

**HUMBOLDT COUNTY
DEPARTMENT OF PUBLIC WORKS
CONTRACT CHANGE ORDER MEMORANDUM**

DATE
April 6, 2022

TO: Thomas K. Mattson Public Works Director			FILE: PROJECT NAME: Mattole Road (F3C010) at PM 5.00 Storm Damage Project	
FROM: Chuck Dory, P.E. Resident Engineer			Contract No.: 217224 Caltrans EA.: None Federal No.: ER-32L0(118)	
CCO NO. 2	SUPPLEMENT NO.	CATEGORY CODE	CHOOSE ONE: <input checked="" type="checkbox"/> CONTINGENCY WORK OR <input type="checkbox"/> SUPPLEMENTAL WORK	
CCO AMOUNT \$291,976.05 INCREASE <input checked="" type="checkbox"/> DECREASE <input type="checkbox"/>			CONTINGENCY BUDGET: \$96,650.00	SUPPLEMENTAL BUDGET: \$0.00
			CONTINGENCY BALANCE (including this change): (-)\$286,951.05	SUPPLEMENTAL BALANCE (including this change): \$0.00
HEADQUARTERS APPROVAL REQUIRED? YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>			ORIGINAL CONTRACT AMOUNT: \$965,167.00	
BOS APPROVAL REQUIRED? (if > Contingency) YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>			CUMULATIVE ENCUMBRANCE OF ALL CONTINGENCY CONTRACT CHANGE ORDERS (including this change): \$383,601.05	CONTINGENCY CONTRACT CHANGE ORDERS AS A % OF ORIGINAL CONTINGENCY AMOUNT (including this change): 396.6%
ORIGINAL CONTRACT TIME: 80 DAY(S)	TIME ADJUSTMENT THIS CHANGE: Deferred	PREVIOUSLY APPROVED CCO TIME (+) 3 WD(s)	TOTAL # OF UNRECONCILED DEFERRED TIME CCO'S (Including this change) 1	DEPARTMENTAL CCO AUTHORITY (This Project) is Contingency Balance = \$210,000.00

THIS CHANGE ORDER PROVIDES FOR: Mattole Road Project Location PM 5.00, Soldier Pile Retaining Wall:
1) Abandon previously installed ground anchors. **2) Install** new ground anchors. **3) Mobilize** required equipment and materials to perform work associated with the ground anchor construction operations.

REASON FOR CHANGE: The contract plans provide for the construction of fifteen (15) ground anchors to support a timber lagging faced soldier pile retaining wall with a single concrete waler. Proof / performance testing of the constructed ground anchors indicated they did not attain the specified bond strength. Further analysis of the bond strength test results indicates the anchors individually or as a group did not attain an acceptable level of strength to support the wall. Investigation of the ground anchor test results and geotechnical conditions point to a differing site condition which resulted in the ground anchors not attaining the minimum specified bond strength.

Since the wall is not fully supported, construction operations are suspended until the ground anchor issue(s) are resolved. Currently, the project site has a single lane open to public traffic which is under a stop and proceed when clear traffic control system.

The prime contractor was provided with reports associated with the completed ground anchors, revised plan details, and revised specifications in a draft change order package to use in soliciting price quotes from drilling subcontractors for abandoning the existing ground anchors and constructing new ground anchors. The Contractor received two (2) price quotes for the work specified in this change. Both quotes have been analyzed. The agreed price of \$291,976.05 is based on the quote submitted by Geostructural Engineering, Inc, and includes support costs for work and materials to be provided by the prime contractor. The second quote was received from Sacramento Drilling, Inc., and totals \$295,576.05 with the prime contractor's support costs.

