CALIFORNIA COASTAL COMMISSION
NORTH COAST DISTRICT OFFICE
1385 EIGHTH STREET, SUITE 130
ARCATA, CA 95521
VOICE (707) 826-8950
FAX (707) 826-8960

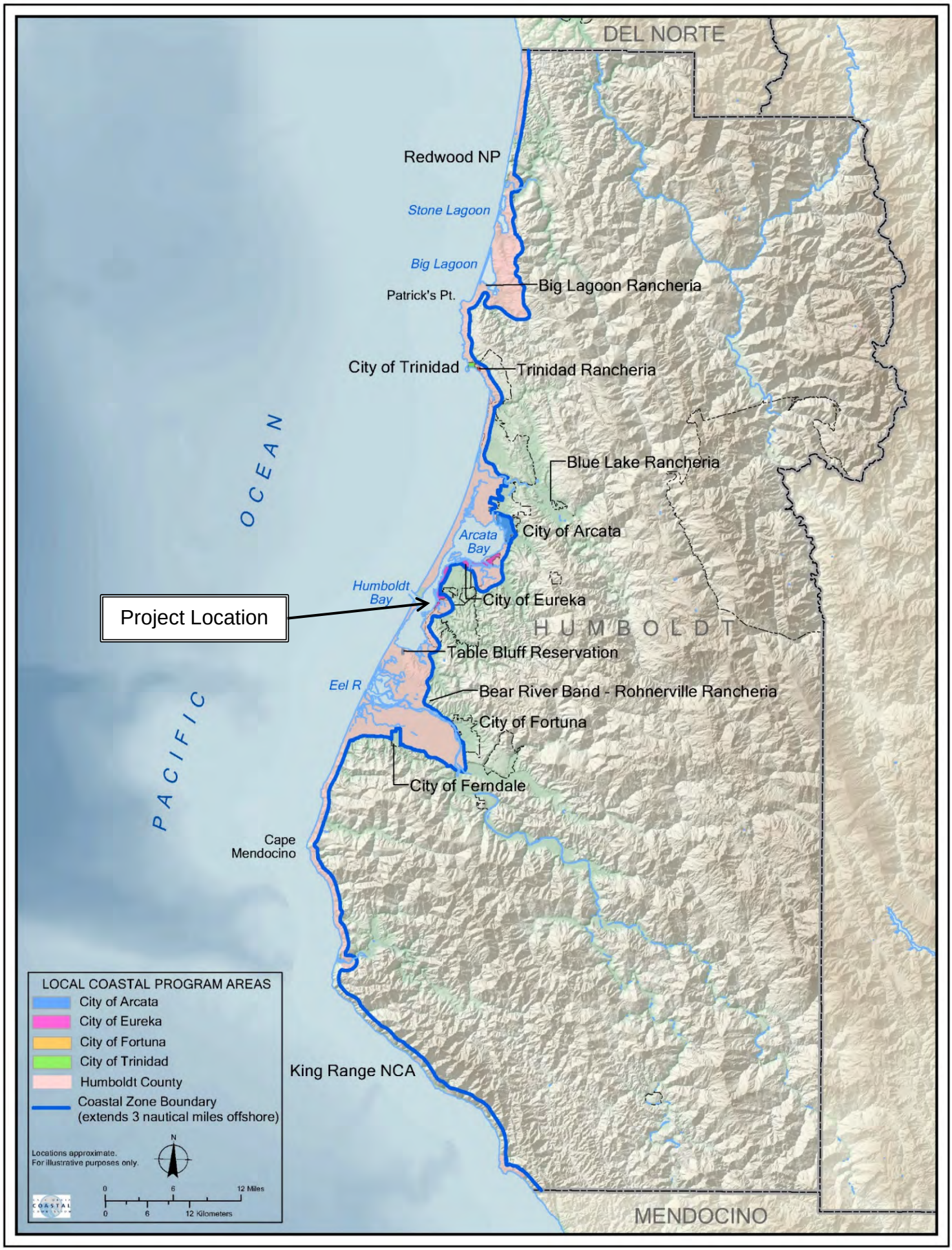
F8a

1-19-0356
(COUNTY OF HUMBOLDT)

APRIL 16, 2021

EXHIBITS

Regional Location Map



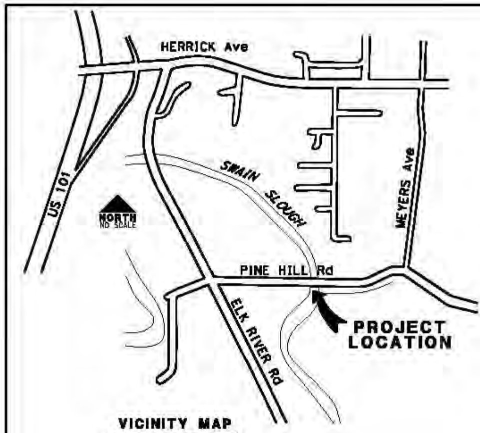
Project Vicinity


City of Eureka
Rosewood
Pine Hill
Bayview
Bucksport
Fairhaven
North Spit
Eureka Municipal Airport
Eureka Municipal Golf Course
Elk River Corners
Sunset Memorial Park
Oceanview Cem
North Bay Channel
Humboldt Bay
Hookton Channel
Entrance Channel
Bar Channel
Elk River
Bridge Replacement Site
N
SCALE 1:24 000
KILOMETERS
METERS
Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)

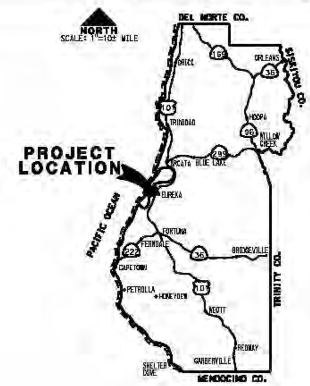
COUNTY OF HUMBOLDT DEPARTMENT OF PUBLIC WORKS		SHEET 1 OF 28
PINE HILL ROAD BRIDGE OVER SWAIN SLOUGH		
COVER SHEET, SHEET INDEX AND DETAILS		

COUNTY OF HUMBOLDT
DEPARTMENT OF PUBLIC WORKS

PROJECT PLANS FOR CONSTRUCTION OF
PINE HILL ROAD
OVER SWAIN SLOUGH BRIDGE No. 04C0260
FEDERAL PROJECT NO. BRLO-5904[112]



VICINITY MAP
NOT TO SCALE



LOCATION MAP
SCALE: 1"=10± MILE

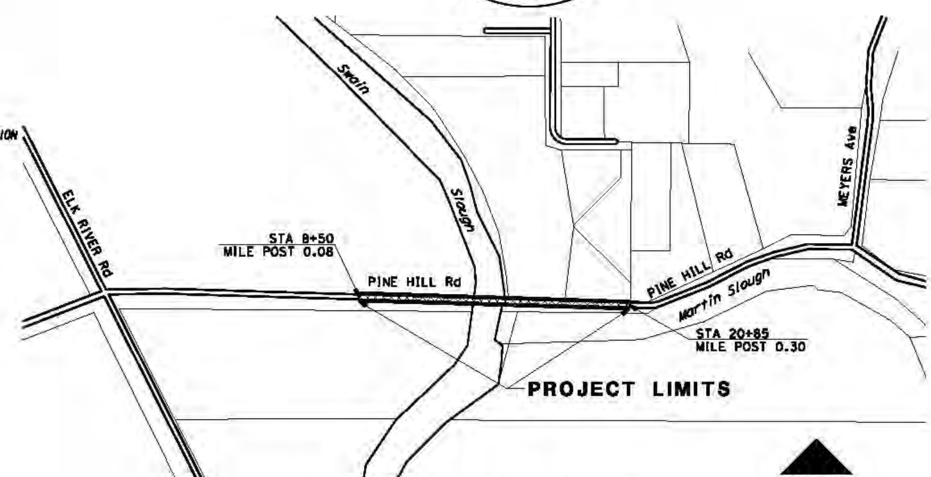
APPLICABLE STANDARD PLANS

CALTRANS STANDARD PLANS DATED 2018.
(SEE SPECIAL PROVISIONS STANDARD PLAN LIST)

NOTES

THE CONTRACTOR SHALL HAVE A CLASS "A" LICENSE FOR THIS PROJECT.

INDEX OF SHEETS



VICINITY MAP

BASIS OF BEARINGS

CCS83 EPOCH 2007.00 BASED ON CONTROL BY BRIAN SOUSA, PLS FOR LIDAR SURVEY (PT NOS. 1510 & 1512)

CONVERGENCE ANGLE 01°25'43"
COMBINATION FACTOR 0.999900144

BASIS OF ELEVATION

NAVD88 BASED ON SAME SOUSA SURVEY (WHICH WAS VIA STATIC GPS TIES TO NGS CONTROL AT MURRAY FIELD)

RECOMMENDED

12/3/2019
DATE

REGISTERED PROFESSIONAL ENGINEER — JAMES L. FOSTER No. 45695 Exp. 12/31/20 CIVIL — STATE OF CALIFORNIA

APPROVED

HUMBOLDT COUNTY DATE

REGISTERED PROFESSIONAL ENGINEER — TONY R. SEGHETTI No. 63714 Exp. 9/30/20 CIVIL — STATE OF CALIFORNIA

ORIGINAL LOW BID PRICE	CONSTRUCTED BY	RESIDENT ENGINEER
	PROJECT COMPLETED / /	CONSTRUCTION COST $

NOTES:

1. DIMENSIONS OF THE PAVEMENT STRUCTURES (STRUCTURAL SECTIONS) ARE SUBJECT TO TOLERANCES SPECIFIED IN THE STANDARD SPECIFICATIONS.
2. CLASS 2 AGGREGATE BASE EXTENDED AT SAME DEPTH UNDER APPROACH SLAB.
3. FOR DITCH FLOW ELEVATIONS, SEE DRAINAGE DETAILS

COUNTY OF HUMBOLDT
DEPARTMENT OF PUBLIC WORKS

PINE HILL ROAD BRIDGE OVER SWAIN SLOUGH

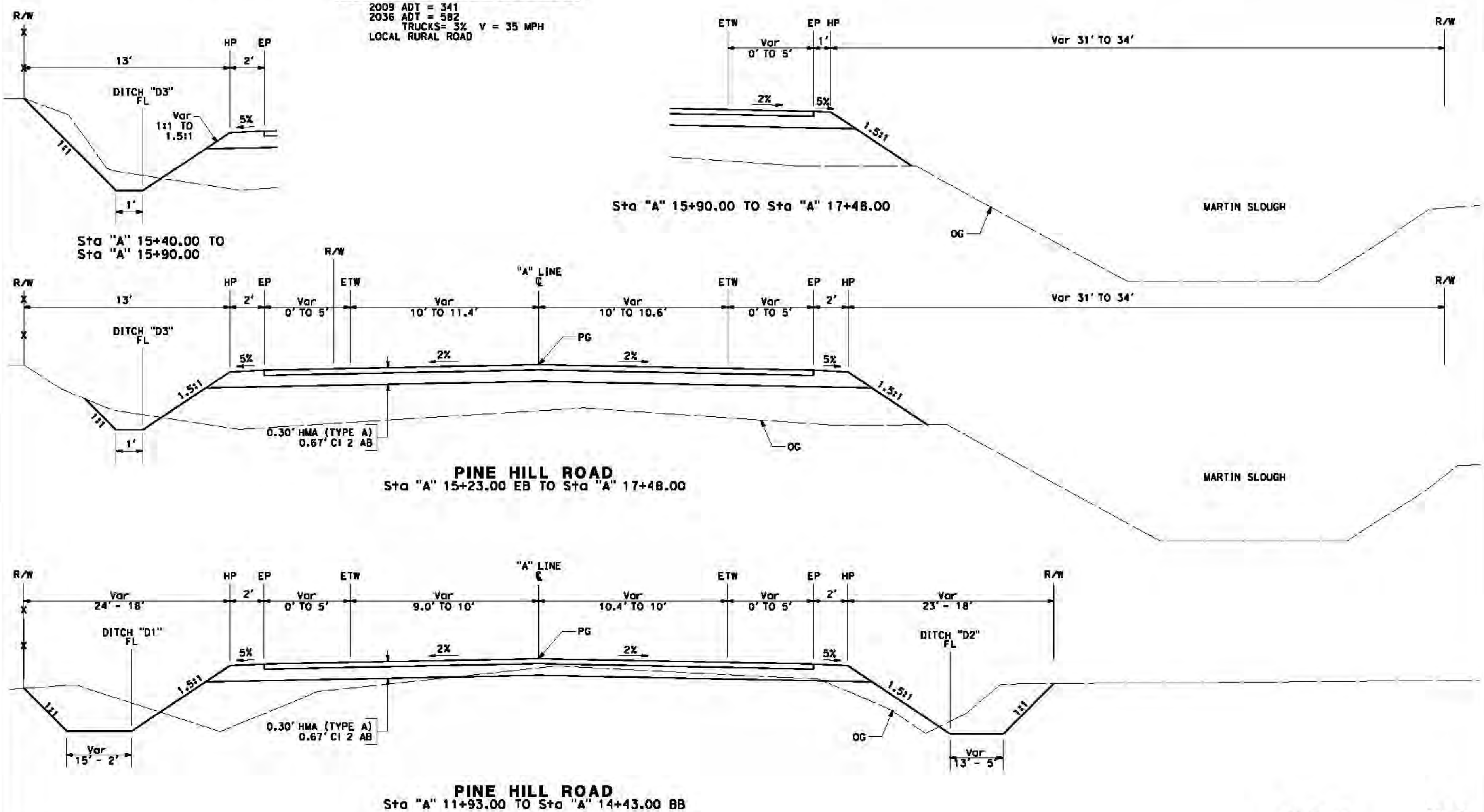
TYPICAL CROSS SECTIONS

SHEET 2 OF 28

QUINCY ENGINEERING

DESIGN DESIGNATION (COUNTY ROAD)

