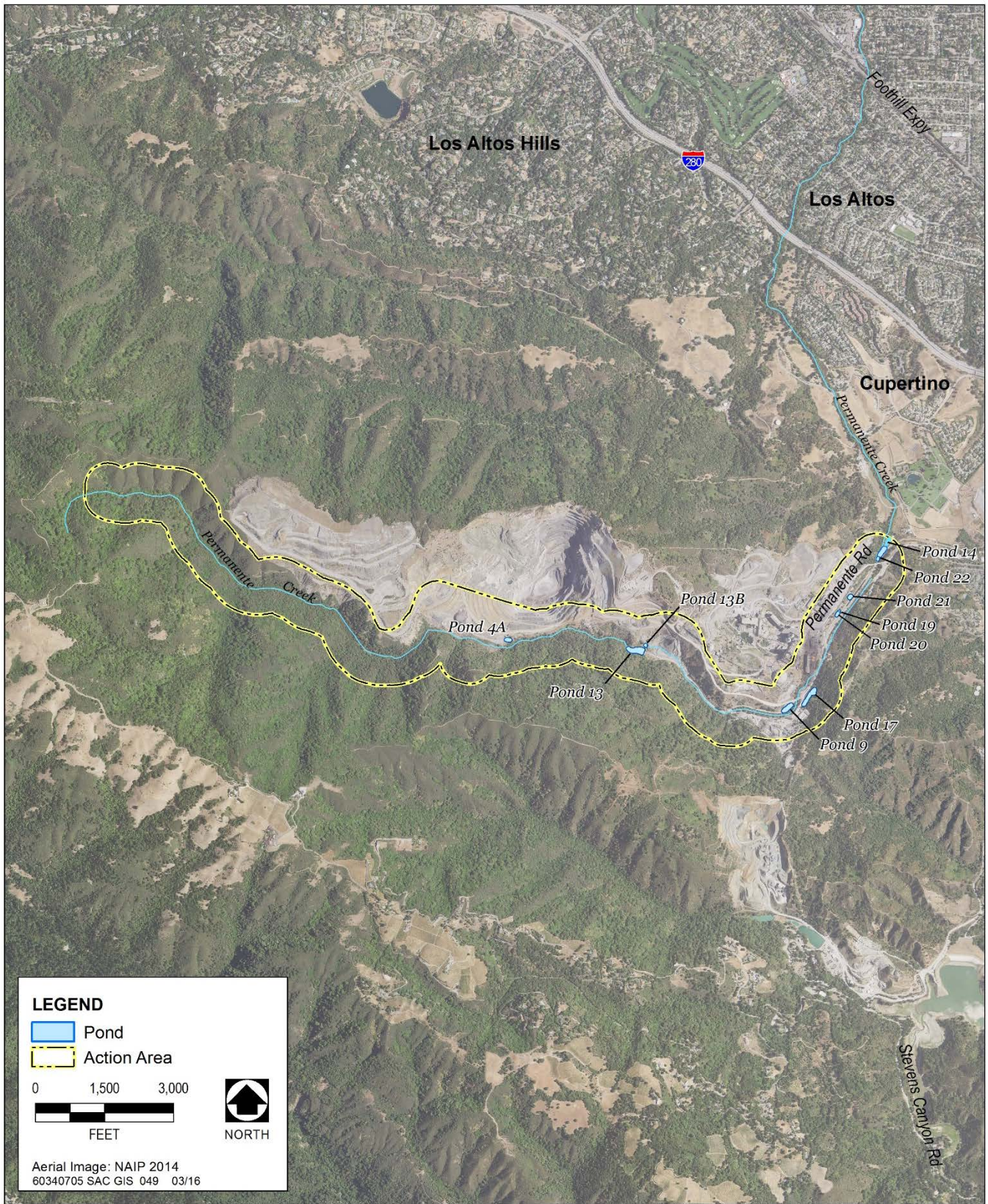
Several non-jurisdictional storm water sedimentation basins are present in the Action Area (Ponds 4A, 13B, 9, 17, 19, and 20). They were excavated in uplands and receive process water and storm water from the quarry pit (Pond 4A), or storm water from other areas of operations, to settle suspended solids. These ponds are actively managed as part of ongoing quarry operations. No settling ponds/sedimentation basins are subject to potential direct effects as part of the Project.

3.2.4 IN-STREAM/JURISDICTIONAL PONDS AND IMPOUNDMENTS

There are four in-stream or otherwise jurisdictional ponds or impoundments in the Action Area: Ponds 13, 14, 21, and 22 (Exhibit 7). A significant amount of riparian vegetation, including Gooding's black willow (*Salix gooddingii*), white alder (*Alnus rhombifolia*), and big leaf maple (*Acer macrophyllum*) is growing around the margins of the ponds. Dense growth of narrowleaf cattail (*Typha angustifolia*) surrounds Ponds 21 and 22. Approximately 0.50 acre of in-stream pond and impoundment is subject to potential direct effects as part of the Project (see Table 5 in Section 5, "Potential Project Effects").

3.2.5 WETLANDS AND MARSHES

Several wetlands and marshes are present in the Action Area. Most of the features are contiguous with Permanente Creek, but a few are connected via culvert. These wetlands are dominated by Pampas grass (*Cortaderia selloana*) and willow species, including arroyo willow (*Salix lasiolepis*), stinging nettle (*Urtica dioica*), mugwort (*Artemisia douglasiana*), water cress (*Nasturtium officinale*), and tall flat sedge (*Cyperus eragrostis*). Approximately 0.09 acre of wetland and marsh is subject to potential direct and indirect effects as part of the Project (see Table 5 in Section 5, "Potential Project Effects").



Source: AECOM 2015, adapted by GEI

Exhibit 7. Location of Ponds in Action Area

4 BASIC BIOLOGY, LIFE HISTORY, AND BASELINE FOR CALIFORNIA RED-LEGGED FROG

CRLF was federally listed as threatened in May 1996 (61 *Federal Register* [FR] 25813, May 23, 1996). Critical habitat has been designated for this species and is discussed in further detail below. The *Recovery Plan for the California Red-Legged Frog* was also developed for CRLF in September 2002 (USFWS 2002).

4.1 SPECIES DESCRIPTION

CRLF is the largest native frog in the western United States (Wright and Wright 1949). The abdomen and hind legs of adults are often a red or salmon color. The back of a CRLF is characterized by small black flecks and larger dark blotches with indistinct outlines on a brown, gray, olive, or reddish-brown background color (Stebbins 2003). Dorsolateral folds are prominent. Tadpoles range from 0.6 inch to 3.1 inches long, and a line of very small, gold-colored spots becomes the dorsolateral fold (USFWS 2002). Adults are highly aquatic and are most active at night (USFWS 2002). CRLF also uses terrestrial habitat, especially after precipitation events, for nonmigratory forays into adjacent upland habitats and migratory overland movements to breeding sites. Movement of up to 1 mile from breeding to aestivation sites is typical (Stebbins 2003); however, CRLF has been reported to travel up to 2 miles between habitats (Bulger et al. 2003).

Breeding typically begins between November and mid-December and continues through April in most years, but is dictated by winter rainfall (Jennings and Hayes 1994). At breeding sites, males call in groups of three to seven individuals to attract females (Jennings and Hayes 1994). During amplexus (breeding posture), eggs are fertilized by the male while the female deposits the egg mass (Jennings and Hayes 1994). Larvae typically hatch in 6–22 days, and metamorphosis is usually completed in 4–5 months (Jennings and Hayes 1994; Bobzien et al. 2000). Males and females usually attain sexual maturity at 2 years and 3 years, respectively (Jennings and Hayes 1994).

4.2 HABITAT REQUIREMENTS AND RANGE

The CRLF historically ranged from Redding and Marin County in the north, south to northern Baja California, Mexico, and essentially throughout lowland California (Jennings and Hayes 1994). Since then, its range has been reduced to mostly isolated drainages within the Coast Ranges and near-coastal foothills. The Service notes that although the CRLF once occupied 46 counties, it now is known from only 22, with the greatest concentrations in Monterey, San Luis Obispo, and Santa Barbara Counties (USFWS 2002).

Optimal habitat for CRLF includes ponds, stream courses, permanent pools, and intermittent streams fed by drainage areas no larger than 115 square miles (USFWS 2002). This species occurs at elevations between sea level and 5,000 feet (USFWS 2002). Typical habitat characteristics include water depth of at least 2.5 feet, largely intact emergent or shoreline vegetation, and absence of competitors/predators such as bullfrogs (*Rana catesbeiana*) and largemouth bass (*Micropterus salmoides*) (Hayes and Jennings 1988). CRLF uses a wide variety of habitats in the absence of optimal conditions, such as temporary pools and streams and stock ponds. However, permanent aquatic habitat is essential to the survival of local CRLF populations. CRLF is threatened by potential degradation and loss of its habitat from agriculture, urbanization, mining, overgrazing, recreation, timber harvesting, nonnative-plant invasions, impoundments, water diversions, degraded water quality, use of pesticides, and introduced predators (USFWS 2002).

4.3 POTENTIAL TO OCCUR IN THE ACTION AREA

CRLF is known to occur in the Action Area. This species has been documented during repeated focused surveys and habitat assessments conducted from 1997 to 2014, protocol-level surveys performed in 2006 and 2007 (Jennings 2006, 2007), and incidental observations while conducting surveys unrelated to CRLF. Incidental observations of presumed CRLF in Pond 22 occurred in 2000 during fish surveys (WRA 2011). CRLF was detected in 2006 and 2007 during the protocol-level surveys in in-stream or adjacent wetlands, at Ponds 14, 21 (adjacent wetlands), and 22, on the eastern edge of the Action Area. CRLF was observed in Pond 9 during an August 2014 pre-construction survey conducted in anticipation of potential vegetation and silt removal (vegetation and sediment removal ceased after this observation). Breeding has been documented in Permanente Creek in Ponds 14 and 21 (WRA 2011). Aquatic habitat for CRLF was delineated and characterized in wetland delineations conducted for the Project in 2008 (WRA 2008) and again in 2015 (AECOM 2015).

Suitable aquatic breeding habitat for CRLF is present in several of the ponds created as impoundments along Permanente Creek, as well as ponds and wetlands adjacent to the creek (Appendix C). Surface water was observed in all ponds during field surveys in May 2015. Pond 9 was previously used as a settling basin for localized storm water and now only receives upwelling groundwater contributions; Pond 9 has suitable aquatic habitat that could potentially support breeding CRLF. This pond is approximately 3 feet deep and has a thick layer of green algae coating the bottom surface. Dense growth of narrowleaf cattail surrounds Ponds 9, 14, and 21. Instead of cattail, common horsetail (*Equisetum arvense*) is the dominant emergent vegetation present at Pond 13, mostly upstream of the pond. Pond 13 itself has relatively steep, vegetated sides and a maximum depth of 5 feet. Ponds 9, 21, and 14 are cattail marshes with open water that is approximately 3–4 feet deep. CRLF has not been documented in Pond 13. Cattail vegetation is absent at Pond 22 and the typical vegetation there is riparian species such as black willow and white alder.

Upstream of these ponds, aquatic habitat is generally not present in Permanente Creek in the Action Area because of lack of deep pools. The stream corridor, however, could still function as upland and dispersal habitat. CRLF are unlikely to occur in heavily disturbed portions on the north side of Permanente Creek adjacent to the quarry because of lack of cover, exposure to predation, and frequent vehicle traffic.

4.4 CRITICAL HABITAT

Critical habitat was first designated for CRLF in April 2006 (71 FR 19244, April 13, 2006) and was revised in March 2010 (75 FR 12816, March 17, 2010). In designating critical habitat for CRLF, the Service evaluated the following specific primary constituent elements of habitat:

Aquatic breeding habitat: Low-gradient freshwater habitats, such as pools and marshes that should hold water for a minimum of 20 weeks in most years and have salinity less than 7.0 parts per thousand.

Nonbreeding aquatic habitat: This habitat that could be defined as aquatic breeding habitat and also includes intermittent creeks, seeps, or springs that could provide refuge or foraging habitat during drought periods.

Upland habitat: Terrestrial habitat within 200 feet of aquatic habitat and could include riparian, grassland, or woodland habitats. Upland habitat considered suitable includes features that provide refuge for the species, such as active mammal burrows.

Dispersal habitat: This habitat can be a variety of upland habitat types, provided that it is free of barriers such as highways. The Service considers 1 mile a dispersal distance that in most cases will provide for connectivity between breeding habitats and nonbreeding aquatic and upland habitats.

The Action Area does not include designated critical habitat for CRLF. The closest designated critical-habitat unit to the Action Area is SNM-2 in San Mateo County, approximately 1.5 miles southwest of the Action Area.

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5 POTENTIAL PROJECT EFFECTS

5.1 INTRODUCTION

This section discusses potential effects of Project construction and operation on federally listed species and any designated critical habitat(s) or EFH that may occur.

The 24.47-acre Designated Restoration Plan Area lies within the 662.4-acre Action Area, and encompasses the portion of upland and aquatic habitats in the Action Area where potential direct effects to listed species could occur from construction activities (see Exhibit 8). Construction and restoration activities within each designated phase of restoration would be completed within a single season. Completion of all restoration phases would require several seasons to complete. Potential effects on listed species that may occur in the Designated Restoration Plan Area are estimated based on the maximum acreages of suitable habitat that could be affected by Project construction and maintenance. Potentially suitable habitat is classified based on literature review, site surveys, and/or desktop research. Under the ESA, direct effects are those that would be caused by the Project and would occur at the same time as the action (e.g., construction-related effects). Indirect effects are those that would be caused by the Project later in time, but would be reasonably certain to occur (e.g., operational effects). Avoidance and minimization measures for both direct and indirect effects are presented in Section 6, “Avoidance and Minimization Measures.”

5.2 DIRECT AND INDIRECT EFFECTS ON CALIFORNIA RED-LEGGED FROG IN THE ACTION AREA

5.2.1 DIRECT EFFECTS

CRLF is known to occur within the Action Area. Suitable aquatic habitat for this species is present in the Action Area, associated with cattail marsh and stock ponds at Ponds 9, 13, 14, 21, and 22. Breeding has been documented at Ponds 14 and 21. Pond 13 is the only pond located within the Designated Restoration Plan Area and would be the only pond directly affected by Project construction. Although the Project would result in a net benefit for CRLF by expanding the available aquatic and upland refugia habitat, occupied aquatic and associated upland refugia and movement corridors may be affected temporarily during construction. Table 5 provides a breakdown of this direct effect acreage by community.

Of the 24.47 acres subject to direct effects, (the Designated Restoration Plan Area), construction activities associated with the Project would affect up to 11.66 total acres of potential CRLF aquatic and upland habitat (Table 6). Of these 11.66 acres of direct effect, at least 11.16 acres would include temporary effects, and up to 0.5 acre of habitat at Pond 13 may be permanently altered at. To date, CRLF has not been documented within Pond 13 (WRA 2011). As described in Section 2.3.2, *Project Construction*, a pond may remain in this location if bedrock conditions allow the dam to be replaced with a boulder grade control structure. Alternatively, the dam would be removed permanently, and a new reach of the creek would be constructed at the location. Under the latter scenario, the 0.5-acre pond would be converted to stream channel and associated riparian upland habitat.

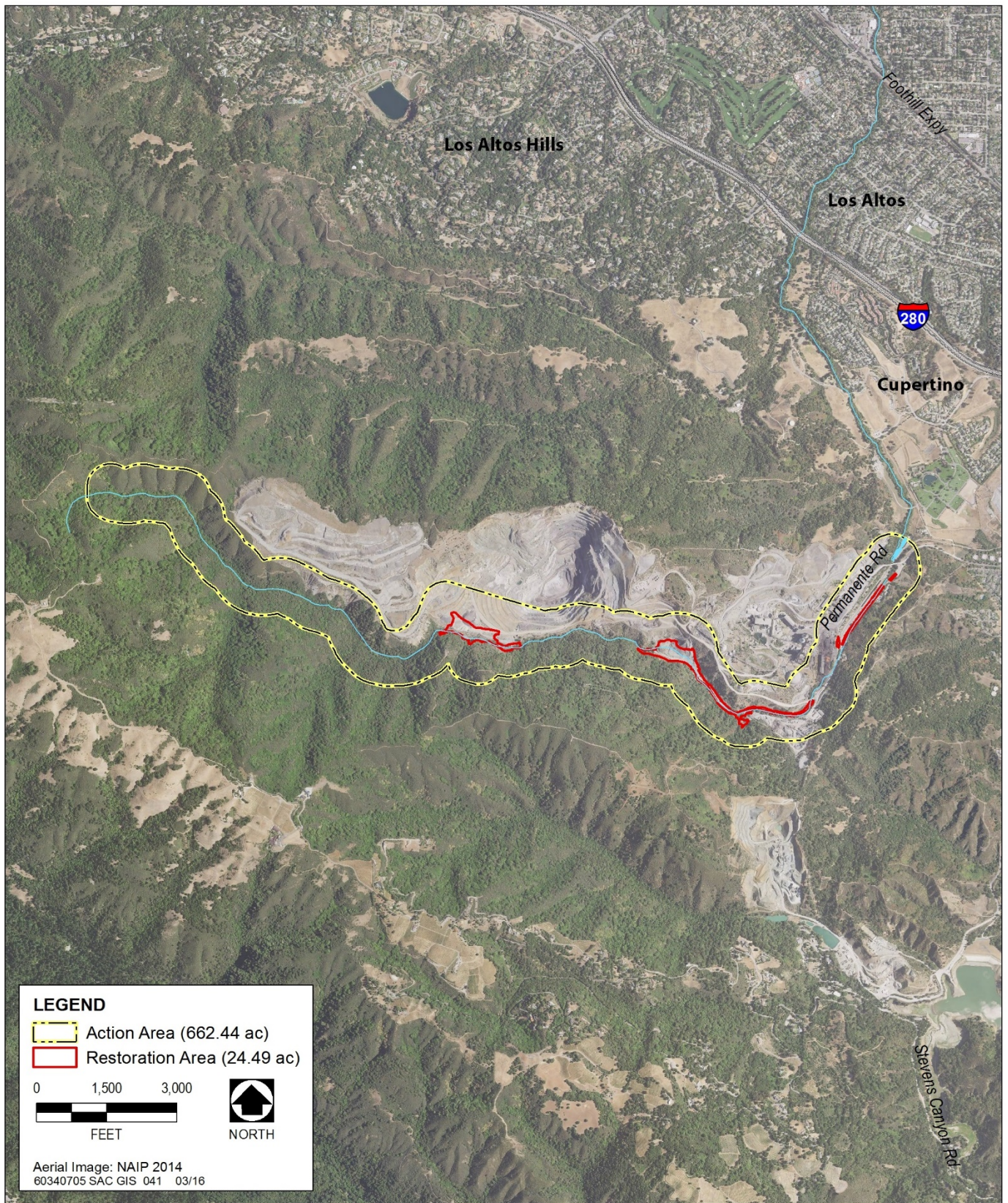
Vegetation Community	Acres	Temporary or Permanent
Oak woodlands and forest	0.30	Temporary
California bay forest	0.50	Temporary
White alder riparian	2.32	Temporary
Willow riparian forest and scrub	1.25	Temporary
Northern mixed chaparral	0.04	Temporary
Mixed scrub	0.03	Temporary
Poison oak scrub	0.05	Temporary
Disturbed	0.33	Temporary
Ruderal grassland	4.79	Temporary
Rock outcrop	0.07	Temporary
Active quarry	12.74	Temporary
Perennial streams	1.44	Temporary
Ephemeral streams/drainage	0.02	Temporary
Instream ponds and impoundments	0.50	Permanent
Wetlands and marshes	0.09	Temporary
Total	24.47	
Source: Data compiled by AECOM in 2015		

	Acres of Directly Affected Suitable Habitat	Permanent or Temporary Effect
Aquatic habitat ¹	1.55	Temporary
Pond 13 (Conversion of pond habitat to stream channel and associated riparian upland habitat)	0.5	Permanent
Riparian forest and scrub, grassland, scrub/chaparral, disturbed, and oak woodland for upland refugia and dispersal habitat ²	9.61	Temporary
Total	11.66	
Notes:		
¹ Includes jurisdictional wetlands, potential waters of the United States, and sedimentation basin.		
² All upland habitat within 200 feet of the area of direct disturbance was considered suitable for California red-legged frog with the exception of active quarry areas and rock outcrops.		
Source: Data compiled by AECOM in 2015		

Direct mortality of frogs may occur during ground disturbance activities in the suitable wetland and riparian woodland as a result of restoration activities or from being struck by construction vehicles in the construction or staging area. The Project would include activities in areas where CRLF has been documented. To avoid and minimize potential effects on CRLF, the Project would implement the conservation measures described in Section 6, “Avoidance and Minimization Measures.”

5.2.2 INDIRECT EFFECTS

Potential indirect effects on CRLF include potential temporary degradation of water quality resulting from discharge of contaminants or sediment from construction, and alteration of the hydrology in Permanente Creek during creek restoration activities.



Source: AECOM 2015, adapted by GEI

Exhibit 8. Designated Restoration Plan Area

In addition, noise, visual disturbance, and vibrations from construction activity could cause CRLF individuals to vacate or avoid suitable habitat, potentially resulting in increased predation and stress associated with the temporary loss of movement and foraging habitat. In addition, increases in human concentrations and activity near suitable habitat may increase the number of native and nonnative predators attracted to trash or food left in the area. To avoid and minimize potential effects on CRLF, the Project would follow conservation measures, such as implementing standard best management practices for water quality, as described in Section 6.

5.3 EFFECTS ON CRITICAL HABITAT AND ESSENTIAL FISH HABITAT

5.3.1 CRITICAL HABITAT

Designated critical habitat for CRLF and Central California Coastal Steelhead are present near the Action Area. The nearest unit of CRLF critical habitat is approximately 2 miles to the southwest, but it is not hydrologically connected to the Action Area and would not be affected by the Proposed Action. Designated critical habitat for Central California Coastal Steelhead includes Stevens Creek, which is approximately 4 miles downstream of and hydrologically connected to the Action Area, via Permanente Creek and the Permanente Creek Diversion Channel. Because of the intermittent flows to Stevens Creek, and the distance downstream of Stevens Creek, it is very unlikely that any potential temporary increase in sedimentation or other adverse conditions that could result from the Proposed Action would extend to critical habitat in Stevens Creek. Therefore, no effect on designated critical habitat for CRLF or steelhead would occur.

5.3.2 ESSENTIAL FISH HABITAT

The Action Area is within the Coyote Creek U.S. Geologic Survey Hydrologic Unit, which is designated EFH for Chinook Salmon. Permanente Creek is currently inaccessible to salmon. Implementation of the proposed action would enhance habitat quality in Permanente Creek and would not diminish future potential to establish access to the creek for salmon. Therefore, no effect on salmon EFH would occur.

5.4 INTERRELATED AND INTERDEPENDENT ACTIONS

ESA Section 7(a)(2) requires agencies with regulatory authority over listed species to issue BOs, evaluating the direct and indirect effects of federal actions, and actions that are interrelated or interdependent with such actions. A BO must determine whether the actions being evaluated may appreciably reduce the listed species' likelihood of survival or recovery in the wild by reducing their productivity, numbers, or distribution.

No additional projects or actions associated with the Project analyzed in this BA are interrelated or interdependent on the Project. There are no related projects associated with the Project. The ongoing mining activities at the Lehigh site and the future reclamation of the mine and associated facilities are not dependent on the Project for their implementation or success.

5.5 CUMULATIVE EFFECTS

Cumulative effects on listed species and habitat include the effects of pending, and future state, tribal, local, or private actions that are reasonably certain to occur in the Action Area under consideration. The effects of projects that require a federal action are not considered in the cumulative-effects evaluation during Section 7 consultation evaluations because they are subject to separate consultation (USFWS and NMFS 1998). Also, the nonfederal

action must be located in the Action Area, or project site, that is evaluated in the Section 7 consultation process (USFWS and NMFS 1998).

No other projects are expected to occur in the Action Area as defined by this Project. Lehigh will continue implementing the approved off-channel reclamation plan for the existing quarry and surrounding areas, and the work described herein is expected to satisfy creek restoration obligations, of that reclamation plan.. Therefore, implementation of the reclamation plan is exempted from the cumulative impact analysis for this Project.

In addition, the stream restoration project is expected to result in improvement to and expansion of existing aquatic and upland habitat upon Project completion. Therefore, the Project is not expected to result in a cumulative effect on CRLF or its habitat. The Action Area does not contain designated critical habitat for CRLF; therefore, critical habitat would not be subject to cumulative effects from the Project.

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6 AVOIDANCE AND MINIMIZATION MEASURES

This section describes avoidance and minimization and habitat conservation measures that would be incorporated as part of the Project. The measures described in this section are proposed in part to avoid and minimize effects on the federally listed species (i.e., CRLF) that may occur in the Action Area.

6.1 STANDARD ENVIRONMENTAL COMMITMENTS

Lehigh would implement standard environmental protection measures (environmental commitments) during construction to minimize environmental effects and disruption of surrounding areas. These commitments include those required by State of California regulations as well as county ordinances. This would include completing stormwater permitting, and preparing and implementing a SWPPP as required by the San Francisco Bay RWQCB to minimize erosion and potential impacts on downstream water quality. The SWPPP would outline stormwater best management practices, such as placing sandbags around stormwater catch basins, silt fences around disturbed areas, and covers on excavated soil piles, and spraying disturbed areas using water trucks to minimize fugitive dust and dirt emissions. The Project would comply with city ordinances related to noise generation, traffic control, public notices, protection of historical resources, and protection of existing vegetation. The Project also would comply with state and local requirements to characterize and dispose of hazardous materials and recycle solid waste.

6.2 COMPLIANCE WITH PERMIT TERMS AND CONDITIONS

Lehigh would require its contractors and suppliers, its general contractor, and all of the general contractor's subcontractors and suppliers to comply with all terms and conditions of all required Project permits, approvals, and conditions. Lehigh ultimately would be responsible for the actions of its contractors regarding compliance with permit conditions.

Before the start of any ground-disturbing activity associated with construction of any Project feature that would affect waters of the United States, including wetlands, or waters of the state, Lehigh would obtain all necessary permits for the Project under Sections 404 and 401 of the Clean Water Act or the state's Porter-Cologne Water Quality Control Act.

All permits, regulatory approvals, and permit conditions for effects on wetland habitats would be secured before implementation of any grading activities in waters of the United States or wetland habitats, including waters of the state. Lehigh would commit to replacing, restoring, or enhancing on a "no net loss" basis (in accordance with USACE and the San Francisco Bay RWQCB) the acreage of all wetlands and other waters of the United States, if any, that would be removed, lost, and/or degraded with Project implementation.

Wetland habitat would be restored, enhanced, and/or replaced at an acreage and location and by methods agreeable to USACE and the San Francisco Bay RWQCB, as determined during the Section 404 and Section 401 permitting processes. Final mitigation ratios would be determined during the permitting process. All mitigation requirements determined through this process would be implemented before grading plans are approved.

Water quality certification pursuant to Section 401 of the Clean Water Act is required before issuance of the record of decision and a Section 404 permit. Before construction in any areas containing wetland features, Lehigh

would obtain water quality certification for the Project. Any measures required as part of the issuance of water quality certification would be implemented.

6.3 SPECIES-SPECIFIC AVOIDANCE AND MINIMIZATION AND HABITAT CONSERVATION MEASURES

Applicable avoidance and minimization measures from the 2014 Programmatic Biological Opinion for Section 404 Permits potentially affecting CRLF (USFWS 2014) were included in this biological assessment. The following conservation measures would be implemented before and during Project construction:

- a) **Prepare a Wetland Mitigation Plan.** A qualified wetland biologist will prepare a wetland mitigation and monitoring plan (MMP) for impacts on wetlands and waters under state or federal jurisdiction. The MMP will outline the anticipated mitigation obligations for temporary and permanent impacts on waters of the United States, including wetlands, resulting from Project-related activities. The wetland MMP will include the following elements:
 - Baseline information.
 - Anticipated habitat enhancements to be achieved through onsite restoration actions.
 - When possible, a preference for mitigation within the Permanente Quarry property, for impacts on both jurisdictional waters and wetlands.
 - Performance and success criteria for habitat enhancement of Permanente Creek and adjacent features to compensate for impacts on other waters, including:
 - a replanting plan for appropriate native riparian woody vegetation;
 - an 80% overall revegetation planting success rate for mitigation areas over a 10-year period;
 - a minimum overall mitigation ratio of 1.1:1 acres for permanent impacts and 1:1 acres for temporary impacts;
 - plantings that are self-reliant, exhibit average or better health and vigor, and have observable growth in stems and leaves at least 2 years before the end of the 10-year monitoring period;
 - visual inspection of all revegetation sites during each growing season, with qualitative and quantitative measures of plant cover and performance;
 - observations of total percent plant cover in the planting area, natural recruitment of native species, and establishment of new nonnative species; and
 - annual monitoring reports submitted to the California Department of Fish and Wildlife and the San Francisco Bay RWQCB documenting revegetation conditions, including recommendations to adapt maintenance and replacement of failed plantings.

- Performance and success criteria for wetland creation or enhancement, including but not limited to the following:
 - At least 70% survival of installed plants for each of the first 3 years following planting.
 - Performance criteria for vegetation percent cover in years 1–4 as follows: at least 10% cover of installed plants in year 1; at least 20% cover in year 2; at least 30% cover in year 3; and at least 40% cover in year 4.
 - Performance criteria for hydrology in Years 1–5 as follows: 14 or more consecutive days of flooding, ponding, or a water table 12 inches or less below the soil surface during the growing season at a minimum frequency of 3 of the 5 monitoring years OR establishment of a prevalence of wetland obligate plant species.
 - Limitations on relative cover contributed by invasive plant species that can threaten the success of created or enhanced wetlands, as follows: no greater than 35% in year 1, 20% in years 2 and 3, 15% in year 4, and 10% in year 5.
 - Supplemental water provided by a water truck for the first 2 years following installation, if necessary. Any supplemental water must be removed or turned off for a minimum of 2 consecutive years before the end of the monitoring period, and the wetland must meet all other criteria during this period. At the end of the 5-year monitoring period, the wetland must be self-sufficient and capable of persistence without supplemental water.
 - At least 75 percent cover by hydrophytic vegetation at the end of the 5-year monitoring period. In addition, wetland hydrology and hydric soils as defined by the USACE (2008) must be present and defined as follows:
 - *Hydrophytic vegetation:* A plant community occurring in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present.
 - *Wetland hydrology:* Identified by indicators such as sediment deposits, water stains on vegetation, and oxidized rhizospheres along living roots in the upper 12 inches of the soil, or satisfaction of the hydrology performance criteria listed above.
 - *Hydric soils:* Soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions, which often are characterized by features such as redox concentrations that form by the reduction, translocation, and/or oxidation of iron and manganese oxides. Hydric soils may lack hydric indicators for a number of reasons. In such cases, the same standard used to determine wetland hydrology (when indicators are lacking) can be used.
 - 5 years after any wetland creation, performance of a wetland delineation to determine whether created wetlands are developing as planned. If they are not, remedial measures will be taken to meet the mitigation measure’s performance standard.

- Monitoring and reporting requirements.
 - The wetland MMP also will include conceptual site-specific plans to compensate for wetland losses resulting from the Project and the USACE Section 404 permit terms. These may include but are not limited to the provision of on-site mitigation through wetland creation or enhancement of existing jurisdictional features; additional on-site wetland creation or enhancement; or off-site mitigation.
- b) **Implement Riparian Mitigation.** The purpose of the Project is to restore wetland and riparian habitat along Permanente Creek. Stream restoration activities include hand planting of woody riparian vegetation, as well as seeding for understory riparian vegetation. Replacement and restoration plantings will restore and expand existing riparian habitat along Permanente Creek. The restoration and planting will be consistent with the revegetation plan prepared as part of the Amended Consent Decree with the Sierra Club and the approved *Reclamation Plan for Permanente Quarry* (WRA 2011), and the adopted mitigation monitoring and reporting program (Santa Clara County 2011). The 5-year performance standards identified in the revegetation plan include:
- species richness of two tree or shrub species per plot,
 - 45 percent canopy cover,
 - an average density of 200 plantings per acre, and
 - 60 percent survival of plantings.
- c) **Manage Wildlife Passage during Construction.** Wherever possible, Lehigh will enhance or construct wildlife passage for CRLF across access roads during construction. Accommodations will be made for terrestrial wildlife movement through existing culverts that convey hydrology.
- d) **Designate a Point of Contact.** USACE will ensure that Lehigh implements the conservation measures of the BO and that Lehigh designates a point of contact for all inquiries for the duration of the construction period. The name and contact information will be provided to the Service no more than 30 calendar days before the date of initial ground disturbance. At least 14 calendar days before the date of initial ground disturbance, USACE will ensure that Lehigh submits a signed letter to the Service verifying they possess a copy of the BO and have read and fully understand their responsibilities.
- e) **Allow Site Access to Agencies.** Lehigh will ensure that the Service, California Department of Fish and Wildlife, and/or their designated agents can immediately and without delay, access and inspect the Project site for compliance with the Project description, conservation measures, and reasonable and prudent measures included in the BO and evaluate Project effects on CRLF and its habitat.
- f) **Implement a Worker Environmental Awareness Program.** The Service-approved biologist will conduct employee education training for employees working on earthmoving and/or construction activities. Personnel will be required to attend the presentation, which will describe the CRLF; avoidance, minimization, and conservation measures; legal protection of CRLF; and other related issues. Each attendee will sign an attendance sheet that includes his or her printed name, company or

agency, e-mail address, and telephone number. The sign-in sheet will be sent to the Service within 7 calendar days of the completion of the training.

- g) **Minimize the Work Area.** Lehigh will limit the number of access routes, construction areas, equipment staging, storage, parking, and stockpile areas to the maximum extent possible. All Project-related traffic will be restricted to established roads, construction areas, equipment staging, storage, parking, and stockpile areas. These areas will be included in any preconstruction surveys and, to the maximum extent possible, established in previously disturbed locations.
- h) **Enforce Seasonal Work Restrictions.** To the extent practicable, construction in the Permanente Creek channel and suitable pond habitats will be conducted during the dry summer months, between June 15 and October 15, to minimize potential impacts on moving or breeding CRLF.
- i) **Post and Observe Construction Speed Limits.** A 10-mile-per-hour speed limit will be posted by Lehigh or its representatives at all construction locations except on roads with a posted speed limit. This speed limit will be observed by all Project personnel. On roads with posted speed limits, construction-related vehicles will observe the minimum safe speed.
- j) **Conduct CRLF Preconstruction Surveys and Relocate Individuals.** Preconstruction surveys for CRLF will be conducted within 24 hours before the start of initial ground disturbance. The preconstruction surveys will be conducted by a qualified biologist, who will be preapproved by the Service and experienced in identifying CRLF. The biologist will consult with the Service before conducting the preconstruction surveys to coordinate on methodology for movement of CRLF individuals found in the work area. If CRLF are observed, a Service-permitted biologist will remove them from the construction site and temporarily relocate them to nearby suitable aquatic habitat.

The Service-approved biologist will limit the duration of the handling and captivity of the CRLF to the minimum amount of time necessary to complete the task. If the animal must be held in captivity, it will be kept in a cool, dark, moist, aerated environment, such as a clean and disinfected bucket or plastic container with a damp sponge. The holding container will not contain any standing water.

Lehigh will immediately notify the Service once the CRLF and the site are secure.

- k) **Enforce a Litter Control Program.** A litter control program will be instituted at the Project site. All workers will ensure that their food scraps, paper wrappers, food containers, cans, bottles, and other trash are deposited in covered or closed trash containers. The trash containers will be removed from the Project site each working day.
- l) **Restrict Pets and Firearms.** No pets will be permitted at the Project site. No firearms will be allowed at the Project site with the exception of those carried by authorized security personnel or local, state, or federal law enforcement officials.
- m) **Stop Work during Rain Events.** To the maximum extent practicable, no construction activities will occur during rain events or within 24 hours following a rain event. A Service-approved biologist will inspect the construction area and all equipment/materials for the presence of CRLF before the resumption of construction activities after rain events. Any CRLF found in the construction area will be avoided and allowed to leave on its own or removed as agreed to under the Service-approved CRLF relocation methodology.

- n) **Minimize or Avoid Nighttime Construction.** To the maximum extent practicable, nighttime construction will be minimized or avoided.
- o) **Avoid Use of Woven Netting in Erosion Control Measures.** Plastic monofilament netting, loosely woven netting, or similar materials will not be used at the Project site because CRLF can become entangled in this material. Materials using fixed weaves, polypropylene, polymer, or other synthetic materials will not be used. Any materials found on-site will be immediately removed by Lehigh or its designated representatives.
- p) **Control Dust.** If necessary, dust control measures will be implemented during construction. These measures will include regular truck watering of construction access areas and disturbed soil areas with water or organic soil stabilizers. Watering guidelines will be established to avoid excessive runoff into potential aquatic habitat for CRLF.
- q) **Cover Trenches.** Trenches or pits 1 foot or deeper that will be left unfilled for more than 48 hours will be securely covered with boards or other materials to prevent CRLF from falling into them. If this is not possible, Lehigh will ensure that wooden ramps or other structures of suitable surface that provide adequate footing for CRLF are placed in the trench or pit to allow for their unaided escape. The trench, pit, or hole will be inspected by the Service-approved biologist each workday morning at least 1 hour before the initiation of work and in the late afternoon no more than 1 hour after work has ceased to ascertain whether any individuals have become trapped. If the ramps fail to allow the animal to escape, the Service-approved biologist will remove the CRLF and transport it to a safe location.
- r) **Monitor Construction within Aquatic Habitats.** To minimize disturbance on CRLF, any restoration or grading within suitable aquatic habitat will be conducted under the supervision of a Service-approved biologist and first cleared of any CRLF by transferring them to suitable habitat where construction is not occurring, as agreed to by the Service. Before the initial ground disturbance, Lehigh will obtain approval of the relocation protocol from the Service in the event that a CRLF is encountered and needs to be moved away from the Project site.

The construction site will be checked at the beginning of each day to confirm that CRLF have not reentered the site. CRLF that reenter the Project site will be relocated as designated by the Service.

- s) **Provide Stop-Work Authority.** The Service-approved biologist will have oversight over implementation of all the conservation measures and have the authority and responsibility to stop Project activities if the biologist determines that any of the environmental requirements are not being fulfilled.
- t) **Implement Dewatering Protocols.** If the work site is to be temporarily dewatered by pumping, intakes will be completely screened with wire mesh not larger than 5 millimeters to prevent CRLF from entering the pump system. Water will be released or pumped downstream at an appropriate rate to maintain downstream flows during construction. Upon completion of construction activities, any barriers to flow will be removed in a manner that will allow flow to resume with the least disturbance to the substrate.
- u) **Remove Exotic Species.** The Service-approved biologist will permanently remove any aquatic exotic wildlife species such as bullfrogs and crayfish to the maximum extent possible during construction activities.

- v) **Notify the Service If Take Occurs.** USACE will ensure that Lehigh reports any information to the Service about take or suspected take of listed wildlife species not exempted by the BO for the project. The Service will be notified via electronic mail and telephone within 24 hours from the time the information is received by Lehigh. Notification will include the species, number of individuals, sex (if known), date, time, location of the incident or of the finding of a dead or injured animal, how the individual was taken, photographs of the species animal, and names of persons who observed the take and/or found the animal. The individual animal will be preserved, as appropriate, and held in a secure location until instructions are received from the Service regarding the disposition of the specimen or until the Service takes custody of the specimen.

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7 CONCLUSIONS

Based on the biology and ecology of the federally listed species with the potential to occur in the Action Area, on the environmental baseline for the Action Area, and on the potential effects of the Project, implementing the Project may affect, and is likely adversely affect CRLF. The Project would have no effect on designated critical habitat or EFH.

California Red-Legged Frog: The Project may affect, and is likely to adversely affect CRLF through potential loss of individuals and disturbance of individuals or their habitat. However, with the exception of potential conversion of Pond 13 to stream channel and associated riparian habitat, these effects are expected to be localized and temporary. CRLF has not been documented within Pond 13, and conversion of this pond to other suitable CRLF habitat is not expected to result in loss of occupied aquatic habitat in the Action Area. Relatively few CRLF individuals would be affected given the quality of habitat on the site and the limited extent of the Project, both spatially and temporally. Furthermore, the restoration of Permanente Creek would result in a net long-term benefit to the species by increasing aquatic and upland habitat for CRLF. The Project would not jeopardize the continued existence of this species based on the limited effects of the Project and the limited local population size of CRLF in the Action Area. The Project is expected to result in increased carrying capacity for CRLF in the Action Area upon Project completion and therefore provide a net benefit to local CRLF populations.

Critical Habitat: The project would have no effect on designated critical habitat. The nearest unit of CRLF critical habitat is approximately 2 miles southwest of and is not hydrologically connected the Action Area. The Action Area is approximately 4 miles upstream of critical habitat for Central California Coastal Steelhead, and Project implementation is very unlikely to increase sedimentation or result in other adverse effects to this habitat.

Essential Fish Habitat: The project would have no effect on EFH for Chinook Salmon. Implementation of the proposed action would enhance habitat quality in Permanente Creek and would not diminish potential to establish access to the creek for salmon if the Permanente Creek Diversion Channel is altered as part of a future unrelated action.

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9 LIST OF PREPARERS

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APPENDIX A

U.S. Fish and Wildlife Service Species List



United States Department of the Interior



FISH AND WILDLIFE SERVICE

Sacramento Fish and Wildlife Office

FEDERAL BUILDING, 2800 COTTAGE WAY, ROOM W-2605

SACRAMENTO, CA 95825

PHONE: (916)414-6600 FAX: (916)414-6713

Consultation Code: 08ESMF00-2016-SLI-1351

April 26, 2016

Event Code: 08ESMF00-2016-E-02936

Project Name: Permanente Creek Restoration Project

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, under the jurisdiction of the U.S. Fish and Wildlife Service (Service) that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2)

of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment



United States Department of Interior
Fish and Wildlife Service

Project name: Permanente Creek Restoration Project

Official Species List

Provided by:

Sacramento Fish and Wildlife Office
FEDERAL BUILDING
2800 COTTAGE WAY, ROOM W-2605
SACRAMENTO, CA 95825
(916) 414-6600

Consultation Code: 08ESMF00-2016-SLI-1351

Event Code: 08ESMF00-2016-E-02936

Project Type: ** OTHER **

Project Name: Permanente Creek Restoration Project

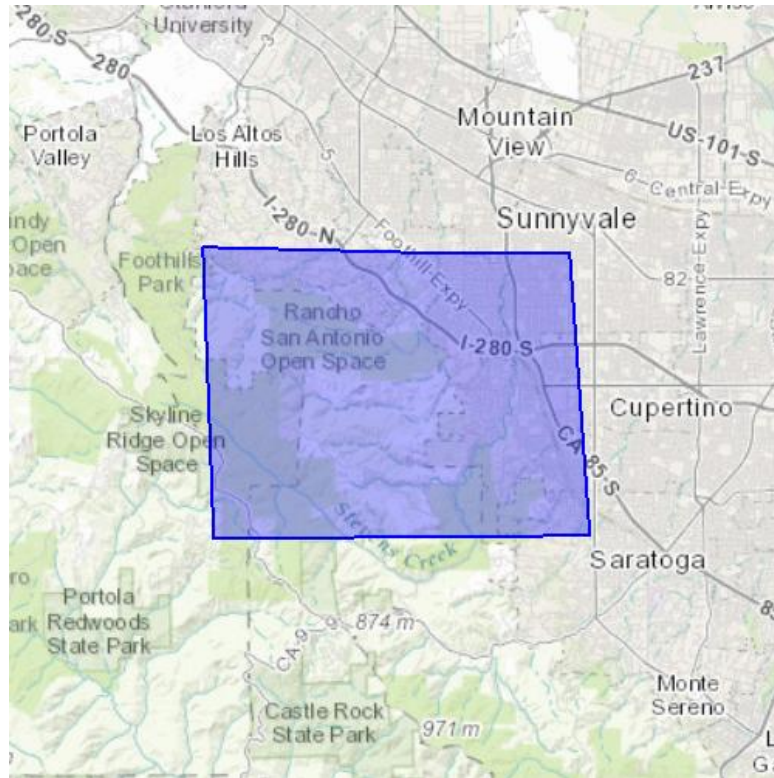
Please Note: The FWS office may have modified the Project Name and/or Project Description, so it may be different from what was submitted in your previous request. If the Consultation Code matches, the FWS considers this to be the same project. Contact the office in the 'Provided by' section of your previous Official Species list if you have any questions or concerns.