**HUMBOLDT COUNTY
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CCO No.: **2**

Page 2 of 2

DATE

April 6, 2022

TO: Thomas K. Mattson Public Works Director	FILE: PROJECT NAME: Mattole Road (F3C010) at PM 5.00 Storm Damage Project
FROM: Chuck Dory, P.E. Resident Engineer	Contract No.: 217224 Caltrans EA.: None Federal No.: ER-32L0(118)

METHOD OF PAYMENT: This change order consists of three (3) components: 2-1) Abandon existing ground anchors; 2-2) Install new ground anchors; and 2-3) Mobilization.

2-1) For abandoning the existing ground anchors, the Contractor agrees to accept a unit price payment of \$926.67 per each (EA) existing anchor abandoned, including all markups. Total Cost = 15 EA @ \$926.67 = \$13,900.05. **2-2)** For installing new ground anchors (subhorizontal), the Contractor agrees to accept a unit price payment of \$14,707.00 per each (EA) anchor installed, including all markups. Total Cost = 16 EA @ \$14,707.00 = \$235,312.00. **2-3)** For mobilization associated with this change, the Contractor agrees to accept a lump sum payment of \$42,764.00, including all markups.

The total cost of this change is \$291,976.05. The cost of this change order is based on a detailed estimate of the work which is on file in the project records

CONTRACT TIME ADJUSTMENT: Adjustment of contract time is deferred until completion of the work since the work specified in this change is the controlling operation and will delay the completion of the contract.

CONCURRED BY:		ESTIMATE OF COST	
DPW, ENGINEERING	DATE	THIS REQUEST	TOTAL TO DATE
<i>Mugi Sorenson</i>	4-7-22		
DPW, ENGINEERING	DATE	CONTRACT ITEMS	\$0.00
<i>Tommy Dight</i>	4/7/22	FORCE ACCOUNT	\$0.00
CALTRANS OVERSIGHT ENGINEER	DATE	AGREED PRICE	\$291,976.05
N/A		ADJUSTMENT	\$0.00
FHWA REPRESENTATIVE	DATE	TOTAL	\$291,976.05
N/A		FEDERAL PARTICIPATION	
COUNTY PRIOR APPROVAL BY:	DATE	<input checked="" type="checkbox"/> PARTICIPATING <input type="checkbox"/> PARTICIPATING IN PART <input type="checkbox"/> NONE <input type="checkbox"/> NON-PARTICIPATING (Maintenance) <input type="checkbox"/> NON-PARTICIPATING	
DIRECTOR OF PUBLIC WORKS	DATE	FEDERAL SEGREGATION (If more than one funding source or P.I.P. type)	
Thomas K. Mattson		<input type="checkbox"/> CCO FUNDED PER COOPERATIVE AGREEMENT <input type="checkbox"/> CCO FUNDED AS FOLLOWS	
RESIDENT ENGINEER'S SIGNATURE	DATE	_____ _____ _____	
<i>Charles A. Dory</i>	4/6/2022		

CONTRACT CHANGE ORDER

Change Requested by: Engineer Contractor

CCO No.	Suppl. No.	Contract No.	Road	Federal Number(s)
2	0	217224 (PM 5.00)	Mattole Road (F3C010)	ER-32L0(118)

To: Mercer-Fraser Company, Contractor

You are directed to make the following changes from the plans and specifications or do the following described work not included in the plans and specifications for this contract. NOTE: This change order is not effective until approved by the Engineer

Description of work to be done, estimate of quantities and prices to be paid. (Segregate between additional work at contract price, agreed price and force account.) Unless otherwise stated, rates for rental of equipment cover only such time as equipment is actually used and no allowance will be made for idle time. The last percentage shown is the net accumulated increase or decrease from the original quantity in the Engineer's Estimate

Description of Work - Mattole Road Project Location PM 5.00, Soldier Pile Retaining Wall: **1)** Abandon previously installed ground anchors. **2)** Install new ground anchors. **3)** Mobilize required equipment and materials to perform work associated with the ground anchor construction operations.

All work shall be performed in accordance with the contract documents which include the revised plan sheets, revised special provisions, and supplemental project information presented in this change order and applicable sections of the original contract plans and specifications for Contract No. 217224.