2009 ADT = 341
2036 ADT = 582
TRUCKS= 3% V = 35 MPH
LOCAL RURAL ROAD



NO SCALE

X-1

COUNTY OF HUMBOLDT
DEPARTMENT OF PUBLIC WORKS

PINE HILL ROAD BRIDGE OVER SWAIN SLOUGH

LAYOUT

SHEET 3 OF 28

QUINCY ENGINEERING

NOTES:

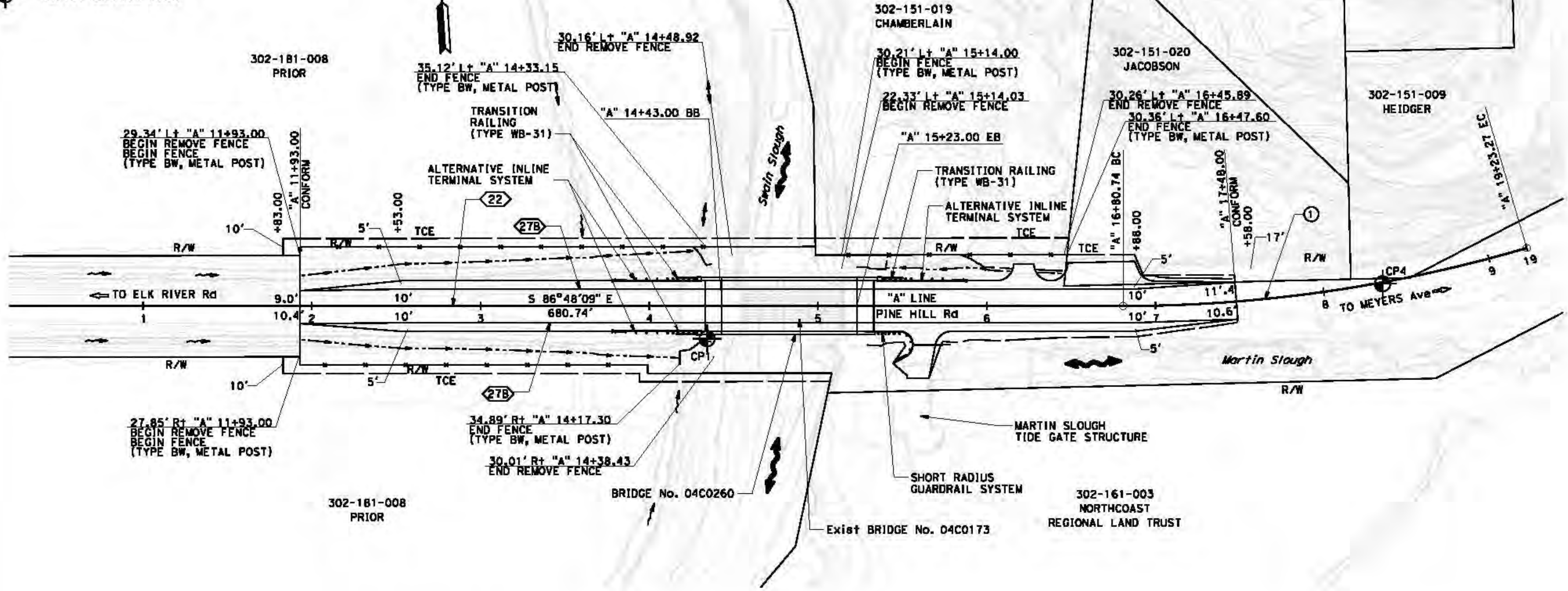
1. FOR COMPLETE RIGHT OF WAY AND ACCURATE ACCESS DATA, SEE RIGHT OF WAY RECORD MAPS AT THE COUNTY OFFICE.
2. PINE HILL ROAD TO MYERS (MEYERS) AVE - 60' WIDE PER 62 DEEDS 372 UNABLE TO LOCATE POINT OF BEGINNING-HELD EXISTING ROAD AS BEST EVIDENCE OF DEEDED R/W.
3. ALSO 60' WIDE PER BOOK 6 OF MAPS PAGE 40 (PT NOS. 417, 418, 421 & 422) NOTE THIS DOES NOT FIT EXISTING ROAD VERY WELL.
4. IMPLIED COMMON LAW DEDICATION FOR OTHER AREAS FALLING WITHIN MAINTAINED ROAD VIA LONG TERM PUBLIC USE AND MAINTENANCE BY THE COUNTY.
5. TRAFFIC STRIPES SHALL BE 4" WIDE, MODIFIED FROM CALTRANS STANDARD PLANS A20A AND A20B.

LEGEND:

- DIRECTION OF TRAFFIC
- CURVE DATA NUMBER
- PAVEMENT DELINEATION DETAIL
- DIRECTION OF DITCH FLOW
- SURVEY CONTROL POINT

CURVE DATA

No.	R	Δ	T	L
1	850.00'	16° 20' 53"	122.09'	242.53'



SURVEY CONTROL DATA

No.	NORTHING	EASTING	ELEV	LINE	STATION	OFFSET	DESCRIPTION
CP1	2164937.002	5957031.194	10.172	"A"	14+34.23	19.36' Rt	SET80DSPIKE
CP2	2165008.312	5956085.236	9.142	"A"			BRASSCAPHUMCORE19203
CP4	2164947.122	5957432.660	9.366	"A"	18+35.19	0.88' Rt	SETMAGNAIL&DPWTAG
CP5	2165073.438	5957926.179	8.956	"A"			FD1510

SCALE: 1"=30'

L-1

NOTES:

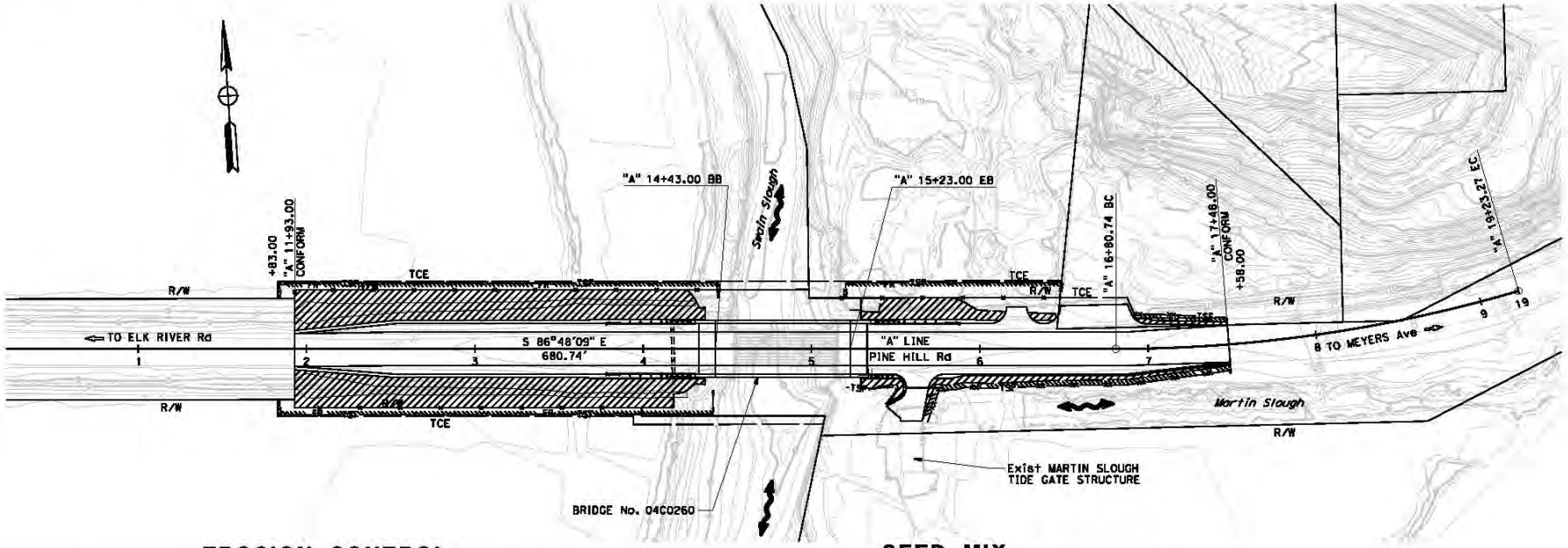
1. FOR COMPLETE RIGHT OF WAY AND ACCURATE ACCESS DATA, SEE RIGHT OF WAY RECORD MAPS AT THE COUNTY OFFICE.
2. LOCATION OF FIBER ROLLS ARE SCHEMATIC. ACTUAL PLACEMENT LOCATIONS OF FIBER ROLLS SHALL BE IN ACCORDANCE WITH THE SPECIAL PROVISIONS.

LEGEND:

EROSION CONTROL

FR FIBER ROLL

TSF TEMPORARY HIGH-VISIBILITY FENCE



EROSION CONTROL

SEQUENCE	ITEM	MATERIAL		APPLICATION RATE	REMARKS
		DESCRIPTION	TYPE		
STEP 1	HYDROSEED	SEED	MIX	28 LB/ACRE	
		FIBER	WOOD	1000 LB/ACRE	
STEP 2	ROLLED EROSION CONTROL PRODUCT (BLANKET)	BLANKET	TYPE A		
STEP 3	FIBER ROLLS	FIBER ROLL	8 TO 10 INCHES IN Dia		TYPE 2 INSTALATION

SEED MIX

BOTANICAL NAME (COMMON NAME)	POUNDS PURE LIVE SEED PER ACRE (SLOPE MEASUREMENT)
WESTERN YARROW (ACHILLEA MILLEFOLIUM)	1
SAN DIEGO BENTGRASS (AGROSTIS PALLENS)	1
CLUSTERED FIELD SEDGE (CAREX PRAEGRACILIS)	5
SLENDER HAIRGRASS (DESCHAMPSIA ELONGATA)	1
BARLEY (HORDEUM BRACHYANTHERUM)	20
TOAD RUSH (JUNCUS BUFONIUS)	0

SCALE: 1"=30'

EC-1

QUINCY ENGINEERING

COUNTY OF HUMBOLDT
DEPARTMENT OF PUBLIC WORKS

PINE HILL ROAD BRIDGE OVER SWAIN SLOUGH

EROSION CONTROL PLAN

SHEET 6 OF 28

NOTES:

1. FOR COMPLETE RIGHT OF WAY AND ACCURATE ACCESS DATA, SEE RIGHT OF WAY RECORD MAPS AT THE COUNTY OFFICE.
2. FOR STEEL SHEET PILING, SEE BRIDGE PLANS.