United States Department of Interior
Fish and Wildlife Service

Project name: Permanente Creek Restoration Project

Project Location Map:



Project Coordinates: MULTIPOLYGON (((-122.16865539550781 37.36142550190517, -122.16487884521483 37.280882458555325, -122.03407287597655 37.28170197474228, -122.04093933105469 37.359788198380755, -122.08419799804689 37.359788198380755, -122.16865539550781 37.36142550190517)))

Project Counties: San Mateo, CA | Santa Clara, CA | Santa Cruz, CA



United States Department of Interior
Fish and Wildlife Service

Project name: Permanente Creek Restoration Project

Endangered Species Act Species List

There are a total of 12 threatened or endangered species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section further below for critical habitat that lies within your project. Please contact the designated FWS office if you have questions.

Amphibians	Status	Has Critical Habitat	Condition(s)
California red-legged frog (<i>Rana draytonii</i>) Population: Entire	Threatened	Final designated	
California tiger Salamander (<i>Ambystoma californiense</i>) Population: U.S.A. (Central CA DPS)	Threatened	Final designated	
Birds			
California Clapper rail (<i>Rallus longirostris obsoletus</i>) Population: Entire	Endangered		
California Least tern (<i>Sterna antillarum browni</i>)	Endangered		
Marbled murrelet (<i>Brachyramphus marmoratus</i>) Population: CA, OR, WA	Threatened	Final designated	
Fishes			
Delta smelt (<i>Hypomesus transpacificus</i>)	Threatened	Final designated	



United States Department of Interior
Fish and Wildlife Service

Project name: Permanente Creek Restoration Project

Population: Entire			
steelhead (<i>Oncorhynchus (=salmo) mykiss</i>) Population: Northern California DPS	Threatened	Final designated	
Tidewater goby (<i>Eucyclogobius newberryi</i>) Population: Entire	Endangered	Final designated	
Flowering Plants			
San Mateo Woolly sunflower (<i>Eriophyllum latilobum</i>)	Endangered		
Insects			
Bay Checkerspot butterfly (<i>Euphydryas editha bayensis</i>) Population: Entire	Threatened	Final designated	
San Bruno Elfin butterfly (<i>Callophrys mossii bayensis</i>) Population: Entire	Endangered		
Reptiles			
San Francisco Garter snake (<i>Thamnophis sirtalis tetrataenia</i>) Population: Entire	Endangered		



United States Department of Interior
Fish and Wildlife Service

Project name: Permanente Creek Restoration Project

Critical habitats that lie within your project area

The following critical habitats lie fully or partially within your project area.

Amphibians	Critical Habitat Type
California red-legged frog (<i>Rana draytonii</i>) Population: Entire	Final designated

APPENDIX B

Project Design Drawings

PERMANENTE CREEK RESTORATION PLAN

DRAFT 70% DESIGN SUBMITTAL

SHEET INDEX

C1	COVER SHEET
C2	OVERVIEW
C3	EXISTING CHANNEL PROFILE
C4	SHEET LAYOUT OVERVIEW
C5	CONCRETE CHANNEL SOUTHERN BANK PLANTING PLAN
C6	CHANNEL WIDENING PLAN (1 OF 5)
C7	CHANNEL WIDENING PLAN (2 OF 5)
C8	CHANNEL WIDENING PLAN (3 OF 5)
C9	SEDIMENT REMOVAL AREA AND CULVERT #8 PLAN
C10	CULVERT #8 PROFILE AND SECTION
C11	SEDIMENT REMOVAL AREA PROFILE AND SECTIONS
C12	CHANNEL WIDENING PLAN (4 OF 5)
C13	CHANNEL WIDENING PLAN (5 OF 5)
C14	ROCK PILE AREA PLAN
C15	ROCK PILE AREA SECTIONS
C16	MATERIAL REMOVAL AREA PLAN (1 OF 2)
C17	MATERIAL REMOVAL AREA PLAN (2 OF 2)
C18	MATERIAL REMOVAL AREA SECTIONS (1 OF 2)
C19	MATERIAL REMOVAL AREA SECTIONS (2 OF 2)
C20	ACCESS AND STAGING PLAN (1 OF 2)
C21	ACCESS AND STAGING PLAN (2 OF 2)
C22	DEWATERING DETAILS
C23	MISCELLANEOUS DETAILS
C24	HABITAT LOG DETAILS AND ROCK SPECIFICATIONS
C25	NOTES
L1	RIPARIAN PLANTING SECTIONS (1 OF 3)
L2	RIPARIAN PLANTING SECTIONS (2 OF 3)
L3	RIPARIAN PLANTING SECTIONS (3 OF 3)

PROJECT
LOCATION



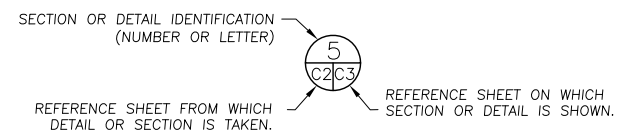
VICINITY MAP
N.T.S. (GOOGLE)

GENERAL NOTES

- TOPOGRAPHIC MAPPING WAS PERFORMED BY: WATERWAYS CONSULTING, INC. 509 SWIFT STREET, UNIT A SANTA CRUZ, CA 95060 SURVEY DATES: JUNE THROUGH AUGUST 2013, FEBRUARY THROUGH MAY 2014, MARCH 2015.
- ELEVATION DATUM: NAVD88 BASED ON A FIELD TIE TO SANTA CLARA VALLEY WATER DISTRICT BENCHMARK ID: BM198 WITH AN ELEVATION OF 478.22'.
- HORIZONTAL DATUM: NAD83 CALIFORNIA STATE PLANE, ZONE 3.
- AERIAL PHOTO SOURCE: AERIAL PHOTOMAPPING SERVICES 2929 LARKIN AVENUE CLOVIS, CA 93612 PHOTOGRAPH DATE: JUNE 20, 2013
- ELEVATIONS AND DISTANCES SHOWN ARE IN FEET AND DECIMALS THEREOF. CONTOUR INTERVAL IS 1 FOOT.
- THIS IS NOT A BOUNDARY SURVEY. PROPERTY LINES, IF SHOWN, WERE COMPILED FROM RECORD INFORMATION AND FROM FIELD TIES TO EXISTING BOUNDARY MONUMENTATION. THE LOCATION OF THESE LINES IS SUBJECT TO CHANGE, PENDING THE RESULTS OF A COMPLETE BOUNDARY SURVEY.
- TREE DIMENSIONS: TRUNK DIAMETERS SHOWN REPRESENT DIAMETER AT BREAST HEIGHT (DBH), MEASURED IN INCHES. DBH IS MEASURED 4.5 FT ABOVE GROUND FOR SINGLE TRUNKS AND TRUNKS THAT SPLIT INTO SEVERAL STEMS CLOSE TO THE GROUND. EACH TRUNK IS SHOWN AT MULTI-STEM TREES. ONLY THE LABEL OF THE DBH OF THE LARGEST TRUNK IS SHOWN FOR DRAWING CLARITY. WHERE TREES FORK NEAR BREAST HEIGHT, TRUNK DIAMETER IS MEASURED AT THE NARROWEST PART OF THE MAIN STEM BELOW THE FORK. FOR TREES ON A SLOPE, BREAST HEIGHT IS REFERENCED FROM THE UPPER SIDE OF THE SLOPE. FOR LEANING TREES, BREAST HEIGHT IS MEASURED ON THE SIDE THAT THE TREE LEANS TOWARD. TREES WITH DBH LESS THAN 8" ARE TYPICALLY NOT SHOWN.

12" P = 12" DBH PINE
- TREE SPECIES ARE IDENTIFIED WHEN KNOWN. HOWEVER, FINAL DETERMINATION SHOULD BE MADE BY A QUALIFIED BOTANIST. REFER TO THE LEGEND FOR TREE SPECIES SYMBOLS.
- SURVEYED TREES INCLUDE:
 - OAKS (QUERCUS SPP.) 5 INCHES OR LARGER DBH
 - ALL OTHER TREES 12 INCHES OR LARGER DBH
 - ALL MULTI-STEM TREES WITH A COMBINED DIAMETER OF 24 INCHES OR LARGER DBH

SECTION AND DETAIL CONVENTION



ABBREVIATIONS

AVG.	AVERAGE	NTS	NOT TO SCALE
CC	CONCRETE	O.C.	ON CENTER
CY	CUBIC YARDS	O.D.	RELATIVE COMPACTION
DBH	DIAMETER BREAST HEIGHT	RSP	ROCK SLOPE PROTECTION
DIA.	DIAMETER	SD	STORM DRAIN
E	EXISTING	SPK	SPIKE
E.G.	EXISTING GROUND	SQ.FT.	SQUARE FOOT
ELEV.	ELEVATION	TBD	TO BE DETERMINED
DI	DRAINAGE INLET	TYP	TYPICAL
FG	FINISHED GRADE	UNK	UNKNOWN
FT	FEET	WSE	WATER SURFACE ELEVATION
INV	INVERT	YR	YEAR
N	NEW		

PROJECT DESCRIPTION

THESE DRAWINGS PROVIDE 70% LEVEL DESIGNS FOR THE CONSTRUCTION OF CHANNEL AND FLOODPLAIN ENHANCEMENTS ON PORTIONS OF PERMANENTE CREEK AT THE PERMANENTE QUARRY PROPERTY IN SANTA CLARA COUNTY, CALIFORNIA.

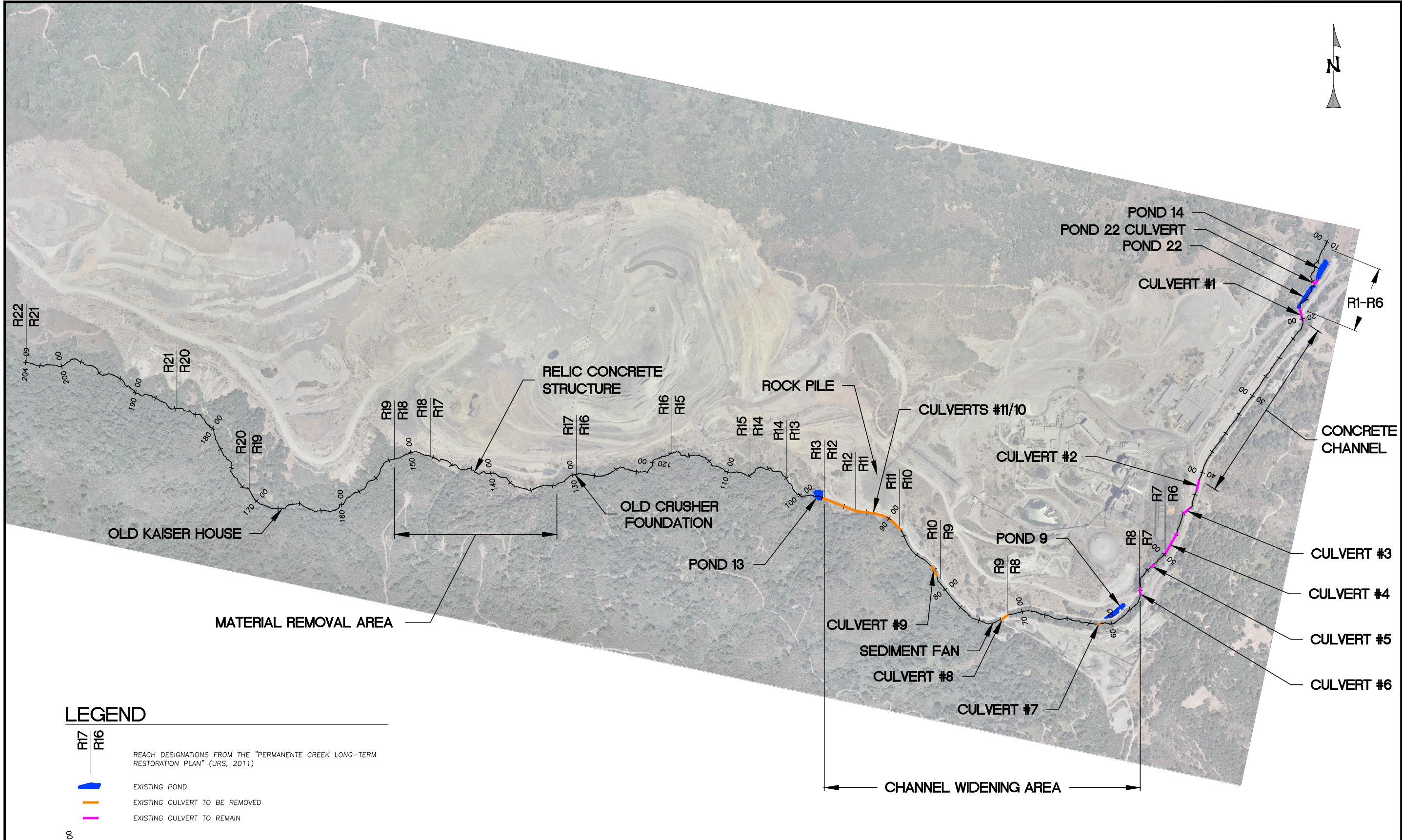
THE DESIGNS ARE SUBJECT TO CHANGE BASED ON RESOURCE AGENCY COMMENTS, ENVIRONMENTAL REVIEW AND PERMIT ISSUANCE.

TREE REMOVAL NOTES

- DBH IS THE DIAMETER MEASURED AT BREAST HEIGHT.
- WILLOWS TO BE REMOVED SHALL BE SALVAGED PER DETAIL 2, SHT. C23. THIS INCLUDES ALL UNMAPPED WILLOWS. WILLOWS TO BE SALVAGED FOR TRANSPLANTING WILL BE FLAGGED IN THE FIELD BY THE PROJECT ARBORIST.
- ALL OTHER TREES REMOVED DURING CONSTRUCTION SHALL BE SALVAGED WITH ROOTWADS INTACT AND INCORPORATED ON BENCHES AS FLOODPLAIN ROUGHNESS LOGS. BRANCHES SHALL BE PLACED ON FLOODPLAIN BENCHES AND ADJACENT UPPER BANK SLOPES AS SLASH.

TREE ABBREVIATIONS

A	ALDER
B	BAY
BK	BUCKEYE
M	MAPLE
O	OAK
SYC	SYCAMORE
W	WILLOW



LEGEND

- R17
R16
- REACH DESIGNATIONS FROM THE "PERMANENTE CREEK LONG-TERM RESTORATION PLAN" (URS, 2011)
- EXISTING POND
- EXISTING CULVERT TO BE REMOVED
- EXISTING CULVERT TO REMAIN
- 70+00
- THALWEG ALIGNMENT 2013

PROJECT AREA OVERVIEW
SCALE: 1" = 500'

PRELIMINARY
NOT FOR CONSTRUCTION

PREPARED AT THE REQUEST OF:
**LEHIGH HANSON
HEIDELBERG CEMENT
GROUP**

OVERVIEW

**PERMANENTE CREEK
RESTORATION PLAN
70% DESIGN SUBMITTAL**

DESIGNED BY: B.M.S.
DRAWN BY: B.M.S.
CHECKED BY: M.W.W.
DATE: 04/27/15
JOB NO.: 13-016

BAR IS ONE INCH ON ORIGINAL DRAWING. ADJUST SCALES FOR REDUCED PLOTS

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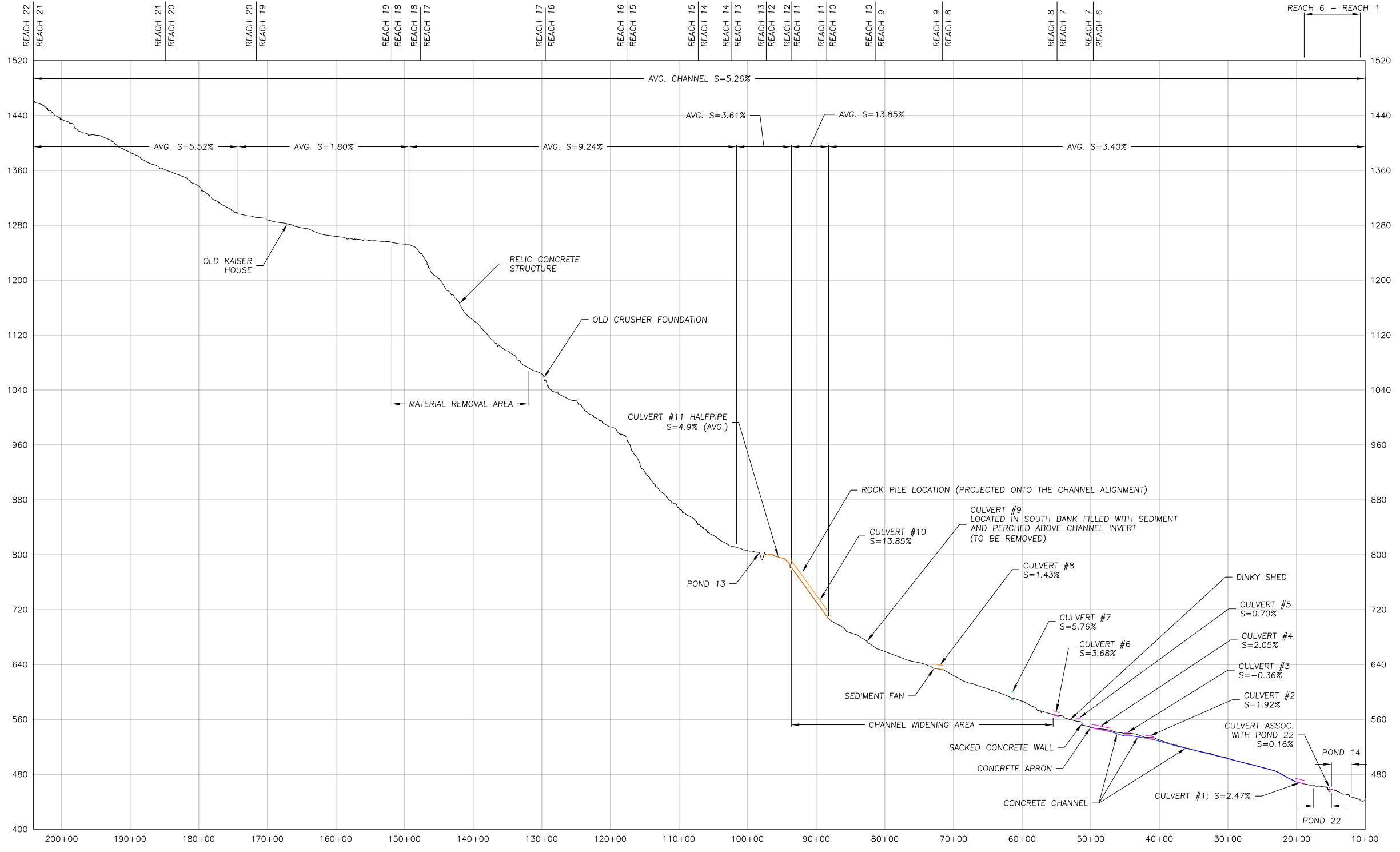
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**EXISTING
CHANNEL
PROFILE**

**PERMANENTE CREEK
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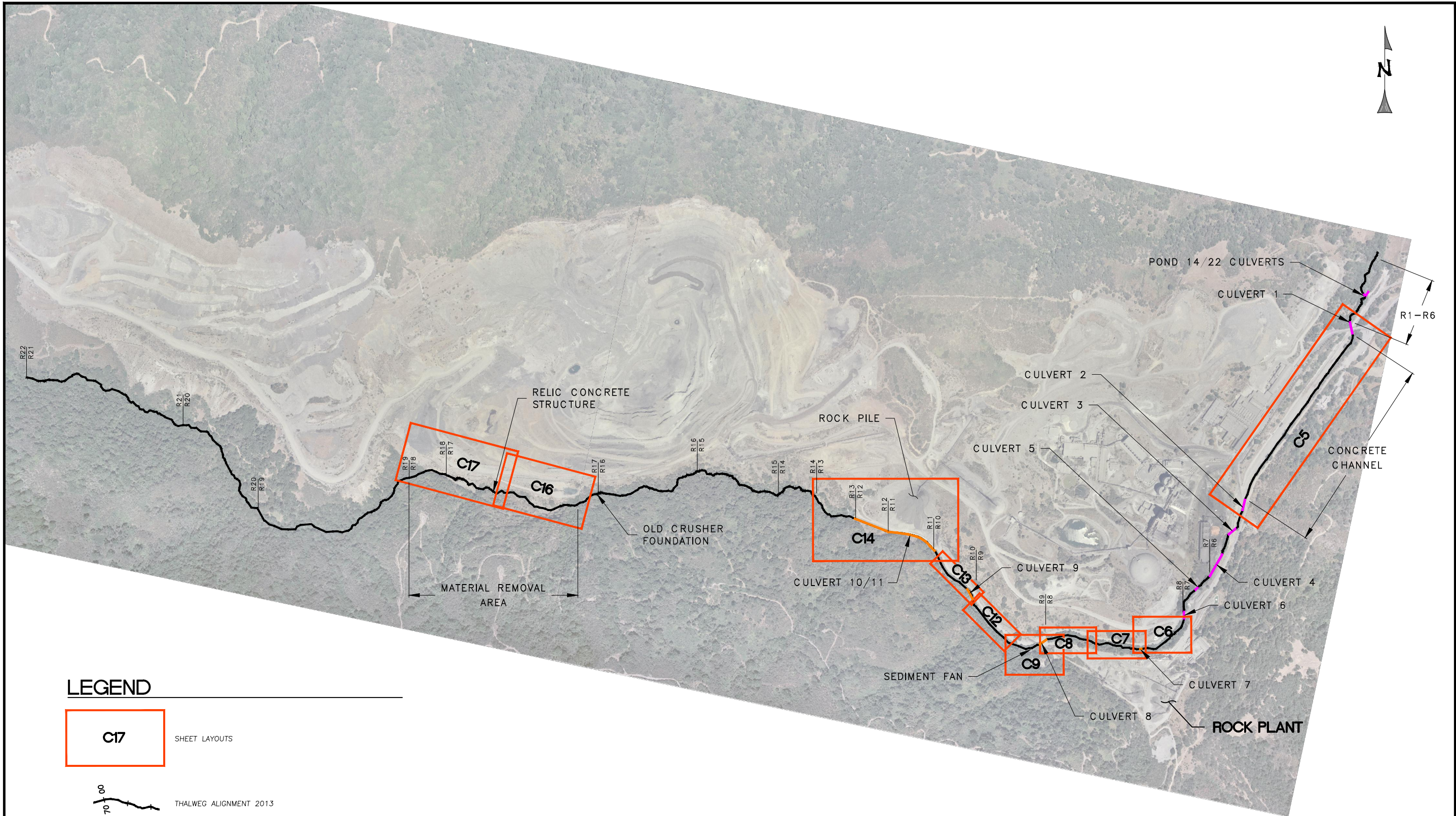
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EXISTING CHANNEL PROFILE
SCALE: H: 1" = 800'; V: 1"=80'

LEGEND

- REACH 7
REACH 6
REACH DESIGNATIONS FROM THE "PERMANENTE CREEK LONG-TERM RESTORATION PLAN" (URS, 2011)
- EXISTING CULVERT TO BE REMOVED
- EXISTING CULVERT TO REMAIN



LEGEND

- C17 SHEET LAYOUTS
- THALWEG ALIGNMENT 2013
- EXISTING CULVERT TO BE REMOVED
- EXISTING CULVERT TO REMAIN

SHEET LAYOUT OVERVIEW
SCALE: 1" = 500'

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NOT FOR CONSTRUCTION

PREPARED AT THE REQUEST OF:
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SHEET LAYOUT OVERVIEW

PERMANENTE CREEK RESTORATION PLAN
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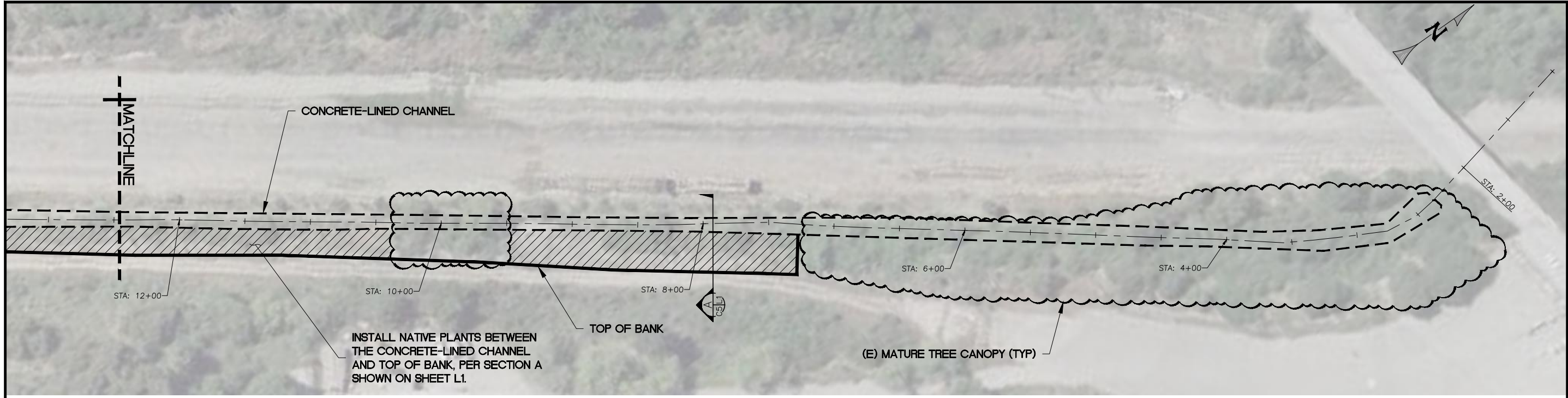
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 GROUP**

**CONCRETE
 CHANNEL
 SOUTHERN BANK
 PLANTING PLAN**

**PERMANENTE CREEK
 RESTORATION PLAN
 70% DESIGN SUBMITTAL**

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 0 1" 1"

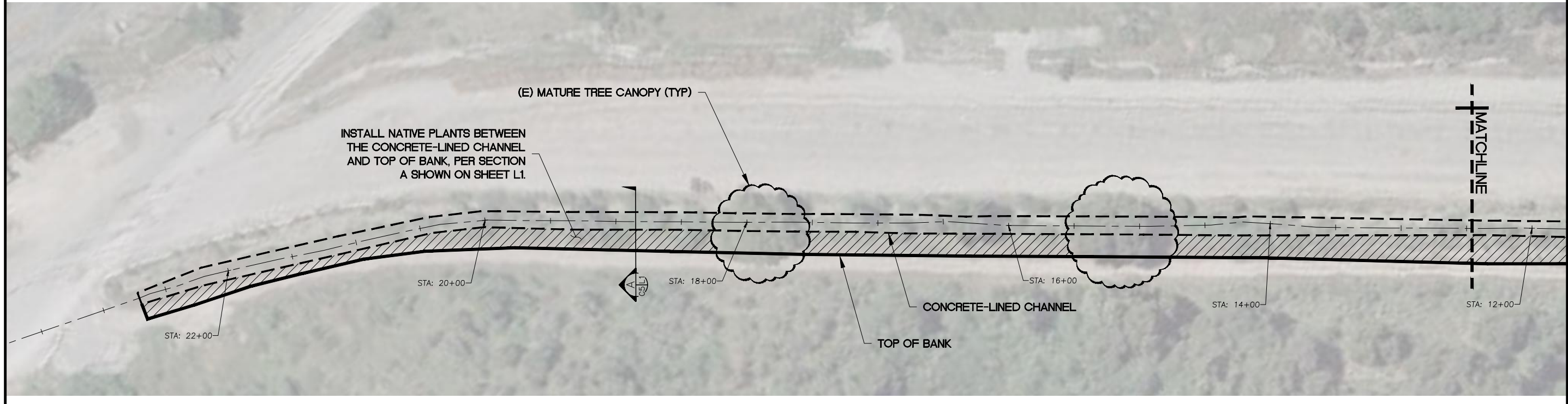
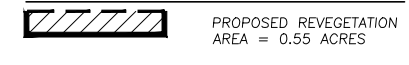


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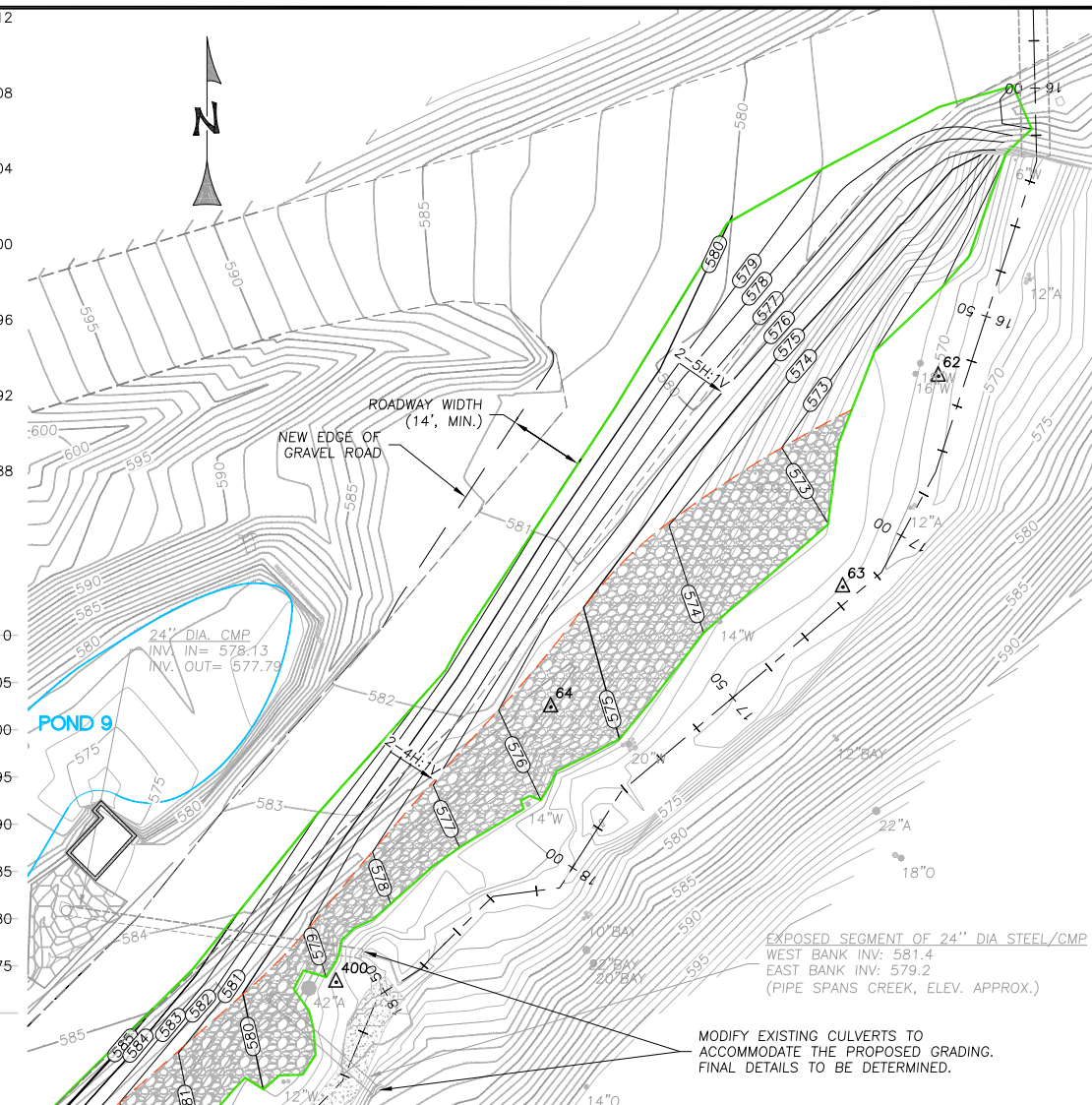
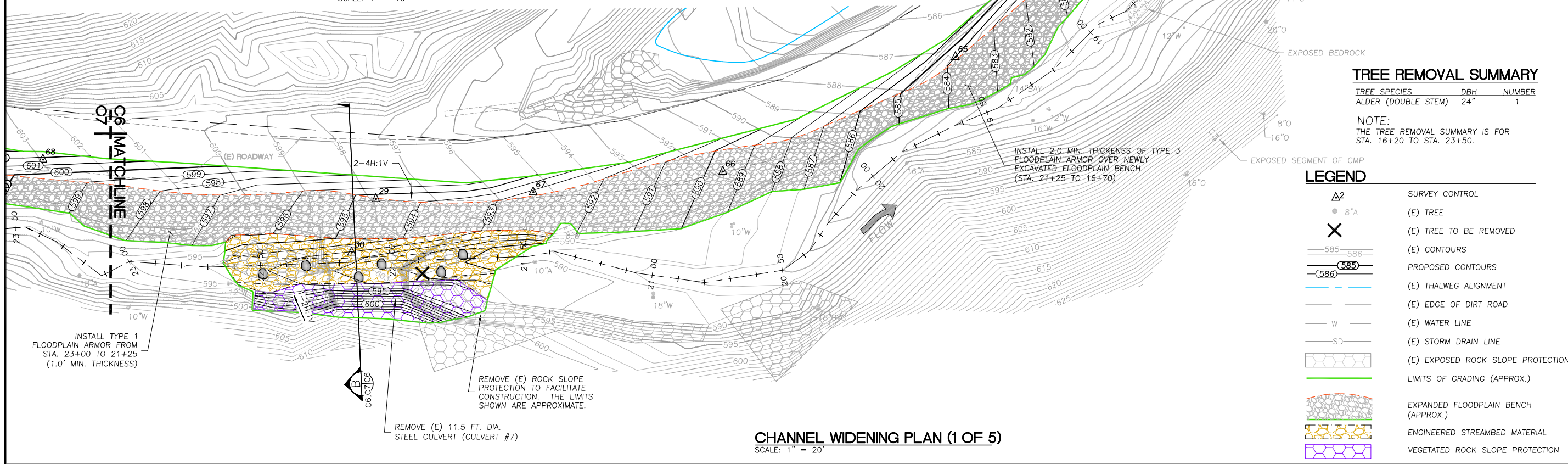
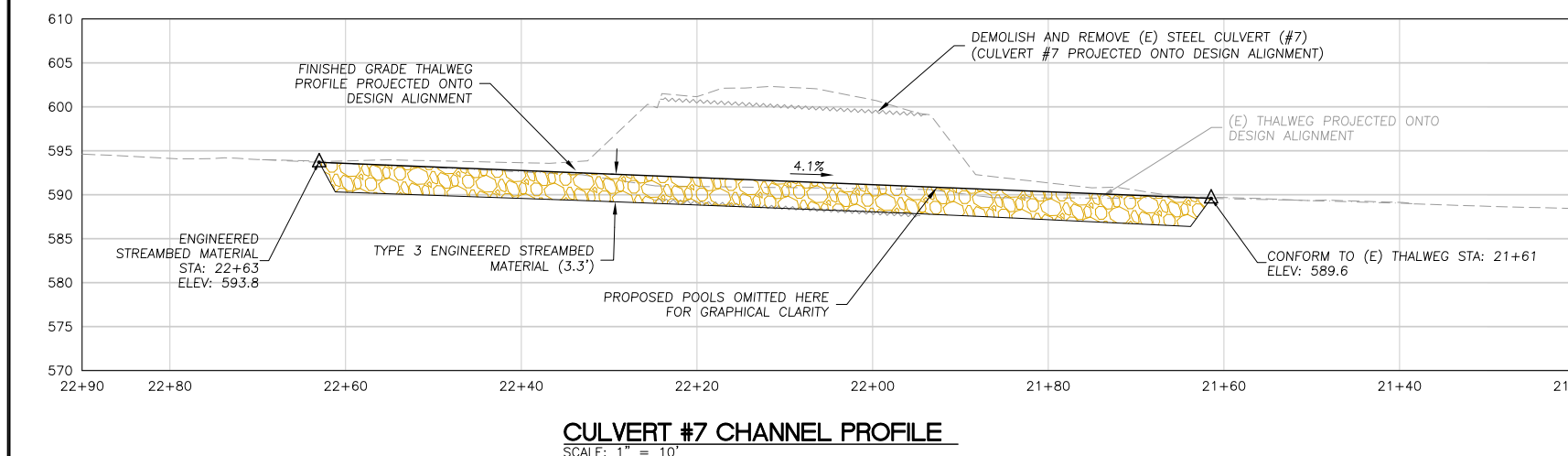
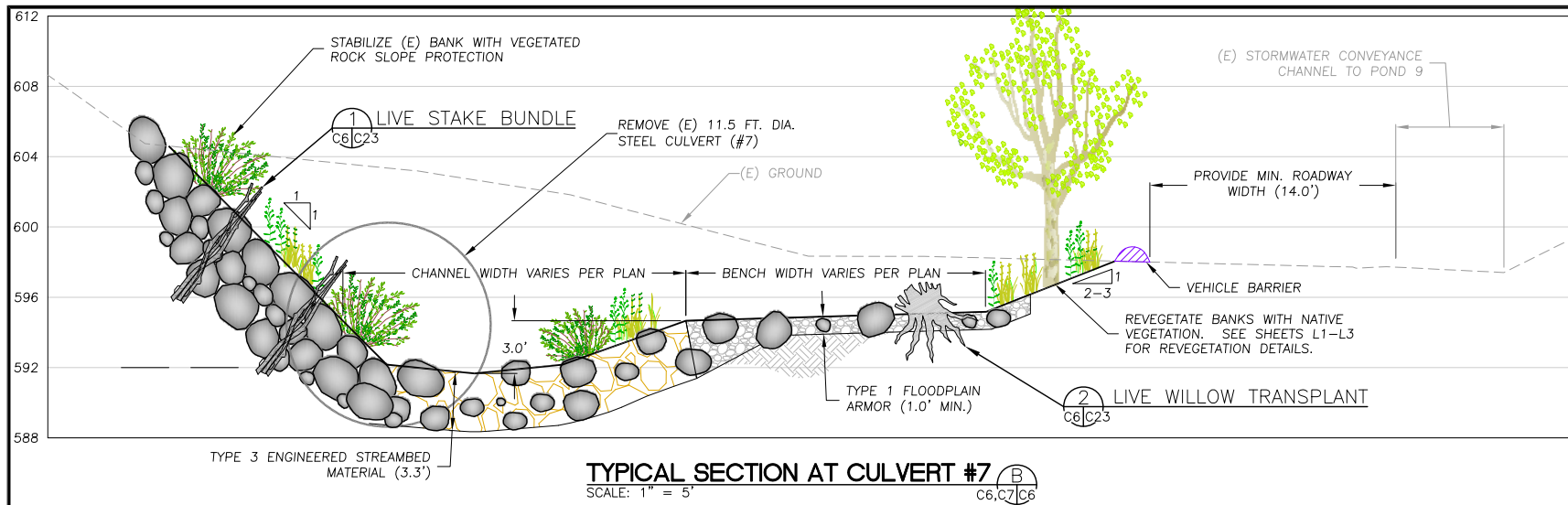
1. ALL EXISTING NATIVE TREES AND SHRUBS SHALL BE PROTECTED IN PLACE. EXISTING PLANT SPECIES INCLUDE, BUT ARE NOT LIMITED TO, PRUNUS ILICIFOLIA, QUERCUS AGRIFOLIA, SALIX LAEVIGATA, SALIX LASIOLEPSIS, AND UMBELLULARIA CALIFORNICA. WEED CONTROL ACTIONS SHALL BE PERFORMED AROUND EXISTING OAK SEEDLINGS, AS DESCRIBED BELOW, TO ENCOURAGE ESTABLISHMENT.
2. A THREE-FOOT DIAMETER AREA SHALL BE CLEARED AND GRUBBED AT EACH PROPOSED PLANTING LOCATION AND AROUND EACH EXISTING OAK SEEDLING. CLEARING AND GRUBBING AROUND OAK SEEDLINGS SHALL OCCUR BY HAND-WEEDING TO AVOID ANY ROOT DISTURBANCE OR PLANT DAMAGE.
3. PLANTING EXCAVATION SHALL NOT OCCUR WITHIN THE DRIP LINE OF EXISTING SHRUBS, WITHIN TEN FEET FROM THE TRUNKS OF EXISTING ESTABLISHED TREES, OR WITHIN FIVE FEET OF EXISTING OAK SEEDLINGS.
4. A QUALIFIED RESTORATION SPECIALIST SHALL CONFIRM THE LOCATION OF PROPOSED PLANTS AND OAK SEEDLINGS PRIOR TO PLANTING AND WEED CONTROL TO CONFIRM AVOIDANCE OF EXISTING VEGETATION.
5. DEPENDING ON THE CONDITION OF EXISTING SOILS, SOIL EXCAVATED FOR PLANTING MAY REQUIRE AMENDMENT WITH GREEN WASTE COMPOST. EXCESS SOIL SHALL BE USED TO FORM A WATERING WELL AROUND THE INSTALLED PLANT.
6. THREE TO FOUR INCHES OF MULCH AND/OR WEED MATS SHALL BE PLACED IN THE CLEARED AND GRUBBED AREA AROUND EACH INSTALLED PLANT OR OAK SEEDLING FOR WEED CONTROL AND MOISTURE RETENTION.

CONCRETE-LINED CHANNEL SOUTHERN BANK PLANTING PLAN
 SCALE: 1" = 40'

LEGEND



CONCRETE-LINED CHANNEL SOUTHERN BANK PLANTING PLAN
 SCALE: H: 1" = 40'



TREE REMOVAL SUMMARY

TREE SPECIES	DBH	NUMBER
ALDER (DOUBLE STEM)	24"	1

NOTE:
THE TREE REMOVAL SUMMARY IS FOR STA. 16+20 TO STA. 23+50.