Provide detailed cost estimate data for Item No. 1, 2, and 3 listed below.

Provide a progress schedule for the work specified in this change order.

1) Extra Work at Agreed Unit Price - Abandon Existing Ground Anchors:

In accordance with the provisions of Section 4-1.05, Changes and Extra Work, of the Standard Specifications, abandon the existing ground anchors as specified on the attached plans sheets.

For this work, the contractor shall receive and accept a payment of \$926.67 for each (EA) existing ground anchor abandoned. This sum constitutes full and complete compensation for furnishing all labor, material, equipment, tools, and incidentals including all markups by reason of this change.

Total Cost = 15 EA @ \$926.67 / EA = \$13,900.05

2) Extra Work at Agreed Unit Price - Install Ground Anchors (Subhorizontal):

In accordance with the provisions of Section 4-1.05, Changes and Extra Work, of the Standard Specifications, install ground anchors (subhorizontal) as specified on the attached plan sheets.

For this work, the contractor shall receive and accept a payment of \$14,707.00 for each (EA) ground anchor (subhorizontal) installed. This sum constitutes full and complete compensation for furnishing all labor, material, equipment, tools, and incidentals including all markups by reason of this change.

Total Cost = 16 EA @ \$14,707.00 / EA = \$235,312.00

3) Extra Work at Agreed Lump Sum Price - Mobilization:

In accordance with the provisions of Section 4-1.05, Changes and Extra Work, and Section 9-1.16D, Mobilization, of the Standard Specifications, mobilize required equipment and materials to perform work associated with the ground anchor abandonment and construction operations.

For this work, the contractor shall receive and accept a lump sum (LS) payment of \$42,764.00 for mobilization. This sum constitutes full and complete compensation for furnishing all labor, material, equipment, tools, and incidentals including all markups by reason of this change.

CONTRACT CHANGE ORDER

Change Requested by: Engineer Contractor

CCO No.	Suppl. No.	Contract No.	Road	Federal Number(s)
2	0	217224	Mattole Road (F3C010)	ER-32L0(118)

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4) Time Adjustment:

Consideration of a time adjustment shall be deferred until completion of the work specified in this Change Order. Determination of time adjustment will be made in accordance with Section 8-1.07B of the Standard Specifications.

REVISED SPECIAL PROVISIONS

DIVISION I GENERAL PROVISIONS

2 BIDDING

The Department makes the following supplemental project information available:

Add to Supplemental Project Information:

- Ground Anchor Log Sheet dated 9/26/21 – 10/5/21 by Ghirardelli Associates (GA)
- Micropile Proof Tests dated October 27, 2021 by Sacramento Drilling, Inc. (SDI)
- Tieback Drilling and Test Data dated November 3, 2021 by (SDI)

46 GROUND ANCHORS AND SOIL NAILS

Replace the last sentence of section 46-1.01C(2)(b) with:

4. Calculations for determining the bonded length. Do not rely on any capacity from the grout-to-ground bond within the unbonded length. Do not rely on any capacity from the Type B ground anchors.

Add to section 46-1.01D(2)(b)(ii):

Provide documentation and calibration results for each jack to be used in the work, indicating the date and results of the Caltrans Transportation Laboratory Calibration. Furnish the certified calibration results to the Engineer a minimum of 5 working days prior to stressing.

CONTRACT CHANGE ORDER

Change Requested by: Engineer Contractor

CCO No.	Suppl. No.	Contract No.	Road	Federal Number(s)
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Add section 46-1.03F:

46-1.03F Coring

Cores through the existing waler must conform to section 60-4.04. Select a core diameter that provides adequate clearance for drilling and a minimum 1 inch clear space around the steel tube.

Prior to coring, locate existing reinforcement and determine location of core as shown.

Prior to inserting the tendon, clean loose and foreign material from cores and flush cored holes with water.