LEGEND:

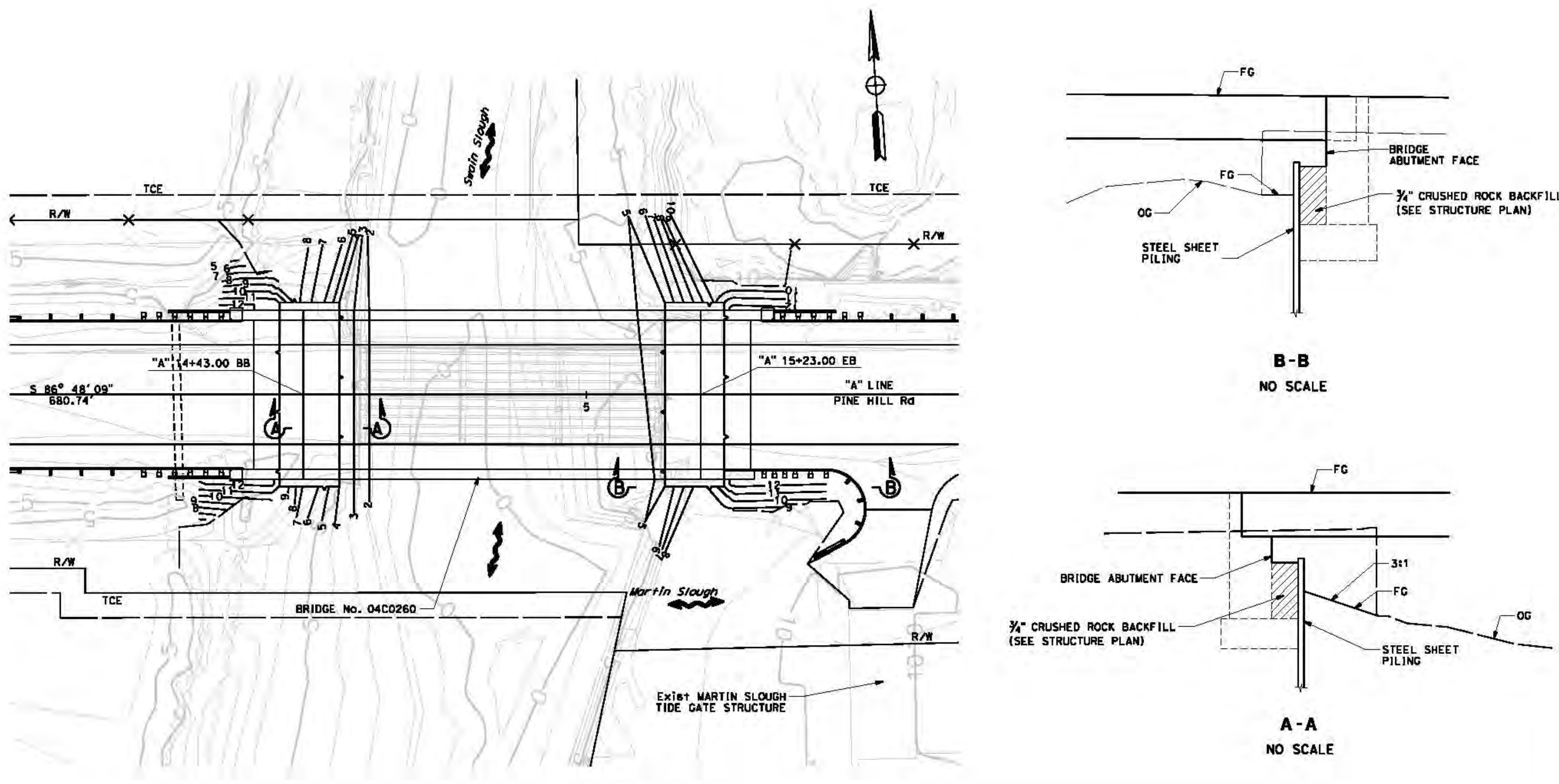
LIMITS OF STEEL SHEET PILING

COUNTY OF HUMBOLDT
DEPARTMENT OF PUBLIC WORKS

PINE HILL ROAD BRIDGE OVER SWAIN SLOUGH

CONTOUR GRADING AND ROCK SLOPE PROTECTION

SHEET 7 OF 28



THIS PLAN ACCURATE FOR CONTOUR GRADING WORK ONLY.

SCALE: 1"=10'

G-1

NOTES:

1. FOR COMPLETE RIGHT OF WAY AND ACCURATE ACCESS DATA, SEE RIGHT OF WAY RECORD MAPS AT THE COUNTY OFFICE.
2. CONTRACTOR SHALL POSITIVELY DETERMINE ALL HORIZONTAL AND VERTICAL LOCATIONS OF ALL UTILITIES PRIOR TO CONSTRUCTION OF ANY COMPONENT OF ANY DRAINAGE SYSTEM IN ORDER TO VERIFY CONSTRUCTIBILITY OF THE DRAINAGE SYSTEM AS SHOWN ON PLANS.

LEGEND:

- (XXX) DRAINAGE SYSTEM NUMBER
- (XX) DRAINAGE UNIT NUMBER
- DIRECTION OF DITCH FLOW
- WATER LINE (BY OTHERS)

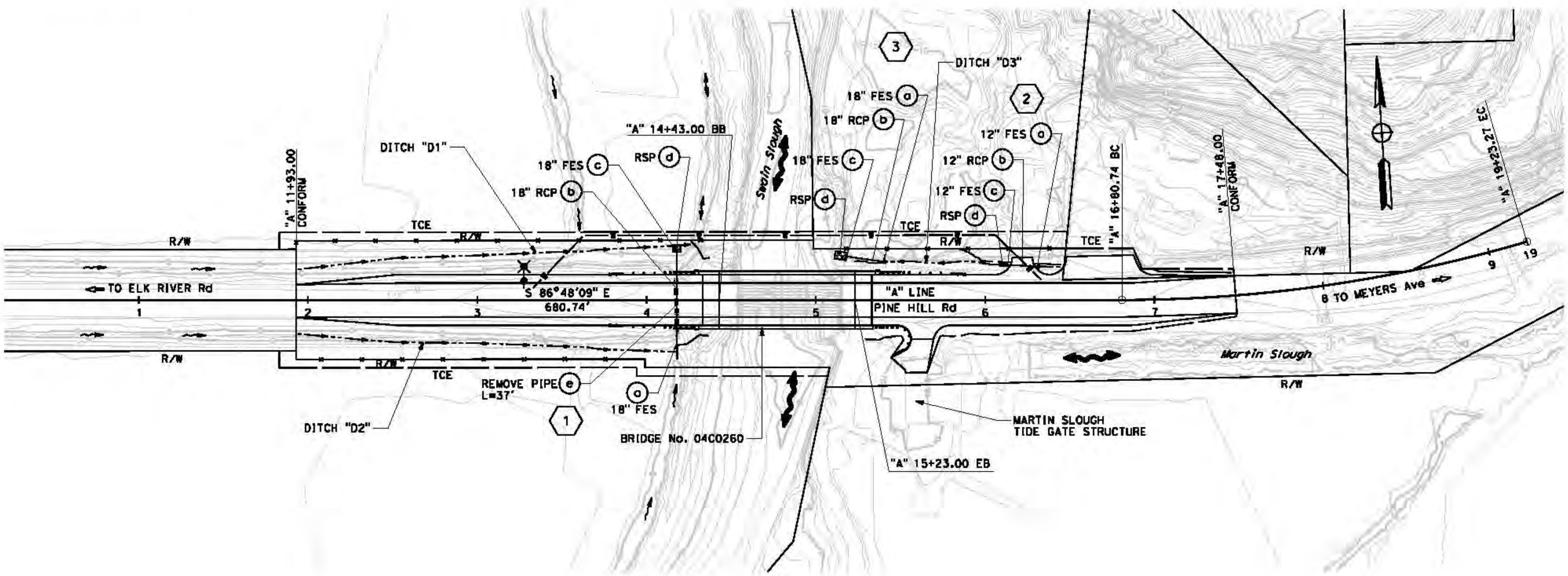
QUINCY ENGINEERING

COUNTY OF HUMBOLDT
DEPARTMENT OF PUBLIC WORKS

PINE HILL ROAD BRIDGE OVER SWAIN SLOUGH

DRAINAGE PLAN

SHEET 8 OF 28



THIS PLAN ACCURATE FOR DRAINAGE WORK ONLY.

SCALE: 1"=30'

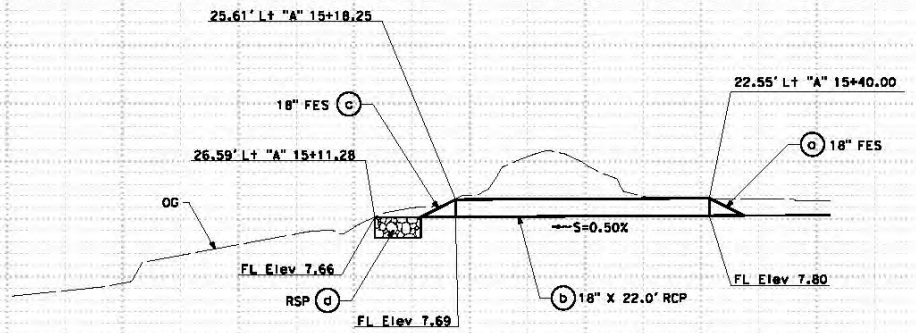
D-1

LEGEND:

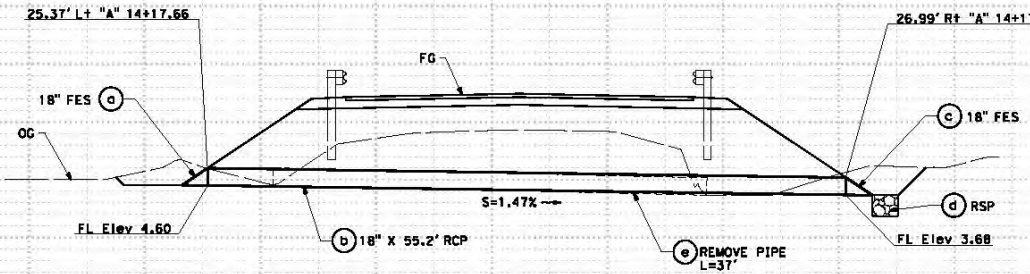
MINOR CONCRETE (PIPE ENCASEMENT)

ROAD NAME: PINE HILL ROAD		QUINCY ENGINEERING	COUNTY OF HUMBOLDT DEPARTMENT OF PUBLIC WORKS
ROAD NO.: 34120	MILE POST: 0.19	DESIGNED BY: MP	PINE HILL ROAD BRIDGE OVER SWAIN SLOUGH
PROJECT NO.: BRLO-5934(113)	EA NO.:	DRAWN BY: MP	
CONTRACT NO.: 59492S	PPNO:	REVIEWED BY: JJ	DRAINAGE PROFILES
DRAWING FILE NAME:		APPROVED BY:	
PLOT DATE: 12-3-2019	REVISION DATE: 11-19-2019		

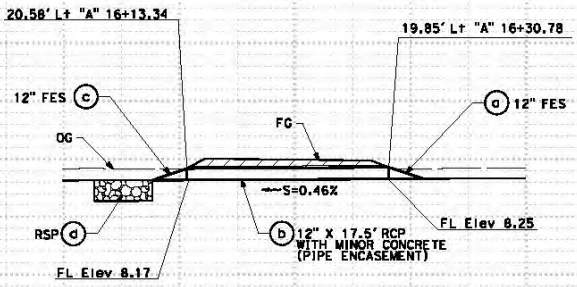
SHEET 9 OF 28



DRAINAGE SYSTEM No. 3
"A" 15+18.25 TO "A" 15+40.00



DRAINAGE SYSTEM No. 1
"A" 14+17.66



DRAINAGE SYSTEM No. 2
"A" 16+13.34 TO "A" 16+30.78

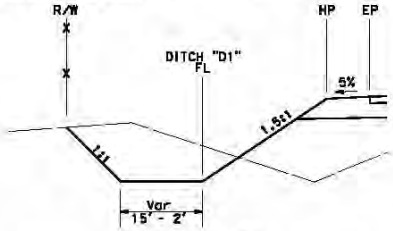
THIS PLAN ACCURATE FOR DRAINAGE WORK ONLY.

Horiz 1"=5'
Vert 1"=5'

DP-1

NOTES:

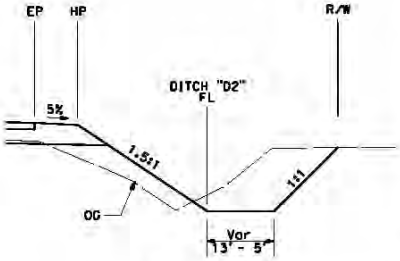
1. FOR RSP CLASS AND DIMENSIONS, SEE TABLE 1.
2. FOR FLARED END SECTION DETAILS NOT SHOWN, SEE STANDARD PLAN D94B.
3. CUTOFF WALL ONLY PRESENT WITH CONCRETE FES, SEE STANDARD PLAN D94B.



