Biological Assessment

For Potential Impacts to Coho Salmon (*Oncorhynchus kisutch*), Chinook Salmon (*Oncorhynchus tshawytscha*), Steelhead (*Oncorhynchus mykiss*), their Designated Critical Habitat, and

Essential Fish Habitat Assessment

for Pacific Salmon

Richardson Grove Operational Improvement Project
US 101 PM 1.1 / 2.2 in Humboldt County
EA 01-46480
October 2016

Caltrans
CALIFORNIA DEPARTMENT OF TRANSPORTATION

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Biological Assessment
Essential Fish Habitat Assessment

Richardson Grove Operational Improvement Project

District 1 - HUM 101-PM-1.1 / 2.2
EA 01-46480

October 2016

STATE OF CALIFORNIA
Department of Transportation

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Summary of Findings and Determination

The California Department of Transportation (Caltrans) proposes to adjust the roadway alignment on US Route 101 (US 101 or Route 101) from one mile north of the Mendocino/Humboldt County line (PM 1.1) to approximately 8 miles south of Garberville (PM 2.2) so that two Surface Transportation Assistance Act (STAA) trucks passing in opposite directions can be accommodated.

The project would involve ground disturbance, slope excavations, retaining wall construction, drainage work, equipment staging areas, guardrail modification, temporary construction easements, and vegetation removal. The project is not expected to increase truck traffic in the corridor.

The "action area" for this consultation extends along the US 101 corridor in Humboldt County from Post Miles (PMs) 1.1 to 2.2; potential staging areas at Post Mile 2.2 in Humboldt County and Post Mile R106.5 in Mendocino County; and all terrestrial and aquatic features that may be affected by direct and indirect impacts from construction activities.

The Southern Oregon/Northern California Coast (SONCC) Evolutionary Significant Unit (ESU) coho salmon (*Oncorhynchus kisutch*), the California Coastal (CC) ESU Chinook salmon (*Oncorhynchus tshawytscha*), and the Northern California (NC) Distinct Population Segment (DPS) steelhead (*Oncorhynchus mykiss*) could occur in the vicinity of the proposed project. Each of these salmonid species is listed as *threatened* under the federal Endangered Species Act (FESA). Critical Habitat for all three listed salmonids and Essential Fish Habitat (EFH) for coho and Chinook salmon is also designated within the action area.

The proposed project was developed by a multidisciplinary team to achieve the project purpose and need while avoiding or minimizing environmental impacts. To minimize impacts to fish species, designated Critical Habitat, and EFH, no work would occur below the wetted channel of fish-bearing waters; vegetation impacts would be minimized; the action is designed not to threaten the survival or stability of any large coast redwood trees (*Sequoia sempervirens*); and measures would be implemented during and after construction to minimize discharge of sediment and contaminants to the river.

Caltrans considered the following potential stressors for their likelihood and magnitude of negative impacts to ESA-listed salmonids and their designated critical habitat.

- Riparian Vegetation Impacts
- Fish Passage Impacts
- Water Quality Impacts
    - Water Temperature
    - Construction Lubricants and Liquids
    - Sediment and Turbidity
    - Contaminants Associated with Stormwater Runoff
- Noise and Visual Disturbance
- Increased Impervious Surface
- Simultaneous Construction Impacts

Despite standard protection measures, the proposed action could have the potential to produce negative impacts to listed salmonids. Caltrans does not expect any reduction in growth or survival of individual salmonids as a result of the proposed action. Juvenile salmonids could experience physical stress from increases in turbidity associated with runoff originating from areas of ground disturbance, as well as small reductions in allochthonous inputs and water quality due to vegetation removal. Potential increases in sediment delivery to the river would be short-term and localized (as quantified in Chapter 5). The combined impacts to riparian vegetation are not expected to result in changes in water quality, food availability, or recruitment of habitat-forming large woody debris. Due to project design, the low magnitude of disturbance, and the measures that would be in place to protect water quality and to revegetate areas subject to ground disturbance, negative effects to listed salmonids and their critical habitat resulting from turbidity and vegetation removal would be insignificant.

Caltrans has examined potential impacts to listed salmonids at the activity scale (i.e., a single stressor at a single location), the site scale, (i.e., the effects of multiple stressors at a given location), and the action area scale (i.e., all potential direct and indirect stressors at all locations). Caltrans concludes that the proposed action, as a whole, would not reduce the growth, survival, and overall fitness of individual listed salmonids, and would not negatively impact the South Fork Eel River populations of listed salmonids. Caltrans also examined the potential impacts to the primary constituent elements of critical habitat, in particular juvenile rearing habitat, and has concluded that any impacts due to the proposed action would be insignificant.

Based on the analysis of project impacts in this biological assessment, Caltrans has determined that the proposed action *may affect*, but *is not likely to adversely affect* coho salmon of the SONCC ESU, Chinook salmon of the CC ESU, and steelhead of the NC DPS. Potential negative effects to individual listed salmonids of all life stages were determined to be either insignificant or discountable given the scale of project impacts and the low risk of exposure of listed salmonids to any potential stressors.

In addition, the proposed action *may affect*, but *is not likely to adversely affect* critical habitat for the listed salmonids. The primary constituent elements of designated critical habitat that could be affected include impacts to water quality, cover/shelter, foraging potential, safe passage conditions, and riparian vegetation. Impacts from these elements would result in minor, short-term, and/or localized changes to the environmental baseline conditions of designated critical habitat.

The proposed action may result in temporary *adverse effects* to EFH for Pacific salmon managed under the Pacific Fishery Management Council Salmon Fishery Management Plan (coho salmon and Chinook salmon). Elements of EFH that may be affected by the proposed action are the same as those identified for designated critical habitat, which include water quality, foraging potential, safe passage conditions, and riparian vegetation. However, the functional components of these elements would be restored once construction is complete. Caltrans has determined that there would be no long-term, permanent impacts to EFH for Pacific salmon.

List of Abbreviated Terms

BA	Biological Assessment
BMP	Best Management Practice
Caltrans	California Department of Transportation
CC	California Coastal
CDFW	California Department of Fish and Wildlife
CEDEN	California Environmental Data Exchange Network
CSP	Corrugated Steel Pipe
CY	Cubic yards
DBH	Diameter at breast height
DPS	Distinct Population Segment
EFH	Essential Fish Habitat
EIR	Environmental Impact Report
ESU	Evolutionarily Significant Unit
FESA	Federal Endangered Species Act
Ft.	Foot/feet
HMA	Hot mix asphalt
HUM	Humboldt County (used in reference to a state route or United States highway in Humboldt County, e.g., HUM 101)
MBGR	Metal Beam Guardrail
MSA	Magnuson Stevens Fishery Conservation and Management Act
NC	Northern California
NCRWQCB	North Coast Regional Water Quality Control Board
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service (National Oceanic & Atmospheric Administration Fisheries Service)
NOT	Notice of Termination
OHWM	Ordinary High Water Mark
PFMC	Pacific Fishery Management Council
PAH	Polycyclic Aromatic Hydrocarbon
PFMC	Pacific Fishery Management Council
PM	Post Mile
REAP	Rain Event Action Plan
RED	Rock Energy Dissipater
ROUTE 101	U.S. Route 101
SH/RT	Steelhead/Rainbow trout
SONCC	Southern Oregon/Northern California Coast
STAA	Surface Transportation Assistance Act
SWPPP	Stormwater Pollution Prevention Program
US	United States
US 101	U.S. Route 101
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
WPCP	Water Pollution Control Program

Chapter 1. Introduction

The purpose of this Biological Assessment (BA) is to provide technical information and to review the proposed project in sufficient detail to determine to what extent the proposed project may affect threatened, endangered, or proposed species. This BA is prepared in accordance with legal requirements found in Section 7(a)(2) of the Endangered Species Act (16 U.S.C. 1536(c)) and with Federal Highway Administration and California Department of Transportation regulation, policy, and guidance. The document presents technical information on which later decisions regarding project impacts are developed.

1.1. Project Purpose and Need

The purpose of the proposed project is to adjust the roadway alignment so that two Surface Transportation Assistance Act (STAA) trucks passing in opposite directions can be accommodated. STAA trucks can be longer than California Legal trucks, have a larger turning radius, and require more gradual curves to avoid encroaching onto shoulders or crossing into the opposing or adjacent lane of traffic. By making minor realignment improvements to accommodate STAA trucks, the restriction on STAA vehicles would be removed and the safety and operation of US Route 101 would be improved while also improving goods movement. The primary need for the project is the result of: (1) non-standard curves, (2) absence of shoulders, and (3) fixed objects in close proximity of the traveled way.

1.2. Project Location

The project is in Humboldt County on US Route 101 from one mile north of the Mendocino/Humboldt County line (PM 1.1) to approximately 8 miles south of Garberville (PM 2.2). The project is just over one mile in length (Figure 1.1).

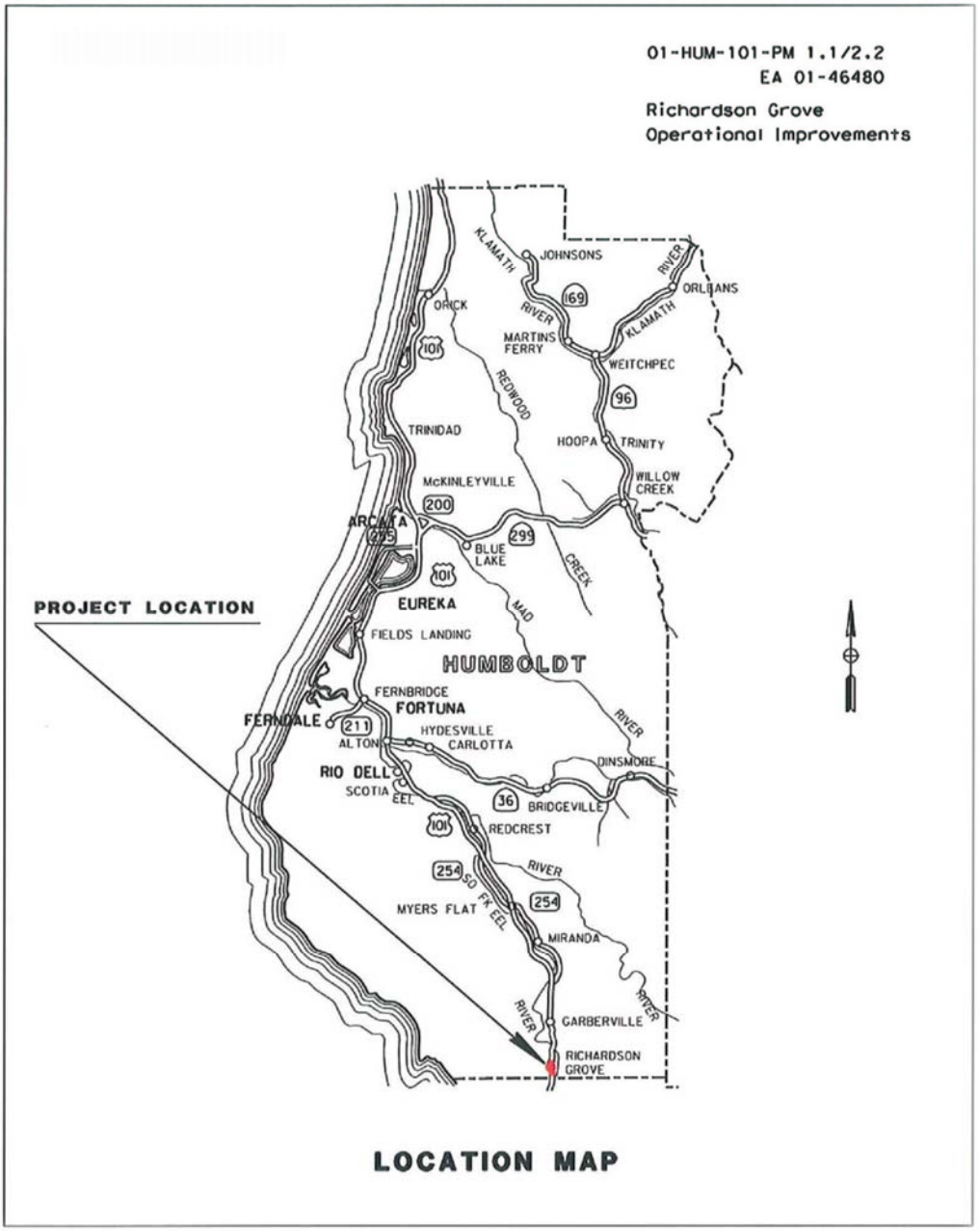

Figure 1.1 Location Map

1.3. Project Summary

Within the limits of the proposed project, US Route 101 is a conventional two-lane highway with two 12-foot lanes and 0 to 4-foot shoulders. The project proposes minor realignment (including minor widening) of US Route 101 to correct STAA restrictions between PM 1.1 and 2.2. This proposed action would involve:

- Pavement removal and repaving
- Culvert work with potential temporary diversions of roadside drainages and ephemeral watercourses
- Barrier rail modifications
- Retaining wall construction
- Embankment construction
- Slope excavations
- Equipment staging areas
- Vegetation (herbaceous, shrub, and tree) removal
- Implementation of standard best management practices (BMPs).

The project is expected to take one to two construction seasons to complete and is currently scheduled to begin construction in 2018.

Chapter 2. Consultation History

The 2010 Natural Environment Study for this project determined it would not "adversely impact" listed fish species (Caltrans 2010a). Since then, additional data and analysis were required for the project. In 2015, Caltrans requested technical assistance from the National Marine Fisheries Service (NMFS) to reevaluate the potential effects of the culvert work and proposed barrier rail modifications on listed fish species. On February 18, 2015, NMFS Fisheries Biologist Rebecca Bernard visited the site with the Caltrans biologist and design engineer. In September 2015, Caltrans obtained a current official species list for this action (Appendix C). From January 11, 2016, to February 2, 2016, Caltrans was in contact with NMFS for clarification of EFH effects conclusion.

On March 16, 2016, Caltrans submitted a BA for the project. On April 4, 2016, Ms. Bernard met with the Caltrans senior environmental planner and the project biologist for review of NMFS comments. Ms. Bernard emailed the remainder of the comments the next day. As a result of those comments, Caltrans decided to rescind and revise the BA. The BA was rescinded formally via an email sent to Ms. Bernard on April 6, 2016. In May 2016, Caltrans contacted NMFS regarding the September 2015 species list and received NMFS confirmation that it was still accurate (J. Jahn, personal communication, May 2016). On June 14, 2016, Caltrans submitted a new BA. On July 20, 2016, Caltrans received an insufficiency letter from NMFS. The insufficiency letter provided additional comments that were not identified in the comments that NMFS provided on April 4 and 5. This BA addresses all the comments identified in the July 20, 2016, insufficiency letter.

2.1. Authorities and Discretion

The following sections describe the Federal authorities, policies, and ordinances under which the project is being proposed, implemented, maintained, regulated, or otherwise affected.

2.1.1. Federal Endangered Species Act (FESA)

The Federal Endangered Species Act (FESA) defines *endangered species* as those in danger of extinction throughout all or a significant portion of their range. A *threatened species* is any species that is likely to become an endangered species in the foreseeable future throughout all or a significant portion of its range.

This document addresses Southern Oregon/Northern California Coast coho salmon (*Oncorhynchus kisutch*) (Threatened), Northern California steelhead (*Oncorhynchus mykiss*) (Threatened), and California Coastal Chinook salmon (*Oncorhynchus tshawytscha*) (Threatened).

The action area (Figure 3.1 and described in Section 3.2) includes the South Fork Eel River and Durphy Creek. The following Federally listed species have the potential to occur within the action area:

- Southern Oregon/Northern California (SONCC) coho salmon
- California Coastal (CC) Chinook salmon
- Northern California (NC) steelhead

Table 2.1 shows designated critical habitat within the action area.

Table 2.1. Designated critical habitat of listed species in fish-bearing watercourses within the action area.

Watercourses Within Action Area	SONCC Coho Salmon	CC Chinook Salmon	NC Steelhead
South Fork Eel River	Yes	Yes	Yes
Durphy Creek	Yes	No	Yes

2.1.2. Magnuson-Stevens Fisheries Act

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), also known as the Sustainable Fisheries Act (Public Law 104-297), requires all federal agencies to consult with the Secretary of Commerce on activities or proposed activities authorized, funded, or undertaken by that agency that may adversely affect Essential Fish Habitat (EFH) (PFMC 2014). This document addresses EFH for Pacific salmon covered under the Pacific Coast Salmon Fisheries Management Plan administered through the MSA.

The EFH provisions of the Sustainable Fisheries Act are designed to protect fish habitat from being lost due to disturbance and degradation. An EFH analysis evaluating impacts of project activities to EFH for CC Chinook and SONCC coho salmon is included in this document (Chapter 7).

Chapter 3. Description of Proposed Action

3.1. Project Location

The project is in Humboldt County (Figure 1.1 and Appendix A) in the Garberville USGS Quadrangle in T5S, R3E, S13 & 24. The project begins at 40.0141º North Latitude and 123.7914º West Longitude (PM 1.1) and ends at 40.0302º North Latitude and 123.7938º West Longitude (PM 2.2). The project location is in the Northern California Coast Ranges Ecological Province. The terrain surrounding the project location consists of steep and moderately steep hills/mountains. Elevation of US 101 at the project location is about 500 feet.

3.2. Action Area Defined

The "action area" is defined in 50 CFR §402.02 as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." A federal action is any highway construction, reconstruction, rehabilitation, repair, or improvement undertaken with federal-aid highway funds or Federal Highway Administration approval. The action area (Figure 3.1) includes:

- The US 101 corridor in Humboldt County from Post Miles 1.1 to 2.2
- The potential staging areas at Post Mile 2.2 in Humboldt County and US 101 in Mendocino County, Post Mile R106.5
- The South Fork Eel River from where stormwater from the most southerly culvert in the project area (PM 1.18, the culvert at PM 1.14 does not convey any drainage from the roadway, only from adjacent uplands, see Section 4.1.1) enters the river (40.016506° N Latitude, 123.791302° W Longitude) to 600 feet downstream of where the most northerly project area culvert (PM 2.20) enters the river (40°01'46.5"N Latitude, 123°47'34.4"W Longitude) based on the following:
    - The 600-foot downstream limit is based on a USFWS Biological Opinion that stated, "All projects have the potential to cause sediment-related effects up to 600 feet downstream of a crossing site" (USFWS 2006).

- Associated tributaries (Durphy Creek [PM 1.61], North Creek [PM 1.78], Laurel Creek [PM 1.98], and nine unnamed tributaries [PM 1.14, PM 1.18, PM 1.34, PM 1.35, PM 1.63, PM 1.87, PM 2.10, PM 2.12, and PM 2.20]) from the west side of US 101 to their confluences with the South Fork Eel River, and associated areas of riparian vegetation (Table 3.1).

- Two culverts (PM 1.28 and PM 2.17) that drain into vegetated uplands (Table 3.1).

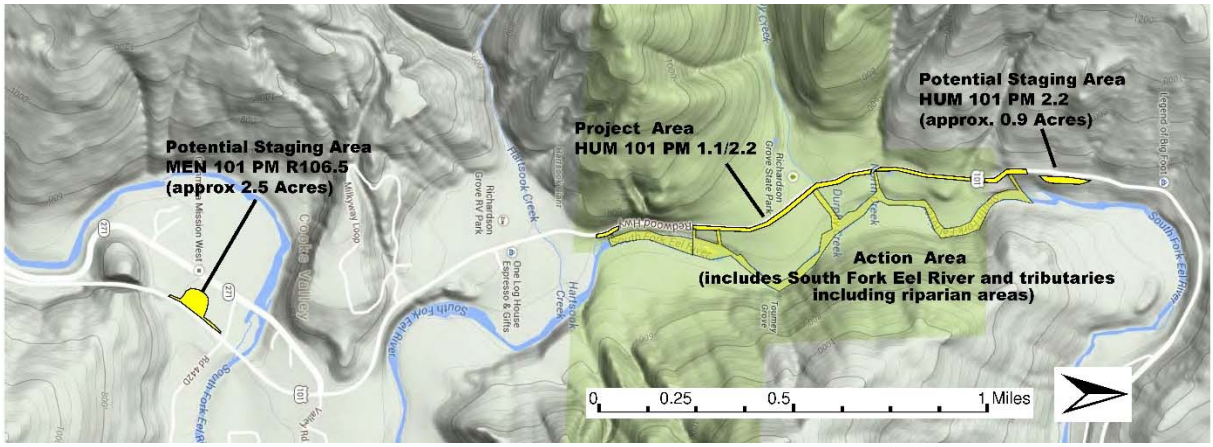

Figure 3.1. Map of Action Area (shown in yellow)

Table 3.1 Fourteen Drainages/Watercourses that Cross US 101 within the Action Area

	Post Mile	Fish-Bearing	Construction Activity	Connectivity to South Fork Eel River	Potential Water Diversion
Unnamed seasonal runoff (does not convey any roadway drainage)	1.14	No	None	Yes	N/A
Unnamed seasonal runoff	1.18	No	Extend existing culvert and replace headwall.	Yes	No
Unnamed seasonal runoff (does not convey any roadway drainage)	1.28	No	Extend existing culvert and replace headwall.	No	No
Unnamed seasonal runoff and groundwater (spring)	1.34	No	Extend existing culvert and install headwall.	Yes	Yes
Unnamed seasonal runoff and groundwater (spring)	1.35	No	Extend existing culvert and install inlet.	Yes	Yes
Durphy Creek (does not convey any roadway drainage)	1.61	Yes	No work on culvert. Remove MBGR and install transition barriers and crash cushions at four corners of undercrossing.	Yes	No
Unnamed seasonal runoff	1.63	No	None	Yes	N/A
North Creek	1.78	No	Install overside drain and connect to existing culvert.	Yes	No
Unnamed seasonal runoff	1.87	No	None	Yes	N/A
Laurel Creek	1.98	No	None	Yes	N/A
Unnamed seasonal runoff	2.10	No	Replace existing culvert which would pass through new gabion wall and install slotted drain.	Yes	No
Unnamed seasonal runoff	2.12	No	Replace existing, defunct down drain and reconnect to ditch that begins at PM 2.10.	Yes	No
Unnamed seasonal runoff	2.17	No	None	Yes	N/A
Unnamed seasonal runoff	2.20	No	None	Yes	N/A

3.3. Project Description

Between PM 1.1 and 2.2 on US 101 in Humboldt County, the goal of the proposed project is to adjust the roadway alignment so that two Surface Transportation Assistance Act (STAA) trucks passing in opposite directions can be accommodated. A very limited number of STAA trucks currently have legal exemptions to pass through Richardson Grove on US 101. Caltrans does not support additional exemptions because two STAA trucks may not currently pass safely in opposite directions through certain curves.

By making minor realignment improvements to accommodate STAA trucks, the restriction on STAA vehicles would be removed and the safety and operation of US Route 101 would be improved while also improving goods movement. The primary need for the project is the result of the non-standard curves, absence of shoulders, and fixed objects in close proximity of the traveled way.

The objectives of the proposed project include:

- Making minor alignment modifications including minor widening
- Lengthening four existing culverts
- Installing an overside drain to connect to an existing culvert
- Replacing and lengthening one existing culvert
- Replacing existing guardrail at each of the four corners of the bridge (Richardson Grove Undercrossing) with shorter transition barriers and crash cushions
- Constructing a retaining wall composed of a soldier pile wall with a gabion wall on either end
- Grinding existing pavement, repaving with standard (non-rubberized) asphalt, and restriping

About STAA Trucks

STAA trucks are typically longer than California Legal trucks, mainly due to use of a longer cab to allow for a sleeping space. STAA trucks have a larger turning radius (require more space for turning to avoid encroaching onto shoulders or crossing into the opposing or adjacent lane of traffic). It should be noted that some configurations of

California Legal trucks (e.g., California Legal doubles) can be longer than STAA trucks (Figure 3.2).

Regardless of designation (STAA or California Legal), the maximum legal weight limit for all trucks is 80,000 pounds. STAA trucks typically have the same number of axles as California Legal trucks. Truck components (such as fuel, brakes, and tires) are the same for California Legal and STAA trucks.

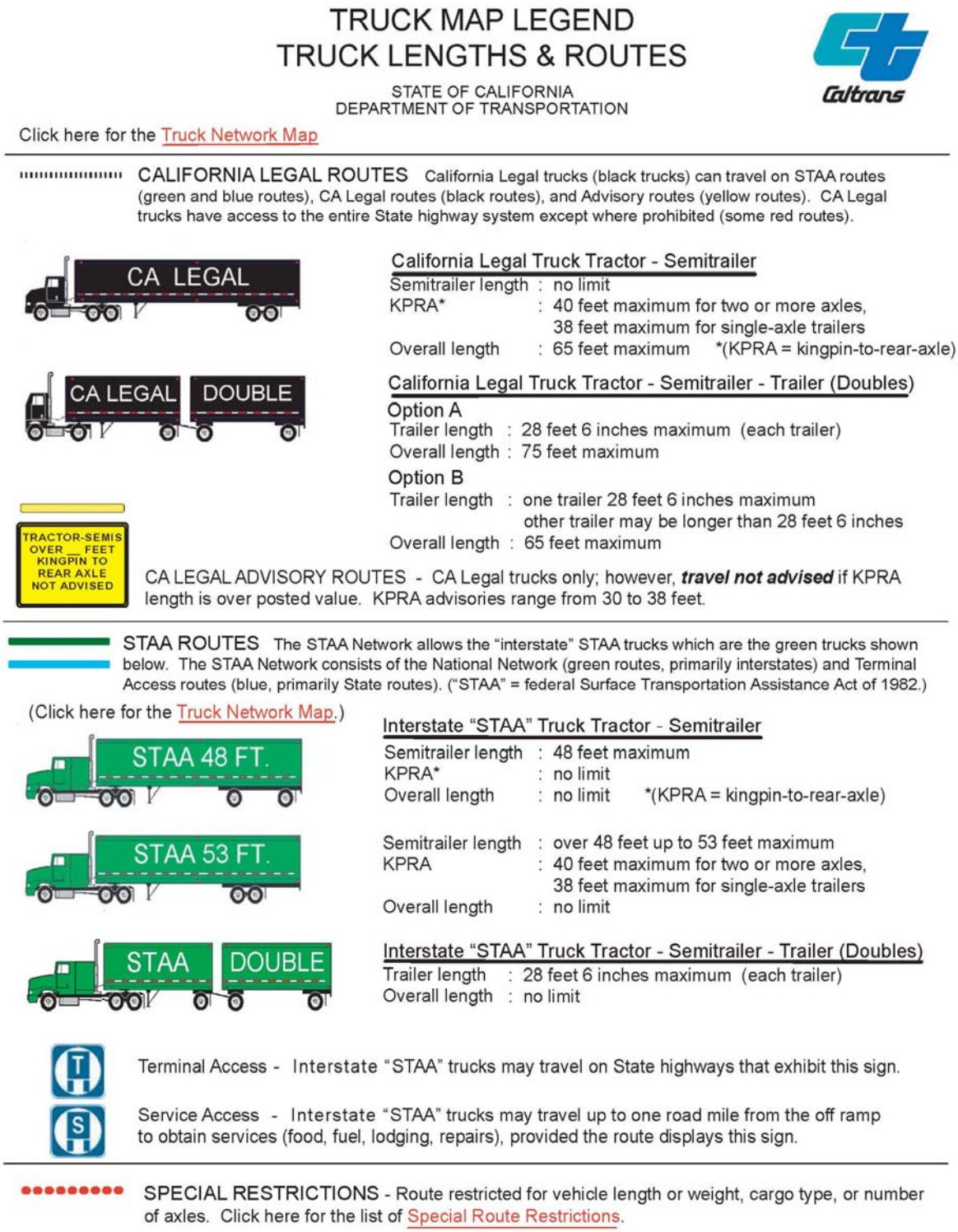

Figure 3.2 STAA Truck Map Legend (To access links from Figure 3.2, go to http://www.dot.ca.gov/hq/traffops/trucks/truckmap/truck-legend.pdf)

3.3.1. Alignment Modifications

Alignment modifications would require earthwork (Tables 3.2, 3.3), including sliver widening of the roadway and adjustments to the super-elevation (to "bank the curves"). Work would also include pavement grinding, repaving, and restriping. The maximum lateral change in the alignment would be about 17 feet, and the average alignment shift from the existing centerline would be approximately 2 to 6 feet. Excavated earthen material would be reused within the project (Table 3.3). These proposed modifications would result in changes to the roadway drainage areas of some of the culverts in the action area (Table 3.4).