LEGEND

△2	SURVEY CONTROL
● 8"A	(E) TREE
X	(E) TREE TO BE REMOVED
585	(E) CONTOURS
586	PROPOSED CONTOURS
---	(E) THALWEG ALIGNMENT
---	(E) EDGE OF DIRT ROAD
W	(E) WATER LINE
SD	(E) STORM DRAIN LINE
---	(E) EXPOSED ROCK SLOPE PROTECTION
---	LIMITS OF GRADING (APPROX.)
---	EXPANDED FLOODPLAIN BENCH (APPROX.)
---	ENGINEERED STREAMBED MATERIAL
---	VEGETATED ROCK SLOPE PROTECTION

WATERWAYS CONSULTING INC.
500A SWIFT ST. SANTA ANITA, CA 92586
PH: (831) 212-9515 FAX: (888) 819-6847 WWW.WATERWAYS.COM

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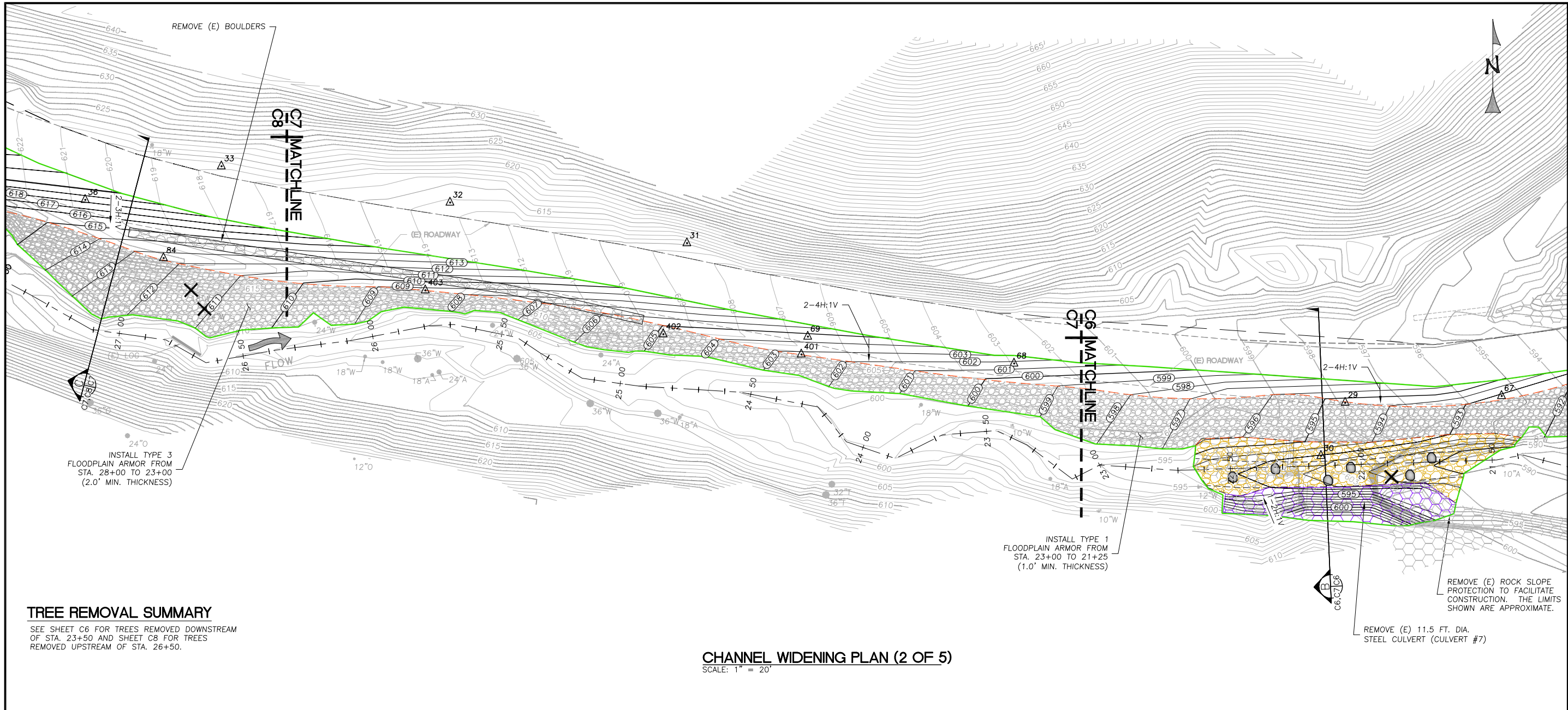
CHANNEL WIDENING PLAN (1 OF 5)

PERMANENTE CREEK RESTORATION PLAN 70% DESIGN SUBMITTAL

DESIGNED BY: B.Z.
DRAWN BY: B.M.S.
CHECKED BY: M.W.W.
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C6 OF 25



TREE REMOVAL SUMMARY

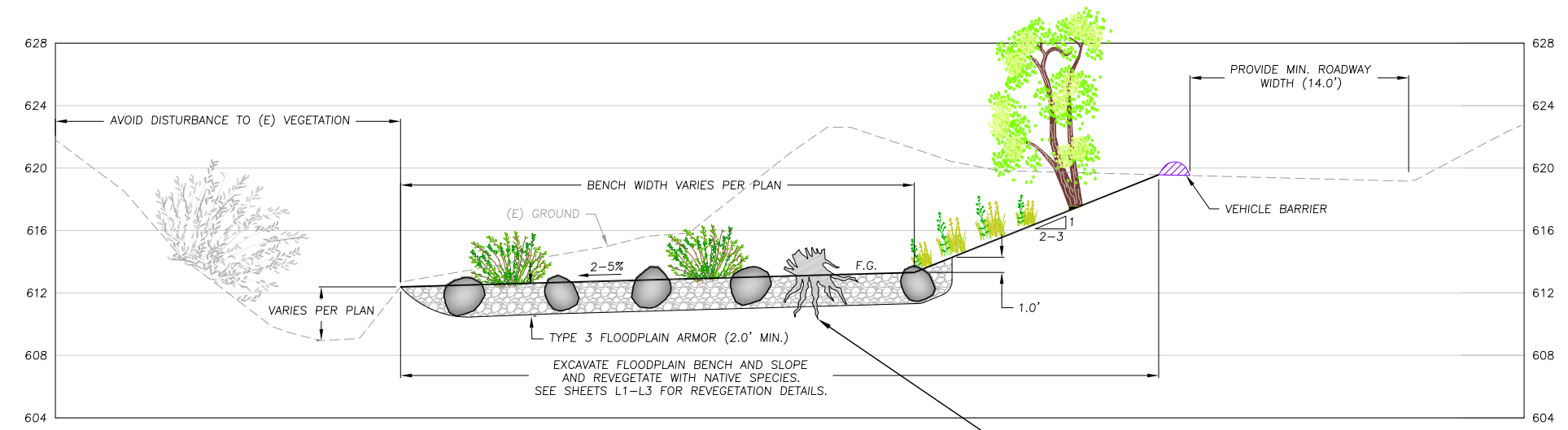
SEE SHEET C6 FOR TREES REMOVED DOWNSTREAM OF STA. 23+50 AND SHEET C8 FOR TREES REMOVED UPSTREAM OF STA. 26+50.

CHANNEL WIDENING PLAN (2 OF 5)

SCALE: 1" = 20'

LEGEND

- △2 SURVEY CONTROL
- 8"A (E) TREE
- X (E) TREE TO BE REMOVED
- 585—586 (E) CONTOURS
- (585)— (E) THALWEG ALIGNMENT
- (586)— PROPOSED CONTOURS
- (E) EDGE OF DIRT ROAD
- W (E) WATER LINE
- SD (E) STORM DRAIN LINE
- [Pattern] (E) EXPOSED ROCK SLOPE PROTECTION
- [Green Line] LIMITS OF GRADING (APPROX.)
- [Pattern] EXPANDED FLOODPLAIN BENCH (APPROX.)
- [Pattern] ENGINEERED STREAMBED MATERIAL
- [Pattern] VEGETATED ROCK SLOPE PROTECTION



TYPICAL SECTION

SCALE: 1" = 5'

C7/C8/C7

C7/C23

PRELIMINARY
NOT FOR CONSTRUCTION

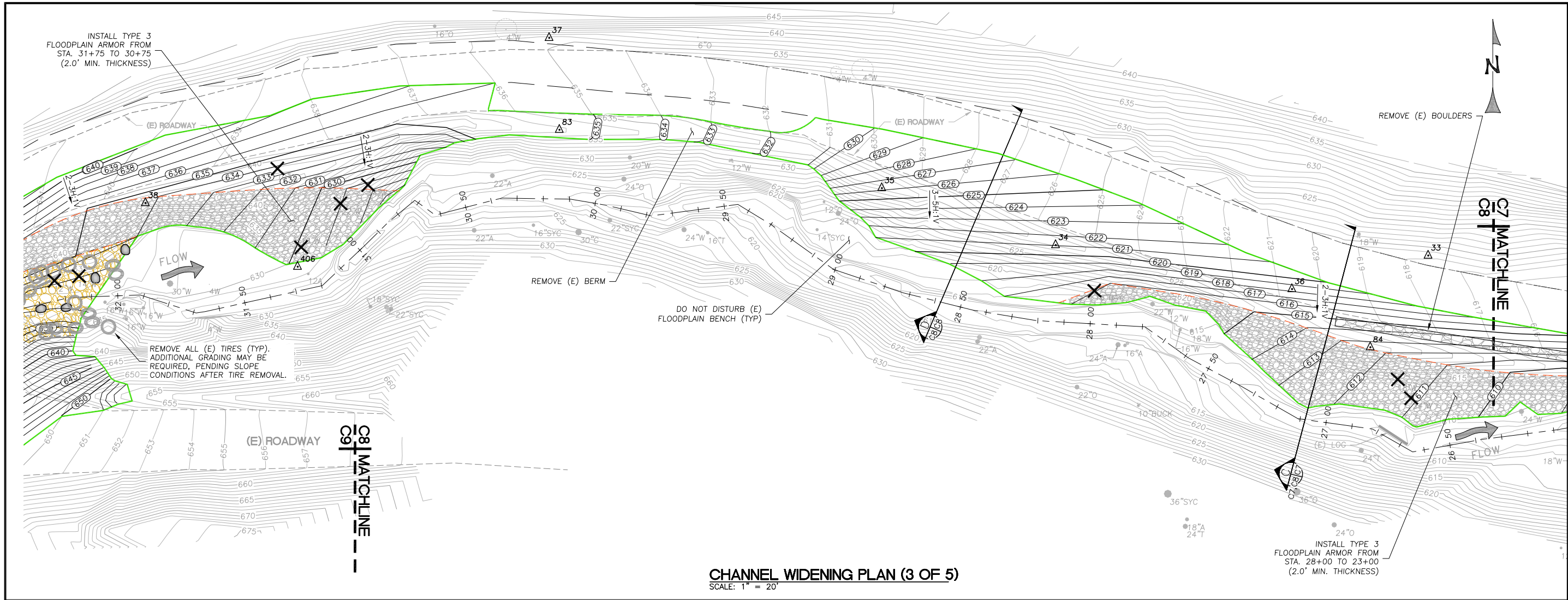
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HEIDELBERG CEMENT GROUP

CHANNEL WIDENING PLAN
(2 OF 5)

PERMANENTE CREEK RESTORATION PLAN
70% DESIGN SUBMITTAL

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 CHECKED BY: M.W.W.
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CHANNEL WIDENING PLAN
 (3 OF 5)

PERMANENTE CREEK RESTORATION PLAN
 70% DESIGN SUBMITTAL

DESIGNED BY: B.M.S.
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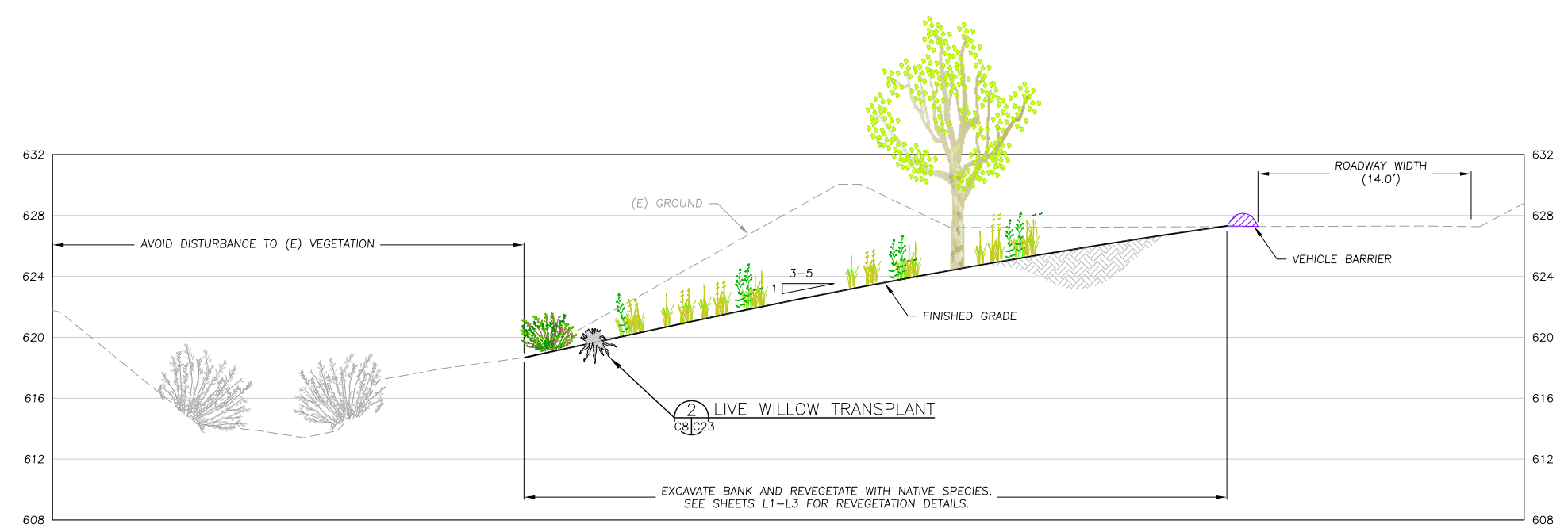
TREE REMOVAL SUMMARY

TREE SPECIES	DBH	NUMBER
WILLOW	14"	1
WILLOW	18"	2
WILLOW	24"	1
WILLOW	22"	1
OAK	10"	1
BAY	16"	1

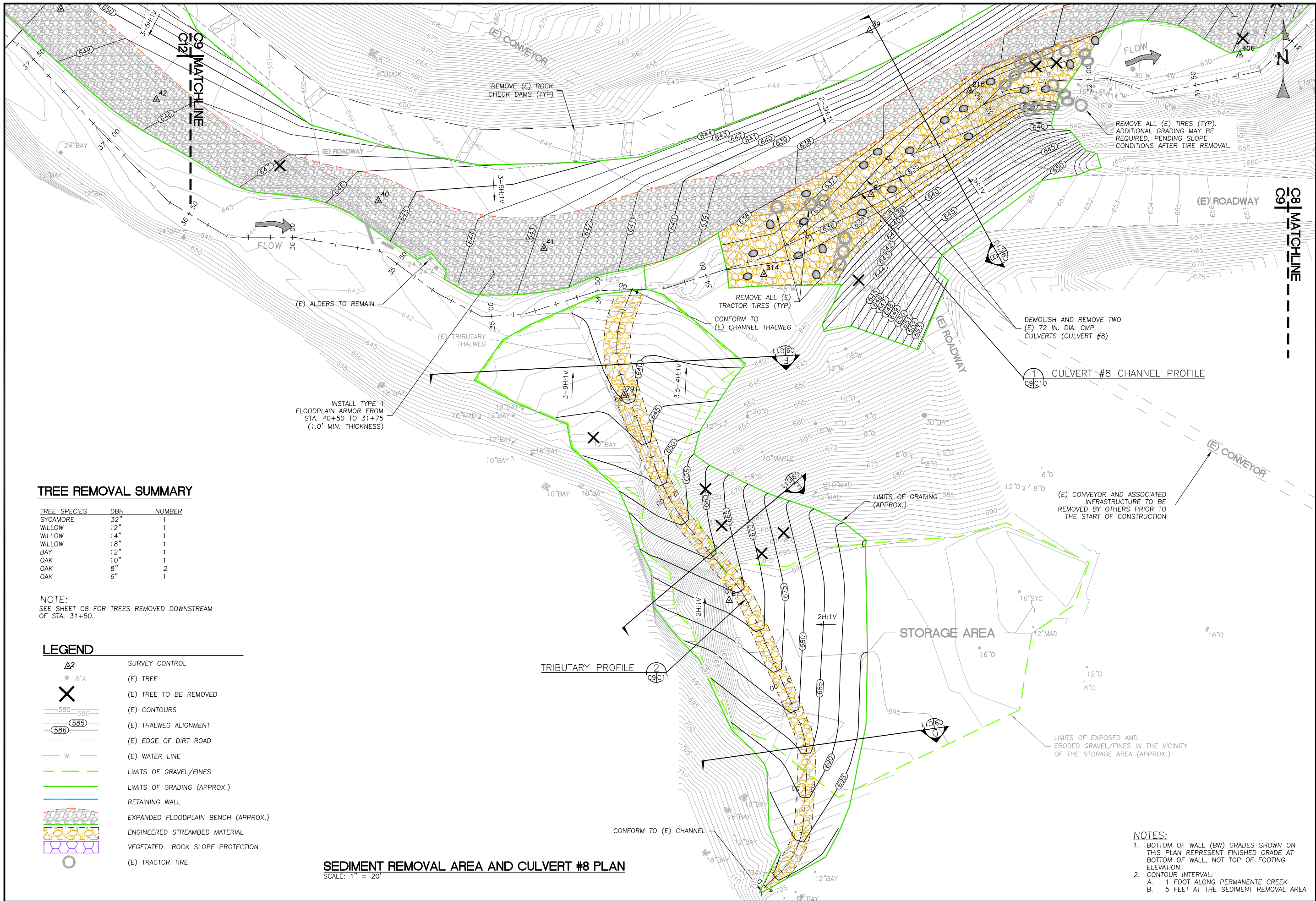
NOTES:
 1. SEE SHEET C9 FOR TREES TO BE REMOVED UPSTREAM OF STA. 31+50. SEE SHEET C7 FOR TREES TO BE REMOVED DOWNSTREAM OF STA. 26+50.

LEGEND

△2	SURVEY CONTROL
● 8"A	(E) TREE
X	(E) TREE TO BE REMOVED
—585—586	(E) CONTOURS
(586)	PROPOSED CONTOURS
—	(E) THALWEG ALIGNMENT
—	(E) EDGE OF DIRT ROAD
— W —	(E) WATER LINE
— SD —	(E) STORM DRAIN LINE
[Pattern]	(E) EXPOSED ROCK SLOPE PROTECTION
[Green Line]	LIMITS OF GRADING (APPROX.)
[Pattern]	EXPANDED FLOODPLAIN BENCH (APPROX.)
[Pattern]	ENGINEERED STREAMBED MATERIAL
[Pattern]	VEGETATED ROCK SLOPE PROTECTION



TYPICAL SECTION
 SCALE: 1" = 5'



TREE REMOVAL SUMMARY

TREE SPECIES	DBH	NUMBER
SYCAMORE	32"	1
WILLOW	12"	1
WILLOW	14"	1
WILLOW	18"	1
BAY	12"	1
OAK	10"	1
OAK	8"	2
OAK	6"	1

NOTE:
SEE SHEET C8 FOR TREES REMOVED DOWNSTREAM
OF STA. 31+50.

LEGEND

- SURVEY CONTROL
- (E) TREE
- (E) TREE TO BE REMOVED
- (E) CONTOURS
- (E) THALWEG ALIGNMENT
- (E) EDGE OF DIRT ROAD
- (E) WATER LINE
- LIMITS OF GRAVEL/FINES
- LIMITS OF GRADING (APPROX.)
- RETAINING WALL
- EXPANDED FLOODPLAIN BENCH (APPROX.)
- ENGINEERED STREAMBED MATERIAL
- VEGETATED ROCK SLOPE PROTECTION
- (E) TRACTOR TIRE

SEDIMENT REMOVAL AREA AND CULVERT #8 PLAN
SCALE: 1" = 20'

- NOTES:**
- BOTTOM OF WALL (BW) GRADES SHOWN ON THIS PLAN REPRESENT FINISHED GRADE AT BOTTOM OF WALL, NOT TOP OF FOOTING ELEVATION.
 - CONTOUR INTERVAL:
A. 1 FOOT ALONG PERMANENTE CREEK
B. 5 FEET AT THE SEDIMENT REMOVAL AREA

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HEIDELBERG CEMENT
GROUP**

**SEDIMENT
REMOVAL AREA
AND CULVERT
#8 PLAN**

**PERMANENTE CREEK
RESTORATION PLAN
70% DESIGN SUBMITTAL**

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C9 OF 25

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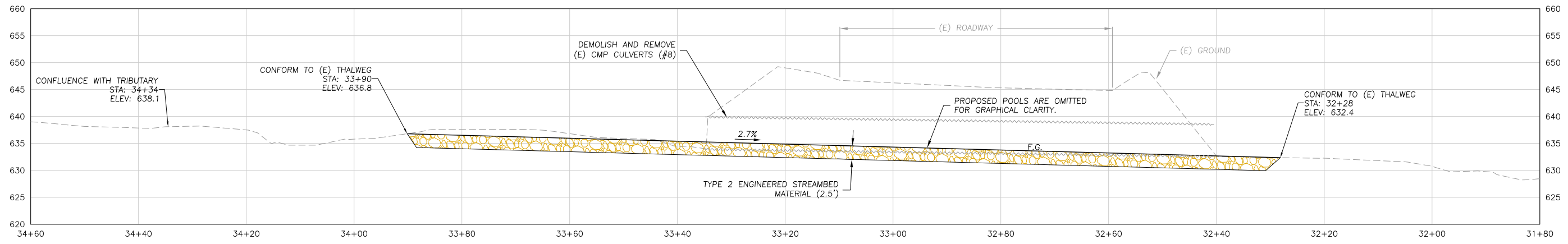
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CULVERT #8
PROFILE AND
SECTION

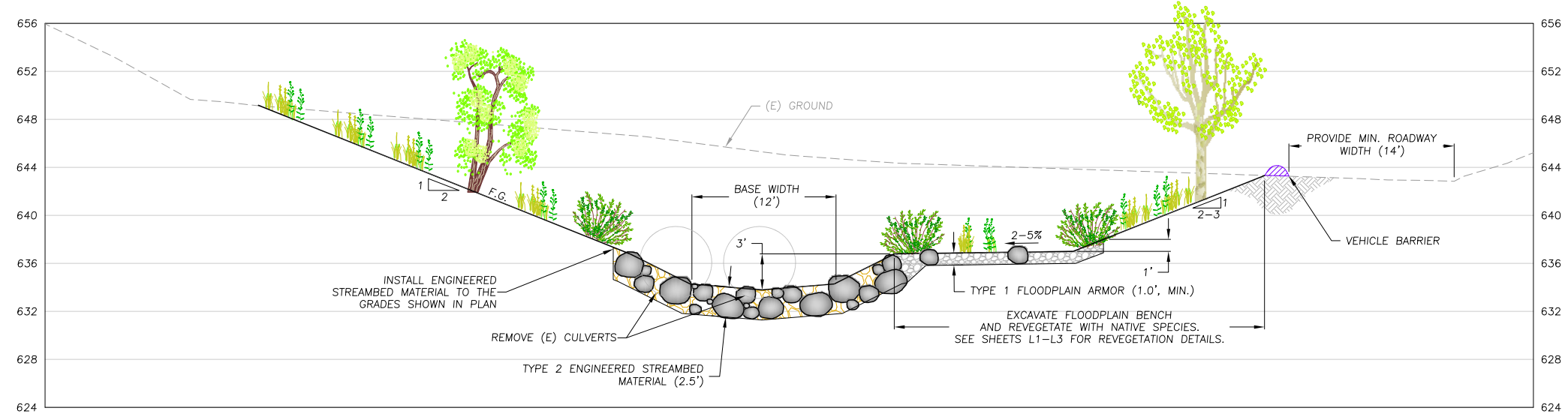
PERMANENTE CREEK
RESTORATION PLAN
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CULVERT #8 CHANNEL PROFILE
SCALE: 1" = 10'



CULVERT #8 SECTION
SCALE: 1" = 6'

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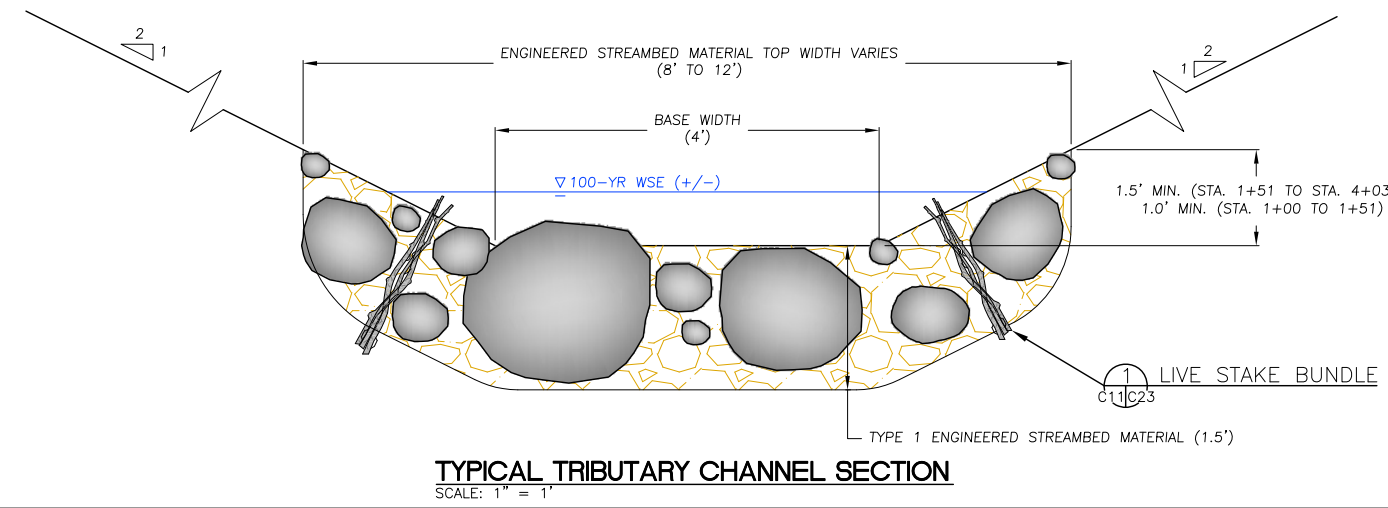
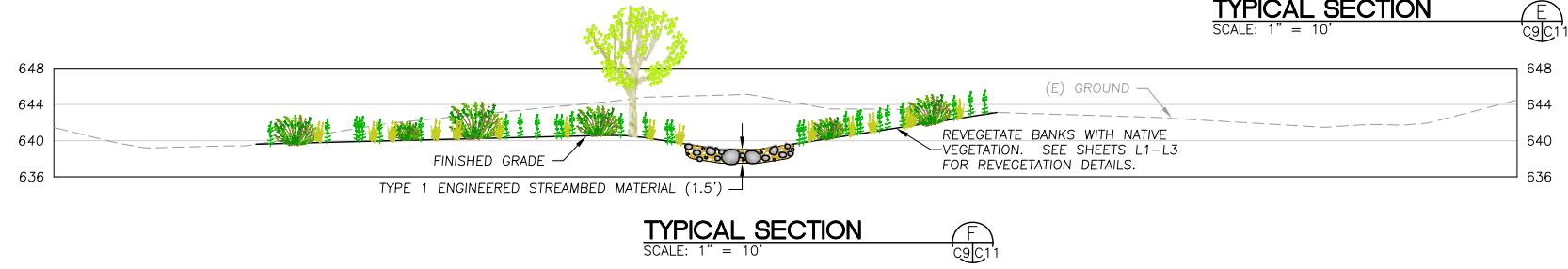
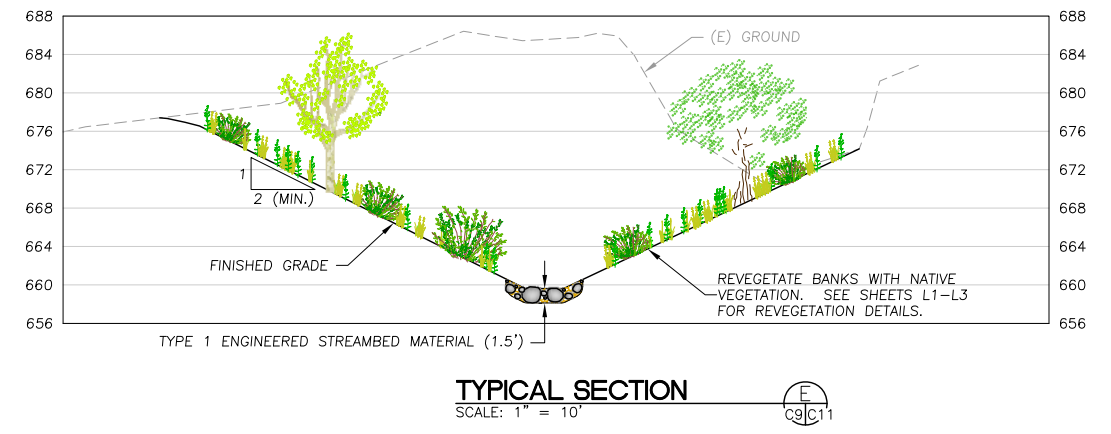
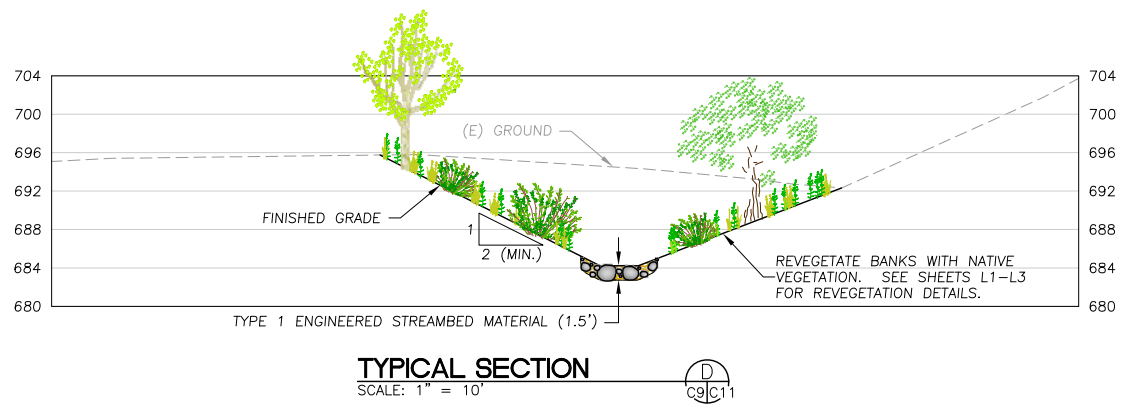
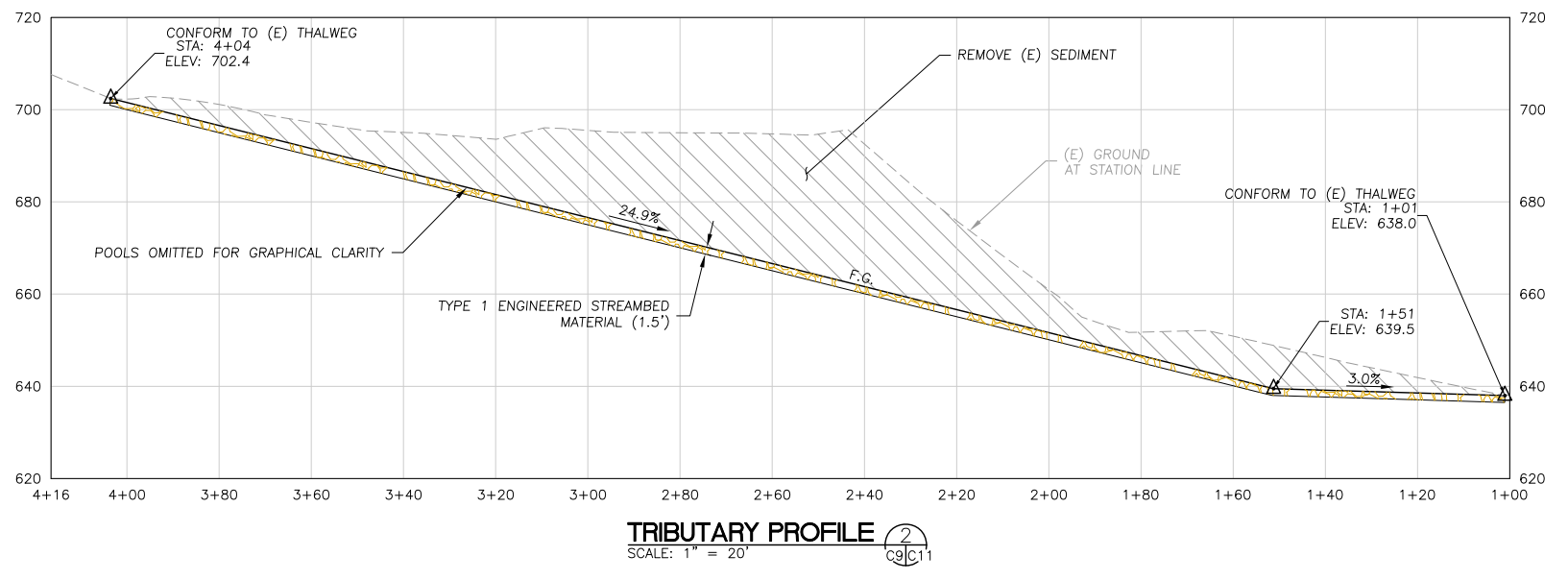
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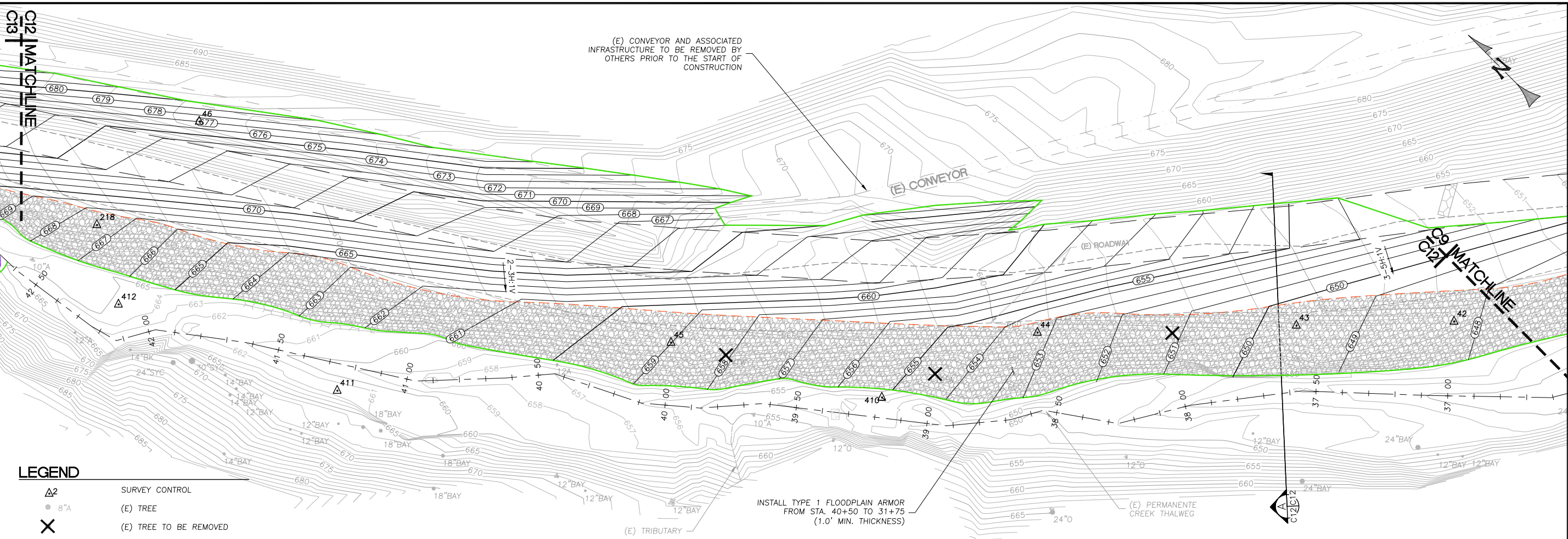
**SEDIMENT
REMOVAL AREA
PROFILE AND
SECTIONS**

**PERMANENTE CREEK
RESTORATION PLAN
70% DESIGN SUBMITTAL**

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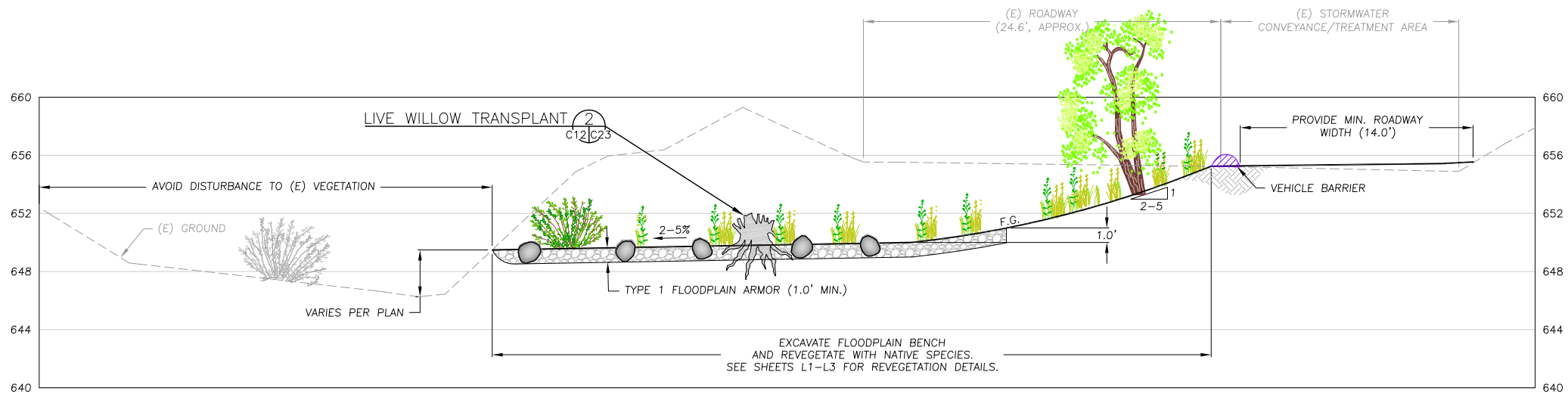


- LEGEND**
- △2 SURVEY CONTROL
 - 8" A (E) TREE
 - X (E) TREE TO BE REMOVED
 - 585-586 (E) CONTOURS
 - 585 PROPOSED CONTOURS
 - 586 (E) THALWEG ALIGNMENT
 - (E) EDGE OF DIRT ROAD
 - W (E) WATER LINE
 - SD (E) STORM DRAIN LINE
 - (E) EXPOSED ROCK SLOPE PROTECTION
 - LIMITS OF GRADING (APPROX.)
 - EXPANDED FLOODPLAIN BENCH (APPROX.)
 - ENGINEERED STREAMBED MATERIAL
 - VEGETATED ROCK SLOPE PROTECTION

TREE REMOVAL SUMMARY

TREE SPECIES	DBH	NUMBER
ALDER	18"	1
WILLOW	12"	1
WILLOW	24"	1

CHANNEL WIDENING PLAN
SCALE: 1" = 20'



TYPICAL SECTION
SCALE: 1" = 5'

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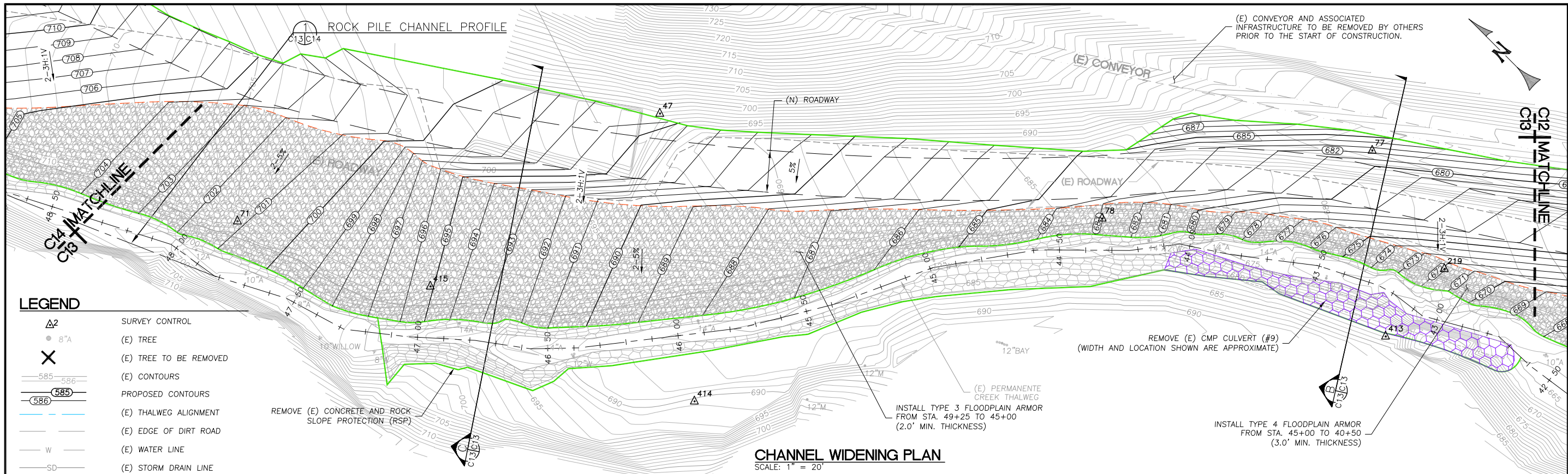
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CHANNEL WIDENING PLAN (4 OF 5)

PERMANENTE CREEK RESTORATION PLAN 70% DESIGN SUBMITTAL

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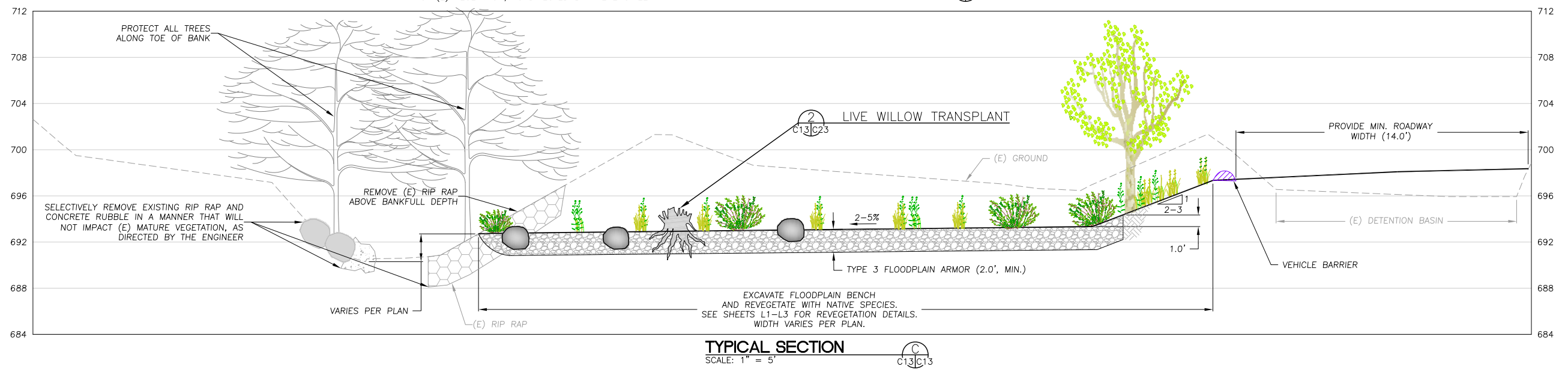
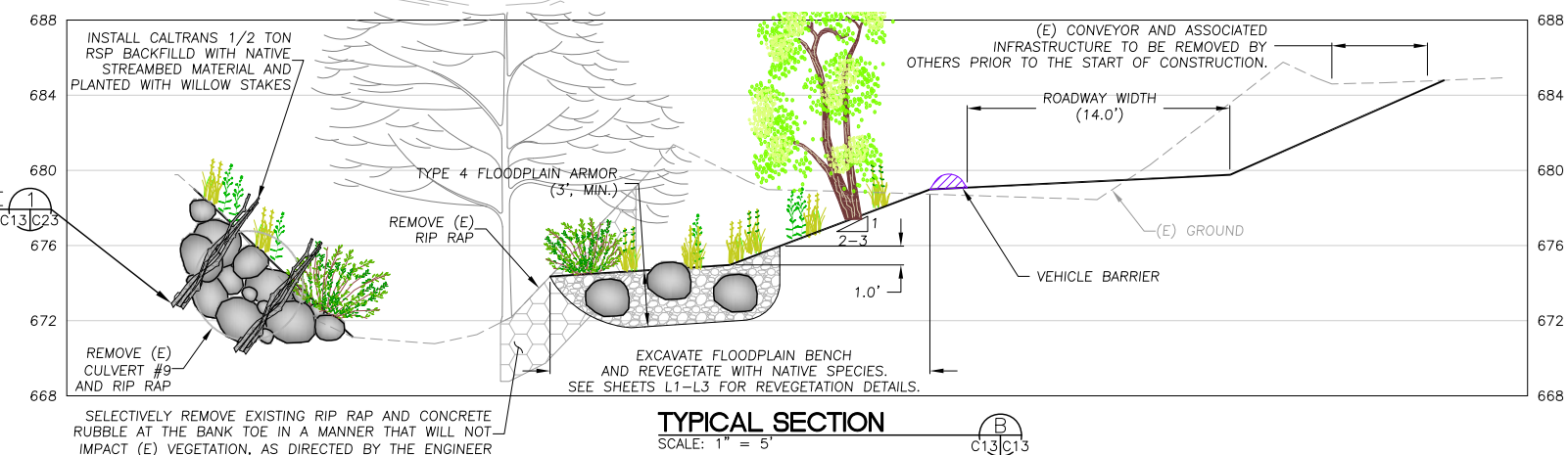


LEGEND

- △2 SURVEY CONTROL
- 8" A (E) TREE
- ✕ (E) TREE TO BE REMOVED
- 585-586 (E) CONTOURS
- 585 PROPOSED CONTOURS
- 586 (E) THALWEG ALIGNMENT
- (E) EDGE OF DIRT ROAD
- W (E) WATER LINE
- SD (E) STORM DRAIN LINE
- (E) EXPOSED ROCK SLOPE PROTECTION
- LIMITS OF GRADING (APPROX.)
- EXPANDED FLOODPLAIN BENCH (APPROX.)
- VEGETATED ROCK SLOPE PROTECTION

TREE REMOVAL SUMMARY

TREE SPECIES	DBH	NUMBER
NONE	N/A	N/A



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CHANNEL WIDENING PLAN (5 OF 5)