DITCH "D1"
Sta "A" 11+93.00 TO Sta "A" 14+29.00

DITCH "D1"

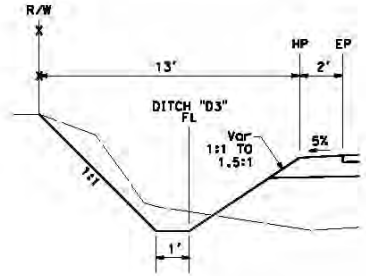
STATION	LINE	OFFSET	L+/R+	WIDTH	FL Elev	SLOPE (%)
11+93.00	"A"	15.91	L+	15.91	4.07	
12+00.00	"A"	16.67	L+	15.25	4.05	-0.29
12+20.00	"A"	18.93	L+	12.95	4.00	-0.25
12+40.00	"A"	21.30	L+	10.47	3.95	-0.25
12+60.00	"A"	23.00	L+	8.78	3.96	0.05
12+80.00	"A"	23.57	L+	7.55	3.97	0.05
13+00.00	"A"	24.27	L+	6.73	3.98	0.05
13+20.00	"A"	25.11	L+	6.25	3.97	-0.05
13+40.00	"A"	25.97	L+	5.62	3.95	-0.10
13+60.00	"A"	26.50	L+	6.71	4.17	1.10
13+80.00	"A"	28.04	L+	5.17	4.01	-0.80
14+00.00	"A"	29.13	L+	2.81	3.85	-0.80
14+20.00	"A"	30.22	L+	2.44	3.58	-1.35
14+29.00	"A"	30.96	L+	2.42	3.26	-3.56



DITCH "D2"
Sta "A" 11+93.00 TO Sta "A" 14+18.00

DITCH "D2"

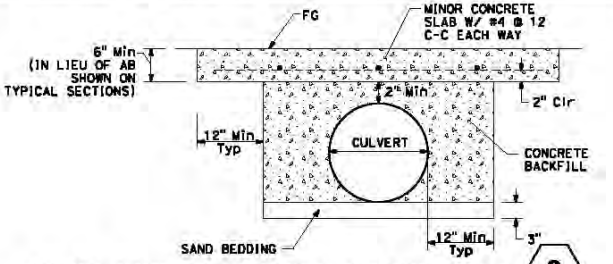
STATION	LINE	OFFSET	L+/R+	WIDTH	FL Elev	SLOPE (%)
11+93.00	"A"	17.97	R+	13.80	3.62	
12+00.00	"A"	18.57	R+	13.16	3.60	-0.29
12+20.00	"A"	20.39	R+	11.25	3.52	-0.40
12+40.00	"A"	22.09	R+	9.62	3.61	0.45
12+60.00	"A"	23.12	R+	8.83	3.88	1.35
12+80.00	"A"	23.31	R+	8.94	4.14	1.30
13+00.00	"A"	23.62	R+	8053	4.41	1.35
13+20.00	"A"	24.30	R+	7.52	4.51	0.50
13+40.00	"A"	25.04	R+	6052	4.58	0.35
13+60.00	"A"	25.75	R+	7.79	4.67	0.45
13+80.00	"A"	27.42	R+	5015	4.43	-1.20
14+00.00	"A"	28.01	R+	4.50	4.59	0.80
14+18.00	"A"	28.74	R+	5.45	4.53	-0.33



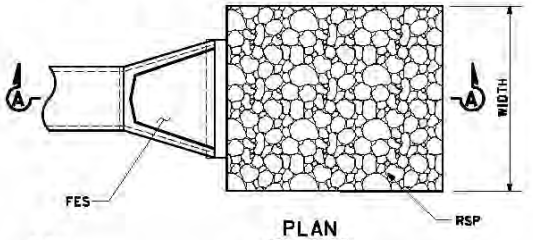
DITCH "D2"
Sta "A" 15+40.00 TO Sta "A" 15+90.00

DITCH "D3"

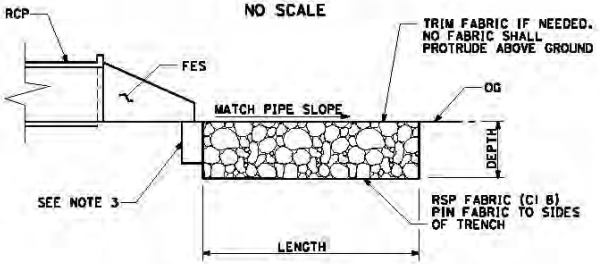
STATION	LINE	OFFSET	L+/R+	FL Elev	SLOPE (%)
15+40.00	"A"	22.05	L+	7.80	
15+60.00	"A"	21.96	L+	7.90	0.50
15+80.00	"A"	21.63	L+	8.00	0.50
15+90.00	"A"	21.66	L+	8.05	0.50
16+00.00	"A"	20.70	L+	8.10	0.50
16+13.34	"A"	20.08	L+	8.17	0.52
16+30.79	"A"	19.36	L+	8.25	0.46
16+40.00	"A"	19.01	L+	8.30	0.54
16+44.96	"A"	18.83	L+	8.33	0.60



MINOR CONCRETE (PIPE ENCASEMENT) 2(b)



PLAN
NO SCALE



SECTION A-A

ROCK SLOPE PROTECTION (RSP)
NO SCALE

TABLE 1

DRAINAGE UNIT	RSP CLASS	LENGTH FT	DEPTH FT	WIDTH FT
1d	150 LB, CLASS III, METHOD B	3.0	1.8	4.5
2d	150 LB, CLASS III, METHOD B	5.0	1.8	1.0
3d	150 LB, CLASS III, METHOD B	7.0	1.8	4.5

NO SCALE

DD-1

COUNTY OF HUMBOLDT
DEPARTMENT OF PUBLIC WORKS

PINE HILL ROAD BRIDGE OVER SWAIN SLOUGH

CONSTRUCTION DETAILS

SHEET 10 OF 28

QUINCY ENGINEERING

COUNTY OF HUMBOLDT
DEPARTMENT OF PUBLIC WORKS

PINE HILL ROAD BRIDGE OVER SWAIN SLOUGH

DETOUR PLAN

SHEET 12 OF 28

NOTES:

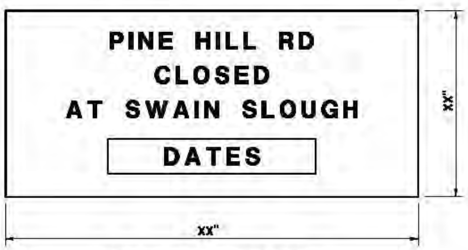
1. THIS PLAN ACCURATE FOR DETOUR WORK ONLY.
2. SIGN LOCATIONS SHOWN ARE APPROXIMATE. EXACT LOCATIONS TO BE DETERMINED BY THE ENGINEER.
3. R11-2 SIGNS MOUNTED ON BARRICADE.

LEGEND:

- CONSTRUCTION AREA
- CONSTRUCTION AREA SIGN
- TYPE III BARRICADE
- * USE WITH FLASHERS AT NIGHT

CONSTRUCTION AREA SIGNS

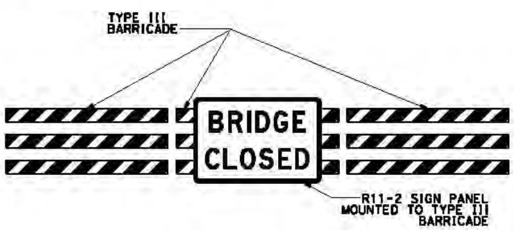
SIGN CODE	PANEL SIZE	SIGN MESSAGE	NUMBER OF POSTS AND SIZE	NUMBER OF SIGNS
R11-2	48" x 30"	ROAD CLOSED	1 - 4" x 6"	2
W20-3	36" x 36"	ROAD CLOSED AHEAD	1 - 4" x 6"	2
M4-8a	24" x 18"	END DETOUR	1 - 4" x 6"	2
M4-10(R)	48" x 18"	DETOUR ARROW SIGN	1 - 4" x 6"	3
M4-10(L)	48" x 18"	DETOUR ARROW SIGN	1 - 4" x 6"	3
SC3(CA)	36" x 12"	DETOUR WITH ARROW	1 - 4" x 6"	2
A-1	XX" x XX"	PINE HILL ROAD CLOSED AT SWAIN SLOUGH	2 - 4" x 6"	4



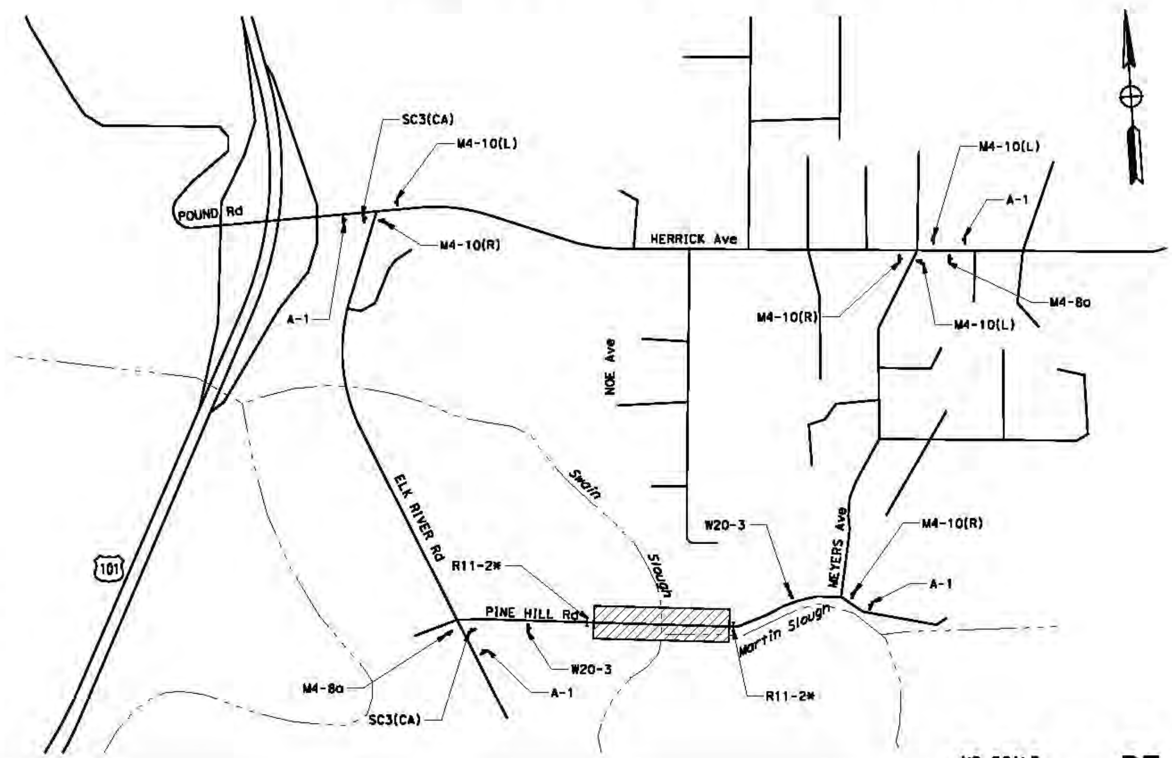
A-1 SIGN DETAIL
NO SCALE

TYPE III BARRICADE

LINE	STATION	EA
"A"	8+50	3
"A"	20+85	3
TOTAL		6



BRIDGE CLOSURE DETAIL



NO SCALE

DE-1

LOAD AND RESISTANCE FACTOR DESIGN PILE DATA TABLE

LOCATION	PILE TYPE	NOMINAL RESISTANCE (kips)		DESIGN TIP ELEVATION	SPECIFIED TIP ELEVATION	NOMINAL DRIVING RESISTANCE kips
		COMPRESSION	TENSION			
Abut 1	CISS 24x0.75	360	N/A	-120.0(a); -35.0(b); -55(c)	-120.0	460
Abut 2	CISS 24x0.75	360	N/A	-85.0(a); -35.0(b); -55(c)	-85.0	410

(1) Design Tip Elevation is controlled by the following demands:
(a) Compression (Strength Limit), (b) Compression (Extreme Limit), (c) Lateral Load
(2) Do not raise the tip elevation

SCOUR DATA TABLE

SUPPORT No.	LONG TERM (DEGRADATION AND CONTRACTION) SCOUR ELEVATION (ft)	SHORT TERM (LOCAL) SCOUR DEPTH (ft)
Abut 1	-1.1	8.2
Abut 2	-1.1	8.6