Given that proposed work varies along the 1.1 miles of highway, alignment modifications and cuts/fills are described in three segments (Appendix A). Segment 1 runs from PM 1.11 to PM 1.70, Segment 2 from PM 1.70 to PM 2.04, and Segment 3 from PM 2.04 to PM 2.20. STAA access restrictions are located in segments 1 and 3. Cuts and fills to accommodate realignments and widening, drainage improvements, repaving, and restriping would occur in segments 1 and 3. Only pavement overlay and restriping with one minor drainage improvement would occur in segment 2. The alignment modifications are as follows:

- Within Segment 1 from PM 1.10 to PM 1.70, there would be minor realignment of the existing roadway to minimize off-tracking conflicts between large vehicles and fixed objects (trees). Two lanes with a width of 12 feet are proposed where possible.
- Within Segment 2 from PM 1.70 to PM 2.04, only grinding, pavement overlay, and restriping would occur with no change in the current alignment.
- Within Segment 3 from PM 2.04 to PM 2.10, the proposed alignment would be shifted up to approximately 10 feet west by further excavating an existing 250-foot long slope-cut area west of the roadway.
- Between PM 2.10 and PM 2.15, also within Segment 3, the proposed alignment would be shifted slightly to the east. A 200-foot long retaining wall would be constructed to support the roadway from below the road (Appendix A, page 19). The retaining wall would be composed of a soldier pile wall with a gabion wall on either end (Section 3.3.4).

Table 3.2. Quantities of Soil Disturbance[1]

Location	Area of Temporary Disturbance (square feet)	Area of Permanent Disturbance / New Impervious Surface (square feet)	Total Disturbed Area (square feet)
Culvert PM 1.18	30	14 (headwall)	44
Culvert PM 1.28	25	14 (headwall)	39
Culvert PM 1.34	20	14 (headwall)	34
Culvert PM 1.35	18	16 (headwall)	34
Culvert PM 1.78	6	30 (overside drain and drainage apron)	36
Culvert PM 2.10/PM 2.12	692	46 (headwall)	738
Retaining Wall: Gabion walls portion PM 2.10/2.14	541	588	1,129
Retaining Wall: Soldier pile wall portion PM 2.10/2.14	1,762	926	2,688
Areas of roadway widening (includes area of transition barriers PM 1.6/1.7)	16,045 (0.37 acre)	8,341 (0.19 acre)	24,386 (0.56 acre)
TOTAL	**19,139 (0.44 acre)**	**9,989 (0.23 acre)**	**29,128 (0.67 acre)**

[1] This table discusses total disturbed area. A portion of the disturbance is riparian. See Chapter 5.

Table 3.3. Cubic Yards of Cut (Excavation) and Fill

	Location by Stations[2]	*Cut (cubic yards)*	*Fill (cubic yards)*
Segment 1 (PM 1.11 to PM 1.70) Total	**63+00 to 90+00**	**151**	**432**
Largest Cut/Fill Locations in Segment 1			
Cut	70+75 to 71+50	49	0
Fill	72+00 to 73+50	12	218
Crash Cushions	86+30 to 84+56	62	0
No cuts or fills are proposed for Segment 2 (PM 1.70 to PM 2.04)			
Segment 3 (PM 2.04 to PM 2.20) Total	**105+00 to 113+50**	**482**	**145**
Largest Cut/Fill Locations in Segment 3			
Cut	107+00 to 110+00	441	2
Gabion Walls	110+10 to 110+42, 112+26 to 112+61	22	84[3]
Soldier Pile Wall	110+42 to 112+26	5	76

[2] Stations are shown in Appendix A. Stations are used by engineers to designate exact locations within a project.

[3] Volume of the gabion baskets

Table 3.4. Roadway Drainage Areas of Culverts

Culvert Location (PM)	Pre-Project Roadway Drainage Area (square feet)	Post-Project Roadway Drainage Area (square feet)	Change (square feet)
1.14	0	0	0
1.18	10,692	10,600	-92
1.28	5,460	5,460	0
1.34	1,120	5,900	4,780
1.35	1,601	736	-865
1.61	0	0	0
1.63	10,800	11,500	700
1.78	9,470	9,470	0
1.87	12,200	12,200	0
1.97	2,080	2,080	0
2.10	800	210	-590
2.12	0	2,990	2,990
2.17	0	0	0
2.20[4]	-	-	0
Total	**54,223**	**61,146**	**6,923**

3.3.2. Culvert Modifications

Project actions include modifications to six culverts as described below and in Table 3.1. None of these culverts convey fish-bearing streams; all but one (PM 1.28) drain directly into the South Fork Eel River (Table 3.1).

Four 18-inch diameter Corrugated Steel Pipe (CSP) culverts (at PM 1.18, 1.28, 1.34, and 1.35; Figure 3.3) would be lengthened approximately 6 feet on the upstream side and new drainage inlets installed. Minor excavation would be required at each location. The work proposed at the four culverts is described below, the disturbance associated with each is shown in Table 3.2, and the location by station shown in Figure 3.3.

[4] The culvert at PM 2.20 conveys drainage from both inside and outside the project area. The drainage area associated with this culvert would not be changed as a result of this project.

- **PM 1.18 and PM 1.28**. (Appendix A, pages 3 and 4)
  - Remove headwalls
  - Extend the upstream portion a maximum of 6 feet
  - New headwalls would be installed

- **PM 1.34.** (Appendix A, page 5)
  - If water is present, install clear water diversion
  - Extend the pipe approximately 4 feet on the upstream side
  - Install a headwall
  - Remove clear water diversion, if used

- **PM 1.35.** (Appendix A, page 5)
  - If water is present, install clear water diversion
  - Extend the upstream portion of the culvert 6 feet
  - Install a Type GO inlet (Figure 3.4)
  - Remove clear water diversion, if used

Figure 3.3 Inlets of Four 18-Inch Culverts at Post Miles 1.18, 1.28, 1.34, and 1.35

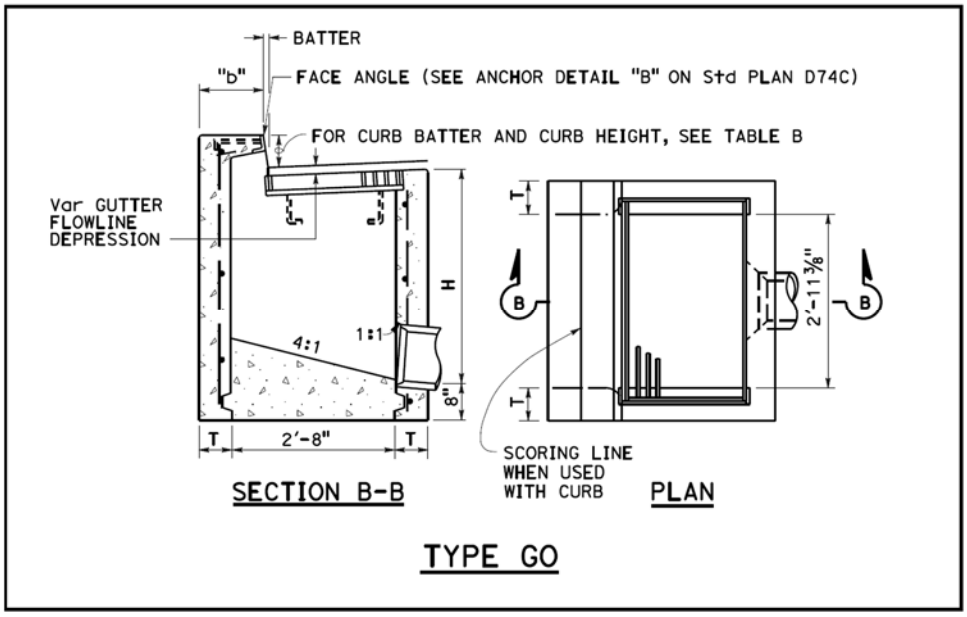

Figure 3.4 Type GO drainage inlet proposed for culverts at PM 1.35 and 2.10

PM 1.78

At PM 1.78, a new overside drain would be installed (Figures 3.5, 3.6) and connected to the existing 48-inch CSP. This location was added to the project at the request of the California Department of Fish and Wildlife to address erosion issues. The work proposed involves modifying an existing 48-inch diameter CSP by installing a 6-inch diameter overside drain into the top of the existing culvert and would require minor excavation. The associated disturbance is shown in Table 3.2 and the location is shown on page 13 of Appendix A.

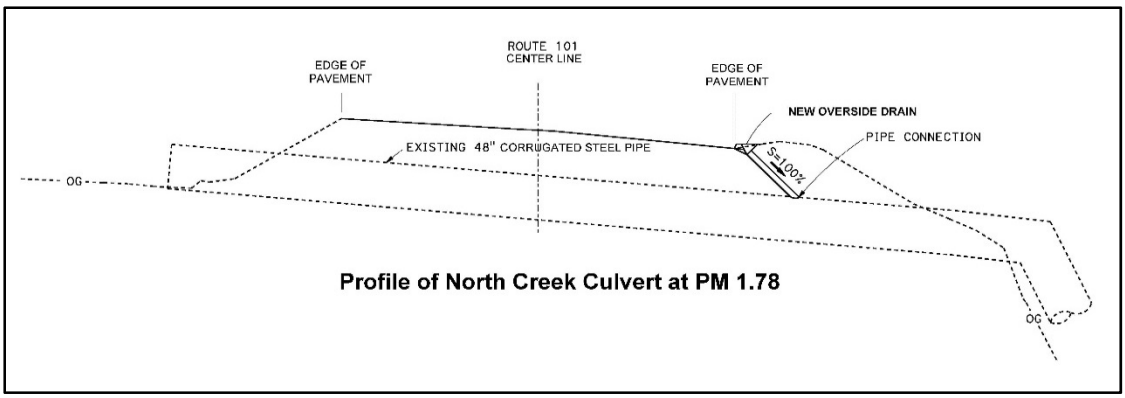

Figure 3.5 Profile of North Creek at PM 1.78 Culvert

Figure 3.6 Location of New Overside Drain at PM 1.78

PM 2.10 and PM 2.12

A sixth culvert, 24-inches in diameter, at PM 2.10 (Figure 3.7), would be replaced with one of the same diameter. The down drain at PM 2.12 would be replaced.The associated disturbance is shown in Table 3.2 and the location on page 19 of Appendix A.

Work at PM 2.10 would include:

- Excavate a trench across the roadway for a new 24-inch diameter culvert
- Replace existing CSP with one that is extended approximately 7 feet upstream and 7 feet downstream
- Construct a new inlet structure with a Type GO inlet (Figure 3.4)
- CSP would pass through new gabion wall—install rock slope protection at the outlet as an energy dissipater
- Install a slotted drain across the paved driveway east of the highway to capture water that runs onto the roadway from the adjacent hillside -- the water would be routed to the drainage inlet at this location.

Work at PM 2.12 would include:

- Replace downdrain, passing pipe through the soldier pile wall
- Reconnect outlet to the ditch associated with the culvert at PM 2.10 (currently disconnected due to downdrain failure).

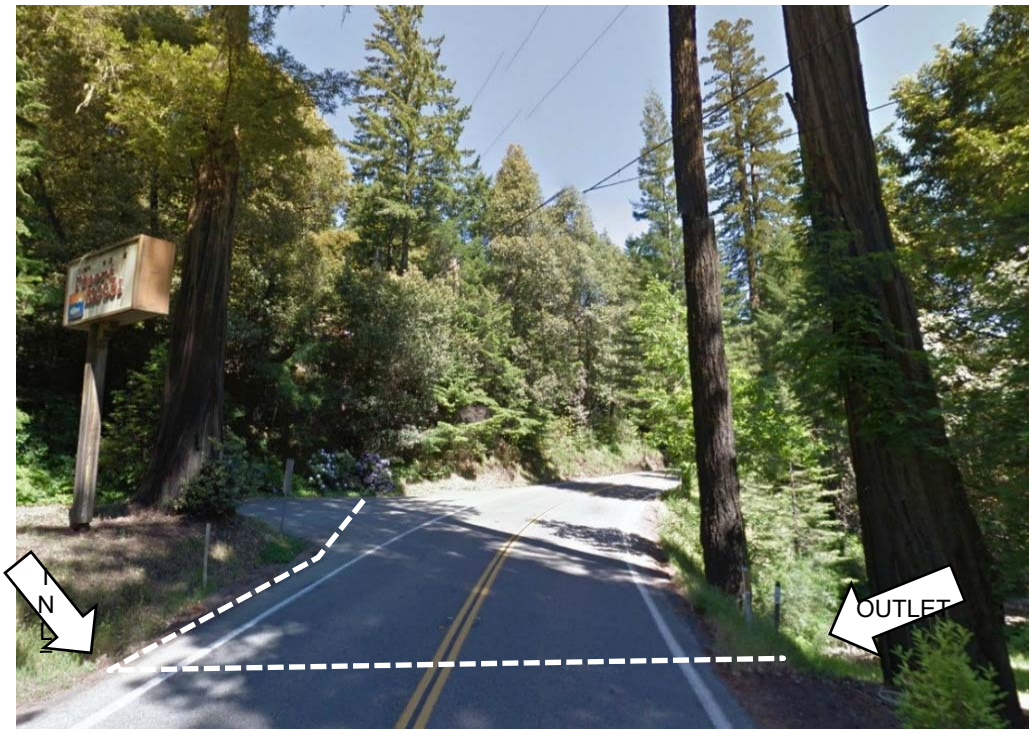

Figure 3.7 Location of culvert to be replaced at PM 2.10

3.3.3. Guardrail Modifications (near Durphy Creek)

In order to meet current standards, the proposed project would include removing the metal beam guard rail (MBGR) at each of the four corners of the Richardson Grove Undercrossing (Post Mile 1.61) and replacing it with transition barriers and crash cushions (examples shown in Figure 3.8). The combined length of the new transition barrier and crash cushion would be shorter than the existing MBGR. There would be no work within the bed or channel of Durphy Creek nor to the existing culvert or concrete bridge rails above the channel. Work would be limited to the top of the bank at the break of the slope. The area of soil disturbance and excavation amounts for the footings required for the crash cushions and transition barriers are shown in Tables 3.2 and 3.3. Work at PM 1.61 would include:

- Remove existing MBGR at each corner of the bridge.
- Excavate soil and install footings. The four crash cushions would be a maximum of 15 feet long by 4 feet wide, and would require a foundation 1 foot deep. The four 20-foot long by 5.5-foot wide transition barriers would require footings 4 feet deep.
- Install concrete transition barriers at the four corners of the existing bridge (Figures 3.8, 3.9, 3.10, and 3.11).
- Install crash cushions at each new transition barrier (Figure 3.8).

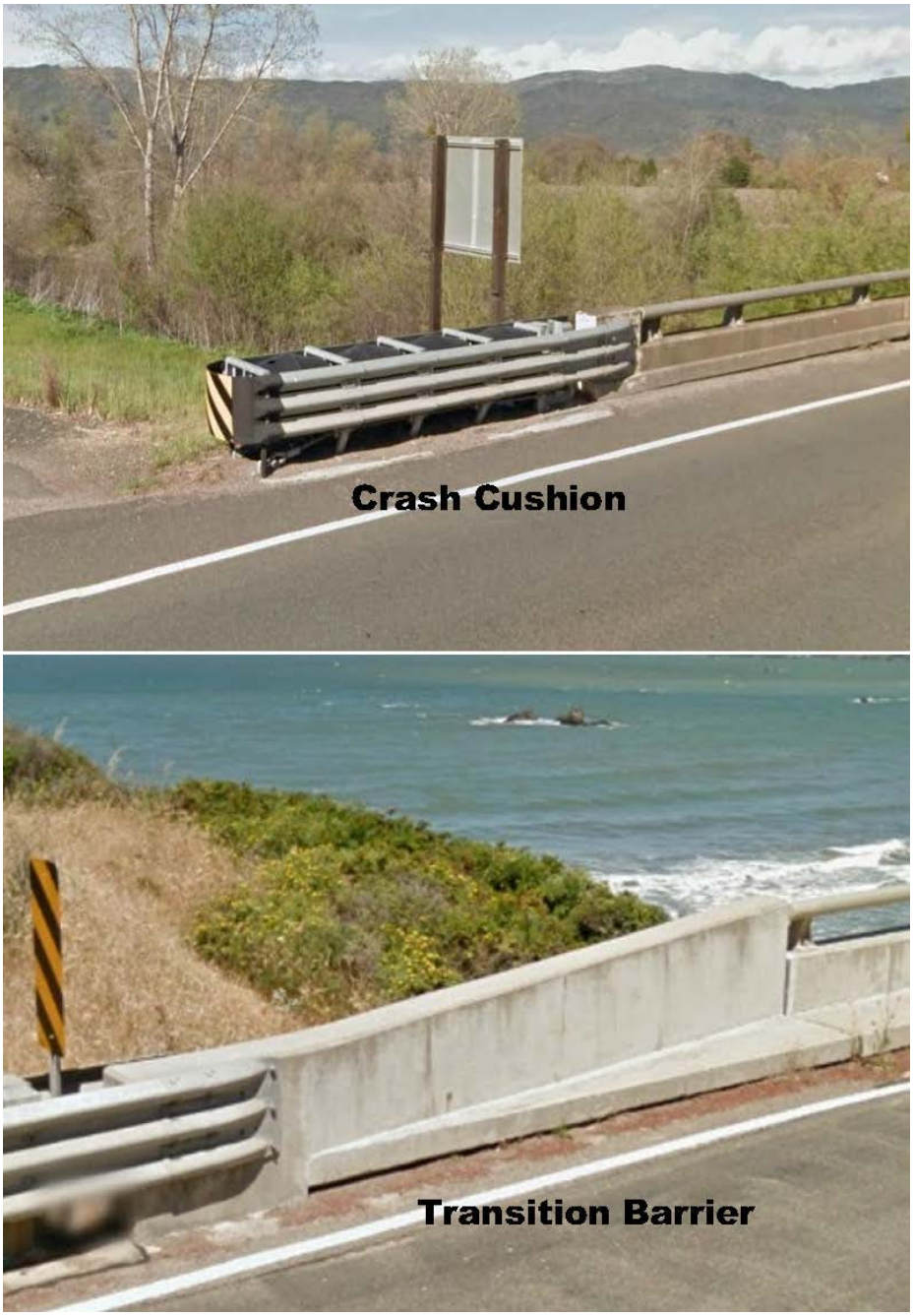

Figure 3.8 Example of Crash Cushion and Transition Barrier

3.3.4. Retaining Wall

To accommodate roadway widening north of the state park near Singing Trees Recovery Center, a below-the-road wall 10 to 13 feet in height would be constructed from PM 2.10 to PM 2.14. The retaining wall would be composed of a soldier pile

wall with a gabion wall (steel mesh box filled with rocks) on either end. The gabion walls were included in the design to protect the large trees at the north and south ends of the retaining wall. Excavation and embankment quantities for the retaining wall, including the gabions, and roadway widening to the north of and across the highway from the wall are shown in Tables 3.2 and 3.3. The objectives in wall construction are:

- Excavate for gabions and soldier pile wall
- Install soldier piles by drilling holes in soil (no pile driving)
- Install timber lagging on face of soldier pile wall
- Install gabions
- Install concrete barrier with metal bike railing along the top of the wall at the edge of the roadway
- Install a crash cushion at the south end of the barrier
- Cut slope for a length of about 60 feet just north of the soldier pile/gabion wall
- West of the highway, across from the soldier pile wall, excavate base of existing cut slope

3.3.5. Construction Methodology, Sequence, and Quantities

A summary of the construction scenario and timeframes can be found in Appendix B. The project is expected to take approximately 180 working days, to be completed over one to two construction seasons. Construction may take place during the day and night.

Areas of soil disturbance and impervious surface are shown in Table 3.2. Additional details of the construction methodology are listed below by construction year. The contractor may be able to complete all items in one year, depending on the timing of the construction contract.

First Year

- Establish staging areas and trim and/or remove vegetation by hand or with chainsaws from work areas (Appendix A)
- Some areas may have existing pavement ground off and new pavement placed

Culvert Work

- Install BMPs for sediment and erosion control prior to any soil disturbance (Section 3.3.8 and Caltrans 2003d)
- If needed, install clear water diversion at culverts with sand bags, plastic sheeting and screened pumps for culvert work at PM 1.34 and 1.35 (Section 3.3.5.3.)
- Excavate for culvert work (PM 1.18, 1.28, 1.34, 1.35, and 1.78)
- Install headwalls/drainage inlets (PM 1.18, 1.28, 1.34, 1.35) and overside drain (PM 1.78)
- Remove clear water diversions at culverts if used, backfill areas as needed

Transition Barrier/Crash Cushion Work at Richardson Grove Undercrossing PM 1.61

- Install BMPs (Section 3.3.8 and Caltrans 2003d) and remove MBGR near bridge
- Excavate for crash cushions and concrete transition barriers near bridge with backhoe
- Build forms for transition barrier footings near bridge and pour concrete footings
- Install concrete transition barriers and crash cushions near bridge

Second Year

Retaining Wall/Culvert Replacement

- Install BMPs (Section 3.3.8 and Caltrans 2003d) and remove vegetation for soldier pile/gabion wall and culvert at PM 2.10
- Excavate for retaining wall
- Drill holes for soldier pile retaining wall with drill rig, place piles and lagging with cranes/backhoes
- Construct gabions

- Excavate for and replace culvert, including installing slotted drain, at PM 2.10, (culvert would pass through the south gabion, Appendix A, page 19)
- Place engineered fill (Table 3.2) between wall and roadway with dump trucks and backhoes
- Grind old pavement with grinder and finish any repaving with paver
- Apply seed of native herbaceous plant species to disturbed soil areas, apply erosion control BMPs (Section 3.3.8 and Caltrans 2003d)

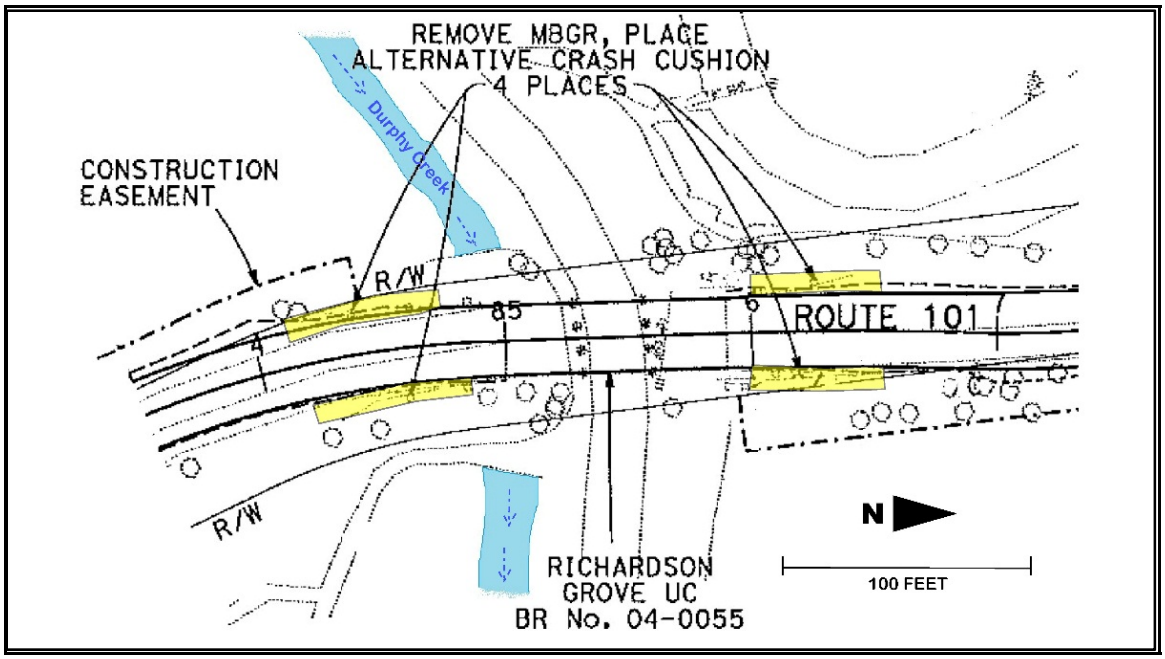

Figure 3.9 Crash Cushion Placement Relative to Durphy Creek

Figure 3.10 Durphy Creek Riparian Areas (yellow arrows show guardrail to be replaced with transition barriers and crash cushions)

Figure 3.11 Area of Potential Riparian Disturbance (southeast of bridge)

3.3.5.1. STAGING AREAS

Areas for staging construction materials and equipment would be available to the contractor in well-established, unvegetated pullout areas on US Route 101 at PM R106.5 in Mendocino County and PM 2.2 in Humboldt County (Figure 3.12). Both staging areas are in pullouts where there is existing disturbed soil within the state right of way. The contractor is required to provide BMPs (Section 3.3.8 and Caltrans 2003d) to ensure runoff from the staging area does not enter waters of the state. Portable toilets for workers would be placed as needed.

Figure 3.12 Potential Staging areas at MEN 101-R106.5 and HUM 101 PM 2.2

3.3.5.2. POTENTIAL WATER DIVERSIONS FOR CULVERT WORK

If water is present in the culverts during construction, a combination of plastic liner, gravel bags, or other impermeable materials (such as a water bladder) would be used to construct a temporary dam upstream of the culvert. The two culverts likely to have water present are at PM 1.34 and PM 1.35 (Appendix A, page 5), which are approximately 75 feet apart. The water that flows through the culverts originates from a spring or springs, and is connected in a broad area of forest floor upstream and downstream of the culverts. Therefore, while work is being done on the culvert at PM 1.34, the water would be diverted to the culvert at PM 1.35. Conversely, while the work is being done on the culvert at PM 1.35, the water would be diverted to the culvert at PM 1.34. Stream diversions would be in place no earlier than June 15 and would be removed before October 15 of each year. Any pump used for stream diversion would be screened to avoid intake of amphibians. Details of BMPs for clear water diversion can be found in the *Construction Site Best Management Practices (BMPs) Manual* (Caltrans 2003d).

3.3.5.3. EQUIPMENT

Equipment likely to be used is as follows: trucks to transport construction materials (dump trucks, concrete trucks, flatbed trucks, and pickup trucks), excavator or similar excavating equipment, backhoes, loaders, skid steers, air compressors, pneumatic excavators, jack hammers, pavement saws, power saws, chain saws, welders, generators, gas and electric water pumps, drills, basic hand tools, fans, lighting, compacting equipment, paving equipment, vibratory rollers, graders, and cranes.

3.3.6. Project Operations and Maintenance

Although maintenance is not part of the action, the culverts modified by the proposed action would be subject to regular inspection and maintenance as needed. Drainage systems would be maintained to prevent flooding and allow unobstructed flow. Drainage and culvert maintenance would be performed in accordance with operation procedures outlined in the Caltrans Storm Water Quality Handbook (Caltrans 2012).

3.3.7. Interrelated and Interdependent Actions

As defined in 50 CFR §402.02, interrelated actions are those that are part of a larger action and depend on the larger action for their justification. This project is an independent action that could proceed without the implementation of any other larger action, nor does any other larger action depend on it. According to 50 CFR §402.02, interdependent actions have no independent utility apart from the action under consideration. This project is a stand-alone project. No other actions are part of and/or dependent on the proposed action. Whether or not this project proceeds would have no influence on any other known project.

3.3.8. Standard Construction Measures for Water Quality

The contractor would be required to prepare and implement a Water Pollution Control Plan (WPCP) or a Storm Water Pollution Prevention Plan (SWPPP)[5] to protect water quality (Caltrans 2003c). Caltrans requires standard BMPs during construction of every project to reduce impacts to water quality.

When construction is complete, Caltrans would ensure stormwater BMPs (Caltrans 2010b) are in place to stabilize all bare soil areas in order to maintain water quality and minimize the movement of soils and sediment both into and within the project watercourses.

Caltrans is required by the State Water Resources Control Board's Construction General Permit to implement standard water quality BMPs (Caltrans 2003d) during

[5] The total disturbed soil area is estimated to be 0.67 acre and therefore the contractor would be required to develop and implement a Water Pollution Control Plan (WPCP) identifying site-specific best management practices and emergency spill controls. If one or more acres of soil is disturbed, a Storm Water Pollution Prevention Plan (SWPPP) would be prepared and implemented in accordance with the Construction General Permit to address all construction-related activities, equipment, and materials that have the potential to impact water quality.

construction of all projects. Examples of standard BMPs that are part of the description of the proposed action (Caltrans 2003d, Caltrans 2010b) include:

- Structural stormwater controls (rock slope protection, dikes)
- Soil stabilization practices (vegetation, erosion control blankets)
- Silt fences/fiber rolls to control sediment discharge during construction
- Measures to prevent construction equipment effluents from contaminating soil or waters in the construction site, such as absorbent pads
- Excavated spoils controlled to prevent sedimentation to watercourses
- Weed-free straw mulch and fiber rolls applied to exposed soil areas for over-wintering
- Contractor-developed and implemented site-specific BMPs and emergency spill controls
- Concrete debris or contact water not allowed to flow into waterways
- Concrete not poured within flowing water in the waterways
- Water that has come into contact with setting concrete pumped into a tank truck for disposal at an approved disposal site or settling basin
- Concrete truck washouts located at upland staging areas a minimum of 50 feet away from watercourses

Best Management Practices to Protect Water Quality

BMPs would be used to avoid/minimize impacts to water quality, aquatic habitat, and listed fish. These measures would conform to the provisions of the Caltrans Standard Specifications and the special provisions included in the contract for the proposed action. Such provisions include the preparation of a Storm Water Pollution Prevention Plan (SWPPP) or Water Pollution Control Program (WPCP) prior to construction, which describe construction activities and illustrate the best BMPs for the proposed action.