PERMANENTE CREEK RESTORATION PLAN 70% DESIGN SUBMITTAL

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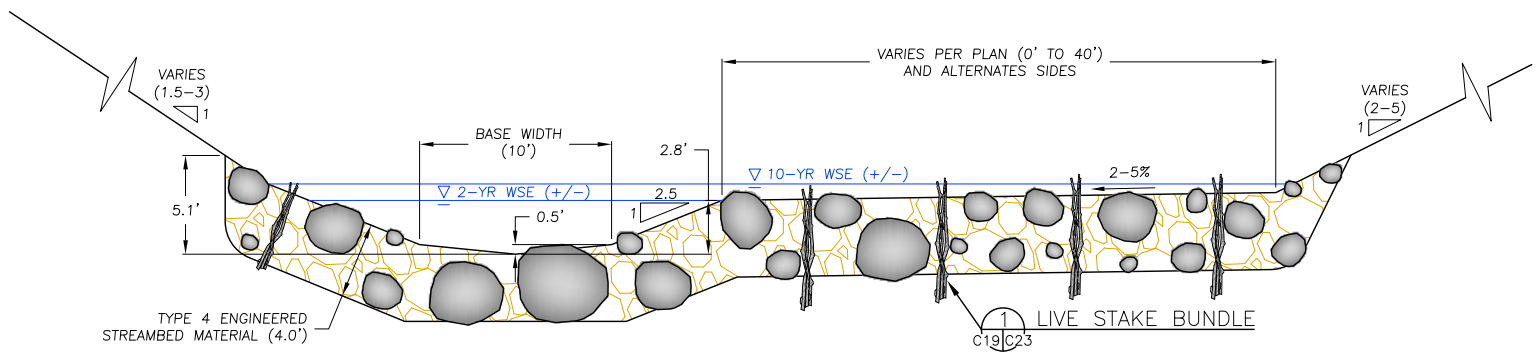
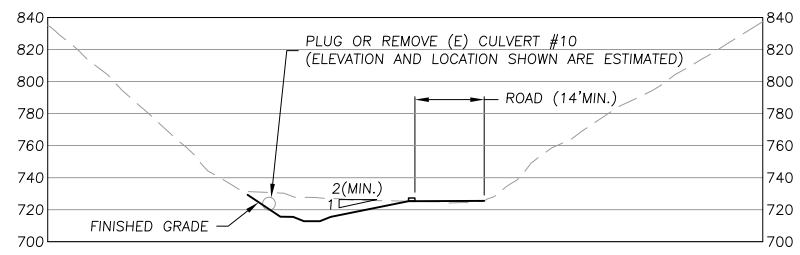
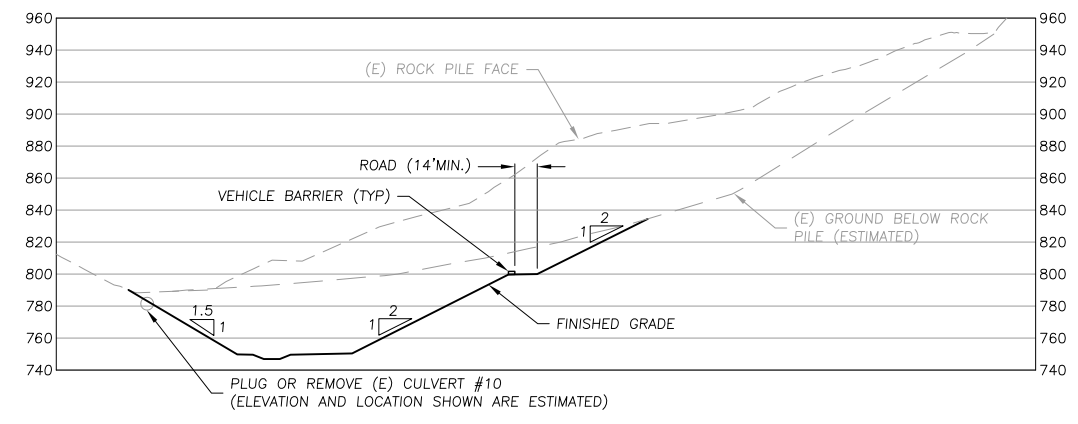
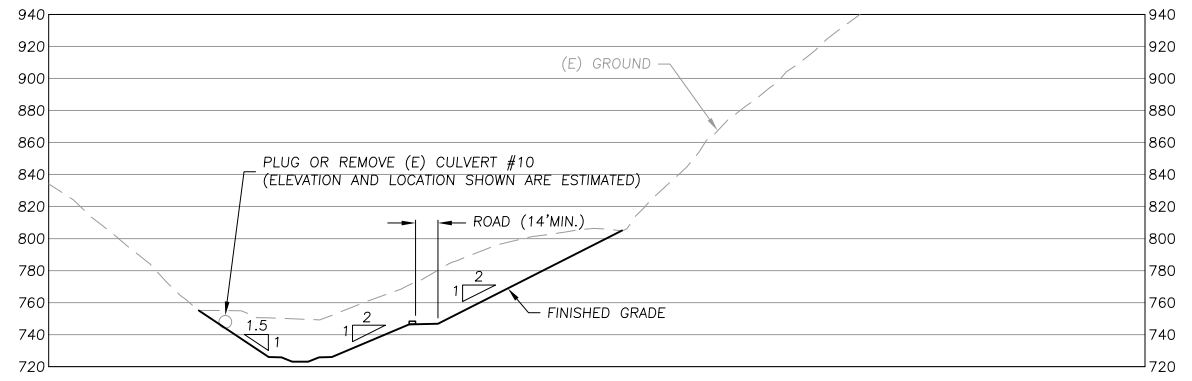
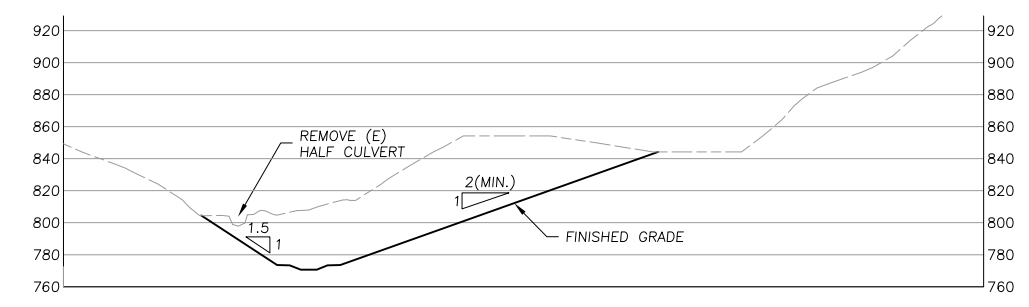
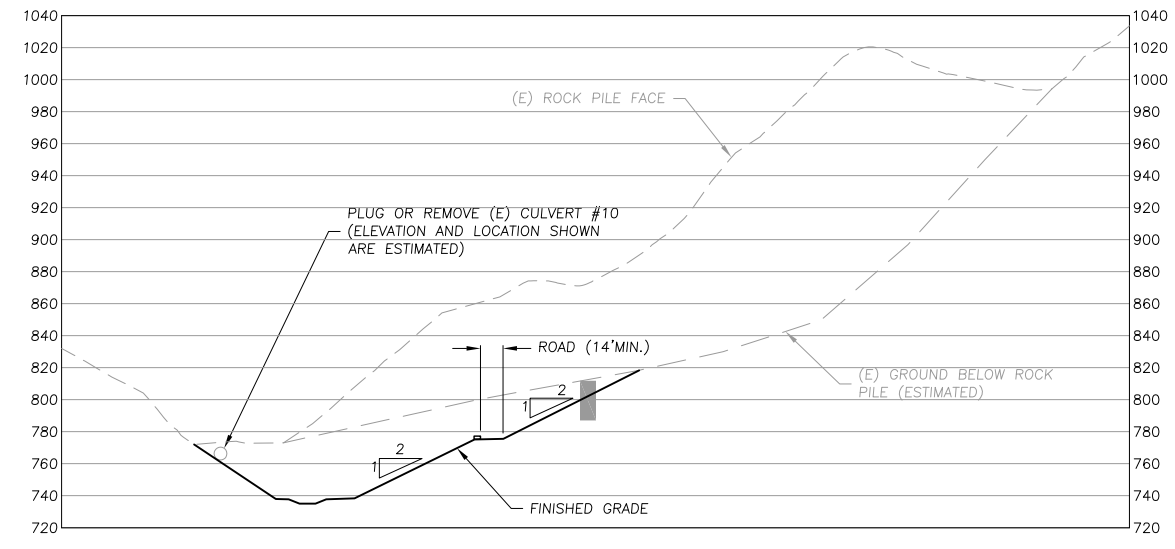
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**ROCK PILE
AREA
SECTIONS**

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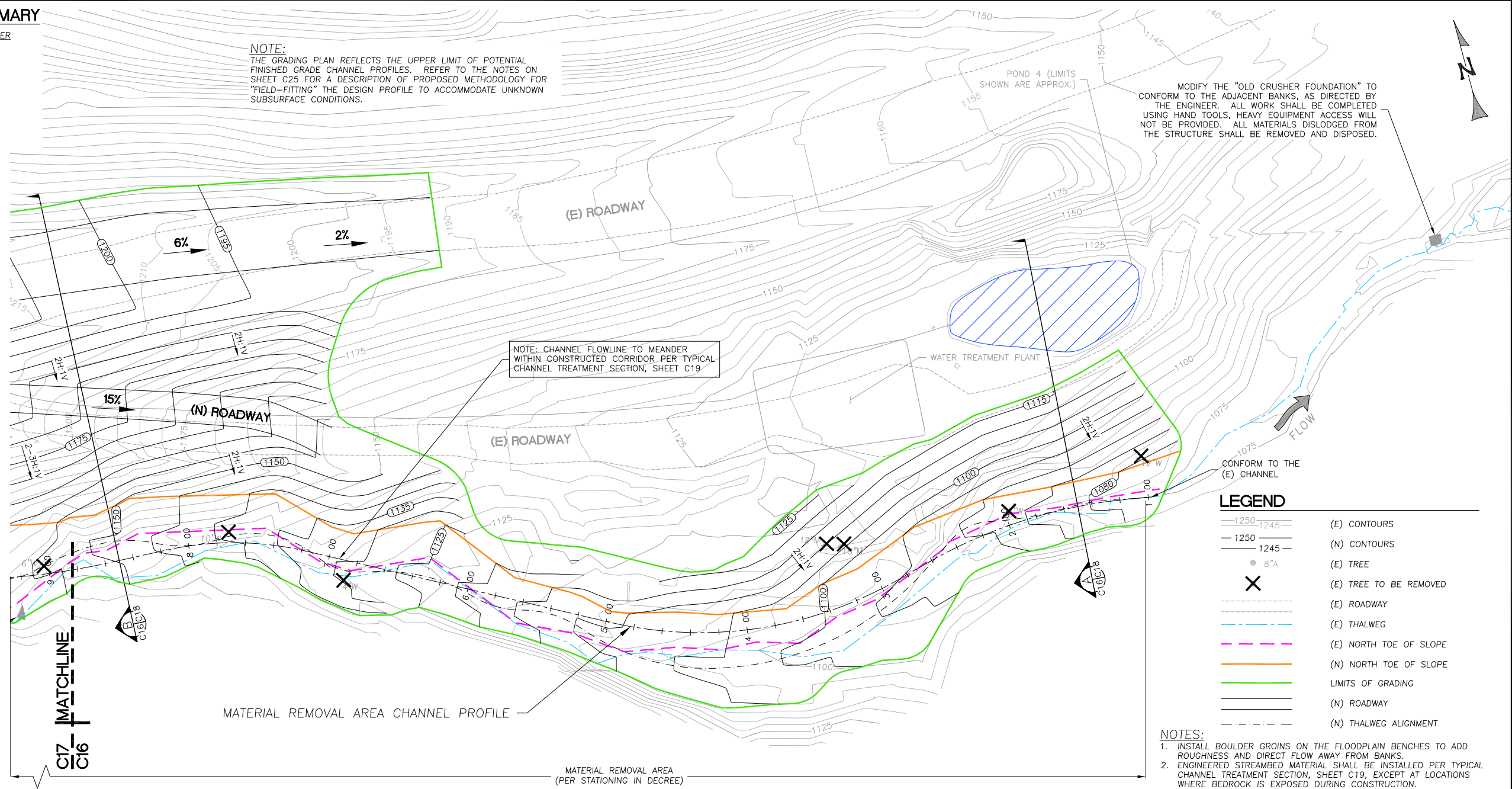
TYPICAL SECTION A
SCALE: 1" = 60'

TREE REMOVAL SUMMARY

TREE SPECIES	DBH	NUMBER
MADRONE	12"	1
MADRONE	18"	1
WILLOW	4"	1
WILLOW	6"	2
WILLOW	10"	1
WILLOW	12"	1

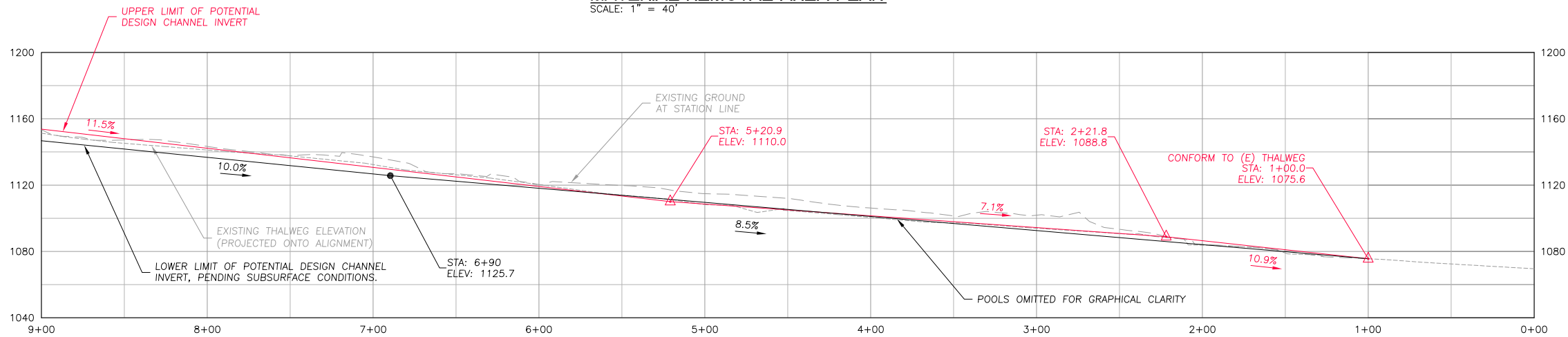
NOTE:
THE GRADING PLAN REFLECTS THE UPPER LIMIT OF POTENTIAL FINISHED GRADE CHANNEL PROFILES. REFER TO THE NOTES ON SHEET C25 FOR A DESCRIPTION OF PROPOSED METHODOLOGY FOR "FIELD-FITTING" THE DESIGN PROFILE TO ACCOMMODATE UNKNOWN SUBSURFACE CONDITIONS.

MODIFY THE "OLD CRUSHER FOUNDATION" TO CONFORM TO THE ADJACENT BANKS, AS DIRECTED BY THE ENGINEER. ALL WORK SHALL BE COMPLETED USING HAND TOOLS, HEAVY EQUIPMENT ACCESS WILL NOT BE PROVIDED. ALL MATERIALS DISLODGED FROM THE STRUCTURE SHALL BE REMOVED AND DISPOSED.



MATERIAL REMOVAL AREA PLAN

SCALE: 1" = 40'



PRELIMINARY
NOT FOR CONSTRUCTION

PREPARED AT THE REQUEST OF:
LEIGH HANSON HEIDELBERG CEMENT GROUP

MATERIAL REMOVAL AREA PLAN (1 OF 2)

PERMANENTE CREEK RESTORATION PLAN 70% DESIGN SUBMITTAL

DESIGNED BY: B.M.Z.
DRAWN BY: B.M.S.
CHECKED BY: M.W.W.
DATE: 04/27/15
JOB NO.: 13-016

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS

LEGEND

- (E) CONTOURS
- (N) CONTOURS
- (E) TREE
- (E) TREE TO BE REMOVED
- (E) ROADWAY
- (E) THALWEG
- (E) NORTH TOE OF SLOPE
- (N) NORTH TOE OF SLOPE
- LIMITS OF GRADING
- (N) ROADWAY
- (N) THALWEG ALIGNMENT

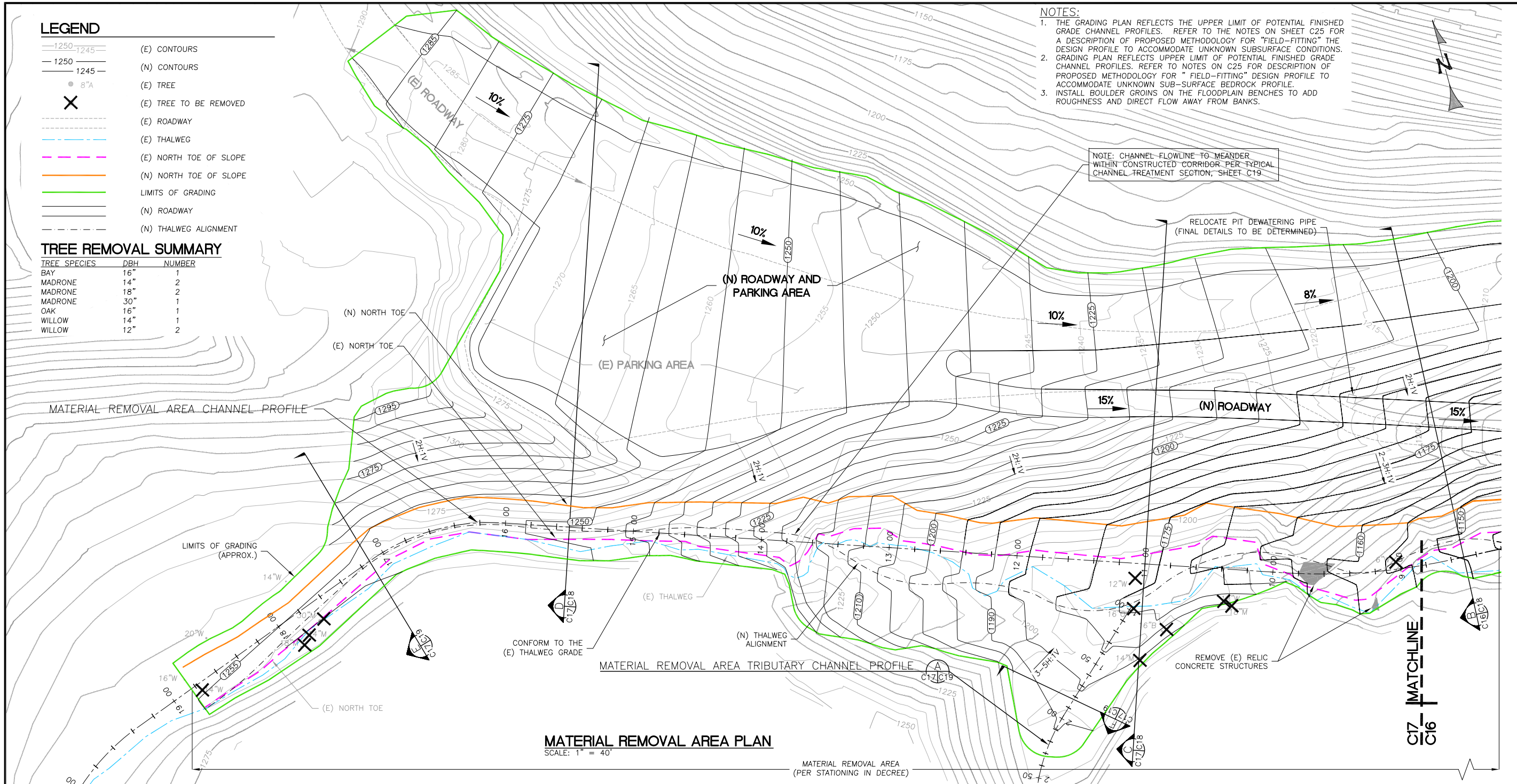
TREE REMOVAL SUMMARY

TREE SPECIES	DBH	NUMBER
BAY	16"	1
MADRONE	14"	2
MADRONE	18"	2
MADRONE	30"	1
OAK	16"	1
WILLOW	14"	1
WILLOW	12"	2

NOTES:

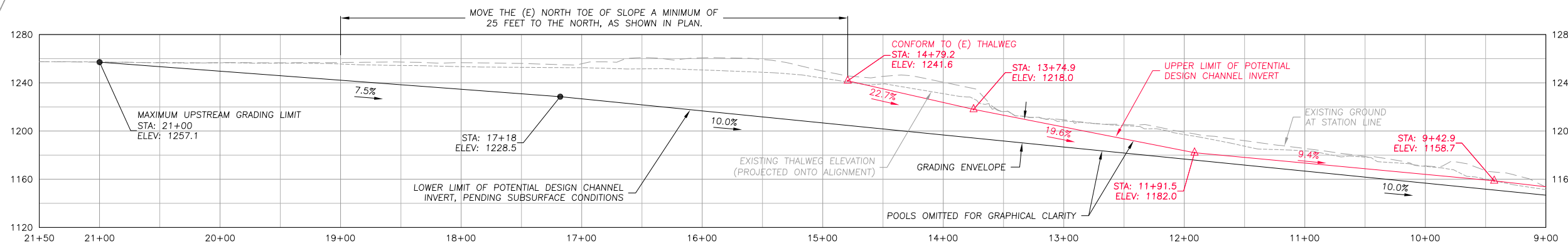
1. THE GRADING PLAN REFLECTS THE UPPER LIMIT OF POTENTIAL FINISHED GRADE CHANNEL PROFILES. REFER TO THE NOTES ON SHEET C25 FOR A DESCRIPTION OF PROPOSED METHODOLOGY FOR "FIELD-FITTING" THE DESIGN PROFILE TO ACCOMMODATE UNKNOWN SUBSURFACE CONDITIONS.
2. GRADING PLAN REFLECTS UPPER LIMIT OF POTENTIAL FINISHED GRADE CHANNEL PROFILES. REFER TO NOTES ON C25 FOR DESCRIPTION OF PROPOSED METHODOLOGY FOR "FIELD-FITTING" DESIGN PROFILE TO ACCOMMODATE UNKNOWN SUB-SURFACE BEDROCK PROFILE.
3. INSTALL BOULDER GROINS ON THE FLOODPLAIN BENCHES TO ADD ROUGHNESS AND DIRECT FLOW AWAY FROM BANKS.

NOTE: CHANNEL FLOWLINE TO MEANDER WITHIN CONSTRUCTED CORRIDOR PER TYPICAL CHANNEL TREATMENT SECTION, SHEET C19



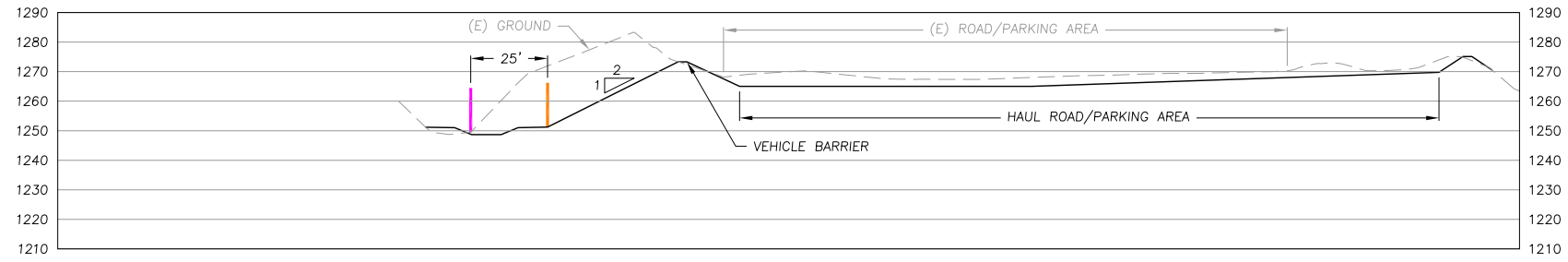
MATERIAL REMOVAL AREA PLAN

SCALE: 1" = 40'

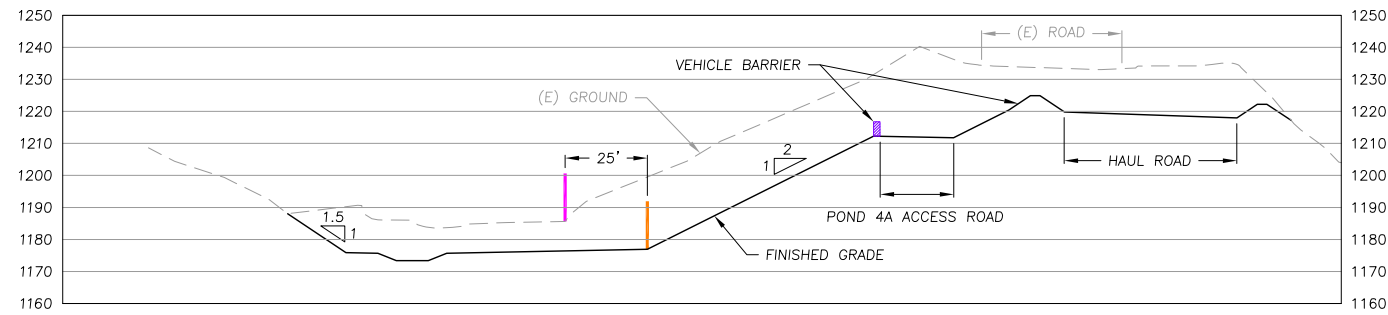


MATERIAL REMOVAL AREA CHANNEL PROFILE

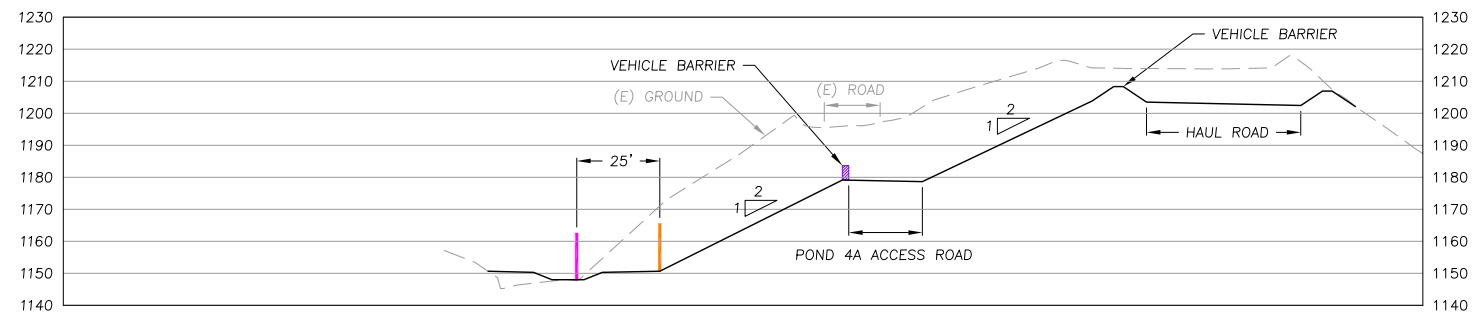
SCALE: 1" = 50'



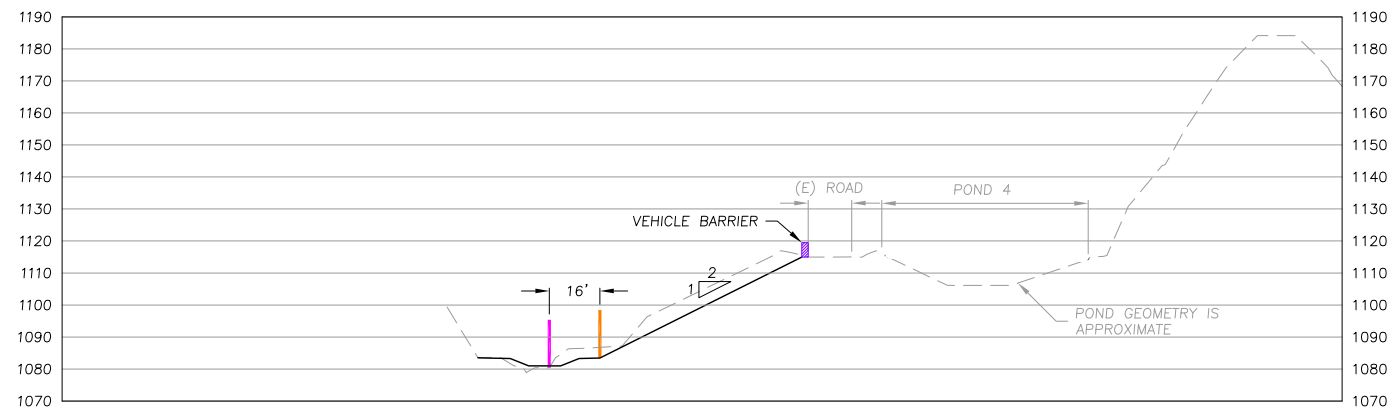
TYPICAL SECTION D
SCALE: 1" = 30'



TYPICAL SECTION C
SCALE: 1" = 30'



TYPICAL SECTION B
SCALE: 1" = 30'



TYPICAL SECTION A
SCALE: 1" = 30'

LEGEND

- | (E) NORTH SLOPE TOE
- | PROPOSED NORTH SLOPE TOE

PRELIMINARY
 NOT FOR CONSTRUCTION

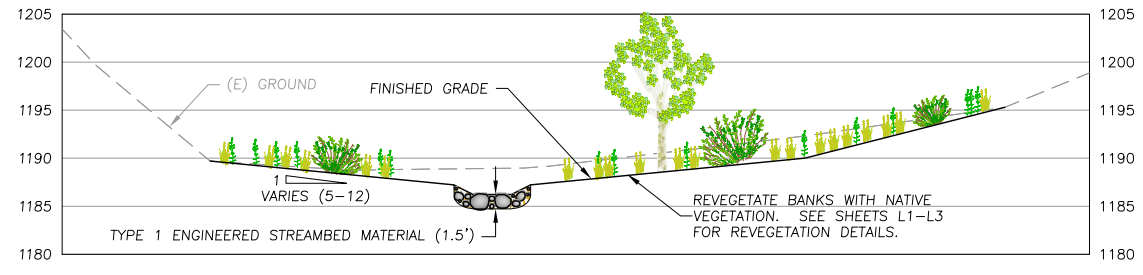
PREPARED AT THE REQUEST OF:
**LEHIGH HANSON
 HEIDELBERG CEMENT
 GROUP**

**MATERIAL
 REMOVAL AREA
 SECTIONS (1 OF
 2)**

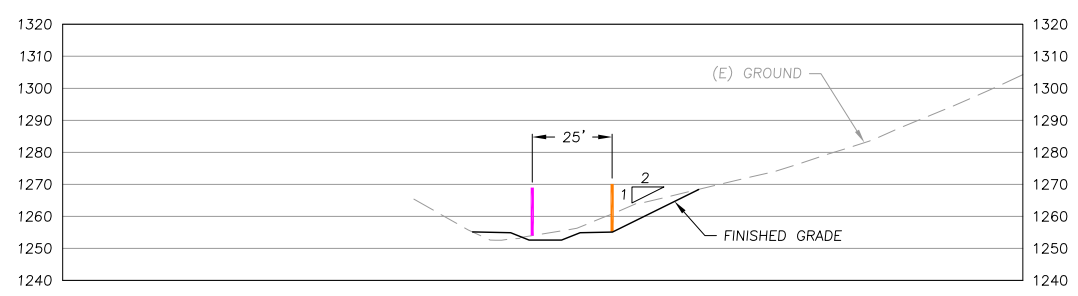
**PERMANENTE CREEK
 RESTORATION PLAN
 70% DESIGN SUBMITTAL**

DESIGNED BY: B.M.Z.
 DRAWN BY: B.M.S.
 CHECKED BY: M.W.W.
 DATE: 04/27/15
 JOB NO.: 13-016

BAR IS ONE INCH ON ORIGINAL DRAWING. ADJUST SCALES FOR REDUCED PLOTS



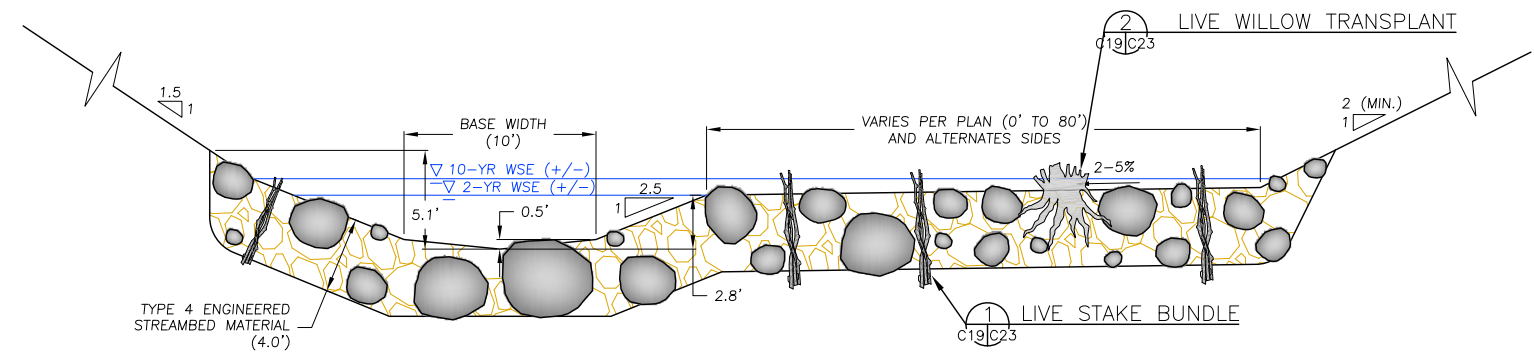
TYPICAL SECTION F
 SCALE: 1" = 10'
 C17|C19



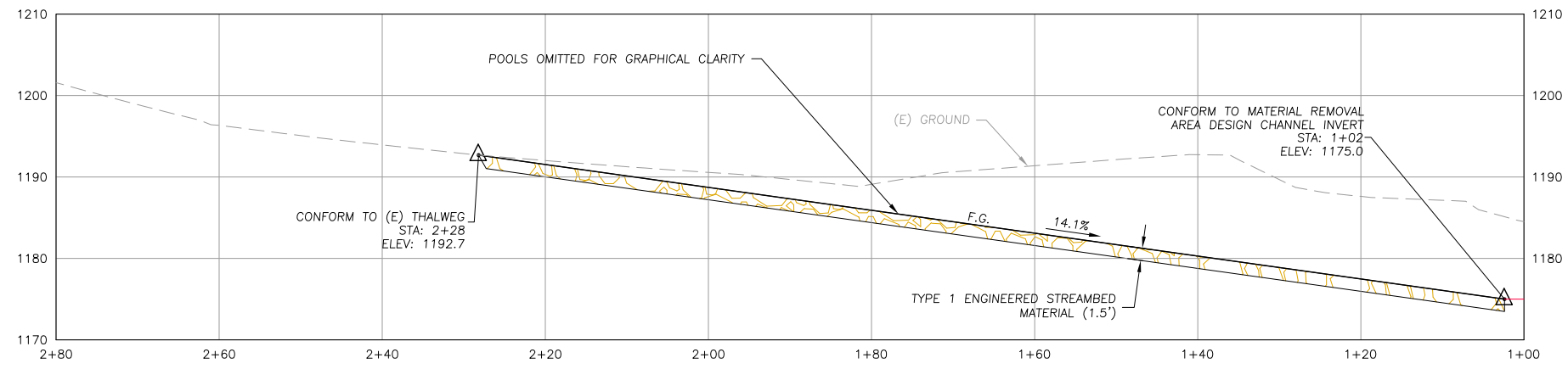
TYPICAL SECTION E
 SCALE: 1" = 30'
 C17|C19

LEGEND

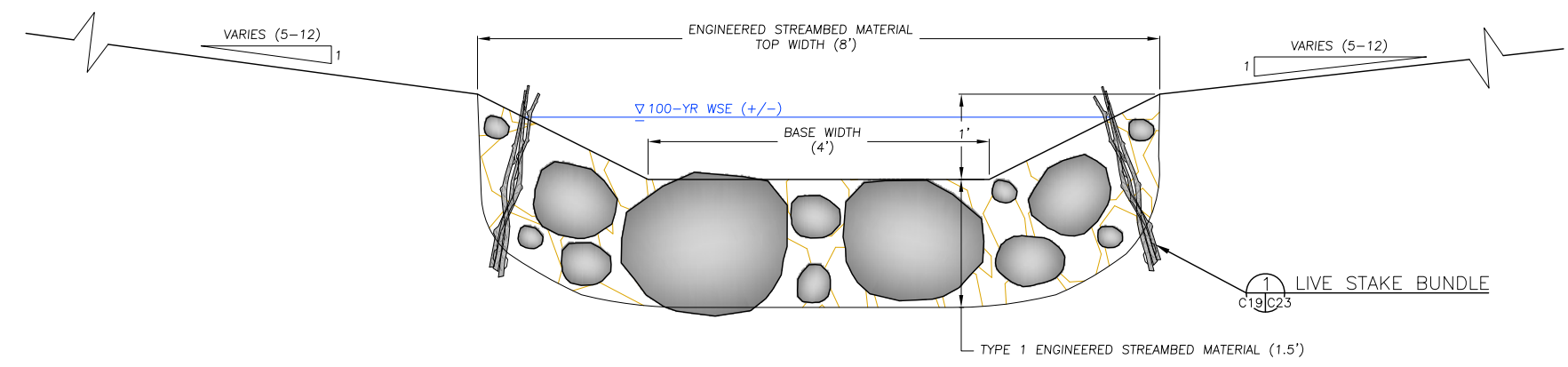
- (E) NORTH SLOPE TOE
- PROPOSED NORTH SLOPE TOE



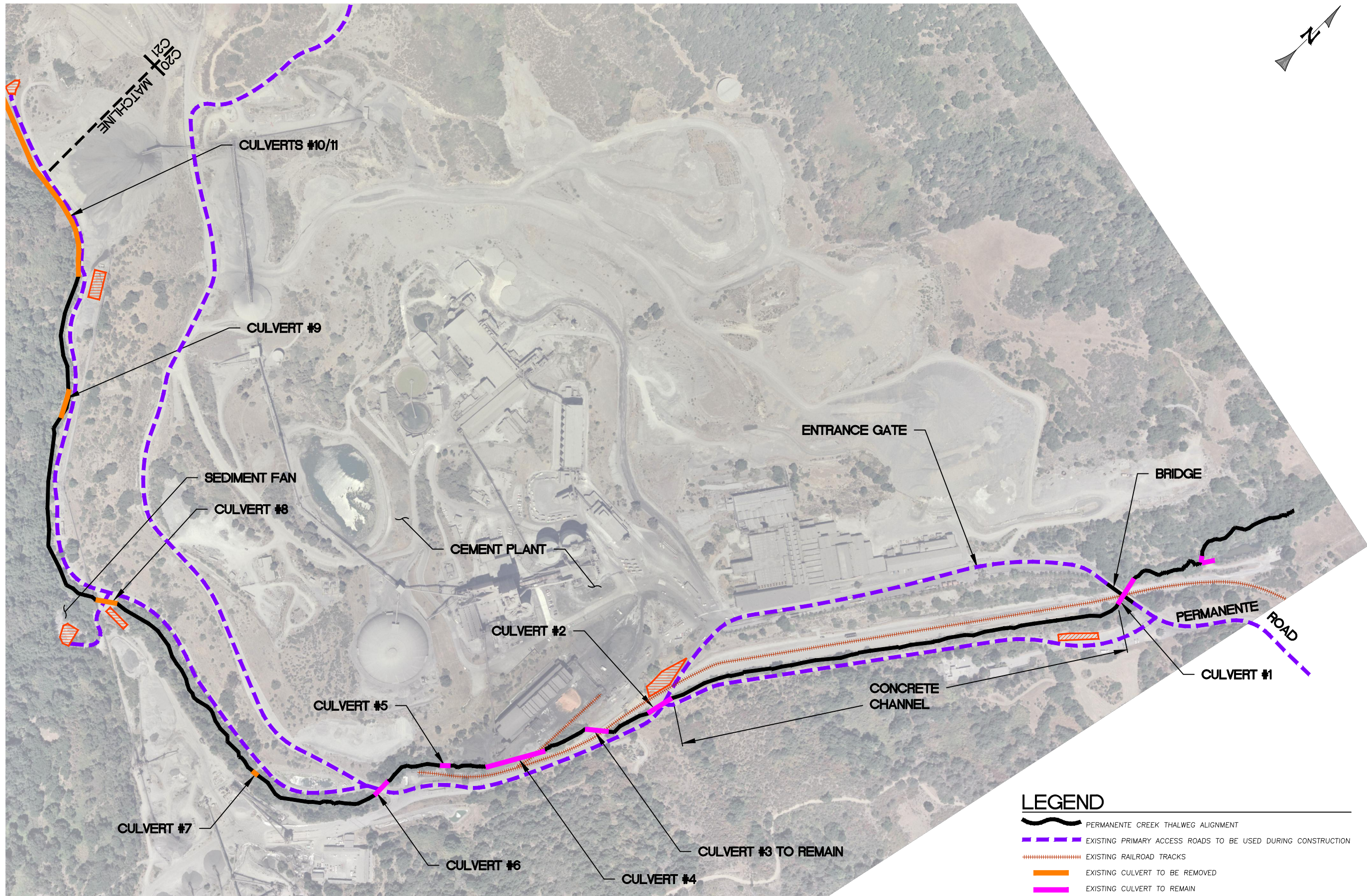
TYPICAL CHANNEL TREATMENT SECTION
 SCALE: 1" = 5'



MATERIAL REMOVAL AREA TRIBUTARY CHANNEL PROFILE
 SCALE: 1" = 10'
 C17|C19



TYPICAL TRIBUTARY CHANNEL TREATMENT SECTION
 SCALE: 1" = 1'



ACCESS AND STAGING PLAN
SCALE: 1"=200'

LEGEND

- PERMANENTE CREEK THALWEG ALIGNMENT
- EXISTING PRIMARY ACCESS ROADS TO BE USED DURING CONSTRUCTION
- EXISTING RAILROAD TRACKS
- EXISTING CULVERT TO BE REMOVED
- EXISTING CULVERT TO REMAIN
- STAGING AND STOCKPILE AREAS

PRELIMINARY
NOT FOR CONSTRUCTION

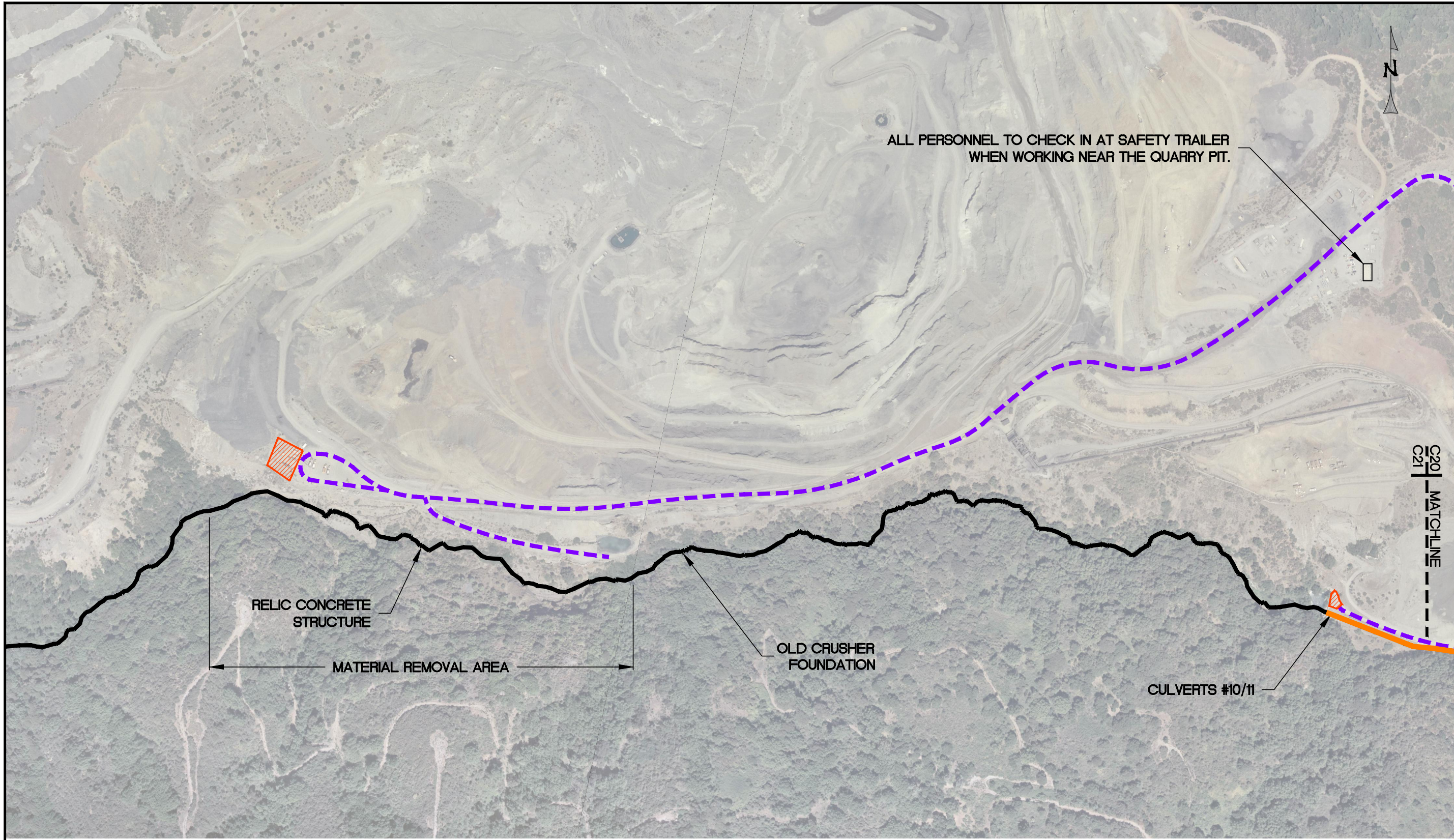
PREPARED AT THE REQUEST OF:
**LEHIGH HANSON
HEIDELBERG CEMENT
GROUP**

ACCESS AND STAGING PLAN
(1 OF 2)

PERMANENTE CREEK
RESTORATION PLAN
70% DESIGN SUBMITTAL

DESIGNED BY: B.M.S.
DRAWN BY: B.M.S.
CHECKED BY: M.W.W.
DATE: 04/27/15
JOB NO.: 13-016

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS



PRELIMINARY
 NOT FOR CONSTRUCTION

PREPARED AT THE REQUEST OF:
**LEHIGH HANSON
 HEIDELBERG CEMENT
 GROUP**

ACCESS AND STAGING PLAN
 (2 OF 2)

PERMANENTE CREEK RESTORATION PLAN
 70% DESIGN SUBMITTAL

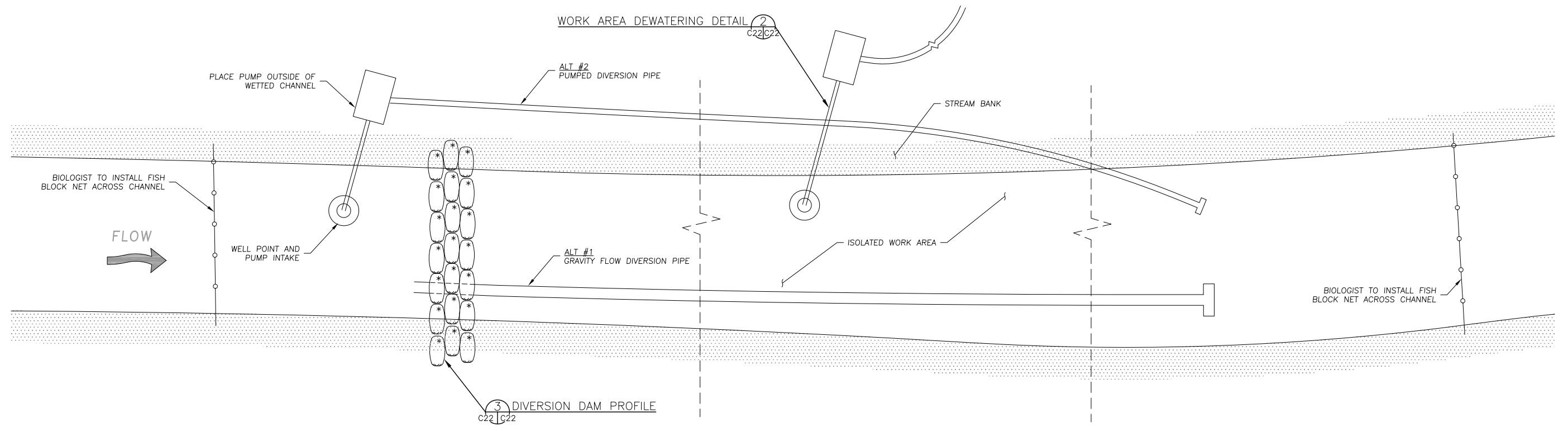
DESIGNED BY: B.M.S.
 DRAWN BY: B.M.S.
 CHECKED BY: M.W.W.
 DATE: 04/27/15
 JOB NO.: 13-016

BAR IS ONE INCH ON ORIGINAL DRAWING. ADJUST SCALES FOR REDUCED PLOTS.