Fully grout the space around the steel tube.

Add to section 46-2.01A:

Install tubes to facilitate post-grouting of all ground anchors.

Magnesium phosphate concrete must comply with the specifications for bonding materials in section 51-1.02C.

Add to section 46-2.01D(2)(b)(i):

Performance test 3 ground anchors that are installed. The Engineer determines which anchors are to be installed first and performance tested. Complete all performance tests before installing the remaining ground anchors.

Replace the 3rd paragraph of section 46-2.01D(2)(b)(i) with:

Do not stress against the concrete until it has attained a compressive strength of at least 3600 psi or has cured for at least 7 days.

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Replace the 3rd paragraph of section 46-2.02B with:

The permanent bearing plate must effectively distribute the factored test load uniformly to the concrete such that:

1. In your design calculations, the area of the cored hole is treated as an open hole and does not provide any bearing support
2. Concrete bearing stress does not exceed 2,400 psi
3. Bending stress of the plate does not exceed:
 - 2.1. 0.90 of the yield strength for steel
 - 2.2. 0.55 of the yield strength for cast steel or cast iron

Add to the end of section 46-2.03A:

Expect difficult ground anchor installation due to the presence of the following conditions:

1. Presence of existing abandoned ground anchors and grout, waler, and reinforcement
2. Variable drilling conditions in all excavations due to the variable weathering/fractures/hardness of the bedrock. Variable drilling conditions may include alternating between soft and hard drilling.

You may encounter voids in the foundation material along the length of the drilled hole that affect drilling and grouting. Use measures such as a grout sock to avoid the excessive loss of grout into the voids encountered.

60 EXISTING STRUCTURES

Replace Section 60-4.04D with:

Payment for coring through the waler and for grouting the annulus around the steel tube is included in the payment for Ground Anchor (Subhorizontal).

HUMBOLDT COUNTY DEPARTMENT OF PUBLIC WORKS
CONTRACT CHANGE ORDER

Sheet 5 of 15

Change Requested by: Engineer Contractor

CCO No. 2	Suppl. No. 0	Contract No. 217224	Road Mattole Road (F3C010)	Federal Number(s) ER-32L0(118)
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To: Mercer-Fraser Company, Contractor

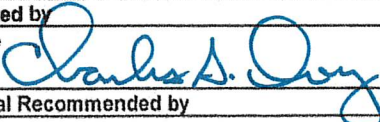

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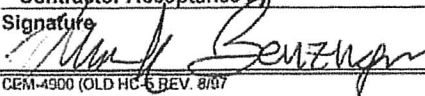
No Additional Text in This Section.

Estimated Cost: Decrease Increase \$291,976.05

By reason of this order the time of completion will be adjusted as follows: **DEFERRED**

Submitted by		
Signature 	(Print name & title) Charles A. Dory, P.E., Resident Engineer	Date 3/31/2022
Approval Recommended by		
Signature 	(Print name & title) Angi Sorensen, P.E., Assoc. Civil Engineer	Date 4-7-22
Engineer Approval by		
Signature	(Print name & title) Thomas K. Mattson, P.E., Director of Public Works	Date

We the undersigned contractor, have given careful consideration to the change proposed and agree, if this proposal is approved, that we will provide all equipment, furnish the materials, except as may otherwise be noted above, and perform all services necessary for the work above specified, and will accept as full payment therefor the prices shown above. **NOTE: If you, the contractor, do not sign acceptance of this order, your attention is directed to the requirements of the specification as to proceeding with the ordered work and filing a written protest within the time therein specified.**

Contractor Acceptance by		
Signature 	(Print name & title) Mark Benzinger Vice President	Date 4/4/22