Additionally, the project must comply with, and would be designed and constructed in conformance with, the following laws and permits:

- The Clean Water Act of 1972, the major Federal legislation governing water quality.
- The Porter-Cologne Water Quality Act, the basis for water quality regulation in California.

- Caltrans' Statewide NPDES Permit, Order No. 99-06-DWQ, covering all Caltrans facilities in the state. In compliance with this permit, Caltrans developed a Storm Water Management Plan (SWMP) in 2003 to address stormwater pollution controls related to highway planning, design, construction, and maintenance activities throughout the state.

- Statewide Construction General Permit, Order 2009-0009-DWQ, adopted by the California State Water Resources Control Board in 2009. These regulatory control measures are currently in place. After construction, stormwater conveyance systems and permanent erosion control measures would be maintained in compliance with the Department's SWMP.

All areas disturbed during construction must meet the conditions included in the State Water Resources Control Board, Section D, Construction General Permit (Order No. 2010-0014-DWQ) in order to terminate permit coverage. All BMPs must continue to be inspected and maintained until the project has received a Notice of Termination (NOT) from the North Coast Regional Water Quality Control Board (NCRWQCB). In addition, construction site monitoring, sampling, and analysis must continue until the NOT is certified.

In order to receive the NOT, the project must demonstrate that final stabilization has been achieved by the following:

- Post-construction stormwater management measures have been installed and a long-term maintainance plan has been established;
- All construction-related equipment, materials, and any temporary BMPs no longer needed are removed from the site;
- Demonstrate via photos, inspection, testing, and analyses that all the above conditions have been met to demonstrate a minimum of 70 percent stabilization of disturbed soil areas.

BMPs for the proposed action include, but are not limited to, the following:

1. Scheduling: construction activities involving soil disturbance would take place during dry weather conditions, generally between June 15 and October 15, to minimize sediment discharges to receiving waters. Furthermore, the WPCP or SWPPP prepared by the contractor prior to construction would include a scheduling BMP that specifies: 1) the project schedule would sequence construction activities with the installation of both soil stabilization and sediment

control measures; 2) BMPs would be deployed in a sequence to follow the progress of grading and construction; 3) the construction plan would be arranged so that grading and construction are scheduled during the dry summer months between June 15 and October 15; 4) proper scheduling would be done to avoid grading, landscaping application, pavement striping, concrete work, and asphalt paving from occurring immediately prior to forecast rain events; and 5) vegetation removal within riparian areas would be scheduled at least 48 hours prior to any forecasted precipitation event.

2. Preparation of Rain Event Action Plans (REAP) 48-hours prior to any forecasted precipitation to ensure adequate stabilization of equipment, materials and soils is completed prior to rain.

3. Soil stabilization measures (e.g., mulching, straw wattles) would be implemented during and after construction to reduce sediment discharge from areas of disturbed soil. After construction, areas of bare soil would be seeded or planted with a non-persistent cereal grain and California native seed mix. Straw would be certified weed free. Soil disturbance would be minimized by using hand-held equipment to remove above-ground vegetation. These measures would provide for immediate soil stabilization and subsequent vegetative cover (i.e., next growing season) until natural processes resume.

4. Silt fences, straw bales, and/or fiber rolls would be placed to control sediment discharge; minimal sediment would be released into receiving waters. Certified weed-free mulch, silt fences, straw bales, and/or fiber rolls would be applied to exposed soil areas for over-wintering protection from erosion.

5. Measures would be taken to prevent construction equipment discharges from contaminating soil or waters in the construction site. Construction site entrances/exits would be stabilized and street sweeping performed to prevent tracking of sediment.

6. Perimeter control for the temporary stockpiling of materials, soil, and debris that may contain potential contaminants (e.g., pavement grindings). Excavated spoils would be controlled to prevent sedimentation to the stream.

7. Use of geo-synthetic fabric (e.g., plastic, filter fabric) barriers to prevent the discharge of pollutants (e.g., sediment, oil and grease, etc.,) when equipment is working adjacent to or over waterways.

8. A temporary concrete washout facility would be placed on-site for concrete clean up. No concrete washings or water from concrete would be allowed to flow into waterways. No concrete would be poured within the waterways. Water that has come into contact with setting concrete would be pumped into a tank and disposed of at an approved disposal site.

9. To control fugitive dust during construction, loose debris would be cleaned up using a vacuum truck (as opposed to a kick broom machine). Also, pavement would be removed by cold planing, using a machine that deposits grindings directly into a truck. The cutting teeth of the grinder are lubricated with water, which is enough to minimize dust production, but not enough to create runoff.

10. Preparation and implementation of a sampling and analysis plan for discharges during construction.

11. Instead of conventional hydraulic fluids, non-toxic, bio-degradable vegetable oil would be used in hydraulic equipment working over or adjacent (within 50 feet) to project watercourses as feasible.

12. Treated timbers used in temporary construction applications, as well as permanent uses such as sign posts and retaining walls, would not contain chromated copper arsenate (CCA), and would be kiln dried prior to use to attain a moisture content less than 25%. It has been demonstrated that the amount of leachate from treated timber decreases with moisture content (Lebow and Lebow 2007). Additionally, the contractor is required to contain and properly dispose of all treated wood cuttings, and no treated wood would be cut or used within 50 feet of watercourses for temporary applications.

Staging

1. No staging would occur within environmentally sensitive areas.

2. Any vehicles stored within 150 feet of Ordinary High Water Mark (OHWM), drainage facilities, or any watercourse would have spill prevention measures in place for refueling. This includes placement of an absorbent boom around the fuel port (on machine being fueled), as well as a thick absorbent mat that is rolled out on the ground under the equipment to catch a larger spill. When fueling vehicles and other equipment, there would be a person at both the fuel nozzle and the truck

valve so that emergency shut-off could be made if there was a nozzle or hose failure.

3. Proper and timely maintenance of vehicles and equipment used during construction would be performed to reduce the potential for mechanical breakdowns leading to a spill of materials.

4. All equipment remaining on the job site would have secondary containment placed beneath the drip zone when left overnight. Leaks would be immediately controlled with absorbent mats and repaired before equipment operates again. Clean up of petro-chemical drips would occur as soon as they are observed. All equipment would be monitored by the contractor daily for chemical leakage. To offer protection from storm events, Caltrans would require monitoring for storm events and the movement of equipment accordingly.

5. For all night road work and paving operations that require the use of artificial light, light shields would be used to direct lighting toward the roadway and away from adjacent water bodies to avoid impacting the aquatic environment.

Conservation of Riparian Habitat

The following measures would be implemented to reduce potential impacts to riparian habitat in the action area:

1. The width of the construction disturbance zone within riparian areas would be minimized through careful pre-construction planning.

2. Riparian vegetation removal (e.g., tree trimming) would be restricted to the minimum needed for construction access.

Prevention and Spread of Invasive Species

All equipment used for off-road construction activities would be weed-free prior to entering the action area. If the proposed action implementation calls for mulches or fill, they would be weed free. Any seed mixes or other vegetative material used for re-vegetation of disturbed sites would consist of non-persistent cereal grain, California native seed mix and/or locally adapted native plant materials to the extent practicable.

Worker Education

The pre-construction meeting with the contractor would consist of a briefing on environmental permit conditions and requirements relative to each stage of the proposed project, including, but not limited to, work windows, construction site management, and how to identify regulated species within the project areas.

Revegetation Plan

In areas disturbed by construction, where permeable soils remain, Caltrans has prepared a final revegetation plan that details the methods that would be implemented to re-establish regionally appropriate native plant species within the natural communities from which they were removed. The re-vegetation plan includes adequate native plant sources using seed, containerized plants, and cuttings so that the re-vegetation areas are observed to be on a trajectory toward re-establishing natural communities at the end of the five-year maintenance and monitoring period.

Chapter 4. Environmental Baseline

The environmental baseline consists of the past and present impacts of all Federal, State, or private actions and other human activities in an action area, the anticipated impacts of all proposed Federal projects in an action area that have already undergone formal or early Section 7 consultation, and the impact of State or private actions that are contemporaneous with the consultation in process. [50 CFR §402.02].

4.1. Description of Existing Biological and Physical Conditions

The action area is in the Coastal Franciscan Ecological subsection. This subsection is a steep mountainous area of the northern California Coast Ranges south from Humboldt Bay to the Russian River. There is substantial oceanic influence on climate, including summer fog.

Geography The terrain consists of mountains with rounded ridges, steep and moderately steep sides, and narrow canyons. There are small areas of alluvium along the South Fork Eel River. Fluvial erosion and mass wasting are the primary geomorphic processes. The elevation of the area is about 500 feet.

Climate The mean annual precipitation is about 40 to 110 inches with primarily rain at lower elevations and some snow at higher elevations. Mean annual temperature is about 40° to 53° F. The mean freeze-free period is about 225 to 300 days.

Surface Water Runoff is rapid and many of the smaller streams are dry by the end of the summer. Natural lakes are absent.

Soils The soils have a high content of plant material in the upper layer with marine sediments below. The soils are leached free of carbonates, and some older soils are strongly acid. Soil moisture regimes in the area are predominantly xeric (dry) or at least dry during the summer months.

Vegetation The predominant natural plant community in the action area is *Sequoia sempervirens* (Redwood Forest) Alliance (Sawyer et al. 2009). In this vegetation alliance, coast redwood (*Sequoia sempervirens*) is dominant or co-dominant in the tree canopy with grand fir (*Abies grandis*), bigleaf maple, red alder (*Alnus rubra*), Pacific madrone (*Arbutus menziesii*), chinquapin (*Chrysolepis chrysophylla*), tanoak (*Notholithocarpus densiflorus* var. *densiflorus*), Sitka spruce (*Picea sitchensis*), Douglas-fir (*Pseudotsuga menziesii*), western hemlock (*Tsuga heterophylla*) and California bay (*Umbellularia californica*) also present. Brush/sapling understory includes poison oak (*Toxicodendron diversilobum*), madrone, live oak (*Quercus chrysolepis*), and tan oak. Ground vegetation in this area includes evergreen huckleberry (*Vaccinium ovatum*), sword fern (*Polystichum munitum*), and gold-back fern (*Pentagramma triangularis*).

Invasive Plant Species French broom (*Genista monspessulana*) is an exotic invasive species. It can be found along the highway corridor throughout Richardson Grove. Himalayan blackberry (*Rubus armeniacus*) is another invasive exotic present within the project limits. A number of common exotic grass and herb species can also be found along the highway shoulders in Richardson Grove.

Animal Species Natural communities in the vicinity of Richardson Grove support a number of wildlife species including black-tailed deer (*Odocoileus hemionus*), coyote (*Canis latrans*), grey fox (*Urocyon cinereoargenteus*), otter (*Lontra canadensis*), black bear (*Ursus americanus*), wild boar (*Sus scrofa*), raccoon (*Procyon lotor)*, plus a number of smaller carnivores and rodents. Acorn woodpecker (*Melanerpes formicivorus*), wild turkey (*Meleagris gallopavo)*, and California quail (*Callipepla californica*) are common in the upland areas. American dipper (*Cinclus mexicanus*) and songbirds inhabit the riparian corridor. Western fence lizards (*Sceloporus occidentalis*) are commonly seen in the area. In tree cavities, habitat is available for bats and nesting birds. In the South Fork Eel River and Durphy Creek, frogs, salamanders, and fish can be found, including Chinook salmon, coho salmon, rainbow trout/steelhead, golden shiner (*Notemigonus crysoleucas*), green sunfish (*Lepomis cyanellus*), Humboldt sucker (*Catostomus occidentalis humboldtianus*), inland threespine stickleback (*Gasterosteus aculeatus microcephalus*), largemouth bass, *(Micropterus salmoides*), Pacific lamprey (*Entosphenus tridentata*), and Sacramento pikeminnow (*Ptychocheilus grandis)*.

4.1.1. Watershed Setting

The South Fork Eel River is present to the east of US 101 in the action area (Figure 1.6). The headwaters of the South Fork Eel River are at Cahto Peak near Laytonville in Mendocino County. From there, it flows to its confluence with the mainstem Eel River near Weott in Humboldt County. The river flows mainly from south to north and is approximately 105 miles long.

South Fork Eel Basin drains 689 square miles. Elevations within the basin range from 100 feet at the confluence with the Eel River to 4,491 feet at the headwaters at Iron Peak.

Predominant land uses throughout the basin are timber harvest, livestock grazing, farming, and dispersed rural development. Approximately 80% of the basin is privately owned. Highway 101 runs along much of the South Fork Eel River and provides a major thoroughfare for travel.

The South Fork Eel River, from its confluence with the mainstem to the Section Four Creek confluence in Mendocino County, is designated a Wild and Scenic River. The section of the river in the action area is designated "recreational." The basin supports runs of coho salmon, steelhead, and Chinook salmon.

Fourteen drainages and watercourses are adjacent to Route 101 within the project limits (Table 3.1). This project would not involve work in any fish-bearing stream; however, there would be work in the riparian habitat of one fish-bearing stream (Durphy Creek). The following drainages and watercourses are in the action area.

PM 1.14. This culvert conveys water from adjacent uplands only, not from the roadway, and is typically dry from June to October. Due to the steep topography at this location, this drainage is not fish-bearing. No work is proposed at this culvert.

PM 1.18. This unnamed tributary conveys intermittent runoff to South Fork Eel River and is typically dry from June to October. The culvert outlet is perched high on the cut bank of the South Fork Eel River. Due to the steep topography at this location, this drainage is not fish-bearing.

PM 1.28. This culvert conveys water from adjacent uplands only, not from the roadway, and is typically dry from June to October. Due to the steep topography at this location, this drainage is not fish-bearing. No work is proposed at this culvert.

PM 1.34. This pipe conveys intermittent runoff and groundwater (spring) from an unnamed tributary to South Fork Eel River. There is typically some flow year-round, so temporary stream diversion may be required to extend the culvert. The culvert outlet is perched high on the cut bank of the South Fork Eel River. Due to the steep topography at this location, this drainage is not fish-bearing.

PM 1.35. This pipe conveys intermittent runoff and groundwater (spring) from the same unnamed tributary to the South Fork Eel River as the culvert at PM 1.34. (The channel splits above the culvert locations, and rejoins into a single channel below the culverts.) There is typically some flow year-round, so temporary stream diversion may be required to extend the culvert. The culvert outlet is perched high on the cut bank of the South Fork Eel River. Due to the steep topography at this location, this drainage is not fish-bearing.

PM 1.61, Durphy Creek. This stream flows 2.4 miles from its headwaters northwest of Richardson Grove at an elevation of 1,418 feet to its confluence with the South Fork Eel River at an elevation of 421 feet in Richardson Grove. Durphy Creek drains an area of about 2.15 square miles. Durphy Creek flows through an 8-foot high by 12-foot wide by 38-foot long concrete box culvert under Route 101 in Richardson Grove (Figure 3.10). No highway drainage flows through this culvert, only the creek. The creek goes subsurface in the coarse sediment near the confluence with the South Fork Eel River during the dry season.

There are state park culverts just upstream and downstream of Route 101. The park culvert just downstream at 100 feet has been identified as a potential impediment to fish passage (Lang 2001). There is significant bedload transport through the Route 101 box culvert (at 697 feet) and the concrete is very abraded. Fish passage through the Route 101 crossing probably benefits from backwatering by sediment buildup below the US 101 culvert. Thus, actual passage may be better than predicted. Retrofitting the culvert bottom to improve passage would be difficult given the high bedload transport rate (Lang 2001).

Durphy Creek has been surveyed for salmonids at various times. The following is a summary of the results:

- In a 1938 California Department of Fish and Game survey, coho, Chinook, and steelhead were present in Durphy Creek (CDFW 2014).
- A fish passage evaluation summary was completed for Durphy Creek (Lang 2001). The study noted many unidentified fish (0 -6") observed upstream of the US 101 culvert.

- The most recent survey did not observe either Chinook or coho salmon, only steelhead (CDFW 2006).

No work would occur within Durphy Creek nor on the existing culvert, nor would the creek be diverted. Construction would occur more than 25 feet from the creek's ordinary high water mark (OHWM).

Richardson Grove State Park maintains foot paths on both sides of the highway at the Richardson Grove Undercrossing where the guardrail would be replaced with crash cushions and transition barriers. These foot paths vary in width from approximately 3 to 10 feet and act as a buffer between the highway and Durphy Creek (Figures 3.9, 3.10, 4.1, and 4.2).

PM 1.63. At this location, intermittent runoff is collected in down drains and conveyed to Durphy Creek downstream of the PM 1.61 box culvert. No work is proposed on these down drains.

PM 1.78, North Creek. With a length of 0.7 mile and drainage area of 0.2 square mile (CDFW 2014), North Creek is an intermittent tributary to the South Fork Eel River. This creek flows through a 48-inch diameter culvert under Route 101 at Post Mile 1.78. A new overside drain is planned for the culvert at North Creek. The culvert at North Creek has a steep downdrain (Figures 3.3, 3.4). North Creek is not a fish-bearing stream and all work would occur during the dry season above the ordinary high water mark.

PM 1.87. This culvert conveys intermittent runoff to South Fork Eel River and is typically dry from June to October. The culvert outlet is perched high on the cut bank of the South Fork Eel River. Due to the steep topography at this location, this drainage is not fish-bearing.

PM 1.98, Laurel Creek. There is no work anticipated in Laurel Creek or its riparian habitat. This intermittant stream is about 0.7 mile long as it flows from its headwaters west of Richardson Grove at an elevation of 1,260 feet to its confluence with the South Fork Eel River at an elevation of about 412 feet in Richardson Grove. Laurel Creek drains an area of about 0.2 square mile (CDFW 2014). This creek flows through a culvert under Route 101.

PM. 2.10. The flow at this culvert is seasonal and would be dry at the time of construction. This tributary conveys intermittent runoff to South Fork Eel River. The culvert outlet is perched high on the cut bank of the South Fork Eel River. Due to the steep topography at this location, this drainage is not fish-bearing.

PM 2.12. A component of the drainage system at PM 2.10, the 8-inch down drain at this location is not currently functioning. Intermittent runoff that would enter this drain currently flows in an uncontrolled manner over a fill slope.

PM 2.17. No roadway runoff flows through this culvert. The outlet channel appears to go underground or flow outside of the highway right of way onto private property. No work is proposed on this culvert.

PM 2.20. This culvert conveys intermittent runoff via a channel to South Fork Eel River and is typically dry from June to October. No work is proposed on this culvert, which is at the northern end of the project limits.

Figure 4.1 Park foot path at Durphy Creek – East of 101

Figure 4.2 Park foot path at Durphy Creek – West of 101

4.1.2. Land Use

Southern Humboldt County is largely rural. The nearest town to the project site is Garberville, approximately 8 miles to the north. The predominant land uses in the project vicinity are timber harvest, livestock grazing, legal and illegal agriculture, and dispersed rural development. Approximately 80% of the area is privately owned. Immediately upstream of the action area, an annual multi-day music festival is held on the South Fork Eel River with approximately 10,000 attendees and workers. Within Richardson Grove State Park, the Park maintains roads, bridges, buildings, trails, parking lots, and other facilities.

US Route 101 runs through Humboldt County and is the area's major thoroughfare. The Caltrans Office of Travel Forecasting and Modeling developed current and forecasted traffic data on US Route 101 within the project limits based on future projected growth independent of the project (*i.e.,* this growth would occur regardless of project implementation) (Table 4.1). It is estimated that trucks compose 11 percent of the traffic.

Table 4.1 Current and Forecasted Traffic Data

	2015	2020	2030	2040
ADT*	4,630	4,700	4,830	4,970
Peak Hour	710	720	740	770

*ADT- Average Daily Traffic

4.1.3. Water Quality

A water quality assessment report was prepared for this action (Caltrans 2015). The assessment found that the South Fork Eel River is listed as impaired for sedimentation/siltation, temperature, and aluminum pursuant to Section 303(d) of the Clean Water Act (SWRCB 2015). Potential sources of these impairments include erosion/siltation, removal of riparian vegetation, logging/construction, range grazing, silviculture, flow regulation, hydromodification, and nonpoint and natural sources. (Caltrans 2015).

Exposure to stormwater contaminants can cause reduced growth, impaired migratory ability, and impaired reproduction in salmonids (U.S. Environmental Protection Agency [USEPA] 1980). Metals such as copper, zinc, chromium, lead, nickel, arsenic, cadmium, and mercury are present in highway stormwater runoff. Copper can be found in brake pads of both passenger vehicles and trucks and small amounts are deposited on the roadway.[6] Zinc is deposited on the roadway from tire wear (Whiley 2011). Polycyclic aromatic hydrocarbons (PAHs) are a group of chemicals that occur in coal, crude oil, and gasoline. Waterways near urban centers often receive inputs of these toxic contaminants from municipal and industrial activities (USEPA 1997; Brown, et al. 1998) which may be taken up by juvenile salmon and their prey (Johnson et al. 2007) and result in reduced growth and reduced resistance to disease (Arkoosh et al. 1998).

[6] Since September 2010, California law (Senate Bill 346) has been phasing in a prohibition of brake pads sold in California containing more than trace amounts of copper, certain heavy metals, and asbestos. A significant decrease in vehicle-related copper roadway deposits is anticipated.

The California Environmental Data Exchange Network (CEDEN) was reviewed in an effort to determine the baseline background concentration of metals of potential concern to salmonid growth and survival. Data from five sampling stations was found on the South Fork Eel River (Figure 4.3); two upstream, one immediately downstream, and two farther downstream of the action area that show data from samples taken at various times of the year from 2002 to 2010 (Appendix D).

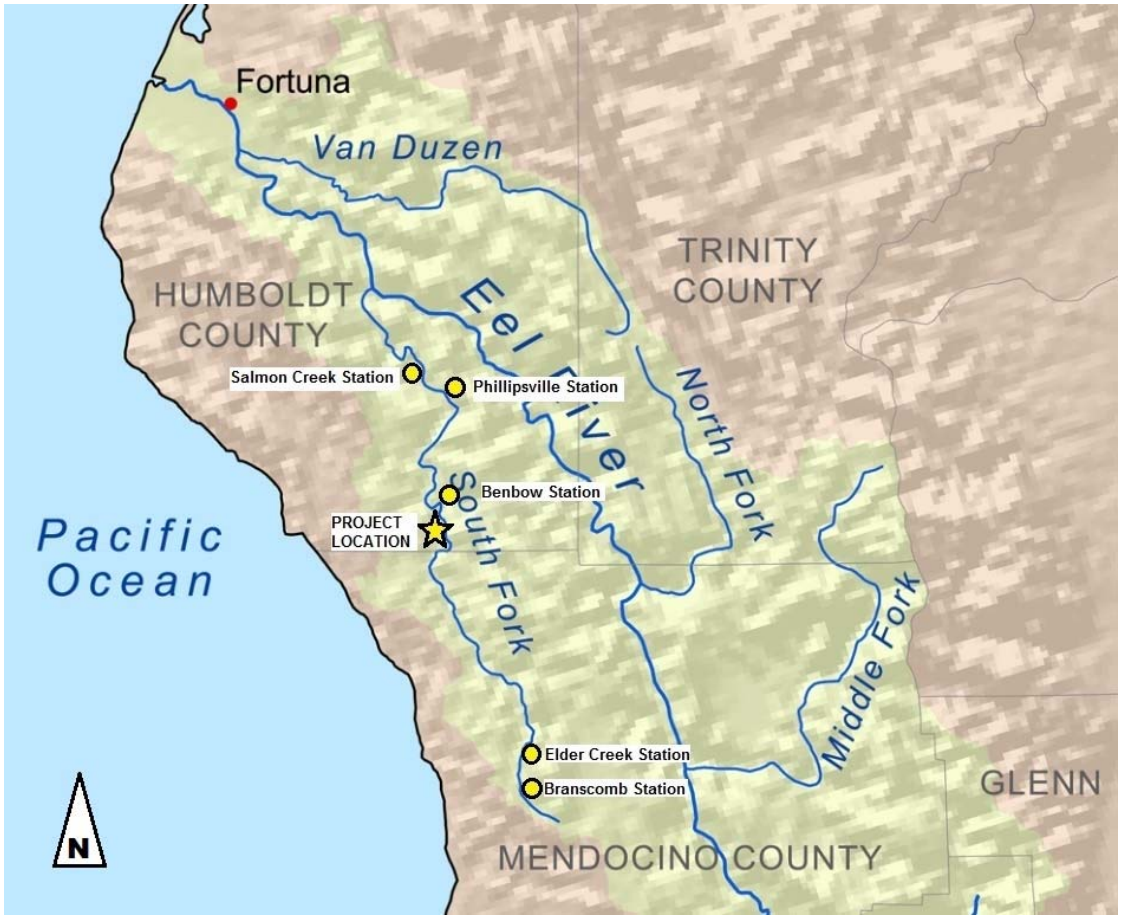

Figure 4.3. Five Water Quality Monitoring Locations on the South Fork Eel River

The upstream South Fork Eel River Water Quality Monitoring Stations are in Mendocino County. They include the Elder Creek Station, about 40 miles upstream of the action area, and the Branscomb station, near the town of Branscomb, over 45 miles upstream of the action area (Figure 4.3).

The nearest downstream South Fork Eel River Water Quality Monitoring Station is near US 101 in Humboldt County at Benbow (Figure 4.3), approximately four miles downstream of the action area. Mean concentrations of both metals for which NMFS has developed criteria for thresholds of toxicity (Copper - 2 µg/l above background and Zinc - 5.6 µg/l above background) are below these thresholds at Benbow; 0.521µg/l for Copper and 0.787 for Zinc (Appendix D). Moreover, at Benbow (which is the station closest to the action area), the maximum concentrations collected (Copper -1.30 µg/l, Zinc – 2.14 µg/l-Appendix D) were below the threshold of toxicity.

The rural location of the action area lends itself to low baseline levels of PAHs and other toxic contaminants associated with urban environments. Studies have shown that soil is an effective filter for roadway toxins (McIntyre 2015), and there is permeable soil along the highway corridor throughout the project. Additionally, studies have shown traffic would not increase due to the project (Gallo 2008), so traffic-related toxins in receiving waters are not expected to increase beyond current environmental baseline levels.

4.2. Status of Species in the Action Area

A list of species and habitats potentially occurring within the project vicinity was provided by NMFS (Appendix C). This section evaluates the potential presence of those federally listed salmonid species (CC Chinook salmon, SONCC coho salmon, and NC steelhead) and their designated critical habitat within the action area (Table 2.1). Adult and juvenile salmonids are likely to be seasonally present in the South Fork Eel River and Durphy Creek. None of the other watercourses in the action area are fish-bearing. The patterns of salmonid activity in the action area are as follows:

- Adult coho are likely to be present in the South Fork Eel River, and may be present in Durphy Creek, from December to February;
- Adult steelhead are likely to be present in the South Fork Eel River, and may be present in Durphy Creek, from November to June;
- Adult Chinook are likely to be present in the South Fork Eel River from November to January;
- Portions of the South Fork Eel River that are within the action area provide spawning habitat for Chinook salmon (A. Renger, personal communication, September 2016).

- Portions of Durphy Creek are potential spawning habitat for coho salmon and steelhead; however, known locations of suitable spawning habitat are upstream of the action area.
- Juvenile coho and steelhead may rear in Durphy Creek year round.
- Juvenile Chinook, coho and steelhead may be present in South Fork Eel River within the action area year round; however, they are expected only to persist in areas of cool water refuge (e.g., creek mouths or upwelling spring water) during summer (A. Renger, personal communication, September 2016). Apart from one identified small spring seep that is not currently providing measurably cool water to the river, there are no known thermal refugia in the action area. Therefore, listed salmonids are likely to be rare in the action area during summer months.

4.2.1. Surveys

Data from an October 2006 California Department of Fish and Wildlife (CDFW) Stream Inventory Report on Durphy Creek found no coho or Chinook present; however, young-of-the-year, age 1+ and age 2+ steelhead/rainbow trout were found (CDFW 2006). Historical fish survey data, taken from *NMFS California Anadromous Fish Distributions* prepared by Weldon Jones for NMFS in 2000, found Chinook, coho and steelhead present in the South Fork Eel River. The stream crossings at 100 feet and 697 feet (Hwy 101) in Durphy Creek have been noted as potential impediments to fish passage (CDFW 2006). Historical surveys have indicated Chinook salmon, coho salmon, and steelhead were observed in Durphy Creek, but more recent surveys did not observe Chinook salmon, and the most recent survey (CDFW 2006) did not observe either Chinook or coho salmon, only steelhead. North Creek is too steep for fish passage, and no records of stream surveys for North Creek were available. No records of stream surveys were available for Laurel Creek, and there would be no work at Laurel Creek. No additional fish surveys were conducted for this BA because data from previous surveys was determined to be sufficient for this analysis.

4.2.2. Resource Agency Coordination and Professional Contacts

Existing records of special status animal species occurrences were consulted prior to conducting a site reconnaissance survey to determine which species have the potential to occur within the action area. NMFS provided an official species list for this action in September 2015 (Appendix C).