0 1" 1"

- LEGEND**
- PERMANENTE CREEK THALWEG ALIGNMENT
 - EXISTING PRIMARY ACCESS ROADS TO BE USED DURING CONSTRUCTION
 - EXISTING RAILROAD TRACKS
 - EXISTING CULVERT TO BE REMOVED
 - EXISTING CULVERT TO REMAIN
 - STAGING AND STOCKPILE AREAS

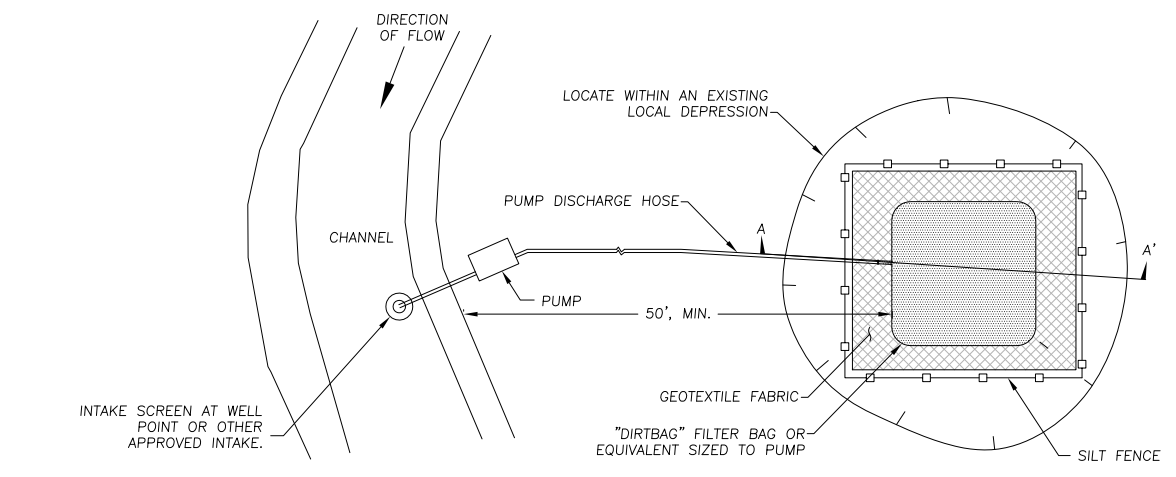
ACCESS AND STAGING PLAN
 SCALE: 1" = 200'



TYPICAL DEWATERING PLAN
 N.T.S. (1) C22/C22

DIVERSION NOTES

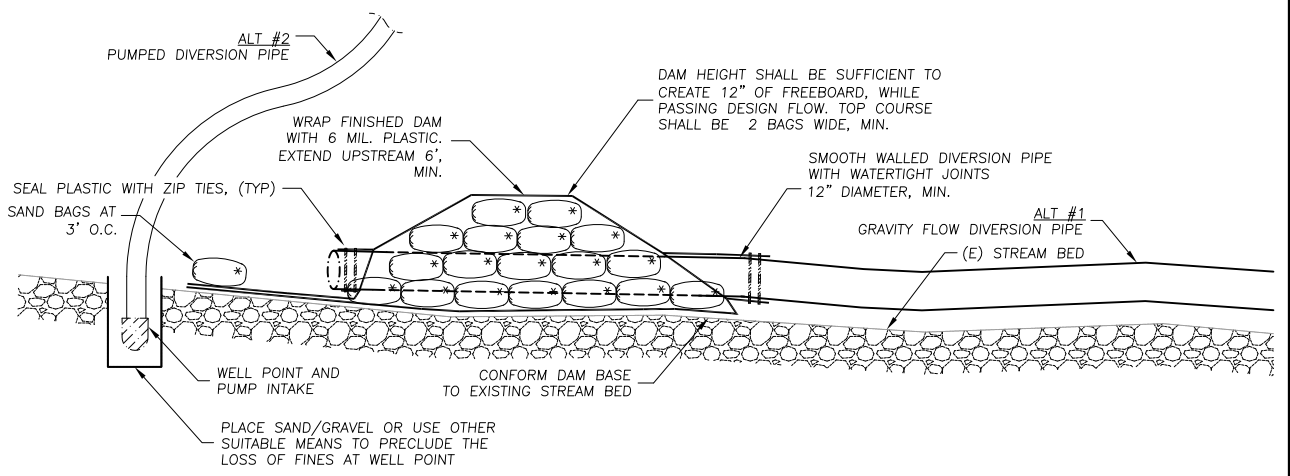
1. THE DIVERSION PLAN SHOWN IS SCHEMATIC. CONTRACTOR SHALL SUBMIT A SITE DIVERSION/DEWATERING PLAN FOR APPROVAL BY THE ENGINEER. THE BASIC REQUIREMENTS OF THE DIVERSION PLAN ARE SPECIFIED IN THE SPECIAL PROVISIONS.
2. THE TYPICAL DEWATERING PLAN SHOWN DEPICTS TWO SEPARATE TYPES OF DIVERSION STRUCTURES TO BE INSTALLED AND MAINTAINED DURING CONSTRUCTION. THESE STRUCTURES MAY BE USED SEPARATELY OR IN TANDEM AS NECESSARY TO MEET WATER QUALITY REQUIREMENTS.
3. DIVERSION PIPES MAY BE RELOCATED DURING CONSTRUCTION.



DEWATERING DISCHARGE AREA NOTES:

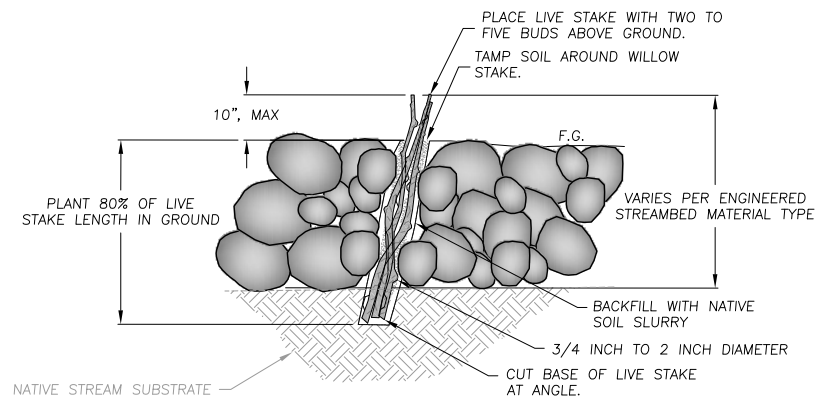
1. DEWATERING SHALL COMPLY WITH ALL PROJECT PERMITS.
2. THIS DETAIL REPRESENTS A POTENTIAL OPTION FOR DEWATERING OF WORK AREAS.
3. PROPOSED FILTRATION METHODS WILL BE FIELD-FIT TO EXISTING CONDITIONS AT THE TIME OF CONSTRUCTION, AS APPROVED BY THE ENGINEER.
4. TURBID WATER SHALL BE DISCHARGED AT A LOCATION WHERE THERE IS AN EXISTING DEPRESSION AT A MINIMUM OF 50 FEET FROM THE EXISTING CHANNEL. EXACT LOCATION TO BE APPROVED BY THE ENGINEER. WHERE NATURAL DEPRESSION CANNOT BE FOUND, FILTER BAGS, "BAKER TANKS" OR OTHER APPROVED MEANS SHALL BE EMPLOYED.
5. NO OVERLAND FLOW SHALL BE ALLOWED TO DRAIN FROM A DISCHARGE AREA TO AN EXISTING OR PROPOSED CHANNEL.

WORK AREA DEWATERING DETAIL (2) C22/C22
 N.T.S.



DIVERSION DAM PROFILE (3) C22/C22
 N.T.S.

NOTE: CONTRACTOR MAY USE ALTERNATE DAM DETAIL, SUBJECT TO APPROVAL OF THE ENGINEER AND THE PERMITTING AGENCIES.

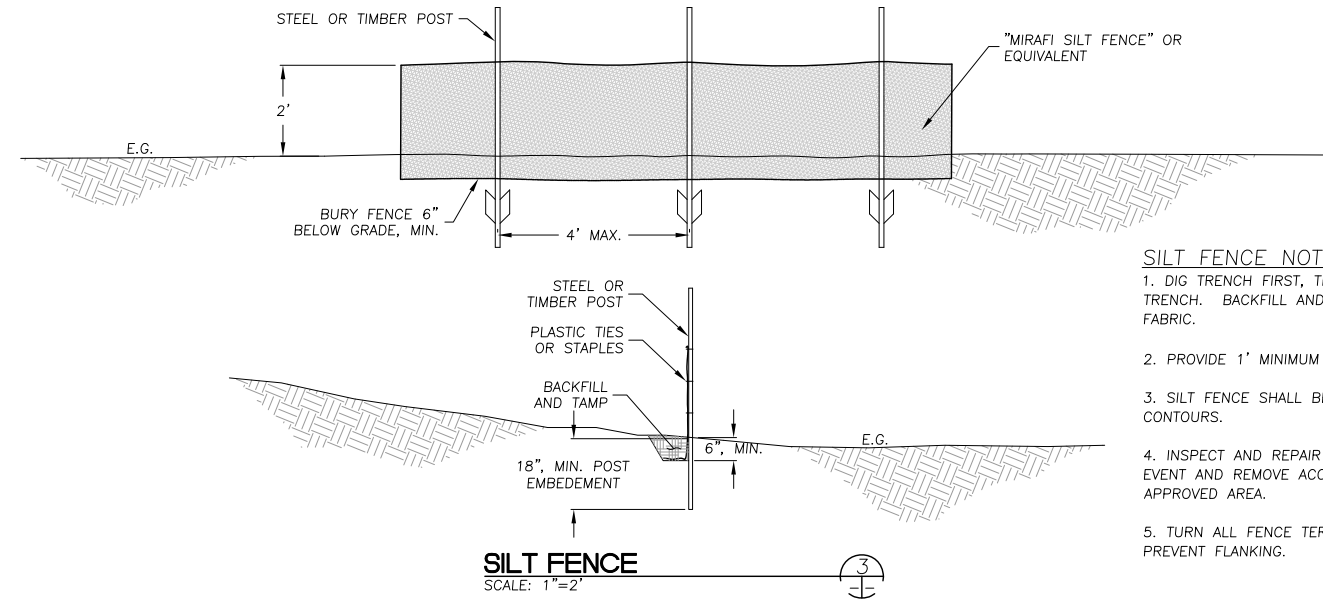


LIVE STAKE BUNDLE
N.T.S.



LIVE STAKE BUNDLE NOTES:

1. LIVE STAKE BUNDLES TO BE INSTALLED WITHIN ENGINEERED STREAMBED MATERIAL ON EXCAVATED FLOODPLAINS AND WITHIN FLOODPLAIN ARMOR AT 7' ON-CENTER SPACING.
2. LIVE STAKE BUNDLES SHALL CONTACT NATIVE SOIL.
3. LIVE STAKE BUNDLES TO CONSIST OF LIVE STAKES 3/4"-2" IN DIA. AT THE BASAL END.
4. TOP ENDS OF STAKES SHALL BE BLUNT AND BASAL ENDS SHALL BE ANGLED AT 45 DEGREES.
5. PLACE LIVE STAKE BUNDLES COINCIDENT WITH THE ENGINEERED STREAMBED MATERIAL AND FLOODPLAIN ARMOR.
6. AFTER PLACEMENT, BACKFILL AND WATER-JET ALL VOIDS AROUND LIVE STAKE BUNDLES TO REMOVE AIR POCKETS.
7. AFTER INSTALLATION CLEANLY CUT EACH STAKE TO LEAVE 10" EXPOSED, MAX.

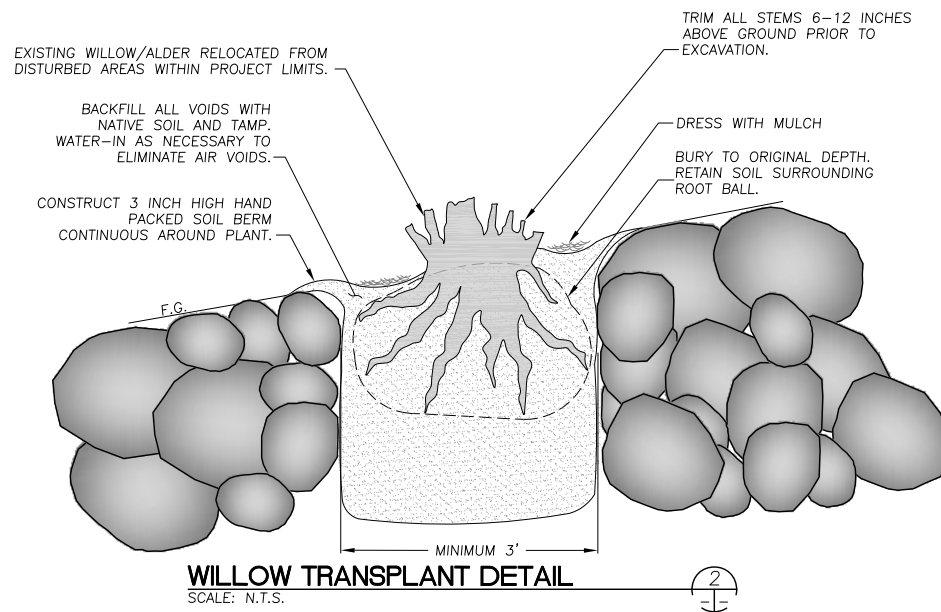


SILT FENCE
SCALE: 1"=2'



SILT FENCE NOTES

1. DIG TRENCH FIRST, THEN ERECT FENCE IN TRENCH. BACKFILL AND COMPACT SOIL TO SECURE FABRIC.
2. PROVIDE 1' MINIMUM OVERLAP AT FENCE SPLICES.
3. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS.
4. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE ACCUMULATED SEDIMENT, TO AN APPROVED AREA.
5. TURN ALL FENCE TERMINATIONS UPSLOPE TO PREVENT FLANKING.

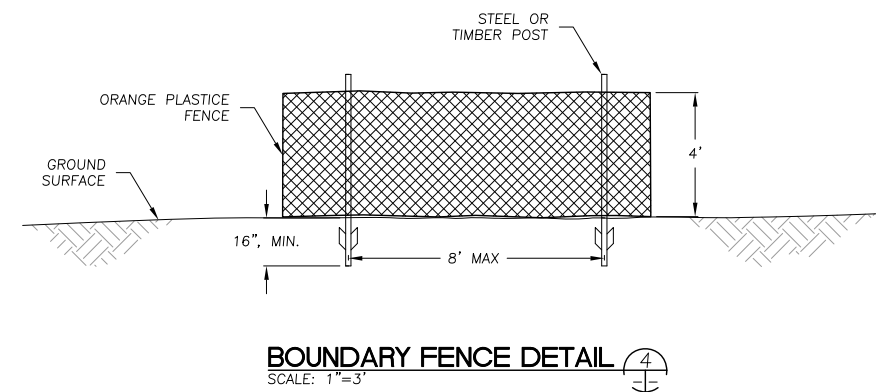


WILLOW TRANSPLANT DETAIL
SCALE: N.T.S.

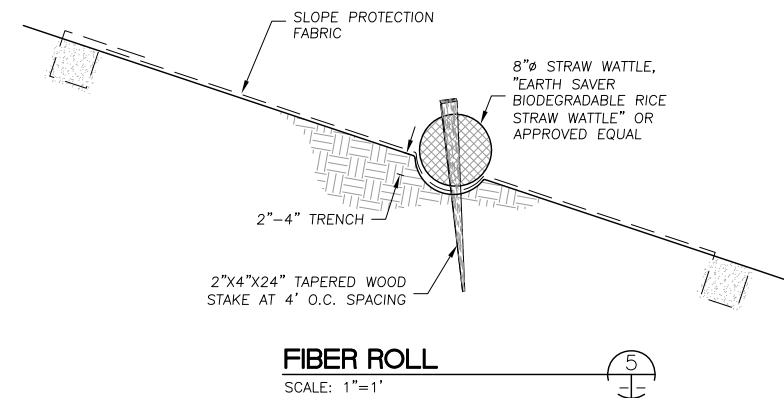


WILLOW TRANSPLANT NOTES:

1. SALVAGE:
 - 1.1. LIVE SHRUBS TO BE SALVAGED FOR TRANSPLANTING WILL BE FLAGGED IN THE FIELD BY THE ENGINEER.
 - 1.2. PRIOR TO REMOVAL, LOP BRANCHES TO 6-12 INCHES ABOVE THE ROOT CROWN, USING SHARP, CLEAN TOOLS.
 - 1.3. REMOVE THE ROOTWAD AND A MINIMUM EIGHTEEN INCH LAYER (AT SIDES AND BASE) OF ROOTS AND SOIL FROM THE GROUND AND EITHER TRANSPORT DIRECTLY TO THE PROPOSED LOCATION FOR INSTALLATION, OR STORE AS OUTLINED BELOW. PERFORM SALVAGE AND RELOCATION IN SUCH A MANNER AS TO MINIMIZE HANDLING AND ASSOCIATED DISTURBANCE TO THE SOIL BOUND BY THE ROOTS.
 - 1.4. IMMEDIATELY COVER LIVE SHRUBS WITH A SINGLE LAYER OF SATURATED BURLAP TO PREVENT DESICCATION OF THE ROOTS, AND PLACED UNDER SHADE COVERING IF THE LIVE SHRUB IS NOT PLANTED WITHIN FIFTEEN MINUTES OF SALVAGE. CONTRACTOR SHALL MAINTAIN SATURATION OF THE BURLAP AND SOIL MASS UNTIL PLANTED.
 - 1.5. DO NOT STACK LIVE SHRUBS ON TOP OF ONE ANOTHER DURING STORAGE.
 - 1.6. IN NO EVENT SHALL SALVAGED ROOTWADS BE STORED FOR PERIODS EXCEEDING 72 HOURS, WITHOUT PRIOR WRITTEN PERMISSION OF THE ENGINEER.
2. INSTALLATION
 - 2.1. PLACE LIVE SHRUBS AT FLOODPLAIN LOCATIONS FLAGGED IN THE FIELD BY THE ENGINEER.
 - 2.2. PLACE THE EXCAVATED ROOTWAD IN A PRE-PREPARED HOLE. FILL THE HOLE WITH WATER IMMEDIATELY PRIOR TO PLANTING. SCARIFY THE SIDES OF THE PLANTING HOLE PRIOR TO PLANTING.
 - 2.3. REMOVE BURLAP PRIOR TO PLANTING. BACKFILL THE HOLE HALF WAY WITH NATIVE SOIL AND JET WITH WATER TO REMOVE VOIDS AFTER PLACEMENT. CONTINUE TO ADD SOIL AND WATER UNTIL THE SATURATED BACKFILL MATERIAL COVERS THE TOP OF THE ROOT CROWN TO THE APPROXIMATE ORIGINAL DEPTH OF SOIL, PRIOR TO SALVAGE.



BOUNDARY FENCE DETAIL
SCALE: 1"=3'



FIBER ROLL
SCALE: 1"=1'



PRELIMINARY
NOT FOR CONSTRUCTION

PREPARED AT THE REQUEST OF:
LEHIGH HANSON HEIDELBERG CEMENT GROUP

MISCELLANEOUS
DETAILS

PERMANENTE CREEK
RESTORATION PLAN
70% DESIGN SUBMITTAL

DESIGNED BY: B.M.S.
DRAWN BY: M.W.W.
CHECKED BY: M.W.W.
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BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS

ROCK SPECIFICATIONS

THERE SHALL BE THREE CLASSES OF ROCK SPECIFIED ON THIS PROJECT;
 (1) - ENGINEERED STREAMBED MATERIAL
 (2) - FLOODPLAIN ARMOR
 (3) - ROCK SLOPE PROTECTION (R.S.P.)

ALL IMPORTED ROCK SHALL CONFORM TO THE FOLLOWING QUALITY REQUIREMENTS:

- ROCK SHALL BE RESISTANT TO WEATHERING AND WATER ACTION AND FREE OF ORGANIC OR OTHER UNSUITABLE MATERIAL. DO NOT USE SHALE, ROCK WITH SHALE SEAMS, OR OTHER FISSILE OR FISSURED ROCK THAT MAY BREAK INTO SMALLER PIECES IN THE PROCESS OF HANDLING AND PLACING.
- ROCK SHALL BE SUB-ROUNDED TO SUB-ANGULAR IN SHAPE.
- ROCK SHALL BE GRANITE OR HAVE A SPECIFIC GRAVITY EQUAL TO OR GREATER THAN THAT OF GRANITE.
- COLOR AND TEXTURE SHALL BE CONSTANT THROUGHOUT THE STOCKPILE.

SAMPLES OF ALL IMPORTED ROCK SHALL BE PROVIDED TO THE ENGINEER FOR APPROVAL, PRIOR TO STOCKPILING ON SITE.

INDIVIDUAL ROCK CLASSES AND PLACEMENT METHODS ARE FURTHER DEFINED AS FOLLOWS:

1 - ENGINEERED STREAMBED MATERIAL

ENGINEERED STREAMBED MATERIAL SHALL CONSIST OF SANDS, GRAVELS, COBBLES, AND BOULDERS FREE OF ORGANIC MATTER, AND MEETING THE FOLLOWING GRADATION SPECIFICATIONS (REFER TO DRAWINGS FOR TYPE LOCATIONS):

TYPE 1 GRADATION:

U.S. SIEVE SIZE	PERCENT PASSING (BY WEIGHT)
18"	100
12"	60-85
8"	40-60
4"	25-40
0.6"	10-20
No. 4	5-10

TYPE 2 GRADATION:

U.S. SIEVE SIZE	PERCENT PASSING (BY WEIGHT)
30"	100
24"	60-85
12"	40-60
4"	25-40
0.6"	10-20
No. 4	5-10

TYPE 3 GRADATION:

U.S. SIEVE SIZE	PERCENT PASSING (BY WEIGHT)
40"	100
30"	60-85
16"	40-60
8"	25-40
4"	15-25
0.6"	10-15
No. 4	5-10

TYPE 4 GRADATION:

U.S. SIEVE SIZE	PERCENT PASSING (BY WEIGHT)
48"	100
36"	60-85
20"	40-60
10"	25-40
4"	15-25
0.6"	10-15
No. 4	5-10

A) ENGINEERED STREAMBED MATERIAL SHALL BE PLACED TO THE LINES, GRADES AND DEPTHS SHOWN ON THE DRAWINGS, OR AS DIRECTED BY THE ENGINEER. UNIFORMLY DISTRIBUTE LARGE STONES TO PRODUCE THE REQUIRED GRADATION OF ROCK. PREVENT CONTAMINATION OF ROCK MATERIALS BY EXCAVATION AND/OR EARTH MATERIALS.

B) FOLLOWING PLACEMENT, ROCK SURFACE SHALL BE JETTED WITH WATER TO IMPROVE COMPACTION AND EMBED THE FINES WITHIN THE MIX. JETTING SHALL START AT THE UPSTREAM LIMITS OF PLACEMENT AND PROGRESS DOWNSTREAM. JETTING SHALL CONTINUE UNTIL THE TURBIDITY LEVELS OF RUNOFF PRODUCED FROM THE JETTING PROCESS HAVE REACHED AN ACCEPTABLE LEVEL AS DETERMINED BY THE ENGINEER. ALL SEDIMENT-LADEN RUNOFF GENERATED BY THE JETTING OPERATIONS SHALL BE PUMPED TO A SETTLING TANK OR SIMILAR DEVICE TO REDUCE TURBIDITY TO ACCEPTABLE LEVELS, IN COMPLIANCE WITH PERMIT CONDITIONS, PRIOR TO DISCHARGE TO THE CREEK.

2 - FLOODPLAIN ARMOR

FLOODPLAIN ARMOR MATERIAL SHALL CONSIST OF SANDS, GRAVELS, COBBLES, AND BOULDERS FREE OF ORGANIC MATTER, AND MEETING THE FOLLOWING GRADATION SPECIFICATIONS (REFER TO DRAWINGS FOR TYPE LOCATIONS):

TYPE 1 GRADATION:

TYPE 1 FLOODPLAIN ARMOR SHALL COMPLY WITH THE ENGINEERED STREAMBED MATERIAL TYPE 1 GRADATION.

TYPE 2 GRADATION:

U.S. SIEVE SIZE	PERCENT PASSING (BY WEIGHT)
24"	100
18"	60-85
12"	40-60
6"	25-40
3"	10-25
No. 4	5-15
No. 10	0-5

TYPE 3 GRADATION:

U.S. SIEVE SIZE	PERCENT PASSING (BY WEIGHT)
30"	100
24"	60-85
18"	40-60
6"	25-40
3"	10-25
No. 4	5-15
No. 10	0-5

TYPE 4 GRADATION:

TYPE 4 FLOODPLAIN ARMOR SHALL COMPLY WITH THE ENGINEERED STREAMBED MATERIAL TYPE 4 GRADATION.

A) FLOODPLAIN ARMOR MATERIAL SHALL BE PLACED TO THE LINES, GRADES AND DEPTHS SHOWN ON THE DRAWINGS, OR AS DIRECTED BY THE ENGINEER. UNIFORMLY DISTRIBUTE LARGE STONES TO PRODUCE THE REQUIRED GRADATION OF ROCK. PREVENT CONTAMINATION OF ROCK MATERIALS BY EXCAVATION AND/OR EARTH MATERIALS.

B) FOLLOWING PLACEMENT, ROCK SURFACE SHALL BE JETTED WITH WATER TO IMPROVE COMPACTION AND EMBED THE FINES WITHIN THE MIX. JETTING SHALL START AT THE UPSTREAM LIMITS OF PLACEMENT AND PROGRESS DOWNSTREAM. JETTING SHALL CONTINUE UNTIL THE TURBIDITY LEVELS OF RUNOFF PRODUCED FROM THE JETTING PROCESS HAVE REACHED AN ACCEPTABLE LEVEL AS DETERMINED BY THE ENGINEER. ALL SEDIMENT-LADEN RUNOFF GENERATED BY THE JETTING OPERATIONS SHALL BE PUMPED TO A SETTLING TANK OR SIMILAR DEVICE TO REDUCE TURBIDITY TO ACCEPTABLE LEVELS, IN COMPLIANCE WITH PERMIT CONDITIONS, PRIOR TO DISCHARGE TO THE CREEK.

3 - ROCK SLOPE PROTECTION

A) ROCK SLOPE PROTECTION SHALL CONFORM TO SECTION 72-2.02 MATERIALS OF THE STANDARD SPECIFICATIONS FOR 1/2 TON ROCK.

B) BACKFILL MATERIAL CONSISTING OF GRANULAR NATIVE STREAMBED MATERIAL SHALL BE USED TO BACKFILL VOIDS WITHIN THE ROCK SLOPE PROTECTION. IF GRANULAR NATIVE MATERIAL IS NOT AVAILABLE CONTRACTOR SHALL BLEND SAND, GRAVELS, AND NATIVE SOILS TO THE SATISFACTION OF THE ENGINEER FOR USE IN BACKFILLING THE RSP VOIDS.

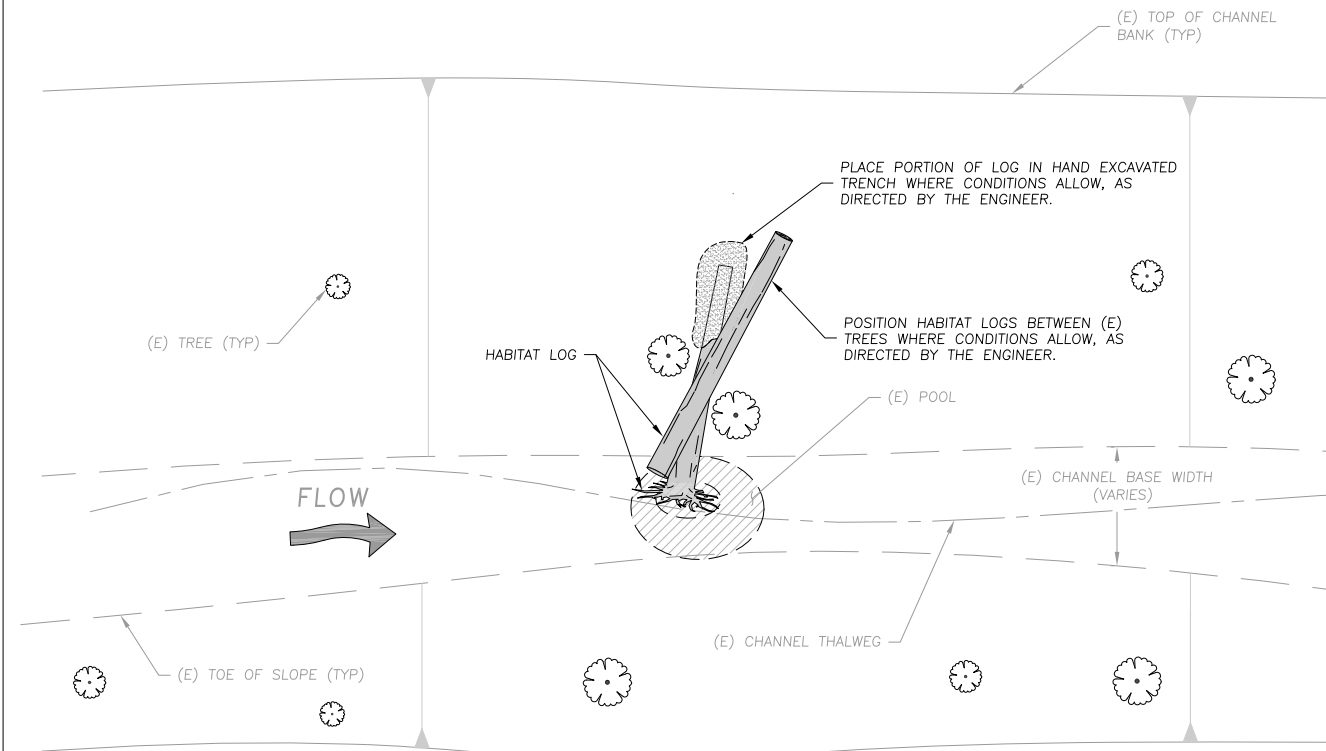
C) BACKFILL MATERIAL SHALL BE PLACED TO MATCH THE FINISHED SURFACE OF THE RSP AND WATER JETTED TO FILL ALL VOIDS, AS DIRECTED BY THE ENGINEER.

ROCK SLOPE PROTECTION FABRIC

- GEOTEXTILE FABRIC SHALL BE PLACED BELOW ROCK SLOPE PROTECTION.
- GEOTEXTILE FABRIC SHALL BE NON-WOVEN, GEOTEX 1601, AS MANUFACTURED BY SYNTHETIC INDUSTRIES; OR MIRAFI 1160N, AS MANUFACTURED BY TC MIRAFI; OR APPROVED EQUAL.

INSTALLATION

- PREPARE SURFACE TO RECEIVE THE GEOTEXTILE TO A RELATIVELY SMOOTH CONDITION, FREE OF OBSTRUCTIONS, DEPRESSIONS, DEBRIS, AND SOFT OR LOW DENSITY POCKETS OF MATERIAL.
- PLACE AND SECURE A LAYER OF GEOTEXTILE FABRIC BELOW THE FIRST ROCK LAYER. AT THE TIME OF INSTALLATION, THE GEOTEXTILE SHALL BE REJECTED IF IT HAS DEFECTS, RIPS, HOLES, FLAWS, DETERIORATION, OR DAMAGE INCURRED DURING MANUFACTURE, TRANSPORTATION, OR STORAGE.
- PLACE GEOTEXTILE WITH THE LONG DIMENSION PARALLEL TO FLOW AND LAID SMOOTH AND FREE OF TENSION, STRESS, FOLDS, WRINKLES, OR CREASES.



HABITAT LOG PLAN
SCALE: 1" = 5'

HABITAT LOG NOTES:

1. GENERAL

- PLACE TWO HABITAT LOGS AT FOUR LOCATIONS PER REACH IN REACHES R14 TO R16 AND R19 TO R21 (SEE SHEET C2 FOR REACH LOCATIONS).
- HABITAT LOGS SHALL BE LOCALLY SOURCED FROM EXISTING LIVE AND DEAD TREES. TREES TO BE SALVAGE WILL BE FLAGGED IN THE FIELD AT THE TIME OF CONSTRUCTION BY THE PROJECT ENGINEER AND ARBORIST. SALVAGE DOWNED TREES WHERE POSSIBLE, PREFERABLY WITH THE ROOTWAD INTACT. IF DOWNED LOGS ARE NOT AVAILABLE, THE PROJECT ARBORIST WILL IDENTIFY TREES TO BE FELLED. LOGS SHALL BE OAK, WILLOW, OR ALDER.
- LOCATIONS FOR HABITAT LOG PLACEMENT WILL BE DETERMINED BY THE ENGINEER AND FISHERIES BIOLOGIST AT THE TIME OF CONSTRUCTION. FINAL LOCATIONS SHALL BE BASED ON LOCAL GEOMORPHIC CONDITIONS AND THE AVAILABILITY OF EXISTING POOLS AND SUITABLE LOGS, MEETING THE CRITERIA BELOW.
- INCORPORATE HABITAT LOGS INTO EXISTING POOLS WHEN LOCALLY AVAILABLE.

2. LOG PLACEMENT AND DIMENSIONS

- HABITAT LOG DESIGNS ARE SHOWN CONCEPTUALLY DUE TO THE INHERENT VARIABILITY OF MATERIAL PROPERTIES. THE DESIGN REQUIRES THAT THE ENGINEER OBSERVE INSTALLATION OF THE HABITAT LOGS TO ENSURE THE INTENT OF THE DESIGN IS MET. OBSERVATIONS WILL INCLUDE LOG SELECTION, PLACEMENT, AND ANCHORING STABILIZATION.
- HABITAT LOGS SHALL BE A MINIMUM OF 12 FT. IN LENGTH AND 1 FT. IN DIAMETER, ALONG THE LENGTH OF THE LOG.
- POSITION HABITAT LOGS BETWEEN EXISTING TREES WITH A PORTION OF THE LOG BURIED IN A TRENCH WHERE CONDITIONS ALLOW. CABLING WILL NOT BE EMPLOYED THEREFORE, LOGS MAY BE MOBILIZED DURING LARGE FLOODING EVENTS.

DESIGNED BY: B.M.Z.
 DRAWN BY: B.M.Z.
 CHECKED BY: M.W.W.
 DATE: 04/27/15
 JOB NO.: 13-016

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS

GENERAL NOTES CONTINUED

1. ALL CONSTRUCTION AND MATERIALS SHALL CONFORM TO THE MAY 2010 EDITION OF THE STATE OF CALIFORNIA STANDARD SPECIFICATIONS, ISSUED BY THE DEPARTMENT OF TRANSPORTATION (HEREAFTER REFERRED TO AS "STANDARD SPECIFICATIONS").
2. THE ENGINEER SHALL BE NOTIFIED AT LEAST 48 HOURS PRIOR TO CONSTRUCTION. THE ENGINEER OR A DESIGNATED REPRESENTATIVE SHALL MONITOR THE CONSTRUCTION PROCESS, AS NECESSARY, TO ENSURE PROPER INSTALLATION PROCEDURES.
3. EXISTING UNDERGROUND UTILITY LOCATIONS:
 - A. PRIOR TO BEGINNING WORK, THE CONTRACTOR SHALL CONTACT ALL UTILITIES COMPANIES WITH REGARD TO WORKING OVER, UNDER, OR AROUND EXISTING FACILITIES AND TO OBTAIN INFORMATION REGARDING RESTRICTIONS THAT ARE REQUIRED TO PREVENT DAMAGE TO THE FACILITIES.
 - B. LOCATIONS SHOWN ARE COMPILED FROM INFORMATION SUPPLIED BY THE APPROPRIATE UTILITY AGENCIES AND FROM FIELD MEASUREMENTS TO ABOVE GROUND FEATURES READILY VISIBLE AT THE TIME OF SURVEY. LOCATIONS SHOWN ARE APPROXIMATE. THE CONTRACTOR IS CAUTIONED THAT ONLY ACTUAL EXCAVATION WILL REVEAL THE DIMENSIONS, SIZES, MATERIALS, LOCATIONS, AND DEPTH OF UNDERGROUND UTILITIES.
 - C. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE LOCATION AND/OR PROTECTION OF ALL EXISTING AND PROPOSED PIPING, UTILITIES, TRAFFIC SIGNAL EQUIPMENT (BOTH ABOVE GROUND AND BELOW GROUND), STRUCTURES, AND ALL OTHER EXISTING IMPROVEMENTS THROUGHOUT CONSTRUCTION.
 - D. PRIOR TO COMMENCING FABRICATION OR CONSTRUCTION, CONTRACTOR SHALL DISCOVER OR VERIFY THE ACTUAL DIMENSIONS, SIZES, MATERIALS, LOCATIONS, AND ELEVATIONS OF ALL EXISTING UTILITIES AND POTHOLE THOSE AREAS WHERE POTENTIAL CONFLICTS ARE LIKELY OR DATA IS OTHERWISE INCOMPLETE.
 - E. CONTRACTOR SHALL TAKE APPROPRIATE MEASURES TO PROTECT EXISTING UTILITIES DURING CONSTRUCTION OPERATIONS, AND SHALL BE SOLELY RESPONSIBLE FOR THE COST OF REPAIR/REPLACEMENT OF ANY EXISTING UTILITIES DAMAGED DURING CONSTRUCTION. CONTRACTOR TO CALL UNDERGROUND SERVICE ALERT (1-800-642-2444) TO LOCATE ALL UNDERGROUND UTILITY LINES PRIOR TO COMMENCING CONSTRUCTION.
 - F. UPON LEARNING OF THE EXISTENCE AND/OR LOCATIONS OF ANY UNDERGROUND FACILITIES NOT SHOWN OR SHOWN INACCURATELY ON THE PLANS OR NOT PROPERLY MARKED BY THE UTILITY OWNER, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE UTILITY OWNER AND THE CITY BY TELEPHONE AND IN WRITING.
 - G. UTILITY RELOCATIONS REQUIRED FOR THE CONSTRUCTION OF THE PROJECT FACILITIES WILL BE PERFORMED BY THE UTILITY COMPANY, UNLESS OTHERWISE NOTED.
12. SHOULD THE CONTRACTOR DISCOVER ANY DISCREPANCIES BETWEEN THE CONDITIONS EXISTING IN THE FIELD AND THE INFORMATION SHOWN ON THESE DRAWINGS, HE SHALL NOTIFY THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.
13. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO BE FULLY INFORMED OF AND TO COMPLY WITH ALL LAWS, ORDINANCES, CODES, REQUIREMENTS AND STANDARDS WHICH IN ANY MANNER AFFECT THE COURSE OF CONSTRUCTION OF THIS PROJECT, THOSE ENGAGED OR EMPLOYED IN THE CONSTRUCTION AND THE MATERIALS USED IN THE CONSTRUCTION.
14. ANY TESTS, INSPECTIONS, SPECIAL OR OTHERWISE, THAT ARE REQUIRED BY THE BUILDING CODES, LOCAL BUILDING DEPARTMENTS, OR THESE PLANS, SHALL BE DONE BY AN INDEPENDENT INSPECTION COMPANY. JOB SITE VISITS BY THE ENGINEER DO NOT CONSTITUTE AN OFFICIAL INSPECTION. OBSERVATION AND TESTING SERVICES ARE REQUIRED BY THE GEOTECHNICAL ENGINEER AS OUTLINED IN THE GEOTECHNICAL REPORT. IT IS THE CONTRACTORS RESPONSIBILITY TO ENSURE THAT THE WORK IS COORDINATED WITH THE GEOTECHNICAL ENGINEER AND THAT REQUIRED TESTS AND INSPECTIONS ARE PERFORMED.
15. PROJECT SCHEDULE: PRIOR TO COMMENCEMENT OF WORK, CONTRACTOR SHALL PROVIDE ENGINEER A DETAILED CONSTRUCTION SCHEDULE FOR APPROVAL. THE CONTRACTOR SHALL NOT BEGIN ANY CONSTRUCTION WORK UNTIL THE PROJECT SCHEDULE AND WORK PLAN IS APPROVED BY THE ENGINEER. ALL CONSTRUCTION SHALL BE CLOSELY COORDINATED WITH THE ENGINEER SO THAT THE QUALITY OF WORK CAN BE CHECKED FOR APPROVAL. THE CONTRACTOR SHALL PURSUE WORK IN A CONTINUOUS AND DILIGENT MANNER TO ENSURE A TIMELY COMPLETION OF THE PROJECT.
16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGN, PERMITTING, INSTALLATION, AND MAINTENANCE OF ANY AND ALL TRAFFIC CONTROL MEASURES DEEMED NECESSARY.
17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR GENERAL SAFETY DURING CONSTRUCTION. ALL WORK SHALL CONFORM TO PERTINENT SAFETY REGULATIONS AND CODES. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR FURNISHING, INSTALLING, AND MAINTAINING ALL WARNING SIGNS AND DEVICES NECESSARY TO SAFEGUARD THE GENERAL PUBLIC AND THE WORK, AND PROVIDE FOR THE PROPER AND SAFE ROUTING OF VEHICULAR AND PEDESTRIAN TRAFFIC DURING THE PERFORMANCE OF THE WORK. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR COMPLIANCE WITH ALL APPLICABLE PROVISIONS OF OSHA IN THE CONSTRUCTION PRACTICES FOR ALL EMPLOYEES DIRECTLY ENGAGED IN THE CONSTRUCTION OF THIS PROJECT.
18. CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS, AND CONSTRUCTION CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD DESIGN PROFESSIONAL HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTION LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF DESIGN PROFESSIONAL. NEITHER THE PROFESSIONAL ACTIVITIES OF CONSULTANT NOR THE PRESENCE OF CONSULTANT OR HIS OR HER EMPLOYEES OR SUB-CONSULTANTS AT A CONSTRUCTION SITE SHALL RELIEVE THE CONTRACTOR AND ITS SUBCONTRACTORS OF THEIR RESPONSIBILITIES INCLUDING, BUT NOT LIMITED TO, CONSTRUCTION MEANS, METHODS, SEQUENCE, TECHNIQUES OR PROCEDURES NECESSARY FOR PERFORMING, SUPERINTENDING OR COORDINATING ALL PORTIONS OF THE WORK OF CONSTRUCTION IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND APPLICABLE HEALTH OR SAFETY REQUIREMENTS OF ANY REGULATORY AGENCY OR OF STATE LAW.
19. THE CONTRACTOR SHALL MAINTAIN A CURRENT, COMPLETE, AND ACCURATE RECORD OF ALL AS-BUILT DEVIATIONS FROM THE CONSTRUCTION AS SHOWN ON THESE DRAWINGS AND SPECIFICATIONS, FOR THE PURPOSE OF PROVIDING THE ENGINEER OF RECORD WITH A BASIS FOR THE PREPARATION OF RECORD DRAWINGS.
20. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE SITE IN A NEAT AND ORDERLY MANNER THROUGHOUT THE CONSTRUCTION PROCESS. ALL MATERIALS SHALL BE STORED WITHIN APPROVED STAGING AREAS.
21. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION AND PRESERVATION OF ALL SURVEY MONUMENTS OR PROPERTY CORNERS. DISTURBED MONUMENTS SHALL BE RESTORED BACK TO THEIR ORIGINAL LOCATION AND SHALL BE CERTIFIED BY A REGISTERED CIVIL ENGINEER OR LAND SURVEYOR AT THE EXPENSE OF THE CONTRACTOR.