SURVEY CONTROL NOTES

1. TOPOGRAPHIC AND RIGHT-OF-WAY SURVEY PREPARED BY POINTS WEST SURVEYING. FIELD WORK DATE: JANUARY 31, 2019.
2. THE PURPOSE OF THIS SURVEY IS TO DETERMINE TOPOGRAPHY FOR A STORM DAMAGE REPAIR PROJECT ON MATTOLE ROAD AT POST MIKE 5.0 AND TO SET CONTROL FOR FUTURE CONSTRUCTION. THIS SURVEY REFLECTS CONDITIONS AT THE TIME OF SURVEY.
3. COORDINATES FOR THIS SURVEY ARE CALIFORNIA COORDINATE SYSTEM OF 1983 (CCS83), ZONE 1, NAD83 (2011) EPOCH 2010.0 BASED ON A STATIC GPS CONTROL SURVEY UTILIZING AN NGS OPUS SOLUTION. THE MAPPING ANGLE IS 1 DEGREE 25 MINUTES 55 SECONDS- ROTATE BEARINGS COUNTERCLOCKWISE BY THIS ANGLE TO OBTAIN "TRUE" OR GEODETIC BEARINGS. GRID DISTANCES SHOWN SHOULD BE DIVIDED BY THE COMBINED SCALE FACTOR OF 0.99993489 TO OBTAIN GROUND DISTANCES. MAPPING ANGLE AND GRID SCALE FACTOR TAKEN AT CONTROL POINT NO. 50.
4. THE VERTICAL CONTROL IS ALSO BASED ON SAID OPUS SOLUTION, UTILIZING THE GEOID 12B GRAVITY MODEL, WITH AN NAVD 88 DATUM ELEVATION OF 333.13 FEET ON CONTROL POINT 50.
5. THE HUMBOLDT COUNTY DEPARTMENT OF PUBLIC WORKS HAS DETERMINED A 66 FOOT WIDE RIGHT OF WAY FOR THIS PORTION OF MATTOLE ROAD EXISTS BASED ON THE EXISTING CENTERLINE AS INDICATED IN THE COUNTY ROAD REGISTER PAGES 18-33 AND 104-105. THIS PORTION OF MATTOLE ROAD LIES ENTIRELY WITHIN THE LANDS OF SCARPULLA ASSOCIATES PER DOCUMENT NO. 1997-8124 (PARCEL FOUR THEREIN).
6. UNDERGROUND UTILITIES SHOWN HEREON ARE BASED ON TIES MADE IN THE FIELD TO VISIBLE UTILITY STRUCTURES. NO PG&E PLANS WERE MADE AVAILABLE AND THE EXISTENCE OF OTHER UNDERGROUND STRUCTURES INCLUDING SEPTIC TANKS IS UNKNOWN. THE ONLY OBSERVED UTILITIES WERE STORM DRAIN PIPE AND OVERHEAD TELEPHONE LINE SHOWN. THE EXISTENCE OF OTHER UTILITIES, IF ANY, IS UNKNOWN.
7. ONLY TREES GREATER THAN 12 INCHES IN DIAMETER WERE LOCATED - OTHER TREES EXIST IN SURVEYED AREA AND ARE NOT SHOWN. TREE LOCATIONS ARE APPROXIMATE AS NOT ALL ARE GROWING VERTICALLY; GENERALLY TREES ARE LOCATED AT BREAST HEIGHT.

GENERAL NOTES

1. CONTRACTOR MUST COMPLY WITH BUSINESS AND PROFESSIONS CODE SECTION 8771 (b) REGARDING REFERENCING, PRESERVING AND RECONSTRUCTING SURVEY MONUMENTS, WHETHER OR NOT SURVEY MONUMENTS ARE SHOWN IN THESE PLANS.
2. IF SURVEY MONUMENT IS DAMAGED BY CONTRACTORS OPERATIONS, CONTRACTOR SHALL REPLACE SURVEY MONUMENT AT CONTRACTORS EXPENSE.