Potential listed species associated with the proposed action were identified through consultation with NMFS, USFWS, and CDFW and through field investigations, review of existing information, and photographs of the project site. If a habitat was not present onsite for a particular listed or proposed species, it was dropped from further consideration for focused project studies. It was determined that there is suitable habitat in the study area for three federally listed salmonids: Southern Oregon/Northern California Coast (SONCC) coho salmon, California Coastal (CC) Chinook salmon, and Northern California (NC) steelhead.

The following information was reviewed during preparation of this BA:

- Margaret Lang's 2005 Final Report to California Department of Transportation (Caltrans) District 1 Pilot Fish Passage Assessment Study
- NMFS fish/stream survey reports (Jones 2000)
- The University of California *California Fish Website* (http://calfish.ucdavis.edu/)
- CDFW Stream Inventory Reports Documents for Durphy Creek (2006)
- CDFW South Fork Eel River Western Subbasin Watershed Assessment (2014)

4.2.3. Limitations and Assumptions that May Influence Results

The presence and impact assessments on sensitive fish species depend largely on previously collected data, general species life history accounts, and literature reviews. If a fish species is known to be present in the vicinity, and habitat for that species is present in the action area, then the species is assumed to be present in the action area. Surface water may or may not be present at several culverts; it is anticipated that most would be dry by June 15.

4.3. Federally Listed/ Proposed Species

Three federally threatened anadromous salmonids are known to inhabit the South Fork Eel River and its tributaries: the California Coastal (CC) Evolutionarily Significant Unit (ESU) of Chinook salmon, Northern California (NC) Distinct Population Segment (DPS) of steelhead, and the Southern Oregon/Northern California Coast (SONCC) ESU of coho salmon.

4.3.1. California Coastal ESU of Chinook Salmon

In the action area, Chinook salmon spawn in November and December, depending on the rainfall pattern. The run continues into January. The female lays eggs in the gravel and dies soon after. After 3 to 4 months, in late winter or spring, the fry emerge from the gravel.

Chinook salmon spend a short period of time in freshwater after emergence, typically migrating to the ocean within their first year of life; however, juvenile Chinook salmon have been observed in the mainstem South Fork Eel River as late as July 13 at a cool-water refuge downstream of the action area. Chinook salmon spawn in the South Fork Eel River throughout the action area (A. Renger, personal communication, September 2016); however, they are not known to spawn in Durphy Creek.

4.3.2. Southern Oregon/Northern California Coast ESU of Coho Salmon

In the Eel River system, the coho salmon spawning run occurs from December to February. Spawning is predominantly confined to the upper South Fork and its tributaries, and lower tributaries of the main-stem Eel and Van Duzen Rivers. Fry emergence takes place between March and July, with peak emergence between March and May. Juvenile coho salmon typically feed and rear within the streams of their natal watershed for a year before migrating to the ocean. Coho salmon fry may move upstream or downstream to rear after emergence. Coho salmon rearing areas include lakes, sloughs, side channels, estuaries, beaver ponds, low-gradient tributaries to large rivers, and large areas of slack water (PFMC 2014).

Coho salmon may spawn and rear in Durphy Creek; however, recent spawner surveys in the mainstem South Fork Eel River in the action area have only detected Chinook salmon spawning (A. Renger, personal communication, September 2016). Juvenile coho may rear during summer in areas of cool water inputs to the South Fork Eel River; however, there are no known efforts to find them in the action area (S. Monday, personal communication, September 2016). Their presence in the mainstem South Fork Eel River during the summer is unlikely due to unsuitably high temperatures (Asarian et al. 2016), even in areas of cooler water inputs where springs and tributaries may enter the river. However, Caltrans considers juvenile coho rearing in the South Fork Eel River portion of the action area during the summer construction season to be plausible. Therefore, in the absence of data, their presence cannot be ruled out.

4.3.3. Northern California DPS of Steelhead

This DPS includes both winter and summer steelhead, as well as what is presently considered to be the southernmost population of summer steelhead, in the Middle Fork Eel River. River entry ranges from August through June and spawning from December through April, with peak spawning in January. Most are winter steelhead that enter the river from November through April. These fish spawn within the same season, typically February through April. A small run of summer steelhead usually enters the river from March to the end of June. Depending on water temperature, steelhead eggs hatch in 1.5 to 4 months. Following yolk sac absorption, alevins emerge from the gravel as young juveniles and begin actively feeding. Juvenile steelhead rear in fresh water from 1 to 4 years, then migrate to the ocean as “smolts."

In October 2006, CDFW conducted electrofishing surveys in Durphy Creek (CDFW 2006). From the mouth of the creek at the confluence with the South Fork Eel River to 7,229 feet upstream, 11 sites were sampled. Sites sampled in this reach yielded 69 young-of-the-year steelhead/rainbow trout (SH/RT), 8 age 1+ SH/RT, and 2 age 2+ SH/RT (CDFW 2006). Juvenile steelhead is also the listed salmonid most likely to be found in the mainstem South Fork Eel River within the action area during the summer construction season, as they are the most tolerant of high water temperatures. As with coho and Chinook, steelhead seek out areas of cooler water at the mouths of tributaries and where spring water upwells.

4.3.4. Critical Habitat

Designated critical habitat for each species is shown in Table 2.1. The designation of critical habitat is based on physical and biological features essential to the conservation of a listed species. Essential habitat features for salmonids include: (1) adequate substrate, (2) water quality, (3) water quantity, (4) water temperature, (5) water velocity, (6) cover/shelter, (7) food, (8) riparian vegetation, (9) space, (10) safe passage conditions, and (11) rearing habitat. In the action area, the physical and biological features of critical habitat essential for salmonids include:

- Freshwater rearing sites with water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility; water quality and forage supporting juvenile development; and natural cover such as shade, submerged and overhanging large wood, log jams, and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.

- Freshwater migration corridors free of obstruction and excessive predation, with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival.

Chapter 5. Effects of the Action

Under the ESA, "effects of the action" means the direct and indirect effects of an action on the listed species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action (50 CFR 402.02). Direct effects are those effects caused by the proposed action that occur at the time of the action, and indirect effects are those effects that are caused by the proposed action but occur later in time. The applicable standard to find that a proposed action is not likely to adversely affect listed species or critical habitat is that all of the effects of the action are expected to be discountable, insignificant, or completely beneficial. Beneficial effects are contemporaneous positive effects without any adverse effects to the species or critical habitat. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those extremely unlikely to occur.

This chapter includes an analysis of the direct and indirect effects of the proposed action, and any interrelated and interdependent activities, on federally-listed SONCC coho salmon, CC Chinook salmon, NC steelhead, and their designated critical habitats. Factors considered in the analysis include description of the spatial extent, duration, magnitude, and frequency of occurrence of direct and indirect effects/stressors on individual fish and critical habitat in the action area.

Sections 5.1.1 through 5.1.6 include an assessment for effects to individual fish and critical habitat including:

- A *response and risk assessment* for the effects of the proposed action to **individuals** describes the conditions that cause negative impacts to individual fish and quantifies the amount and extent of negative impacts expected, if any.

- A *risk assessment* of the impacts of the proposed action to **critical habitat** describes the response of the habitat elements to the potential stressors and any impacts to the function of primary constituent elements of the critical habitat in the action area.

5.1. Riparian Vegetation Impacts

The guardrail modification element at Durphy Creek is the only project activity that would disturb riparian vegetation on fish-bearing waters. This riparian zone is dominated by the dense canopy of large redwood trees. These trees deposit insects and nutrients (allochthonous inputs) into Durphy Creek and the South Fork Eel River. Terrestrial insects that live on the trees fall into the river and provide an important food source for fish. Leaves, twigs, and branches from the redwood trees add nutrients to the water that benefit aquatic invertebrates. These invertebrates, in turn, are food for juvenile salmon and steelhead. The large redwood trees of the canopy contribute the overwhelming majority of organic nutrients to the watercourses.

The riparian canopy at this location also shades the stream and likely moderates the microclimate within the riparian corridor, which helps keep water temperatures within the preferred range of salmonids. Cool water holds more dissolved oxygen than warm water. Salmonids and many of their prey species (aquatic invertebrates) require cool and well-oxygenated water.

The root structure of large redwood trees also provides streambank stability, and fallen trees can provide complex instream cover and streambed stability. An analysis by an arborist (certified by the International Society of Arborists) has determined the action would not threaten the survival or stability of any of the large redwood trees (Yniguez 2015).

Two strips of riparian vegetation consisting of herbaceous species, shrubs, and small understory trees (two bigleaf maples 5 and 9 inches DBH) along the roadway near the top of the bank would be removed for installation of transition barriers and crash cushions just south of Durphy Creek (Figures 3.9, 3.11). Durphy Creek is approximately 2.4 miles long (CDFW 2006). The portions of vegetation to be removed total 15 linear feet (approximately 616 square feet) which is approximately 0.14% of the length of Durphy Creek's riparian zone. The disturbed area not occupied by the new barriers would be revegetated after construction.

Herbaceous vegetation that would be disturbed at culvert locations PM 1.34 and PM 1.35 could also be considered riparian. However, removal of this herbaceous vegetation would not produce any meaningfully measurable impact to salmonids or their critical habitat, and no redwood trees would be impacted.

Steelhead

Durphy Creek is designated as critical habitat for steelhead and juvenile steelhead were noted upstream of the action area during the most recent surveys by CDFW (1993, 2006) and during casual observations by CDFW biologists in June of 2002 and 2003 (S. Monday, personal communication, September 2016). Rearing juvenile steelhead at this location may originate from spawning in Durphy Creek, or may enter as non-natal immigrants from the South Fork Eel River. Therefore, steelhead in the action area could be exposed to stressors resulting from disturbance of the riparian zone.

Due to the intact and well-functioning riparian canopy of large redwood trees along this reach of Durphy Creek, and the relatively small temporary loss of understory riparian vegetation, stressors related to allochthonous inputs, stream temperature, stream channel structure and instream habitat would not be altered to a degree that could create any meaningfully measurable exposure to any life stage of steelhead or its designated critical habitat in the action area. Therefore, impacts to steelhead and its designated critical habitat would be insignificant.

Coho salmon

Durphy Creek is designated as critical habitat for coho salmon. Historical surveys in 1938 noted coho salmon in Durphy Creek (CDFW 2014). Coho salmon were observed in Durphy Creek upstream of the action area by CDFW biologists in June of 2002 and 2003 (S. Monday, personal communication, September 2016) and one juvenile coho was observed during a CDFW stream inventory in 1993 (CDFW 1993). However, coho salmon were not noted during the most recent stream inventory (CDFW 2006). In any given year, coho salmon could spawn in Durphy Creek, and rearing juveniles within the action area of Durphy Creek could originate from local spawning or as non-natal immigrants from elsewhere in the South Fork Eel River.

Due to the intact and well-functioning riparian canopy of large redwood trees along this reach of Durphy Creek, and the relatively small temporary loss of understory riparian vegetation, stressors related to allochthonous inputs, stream temperature, stream channel structure, and instream habitat would not be altered to a degree that could create any meaningfully measurable exposure to any life stage of coho salmon or its designated critical habitat in the action area. Therefore, impacts to coho salmon and its designated critical habitat would be insignificant.

Chinook salmon

Durphy Creek is not designated as critical habitat for Chinook salmon. However, historic surveys (in 1938) have noted Chinook salmon using Durphy Creek (CDFW 2014). Therefore, in any given year, Chinook salmon could be found spawning and rearing in the creek.

Due to the intact and well-functioning riparian canopy of large redwood trees along this reach of Durphy Creek, and the relatively small temporary loss of understory riparian vegetation, stressors related to allochthonous inputs, stream temperature, stream channel structure, and instream habitat would not be altered to a degree that could create any meaningfully measurable exposure to any life stage of Chinook salmon or its designated critical habitat in the action area. Therefore, impacts to Chinook salmon and its designated critical habitat would be insignificant.

5.2. Fish Passage Impacts

Stream diversions required for replacement of culverts associated with this action would not impact access through migratory corridors because these channels are not fish-bearing streams. Therefore, steelhead, coho salmon and Chinook salmon would not be exposed to stressors related to fish passage, and no designated critical habitat would be impacted. Therefore, potential passage impacts to all life stages of listed salmonids and their designated habitats due to culvert work are discountable.

Potential impacts related to noise and visual disturbance during the removal of MBGR and installation of crash cushions and transition barriers near Durphy Creek are analyzed in Section 5.5.

5.3. Water Quality Impacts

A water quality assessment report was prepared for this action (Caltrans 2015). The assessment concluded that due to its proximity to the South Fork of the Eel River and work within its tributaries, the project has the potential for non-stormwater and stormwater discharges to receiving waters both during construction and post-construction.

Water Temperature

Potential impacts to listed salmonids and their designated critical habitat due to any changes in water temperature are analyzed in Section 5.1.1 *Riparian Vegetation Impacts* above. No meaningfully measurable exposure to temperature-related stressors would occur to any life stage of steelhead, coho salmon or Chinook salmon, or their designated critical habitat, due to the proposed action.

Construction Lubricants and Liquids

Accidental lubricant and liquid releases from vehicles and heavy equipment used during construction are potential impact sources. Accidental spill and leaks pose a threat to water quality, vegetation, and wildlife habitat. Impact severity would depend on the material and amount released. BMPs that would be implemented to minimize the chance and severity of accidental construction-related discharges are described in detail in Section 3.3.8.

Accidental spills from construction equipment pose a risk to water quality, particularly at the onset of the rainy season when runoff from the first rains could exacerbate the discharge of any spilled materials. However, activities adjacent to watercourses would be restricted to the dry season. Activities that could impact watercourses would be suspended and all construction areas stabilized prior to the onset of the rainy season. Furthermore, standard measures would prevent most, if not all, chemical contamination during construction. See BMPs Section 3.3.8 for details.

With implementation of standard measures, including the use of pollution prevention plans, localized degradation of water quality from construction related spills is unlikely. The proposed measures are expected to be sufficient to restrict the pollutants to the immediate area; therefore, chemical contamination of the project watercourses as a result of construction operations is extremely unlikely to occur and the potential effects to any life stage of steelhead, coho salmon, Chinook salmon and their designated critical habitats are discountable.

Sedimentation and Turbidity

Salmonids typically avoid areas of higher suspended sediment, which can mean they displace themselves from their preferred habitats in order to seek areas with less suspended sediment. Fish unable to avoid suspended sediment can experience negative impacts. The severity of the impact of suspended sediment increases as a function of the sediment concentration and exposure time (Newcombe and Jensen 1996; Bash et al. 2001).

Suspended sediments can cause sublethal effects such as elevated blood sugars and cough rates (Servizi and Martens, 1992), physiological stress, and reduced growth rates. Elevated turbidity levels can reduce the ability of salmonids to detect prey, cause gill damage (Sigler et al. 1984; Bash et al. 2001; Allen and Hassler, 1986), and cause juvenile steelhead to leave rearing areas (Sigler et al. 1984). Additionally, short-term pulses of suspended sediment influence territorial, gill-flaring, and feeding behavior of salmon under laboratory conditions (Berg and Northcote, 1985). Adult and larger juvenile salmonids appear to be little impacted by the high concentrations of suspended sediments that occur during storm and snowmelt runoff episodes (Bjornn and Reiser, 1991). However, research indicates that chronic exposure can cause physiological stress responses which can increase maintenance energy and reduce feeding and growth (Servizi and Martens, 1992).

Salmonid fry are particularly susceptible to impacts from increased turbidity during their incubation as the entrained sediment can carry fines to spawning areas and settle out in redds. A high percentage of sediment fines within the channel substrate can result in reduced oxygen levels in redds as it blocks the percolation of oxygen-rich water running through the gravel. These fine sediments can smother and even entrap young.

Additionally, the primary constituent elements of designated critical habitat may be negatively impacted by sediment discharges. For example, fine sediments that settle in the substrate can diminish the quality of habitat for aquatic insects upon which salmon depend as a food source, as well as reducing the quality of spawning habitat. Large discharges of sediment can also diminish the quality of rearing habitat by filling pools.

Short-term Discharges during Construction

There is a potential for sediment discharges during construction, particularly during activities involving soil disturbance. Table 3.2 describes the total area and location of each potential disturbance. The only project activity where disturbance of soil is adjacent to fish-bearing waters is the installation of crash cushions and transition barriers at Durphy Creek.

The work at Durphy Creek would occur more than 25 feet from the creek. Standard sediment containment BMPs, as detailed in Section 3.3.8, would minimize the possibility of dry sediment and turbid runoff leaving the construction zone. Additionally, the Park's foot paths at the Richardson Grove Undercrossing are oriented such that they would catch any dry sediment that may escape containment during construction, and this sediment would be removed from the paths on the same day. Therefore, exposure of all life stages of listed salmonids and their designated critical habitats to stressors related to sediment discharges during construction are extremely unlikely to occur, and are discountable.

Additionally, temporary clear water diversions would be required for culvert work at PM 1.34 and PM 1.35 (see Section 3.3.5.2) if water is present. Diversions have the potential to create turbidity pulses as they are implemented and removed.

However, as described in Section 3.3.5.2, the two channels are connected both upstream and downstream of the culvert locations, and water would simply be directed into the opposite channel when work occurs on the culvert in the adjacent channel. No excavation of soil or alteration of channels would be required to complete the diversions. Clean materials would be used to divert the water and water would be prevented from contacting any disturbed soil, so generation of turbidity due to this work should be minimal.

Water downstream of the culverts at PM 1.34 and PM 1.35 flows through a flat area in the forest floor before being collected into another culvert, which appears to have been placed to drain a historic camp area. This old culvert is likely rusted out on the bottom because the water entering it during a September 21, 2016, site visit did not flow out the end of the culvert. However, water likely exits the culvert during higher flows.

During a September 21, 2016 site visit, Caltrans biologists noted a cool shallow pool of standing water at the base of the bluff below this area. It is probable that this cool water originated from spring water flowing through PMs 1.34 and 1.35 culverts. If this water were flowing directly into the South Fork Eel River or a side channel with appropriate depth and cover, it could create a classic cool water refuge for rearing juvenile salmonids. (At 11:00 AM on September 21, 2016, the temperature of the standing pool was 14 degrees C, and the temperature of the river was 20 degrees C.)

Presently, the gravel bar at the site of the State Park summer stream crossing road and bridge separates the cool standing water from the river. Depending on the location of the low water channel of the South Fork Eel River, this gravel bar is typically 100 to 200 feet wide. Therefore, there is currently no connection to the river that would allow juvenile salmonids to access the cool water area, and no potential for turbidity to reach fish-bearing waters because the flow seeps into the gravel bar well before reaching the river.

In some years, there is a side channel of the South Fork Eel River along the bank at the location of the cool water. Aerial photos available on Google Earth indicate a prominent/connected side channel in August 2005, June 2009, and September 2010; a disconnected/fragmented side channel in November 2004 and July 2006; and no side channel in September 2011, August 2012 and May 2014. Therefore, if there were a connected side channel at this location during diversion work at the PM 1.34 and PM 1.35 culverts, an accidental discharge of turbid water could potentially reach important rearing habitat for all three species of listed salmonids.

Additionally, if the thalweg of the mainstem South Fork Eel River shifted to the west bank (where the side channel is sometimes located), then the cool water could flow directly into the river and potentially create a cool water refuge.

If turbidity were generated during diversion, it would be a pulse lasting no longer than a few minutes and would likely settle out in the forest floor below the culverts before flowing toward the South Fork Eel River. Given the expected effectiveness of BMPs used during this diversion, the small quantity of water present during summer, and filtration though the forest floor, Caltrans expects that it is highly unlikely that any turbid water would enter fish-bearing waters in the South Fork Eel River.

Juvenile rearing coho, Chinook, and steelhead could be exposed to the stressor of elevated turbidity if appropriate conditions were present to allow formation of a cool water refuge where water from PM 1.34 and PM 1.35 culverts enters the river channel. Additionally, an accidental release of turbid water could negatively impact designated critical habitat if the value of rearing habitat were compromised. No other life stages of listed salmonids, or other elements of critical habitat, would be impacted due to the timing and relatively small potential input of sediment. For example, the mainstem of the South Fork Eel River is a known Chinook salmon spawning reach (A. Renger, personal communication, September 2016), but no spawning adults or eggs/alevins of any species would be present during construction, and the potential quantity of sediment would not alter the function of spawning habitat in the action area.

Given the extremely low likelihood of elevated turbidity reaching the channel of the South Fork Eel River during diversion at PM 1.34 and PM 1.35, and the low likelihood that the river would change in a way that would allow a cool water refuge to form at this location at the time of construction, negative impacts to all life stages of listed salmonids and their critical habitat are discountable.

Post-construction Sediment Discharges

After construction, there would be areas of disturbed soil in the action area which could result in ongoing sediment delivery to the watercourses as a result of erosion, slope instability, disruption of slope features, vegetation removal, and excavation of slope soils. Table 3.2 quantifies the square footage of temporary soil disturbance at each work location. The total area of disturbed soil for the project (approximately 0.67 acre) is within the defined action area.

Sediment transport would be avoided or minimized through implementation measures contained in the standard specifications, special provisions, permit requirements, and WPCP or SWPPP prepared for the proposed action (Caltrans 2006). Caltrans would ensure that applicable BMPs, as detailed in Section 3.3.8 and outlined in the WPCP or SWPPP, are used to stabilize all bare soil areas over both the short term and long term to avoid adverse effects to water quality, aquatic habitat, and listed fish. Applicable temporary construction BMPs include soil stabilization, sediment control, wind erosion control, tracking control, non-stormwater management, and waste management. Permanent BMPs include application of mulch, straw, stabilizing emulsion, fertilizer, and planting to stabilize and re-vegetate all cut and fill slopes.

All areas disturbed during construction must meet the conditions included in the State Water Resources Control Board, Section D, Construction General Permit (Order No. 2010-0014-DWQ) in order to terminate permit coverage. All BMPs must continue to be inspected and maintained until the project has received a Notice of Termination (NOT) from the NCRWQCB. In addition, construction site monitoring, sampling, and analysis described in the approved WPCP or SWPPP must continue until the NOT is certified. In order to receive the NOT, the project must demonstrate that final stabilization has been achieved by the following:

- Post-construction stormwater management measures have been installed and a long term maintenance plan has been established;
- There is no potential for construction-related stormwater pollutants to be discharged into site runoff;
- All construction-related equipment, materials, and any temporary BMPs no longer needed are removed from the site;
- Demonstrate via photos, inspection, testing, and analyses that all the above conditions have been met to demonstrate a minimum of 70 percent stabilization of disturbed soil areas.

Apart from Durphy Creek, no fish-bearing watercourses would receive direct inputs of turbid water because all ditches and ephemeral channels drain to the South Fork Eel River over distances of 200 to 500+ feet, which would allow some degree of settling and filtration of suspended sediment. Durphy Creek in the action area typically runs dry well before rains begin in the fall and winter (S. Monday, personal communication, September 2016), so it would also not constitute a fish-bearing water at the time of the first winter storm when the most vulnerable life stages would otherwise be present in clear water with elevated temperatures. Therefore, it is extremely unlikely that elevated turbidity would occur in fish-bearing waters due to excursions of project-related sediment.

The staging area at MEN 101 PM R106.5 is an existing area of disturbed ground with approximately 250 feet of vegetated ground and a road between it and the river. The staging area at HUM 101 PM 2.2 is also previously disturbed ground with approximately 150 feet of forest floor between it and the river.

Additionally, stormwater BMPs would be implemented at these sites. Therefore, it is extremely unlikely that stormwater runoff would carry project-related sediment to fish-bearing waters from these locations.

Given the expected effectiveness of stormwater BMPs, the relatively small areas of disturbance, the distances of project related soil disturbance to fish-bearing waters, and the low likelihood that vulnerable life stages would be present in receiving waters at the time when ambient conditions render them the most vulnerable, there is an extremely low likelihood that any life stage of steelhead, Chinook salmon, or coho salmon, or elements of their designated critical habitat, would be exposed to project-related turbid water. Therefore, negative impacts to all life stages of listed salmonids and their designated critical habitats due to project-related turbidity are discountable, and would be insignificant if they were exposed.

Contaminants Associated with Stormwater Runoff

As discussed in Section 4.1.3., metals and polycyclic hydrocarbons are present in highway stormwater runoff. Several traffic-related compounds have been found to be toxic to organisms (Washington 2016).

- Arsenic causes harm by disrupting metabolism at the cellular level. It can cause fetal death and malformations in many mammal species.
- Cadmium can be acutely toxic to freshwater organisms.
- Chromium can affect survival and growth rate in some fish (Velma et al. 2009).
- Copper interferes with salmon's sense of smell, which reduces their ability to avoid predators, find their way back to their birthplace to spawn, and find mates.
- Lead can impair brain development and affect behavior, reproduction, and growth.
- Mercury is a neurotoxin and is linked to kidney and liver damage and possibly cancer.
- Chronic exposure of fish to sub-lethal Nickel concentrations can result in respiratory toxicity in the form of altered gill morphology, impaired swim performance, and impaired and oxygen consumption (Price 2013).
- Zinc can kill young salmon as they swim out of their nest gravel. In high enough concentrations, zinc can kill many adult fish species.
- PAHs can cause heart defects in the developing embryos of some fish species.

The levels of these pollutants in roadway runoff are linked to traffic volume (Caltrans 2003a, 2003b). While overall traffic (autos and trucks) is expected to increase over time (Table 4.1), traffic is not expected to increase specifically as a result of the project. Improved access for STAA trucks alone does not induce truck traffic, as truck traffic is market-driven. Restriction of truck access can constrain markets, but it is only one of many influencing factors (K. Tucker, personal communication, May 2016).

An economic study for the project (Gallo 2008) found that removal of the STAA restriction in southern Humboldt County would likely result in fewer trucks with more cargo on each truck. Further, it is not likely that truck traffic would be diverted from the 1-5 corridor to use US Route 101 if the STAA restriction is lifted because other routes have straighter alignments and higher speed limits.

Use of STAA trucks would not result in potential effects differing from any such effects caused by California Legal trucks already traveling on Highway 101. As discussed in Section 3.3, the maximum legal weight limit for all trucks, including STAA and California Legal trucks, is 80,000 pounds. STAA trucks typically have the same number of axles as California Legal trucks. Truck components (such as fuel, brakes, and tires) are the same for California Legal and STAA trucks. No new pollutant would be introduced to the area as a result of removing the prohibition on STAA trucks.

This project would use Hot Mix Asphalt (HMA) - Type A, a form of dense grade, with an overlay of HMA - Type Open Grade. These formulations are non-rubberized and are similar to the existing, standard asphalt in the project area. Use of new asphalt is not expected to increase the amount of pollutants in the area. Wright et al. (1999) examined direct PAH discharges from new asphalt (both rubberized and standard) slab samples subjected to simulated wear and rainfall. None of the 24 PAHs tested in standard asphalt were found to be above the detection limit of 10 nanograms/liter even though they are known to be present in asphalt. A possible explanation is that PAHs are volatile and quick to off-gas as fresh asphalt pavement cures. Caltrans only paves when rain is not forecast during the week in which paving occurs because dry conditions are necessary for the asphalt to cure properly. This curing and cooling period may allow PAHs to evaporate before a rain event potentially discharges them. Therefore, Caltrans does not expect PAH levels due to wear of new asphalt to differ from that of old asphalt pavement.

Caltrans expects that potential impacts to any life stages of listed salmonids and their critical habitats related to traffic and asphalt-derived contaminants are discountable.

5.4. Impacts Due to New Impervious Surface

Impervious surfaces can result in degraded fish habitat by conveying stormwater run-off to streams more quickly than the natural conditions under which the streams formed. Increases in peak run-off can cause bed and bank erosion, and summer low flows can become lower as a result of reduced groundwater recharge. As the percent of impervious surfaces in a watershed increases, the impacts to downstream areas generally increase as well. Existing quantities of impervious surface in the South Fork Eel River watershed that drain to the Action Area are unknown; however, the watershed is largely timber, agricultural and ranch lands on which impervious surfaces are a negligible part of the land surface. The new impervious surface created by the project is approximately 0.17 acre within a watershed of approximately 440,690 acres.

Approximately 0.06 acre of existing pavement would be removed for the project, and this value is subtracted from the total 0.23 acre of newly created impervious surface, which results in the total of 0.17 acre. The existing impervious state highway surface in the action area is approximately 3.7 acres. Therefore, this work would result in an overall increase in impervious surface of approximately 4.6 percent in the action area.

Within the action area, drainage patterns due to new impervious surface would not change to any degree of significance in terms of impacts to fish-bearing waters. That is, changed quantities of runoff would not alter channels in any way that would create an impact to the physical structure of habitat for listed salmonids.

However, increases in impervious surface could contribute elevated concentrations of contaminated runoff if additional contaminants were deposited by traffic on that surface. Caltrans (2003a) found that impervious fraction of a drainage area did not have a consistent effect on contaminant concentrations. Impervious fraction had the weakest effect of all the factors evaluated. Conversely, traffic volume showed the strongest effect of all factors evaluated. This finding makes sense considering that contaminant deposition occurs primarily due to wear of tires, brake pads, and pavement, as well as exhaust emissions and fluid leaks, rather than from unworn asphalt pavement.

However, there would not be an increase in pollutant loading over the existing condition, because the proposed action is not expected to generate an increase in traffic volume (Gallo 2008).