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
01	Hum	CR	0.19	16	31

Scott McCauley 12-3-19
REGISTERED CIVIL ENGINEER DATE

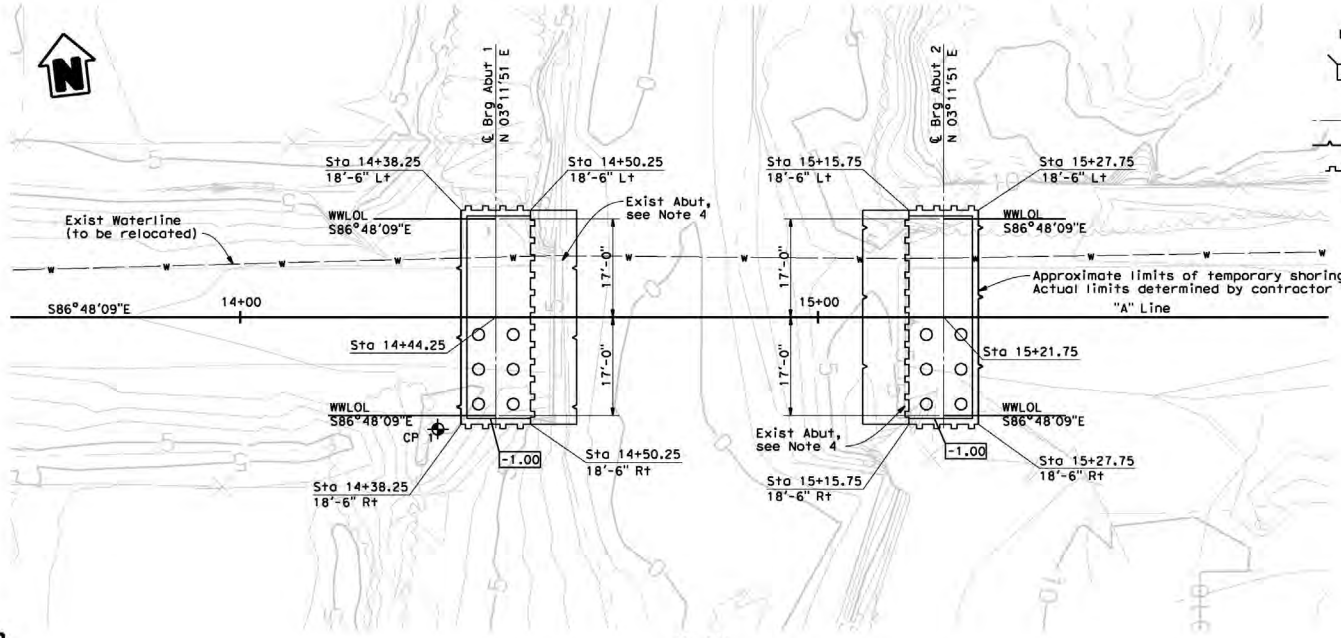
PLANS APPROVAL DATE

The County or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

REGISTERED PROFESSIONAL ENGINEER
SCOTT A. MCCAULEY
No. 71495
Exp. 12-31-21
CIVIL
STATE OF CALIFORNIA

QUINCY ENGINEERING, INC
1101T Cobblerock Drive, Suite 100
Rancho Cordova, CA 95670

COUNTY OF HUMBOLDT
DEPARTMENT OF PUBLIC WORKS
1106 2nd Street
Eureka, CA 95501



Legend:

- X.XX — Indicates bottom of footing elevation
- ○ — Indicates driven vertical pile, not all piles shown
- —w— — Indicates existing 12" Waterline
- Indicates Temporary Shoring
- Indicates Steel Sheet Piling, see Note 2
- Indicates survey control point

Notes:

1. Seal course not shown.
2. For permanent sheet pile shoring specified tip elevation and details, see "Miscellaneous Details" sheet.
3. For Utility information, see Road Plans.
4. Existing abutment locations shown are approximate. Contractor shall field verify actual abutment locations prior to constructing sheet pile and notify Engineer of potential conflict.

PLAN
1"=10'

SURVEY CONTROL DATA

No.	NORTHING	EASTING	ELEV	LINE	STATION	OFFSET	DESCRIPTION
CP1	2164937.002	5957031.194	10.172	"A"	14+34.23	19.36' Rt	SET80DSPIKE
CP2	2165008.312	5956085.236	9.142	"A"			BRASSCAPHUMCORE19203
CP4	2164947.122	5957432.660	9.366	"A"	18+35.19	0.88' Rt	SETMAGNAIL&DPWTAG
CP5	2165073.438	5957926.179	8.956	"A"			FD1510

Note:
The Contractor shall verify all controlling field dimensions before ordering or fabricating any material.

HYDROLOGIC SUMMARY

Drainage area: 5.5 Square Miles

	Design Flood	Base Flood
Frequency (years)	50	100
Discharge (cubic feet per second)	2200	2490
Water Surface Elev at Bridge (ft)	11.5	12.1

Flood plain data based upon information available when the plans were prepared and are shown to meet Federal requirments. The accuracy of said information is not warranted by the County and interested or affected parties should made their own investigations.

X GEOTECHNICAL PROFESSIONAL APPROVAL DATE

X DESIGN OVERSIGHT

X SIGN OFF DATE

FOUNDATION PLAN SHEET (ENGLISH) (REV.03/14/12)

SCALE: As shown | VERT.DATUM NAVD 1988 | HORZ.DATUM CCS 83 Zone 1
PHOTOGRAMMETRY AS OF: 08/2012 | ALIGNMENT TIES See Survey County Data
SURVEYED BY County | DRAFTED BY County
FIELD CHECKED BY County | CHECKED BY County

DESIGN BY L. Smith CHECKED J. Chou
DETAILS BY L. Smith CHECKED J. Chou
QUANTITIES BY J. Cruz CHECKED H. Chou

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

PREPARED FOR THE
COUNTY OF HUMBOLDT
PUBLIC WORKS DEPARTMENT

Scott McCauley
PROJECT ENGINEER

UNIT: X
PROJECT NUMBER & PHASE: X

BRIDGE NO. 04C0260
POST MILE 0.19

SWAIN SLOUGH BRIDGE
FOUNDATION PLAN

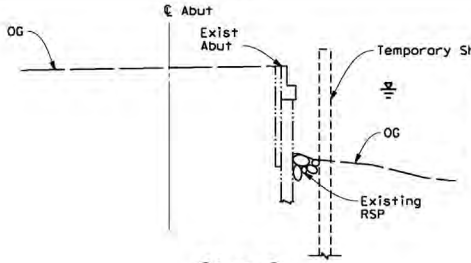
CONTRACT NO.: X

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES			SHEET	OF
5/22/15	12/06/19		3	18

FILE => S:\Client\Humboldt\H07-300 Pine Hill\CAD\Bridge\H07300a-e-fp101.dgn

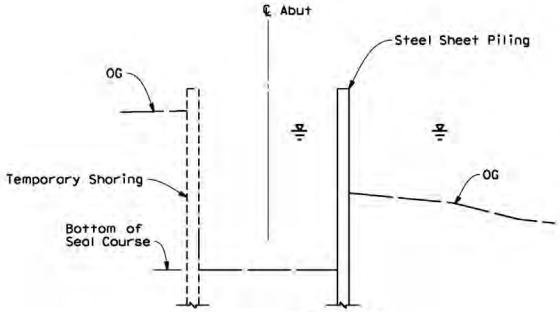
USERNAME => scott.mccauley PLOTTED => 12/3/2020 TIME PLOTTED => 11:49:43 AM



Step 0:

1) Install Temporary Shoring
2) Remove Existing Abutments and RSP

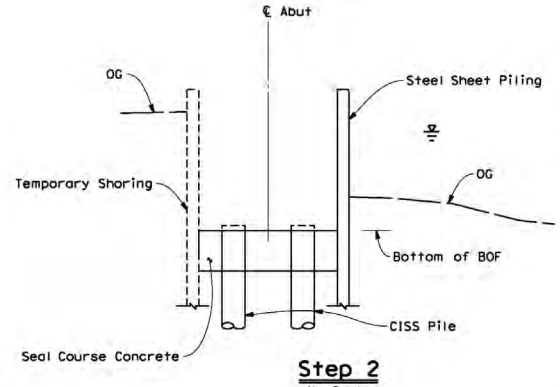
Step 0
No Scale



Step 1:

1) Move Temporary Shoring and Install Steel Sheet Piling
2) Excavate to bottom of seal course

Step 1
No Scale



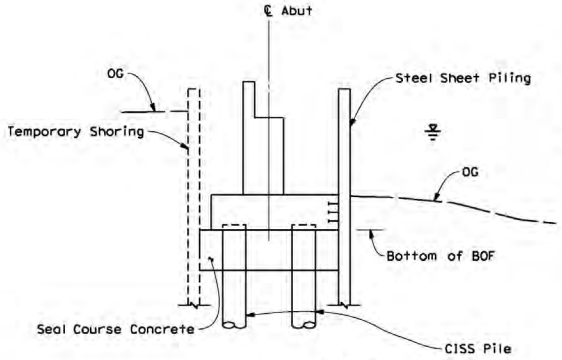
Step 2:

1) Drive CISS Piles
2) Install Seal Course Concrete
3) Dewater Excavation area
3) Install Pile reinforcement

Step 2
No Scale

Notes:

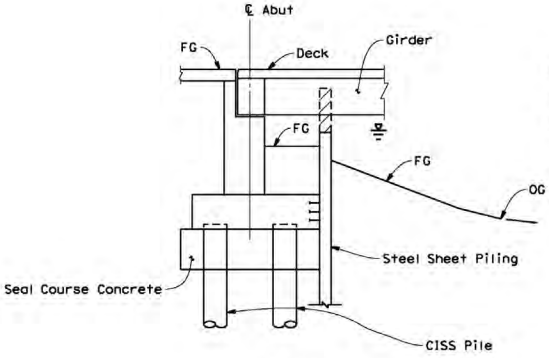
1. Temporary Shoring and Steel Sheet Piling shall prevent seepage with Abut footing construction area, contamination of slough from removal of sediments, & leeching of seal course and footing concrete.
2. Abutment 1 shown, Abutment 2 similar.



Step 3:

1) Install studs on sheet pile. Form and pour abutment footing. Pour abutment footing concrete neat along permanent sheet pile shoring.
2) Construct abutment, stem, and backwall

Step 3
No Scale



Step 4:

1) Remove Temporary Shoring
2) Backfill in front of and behind Abutment
3) Cut-off top of permanent sheet pile
4) Place girders and construct superstructure

Step 4
No Scale

Legend:

Approx ordinary high-tide water surface elevation (WSE)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
01	Hum	CR	0.19	27	31

Scott McCauley 12-3-19
REGISTERED CIVIL ENGINEER — DATE

REGISTERED PROFESSIONAL ENGINEER — SCOTT A. MCCAULEY — No. 71495 — Exp. 12-31-21 — CIVIL — STATE OF CALIFORNIA

PLANS APPROVAL DATE

The County or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

QUINCY ENGINEERING, INC
1017 Cobblerock Drive, Suite 100
Rancho Cordova, CA 95670

COUNTY OF HUMBOLDT
DEPARTMENT OF PUBLIC WORKS
1106 2nd Street
Eureka, CA 95501

DESIGN	BY L. Smith	CHECKED J. Chou	PREPARED FOR THE COUNTY OF HUMBOLDT	Scott McCauley	BRIDGE NO. 04C0260
DETAILS	BY B. Maechler	CHECKED J. Chou	DEPARTMENT OF PUBLIC WORKS	PROJECT ENGINEER	POST MILE 0.19
QUANTITIES	BY J. Cruz	CHECKED H. Chou			

X DESIGN OVERSIGHT
X SIGN OFF DATE

DESIGN DETAIL SHEET (ENGLISH) (REV.03/14/12)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: X
PROJECT NUMBER & PHASE: X
CONTRACT NO.: X

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES			SHEET	OF
5/2015	12/06/18		14	18