LEGEND

- TEMPORARY CONTROL POINT
- MATTOLE ROAD RW
- DRAINAGE RW
- TCE
- ALIGNMENT LINE

DESIGN REVISION:
1/21/22



GHD Inc.
718 Third Street
Eureka California 95501 USA
T 1 707 443 8326 F 1 707 444 8330 W www.ghd.com



BAR IS ONE INCH ON ORIGINAL DRAWING
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

ROAD NAME: MATTOLE ROAD	DESIGN SECTION: ENGINEERING
ROAD NO: F3C010	MILE POST: 5.00 & 13.67
PROJECT NO.: ER-32LO(118) & ER-32LO(240)	DESIGNED BY: S.GOULD
CONTRACT NO.: 217224 & 217219	DRAWN BY: S.GOULD
DRAWING FILE NAME: 11189791_04-CD01-SURVEY CONTROL.dwg	REVIEWED BY: J.WOLF
PLOT DATE: 01/20/2022	Sheet: C-101
	APPROVED BY: J.WOLF

COUNTY OF HUMBOLDT DEPARTMENT OF PUBLIC WORKS	
STORM DAMAGE REPAIR MATTOLE ROAD PM 5.00 & 13.67	
PM 5.00 SURVEY CONTROL PLAN	

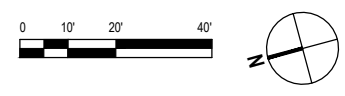
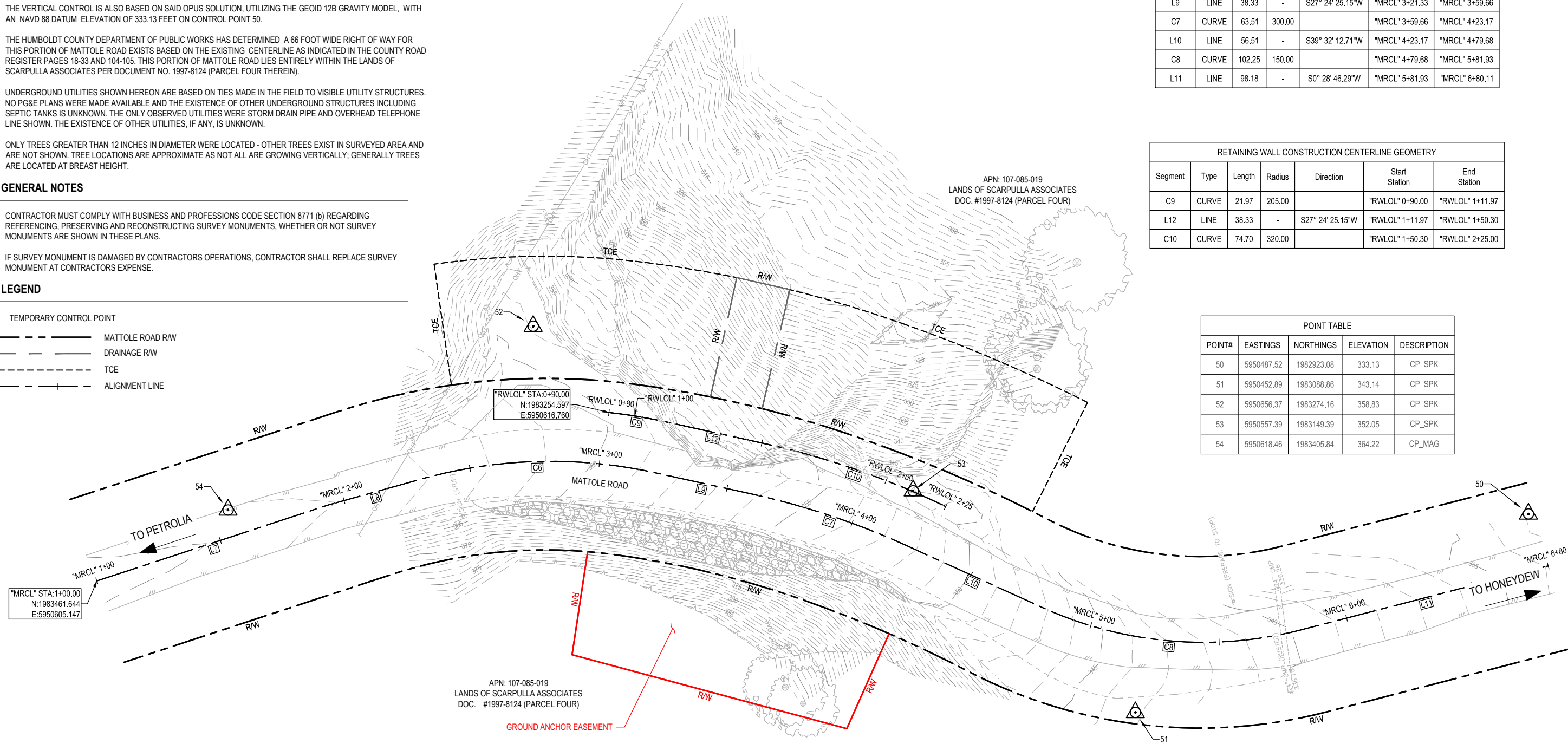
SHEET
4
OF
26