Consequently, no degradation of water quality or physical habitat would occur due to the project's minor increase in impervious surface, and there would be no exposure of listed salmonids or their designated critical habitat to potential stressors related to impervious surface. Therefore, any potential negative impact to any life stage of steelhead, coho salmon or Chinook salmon, as well as their designated critical habitats, is discountable.

5.5. Noise and Visual Disturbance

The crash cushions and transition barriers near the Durphy Creek box culvert would be constructed with cast-in-place concrete footings (Figure 3.8). The soil on the shoulder and a portion of the roadway would be excavated at each of the four corners of the Richardson Grove Overcrossing to accommodate the foundations of the crash cushions and transition barriers. There would be no post-auguring or post-driving. Noise is not expected to exceed ambient traffic noise.

The crash cushions and transition barriers would be constructed more than 25 feet from the OHWM of Durphy Creek. The view shed from the water includes large trucks on the highway, the overhead canopy of large trees, vehicles on the Park Road and people walking on foot-paths between the creek and the highway shoulders. Therefore, visual disturbance due to worker and equipment is not expected to exceed baseline levels of visual disturbance.

Work at Durphy Creek could require nighttime use of artificial lighting. Changes to ambient lighting patterns from the use of artifical light can interfere with physiological processes in fish, including the secretion of hormones that affect growth and maturation (Björnsson et al. 2011), and can disrupt juvenile migration (Tabor et al. 2004).

Night work requiring the use of artificial lighting is not certain but could occur at Durphy Creek during construction of the crash cushions and transition barriers. The use of artificial lighting is expected to last no more than three weeks and would be restricted to critical need—examples of which include an accelerated work schedule to meet permit deadlines or reaching a critical juncture in work at a time when it would be infeasible to stop construction.

Light shields would be used and lighting would be directed toward the roadway and away from Durphy Creek to minimize potential impacts to fish if water is present in the channel. Caltrans expects that light intensity would not be appreciably increased over typical nighttime headlight illumination, or light from a full moon (Tabor et al. 2004, Riley et al. 2015).

Therefore, Caltrans concludes that negative impacts to listed salmonids of any life stage and primary constituent elements of their designated critical habitat (rearing and migration) due to disturbance from construction activity and night work would be insignificant.

5.6. Simultaneous Construction Impacts

The potential exists for simultaneous construction-related impacts to have a synergistic effect that is greater or different than each stressor acting alone.

The Durphy Creek MBGR/crash cushion site is the only location where multiple potential construction related stressors may be expected to occur simultaneously. Examples of potentially simultaneous activities that could expose rearing juvenile salmonids to stressors at Durphy Creek include vibrations from construction equipment, visual impacts from workers and equipment, turbid runoff, and accidental discharge of construction-related debris or fluids.

Given the high human and traffic use at the Durphy Creek crossing (as detailed in Section 5.1.5), the existing containment provided by State Park trails and roads between the work and the creek, seasonal and weather-related timing restrictions, and the expected effectiveness of containment and equipment maintenance BMPs, Caltrans has determined that exposure by multiple stressors acting synergistically on any life stage of steelhead, Chinook salmon or coho salmon, or their critical habitat, is extremely unlikely. Therefore, any negative impact from simultaneous construction-related stressors is discountable.

5.7. Cumulative Effects

Cumulative effects include effects of future State, tribal, local, and private non-federal actions that are reasonably certain to occur within the action area under consideration. Section 7 regulations that implement the Endangered Species Act do not require an analysis of cumulative effects for informal consultations.

5.8. Effects of Interrelated and Interdependent Actions

As defined in 50 CFR §402.02, interrelated actions are part of a larger action and depend on the larger action for their justification. The project would slightly realign portions of an existing highway, modifying existing culverts, install a retaining wall, and replace existing guardrail. The project has logical termini (rational end points), as it addresses the curves that currently result in the STAA vehicle restriction on US Route 101 between Benbow in Southern Humboldt and Leggett in Northern Mendocino. No other project is needed to remove this restriction, nor is this project part of any other project. This project is not part of a larger action and does not depend on any larger action for its justification, therefore this project is not interrelated with any other projects. This project would simply allow slightly longer vehicles on a current truck route.

According to 50 CFR §402.02, interdependent actions have no independent utility apart from the action under consideration. The project has independent utility, as no further improvements on US Route 101 are required to lift the restriction on STAA vehicles between Humboldt and Mendocino Counties. Although other highway improvement projects are planned on an ongoing basis, no actions that are part of and dependent on this proposed action have been identified. Whether or not this project proceeds would have no influence on any other known project. No interdependent activities have been identified as related to the proposed action.

Chapter 6. Conclusions and Determination

Caltrans has made the following determinations for the proposed action's effects to listed species:

- ***May affect, not likely to adversely affect*** SONCC coho salmon
- ***May affect, not likely to adversely affect*** CC Chinook salmon
- ***May affect, not likely to adversely affect*** NC steelhead

Caltrans has made the following determinations for the proposed action's effects to designated critical habitat:

- ***May affect, not likely to adversely affect*** SONCC coho salmon critical habitat
- ***May affect, not likely to adversely affect*** CC Chinook salmon critical habitat
- ***May affect, not likely to adversely affect*** NC steelhead critical habitat

Chapter 7. Essential Fish Habitat Assessment for Pacific Salmon

7.1. Action Agency

California Department of Transportation

7.2. Project Name

Richardson Grove Operational Improvement Project

7.3. Essential Fish Habitat Background

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), requires Federal agencies to consult with NMFS on activities that may adversely affect Essential Fish Habitat (EFH). EFH is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Waters include aquatic areas and their associated physical, chemical, and biological properties. Substrate includes sediment underlying the waters. Necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem. Spawning, breeding, feeding, or growth to maturity covers all habitat types utilized by a species throughout its life cycle.

The objective of this EFH assessment is to determine whether or not the proposed action "*may* adversely affect" designated EFH for relevant commercially, federally managed fisheries species within the proposed action area. It also describes conservation measures proposed to avoid, minimize, or otherwise offset potential adverse effects to designated EFH resulting from the proposed action.

South Fork Eel River and Durphy Creek near the action area support EFH for species regulated under the Federal Pacific Coast Salmon Fishery Management Plan. No records could be found to indicate whether Laurel Creek or North Creek were historically accessible to salmonids, but it is not likely due to the steep topography. They do not currently support EFH.

***Pacific Coast Salmon Fishery Management Plan (Chinook, coho, and Puget Sound pink salmon)*:**

EFH for the Pacific coast salmon fishery means those waters and substrate necessary for salmon production needed to support a long-term sustainable salmon fishery and salmon contributions to a healthy ecosystem. To achieve that level of production, EFH must include all those streams, lakes, ponds, wetlands, and other currently viable water bodies, and most of the habitat historically accessible to salmon in Washington, Oregon, Idaho, and California. In the estuarine and marine areas, salmon EFH extends from the nearshore and tidal submerged environments within state territorial waters out to the full extent of the Exclusive Economic Zone offshore of Washington, Oregon, and California north of Point Conception. Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the Pacific Fishery Management Council [PFMC]), and longstanding, naturally-impassable barriers (i.e., natural waterfalls in existence for several hundred years).

7.4. Description of the Project/Proposed Activity

Between Post Miles 1.1 and 2.2 on US 101 in Humboldt County, the proposed project would include minor realignment (including minor widening) of the existing roadway to allow access of STAA vehicles. This proposed action would involve potential temporary diversions of ephemeral watercourses and roadside drainages for culvert work, ground disturbance, slope excavations, equipment staging areas, and vegetation and shrub removal. The project is expected to take two construction seasons to complete.

The proposed action includes removal of MBGR and installation of crash cushions and transition barriers (Figure 3.8) near Durphy Creek, lengthening of four 18-inch diameter culverts (Figure 3.3), and placement of a new overside drain on a fifth existing culvert (Figures 3.5 and 3.6). Additionally, a sixth culvert would be replaced and rock slope protection installed at the outlet as an energy dissipater to prevent erosion (Figure 3.7). None of these culverts convey fish-bearing streams. However, they all drain into the South Fork Eel River and consequently are associated with Essential Fish Habitat for coho salmon and Chinook salmon. More information on the proposed project can be found in Chapter 3 of the BA.

7.5. Potential Adverse Effects of the Proposed Project

The definition for EFH "adverse effects" states that an adverse effect is any impact which reduces quality and/or quantity of EFH, and may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). Only Salmon EFH occurs in the action area. The ground disturbing activity associated with the action may have a temporary minor adverse effect on EFH (water quality) for Pacific Salmon managed under the Pacific Fishery Management Council Fishery Management Plans (coho salmon and Chinook salmon).

A detailed description of the potential adverse effects of the proposed action can be found in Chapter 5 of this BA.

7.6. EFH Conservation Measures

Areas of disturbed soil would be seeded with native, regionally appropriate plant species. Caltrans is required by the State Water Resources Control Board's Construction General Permit to implement standard water quality BMPs (Caltrans 2003d) during construction of all projects. These are effective erosion and pollution control measures that would avoid and minimize the potential for adverse impacts to EFH from construction activities. The contractor is required to develop and implement site-specific best management practices and emergency spill controls.

Examples of standard BMPs (Caltrans 2003d, Caltrans 2010b) include:

- Structural stormwater controls (rock slope protection, dikes)
- Soil stabilization practices (vegetation, rolled erosion control blankets)
- Silt fences/fiber rolls to control sediment discharge during construction
- Measures to prevent construction equipment effluents from contaminating soil or waters in the construction site, such as absorbent pads
- Excavated spoils controlled to prevent sedimentation to watercourses
- Weed-free straw mulch and fiber rolls applied to exposed soil areas for over-wintering
- Contractor-developed and implemented site-specific BMPs and emergency spill controls
- Concrete debris or contact water not allowed to flow into waterways

- Concrete not poured within flowing water in the waterways
- Water that has come into contact with setting concrete would be pumped into a tank truck for disposal at an approved disposal site or settling basin
- Concrete truck washouts located at upland staging areas a minimum of 50 feet away from watercourses

These are described in Chapter 3 of the BA.

7.7. EFH Conclusion

The project ***may adversely affect EFH*** for species managed under the Pacific Coast Salmon Fishery Management Plans. Roadway realignment, culvert work, installation of crash cushions and transition barriers, and possible temporary diversion of non-fish-bearing roadside drainages have the potential to contribute sediment or cause turbidity temporarily in Durphy Creek and the South Fork Eel River.

Any effects of the project to EFH would be negligible for the following reasons:

- Removal of riparian vegetation to achieve project objectives would be minimal
- Construction would take place during the dry season and would be short in duration
- The park's foot paths act as a buffer between the highway and Durphy Creek, preventing sediment from entering the creek
- Areas appropriate for revegetation would be replanted
- Standard water quality BMPs would be implemented

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Ashton, Diane. NMFS Fisheries Biologist, 2015, phone conversations

Bernard, Rebecca. NMFS Fisheries Biologist, 2015-2016, emails, in-person conversations, and phone conversations

Hostler, Clarence. NMFS Fisheries Biologist, 2015-2016, emails and phone conversations

Jahn, Jeffrey. NMFS Supervisory Fish Biologist, 2016, email

Lund, Eric. Caltrans Transportation Engineer, 2016, memorandum

Monday, Scott. CDFW Environmental Scientist, 2016, emails, in-person conversations, and phone conversations

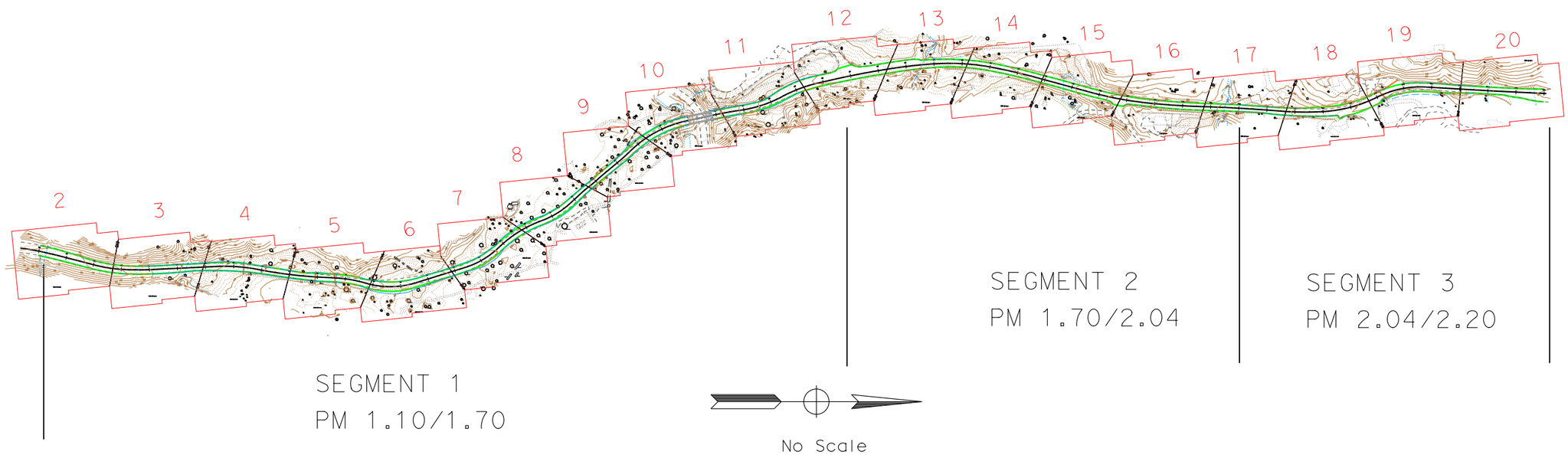
Renger, Allan. CDFW Senior Environmental Scientist, 2016, emails and phone conversations

Tucker, Kevin. Caltrans Senior Transportation Planner, 2016, memorandum

Appendices

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	HUM	101	1.10 / 2.20	1	20

Appendix A. Project Layouts - Richardson Grove BA - EA 46480



Alignment modifications and cuts/fills are described in three segments. Segment 1 from PM 1.11 to PM 1.70, Segment 2 from PM 1.70 to PM 2.04, and Segment 3 from PM 2.04 to PM 2.20. STAA access restrictions are located in segments 1 and 3. Cuts and fills to accommodate realignments and widening, drainage improvements, repaving, and restriping would occur in segments 1 and 3. Only pavement overlay and restriping with one minor drainage improvement would occur in segment 2.

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RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

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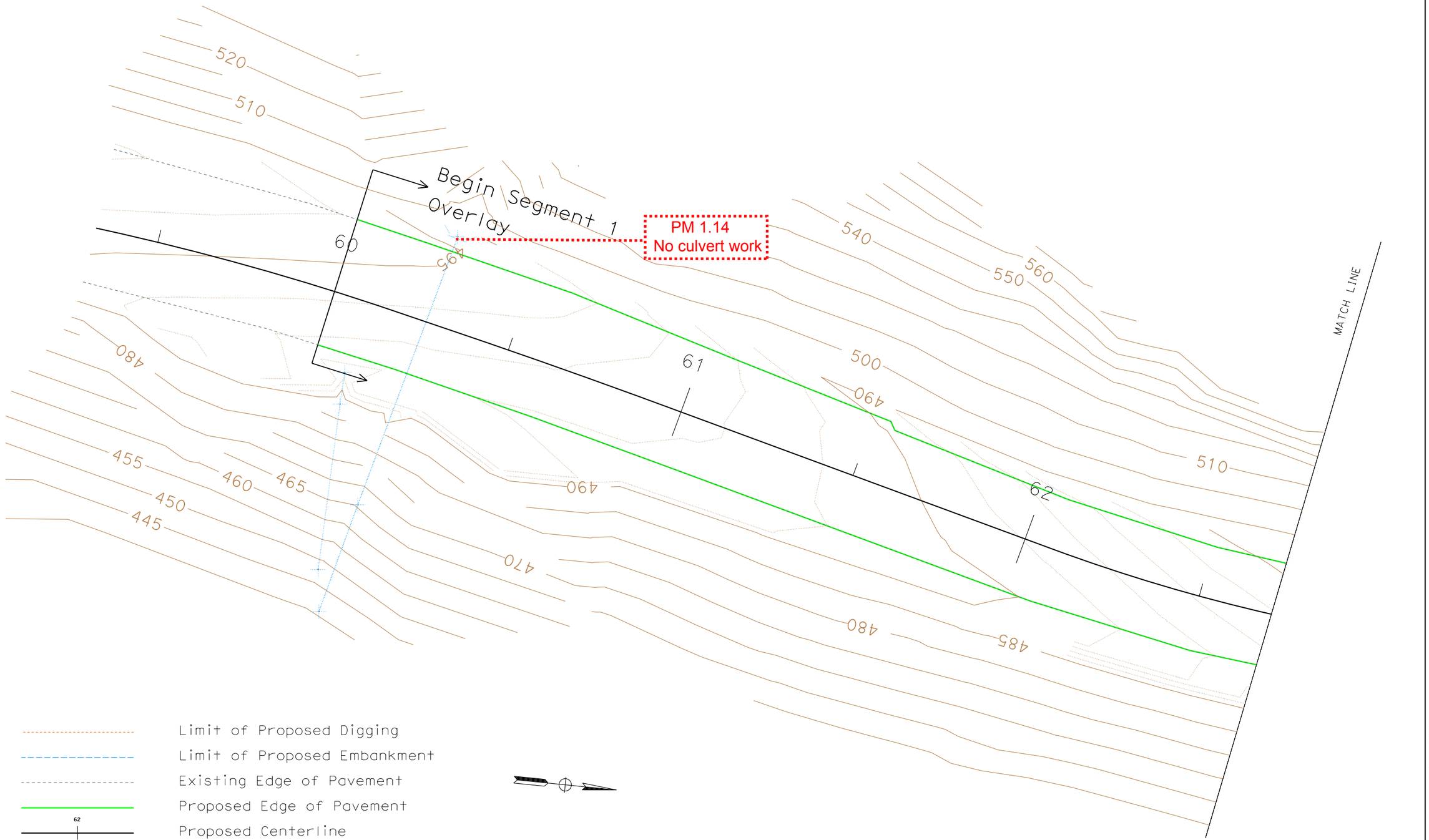
DGN FILE => Title sheet.dgn

CU 00000 EA 01-46480

Appendix A. Project Layouts - Richardson Grove BA - EA 46480

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	HUM	101	1.10 / 2.20	2	20



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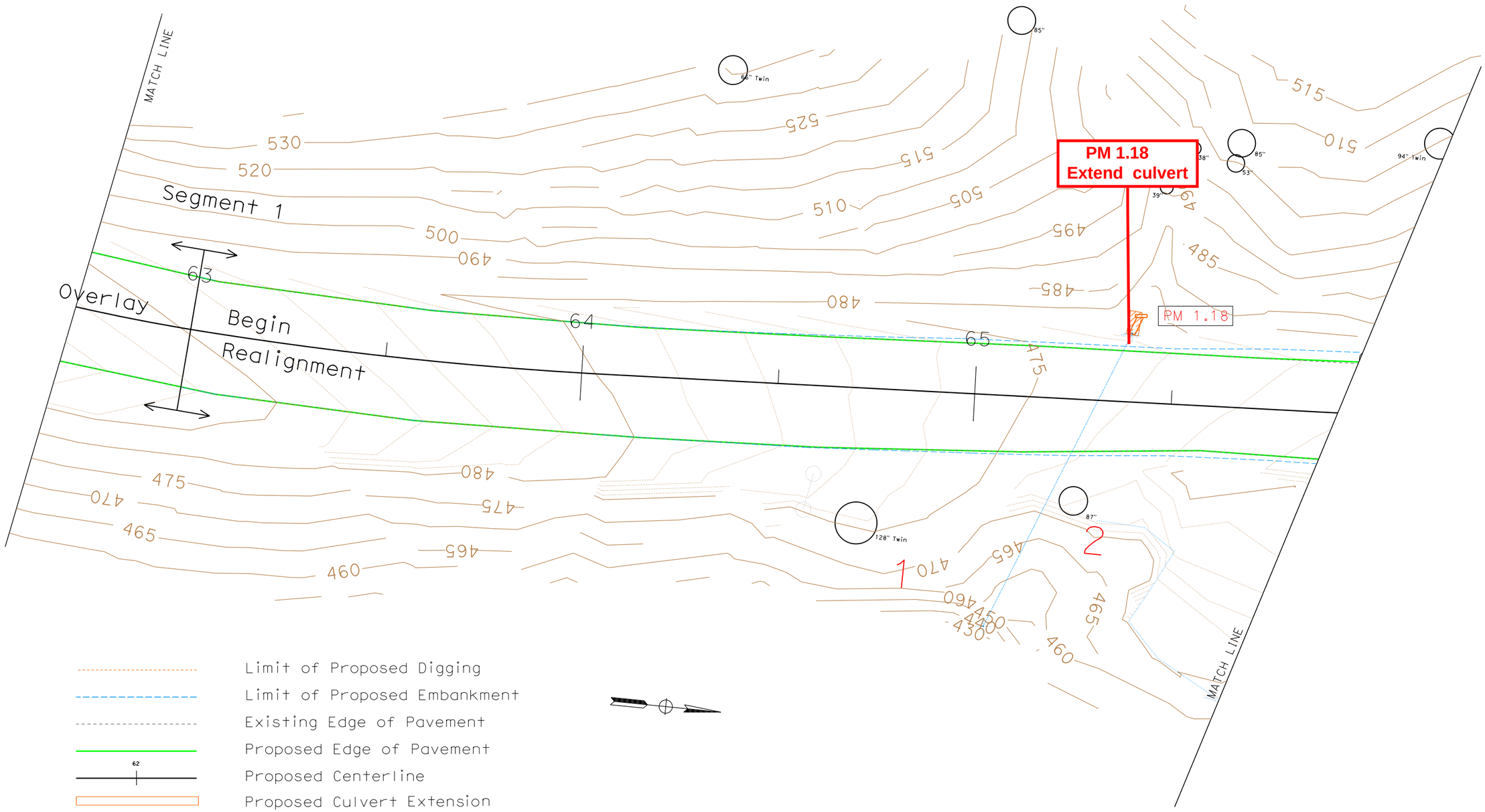
DGN FILE => sheet2.dgn

CU 00000

EA 01-46480

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	HUM	101	1.10 / 2.20	3	20

Appendix A. Project Layouts - Richardson Grove BA - EA 46480



Limit of Proposed Digging

Limit of Proposed Embankment

Existing Edge of Pavement

Proposed Edge of Pavement

62 Proposed Centerline

Proposed Culvert Extension

1"=25'

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RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

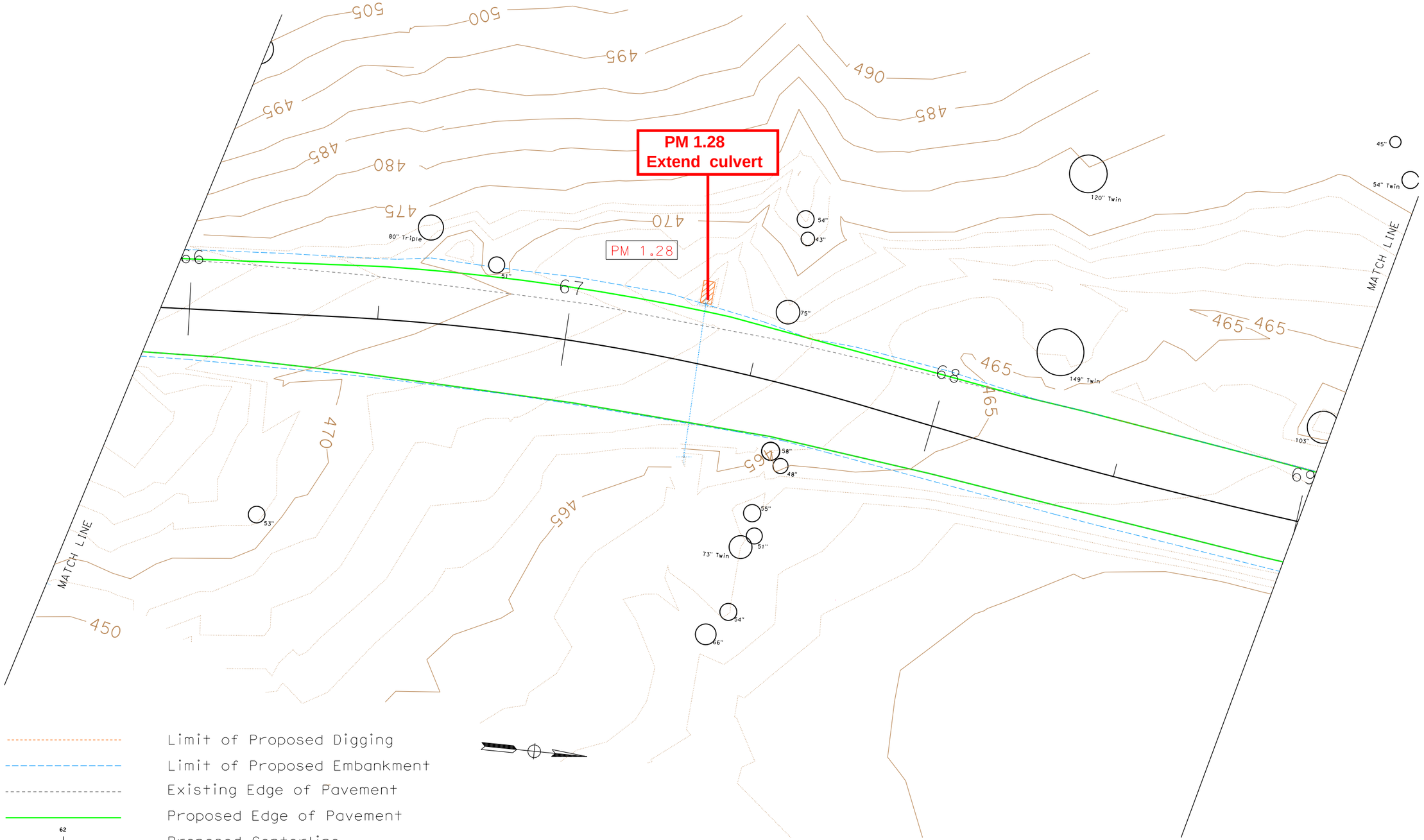
USERNAME => s122576
DGN FILE => sheet3.dgn

CU 00000

EA 01-46480

Appendix A. Project Layouts - Richardson Grove BA - EA 46480

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	HUM	101	1.10 / 2.20	4	20



1"=25'

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LAST REVISION 02/18/15

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RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => s122576
DGN FILE => sheet4.dgn

CU 00000

EA 01-46480

Appendix A. Project Layouts - Richardson Grove BA - EA 46480

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
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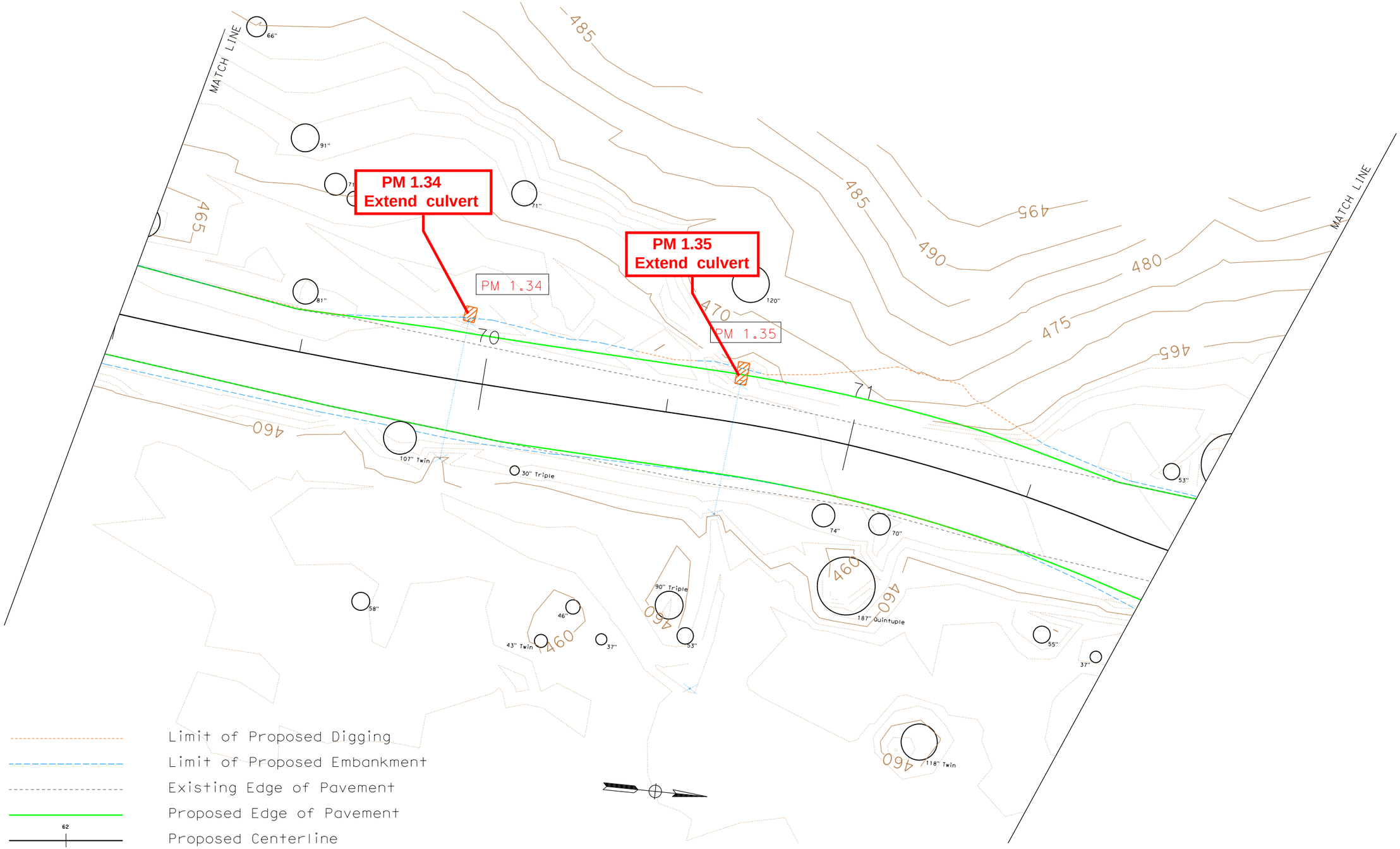