DEMOLITION NOTES

1. THE REMOVAL OF EXISTING IMPROVEMENTS SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 15 OF THE STANDARD SPECIFICATIONS.
2. EXISTING IMPROVEMENTS, ADJACENT PROPERTY, TREES AND PLANTS, UTILITIES AND OTHER FACILITIES THAT ARE NOT REMOVED SHALL BE PROTECTED FROM INJURY OR DAMAGE RESULTING FROM THE CONTRACTOR'S OPERATIONS IN ACCORDANCE WITH SECTION 15.1 OF THE STANDARD SPECIFICATIONS.

EARTHWORK NOTES

1. GRADING SUMMARY:
 TOTAL CUT VOLUME = 420,000 CY
 TOTAL FILL VOLUME = 5,000 CY

THE ABOVE QUANTITIES ARE APPROXIMATE IN-PLACE VOLUMES CALCULATED AS THE DIFFERENCE BETWEEN EXISTING GROUND AND THE PROPOSED FINISH GRADE, PREPARED FOR PERMITTING PURPOSES ONLY. EXISTING GROUND IS DEFINED BY THE TOPOGRAPHIC CONTOURS AND/OR SPOT ELEVATIONS ON THE PLAN. PROPOSED FINISH GRADE IS DEFINED AS THE DESIGN SURFACE ELEVATION OF EARTH TO BE CONSTRUCTED, AS SHOWN ON THE DRAWINGS. THE QUANTITIES HAVE NOT BEEN FACTORED TO INCLUDE ALLOWANCES FOR BULKING, CLEARING AND GRUBBING, SUBSIDENCE, SHRINKAGE, OVER EXCAVATION, AND RECOMPACTION, UNDERGROUND UTILITY AND SUBSTRUCTURE SPOILS AND CONSTRUCTION METHODS. QUANTITIES ARE SUBJECT TO CHANGE, PENDING EXCAVATION AND INSPECTION OF SUBSURFACE CONDITIONS AT THE "ROCK PILE" AND "OVERBURDEN REMOVAL" AREAS, WHICH WILL ULTIMATELY DETERMINE FINISH GRADE AT THESE TWO AREAS.

THE CONTRACTOR SHALL PERFORM AN INDEPENDENT EARTHWORK ESTIMATE FOR THE PURPOSE OF PREPARING BID PRICES FOR EARTHWORK. THE BID PRICE SHALL INCLUDE COSTS FOR ANY NECESSARY IMPORT AND PLACEMENT OF EARTH MATERIALS OR THE EXPORT AND PROPER DISPOSAL OF EXCESS OR UNSUITABLE EARTH MATERIALS.

2. ALL EXCESS SOILS SHALL BE REMOVED TO AN APPROVED DUMP SITE OR DISPOSED OF ON SITE AT A LOCATION TO BE APPROVED BY THE ENGINEER, IN A MANNER THAT WILL NOT CAUSE EROSION,
3. CLEARING AND GRUBBING, SUBGRADE PREPARATION AND EARTHWORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 19 OF THE STANDARD SPECIFICATIONS, THESE DRAWINGS, AND THE TECHNICAL SPECIFICATIONS.
4. UNSUITABLE SOIL OR MATERIALS, NOT TO BE INCLUDED IN THE WORK INCLUDE:
 - A. ORGANIC MATERIALS SUCH AS PEAT, MULCH, ORGANIC SILT OR SOD.
 - B. SOILS CONTAINING EXPANSIVE CLAYS.
 - C. MATERIAL CONTAINING EXCESSIVE MOISTURE.
 - D. POORLY GRADED COURSE MATERIAL, PARTICLE SIZE IN EXCESS OF 6 INCHES.
 - E. MATERIAL WHICH WILL NOT ACHIEVE SPECIFIED DENSITY OR BEARING.
5. FINE GRADING ELEVATIONS AND SLOPES NOT SHOWN SHALL BE DETERMINED BY THE CONTRACTOR IN THE FIELD TO OBTAIN DRAINAGE IN THE DIRECTION INDICATED. ALL FINAL GRADING SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.
6. THE TOP 6" OF SUBGRADE UNDER ALL PAVED SURFACES SUBJECT TO VEHICULAR USE SHALL BE COMPACTED TO A MINIMUM OF 95% RELATIVE COMPACTION, IN ACCORDANCE WITH ASTM-D1557 STANDARD. ALL OTHER FILL TO BE COMPACTED TO A MINIMUM OF 90% MAXIMUM DENSITY AS DETERMINED BY ASTM-D1557 AND SO CERTIFIED BY TESTS AND REPORTS FROM THE ENGINEER IN CHARGE OF THE GRADING CERTIFICATION.
7. FILL MATERIAL SHALL BE SPREAD IN LIFTS OF APPROXIMATELY 8 INCHES, MOISTENED OR DRIED TO NEAR OPTIMUM MOISTURE CONTENT AND RECOMPACTED. THE MATERIALS FOR ENGINEERED FILL SHALL BE APPROVED BY A REGISTERED GEOTECHNICAL ENGINEER. ANY IMPORTED MATERIALS MUST BE APPROVED BEFORE BEING BROUGHT TO THE SITE. THE MATERIALS USED SHALL BE FREE OF ORGANIC MATTER AND OTHER DELETERIOUS MATERIALS.
8. ALL CONTACT SURFACES BETWEEN ORIGINAL GROUND AND RECOMPACTED FILL SHALL BE EITHER HORIZONTAL OR VERTICAL. ALL ORGANIC MATERIAL SHALL BE REMOVED AND THE REMAINING SURFACE SCARIFIED TO A DEPTH OF AT LEAST 12 INCHES, UNLESS DEEPER EXCAVATION IS REQUIRED BY THE ENGINEER.

GENERAL EROSION CONTROL NOTES

1. A DETAILED EROSION AND SEDIMENT CONTROL PLAN WILL BE PREPARED BY THE ENGINEER, PRIOR TO FINALIZATION OF THE CONSTRUCTION DOCUMENTS.
2. CONTRACTOR SHALL BE FAMILIAR WITH THE CONDITIONS OF APPROVAL OF ALL REQUIRED PROJECT PERMITS AND SHALL IMPLEMENT ALL REQUIRED BMP'S PRIOR TO COMMENCING GRADING OPERATIONS
3. CONTRACTOR SHALL UTILIZE ONLY THE APPROVED HAUL ROADS AND ACCESS POINTS (AS SHOWN ON THE DRAWINGS) FOR TRANSPORT OF MATERIALS AND EQUIPMENT.
4. BETWEEN OCTOBER 15 AND APRIL 15, EXPOSED SOIL SHALL BE PROTECTED FROM EROSION AT ALL TIMES. DURING CONSTRUCTION, SUCH PROTECTION MAY CONSIST OF MULCHING AND/OR PLANTING OF NATIVE VEGETATION OF ADEQUATE DENSITY. BEFORE COMPLETION OF THE PROJECT, ANY EXPOSED SOIL ON DISTURBED SLOPES SHALL BE PERMANENTLY PROTECTED FROM EROSION.
5. A STANDBY CREW SHALL BE AVAILABLE AT ALL TIMES FOR EMERGENCY WORK THAT MAY BE REQUIRED DURING THE RAINY SEASON (OCTOBER 15 THROUGH APRIL 15). NECESSARY MATERIALS SHALL BE AVAILABLE AND STOCKPILED AT CONVENIENT LOCATIONS TO FACILITATE RAPID CONSTRUCTION OF TEMPORARY DEVICES.
6. CONSTRUCT TEMPORARY EROSION CONTROL MEASURES AS SHOWN ON THE DRAWINGS AND/OR AS DIRECTED BY THE ENGINEER TO CONTROL DRAINAGE WHICH HAS BEEN AFFECTED BY GRADING AND/OR TRENCHING OPERATIONS.
7. CONSTRUCT AND MAINTAIN EROSION CONTROL MEASURES TO PREVENT THE DISCHARGE OF EARTHEN MATERIALS TO THE CREEK FROM DISTURBED AREAS UNDER CONSTRUCTION AND FROM COMPLETED CONSTRUCTION AREAS.
8. INSTALL ALL PROTECTIVE DEVICES AT THE END OF EACH WORK DAY WHEN THE FIVE-DAY RAIN PROBABILITY EQUALS OR EXCEEDS 50 PERCENT AS DETERMINED FROM THE NATIONAL WEATHER SERVICE FORECAST OFFICE: WWW.SRH.NOAA.GOV.
9. AFTER A RAINSTORM, ALL SILT AND DEBRIS SHALL BE REMOVED FROM SEDIMENT CONTROL MEASURES.
10. THE CONTRACTOR IS RESPONSIBLE TO KEEP IN FORCE ALL EROSION CONTROL DEVICES AND TO MODIFY THOSE DEVICES AS SITE PROGRESS DICTATES.
11. THE CONTRACTOR SHALL MONITOR THE EROSION CONTROL DEVICES DURING STORMS AND MODIFY THEM IN ORDER TO PREVENT PROGRESS OF ANY ONGOING EROSION.
12. THE CONTRACTOR SHALL CONTACT THE ENGINEER IN THE EVENT THAT THE EROSION CONTROL PLAN AS DESIGNED REQUIRES ANY SUBSTANTIAL REVISIONS.

DIVERSION NOTES

1. GENERAL
 - 1.1. DIVERSION SYSTEMS SHALL BE INSTALLED TO DEWATER THE INDIVIDUAL PROJECT AREAS TO FACILITATE IN-STREAM CONSTRUCTION AND TO REDUCE THE POTENTIAL IMPACTS TO WATER QUALITY DOWNSTREAM OF THE PROJECT SITES.
 - 1.2. THE CONTRACTOR SHALL CONFIRM THAT A FAVORABLE LONG TERM WEATHER FORECAST (1 WEEK MIN.) IS OBSERVED PRIOR TO PLACEMENT OF DIVERSION STRUCTURE.
 - 1.3. PRIOR TO PLACEMENT OF DIVERSION STRUCTURE, FISH SHALL BE REMOVED FROM THE DIVERTED REACH, IN ACCORDANCE WITH SECTION 2.
 - 1.4. DIVERSION SYSTEM INSTALLATION SHALL NORMALLY BEGIN IN THE DOWNSTREAM AREA AND CONTINUE IN AN UPSTREAM DIRECTION. THE FLOW SHALL BE DIVERTED ONLY WHEN THE DIVERSION CONSTRUCTION IS COMPLETE.
 - 1.5. FOLLOWING ENGINEER'S APPROVAL OF THE COMPLETED WORK, DIVERSION SHALL BE REMOVED IMMEDIATELY, IN AN UPSTREAM DIRECTION.
2. FISH REMOVAL
 - 2.1. FISH SHALL BE REMOVED FROM THE DIVERTED REACHES BY A QUALIFIED FISHERIES BIOLOGIST, LICENSED FOR SUCH ACTIVITIES BY THE NATIONAL MARINE FISHERIES SERVICE AND THE CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE.
 - 2.2. BLOCK NETS SHALL BE PROVIDED AND INSTALLED BY THE FISHERIES BIOLOGIST. BLOCK NETS SHALL BE MAINTAINED BY THE CONTRACTOR BOTH UPSTREAM AND DOWNSTREAM OF THE WORK AREA, THROUGHOUT THE PERIOD OF CONSTRUCTION. MAINTENANCE INCLUDES PERIODIC REMOVAL OF ACCUMULATED DEBRIS, AS NECESSARY TO ENSURE FUNCTION. BLOCK NETS SHALL BE REMOVED BY THE FISHERIES BIOLOGIST AFTER THE DIVERSION IS REMOVED AND THE IN CHANNEL WORK AREA IS RE-WATERED.
3. DIVERSION SYSTEM
 - 3.1. THE CONTRACTOR SHALL INSTALL A TEMPORARY SEALED SANDBAG DAM TO CAPTURE AND DIVERT STREAM FLOW UPSTREAM OF THE PROJECT SITE. THE DAM AND METHOD OF SEALING SHALL BE PLACED AT AN APPROPRIATE DEPTH TO CAPTURE SUBSURFACE STREAM FLOW, AS NEEDED TO DEWATER THE STREAMBED.
 - 3.2. THE CONTRACTOR SHALL MAINTAIN THE DIVERSION DAM DURING THE COURSE OF CONSTRUCTION WORK.
 - 3.3. THE DIVERSION STRUCTURE SHALL BE CONSTRUCTED AS SHOWN ON THE DRAWINGS, OR AS DIRECTED BY THE ENGINEER IN THE FIELD.
 - 3.4. IN THE EVENT OF A SIGNIFICANT STORM, THE CONTRACTOR SHALL BE PREPARED TO TAKE NECESSARY MEASURES TO INSURE SAFE PASSAGE OF STORM WATER FLOW THROUGH THE PROJECT AREA, WITHOUT DAMAGE TO EXISTING STRUCTURES, OR INTRODUCTION OF EXCESSIVE SEDIMENT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY EROSION CONTROL B.M.P.'S.
4. DEWATERING OF CONSTRUCTION AREAS
 - 4.1. ANY DEWATERING ACTIVITIES WHICH MAY BE REQUIRED FOR CONSTRUCTION PURPOSES SHALL BE CONDUCTED IN A MANNER WHICH DOES NOT RESULT IN AN EXCEEDANCE OF ANY WATER QUALITY REQUIREMENTS ESTABLISHED BY THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD.
 - 4.2. DISCHARGE OF WATER FROM THE DEWATERED CONSTRUCTION SITE, EITHER BY GRAVITY OR PUMPING, SHALL BE PERFORMED IN A MANNER TO PREVENT EXCESSIVE TURBIDITY FROM ENTERING THE RECEIVING WATERWAYS AND TO PREVENT SCOUR AND EROSION OUTSIDE OF THE CONSTRUCTION SITE. PUMPED WATER SHOULD BE PRE-FILTERED WITH SAND/GRAVEL PACK AROUND SUMPS FOR SUBSURFACE FLOWS AND A SILT FENCE OR HAY BALES AROUND PUMPS FOR SURFACE FLOW. PUMPED WATER SHALL BE DISCHARGED INTO ISOLATED LOCAL DEPRESSIONS, FILTER BAGS, SETTLING (BAKER) TANKS, OR TEMPORARY SEDIMENT BASINS, AS NECESSARY TO MEET WATER QUALITY REQUIREMENTS. WHERE WATER TO BE DISCHARGED INTO THE CREEK WILL CREATE EXCESSIVE TURBIDITY, THE WATER SHALL BE ROUTED THROUGH A SEDIMENT INTERCEPTOR OR OTHER FACILITIES TO REMOVE SEDIMENT FROM WATER.
 - 4.3. CONTRACTOR SHALL SUPPLY ALL NECESSARY PUMPS, PIPING, FILTERS, SHORING, AND OTHER TOOLS AND MATERIALS NECESSARY FOR DEWATERING.



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PRELIMINARY

NOT FOR CONSTRUCTION

PREPARED AT THE REQUEST OF:

**LEHIGH HANSON
 HEIDELBERG CEMENT
 GROUP**

NOTES

**PERMANENTE CREEK
 RESTORATION PLAN**

70% DESIGN SUBMITTAL

DESIGNED BY:
 DRAWN BY: B.M.S.
 CHECKED BY: M.W.W.
 DATE: 04/27/15
 JOB NO.: 13-016

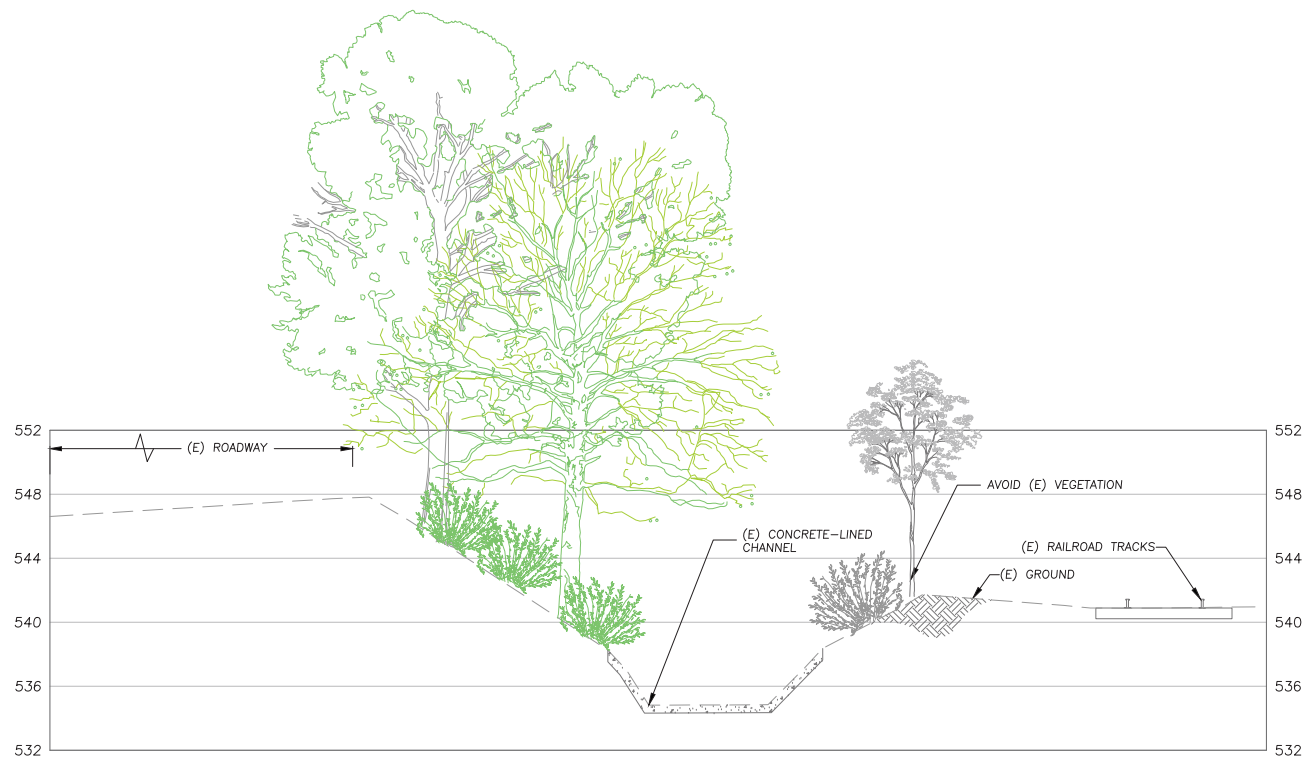
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS

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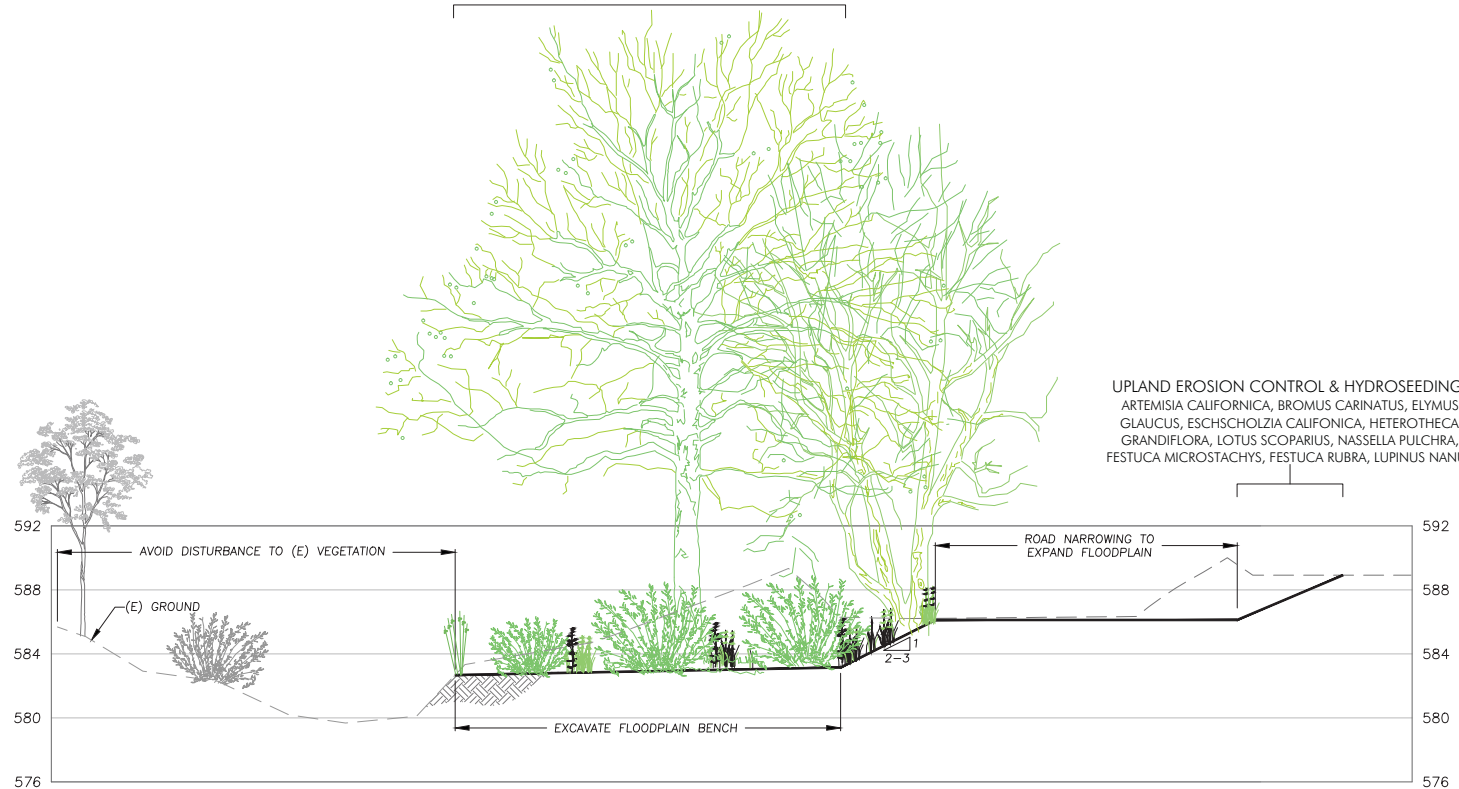
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RIPARIAN PLANTING (TYPE 3):
 ARTEMISIA CALIFORNICA, BACCHARIS PILULARIS, PRUNUS ILICIFOLIA, QUERCUS AGRIFOLIA, SALVIA MELLIFERA, SAMBUCUS NIGRA, UMBELLULARIA CALIFORNICA



TYPICAL CONCRETE-LINED CHANNEL BANK PLANTING SECTION A
 PER SHEET C5
 SCALE: 1" = 10'

RIPARIAN PLANTING (TYPE 1):
 ACER MACROPHYLLUM, ALNUS RHOMBIFOLIA, BACCHARIS PILULARIS, HETEROMELES ARBUTIFOLIA, QUERCUS AGRIFOLIA, ROSA CALIFORNICA, RUBUS URSINUS, SALIX LAEVIGATA, SAMBUCUS NIGRA



TYPICAL CHANNEL WIDENING (ROAD NARROWING) RIPARIAN PLANTING SECTION
 STATIONS 16+20 TO 29+20 AND 30+50 TO 49+30: PER SHEETS C6 TO C9, C12 AND C13
 SCALE: 1" = 10'

RIPARIAN PLANT LEGEND - TYPE 1

SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	SPACING (OC FEET)	ELEVATION RANGE
ACE MAC	ACER MACROPHYLLUM	BIG LEAF MAPLE	16" DEEPOP	25	+2.7' AND ABOVE
AES CAL	AESCULUS CALIFORNICA	CALIFORNIA BUCKEYE	16" DEEPOP	15	+2.7' AND ABOVE
ALN RUB	ALNUS RHOMBIFOLIA	WHITE ALDER	16" DEEPOP	20	+2.7' TO +5.0'
BAC PIL	BACCHARIS PILULARIS	COYOTE BRUSH	1 GAL	8	+4.0' AND ABOVE
HET ARB	HETEROMELES ARBUTIFOLIA	TOYON	1 GAL	8	+4.0' AND ABOVE
QUE AGR	QUERCUS AGRIFOLIA	COAST LIVE OAK	16" DEEPOP, 5 GAL	12	+4.0' AND ABOVE
ROS CAL	ROSA CALIFORNICA	CALIFORNIA WILD ROSE	16" DEEPOP, 1 GAL	6	+4.0' AND ABOVE
RUB URS	RUBUS URSINUS	CALIFORNIA BLACKBERRY	1 GAL	5	+4.0' AND ABOVE
SAL LAE	SALIX LAEVIGATA	RED WILLOW	POLE CUTTINGS, 16" DEEPOP	12	+2.7' TO +6.0'
SAL MEL	SALVIA MELLIFERA	BLACK SAGE	1 GAL	5	+8.0' AND ABOVE
SAM NIG	SAMBUCUS NIGRA SSP. CAERULEA	BLUE ELDERBERRY	16" DEEPOP, 1 GAL	10	+4.0' AND ABOVE

NOTES:
 1. RELATIVE ELEVATION DATUM: THALWEG OF STREAM = 0
 2. Q2 WATER LINE IS APPROXIMATELY 2.7' ABOVE THALWEG

RIPARIAN PLANT LEGEND - TYPE 2

SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	SPACING (OC FEET)	ELEVATION RANGE
ACE MAC	ACER MACROPHYLLUM	BIG LEAF MAPLE	16" DEEPOP	25	+2.3' AND ABOVE
ARB MEN	ARBUTUS MENZESII	PACIFIC MADRONE	16" DEEPOP	12	+5.0' AND ABOVE
ART CAL	ARTEMISIA CALIFORNICA	CALIFORNIA SAGEBRUSH	1 GAL	3	+4.0' AND ABOVE
BAC PIL	BACCHARIS PILULARIS	COYOTE BRUSH	1 GAL	8	+4.0' AND ABOVE
QUE AGR	QUERCUS AGRIFOLIA	COAST LIVE OAK	16" DEEPOP, 5 GAL	12	+4.0' AND ABOVE
SAL LAE	SALIX LAEVIGATA	RED WILLOW	POLE CUTTINGS, 16" DEEPOP	12	+2.3' TO +6.0'
SAL MEL	SALVIA MELLIFERA	BLACK SAGE	1 GAL	5	+6.0' AND ABOVE
SAM NIG	SAMBUCUS NIGRA SSP. CAERULEA	BLUE ELDERBERRY	16" DEEPOP, 1 GAL	10	+4.0' AND ABOVE

NOTES:
 1. RELATIVE ELEVATION DATUM: THALWEG OF STREAM = 0
 2. Q2 WATER LINE IS APPROXIMATELY 2.7' ABOVE THALWEG

RIPARIAN PLANT LEGEND - TYPE 3

SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	SPACING (OC FEET)	ELEVATION RANGE
ART CAL	ARTEMISIA CALIFORNICA	CALIFORNIA SAGEBRUSH	1 GAL	3	+4.0' AND ABOVE
BAC PIL	BACCHARIS PILULARIS	COYOTE BRUSH	1 GAL	8	+4.0' AND ABOVE
PRU ILI	PRUNUS ILICIFOLIA	HOLLYLEAF CHERRY	2 GAL	10	+4.0' AND ABOVE
QUE AGR	QUERCUS AGRIFOLIA	COAST LIVE OAK	16" DEEPOP, 5 GAL	12	+4.0' AND ABOVE
SAL MEL	SALVIA MELLIFERA	BLACK SAGE	1 GAL	5	+6.0' AND ABOVE
SAM NIG	SAMBUCUS NIGRA SSP. CAERULEA	BLUE ELDERBERRY	16" DEEPOP, 1 GAL	10	+4.0' AND ABOVE
UMB CAL	UMBELLULARIA CALIFORNICA	CALIFORNIA BAY	16" DEEPOP, 1 GAL	12	+4.0' AND ABOVE

NOTES:
 1. RELATIVE ELEVATION DATUM: THALWEG OF STREAM = 0
 2. Q2 WATER LINE IS APPROXIMATELY 2.7' ABOVE THALWEG

UPLAND HYDROSEED MIX

BOTANICAL NAME	COMMON NAME	RATE OF APPLICATION PLS. LBS / ACRE
ARTEMISIA CALIFORNICA	CALIFORNIA SAGEBRUSH	0.5
BROMUS CARINATUS	CALIFORNIA BROME	12.0
ELYMUS GLAUCUS	BLUE WILDRYE	10.0
ESCHSCHOLZIA CALIFORNICA	CALIFORNIA POPPY	1.5
HETEROTHECA GRANDIFLORA	TELEGRAPH WEED	0.5
LOTUS SCOPARIUS	DEERWEED	3.0
NASSELLA PULCHRA	PURPLE NEEDLEGRASS	5.0
FESTUCA MICROSTACHYS	THREE WEEKS FESCUE	6.0
FESTUCA RUBRA	RED FESCUE	5.0
LUPINUS NANUS	LUPINE	4.0
TOTAL		47.5

NOTE: WHEREVER POSSIBLE, EXISTING TREES IN THE CHANNEL WIDENING AREA THAT CAN BE SAVED WILL BE FLAGGED BY A BIOLOGIST FOR PROTECTION PRIOR TO GRADING.

PRELIMINARY
 NOT FOR
 CONSTRUCTION

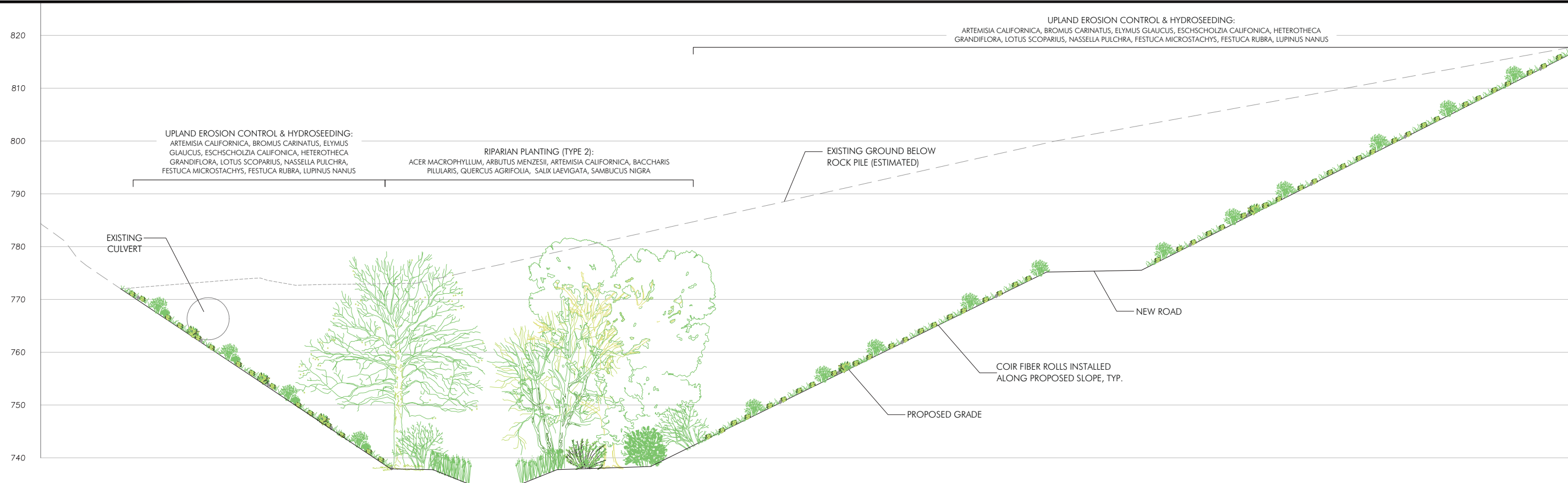
PREPARED AT THE REQUEST OF:
 LEHIGH HANSON
 HEIDELBERG CEMENT GROUP

RIPARIAN
 PLANTING
 SECTIONS

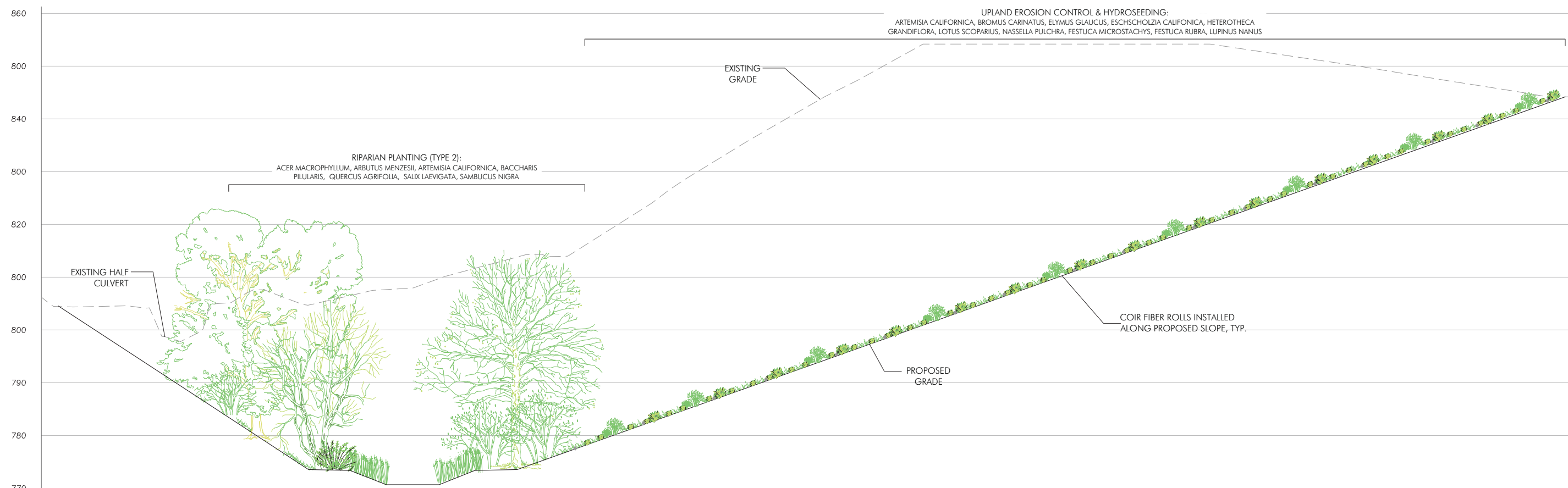
PERMANENTE CREEK
 RESTORATION PLAN
 70% SUBMITTAL

DESIGNED BY:
 DRAWN BY: CES,GMG
 CHECKED BY: MWS
 DATE: 04/27/15
 JOB NO.: 16143-5

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS



ROCK PILE AREA SECTION C
 PER SHEET C14 AND C15
 SCALE: 1" = 10'



ROCK PILE AREA SECTION E
 PER SHEET C14 AND C15
 SCALE: 1" = 10'

**PRELIMINARY
 NOT FOR
 CONSTRUCTION**

PREPARED AT THE REQUEST OF:
**LEHIGH HANSON
 HEIDELBERG CEMENT GROUP**

**RIPARIAN
 PLANTING
 SECTIONS**

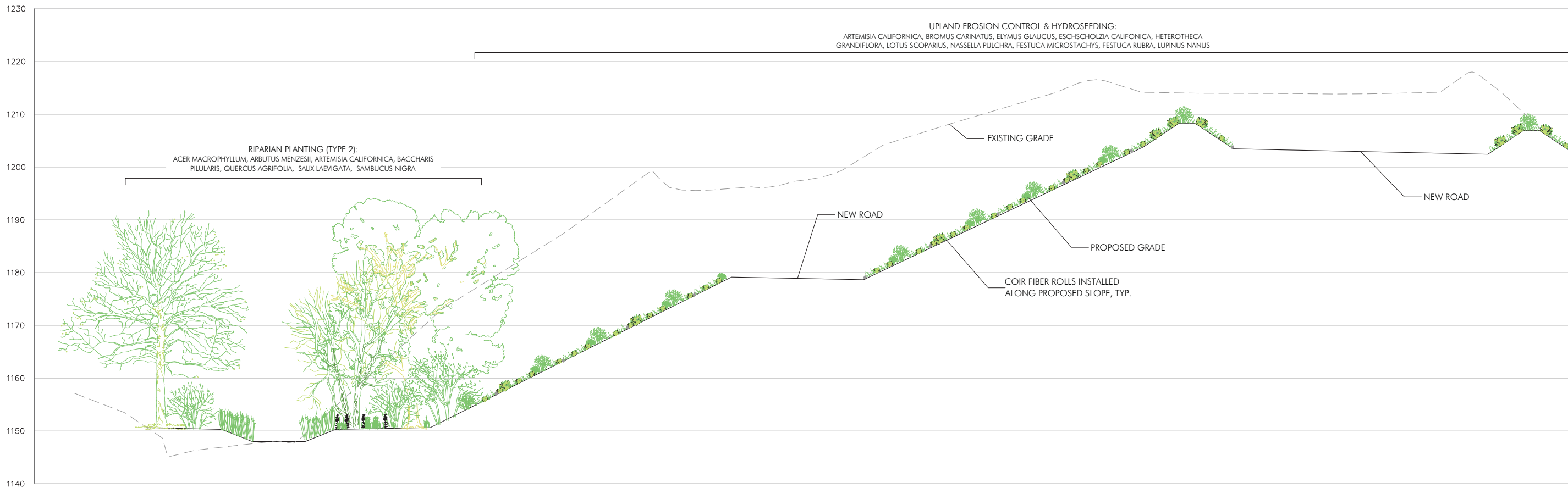
**PERMANENTE CREEK
 RESTORATION PLAN
 70% SUBMITTAL**

DESIGNED BY:
 DRAWN BY: CES,GMG
 CHECKED BY: MWS
 DATE: 04/27/15
 JOB NO.: 16143-5

BAR IS ONE INCH ON
 ORIGINAL DRAWING.
 ADJUST SCALES FOR
 REDUCED PLOTS



OVERBURDEN REMOVAL AREA SECTION E
 PER SHEETS C16 TO C19
 SCALE: 1" = 10'



OVERBURDEN REMOVAL AREA SECTION B
 PER SHEETS C16 TO C19
 SCALE: 1" = 10'

**PRELIMINARY
 NOT FOR
 CONSTRUCTION**

**PREPARED AT THE REQUEST OF:
 LEHIGH HANSON
 HEIDELBERG CEMENT GROUP**

**RIPARIAN
 PLANTING
 SECTIONS**

**PERMANENTE CREEK
 RESTORATION PLAN
 70% SUBMITTAL**

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 CHECKED BY: MWS
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 JOB NO.: 16143-5

BAR IS ONE INCH ON ORIGINAL DRAWING. ADJUST SCALES FOR REDUCED PLOTS

APPENDIX C

Representative Photographs of Aquatic Habitat for
California Red-Legged Frog



View of the canyon Permanente Creek flows through. Photograph taken in the vicinity of Pond 4A.



View of Permanente Creek. Photograph taken in the vicinity of Pond 4A.

Appendix C

Representative Photographs



View of an ephemeral drainage flowing into Permanente Creek.



View of Permanente Creek upstream of T12.

Appendix C

Representative Photographs



View of Permanente Creek and associated riparian vegetation at the downstream reaches of the study area.



View of a channelized portion of Permanente Creek south of Pond 13.

Appendix C

Representative Photographs



View of Pond 20. This feature is used as a settling basin for industrial purposes.



View of Pond 9. This feature is used as a settling basin for industrial purposes.

Appendix C

Representative Photographs



View of Dinky Shed Pond. This feature is used as a settling basin for industrial purposes.



View of Rockpile Basin. Rockpile Basin is used as a settling basin for industrial purposes.

Appendix C

Representative Photographs



View of Pond 17. This feature is used as a settling basin for industrial purposes.



View of Pond 4A. Pond 4A is used as a water treatment basin for industrial purposes.

Appendix C

Representative Photographs



View of the downstream end of Pond 13.



View of the upstream portion of Pond 13.

Appendix C

Representative Photographs



View of Pond 21. This pond is fringed by narrowleaf cattail.

Appendix C

Representative Photographs

E2. Effects to Waters of the
United States (GEI
Consultants, Inc., 2021)

ATTACHMENT B – EFFECTS TO WATERS OF THE UNITED STATES

REASONS FOR DISCHARGE

Discharge of materials into waters of the United States would be required to achieve the objective of restoring portions of Permanente Creek to a more natural state, in accordance with the proposed creek restoration plan. The materials to be discharged to waters of the United States include materials to restore streambed hydrology, geomorphology, and floodplain hydraulics, and to provide habitat for resident rainbow trout.

PROPOSED DISCHARGE OF DREDGE AND/OR FILL MATERIAL

The amount and types of material being dredged from, and/or discharged (filled) into, waters of the United States are provided in Table 1.