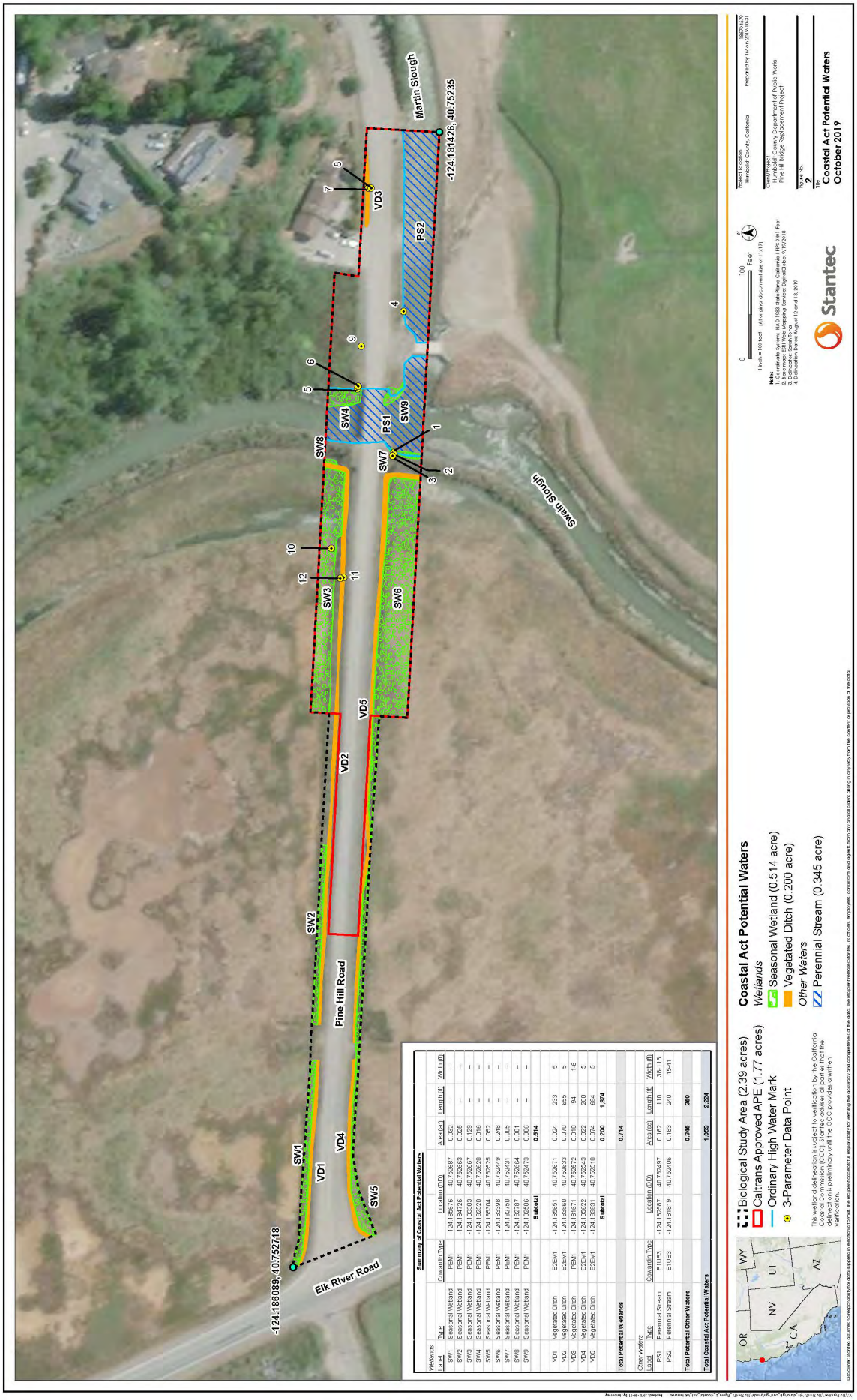
SWAIN SLOUGH BRIDGE
CONSTRUCTION SEQUENCE

FILE => S:\Client\Humboldt\H07-300 Pine Hill\CAD\Bridge\H07300a-u-mlscdt01.dgn

USERNAME => scott.mccauley PLOTTED => 12/3/2020 TIME PLOTTED => 11:49:51 AM

Exhibit 3 11 of 11

Wetland Delineation Map



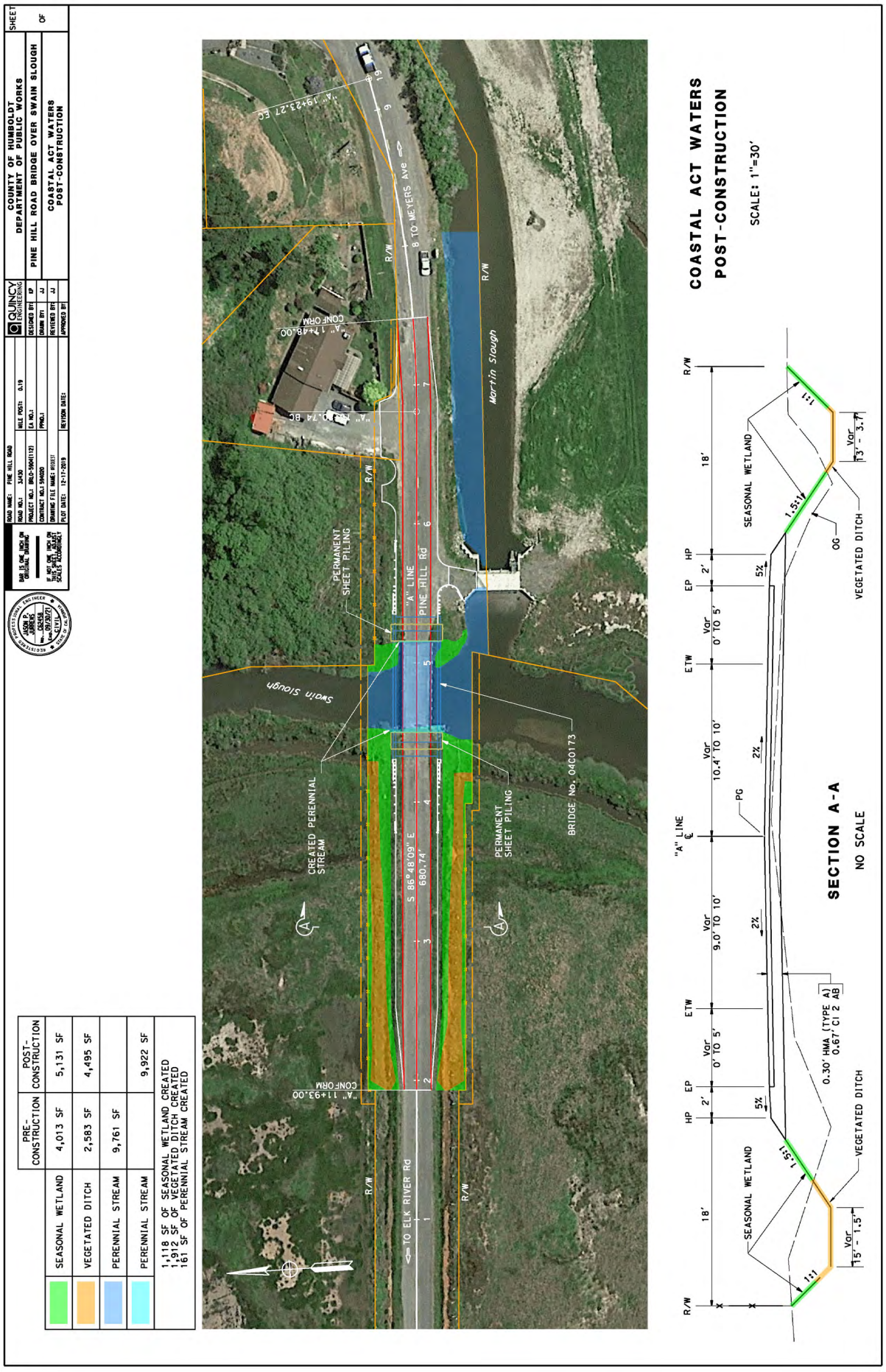
Summary of Coastal Act Potential Waters

Wetlands Label	Type	Cowardin Type	Location (GD)	Area (ac)	Length (ft)	Width (ft)
SW1	Seasonal Wetland	PEMI	-124.186676 40.752687	0.032	--	--
SW2	Seasonal Wetland	PEMI	-124.184726 40.752663	0.025	--	--
SW3	Seasonal Wetland	PEMI	-124.183303 40.752667	0.129	--	--
SW4	Seasonal Wetland	PEMI	-124.182520 40.752628	0.016	--	--
SW5	Seasonal Wetland	PEMI	-124.185304 40.752525	0.052	--	--
SW6	Seasonal Wetland	PEMI	-124.183998 40.752449	0.248	--	--
SW7	Seasonal Wetland	PEMI	-124.182750 40.752451	0.035	--	--
SW8	Seasonal Wetland	PEMI	-124.182750 40.752564	0.001	--	--
SW9	Seasonal Wetland	PEMI	-124.182016 40.752473	0.006	--	--
			Subtotal	**0.514**		
VD1	Vegetated Ditch	E2EMI	-124.185651 40.752571	0.024	283	5
VD2	Vegetated Ditch	E2EMI	-124.183860 40.752633	0.070	655	5
VD3	Vegetated Ditch	PEMI	-124.181671 40.752572	0.010	94	1-6
VD4	Vegetated Ditch	E2EMI	-124.185622 40.752543	0.022	208	5
VD5	Vegetated Ditch	E2EMI	-124.183931 40.752510	0.074	694	5
			Subtotal	**0.200**	**1,874**	
Total Potential Wetlands				**0.714**		
Other Waters						
Label	Type	Cowardin Type	Location (GD)	Area (ac)	Length (ft)	Width (ft)
PS1	Perennial Stream	E1UB3	-124.182597 40.752497	0.162	110	38-113
PS2	Perennial Stream	E1UB3	-124.181819 40.752406	0.183	240	15-41
Total Potential Other Waters				**0.345**	**350**	
Total Coastal Act Potential Waters				**1.059**	**2,224**	

Notes
1. Coordinate System: NAD 1983 State Plane California I (FIPS 0401) Feet
2. Base map: ESRI Web Mapping Service: DigitalGlobe, 9/19/2018
3. Reference Datum: WGS84
4. Delineation Dates: August 12 and 13, 2019

The wetland delineation is subject to verification by the California Coastal Commission (CCC). Unless otherwise stated, the wetland delineation is preliminary until the CCC provides a written verification.

Wetland Impacts Map



Stantec

Pine Hill Road at Swain Slough Bridge Replacement Project

Restoration Plan

February 10, 2020
Revised: November 24, 2020

Prepared for:

Humboldt County Department of Public Works
1106 Second Street
Eureka, CA 95501

Prepared by:

Stantec Consulting Services Inc.
5000 Bechelli Lane, Suite 203
Redding, CA 96002

Revision by:
Humboldt County Department of Public Works

Table of Contents

LIST OF TABLES

LIST OF FIGURES

1.0 INTRODUCTION

The Humboldt County Department of Public Works (County) proposes to replace the existing bridge (No. 04C-0173) on Pine Hill Road (project) over Swain Slough near the city of Eureka, Humboldt County, California (Figure 1). The project is located in the California Coastal Zone and requires a Coastal Development Permit through the California Coastal Commission before implementation. Botanical surveys conducted for the project in 2013 and 2019 located one special-status plant species in the biological project area: Lyngbye's sedge (*Carex lyngbyei*), a California Rare Plant Rank 2B.2 species. The surveys also documented the invasive species dense flowered cord grass (*Spartina densiflora*), which has a California Invasive Plant Council rating of High.

This Restoration Plan has been prepared by the County to document how the project will mitigate potential impacts on Lyngbye's sedge and remove invasive dense flowered cord grass. This restoration plan has also been prepared to satisfy requirements associated with the Coastal Development Permit application and other forthcoming project permits (e.g., California Department of Fish and Wildlife [CDFW] Streambed Alteration Agreement).

2.0 PROJECT LOCATION

The project area encompasses approximately 2.39 acres and consists of a linear alignment running approximately 1,300 feet along Pine Hill Road. It is shown on the *Eureka,* California 7.5-minute U.S. Geological Survey (USGS) quadrangle in Township 4N, Range 1W, Section 4. The approximate center of the project area is located at latitude 40.752536º, longitude -124.182588º (WGS84 datum). The project area location is shown in Figure 1.

3.0 EXISTING CONDITIONS

The project area is located in the coastal plain at the confluence of Swain Slough and Martin Slough. Swain Slough flows approximately 0.5-mile northeast before joining the Elk River, which drains directly into Humboldt Bay. Swain Slough is subject to the rise and fall of the tides, but a tidal gate partially prevents tidewater flow from entering Martin Slough. Low levees along the banks of Swain Slough moderate the normal high water from entering the surrounding coastal plains. The vegetation communities and other land cover types in the project area include wet meadow, montane riparian, barren, and estuarine.

Swain Slough is an approximately 60- to 80-foot-wide water feature that drains the eastern portion of the Elk River floodplain and the surrounding hills to the east (see Figure 1). Waters within Swain Sough are assumed to be brackish based on observed low-tide flow (i.e., fresh water) going out to Humboldt Bay and high-tide flow (salt water) filling the slough as it flows inland. Swain Slough has an unvegetated mud bottom except near the banks, where it is vegetated with Lyngbye's sedge and dense flowered cord grass along the ordinary high water mark (OHWM).

Project Area (2.39 acres) Map
Reference Point

0 2,000 Feet
1 inch = 2,000 feet (At page size of 8.5"x11")

N

Stantec

Project Location
Humboldt County, California

185704679
Prepared by TM on 2019-10-30

Client/Project
Humboldt County Department of Public Works
Pine Hill Bridge Replacement Project

Figure No.
1

Title
Project Location and Vicinity

Notes
1. Coordinate System: NAD 1983 StatePlane California I FIPS 0401 Feet
2. Base map: ESRI USA Topo Maps web mapping service
3. Public Land Survey: T04N, R01W, Sec. 4, 9
4. USGS 7.5 Quad: Eureka 1972

Martin Slough is very similar to Swain Slough in that it has an unvegetated mud bottom feature except for the banks near the OHWM, which are also vegetated with Lyngbye's sedge but lacks dense flowered cord grass. The difference between the two sloughs is that the reach of Martin Slough within the project area has been channelized and is straight, and the tidal influence is limited by a tide gate located at the confluence with Swain Slough.