Limit of Proposed Digging

Limit of Proposed Embankment

Existing Edge of Pavement

Proposed Edge of Pavement

62

Proposed Centerline

Proposed Culvert Extension

1"=25'

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RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

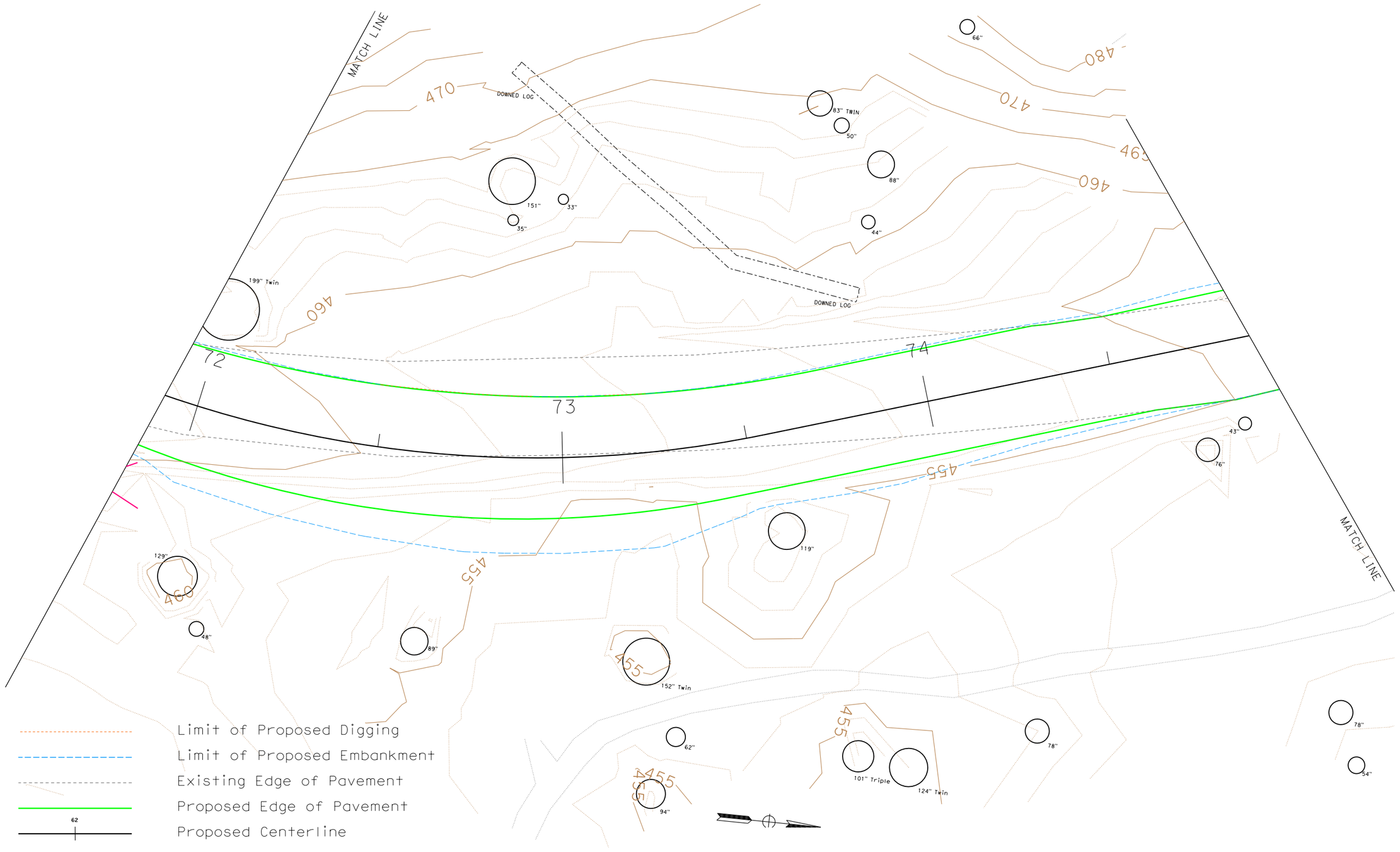
USERNAME => s122576
DGN FILE => sheet5.dgn

CU 00000

EA 01-46480

Appendix A. Project Layouts - Richardson Grove BA - EA 46480

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	HUM	101	1.10 / 2.20	6	20



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RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => s122576
DGN FILE => sheet6.dgn

CU 00000

EA 01-46480

Appendix A. Project Layouts - Richardson Grove BA - EA 46480

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	HUM	101	1.10 / 2.20	7	20

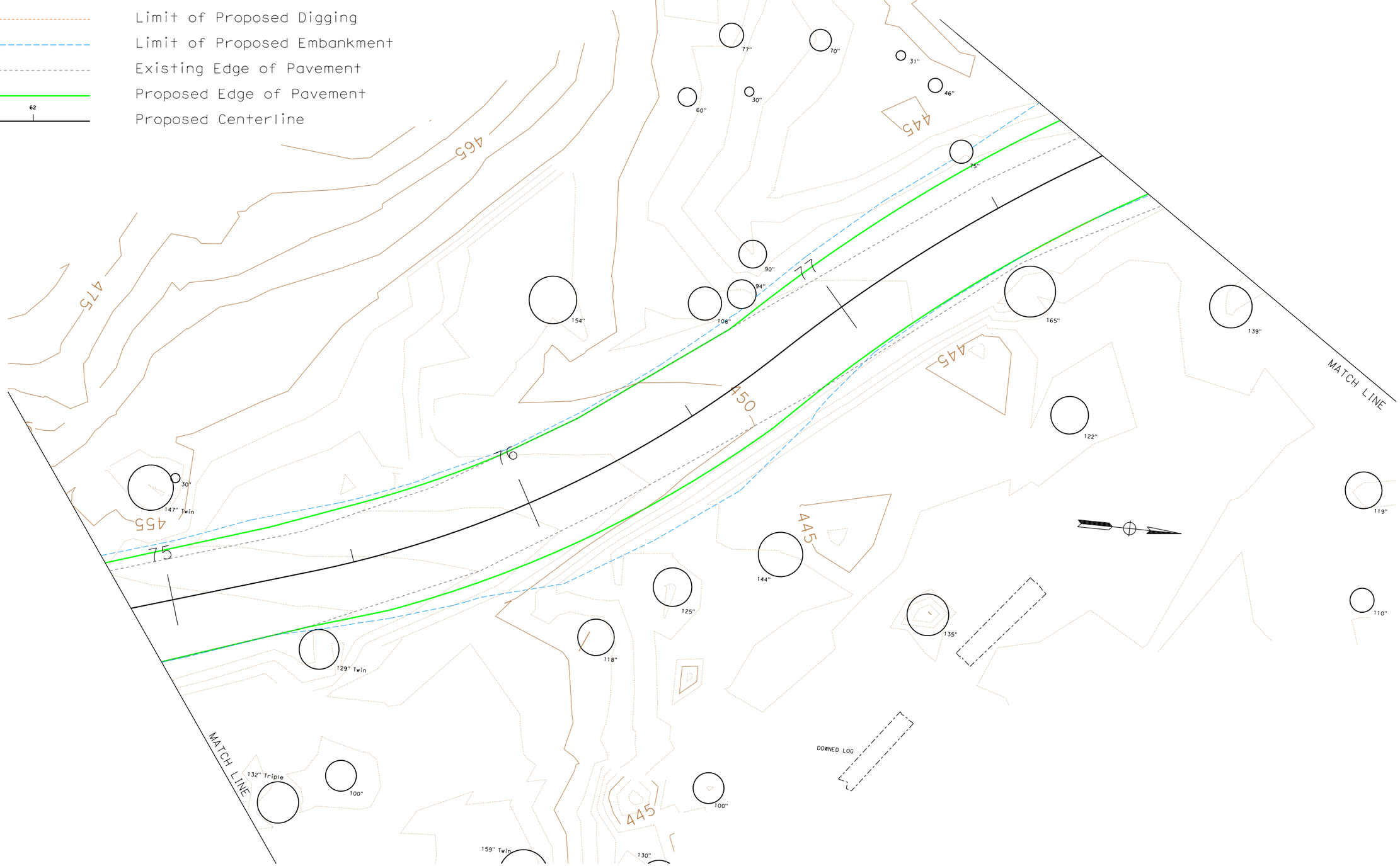
Limit of Proposed Digging

Limit of Proposed Embankment

Existing Edge of Pavement

Proposed Edge of Pavement

62 Proposed Centerline



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DATE PLOTTED => 17-FEB-2015
TIME PLOTTED => 15:57

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => s122576
DGN FILE => sheet7.dgn

CU 00000

EA 01-46480

Appendix A. Project Layouts - Richardson Grove BA - EA 46480

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	HUM	101	1.10 / 2.20	8	20

Limit of Proposed Digging
Limit of Proposed Embankment
Existing Edge of Pavement
Proposed Edge of Pavement
62
Proposed Centerline

1"=25'

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TIME PLOTTED => 15:57

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RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => s122576
DGN FILE => sheet8.dgn

CU 00000

EA 01-46480

Appendix A. Project Layouts - Richardson Grove BA - EA 46480

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	HUM	101	1.10 / 2.20	9	20

Limit of Proposed Digging

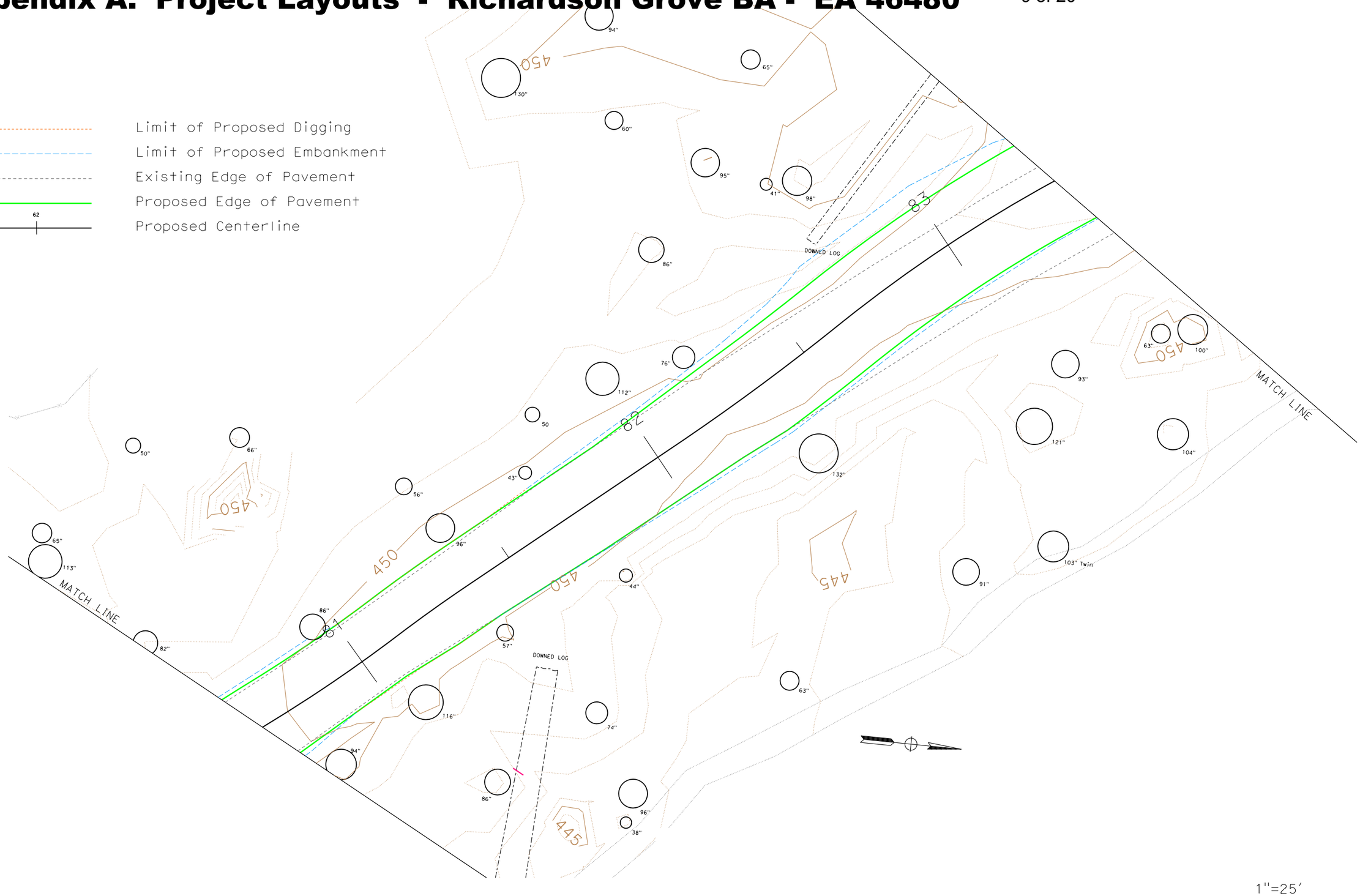
Limit of Proposed Embankment

Existing Edge of Pavement

Proposed Edge of Pavement

62

Proposed Centerline



1"=25'

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DATE PLOTTED => 17-FEB-2015

TIME PLOTTED => 15:57

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => s122576

DGN FILE => sheet9.dgn

CU 00000

EA 01-46480

Appendix A. Project Layouts - Richardson Grove BA - EA 46480

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	HUM	101	1.10 / 2.20	10	20

Limit of Proposed Digging

Limit of Proposed Embankment

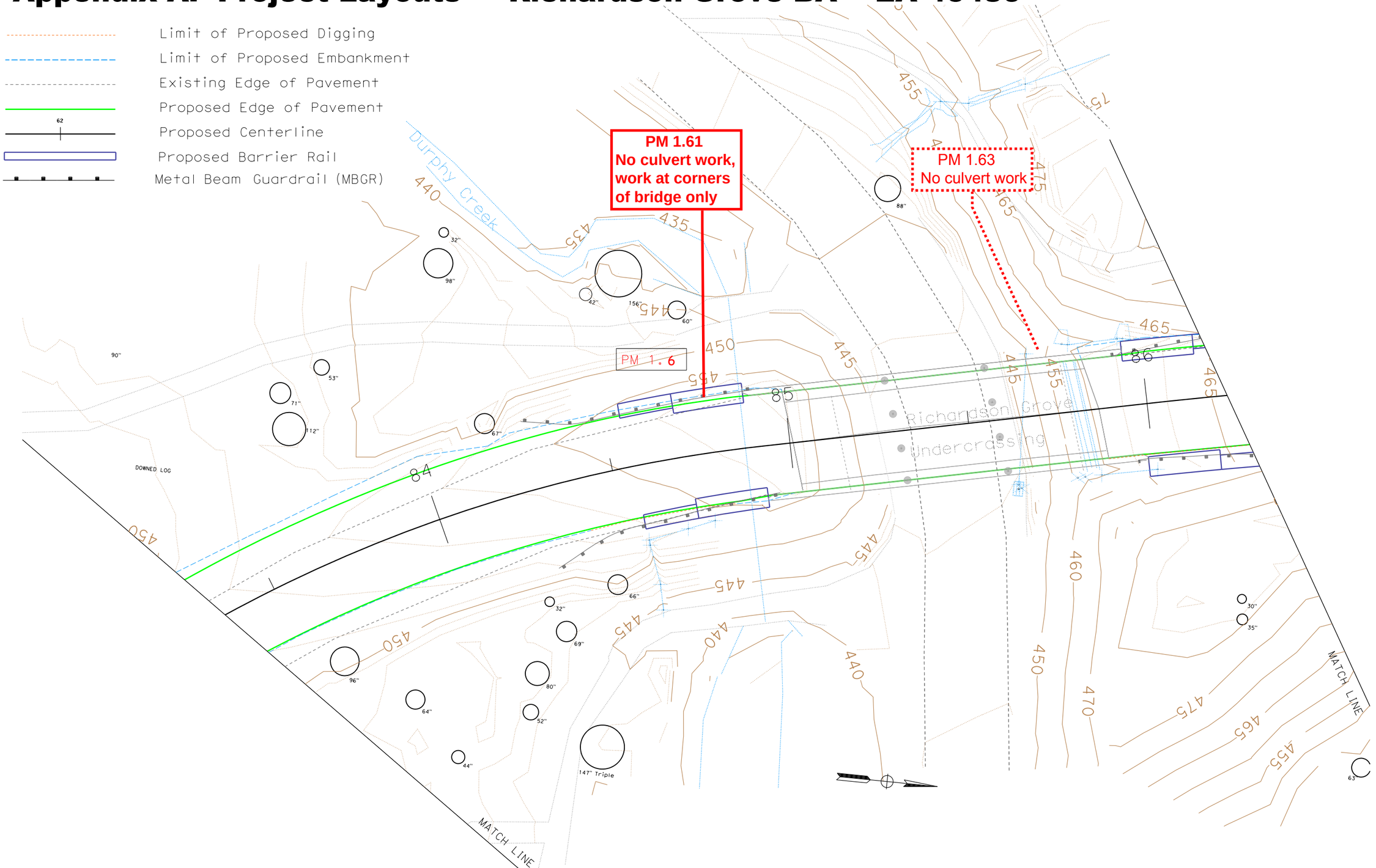
Existing Edge of Pavement

Proposed Edge of Pavement

62 Proposed Centerline

Proposed Barrier Rail

Metal Beam Guardrail (MBGR)



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TIME PLOTTED => 15:57

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => s122576

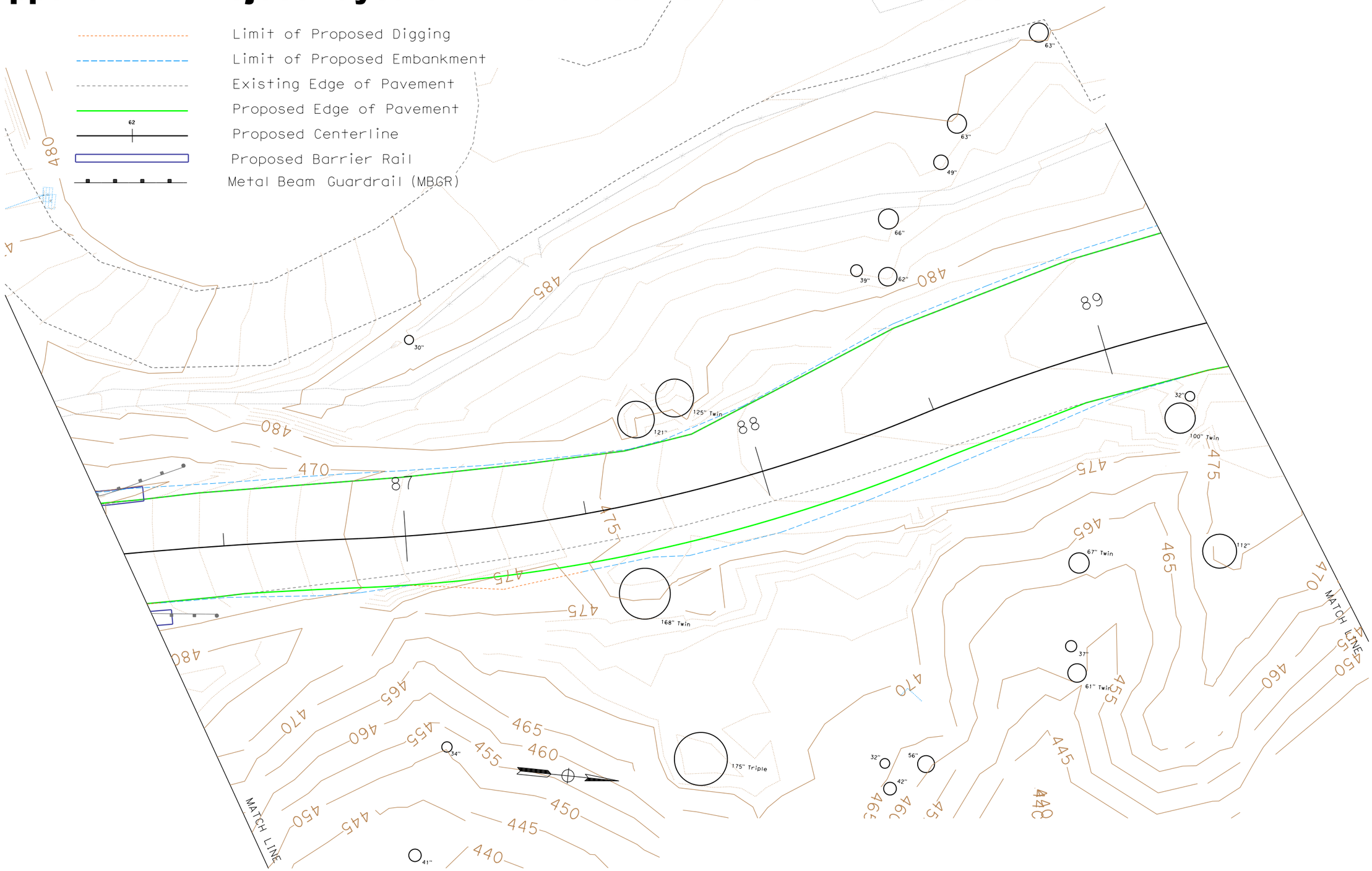
DGN FILE => sheet10.dgn

CU 00000

EA 01-46480

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	HUM	101	1.10 / 2.20	11	20

Appendix A. Project Layouts - Richardson Grove BA - EA 46480



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LAST REVISION 02/18/15
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RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => s122576
DGN FILE => sheet11.dgn

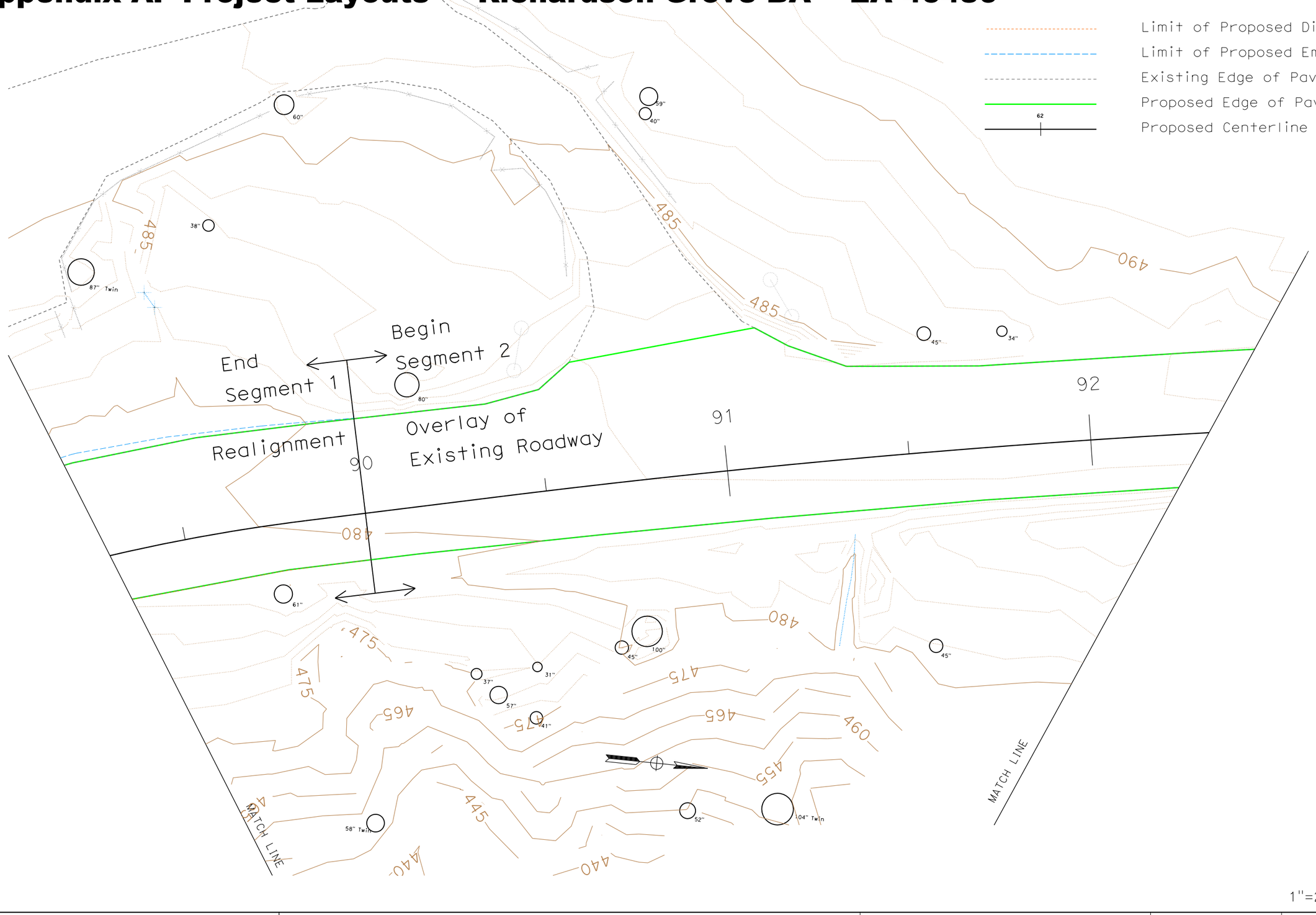
CU 00000

EA 01-46480

Appendix A. Project Layouts - Richardson Grove BA - EA 46480

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	HUM	101	1.10 / 2.20	12	20

Limit of Proposed Digging
Limit of Proposed Embankment
Existing Edge of Pavement
Proposed Edge of Pavement
62
Proposed Centerline



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LAST REVISION 01/21/15
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TIME PLOTTED => 15:57

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

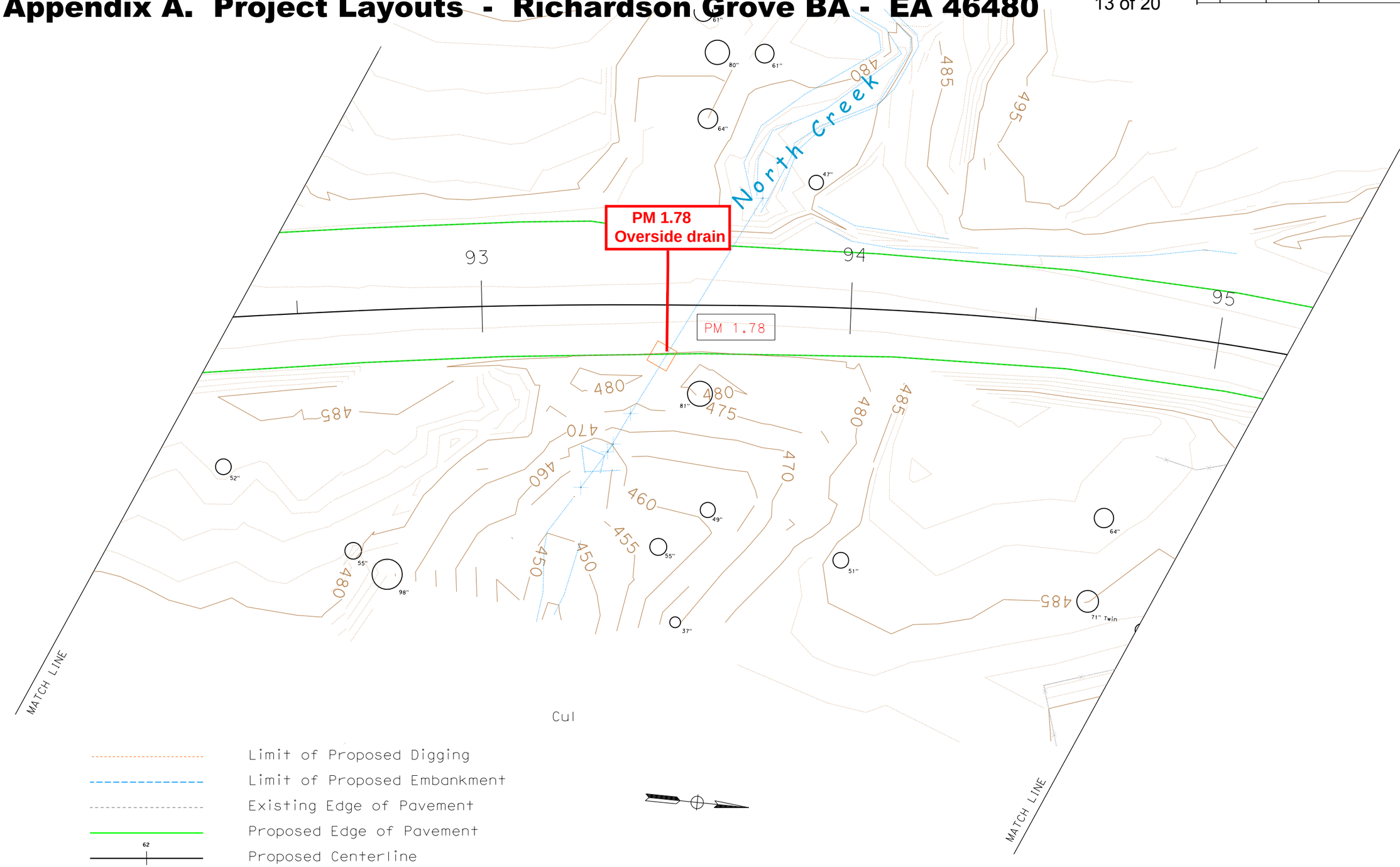
USERNAME => s122576
DGN FILE => sheet12.dgn