Table 1. Volume and Types of Dredge and Fill Material within Waters of the United States for the Proposed Project			
Project Element	Action	Approximate Volume (cy)	Type of Material
Culvert 7	Removal of existing culvert and reconstruction/reconfiguration of creek channel and bed.	143 fill	Engineered streambed material
Culvert 8	Removal of existing culvert and reconstruction/reconfiguration of creek channel and bed.	180 fill	Engineered streambed material
Culvert 9	Removal of existing culvert and reconstruction/reconfiguration of creek channel and bed.	264 fill	Engineered streambed material
Culvert 10	Complete removal of (buried) culvert and excavation of creek channel.	288 cut	Native soil
Culvert 11	Complete removal of (half-pipe) culvert and excavation of creek channel.	223 cut	Native soil
Pond 13	Removal of dam and reconfiguration of creek channel.	1,613 cut	Native soil
Source: Adapted by GEI Consultants, Inc. 2016, based on plans from WRA and Waterways Consulting, Inc. 2015.			

U.S. ARMY CORPS OF ENGINEERS JURISDICTION WITHIN THE PROJECT AREA

A wetland delineation was conducted for the proposed project by AECOM in 2015. The wetland delineation report was sent to the San Francisco District of the U.S. Army Corps of Engineers (USACE) on August 3, 2015. USACE met with AECOM staff on September 10, 2015 to review the delineation at the project site. Revised wetland delineation maps, including changes from the field visit, were sent to USACE on September 17, 2015. Lehigh Hanson is requesting a preliminary jurisdictional determination (PJD) for this project area. USACE confirmed receipt of the revised delineation maps and is in the process of verifying the delineation.

EFFECTS TO JURISDICTIONAL WATERS OF THE U.S.

USACE jurisdictional acreages potentially affected by the proposed activity was calculated by placing the Computer-Assisted Design (CAD) engineering design information (provided by Waterways Consulting, Inc.) over the wetland delineation ArcGIS layers of the project area.

The proposed project would result in effects to a total of 2.052 acres of waters of the United States (see Figures 1 through 4). Effects to waters are a result of three main activities: native vegetation planting along the south slope (above bank) of the concrete-lined channelized portion of Permanente Creek, as shown on Figure 1; channel widening and reconstruction activities, as shown on Figures 2 and 3; and overburden material removal and stream reconstruction, as shown on Figure 4.

Within the native vegetation planting area, it is anticipated that there will be temporary effects to the concrete-lined portion of Permanente Creek. Approximately 0.43 acre of temporary effects would be a result of the need to use the creek channel for access to facilitate planting along the south slope above the channel. The area is very steep and the channel area is the best vantage to facilitate planting on the most downslope portions of the planting efforts.

The channel widening and stream reconstruction portion of the proposed project activities would have permanent effects to approximately 0.64 acres of non-wetland waters of the United States and 0.077 acre of wetlands. Permanent effects are a result of removal of existing in-stream culverts and replacement of these structures with a deeper and wider channel containing engineered streambed material that will restore stream hydraulics, hydrology, and geomorphology. Five culverts would be removed from the stream channel (Culverts 7, 8, 9, 10, and 11). Culvert removal would comprise excavating out the culverts and any fill materials covering the culverts, re-contouring the stream channel to design parameters, and placing the engineered streambed material on the bed and banks of the newly reconstructed channel. This would result in permanent effects to Permanente Creek due to permanent alteration of the existing channel conditions; however, the activities would not result in the net loss of waters of the United States. With the removal of the culvert, the overall restoration activities would include re-contouring the channel, as just mentioned, and creating a floodplain bench along the north bank of the creek with riparian plantings in the floodplain bench. This work would be done for approximately 4,770 linear feet of the stream channel. As part of this work, a tributary stream (T18) will also be re-contoured and reconstructed to have a more gradual and even slope. Currently, the confluence of the tributary and Permanente Creek is a small floodplain where a wetland (W4) has established. This is the circumstance of the creek channel being narrow and not able to accommodate all of the flows from the current tributary. With the reconstruction work in both channels occurring, it is expected that the wetland will be disturbed as part of the construction activities and once the streams have been restored, the wetland will not be re-established due to post-condition changes in hydrology, hydraulics, and geomorphology of the stream. Again, this will result in permanent effects to the wetland, but would not result in a net loss of waters as the stream channel would be replacing the wetland.

This is also the case for three wetlands (W5, W6, and W7) established on the margin of the existing creek channel within this channel widening area. It is expected that these wetlands will be removed (lost) due to post-condition changes in hydrology, hydraulics, and geomorphology of the stream. However, because there is no direct, physical disturbance anticipated to these wetlands, the effects are considered to be indirect permanent effects and changes. Finally, there is a “pond” at the upper limit of the channel widening area which is really an impoundment of the creek behind a dam. As part of the channel widening restoration design, the dam would be

removed and the “pond” area would be re-contoured and reconstructed as part of the creek channel. This would again result in permanent change to the pond area, resulting in loss of the pond, but not a net loss of waters of the United States.

Within the channel widening area, it is also anticipated that there would be 0.513 acre of temporary effects to non-wetland waters. The temporary effects would be a result of temporary disturbance within the creek channel for access and temporary work space to facilitate the restoration efforts. It is anticipated that the creek channel would be both the work area (for restoration), but because of the terrain, it would also need to be the access area for equipment to enter the channel.

The final area of work is the material removal area. Here overburdened material from historic operations has entered into the creek and is present along the banks and upland slopes adjacent to the creek and has changed the topography in the area significantly. The proposed activities include removal of the overburden material and deposition of the material in the quarry area within the cement plant for future use. Removal of the overburden material would be followed by reconstruction of the stream channel to a more natural profile and revegetation of the banks of the channel. This would result in temporary effects to five non-wetland waters (T6, P14, T7, P15, and T8) to improve the stream channels of these waters. There is also one wetland (W8) on the downstream end of T8, a tributary to Permanente Creek. Like W4, mentioned previously, this wetland would be permanently lost as a result of reconstruction of the tributary and creek stream channels, but there would not be a net loss of waters as the streams would replace the wetland area.

The acreages of effects to waters of the United States for the proposed project are shown in Table 2.

**Table 2.
Acreages of Jurisdictional Waters of the United States
Affected by the Proposed Project**

Effect Type	Feature	USACE JD Category¹	Action	Approximate Acreage
Direct Permanent	Culvert 7	RPW	Culvert removal and streambed reconstruction	0.01
	Culvert 8	RPW	Culvert removal and streambed reconstruction	0.01
	Wetland (W4)	Wetland	Loss from excavation and streambed reconstruction	0.06
	Culvert 9	RPW	Culvert removal and streambed reconstruction	0.01
	Culvert 10	RPW	Culvert removal and streambed reconstruction	0.04
	Culvert 11	RPW	Culvert removal and streambed reconstruction	0.07
	Pond 13	Impoundment of RPW	Loss from excavation and streambed reconstruction	0.50
	Wetland (W8)	Wetland	Loss from excavation and streambed reconstruction	0.01
Subtotal				0.71
Indirect Permanent	Wetland (W5)	Wetland	Habitat conversion	0.01
	Wetland (W6)	Wetland	Habitat conversion	0.003
	Wetland (W7)	Wetland	Habitat conversion	0.004
Subtotal				0.017
Direct Temporary	P4	RPW	Temporary disturbance for construction access	0.43
	P8	RPW	Temporary disturbance for construction access	0.26
	T18	Non-RPW	Streambed reconstruction	0.01
	P9	RPW	Temporary disturbance for construction access	0.09
	P10	RPW	Existing riprap removal and streambed reconstruction	0.15
	P12	RPW	Streambed reconstruction	0.003
	T6	Non-RPW	Streambed reconstruction	0.01
	P14	RPW	Streambed reconstruction	0.02
	T7	Non-RPW	Streambed reconstruction	0.001
	P15	RPW	Streambed reconstruction	0.35
	T8	Non-RPW	Streambed reconstruction	0.001
Subtotal				1.325
Direct Permanent Effects Total				0.71
Indirect Permanent Effects Total				0.017
Direct Temporary Effects Total				1.325

Source: Adapted by GEI Consultants, Inc. 2016, based on drawings from Waterways Consulting, Inc. 2015.

AVOIDANCE AND MINIMIZATION MEASURES

Lehigh Hanson would implement the following measures to avoid and minimize impacts to waters of the U.S.

Avoidance and Containment of Shallow Slumps and/or Fallback of Overburden Material

In all areas requiring the use of excavators for grading (e.g., access road in-sloping, installation/repair of sedimentation basins, and removal of slide debris), Lehigh Hanson and/or its contractor shall begin excavations from the top of slope and proceed downward. Lehigh Hanson and/or its contractor shall begin excavations from the top of slope and proceed downward. Lehigh Hanson and/or its contractor shall not undercut sloped materials unless no other option is feasible as determined by a registered geotechnical engineer (e.g., excessively sloped or otherwise inaccessible terrain). In all areas where excavations would occur in sloped materials, Lehigh Hanson and/or its contractor shall install barriers immediately downslope of the activity. Downslope barriers shall be designed and installed in a manner that would be adequate to prevent overburden and/or native materials from falling, sloughing or sliding further downslope, or into Permanente Creek. Such measures may consist of temporary interlocking soldier piles, wooden shoring systems, wire mesh or other containment measures(s), and Lehigh Hanson and/or its contractor shall not be permitted to conduct excavation or grading activities downgradient of the barrier, or prior to its installation. The ultimate location, design and installation method of such measures shall be prepared and certified, or reviewed and approved by a California State registered geotechnical engineer.

Interim Stormwater Control and Sediment Management

To minimize the discharge of sedimentation and metal constituents, particularly selenium, to watercourses, Lehigh Hanson shall implement the following stormwater and sediment management controls in addition to general best management practices (BMPs) required by the stormwater pollution prevention plan (SWPPP) in active and inactive reclamation areas. Lehigh Hanson shall:

- Segregate limestone materials from the non-limestone materials (breccia, graywacke, chert, and greenstone) by way of operational phasing to ensure that limestone materials are placed beneath and are covered by non-limestone materials. A California Professional Geologist shall oversee stockpiling, segregation, and placement of non-limestone materials.
- Stabilize inactive areas, such as temporary stockpiles or dormant excavations that drain directly or indirectly to Permanente Creek using an appropriate combination of BMPs to cover the exposed rock material, intercept runoff reduce its flow velocity, release runoff as sheet flow, and provide a sediment control mechanism (such as silt fencing, fiber rolls, or hydroseeded vegetation). Standard soil stabilization BMPs include geotextiles, mats, erosion control blankets, vegetation, silt fence surrounding the stockpile perimeter, and fiber rolls at the base and on side slopes.
- Temporarily stabilize active, disturbed reclamation areas undergoing fill placement before and during qualifying rain events expected to produce site runoff. Stabilization methods include combined BMPs that protect materials from rain, manage runoff, and reduce erosion. Reclamation activities involving grading, hauling, and placement of backfill materials cannot take place during periods of rain.
- In areas where fill slopes are steep and composed of loose material, controls shall be in place to prevent material from sloughing off into the Permanente Creek Restoration Area and Permanente Creek. These controls shall include debris/silt fencing placed on outer edge of grading and excavation operations back-

sloping excavations to prevent grade slope towards the creek, operations buffer areas that require the use of smaller grading equipment, temporary berms along the outer extent of operations closest to the creek, operator training regarding the prevention of triggering debris slides.

- Cover active haul roads with non-limestone materials where exposed limestone surfaces are present. Roads that undergo dust control by watering must have fiber rolls or equivalent runoff protection installed along the road side to reduce runoff and avoid drainage to Permanente Creek.
- Divert all runoff generated from disturbed active and inactive restoration areas to temporary basins, the Quarry pit, or temporary vegetated infiltration basins and kept away from drainage pathways directly entering Permanente Creek. To the extent possible, drainage of the non-limestone materials shall be diverted directly to sediment control facilities and natural surface drainages.
- Install up-gradient berms where limestone fines or stockpiles are placed, to protect against stormwater run-on, and install ditches and down-gradient berms to promote infiltration rather than run-off.
- Cover large limestone surfaces associated with restoration activities that would remain exposed during the rainy season with interim covers composed of non-limestone rock types.
- Inspect and maintain BMPs after each qualifying rain event to ensure their integrity.
- Regularly inspect all stormwater and erosion controls, especially before and following qualifying rain events. Inspections shall be documented and periodically reported. Any violations shall be corrected immediately.
- Provide adequate erosion control training to all equipment operators, site superintendents, and managers to ensure that stormwater and erosion controls are maintained and remain effective.
- Use only jute netting or other suitable replacement for erosion control in the Permanente Creek Restoration Area; no plastic monofilament shall be used for erosion control or other purposes, as California Red Legged Frogs and other wildlife may become entangled in it.
- Ensure that all stormwater, erosion, and sediment control BMPs are installed, inspected, maintained, and repaired under the direction of either a California certified engineer, geologist, or landscape architect, an American Institute of Hydrology registered professional hydrologist, or a certified erosion control specialist.

PROPOSED COMPENSATORY MITIGATION

Although Lehigh Hansen proposes to permanently impact approximately 0.727 acre of waters of the United States (wetland and non-wetland waters combined), the proposed project, as designed, would result in enhancement of the 0.727 acre of waters of the United States resulting in functional lift of the existing jurisdictional acreage. The enhancements include improving the configuration and hydrology of Permanente Creek, removing an impoundment of the creek, removing culverts and restoring the creek bed under the culverts, creating a floodplain bench alongside the creek in select areas, and planting native riparian vegetation along the creek banks. The text of Nationwide Permit 27 states that if the proposed activities result in functional lift of the existing aquatic habitat, no compensatory mitigation is required. Lehigh Hansen believes the restoration effort will result in functional lift in upper Permanente Creek. Therefore, the proposed activities meet the specification of Nationwide Permit 27 and compensatory mitigation is not required for the project.

ADDITIONAL INFORMATION,

EFFECTS ON FEDERALLY LISTED SPECIES

The proposed project would result in potential adverse effects to the Federally listed California red-legged frog. A Biological Assessment has been prepared for the species and is included as Attachment D to this application package. The Biological Assessment only addresses USFWS-managed species.

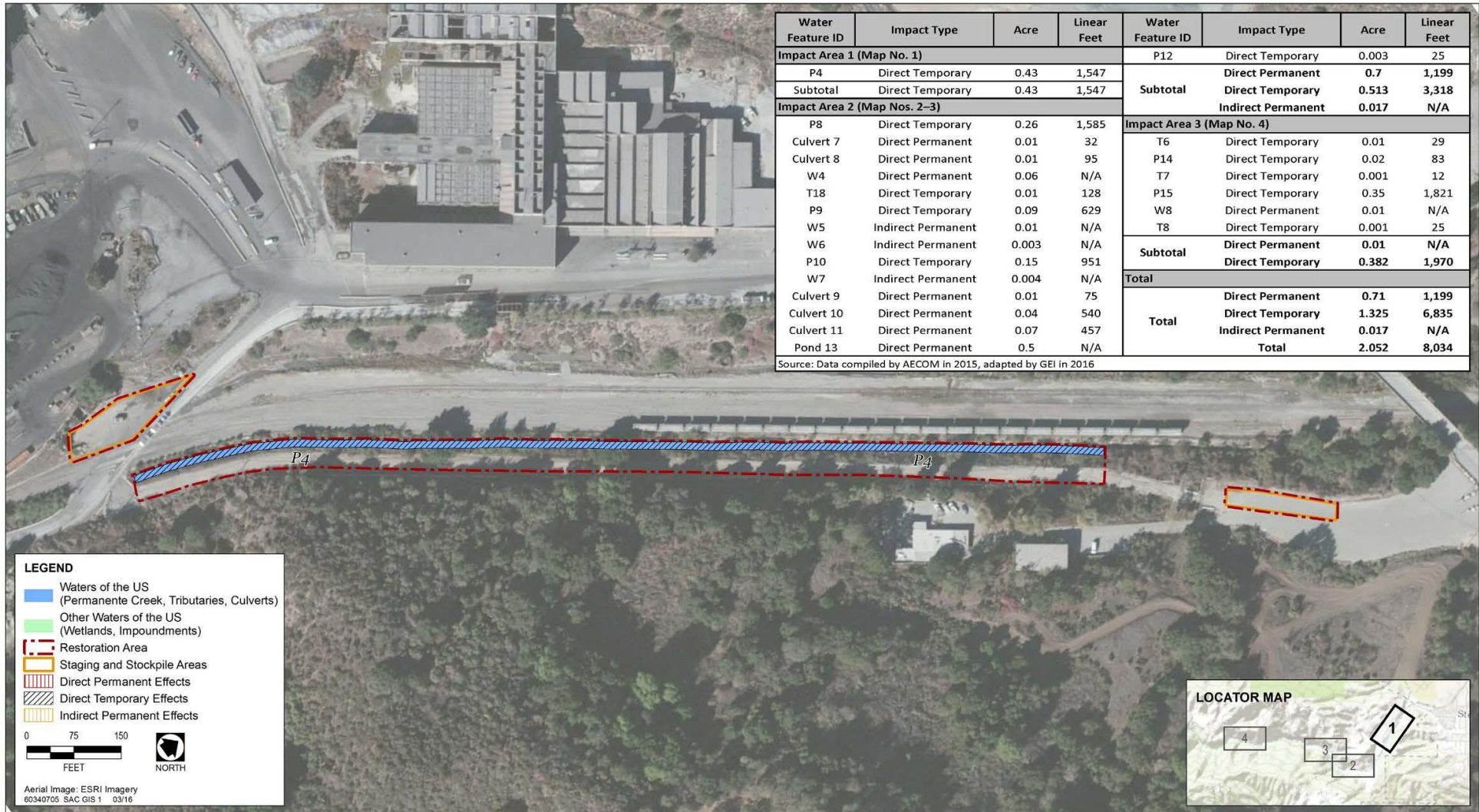
The proposed project location is within a region mapped as Essential Fish Habitat (EFH) for Pacific salmon (specifically *Oncorhynchus kisutch* and *O. tshawytscha*) and critical habitat for Central California Coastal (CCC) steelhead (*O. mykiss irideus*) DPS. These USFWS- and NMFS-managed species cannot access habitat near the project site in upper Permanente Creek because the downstream Permanente Creek Diversion Channel is a highly effective barrier to fish passage since most of the creek's flow culminates in a 10-foot drop at the diversion fish can no longer ascend the stream.

Permanente Creek is a natural channel from its headwater downstream to Heritage Oaks Park, near Portland and Miramonte avenues, where the creek enters a concrete channel and eventually becomes the Permanente Creek Diversion Channel. The channel was built by the Santa Clara Valley Water District in 1959 and runs 1.3 miles to the east until passing into a culvert underneath Highway 85 to Stevens Creek. Virtually all winter flows from upper Permanente Creek are diverted east to Stevens Creek in order to prevent floodwaters from flowing in the original creek channel that runs through urban residential areas.

The diversion channel has altered the course of flow and the total length of Permanente Creek from 13.3 miles (from the headwaters to San Francisco Bay) to 9.3 miles (from the headwaters to the diversion channel's junction with Stevens Creek just past Highway 85), and has essentially cut off the upper portion of Permanente Creek from the lower reaches. In addition, a combination of lack of flows and significant modification in the lower portion of the creek have degraded fish habitat such that no spawning or rearing habitat exists for these species.

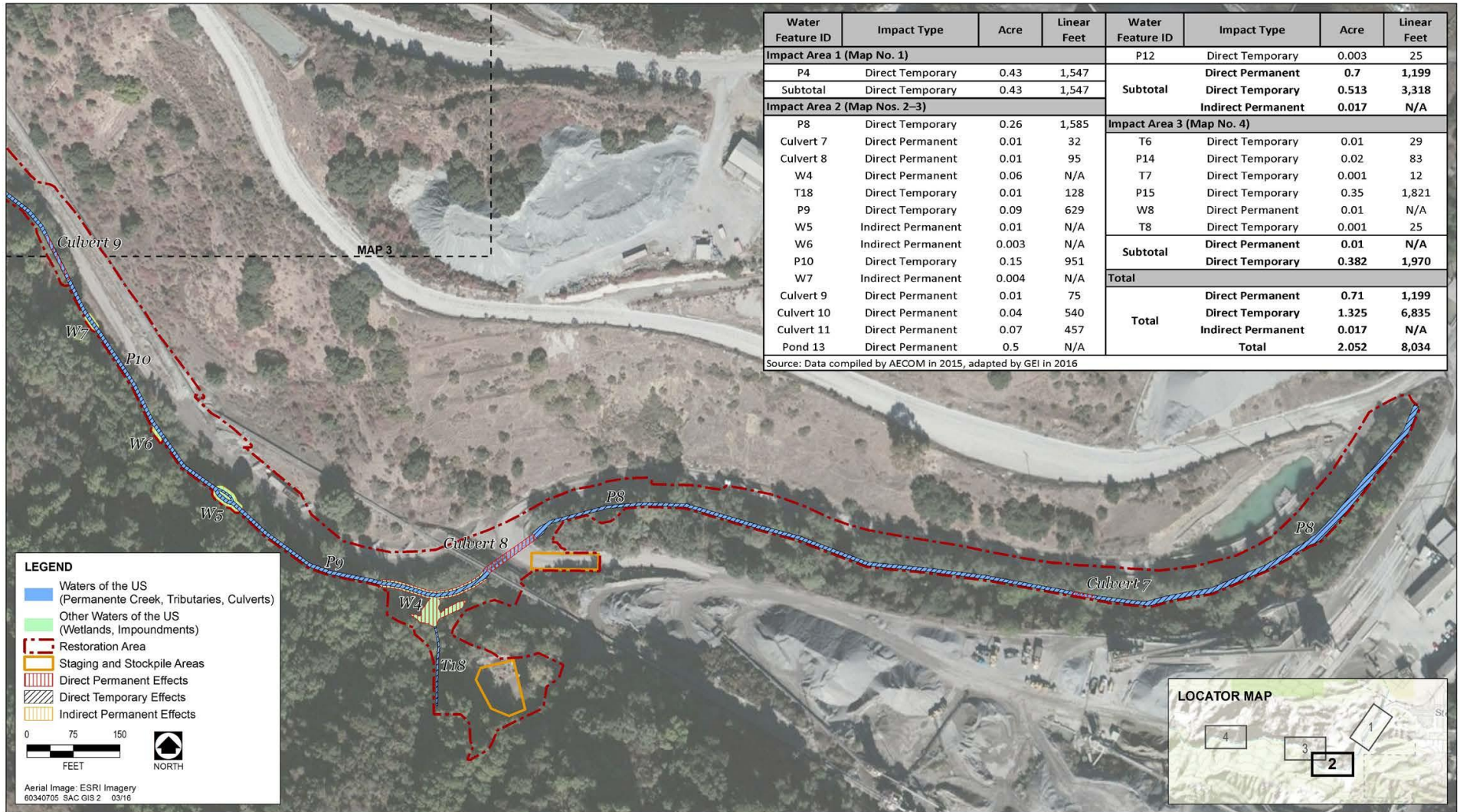
CULTURAL RESOURCES AND HISTORIC PROPERTIES

The proposed action was analyzed for cultural resources and historic properties and a cultural resources inventory report has been prepared. The final Cultural Resources Inventory Report is included as Attachment E.



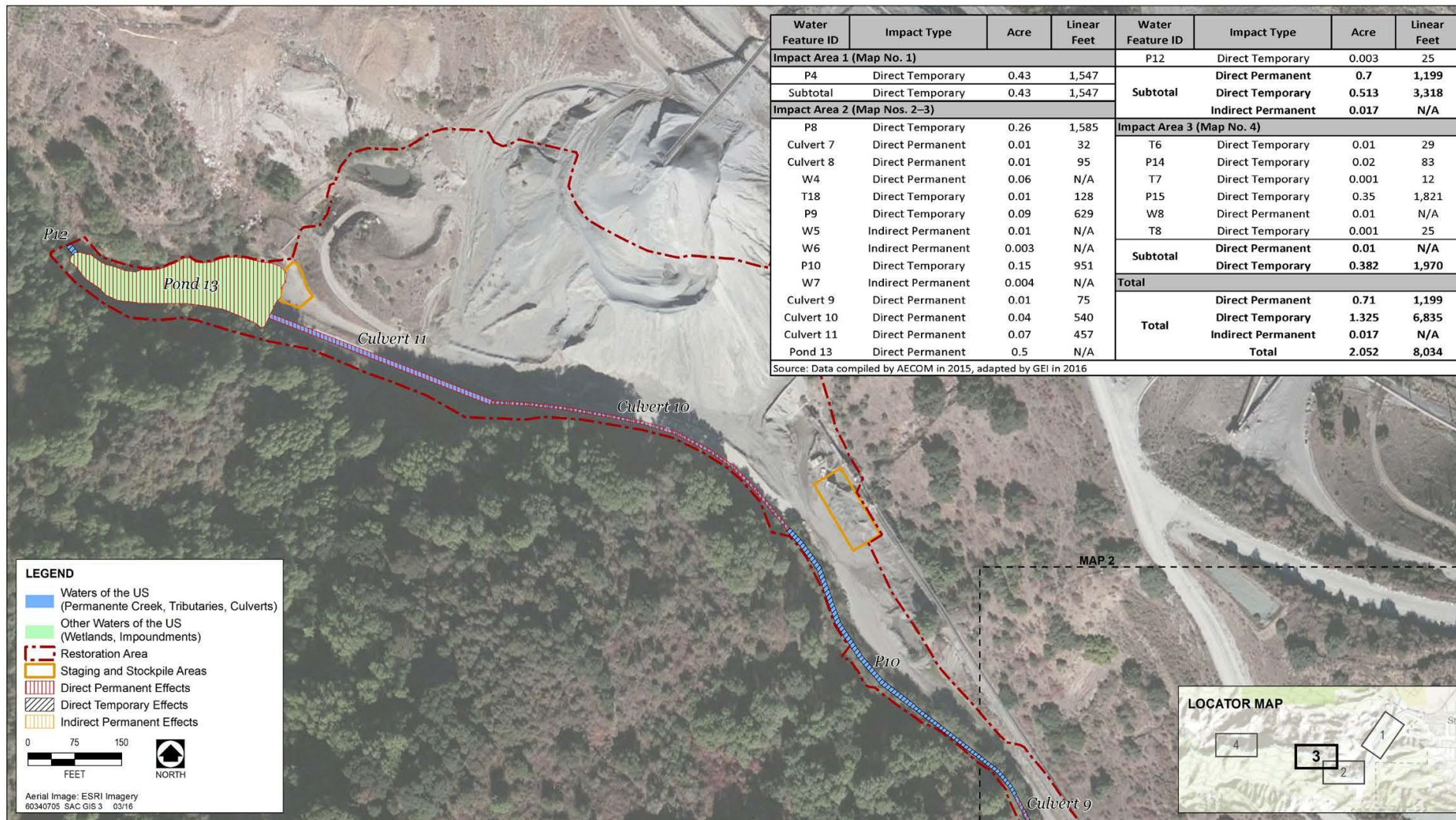
Source: AECOM 2015, adapted by GEI Consultants, Inc. 2016

Figure 1. Effects to Waters of the United States Map 1



Source: AECOM 2015, adapted by GEI Consultants, Inc. 2016

Figure 2. Effects to Waters of the United States Map 2



Source: AECOM 2015, adapted by GEI Consultants, Inc. 2016

Figure 3. Effects to Waters of the United States Map 3

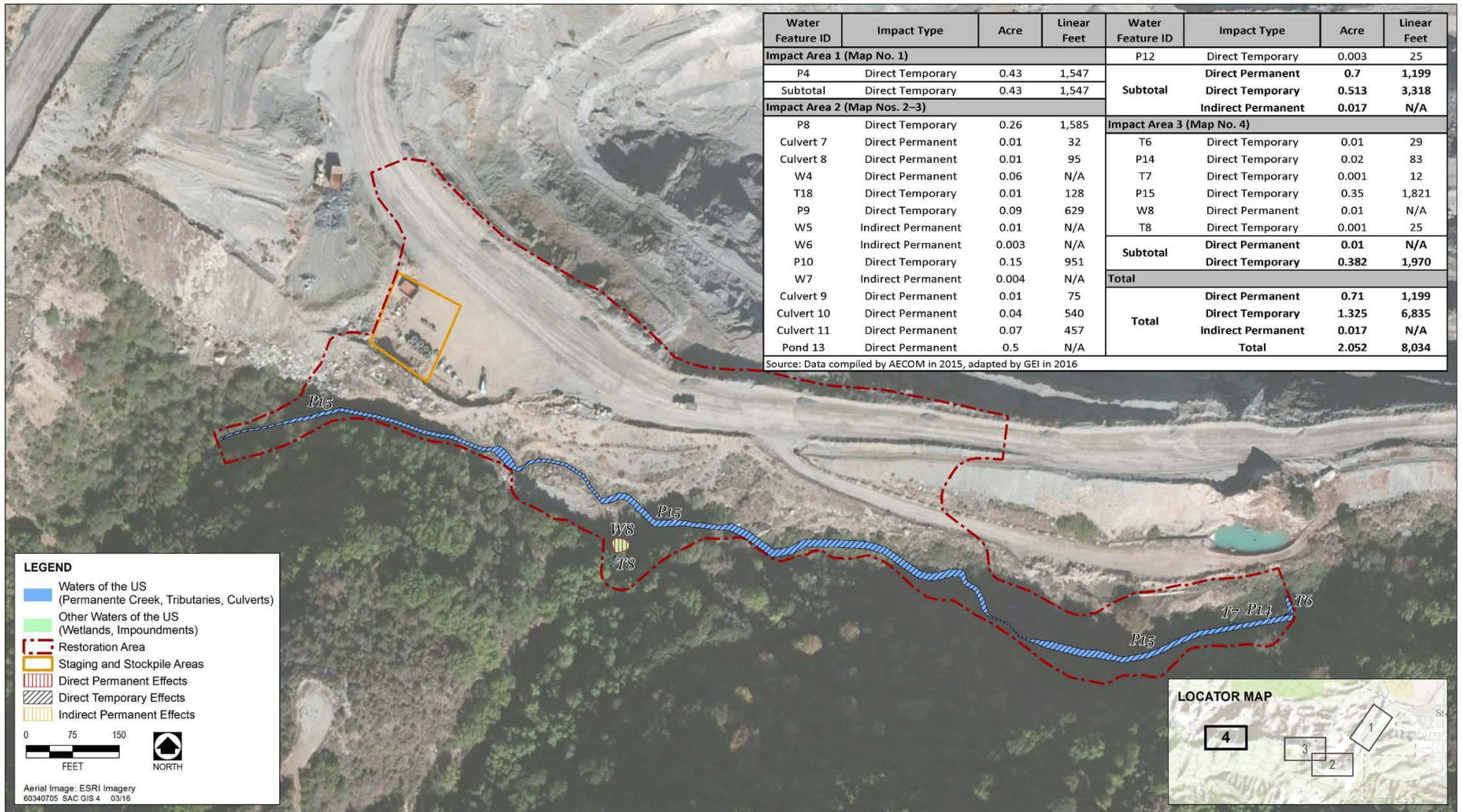


Figure 4. Effects to Waters of the United States Map 4

E3. Revegetation Plan (WRA,
Inc. September 29, 2017)

TECHNICAL MEMORANDUM

PERMANENTE CREEK RESTORATION PLAN: PLANTING PROGRAM

September 29, 2017

INTRODUCTION

This technical memorandum describes the conceptual planting program that will be a component of the Permanente Creek Restoration Plan. The Riparian Planting Sections (Sheets L1-L3) on the accompanying drawings have been completed in conjunction with the Stream Restoration Plan prepared by Waterways Consulting. The revegetation design is intended to meet the requirements of the Consent Decree between Lehigh Southwest Cement Company and Hanson Permanent Cement, Inc. and the Sierra Club effective June 18, 2013 and amended on February 22, 2016. This work is also informed by the extensive site investigations and pilot revegetation work that has been performed and documented in the Revegetation Plan (WRA 2012) prepared in conjunction with the Reclamation Plan for the facility. This plan was prepared by Megan Stromberg, Landscape Architect (California License 5535).

RIPARIAN PLANTING

Proposed planting palettes and representative cross sections are provided in the attached drawings. The goal of the planting effort will be to create a native plant dominated habitat within restored sections of the creek that are similar to the surrounding natural areas. The representative cross sections are conceptual at this time, but are sufficient to demonstrate the level of planting needed for agency review and for initial permit applications. Additional detail will be provided as needed to complete the permitting process. Final drawings will be prepared after permit approval.

The north-facing banks along Permanente Creek can support a wider variety of tree and shrub species since they have less solar radiation and higher soil moisture. In addition, some reaches of the creek experience intermittent flows (Reaches 17 through 21) while the reaches below Pond 4A are mostly perennial. These conditions have been considered in the development of the riparian planting palettes. Specific planting plans identifying the best locations for each species will be developed in the final drawings.

Each riparian species was observed within the existing riparian habitat and evaluated for its proximity to the thalweg of the existing creek. Our plant palette tables provide the recommended elevation range above the design thalweg of the creek.

Trees and shrubs will be planted as container plants or seeds in the revegetation areas. Tree and shrub container plantings may require application of a layer of topsoil and/or soil-building materials to ensure adequate space for root development. In addition, irrigation or other watering methods will be included within a final plan as well as erosion control practices while plant materials are becoming established. Plants will be planted at a higher density than is expected at the end of the performance period to account for expected die-off. Replanting in subsequent years may be required to achieve desired stem density and cover. Adaptive management and the results from the Reclamation Plan pilot plantings will be used to determine which tree and shrub species will be planted, the most effective spacing and location, and species to use in replacement plantings if

necessary. The need for herbivory protection for specific vegetation species will be evaluated based on prior planting efforts. Weed mats or several inches of mulch may be placed around planted trees and shrubs to reduce competition and retain moisture.

UPLAND REVEGETATION AND EROSION CONTROL

A preliminary erosion control stage will be incorporated prior to the riparian revegetation establishment to protect against sediment entering the creek and allow time for plants to establish. Bare surfaces will be covered with native grass, herb, and shrub species via hydroseeding a homogenous slurry of mulch, fertilizer, seed, and a binding agent over the areas to be revegetated. Other appropriate erosion control methods such as slope cross-drains, erosion control matting, and coir fibre rolls will be used. The native seed mix shown in Table 1 includes species that have proven successful in other revegetation efforts on the Permanente Quarry property and is recommended to provide erosion control and initial establishment of native shrubs, grasses and herbaceous species as needed in temporarily disturbed riparian areas. In upland areas, hydroseed with species listed in Table 2 will be applied to areas that have been disturbed.

Table 1. Erosion Control Species for Permanente Creek Riparian Areas			
SCIENTIFIC NAME	COMMON NAME	PURE LIVE SEED (lb / acre)	BULK SEED (lb / acre)
SHRUBS			
<i>Artemisia californica</i>	California sagebrush	1	10
<i>Baccharis pilularis</i>	Coyote brush	.1	6
<i>Lotus scoparius</i>	Deerweed	1.5	2
<i>Salvia mellifera</i>	black sage	1.5	4.3
GRASSES AND HERBS			
<i>Achillea millefolium</i>	Yarrow	.75	2
<i>Artemisia douglasiana</i>	Mugwort	.15	1.9
<i>Bromus carinatus</i>	California brome	8	10
<i>Clarkia purpurea ssp. quadrivulnera</i>	winecup clarkia	1	1
<i>Elymus glaucus</i>	blue wildrye	4.6	6
<i>Heterotheca grandiflora</i>	telegraph weed	0.2	1
<i>Lotus purshianus</i>	Spanish clover	3	3.6
<i>Plantago erecta</i>	dotseed plantain	2.5	3
<i>Sisyrinchium bellum</i>	western blue-eyed grass	1	1.4
<i>Vulpia microstachys</i>	small fescue	8	10
Total		34.8	62.2

Table 2. Upland Erosion Control Hydroseeding Mix.		
SCIENTIFIC NAME	COMMON NAME	Rate of application (lb / acre)
SHRUBS		
<i>Artemisia californica</i>	California sagebrush	0.5
<i>Baccharis pilularis</i>	coyote brush	0.1
GRASSES AND HERBS		
<i>Bromus carinatus</i>	California brome	12
<i>Elymus glaucus</i>	blue wildrye	10
<i>Eschscholzia californica</i>	California poppy	1.5
<i>Heterotheca grandiflora</i>	telegraph weed	0.5
<i>Lotus scoparius</i>	deerweed	3.0
<i>Nassella pulchra</i>	purple needlegrass	5.0
<i>Vulpia microstachys</i>	three weeks fescue	6.0
<i>Festuca rubra</i>	red fescue	5.0
<i>Lupines nanus (innoc)</i>	lupine	4.0
<i>Plantago erecta</i>	plantain	4.0
Total		52.6

E4. Temporary Riparian
Vegetation Impact
Assessment (Waterways
Consulting, Inc.,
August 26, 2022)

TECHNICAL MEMORANDUM

To: Carolina Addison, Lehigh Hanson Inc.

From: Waterways Consulting, Inc.

Date: August 26, 2022

Re: Permanente Creek Restoration Project, Temporary Riparian Vegetation Impact Assessment

Introduction

This memorandum has been prepared in response to comments provided to the County of Santa Clara on May 13, 2021 by the California Department of Fish and Wildlife (CDFW) in response to the County's Notice of Preparation of the Supplemental Draft Environmental Impact Report for the Permanente Creek Restoration Project (PRCP).¹ The comments are regarding impacts to riparian vegetation associated with implementation of the PRCP included under the "Biological Resources, Long-term Impacts to Riparian Sensitive Community" section of the letter. The relevant paragraph under the "Riparian Vegetation Impacts" subsection has been reproduced below for reference.

The revised 90% engineering designs appear to indicate that approximately 30 trees will be removed during Project construction. However, only larger trees to be removed were included in the designs (e.g., non-oak trees equal to or greater than 12-inch diameter). Sapling (1-inch to 4-inch diameter) and pole sized (5-inch to 11-inch diameter) trees are important to riparian vegetation structural complexity and habitat succession. Based on the current designs, impacts of the Project to riparian habitat may be underestimated. CDFW recommends that analysis of riparian vegetation impacts include trees less than 12 inches in diameter or based on area calculations for seedlings and saplings and understory vegetation. As discussed in the previous section of this letter, the long-term (e.g., 10-year) post-construction monitoring and adaptive management plan should include monitoring of revegetated areas and include performance standards to ensure establishment or maintenance of riparian habitat.

Background

Waterways Consulting, Inc. (Waterways) staff completed an evaluation of riparian vegetation within the limits of areas to be impacted during implementation of the PCRCP. This included field work to determine the species, size and number of trees and shrubs that will be removed during project construction as outlined below.

Methods

Waterways walked the extents of each component project area to evaluate riparian impacts during July and August 2022. This included the Channel Widening Area, Rock Pile Area and Material Removal Area. Each project area was broken into multiple smaller areas for determining riparian vegetation impacts as

¹ The subject of the May 13, 2021 letter from CDFW to Mr. Robert Salisbury at the County of Santa Clara is "Permanente Creek Restoration Project, Notice of Preparation of a Supplemental Draft Environmental Impact Report, SCH No. 2021040331, Santa Clara County".

shown on Figures 1-10. Representative sample areas were evaluated where vegetation was very dense, and the findings were proportioned for estimating the impacts for the applicable reach of channel. Where the riparian corridor was reasonably open and Waterways staff were able to traverse a reach of channel, sample areas were not used and the riparian corridor within the limits of proposed grading was evaluated to determine vegetation impacts.

Species and diameter of trees and shrubs observed were recorded on field sheets for each riparian area assessed. Figure 1 provides an overview of the assessment area and Figures 2 - 10 show the limits of each riparian vegetation impact area. The upstream and downstream limits of each area were surveyed using a total station. Individual trees and shrubs were not surveyed as part of this assessment. Trees from the original mapping effort are shown on the drawings.² Solid lines shown on the Figures represent the limits of an assessment area. Dashed lines represent the boundary of sample areas within a larger assessment area with the color matching that of the assessment area. The boundary lines fall within the grading limits where an area is devoid of vegetation.

Results

A table listing the area, species, diameter, and number of trees and shrubs documented in each assessment area is included on the attached Figures. A summary table is included below with the total estimated number of trees and shrubs that will be removed at each component project area and the estimated total for the project. Detailed summary tables that include species and diameter of trees and shrubs that would be removed at each component project area are attached.

Table 1. Total Number of Trees and Shrubs Removed During Project Implementation

Project Location	Number of Trees/Shrubs Removed
Channel Widening Area	271
Rock Pile Area	49
Material Removal Area	550
Estimated Project Total =	870

Conclusion

The PCRPP includes a robust revegetation effort to reestablish riparian vegetation along the restored channel reaches to help stabilize graded areas, provide cover and establish habitat complexity. While approximately 870 tree and shrubs will be removed during project implementation throughout an area of approximately 5.5 acres, over 7,000 tree and shrubs will be planted to reestablish and expand the riparian corridor along approximately 7.6 acres of restored riparian area.

² The trees shown on the Riparian Vegetation Impact Assessment Figures include trees surveyed during mapping efforts completed during 2013-2015. Some trees may have died since the initial mapping effort. Additional trees meeting the survey threshold used during the original mapping efforts may now exist within the mapped areas and are not shown on the figures.

CHANNEL WIDENING AREA		
RIPARIAN VEGETATION IMPACT SUMMARY		
AREA =	1.55	ACRE
SPECIES	(DIA. IN.)	COUNT
ALDER	0-2	5
ALDER	2-4	1
ALDER	4-8	10
ALDER	8-12	5
BAY	2-4	1
BAY	4-8	14
BIG LEAF MAPLE	2-4	6
BIG LEAF MAPLE	4-8	1
BUCKEYE SAPLING	<1	5
COFFEEBERRY	0-2	1
ELDERBERRY	0-2	18
ELDERBERRY	4-6	1
MADRONE	2-4	2
OAK	0-2	11
OAK	2-4	5
OAK SAPPLING	<1	12
SYCAMORE	32	1
TOYON	0-2	9
WALNUT	0-2	11
WILLOW	0-4	43
WILLOW	4-8	56
WILLOW	8-12	52
WILLOW	24+	1

TOTAL COUNT = 271

ROCK PILE AREA		
RIPARIAN VEGETATION IMPACT SUMMARY		
AREA =	1.11	ACRE
SPECIES	(DIA. IN.)	COUNT
BIG LEAF MAPLE	0-2	2
ELDERBERRY	0-2	5
WILLOW	0-4	27
WILLOW	4-8	6
WILLOW	8-12	9

TOTAL COUNT = 49

MATERIAL REMOVAL AREA RIPARIAN VEGETATION IMPACT SUMMARY		
AREA =		2.80 ACRE
SPECIES	(DIA. IN.)	COUNT
BAY	0-2	25
BAY SAPLING	<1	9
BIG LEAF MAPLE SAPLING	<1	28
BIG LEAF MAPLE	1-2	29
BIG LEAF MAPLE	4-6	9
BIG LEAF MAPLE	6-8	23
CEANOTHUS	0-2	10
MADRONE	0-2	21
MADRONE	2-4	34
MADRONE	4-6	2
TOYON	0-2	32
WILLOW	0-4	266
WILLOW	4-8	53
WILLOW	8-12	8
TOTAL COUNT =		550



LEGEND

- 2 SHEET LAYOUTS
- PERMANENTE CREEK THALWEG ALIGNMENT 2013
- TRIBUTARY (RELEVANT TO PROJECT)
- EXISTING CULVERT TO BE REMOVED
- EXISTING CULVERT TO REMAIN

SHEET LAYOUT OVERVIEW
SCALE: 1" = 500'

RIPARIAN IMPACT ASSESSMENT ANALYSIS:
THESE DRAWINGS HAVE BEEN PREPARED TO ACCOMPANY THE TECHNICAL MEMORANDUM TITLED "PERMANENTE CREEK RESTORATION PROJECT, TEMPORARY RIPARIAN VEGETATION IMPACT ASSESSMENT", DATED 8/26/22, AND ASSIST WITH ESTIMATING TEMPORARY RIPARIAN VEGETATION IMPACTS THAT WOULD OCCUR DURING IMPLEMENTATION OF THE PERMANENTE CREEK RESTORATION PLAN. THE QUANTITY, SIZE AND SPECIES OF EXISTING TREES AND SHRUBS THAT WILL BE REMOVED DURING PROJECT IMPLEMENTATION WERE DOCUMENTED WITHIN THE AREAS SHOWN ON THE FOLLOWING FIGURES. SEE THE REFERENCED TECHNICAL MEMORANDUM FOR A DESCRIPTION OF ASSESSMENT METHODS AND RESULTS.