Stantec Consulting Services Inc. (Stantec) botanist Sarah Tona conducted a botanical survey on August 12 and 13, 2019 to update previous surveys conducted in 2013 and document current conditions in the project area. During the survey, Ms. Tona refined the boundaries of the previously recorded Lyngbye's sedge population, mapped the boundaries of dense flowered cord grass, and recorded their relative cover.

Lyngbye's sedge and dense flowered cord grass were located alongside Swain Slough and Martin Slough during the 2019 survey. Both species occur in and just outside the slough inundation area. While Lynbye's sedge and dense flowered cord grass dominate the inundation area, other species such as Bigelow's pickleweed (*Salicornia bigelovii*) and brass buttons (*Cotula coronopifolia*) are present in low quantities. The boundaries of Lyngbye's sedge and dense-flowered cord grass in the project area are shown in Figure 2. Table 1 shows the cover of Lyngbye's sedge and dense-flowered cordgrass at each project location relative to the bridge and sloughs during the 2019 survey. Prior to construction and disturbance activities, each distinct area identified in Figure3 where temporary or permanent impacts may occur will be re-surveyed by a qualified botanist and an overall percent cover of both sedge and cord grass will be estimated to create an existing baseline (Note: photo documentation will be taken during all survey, monitoring, salvage, and restoration activities). Areas identified in Figure 3 will be delineated into specific polygons of areas being proposed to be disturbed with total area and square footage of cover for both Lyngbye's sedge and cord grass.

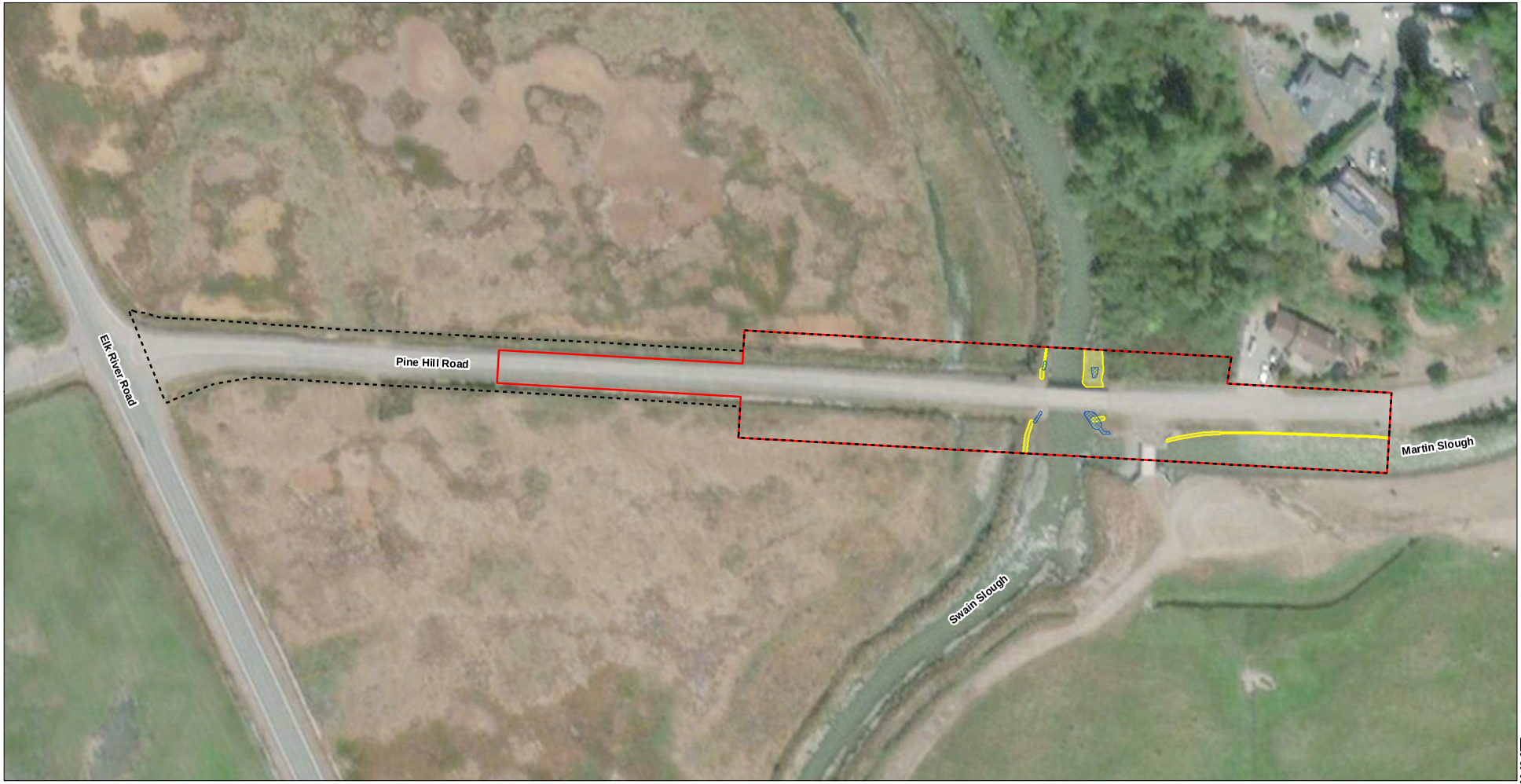
Table 1. Relative Cover of Lyngbye's Sedge and Dense Flowered Cord Grass in the Project Area

Location	Lyngbye's Sedge Relative Cover (Percent)	Dense Flowered Cord Grass Relative Cover (Percent)
Northwest side of bridge (Swain Slough)	70	30
Southwest side of bridge (Swain Slough)	80	20
Northeast side of bridge (Swain Slough)	90	10
Southeast side of bridge (Swain Slough)	40	60
North Side of Martin Slough	100	0

4.0 PROJECT OVERVIEW

4.1 CONSTRUCTION ACTIVITIES

It is anticipated that excavators, dozers, cranes, dump trucks, concrete trucks, concrete pumps, pile driving hammers, and pile drilling equipment may be required to remove the existing bridge and construct the new bridge. Construction is anticipated to begin in June 2020 and be completed in October 2020. Pine Hill Road will be closed at the bridge location during construction, which allows the paved approach roadways to be used as construction staging areas and gives the contractor access to the project site from both embankments. This will minimize the construction footprint and reduce potential environmental impacts on Swain Slough.



Project Area (2.39 acres) Caltrans
Approved APE (1.77 acres)
Spartina densiflora
Carex lyngbyei

0 100 Feet

1 inch = 100 feet (At original document size of 11x17)

Notes
1. Coordinate System: NAD 1983 StatePlane California I FIPS 0401 Feet
2. Aerial imagery: Digital Globe 9/19/2018

Stantec

Project Location
Humboldt County, California

185704679
Prepared by TM on 2019-10-30

Client/Project
Humboldt County Department of Public Works
Pine Hill Bridge Replacement Project

Figure No.
2

Title
Rare and Invasive Plant Species **Locations**

In-channel work is limited and will consist of removal of the existing columns, removal of trash and debris from the channel, and the removal of sediment from in front of the sheet piling. All in-channel work will be performed at low tide when there is minimal flow in Swain Slough. There is no work and/or impacts on Martin Slough.

4.2 CONSERVATION MEASURES

The following conservation measures shall be incorporated into the project to minimize potential impacts on Lyngbye's sedge and other biological resources in the project area:

- The ground disturbance footprint within areas occupied by Lyngbye's sedge shall be minimized through careful pre-construction planning and in coordination with a qualified botanist.
- Flagging shall be installed along the boundaries of all areas of Lyngbye's sedge to be avoided to ensure that there will be no impacts on Lyngbye's sedge outside of construction areas. A qualified botanist shall be present to assist with identifying the populations. The flagging shall be periodically inspected throughout each period of construction and be repaired as necessary.
- All equipment used for off-road construction activities will be weed-free prior to entering the project area.
- If project implementation calls for mulches or fill, they will be weed free.
- Any equipment (including boots/waders) and construction equipment shall be properly disinfected or cleaned according guidance provided by the State of California Aquatic Invasive Species Management Plan (California Department of Fish and Game 2008a; U.S. Bureau of Reclamation 2012) prior to in-water work to prevent the spread of aquatic invasive species.

4.3 IMPACTS ON LYNGBYE'S SEDGE

Implementation of the proposed project will potentially result in permanent impacts of up to nine square feet of habitat supporting Lyngbye's sedge along the banks of Swain Slough. These impacts would result from the placement of cofferdams which will be used to construct the new bridge abutments. Using sheet piles as a cofferdam and abutment scour protection will result in significantly less permanent impacts than the use of rock or RSP along the abutments. The project may also result in up to 471 square feet of temporary impacts on Lyngbye's sedge due to construction access and slope regrading. Project impacts on Lyngbye's sedge are illustrated in Figure 3.

BAR IS ONE INCH ON ORIGINAL DRAWING IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	ROAD NAME: PINE HILL ROAD		QUINCY ENGINEERING	COUNTY OF HUMBOLDT DEPARTMENT OF PUBLIC WORKS	SHEET
	ROAD NO.: 3J430	MILE POST: 0.19	DESIGNED BY KP	PINE HILL ROAD BRIDGE OVER SWAIN SLOUGH	OF
	PROJECT NO.: BRLO-5904(112)	EA NO.:	DRAWN BY: JJ		
	CONTRACT NO.: 594020	PPNO.:	REVIEWED BY JJ	IMPACTS ON RARE PLANT SPECIES	
	DRAWING FILE NAME: RPDIST		APPROVED BY		
	PLOT DATE: 12-30-2019	REVISON DATE:			

LEGEND:

- DIRECTION OF TRAFFIC
- DIRECTION OF DITCH FLOW
- LYNGBYE'S SEDGE (CAREX LYNGBYEI) POPULATION- 1,442 SF
- LYNGBYE'S SEDGE (CAREX LYNGBYEI) PERMANENT IMPACTS- 9 SF
- LYNGBYE'S SEDGE (CAREX LYNGBYEI) TEMPORARY IMPACTS- 471 SF

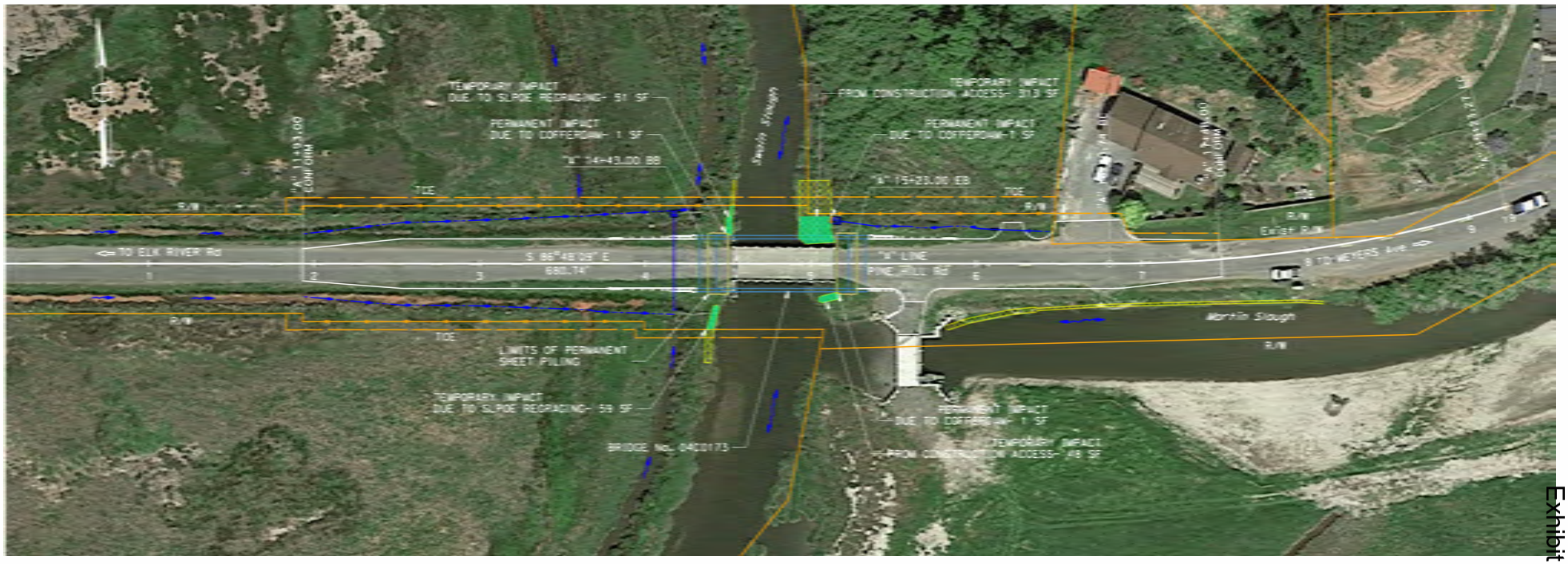


Figure 3
Impacts on Lyngbye's Sedge

SCALE: 1"=30'

Exhibit 6 8 of 12

5.0 RESTORATION PLAN

5.1 RESTORATION OBJECTIVES

The objectives of implementing the project restoration plan are identified below.