CU 00000

EA 01-46480

Appendix A. Project Layouts - Richardson Grove BA - EA 46480

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	HUM	101	1.10 / 2.20	13	20



Limit of Proposed Digging

Limit of Proposed Embankment

Existing Edge of Pavement

Proposed Edge of Pavement

62

Proposed Centerline

Proposed Overside Drain

1"=25'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

LAST REVISION 05/29/13

DATE PLOTTED => 17-FEB-2015
TIME PLOTTED => 15:57

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => s122576
DGN FILE => sheet13.dgn

CU 00000

EA 01-46480

Appendix A. Project Layouts - Richardson Grove BA - EA 46480

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	HUM	101	1.10 / 2.20	14	20

1"=25'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

LAST REVISION 05/29/13 | DATE PLOTTED => 17-FEB-2015 TIME PLOTTED => 15:57

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

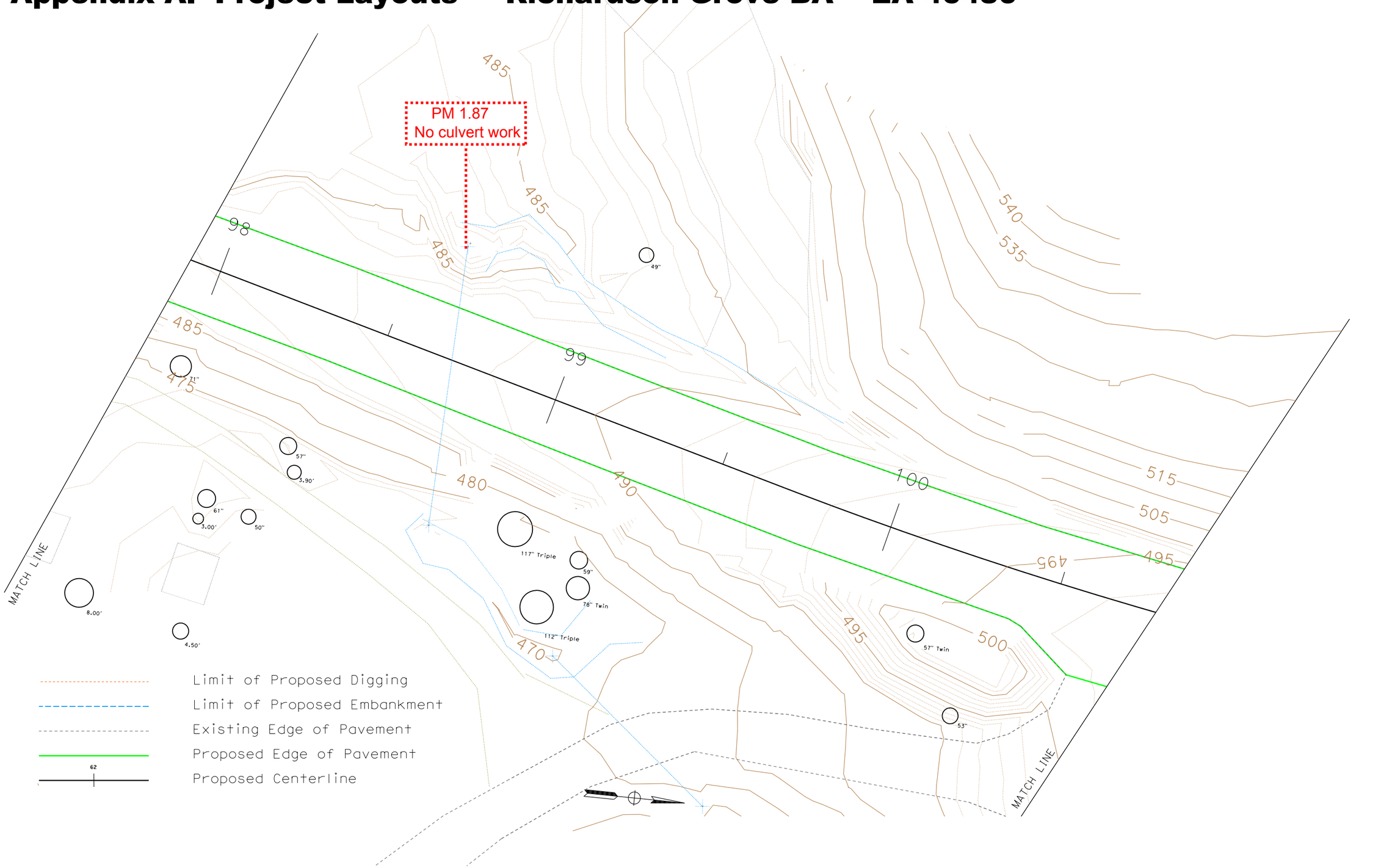
USERNAME => s122576
DGN FILE => sheet14.dgn

CU 00000

EA 01-46480

Appendix A. Project Layouts - Richardson Grove BA - EA 46480

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	HUM	101	1.10 / 2.20	15	20



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STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

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RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => s122576
DGN FILE => sheet15.dgn

CU 00000

EA 01-46480

Appendix A. Project Layouts - Richardson Grove BA - EA 46480

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
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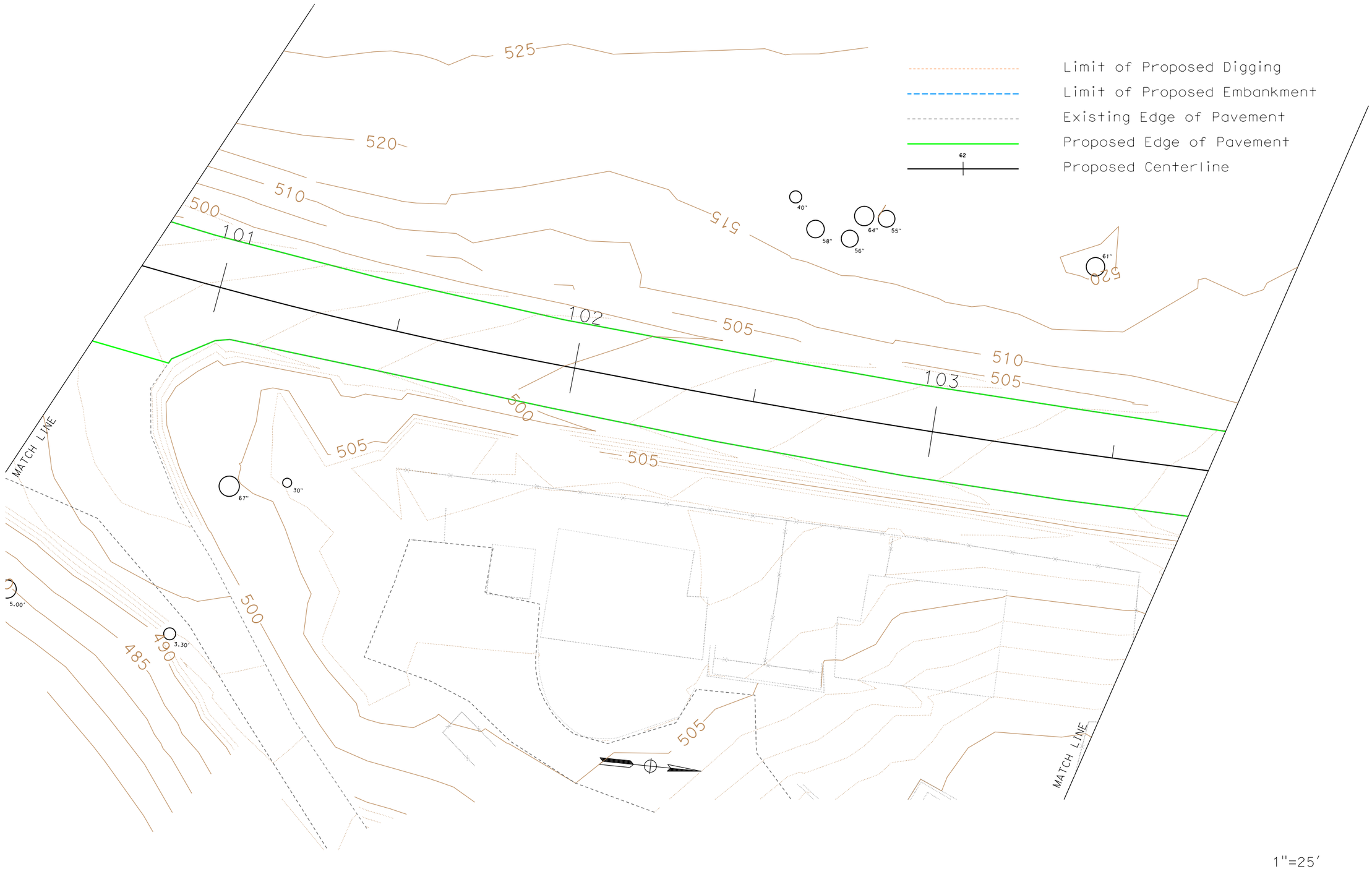

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STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

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RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

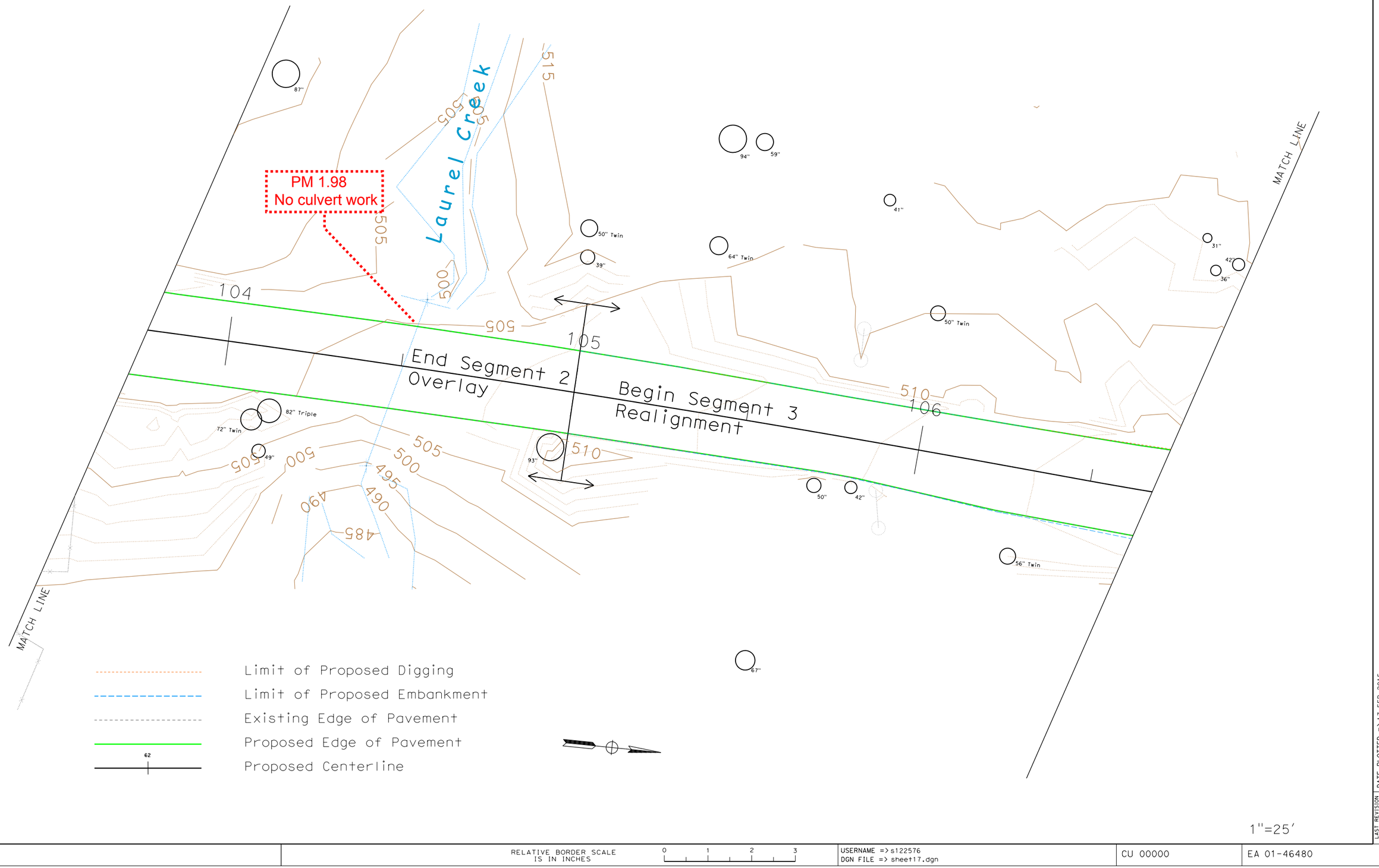
USERNAME => s122576
DGN FILE => sheet16.dgn

CU 00000

EA 01-46480

Appendix A. Project Layouts - Richardson Grove BA - EA 46480

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	HUM	101	1.10 / 2.20	17	20



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RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

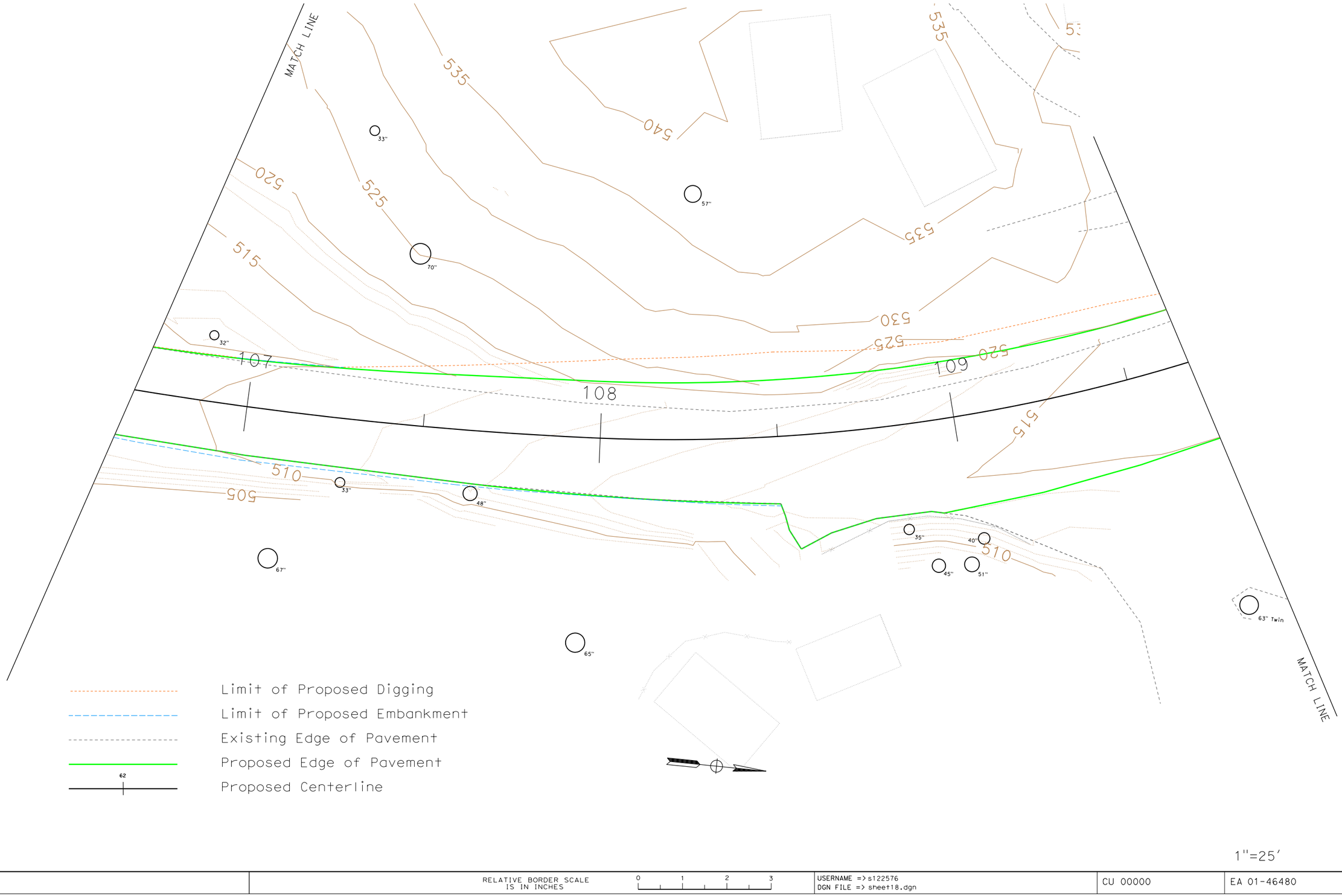
USERNAME => s122576
DGN FILE => sheet17.dgn

CU 00000

EA 01-46480

Appendix A. Project Layouts - Richardson Grove BA - EA 46480

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	HUM	101	1.10 / 2.20	18	20



STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

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RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

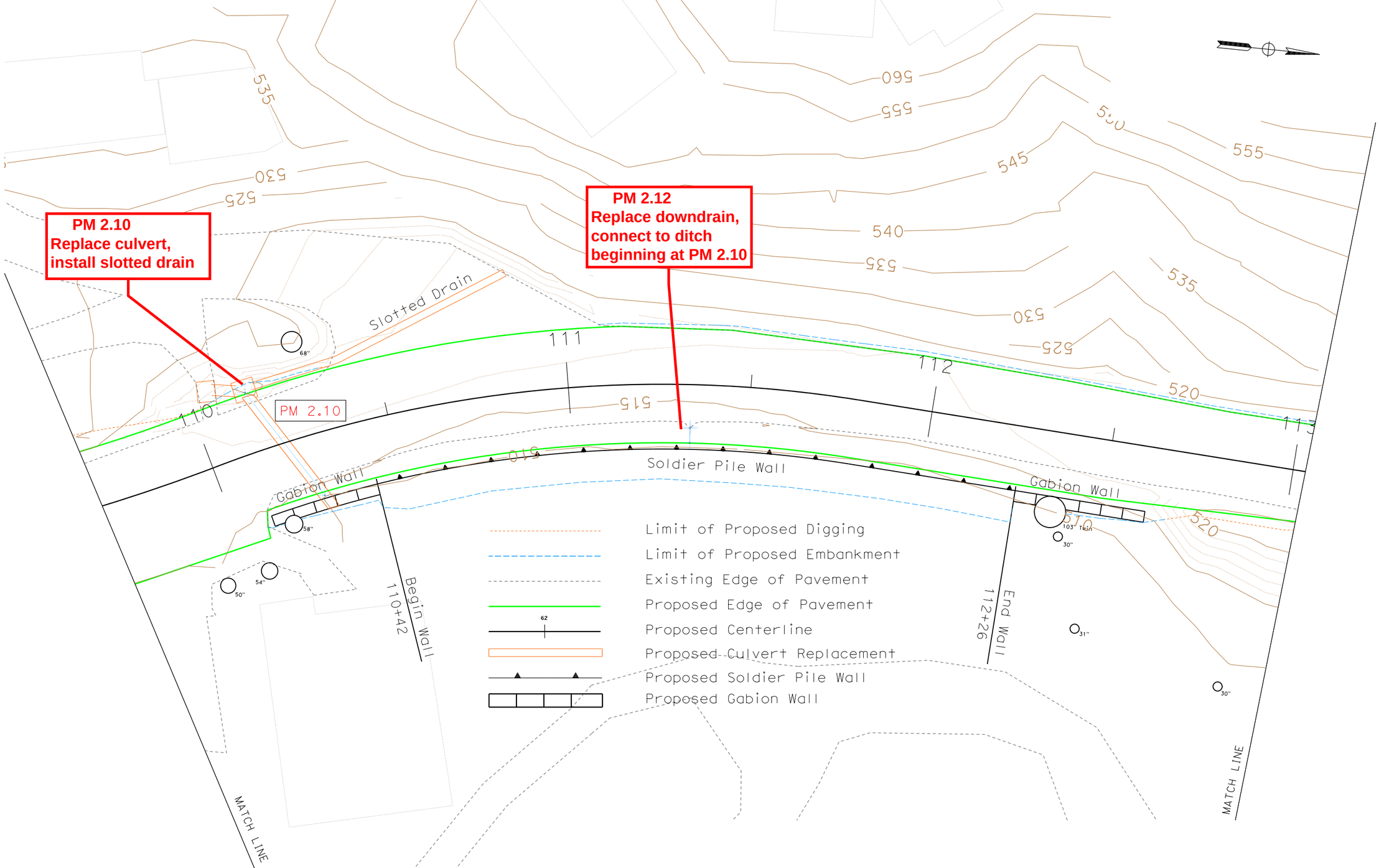
USERNAME => s122576
DGN FILE => sheet18.dgn

CU 00000

EA 01-46480

Appendix A. Project Layouts - Richardson Grove BA - EA 46480

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	HUM	101	1.10 / 2.20	19	20



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STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

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RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

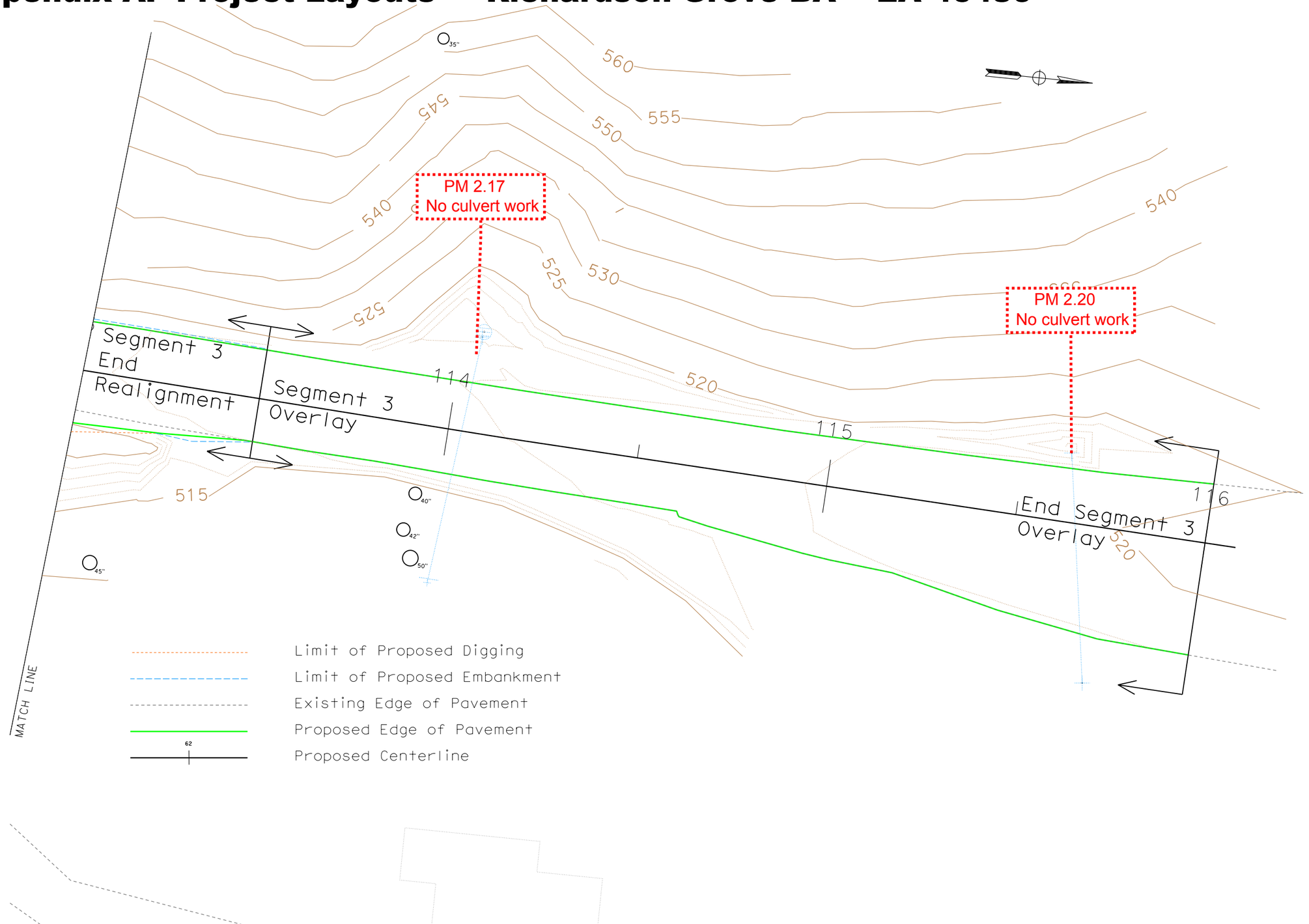
USERNAME => s122576
DGN FILE => sheet19.dgn

CU 00000

EA 01-46480

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	HUM	101	1.10 / 2.20	20	20

Appendix A. Project Layouts - Richardson Grove BA - EA 46480



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STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

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RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => s122576
DGN FILE => sheet20.dgn

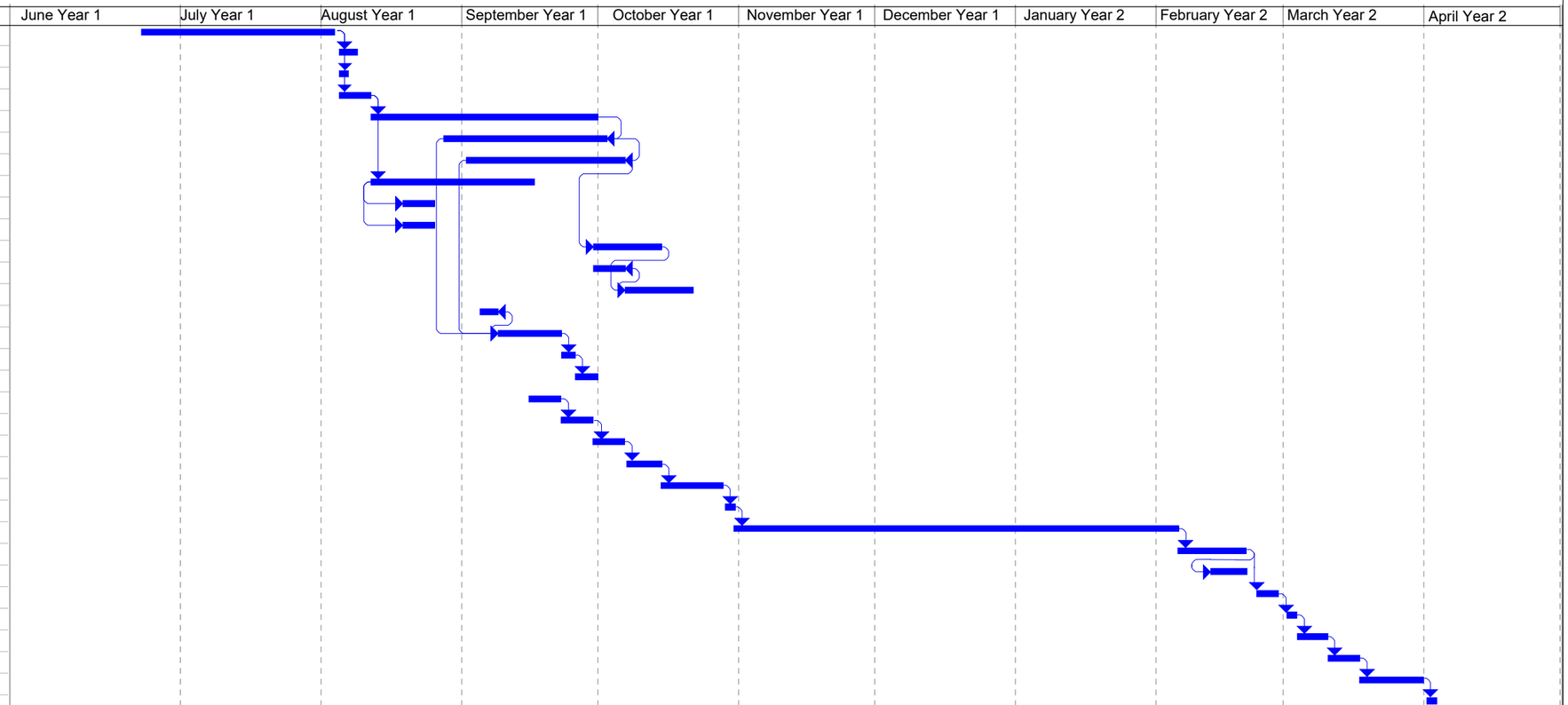
CU 00000

EA 01-46480

Appendix B. Tentative Construction Schedule, Approximately 180 Working Days.