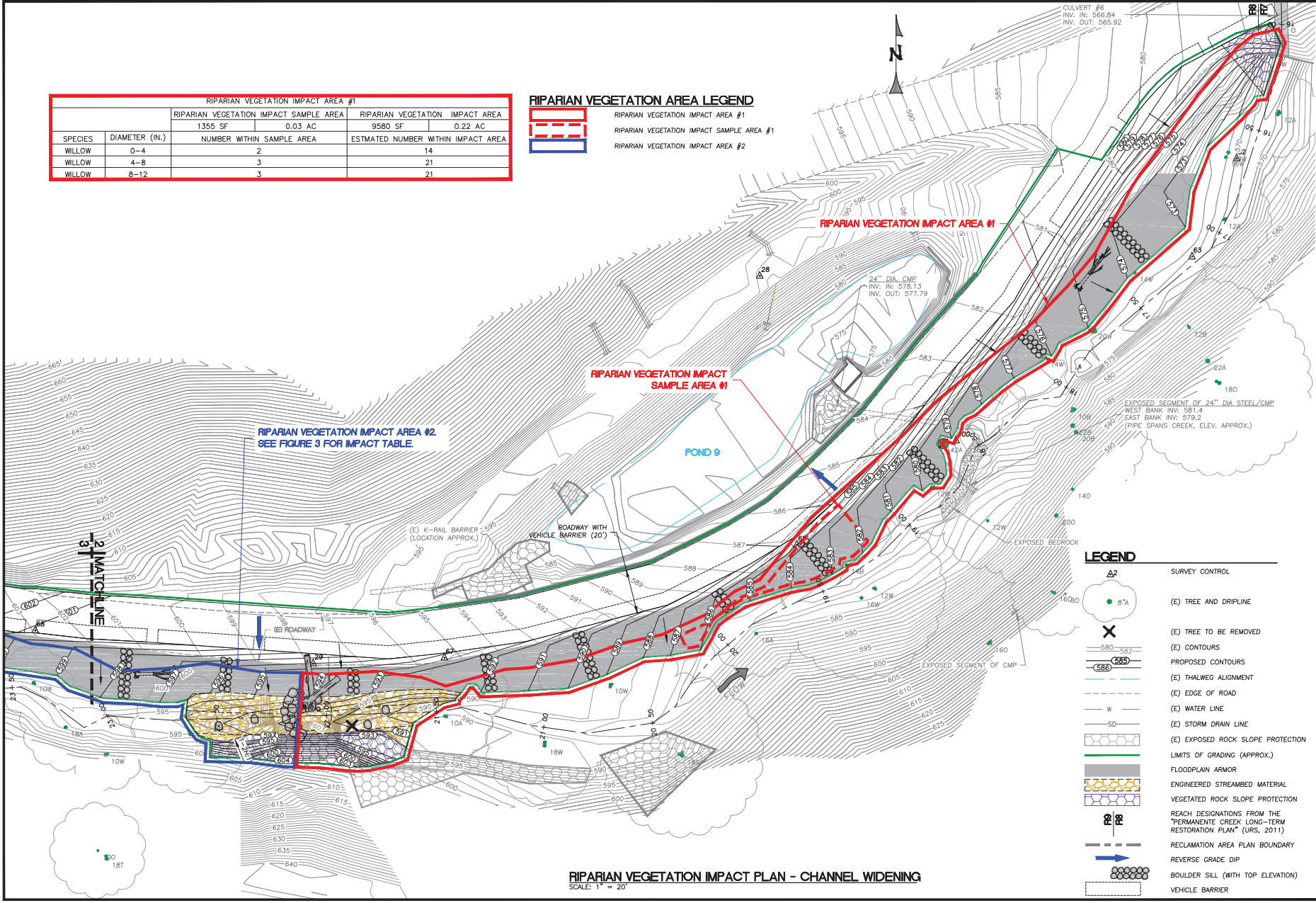
RIPARIAN VEGETATION IMPACT AREA #1			
SPECIES	DIAMETER (IN.)	RIPARIAN VEGETATION IMPACT SAMPLE AREA	RIPARIAN VEGETATION IMPACT AREA
		1355 SF 0.03 AC	9580 SF 0.22 AC
		NUMBER WITHIN SAMPLE AREA	ESTIMATED NUMBER WITHIN IMPACT AREA
WILLOW	0-4	2	14
WILLOW	4-8	3	21
WILLOW	8-12	3	21

RIPARIAN VEGETATION AREA LEGEND

RIPARIAN VEGETATION IMPACT AREA #1

RIPARIAN VEGETATION IMPACT SAMPLE AREA #1

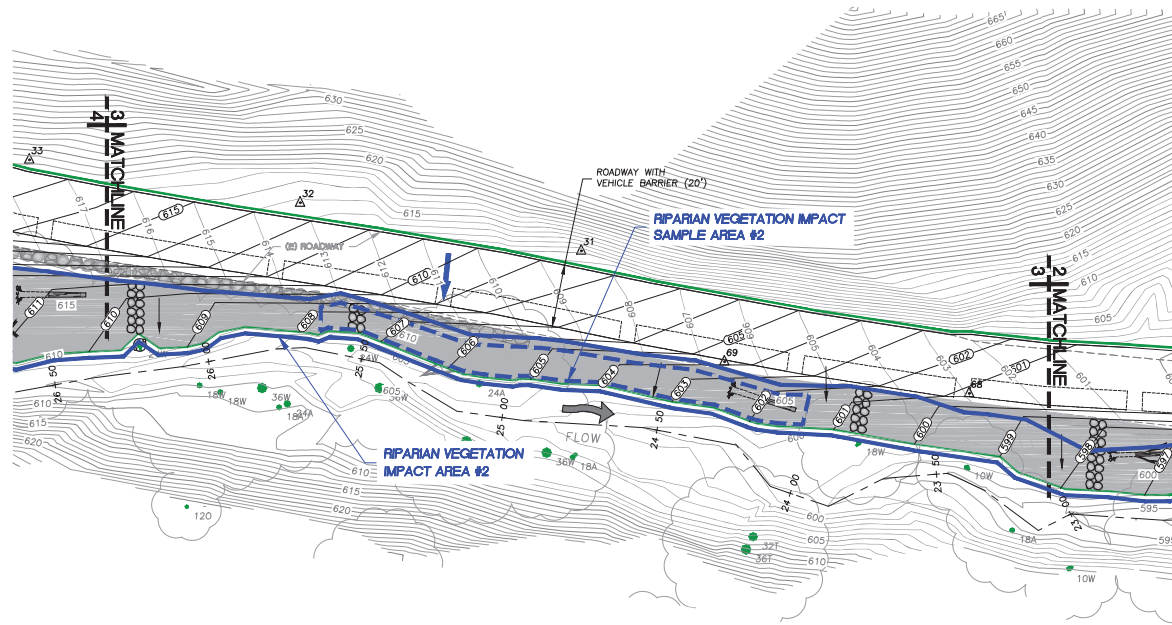
RIPARIAN VEGETATION IMPACT AREA #2



LEGEND

- SURVEY CONTROL
- (E) TREE AND DRIPLINE
- (E) TREE TO BE REMOVED
- (E) CONTOURS
- PROPOSED CONTOURS
- (E) THALWEG ALIGNMENT
- (E) EDGE OF ROAD
- (E) WATER LINE
- (E) STORM DRAIN LINE
- (E) EXPOSED ROCK SLOPE PROTECTION
- LIMITS OF GRADING (APPROX.)
- FLOODPLAIN ARMOR
- ENGINEERED STREAMBED MATERIAL
- VEGETATED ROCK SLOPE PROTECTION
- REACH DESIGNATIONS FROM THE "PERMANENTE CREEK LONG-TERM RESTORATION PLAN" (URS, 2011)
- RECLAMATION AREA PLAN BOUNDARY
- REVERSE GRADE DIP
- BOULDER SILL (WITH TOP ELEVATION)
- VEHICLE BARRIER

RIPARIAN VEGETATION IMPACT PLAN - CHANNEL WIDENING
SCALE: 1" = 20'



RIPARIAN VEGETATION IMPACT PLAN - CHANNEL WIDENING
SCALE: 1" = 20'

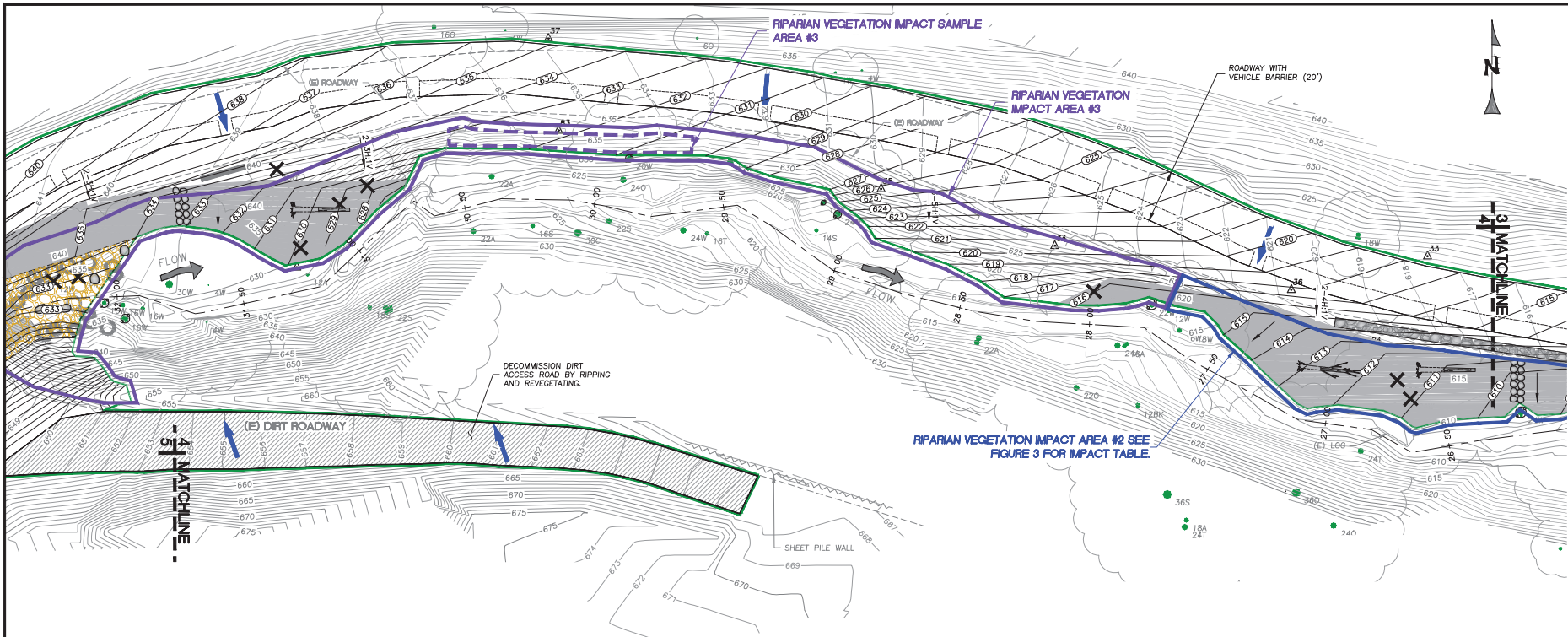
LEGEND

- SURVEY CONTROL
- (E) TREE AND DRIPLINE
- (E) TREE TO BE REMOVED
- (E) CONTOURS
- PROPOSED CONTOURS
- (E) THALWEG ALIGNMENT
- (E) EDGE OF ROAD
- (E) WATER LINE
- (E) STORM DRAIN LINE
- (E) EXPOSED ROCK SLOPE PROTECTION
- LIMITS OF GRADING (APPROX.)
- FLOODPLAIN ARMOR
- ENGINEERED STREAMBED MATERIAL
- VEGETATED ROCK SLOPE PROTECTION
- REVERSE GRADE DIP
- BOULDER SILL (WITH TOP ELEVATION)

RIPARIAN VEGETATION AREA LEGEND

- RIPARIAN VEGETATION IMPACT AREA #2
- RIPARIAN VEGETATION IMPACT SAMPLE AREA #2

RIPARIAN VEGETATION IMPACT AREA #2					
		RIPARIAN VEGETATION IMPACT SAMPLE AREA		RIPARIAN VEGETATION IMPACT AREA	
		1785 SF	0.04 AC	9010 SF	0.21 AC
SPECIES	DIAMETER (IN.)	NUMBER WITHIN SAMPLE AREA		ESTIMATED NUMBER WITHIN IMPACT AREA	
ALDER	0-2	1		5	
ALDER	4-8	2		10	
ALDER	8-12	1		5	
WALNUT	0-2	2		10	
WILLOW	0-4	3		15	
WILLOW	4-8	2		10	

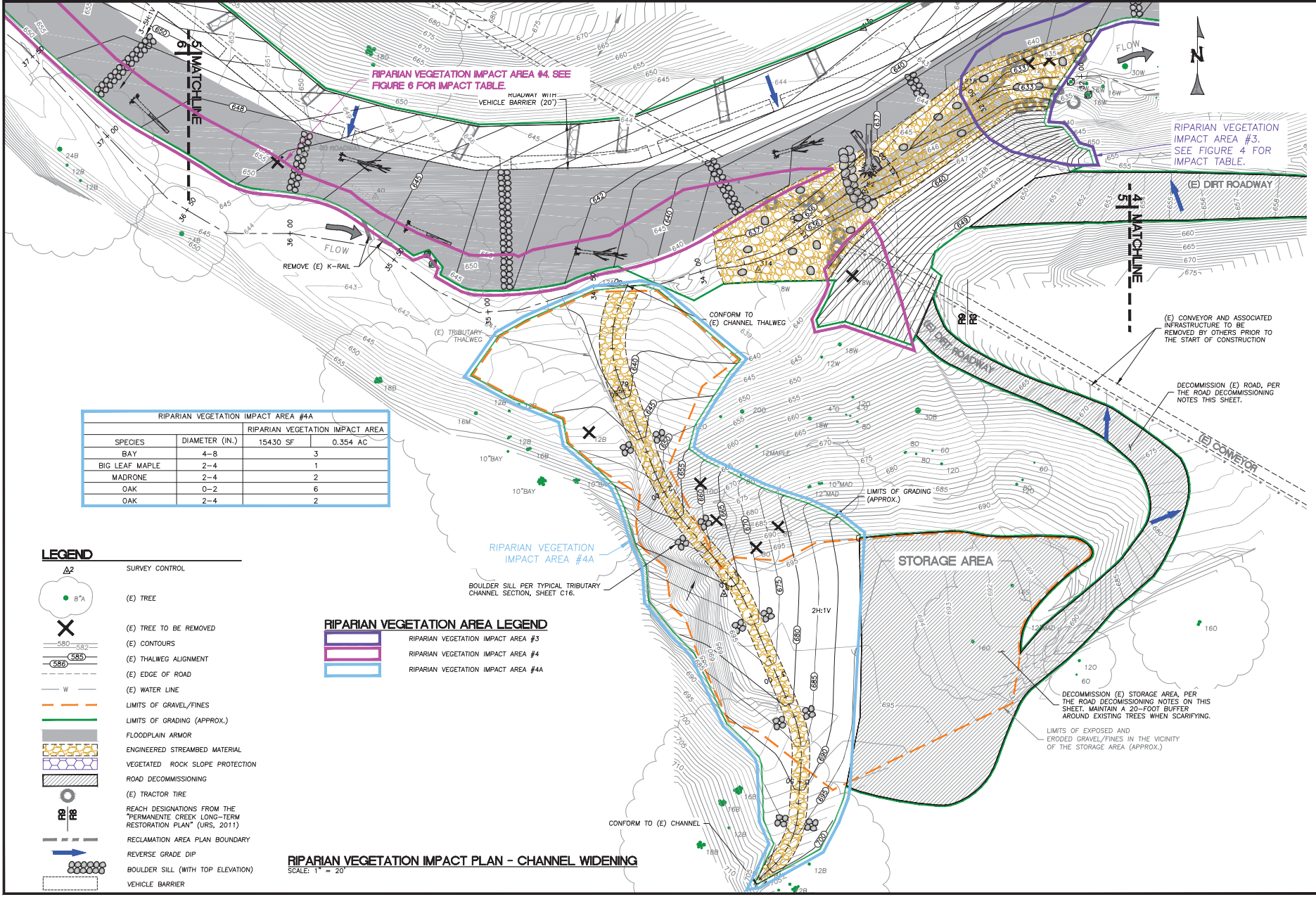


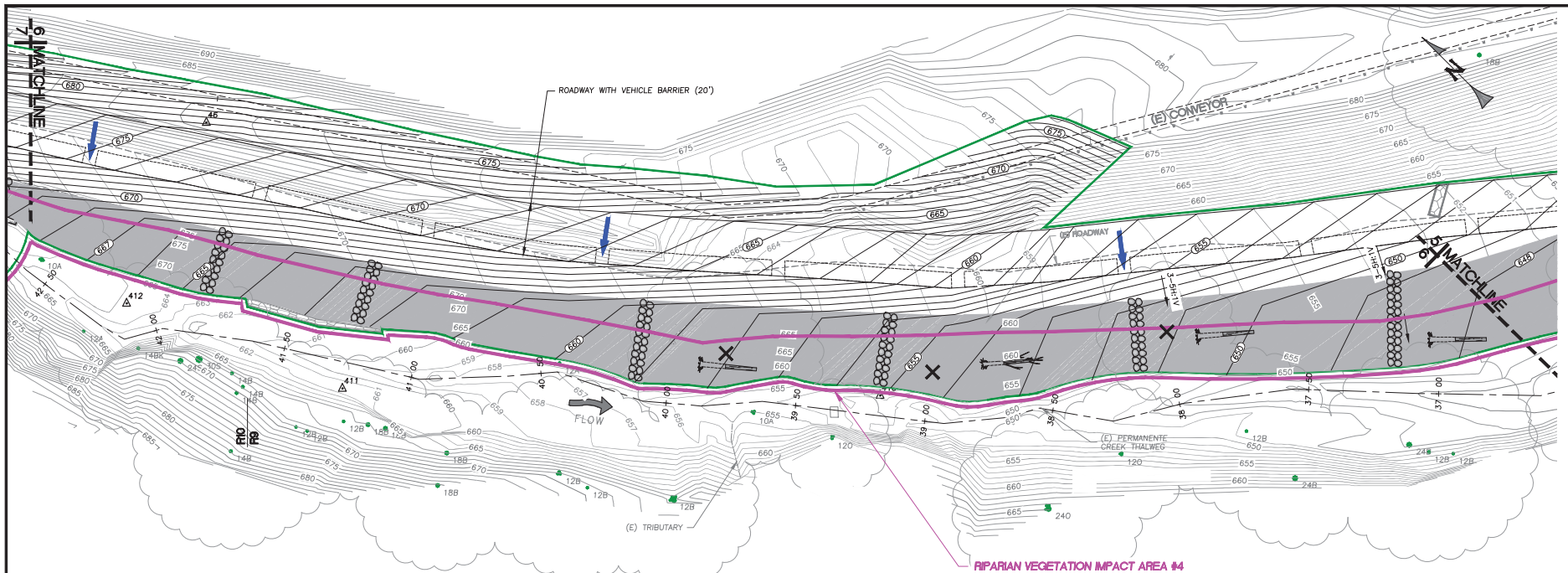
- LEGEND**
- SURVEY CONTROL
 - (E) TREE AND DRIPLINE
 - (E) TREE TO BE REMOVED
 - (E) CONTOURS
 - PROPOSED CONTOURS
 - (E) THALWEG ALIGNMENT
 - (E) EDGE OF ROAD
 - (E) WATER LINE
 - (E) STORM DRAIN LINE
 - (E) EXPOSED ROCK SLOPE PROTECTION
 - LIMITS OF GRADING (APPROX.)
 - FLOODPLAIN ARMOR
 - ENGINEERED STREAMBED MATERIAL
 - VEGETATED ROCK SLOPE PROTECTION
 - ROAD DECOMMISSIONING AREA
 - REACH DESIGNATIONS FROM THE "PERMANENTE CREEK LONG-TERM RESTORATION PLAN" (URS, 2011)
 - RECLAMATION AREA PLAN BOUNDARY
 - REVERSE GRADE DIP
 - BOULDER SILL (WITH TOP ELEVATION)
 - VEHICLE BARRIER

- RIPARIAN VEGETATION AREA LEGEND**
- RIPARIAN VEGETATION IMPACT AREA #2
 - RIPARIAN VEGETATION IMPACT AREA #3
 - RIPARIAN VEGETATION IMPACT SAMPLE AREA #3

RIPARIAN VEGETATION IMPACT PLAN - CHANNEL WIDENING
SCALE: 1" = 20'

RIPARIAN VEGETATION IMPACT AREA #3				
SPECIES	DIAMETER (IN.)	RIPARIAN VEGETATION IMPACT SAMPLE AREA		ESTIMATED NUMBER WITHIN IMPACT AREA
		800 SF	0.02 AC	
BAY ELDERBERRY	4-8	1	11	11
WILLOW	0-2	1	11	11
WILLOW	0-4	1	11	11
WILLOW	4-8	1	11	11
WILLOW	8-12	2	22	22



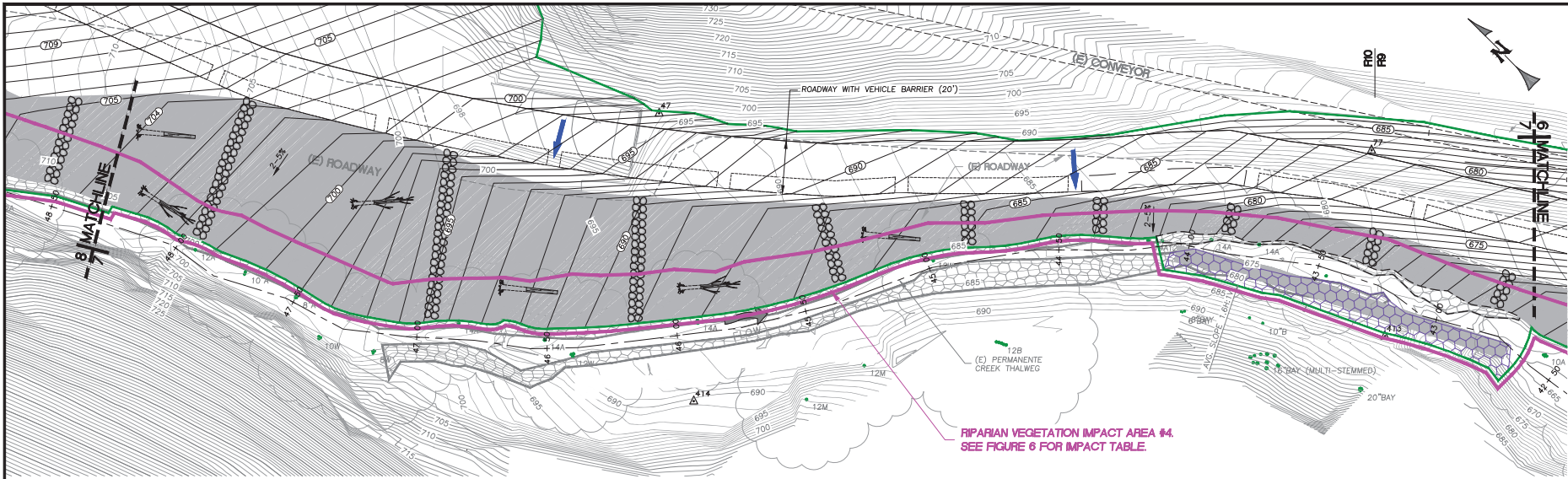


RIPARIAN VEGETATION IMPACT PLAN - CHANNEL WIDENING
SCALE: 1" = 20'

- LEGEND**
- SURVEY CONTROL
 - (E) 8' A
 - (E) TREE AND DRIPLINE
 - (E) TREE TO BE REMOVED
 - (E) CONTOURS
 - PROPOSED CONTOURS
 - (E) THALWEG ALIGNMENT
 - (E) EDGE OF ROAD
 - (E) WATER LINE
 - (E) STORM DRAIN LINE
 - (E) EXPOSED ROCK SLOPE PROTECTION
 - LIMITS OF GRADING (APPROX.)
 - FLOODPLAIN ARMOR
 - ENGINEERED STREAMBED MATERIAL
 - REACH DESIGNATIONS FROM THE PERMANENT CREEK LONG-TERM RESTORATION PLAN (URS, 2011)
 - RECLAMATION AREA PLAN BOUNDARY
 - REVERSE GRADE DIP
 - BOULDER SILL (WITH TOP ELEVATION)
 - VEHICLE BARRIER

RIPARIAN VEGETATION AREA LEGEND
RIPARIAN VEGETATION IMPACT AREA #4

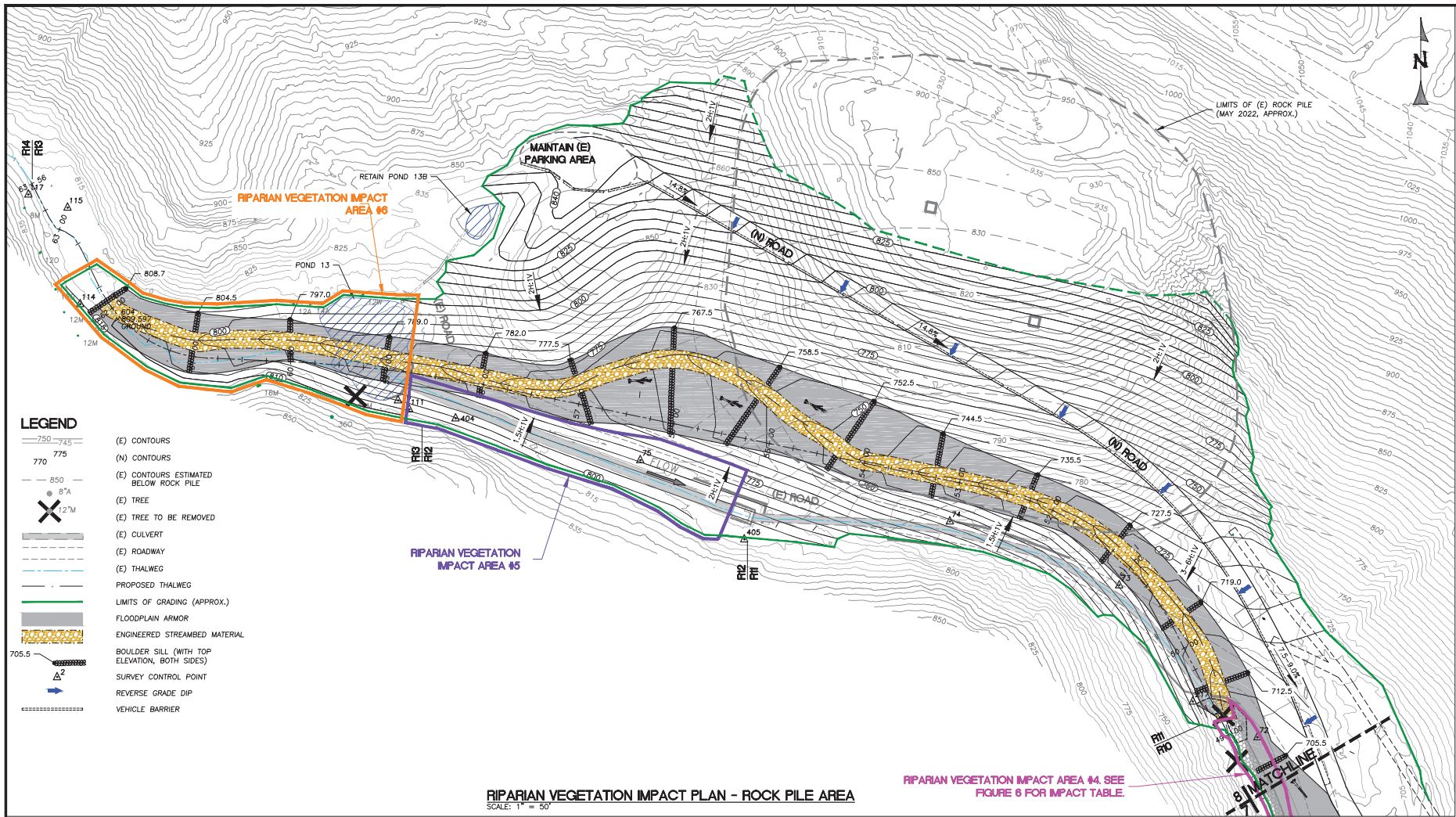
RIPARIAN VEGETATION IMPACT AREA #4			
SPECIES	DIAMETER (IN.)	RIPARIAN VEGETATION IMPACT AREA	
		24,715 SF	0.57 AC
ALDER	2-4	1	
BAY	2-4	1	
BIG LEAF MAPLE	2-4	5	
BIG LEAF MAPLE	4-8	1	
BUCKEYE SAPPLING	0-2	5	
COFFEEBERRY	0-2	1	
ELDERBERRY	0-2	7	
ELDERBERRY	4-6	1	
OAK SAPPLING	<1	12	
OAK	0-2	5	
OAK	2-4	3	
SYCAMORE	32	1	
TOYON	0-2	9	
WALNUT	0-2	1	
WILLOW	0-4	3	
WILLOW	4-8	14	
WILLOW	8-12	9	
WILLOW	24+	1	



RIPARIAN VEGETATION IMPACT PLAN - CHANNEL WIDENING
SCALE: 1" = 20'

- LEGEND**
- $\Delta 2$ SURVEY CONTROL
 - (E) TREE AND DRIPLINE
 - (E) TREE TO BE REMOVED
 - (E) CONTOURS
 - PROPOSED CONTOURS
 - (E) THALWEG ALIGNMENT
 - (E) EDGE OF ROAD
 - (E) WATER LINE
 - (E) STORM DRAIN LINE
 - (E) EXPOSED ROCK SLOPE PROTECTION
 - LIMITS OF GRADING (APPROX.)
 - FLOODPLAIN ARMOR
 - ENGINEERED STREAMBED MATERIAL
 - VEGETATED ROCK SLOPE PROTECTION
 - ROAD DECOMMISSIONING AREA
 - REACH DESIGNATIONS FROM THE "PERMANENTE CREEK LONG-TERM RESTORATION PLAN" (URS, 2011)
 - REVERSE GRADE DIP
 - BOULDER SILL (WITH TOP ELEVATION)
 - VEHICLE BARRIER

RIPARIAN VEGETATION AREA LEGEND
 RIPARIAN VEGETATION IMPACT AREA #4



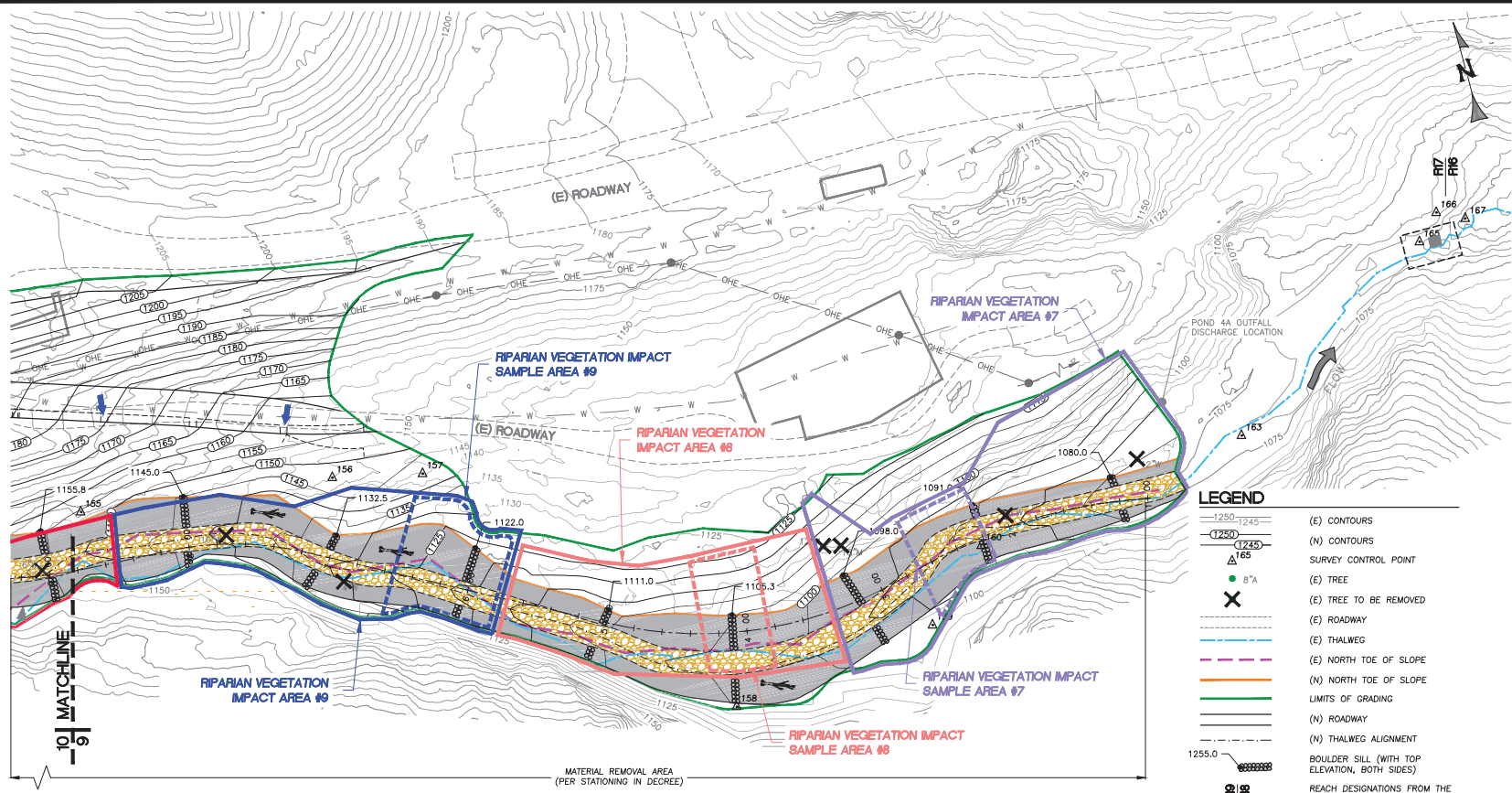
RIPARIAN VEGETATION IMPACT PLAN - ROCK PILE AREA
SCALE: 1" = 50'

RIPARIAN VEGETATION IMPACT AREA #4. SEE FIGURE 6 FOR IMPACT TABLE.

RIPARIAN VEGETATION IMPACT AREA #5			
SPECIES	DIAMETER (IN.)	RIPARIAN VEGETATION IMPACT AREA	
		19050 SF	0.437 AC
BIG LEAF MAPLE	0-2	1	
WILLOW	0-4	1	

RIPARIAN VEGETATION AREA LEGEND	
	RIPARIAN VEGETATION IMPACT AREA #4
	RIPARIAN VEGETATION IMPACT AREA #5
	RIPARIAN VEGETATION IMPACT AREA #6

RIPARIAN VEGETATION IMPACT AREA #6			
SPECIES	DIAMETER (IN.)	RIPARIAN VEGETATION IMPACT AREA	
		29200 SF	0.670 AC
BIG LEAF MAPLE	0-2	1	
ELDERBERRY	0-2	5	
WILLOW	0-4	26	
WILLOW	4-8	6	
WILLOW	8-12	9	



RIPARIAN VEGETATION IMPACT PLAN (1 OF 2) - MATERIAL REMOVAL AREA
SCALE: 1" = 40'

RIPARIAN VEGETATION IMPACT AREA #7					
		RIPARIAN VEGETATION IMPACT SAMPLE AREA		RIPARIAN VEGETATION IMPACT AREA	
		3495 SF	0.080 AC	24540 SF	0.563 AC
SPECIES	DIAMETER (IN.)	NUMBER WITHIN SAMPLE AREA		ESTIMATED NUMBER WITHIN IMPACT AREA	
BIG LEAF MAPLE	4-6	1		8	
BIG LEAF MAPLE	6-8	3		23	
CEANOTHUS	0-2	1		8	
MADRONE	2-4	1		8	
TOYONE	0-2	3		23	
WILLOW	0-4	6		47	

RIPARIAN VEGETATION IMPACT AREA #8					
		RIPARIAN VEGETATION IMPACT SAMPLE AREA		RIPARIAN VEGETATION IMPACT AREA	
		3,995 SF	0.091 AC	18,310 SF	0.420 AC
SPECIES	DIAMETER (IN.)	NUMBER WITHIN SAMPLE AREA		ESTIMATED NUMBER WITHIN IMPACT AREA	
BAY	0-2	3		14	
BIG LEAF MAPLE	0-2	2		9	
MADRONE	0-2	3		14	
MADRONE	2-4	2		9	
TOYONE	0-2	1		5	
WILLOW	0-4	9		41	

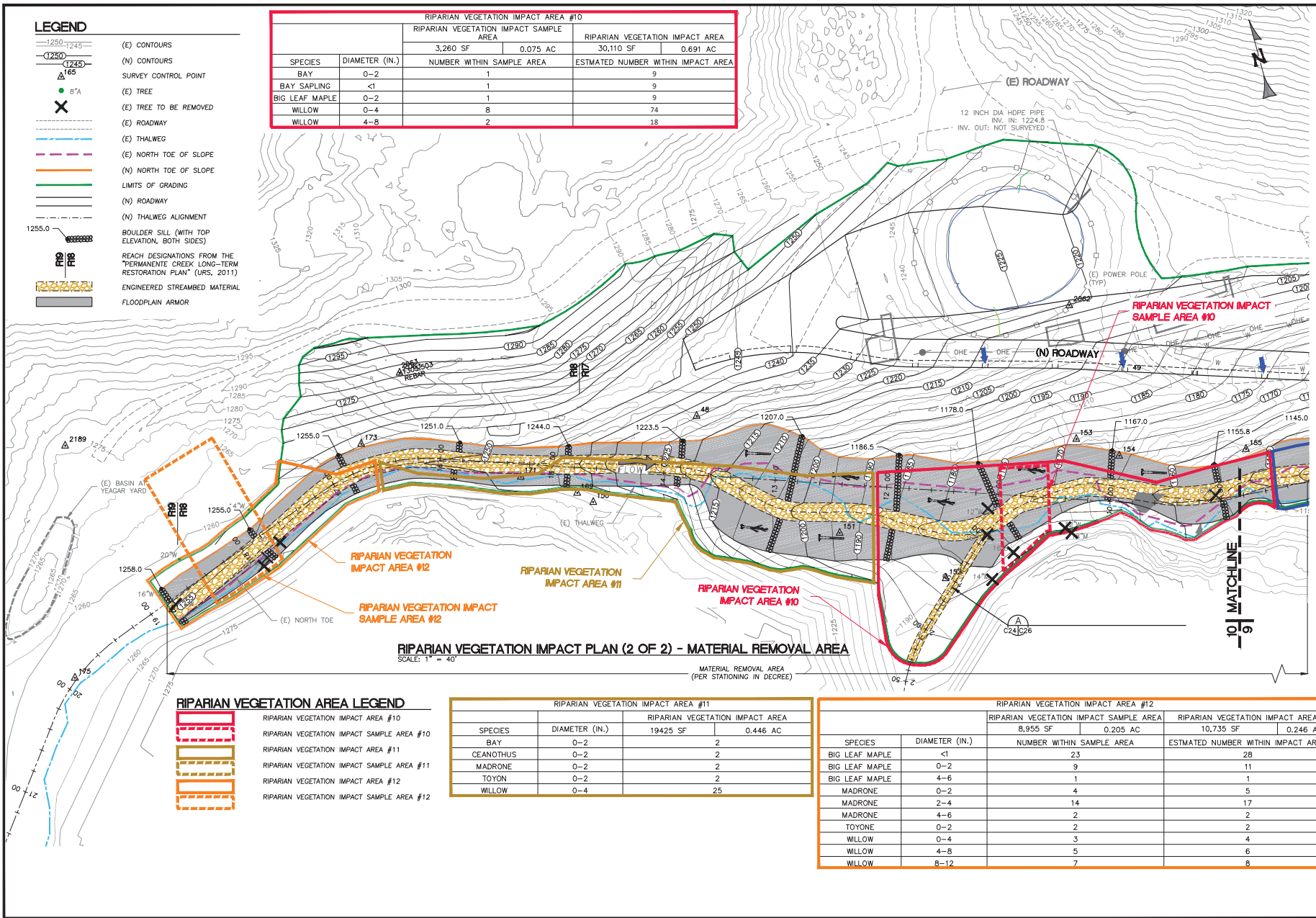
RIPARIAN VEGETATION IMPACT AREA #9					
		RIPARIAN VEGETATION IMPACT SAMPLE AREA		RIPARIAN VEGETATION IMPACT AREA	
		5,945 SF	0.136 AC	18,775 SF	0.431 AC
SPECIES	DIAMETER (IN.)	NUMBER WITHIN SAMPLE AREA		ESTIMATED NUMBER WITHIN IMPACT AREA	
WILLOW	0-4	24		76	
WILLOW	4-8	9		28	

RIPARIAN VEGETATION AREA LEGEND	
	RIPARIAN VEGETATION IMPACT AREA #7
	RIPARIAN VEGETATION IMPACT SAMPLE AREA #7
	RIPARIAN VEGETATION IMPACT AREA #8
	RIPARIAN VEGETATION IMPACT SAMPLE AREA #8
	RIPARIAN VEGETATION IMPACT AREA #9
	RIPARIAN VEGETATION IMPACT SAMPLE AREA #9

LEGEND

- 1250-1245 (E) CONTOURS
- 1250 (N) CONTOURS
- 1245 SURVEY CONTROL POINT
- 8" A (E) TREE
- X (E) TREE TO BE REMOVED
- (E) ROADWAY
- (E) THALWEG
- (E) NORTH TOE OF SLOPE
- (N) NORTH TOE OF SLOPE
- LIMITS OF GRADING
- (N) ROADWAY
- (N) THALWEG ALIGNMENT
- BOULDER SILL (WITH TOP ELEVATION, BOTH SIDES)
- REACH DESIGNATIONS FROM THE "PERMANENTE CREEK LONG-TERM RESTORATION PLAN" (URS, 2011)
- ENGINEERED STREAMBED MATERIAL
- FLOODPLAIN ARMOR

RIPARIAN VEGETATION IMPACT AREA #10					
		RIPARIAN VEGETATION IMPACT SAMPLE AREA		RIPARIAN VEGETATION IMPACT AREA	
SPECIES	DIAMETER (IN.)	NUMBER WITHIN SAMPLE AREA	ESTIMATED NUMBER WITHIN IMPACT AREA	3,260 SF	0.075 AC
BAY	0-2	1	9		
BAY SAPLING	<1	1	9		
BIG LEAF MAPLE	0-2	1	9		
WILLOW	0-4	8	74		
WILLOW	4-8	2	18		



RIPARIAN VEGETATION IMPACT PLAN (2 OF 2) - MATERIAL REMOVAL AREA

SCALE: 1" = 40'
MATERIAL REMOVAL AREA (PER STATIONING IN DEGREE)

RIPARIAN VEGETATION AREA LEGEND

- RIPARIAN VEGETATION IMPACT AREA #10
- RIPARIAN VEGETATION IMPACT SAMPLE AREA #10
- RIPARIAN VEGETATION IMPACT AREA #11
- RIPARIAN VEGETATION IMPACT SAMPLE AREA #11
- RIPARIAN VEGETATION IMPACT AREA #12
- RIPARIAN VEGETATION IMPACT SAMPLE AREA #12

RIPARIAN VEGETATION IMPACT AREA #11				
		RIPARIAN VEGETATION IMPACT AREA		
SPECIES	DIAMETER (IN.)	19425 SF	0.446 AC	
BAY	0-2	2		
CEANOTHUS	0-2	2		
MADRONE	0-2	2		
TOYONE	0-2	2		
WILLOW	0-4	25		

RIPARIAN VEGETATION IMPACT AREA #12					
		RIPARIAN VEGETATION IMPACT SAMPLE AREA		RIPARIAN VEGETATION IMPACT AREA	
SPECIES	DIAMETER (IN.)	NUMBER WITHIN SAMPLE AREA		ESTIMATED NUMBER WITHIN IMPACT AREA	
		8,955 SF	0.205 AC	10,735 SF	0.246 AC
BIG LEAF MAPLE	<1	23		28	
BIG LEAF MAPLE	0-2	9		11	
BIG LEAF MAPLE	4-6	1		1	
MADRONE	0-2	4		5	
MADRONE	2-4	14		17	
MADRONE	4-6	2		2	
TOYONE	0-2	2		2	
WILLOW	0-4	3		4	
WILLOW	4-8	5		6	
WILLOW	8-12	7		8	