- Provide on-site mitigation for permanent impacts on Lyngbye's sedge at a 2:1 ratio by area (i.e. 10 sf permanently impacted shall be mitigated with 20 sf replanted).
- Through short-term maintenance and monitoring efforts, promote the continued presence of self-sustaining occurrences of Lyngbye's sedge in the project area.
- Reduce the cover of dense flowered cord grass in project impact areas.
- Enable the project to comply with the requirements included in regulatory permits (e.g., Coastal Development Permit, Streambed Alteration Agreement) anticipated to be received for the project.

5.2 LYNGBYE'S SEDGE RESTORATION METHODS

All activities related to plant protection, salvage and restoration will be conducted by a qualified botanist. Additionally, all maintenance and monitoring activities will be conducted by a qualified botanist. As discussed in Section 3, a pre-construction survey will be conducted by a qualified botanist to survey the overall percent cover of Lyngbye's sedge and cord grass in the specific areas of temporary and permanent impacts identified in Figure 3. Specific areas that may be disturbed will be estimated in terms of overall size, percent cover of sedge and cord grass, and documented using photographs and/or figures.

5.2.1 Plant Protection and Salvage

All Lyngbye's sedge stands in temporary or permanent construction impact areas will be protected in place or salvaged and replanted on-site. Lyngbye's sedge that will be temporarily impacted due to construction access along Swain slough on the northeast and southeast side of the existing bridge (Figure 3) will be covered in tarps during periods of work activities. The placement of tarps over Lyngbye's sedge stands will minimize damage to the plants from potential crushing or soil disturbance. The tarps should be placed over the Lyngbye's sedge stands for as little time as required to complete work activities in the temporary construction access areas. Tarps should be removed at the end of each workday to minimize the potential of negative impacts on Lyngbye's sedge from prolonged covering. Areas that are covered by tarps will be monitored post-construction to ensure no permanent impacts occur. If the areas return to pre-project conditions within a year, then those impacts will be considered temporary. However, if plants do not recover (80% relative cover from pre-construction survey), then these areas will be treated as areas of permanent impact and treated as areas requiring recovery via plant salvage/replanting efforts.

Lyngbye's sedge stands that will be temporarily impacted along Swain Slough on the northwest and southwest side of the existing bridge due to slope regrading will be left in place if the stands can be avoided during regrading. If slope regrading will be conducted down to the Swain Slough OHWM, and thus impact Lyngbye's sedge, the Lyngbye's sedge stands will be salvaged and retained for replanting. Lyngbye's sedge shall be excavated with a sufficient root mass, stored in nursery containers, watered regularly to ensure survival, and re-planted on the restored landscape following

construction. A plant salvage storage area shall be identified at the project site for the safe storage and care of salvaged plants.

Lyngbye's sedge stands that will be permanently impacted by the placement of sheet pile cofferdams northwest, northeast, and southeast of the bridge (Figure 3) will be salvaged prior to construction. Lyngbye's sedge stands shall be salvaged using the methods described above and retained in a plant salvage storage area for restoration planting.

5.2.2 Restoration Planting Areas

Following all ground disturbing project activities, a qualified botanist will assess the project area for areas that contain suitable habitat conditions for replanting of salvaged Lyngbye's sedge. Based on the current and anticipated post-project site conditions, suitable habitat for restoration of Lyngbye's sedge may be present along Swain Slough on all sides of the proposed bridge, in areas that contained Lyngbye's sedge prior to construction. Replanting of salvaged sedge shall occur at around the same elevation of currently growing sedges to help ensure success. Lyngbye's sedge should not be replanted west of Swain Slough if the proposed slope regrading alters the habitat such that it is no longer suitable for Lyngbye's sedge. Salvaged Lyngbye's sedge may also be replanted in areas described in Section 5.3, where dense flowered cord grass is removed.

When planting salvaged clumps of Lyngbye's sedge, any large root masses shall be divided to generate smaller clumps, which shall be used to expand the area of Lyngbye's sedge in the project area. Replanted areas of Lyngbye's sedge shall cover at least twice the habitat area of what is impacted (currently 9 sf impacted, thus 18 sf replanted). This area does not include any temporary impact areas replanted after slope regrading. If plants are salvaged in the area of slope regrading, the same mitigation ratio (2:1) shall apply. If the slope regrading area is no longer considered suitable habitat, then an area twice the area impacted should be replanted elsewhere.

5.3 DENSE FLOWERED CORD GRASS TREATMENT

Given the relatively small project area and the prevalence of dense flowered cord grass in habitat surrounding the project area, long-term control of dense flowered cord grass is not an objective of this restoration plan. Dense flowered cord grass will be removed from the surveyed project area, with the intent of reducing competition with Lyngbye's sedge and encouraging the reestablishment of native plant species in the project area. The goal will be to replant Lyngbye's sedge in those areas where cord grass is removed.

Dense flowered cord grass shall be completely removed from any area of ground disturbing project activities (e.g., slope regrading west of Swain Slough, excavation for new bridge abutments). Dense flowered cord grass growing directly adjacent to Lyngbye's sedge in temporary construction access areas northeast and southeast of the bridge will be removed as much as possible in a manner that Lyngbye's sedge are not inadvertently impacted. This might result in cord grass being cut to ground level and not excavated/dug out for complete removal. All cut dense flowered cord grass vegetative material and any soil containing root fragments will be disposed of at a waste facility. Soil containing dense flowered cord grass root fragments will not be reused on-site as fill material.

5.4 MONITORING AND MAINTENANCE

5.4.1 Monitoring

The goal of the restoration effort is to successfully retain and re-establish occurrences of Lyngbye's sedge within the project area. This will require periodic site visits to assess the performance of the Lyngbye's sedge and determine the need for any corrective measures.

Monitoring will be initiated following completion of construction and extend for a period of a minimum three years after planting of salvaged plants and continue until all success criteria are met. Monitoring surveys are anticipated to be conducted annually in mid-summer following project completion and would measure the relative cover of Lyngbye's sedge in each of the project areas identified during the pre-construction survey and currently shown in Table 2 and Figure 3. Corrective measures include replacement of Lyngbye's sedge plantings or manual removal of dense flowered cord grass as necessary.

An annual monitoring report will be submitted to permitting agencies (e.g., California Coastal Commission, CDFW) by September 1 of each monitoring year following project completion, or until all success criteria have been met. The first monitoring report will include a map figure documenting the location of all replanted Lyngbye's sedge. Photographs will be included as an appendix in each monitoring report. Photographs will document the pre-disturbance site conditions as well as the conditions of the restoration sites at the time of each monitoring visit. Each report will evaluate the restoration areas against the success criteria to determine if further monitoring is required. When the monitoring indicates that the restoration areas are self-sustaining and have met the success criteria, a final report shall be submitted, and the monitoring program will cease.

5.4.2 Success Criteria

The project restoration will be considered successful if the following success criteria are met by the fifth growing season following the completion of construction.

1. Lyngbye's sedge achieves at least 80% of the pre-construction relative cover in each area of impact (based on the pre-construction estimates of a qualified botanist as outlined in Section 5.2). If post-construction habitat conditions northwest and southwest of the bridge are not suitable for Lyngbye's sedge due to slope regrading, success criteria relative cover will only be based on project areas northeast and southeast of the bridge.

2. Replacement plantings of Lyngbye's sedge have not been required during the last growing season.

3. New populations of dense flowered cord grass do not become established within restoration areas.

5.4.3 Maintenance

If the results of the monitoring surveys indicate that success criteria are unlikely to be achieved, remedial actions should be implemented. As the success criteria are structured by maintaining the cover of Lyngbye's sedge and reducing dense flowered cord grass, remedial measures that may be necessary include additional Lyngbye's sedge plantings and additional removal of dense flowered cord grass. Information gathered during the annual monitoring surveys would be used to best determine the appropriate remedial measures. General guidelines for Lyngbye's sedge replacement and additional dense flowered cord grass removal are provided below.

5.4.3.1 Lyngbye's Sedge Replacement

The density of remaining Lyngbye's sedge and the planting of salvaged plant material should allow for some level of plant mortality without compromising the ability to meet the success criteria. However, if there is significant mortality (e.g., >25%) and/or remaining Lyngbye's sedge do not begin to colonize the site, plant replacement may be required.

5.4.3.2 Dense Flowered Cord Grass Removal

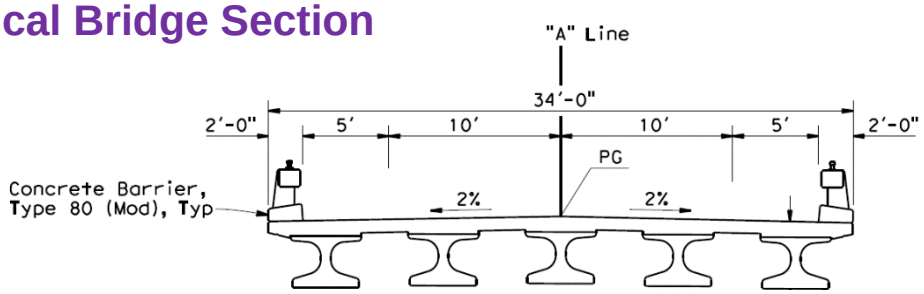
Periodic dense flowered cord grass removal will be required to reduce ongoing competition with Lyngbye's sedge plantings and allow for meeting the established success criteria. Dense flowered cord grass treatment will occur every year during the restoration period and may include hand pulling or cutting. The use of herbicides for weed control shall be prohibited unless this plan is amended to include a number of BMPs and is approved by regulatory agencies.

Pictures of the Existing Pine Hill Bridge.

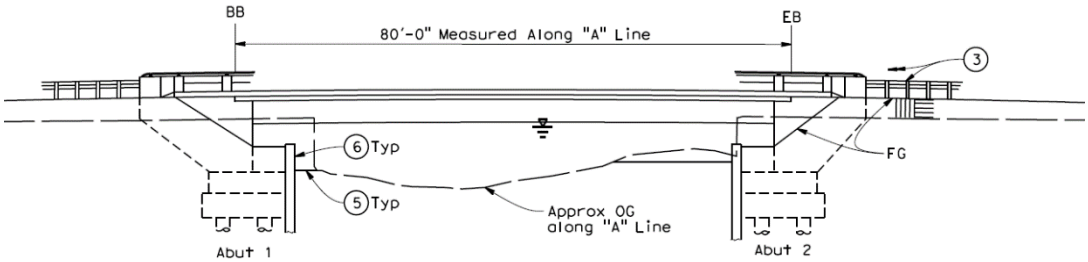
Clockwise from top right: view of the bridge from the southwest looking northeast; view of the bridge from the east looking west; view of the bridge from the west looking east.

PROPOSED NEW BRIDGE DESIGN

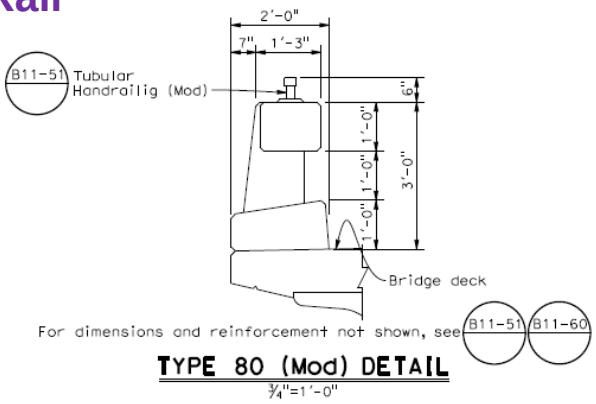
Typical Bridge Section



Bridge Elevation



Proposed Bridge Rail



Example of this type of bridge rail from the Caltrans website: *https://dot.ca.gov/programs/research-innovation-system-information/roadside-safety-research-group/california-type-85-concrete-post-and-beam-bridge-rail*