Richardson Grove Operational Improvement Project, HUM 101 PM 1.1/2.2

ID	Task Name	Duration
1	SWPP Plan	30 days
2	Construction Area Signs	4 days
3	Delineate R/W	2 days
4	Clearing and Grubbing	5 days
5	Excavation	35 days
6	CTPB (Cement Treated Permeable Base)	25 days
7	HMA (Structural Section)	25 days
8	Drainage	25 days
9	Rock Lined Ditches & Rock Energy Dissip	5 days
10	Extend Culverts/Abandon Culverts	5 days
11	Cold Plane AC	10 days
12	Obliterate AC	5 days
13	HMA Leveling & temp striping	10 days
14	K Rail at Crash Cushions	2 days
15	RG Barrier Transitions and slabs	10 days
16	Crash Cushions	3 days
17	Signing	3 days
18	Tree Removal	5 days
19	Mechanical Excavation	5 days
20	CTPB (Cement Treated Permiable Base)	5 days
21	HMA (Structural Section)	5 days
22	Temporary Signal System w/ K-rail	10 days
23	Clearing and Grubbing at Wall	2 days
24	Soldier Pile Wall	65 days
25	Gabion Wall	10 days
26	Barrier w/ Barrier slab	5 days
27	Excavation/CTPB/HMA	5 days
28	Remove Signal System	2 days
29	Cold Plane ACE	5 days
30	HMA Leveling	5 days
31	OGAC	10 days
32	Signing / Striping	2 days



Notes:
- All work in drainages only allowed between June 1 - October 15
- Temporary Signal System only allowed from September 1 - July 1
- Tree Shrub removal limited to September 16 - January 31 (or pre-construction survey clears trees and shrubs)
- No portable lights within 100' of PM 1.49 (approx. Sta 80+50)
- Night work restricted to 20 wdays, and cannot include roadway excavation and clearing and grubbing

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
1655 Heindon Road
Arcata, California 95521-4573

Refer to NMFS No: 150208WCR2015AR00225

SEP 10 2015

Gail Popham
Associate Environmental Planner
California Department of Transportation
1556 Union Street
P.O. Box 3700
Eureka, California 95501

Dear Ms. Popham,

Thank you for your August 26, 2015, request for a species list regarding the presence of Federally threatened or endangered species, or designated critical habitat listed under the Federal Endangered Species Act of 1973, as amended (ESA), that may be within the vicinity of, or affected by, the Richardson Grove Road Realignment Project located on US Route 101 at locations between PM 1.1 and 2.2 in Humboldt County, California.

The project site is also located within an area identified as essential fish habitat (http://www.westcoast.fisheries.noaa.gov/habitat/fish_habitat/efh_consultations_go.html) for species managed under the Magnuson-Stevens Fishery Conservation and Management Act (MSA). Therefore, we are providing a species list under the ESA and the MSA:

Species listed under the ESA that may be in the action area	**Year First Listed**	**Status**	**Critical Habitat**
Coho salmon (*Oncorhynchus kisutch*): Southern Oregon/Northern California Coast evolutionarily significant unit (SONCC ESU)	1997	Threatened; 70 FR 37160, June 28, 2005	64 FR 24049, May 5, 1999
Chinook salmon (*Oncorhynchus tshawytscha*): California coastal ESU	1999	Threatened; 64 FR 50394, September 16, 1999	70 FR 52488, September 2, 2005
Steelhead (*Oncorhynchus mykiss*): Northern California Distinct Population Segment (DPS)	2000	Threatened; 71 FR 834, January 5, 2006	70 FR 52488, September 2, 2005

Species under the MSA that may have Essential Fish Habitat in the action area:
Coho salmon (*Oncorhynchus kisutch*): SONCC coho salmon ESU
Chinook salmon (*Oncorhynchus tshawytscha*): California coastal Chinook salmon ESU

Please contact Rebecca Bernard at 707-825-1622, or Rebecca.bernard@noaa.gov if you have any questions regarding this species list or require additional information.

Sincerely,

for

Lisa Van Atta
Acting Assistant Regional Administrator
California Coastal Office

cc: Steve Croteau, District 1, Caltrans

Appendix C. Species List - Richardson Grove Operational Improvement Project

East, Julie M@DOT

From: Popham, Gail P@DOT
Sent: Wednesday, June 01, 2016 6:37 AM
To: East, Julie M@DOT
Cc: Croteau, Steven T@DOT
Subject: FW: Richardson Grove Species List
Attachments: 20150910 Richardson Grove Spp list.PDF

RE: The updated RG NMFS Species list.

From: Jeffrey Jahn - NOAA Federal [mailto:jeffrey.jahn@noaa.gov]
Sent: Tuesday, May 31, 2016 5:02 PM
To: Popham, Gail P@DOT <gail.popham@dot.ca.gov>
Cc: Rebecca Bernard - NOAA Federal <rebecca.bernard@noaa.gov>
Subject: Richardson Grove Species List

Good Afternoon,
This email is in response to your call earlier today requesting a new species list for the Richardson Grove Road Realignment Project in Humboldt County, California. The species under NMFS jurisdiction has not changed since the September 2015 species list was provided to Caltrans. Therefore, the current species list is consistent with the attached September 2015 species list. Please let me know if you have any questions or need anything else on this.

From,

Jeff

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

Jeffrey Jahn
Supervisory Fish Biologist
South Coast Branch Chief

California Coastal Office / Northern California Office
NOAA Fisheries West Coast Region
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Appendix D. Threshold Concentrations of Toxicity and Baseline Contaminants in Water Samples from South Fork Eel River Watershed

Effects Threshold Concentration Criteria for Contaminants of Most Concern for Salmonids

Contaminant	FRESHWATER CRITERIA	
	ACUTE (µg/l)	CHRONIC (µg/l)
Arsenic	360	190
Cadmium	0.61	0.11
Copper	13 (2.0 above background is NMFS criteria)	9
Chromium	643.6	74.4
Lead	16.3	0.64
Mercury	3.79	0.92
Nickel	495	55
Zinc	40.0 (5.6 above background is NMFS criteria)	36.5
PAHs	Standards vary by type (see discussion in 5.1.3)	
Summarized in Nason et al. 2011 and USEPA 2006.		

Baseline Concentrations of Contaminants (Mean, Minimum, and Maximum) in Water Samples collected from Five Monitoring Locations on the South Fork Eel River

Upstream[1]	µg/l*	Near[2]	µg/l*	Downstream[3]	µg/l*	Overall	µg/l*
Arsenic Mean	0.282	Arsenic Mean	0.283	Arsenic Mean	0.542	Arsenic Mean	0.325
Arsenic Min	0.107	Arsenic Min	0.158	Arsenic Min	0.37	Arsenic Min	0.107
Arsenic Max	1.22[4]	Arsenic Max	0.397	Arsenic Max	0.75	Arsenic Max	1.22
Arsenic N	41	Arsenic N	5	Arsenic N	9	Arsenic N	55
Cadmium Mean	0.017	Cadmium Mean	0	Cadmium Mean	0.01	Cadmium	0.016
Cadmium Min	0.003	Cadmium Min	0	Cadmium Min	0.01	Cadmium Min	0.003
Cadmium Max	0.06[4]	Cadmium Max	0	Cadmium Max	0.01	Cadmium Max	0.06
Cadmium N	6	Cadmium N	0	Cadmium N	1	Cadmium N	7
Chromium Mean	0.437	Chromium Mean	0.427	Chromium Mean	0.501	Chromium	0.445
Chromium Min	0.038	Chromium Min	0.18	Chromium Min	0.27	Chromium Min	0.038
Chromium Max	5.76[4]	Chromium Max	1.1	Chromium Max	0.8	Chromium Max	5.76
Chromium N	39	Chromium N	5	Chromium N	9	Chromium N	53
Copper Mean	0.532	Copper Mean	0.521	Copper Mean	0.413	Copper Mean	0.513
Copper Min	0.07	Copper Min	0.213	Copper Min	0.27	Copper Min	0.07
Copper Max	6.79[4]	Copper Max	1.3	Copper Max	0.63	Copper Max	6.79
Copper N	45	Copper N	5	Copper N	9	Copper N	59

Appendix D. Threshold Concentrations of Toxicity and Baseline Contaminants in Water Samples from South Fork Eel River Watershed

Lead Mean	0.231	Lead Mean	0.19	Lead Mean	0	Lead Mean	0.228
Lead Min	0.008	Lead Min	0.012	Lead Min	0	Lead Min	0.008
Lead Max	2.95[4]	Lead Max	0.368	Lead Max	0	Lead Max	2.95
Lead N	23	Lead N	2	Lead N	0	Lead N	25
Mercury Mean	0.0023	Mercury Mean	0.002	Mercury Mean	0.0007	Mercury Mean	0.002
Mercury Min	0.0003	Mercury Min	0.0003	Mercury Min	0.0006	Mercury Min	0.0003
Mercury Max	0.0208[4]	Mercury Max	0.006	Mercury Max	0.0009	Mercury Max	0.020
Mercury N	43	Mercury N	5	Mercury N	9	Mercury N	57
Nickel Mean	0.786	Nickel Mean	0.750	Nickel Mean	1.414	Nickel Mean	0.900
Nickel Min	0.01	Nickel Min	0.106	Nickel Min	0.91	Nickel Min	0.01
Nickel Max	6.65[4]	Nickel Max	2.7	Nickel Max	2.16	Nickel Max	6.65
Nickel N	34	Nickel N	5	Nickel N	9	Nickel N	48
Zinc Mean	2.259	Zinc Mean	0.787	Zinc Mean	3.76	Zinc Mean	2.175
Zinc Min	0.09	Zinc Min	0.099	Zinc Min	3.76	Zinc Min	0.09
Zinc Max	43.6[4]	Zinc Max	2.14	Zinc Max	3.76	Zinc Max	43.6
Zinc N	31	Zinc N	3	Zinc N	1	Zinc N	35

Data Source: CEDEN data collected from five monitoring locations (Figure 4.1) on the South Fork Eel River, two upstream, one nearby and downstream and two farther downstream of the action area from 2002 to 2010.

N =number of samples collected and analyzed

*µg/l= micrograms per liter

[1]Upstream Stations. Elder Creek at Eel River approximately 40 miles upstream of Action Area; South Fork near Branscomb approximately 45 miles upstream of Action Area

[2]Benbow Station. Approximately 4 miles downstream of the Action Area

[3]Downstream Stations. Salmon Creek above South Fork Eel approximately 25 miles downstream of action area; South Fork Eel River below Phillipsville approximately 20 miles downstream of action area.

[4]Higher-than-average concentrations of these contaminants were found in the sample collected at the Branscomb Station at 12:00 pm on 10/13/2009 (CEDEN 2016). This was the first flush of the season for that year. Precipitation records from *Community Collaborative Rain, Hail & Snow Network* (CoCoRaHS) for that day in Mendocino County both north (Redway Station; http://www.cocorahs.org/ViewData/ViewDailyPrecipReport.aspx?DailyPrecipReportID=5d20d897-d9c5-4604-88ac-24481aa6e30d) and south (Willits Station; http://www.cocorahs.org/ViewData/ViewDailyPrecipReport.aspx?DailyPrecipReportID=a12d99b0-624a-4ba6-a2bf-c78610e99b0c) of Branscomb show 0.79 and 0.70 inches of precipitation respectively, fell before noon that day. In addition, the Branscomb water quality station is located just downstream of Harwood Products, a lumber mill that ceased operations in 2007. It is possible contaminants from the mill site may enter the river during the first-flush rain. This may explain why the concentration of contaminants was high on that day.

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December 22, 2016

File: Richardson Grove Operational Improvement Project
01-HUM-101 PM 1.2/2.2
EA 01-46480

Rebecca Bernard
NOAA Fisheries West Coast Region
California Coastal Office / Northern California Region
U.S. Department of Commerce
1655 Heindon Road
Arcata, CA 95521

RE: Errata to the Literature Cited and Supplemental Information for the Richardson Grove Operational Improvement Project Biological Assessment and Essential Fish Habitat Assessment.

Dear Ms. Bernard:

Caltrans received your December 8, 2016 and December 13, 2016, email requests for additional information and reconciliation of statements made in the Richardson Grove Operational Improvement Project Biological Assessment and Essential Fish Habitat Assessment (BA). In response to those requests, Caltrans has corrected errors identified in the literature cited (Chapter 8) of the BA and prepared a new literature cited, included herein as Attachment 1. Changes made to Chapter 8 that affect preceding chapters of the BA are identified in bulleted format on page 7 of Attachment 1. Responses to comments from the December 13th information request are provided in Attachment 2.

Please inform Caltrans at your earliest convenience should you have additional questions or require further clarification.

Sincerely,

Stephanie Frederickson
Associate Environmental Planner, N.S.

c: Jeffrey Jahn, Steve Croteau, Julie East

Attachment 1

Literature Cited Errata

Richardson Grove Operational Improvement Project

Biological Assessment and Essential Fish Habitat Assessment

Chapter 8. Literature Cited

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PERSONAL COMMUNICATIONS

Monday, Scott. CDFW Environmental Scientist, 2016, emails, in-person conversations, and phone conversations.

Renger, Allan. CDFW Senior Environmental Scientist, 2016, emails and phone conversations.

Changes made to the literature cited (Chapter 8) affect the following sections of the BA:

- Personal communications between Caltrans and NMFS are part of the consultation history and therefore have been deleted from Chapter 8. The last sentence of the first paragraph in Chapter 2 (page 4) should read *"From January 11, 2016, to February 2, 2016, Caltrans was in contact with NMFS (Diane Ashton, Rebecca Bernard, and Clarence Hostler) for clarification of EFH effects conclusion."* The sixth sentence of paragraph two in Chapter 2 (page 4) should read *"On May 31, 2016, Caltrans contacted NMFS (Jeff Jahn, by phone) regarding the September 2015 species list and received NMFS confirmation that it was still accurate."* This sentence is followed by *"On July 13, 2016, NMFS (Jeff Jahn, by phone) requested and Caltrans (Steve Croteau, by phone) granted an additional week for review of the BA."* The remainder of the paragraph remains as written.
- The "(USFWS 2006)" citation has been removed from Section 3.2, page 6, last sentence/bulleted item. The description of the South Fork Eel River portion of the action area has been revised as provided in Attachment 2, Response to NMFS Comments.
- Section 4.1.3, page 41, first and last sentence of first paragraph: replace "(SWRCB 2015)" citation with "(SWRCB 2012)". The full SWRCB 2012 citation has been added to the literature cited.
- "CEDEN 2008", referenced in Appendix D, has been added to the literature cited. This citation also refers to "CEDEN" referenced in the first paragraph on page 42 of section 4.1.3 of the BA.
- Section 5.3, page 57, first sentence of fourth paragraph: replace "(Caltrans 2006)" citation with "(Caltrans 2015)", which refers to the Water Quality Assessment Report for the proposed project. The full (Caltrans 2015) citation has been added to the literature cited.
- Section 5.3, page 59, second sentence of third paragraph: replace "(Washington 2016)" with "(WDOE 2016)". The citation has been updated in the literature cited.
- Section 5.3, page 60, last sentence of paragraph one: the citation for "(K. Tucker, personal communication, May 2016) has been changed to "(Caltrans 2016c)", as reflected in the new literature cited.
- The citation for "Caltrans 2016" has been changed to "Caltrans 2016a" to allow for the addition of the Project Drainage Impact Memorandum prepared by Project Engineer Eric Lund, which is cited as "Caltrans 2016b". The STAA Truck Map Legend on page 11 of the BA should be cited as "(Caltrans 2016a)". The Project Drainage Impact Memorandum (Caltrans 2016b) is now cited in section 5.4 of BA on page 61, fourth paragraph and has been added to the literature cited.

Attachment 2

Response to NMFS December 13, 2016, Comments

Richardson Grove Operational Improvement Project

Biological Assessment and Essential Fish Habitat Assessment

NMFS comments on Caltrans October 2016 Biological Assessment and Essential Fish Habitat Assessment addressing the Richardson Grove Operational Improvement Project (EA 01-46480).

❖ ***Denotes Caltrans response to comment***

- Page iii—Please consider removing the last sentence in the second paragraph that reads: "Impacts from these elements would result in minor, short-term, and/or localized changes to the environmental baseline conditions of designated critical habitat" since "minor" and "localized" are not presented in the description of the effects of the action.

  ❖ *The last sentence of the second paragraph on page iii should read:*

  "Impacts from these elements would result in insignificant or discountable effects to designated critical habitat".

- Page 6—Align the description of the action area–area to be affected–with the description of effects of the action. Please reconcile statements made in the third bullet statement with the sub-bullet statement. The BA cites USFWS (2006) which fails to include the document reference to 600 feet in the Literature Cited section. Please reconcile the citation.

  ❖ *Please remove the USFWS 2006 citation and replace the definition of the action areas as follows:*

  1. *The US 101 corridor in Humboldt County from PM 1.1 to PM 2.2*
  2. *The potential staging areas at PM 2.2 in Humboldt County and US 101 in Mendocino County, PM 106.5.*
  3. *Associated tributaries (Durphy Creek [PM 1.61], North Creek [PM 1.78], Laurel Creek [PM 1.98], and nine unnamed tributaries [PM 1.14, PM 1.18, PM 1.34, PM 1.35, PM 1.63, PM 1.87, PM 2.10, PM 2.12, and PM 2.20]) from the west side of US 101 to their confluences with the South Fork Eel River and associated areas of riparian vegetation (Table 3.1).*
  4. *Any portion of the South Fork Eel River that could receive sediment input through stormwater runoff originating from the project area. This may include the South Fork Eel River from its confluence with outflow from the most southerly culvert at PM 1.18 to a point downstream from the most northerly culvert confluence at PM 2.20 where sediment could remain suspended in the water column depending on river conditions.*
  5. *Two culverts (PM 1.28 and PM 2.17) that drain into vegetated uplands (Table 3.1).*

- Page 49—We suggest removing the word "negative" from two places in the first bullet at the end of the page. The action agency looks at effects—both positive and negative.

  - ❖ *Please strike both uses of the word "negative" from the aforementioned bulleted sentence on page 49 of the BA.*

- Page 50—Please clarify throughout the Effects of the Action section, the specific location of effects that are anticipated (e.g., South Fork Eel River, Durphy Creek, unnamed tributary). This ambiguity is most apparent in the last paragraph of the page where the text could be clearer to indicate the critical habitat in reference is both Durphy Creek (for 2 of the referenced listed species, not CC Chinook) and South Fork Eel River (for all 3 referenced listed species), not the culvert locations at PM 1.34 and PM 1.35 as implied, and that the "*removal of herbaceous vegetation would not produce any meaningfully measured impact to salmonids or their critical habitat…*" statement refers to downstream effects to the South Fork Eel River.

  - ❖ *Throughout Chapter 5, the effects to designated critical habitat within the action area for coho salmon and steelhead refer to both Durphy Creek and the South Fork Eel River. Effects to designated critical habitat for Chinook salmon refers only to the segment of the South Fork Eel River within the action area.*

- Page 51 and 52—subsection headers Steelhead, Coho and Chinook. Again it is unclear which critical habitat and which locations are subject to the effects described. Please consider clarifying if the described effects are anticipated to occur within the South Fork Eel River.

  - ❖ *Table 2.1 in the BA identifies the designated critical habitat of listed species in fish-bearing watercourses within the action area.*
  - ❖ *Insignificant impacts to designated critical habitat described on page 51 for steelhead and coho salmon refers to 1) effects to designated critical habitat at Durphy Creek resulting from removal of riparian vegetation at Durphy Creek, and 2) effects to designated critical habitat of the South Fork Eel River stemming from proposed vegetation removal at Durphy Creek.*
  - ❖ *Durphy Creek is not designated critical habitat for Chinook salmon. Insignificant impacts to designated critical habitat described on page 52 for Chinook salmon refers to potential effects to designated critical habitat of the South Fork Eel River stemming from proposed vegetation removal at Durphy Creek.*

- Page 52—Please rectify the statement of "Durphy Creek is not designated as critical habitat for Chinook salmon" with the affects described at the end of the second paragraph. If the affects determination applies to South Fork Eel River please consider adding that critical habitat designation waterway.

  ❖ *Clarified in previous comment and in Table 2.1 of the BA. Insignificant impacts to designated critical habitat described on page 52 for Chinook salmon refers to potential effects to designated critical habitat of the South Fork Eel River stemming from proposed vegetation removal at Durphy Creek.*

- Pages 52—61 Please clarify the effects analysis for Water Quality Impacts in each subheader section, included the South Fork Eel River, just Durphy Creek, or just South Fork Eel River, and if just Durphy Creek is analyzed rectify the globally referenced, "designated critical habitat", does not include CC Chinook, as Durphy Creek is not designated critical habitat.

  ❖ *The analysis of effects to individual listed salmonids due to water quality pertain to both Durphy Creek and the South Fork Eel River. Impacts identified to designated critical habitat throughout the water quality analysis refers to critical habitat for coho salmon and steelhead in Durphy Creek and critical habitat for coho salmon, steelhead and Chinook salmon in South Fork Eel River, as identified in Table 2.1 of the BA.*

- Page 56-57—The use of "highly unlikely" in the last paragraph on page 56 is later characterized as "extremely low likelihood" on page 57. These are two different terms with different levels of potential effects—please reconcile. Consider omitting "negative" from the second paragraph. Also, clarify the reason the conclusion statement is made for "all life stages" when only earlier statements indicate that only the "juvenile" life stage may be affected – please reconcile.

  ❖ *In the second sentence of the last paragraph on page 56, please change "highly unlikely" to "extremely unlikely".*

  ❖ *Please strike the word "negative" from the second paragraph on page 58 and note that impacts to juvenile life stages and designated critical habitat for the listed salmonids are discountable. There would be no affect to other life stages of the listed salmonids due to the timing of construction.*

- Page 58—The entire paragraph that starts mid-page after the bullets has multiple issues. Please consider the use of "fish-bearing" in paragraph referenced, where the Washington State Department of Natural Resources, Forest Practices Water Typing, Water Type Classifications, describes "fish streams may or may not have flowing water all year; they may be perennial or seasonal" (http://www.dnr.wa.gov/forest-practices-water-typing).

Consider describing "direct inputs", or rephrase, in the first sentence of the paragraph referenced on page 58. This statement is a bit problematic when the last sentence on page 56 states, "…*Caltrans expects that it is highly unlikely that any turbid water would enter fish-bearing waters in the South Fork Eel River.*"

- *Substitute the following paragraphs for the final four paragraphs of this section:*

  "Work at the Durphy Creek crossing is immediately adjacent to the creek. If Durphy Creek were inhabited by steelhead and/or coho salmon at the start of the rainy season, a pulse of turbid water at the maximum expected duration and intensity could be harmful to the fish because of likely elevated water temperatures at that time of year. The combination of high temperatures and turbidity could create a synergistic effect with a greater potential to harm listed salmonids than would a minor turbidity pulse in cooler water. However, Durphy Creek in the action area is expected to be dry well before rains begin in the fall (S. Monday, personal communication, September 2016). Therefore, no fish are expected to be exposed during the time when they would be vulnerable to a minor pulse of turbid water. Additionally, the Durphy Creek crossing is approximately 500 feet from the mainstem South Fork Eel, so significant settling of sediment is expected before any project related sediment would enter waters potentially occupied by listed salmonids. Therefore, given the expected effectiveness of sediment control BMPs; the lack of exposure to listed salmonids when they would be sensitive to the expected intensity and duration of a sediment pulse in Durphy Creek; and the significant settling of sediment before waters would reach potentially occupied habitat, sediment impacts to listed salmonids related to disturbed soil at Durphy Creek are expected to be insignificant.

  Other locations with soil disturbed by the proposed action are between 200 and 500 feet of the South Fork Eel River, and these locations drain to non-fish-bearing seasonal channels and ditches. The distances to potentially occupied habitat will likely allow some settling of sediment before discharge to the habitat. This settling, combined with the expected effectiveness of BMPs, is expected to prevent listed salmonids being exposed to harmful levels of turbidity. Additionally, due to the expected effectiveness of BMPs, distances between disturbance locations, and filtering and settling of runoff, no turbid water from any one site is expected to combine with turbid water discharged at another location to create a duration or intensity of turbidity that would harm listed salmonids. Therefore, potential impacts to listed salmonids are expected to be insignificant.

  Impacts to designated critical habitat for coho salmon and steelhead in Durphy Creek, and for all three species in the South Fork Eel River, are also expected to be insignificant in the short term for the reasons described above. Longer term impacts to designated critical habitat for all three species are expected to be insignificant as well because the potential quantity of sediment would not impact substrate or water quality in such a way to reduce the value of spawning, rearing, or migratory corridor habitat."

- Page 59—last sentence in the second paragraph; consider striking "negative" and further consider striking the last portion of the last sentence; "…and would be insignificant if they were exposed."

  ❖ *This comment is addressed by proposed replacement language for section 5.3 on page 58 (i.e. previous response to comment).*

- Page 62—end on the third paragraph on the page. Consider rewriting the following statement to make a logical argument: "Therefore, visual disturbance due to worker and equipment is not expected to exceed baseline levels of visual disturbance". Anticipated visual disturbance due to workers and equipment are added to the environmental baseline, therefore, do exceed baseline levels.

  ❖ *Please replace the last sentence of the third paragraph on page 62 with the following:*

  "Listed salmonids could experience visual disturbance due to the presence of workers and equipment at the Durphy Creek location if the creek is flowing and fish are present. It is unknown at this time whether the trail system that parallels US 101and crosses Durphy Creek at this location will be open or closed to the public. If the trail is open, then visual disturbance by hikers on the trail below the roadway would be expected to affect fish as much or more than the workers and equipment operating on the road. If the trail is closed, workers and equipment operating on the roadway would likely create no more visual disturbance than hikers on the trail would under the baseline condition. Therefore, additional impacts above the baseline condition are extremely unlikely and discountable."

  ❖ *Further, replace the second paragraph on page 63 (last paragraph of section 5.5, Noise and Visual Disturbance) with the following:*

  "Therefore, Caltrans concludes that negative impacts to listed salmonids of any life stage and primary constituent elements of their designated critical habitat (rearing and migration) due to disturbance from construction activity and night work would be discountable."

  ❖ *Please add the following description of the Durphy Creek Trail system to the end of the second paragraph on page 38 of section 4.4.1 of the BA:*

  "This trail system crosses, parallels and allows access to Durphy Creek, which is designated critical habitat for coho salmon and steelhead. The presence of hikers at this location may create visual disturbances to juvenile listed salmonids, and people entering the creek may create minor impacts to fish and habitat."

- Page 63—Beginning of the first paragraph under the Simultaneous Construction Impacts section 5.6,"*The Durphy Creek MBGR/crash cushion site is the only location where multiple potential construction related stressors may be expected to occur simultaneously."* Please verify if Durphy Creek is the only location where multiple potential construction related stressors may be expected to occur simultaneously—sediment or turbidity could come from multiple sources.

  - ❖ *There is potential for sediment and turbidity to be generated from multiple sources simultaneously, as in the case of simultaneous culvert work. However, with the BMPs proposed, sediment produced from individual sources are extremely unlikely to reach fish-bearing watercourses. The potential combined effect of simultaneous culvert work on listed salmonids is therefore considered discountable.*

- Page 64—Strike the last sentence in the first paragraph on the page. There's no need to make a statement regarding whether ESA section 7 require a cumulative effects analysis for informal consultation.

  - ❖ *Please remove section 5.7 from the BA given there is no need to make a statement regarding cumulative effects for informal consultation.*

- EFH conclusion (page 69)—strike "negligible" from the sentence leading to the bullets—not necessary to make that conclusion, in fact, can strike the bullets as well. There's no need to restate some or all of the possible adverse effects to EFH within the "EFH Conclusion" section. Section 7.5 of the EFHA already captures the possible adverse effects, primarily by directing the reader to Chapter 5 of the ESA B

  - ❖ *Please remove all text and bullets after the first paragraph in section 7.7.*

- During telephone conversations on December 21 and 22, 2016, NMFS (Rebecca Bernard) asked the project biologist (Stephanie Frederickson) if a sealant would be used on the roadway for paving operations.

  - ❖ The project biologists conferred with the Caltrans Materials Lab to verify that sealant is not used on the open type HMA overlay that is proposed for the project.