CCO No. 2
Sheet 6 of 15

Segment	Type	Length	Radius	Direction	Start Station	End Station
L7	LINE	93.29	-	S3° 10' 11.50"E	"MRCL" 1+00.00	"MRCL" 1+93.29
L8	LINE	37.55	-	S0° 36' 56.76"E	"MRCL" 1+93.29	"MRCL" 2+30.85
C6	CURVE	90.48	185.00		"MRCL" 2+30.85	"MRCL" 3+21.33
L9	LINE	38.33	-	S27° 24' 25.15"W	"MRCL" 3+21.33	"MRCL" 3+59.66
C7	CURVE	63.51	300.00		"MRCL" 3+59.66	"MRCL" 4+23.17
L10	LINE	56.51	-	S39° 32' 12.71"W	"MRCL" 4+23.17	"MRCL" 4+79.68
C8	CURVE	102.25	150.00		"MRCL" 4+79.68	"MRCL" 5+81.93
L11	LINE	98.18	-	S0° 28' 46.29"W	"MRCL" 5+81.93	"MRCL" 6+80.11

Segment	Type	Length	Radius	Direction	Start Station	End Station
C9	CURVE	21.97	205.00		"RWLOL" 0+90.00	"RWLOL" 1+11.97
L12	LINE	38.33	-	S27° 24' 25.15"W	"RWLOL" 1+11.97	"RWLOL" 1+50.30
C10	CURVE	74.70	320.00		"RWLOL" 1+50.30	"RWLOL" 2+25.00

POINT#	EASTINGS	NORTHINGS	ELEVATION	DESCRIPTION
50	5950487.52	1982923.08	333.13	CP_SPK
51	5950452.89	1983088.86	343.14	CP_SPK
52	5950656.37	1983274.16	358.83	CP_SPK
53	5950557.39	1983149.39	352.05	CP_SPK
54	5950618.46	1983405.84	364.22	CP_MAG



NOTE: FOR "MRCL" AND "RWLOL" ALIGNMENT DATA SEE SHEET 3.

DESIGN REVISION:
1/21/22



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ROAD NAME: MATTOLE ROAD	DESIGN SECTION: ENGINEERING
ROAD NO: F3C010	MILE POST: 5.00 & 13.67
PROJECT NO: ER-32LO(118) & ER-32LO(240)	DESIGNED BY: S.GOULD
CONTRACT NO: 217224 & 217219	DRAWN BY: S.GOULD
DRAWING FILE NAME: 11189791_06-C101-PLAN VIEW.dwg	REVIEWED BY: J.WOLF
PLOT DATE: 01/20/2022	Sheet: C-103
	APPROVED BY: J.WOLF

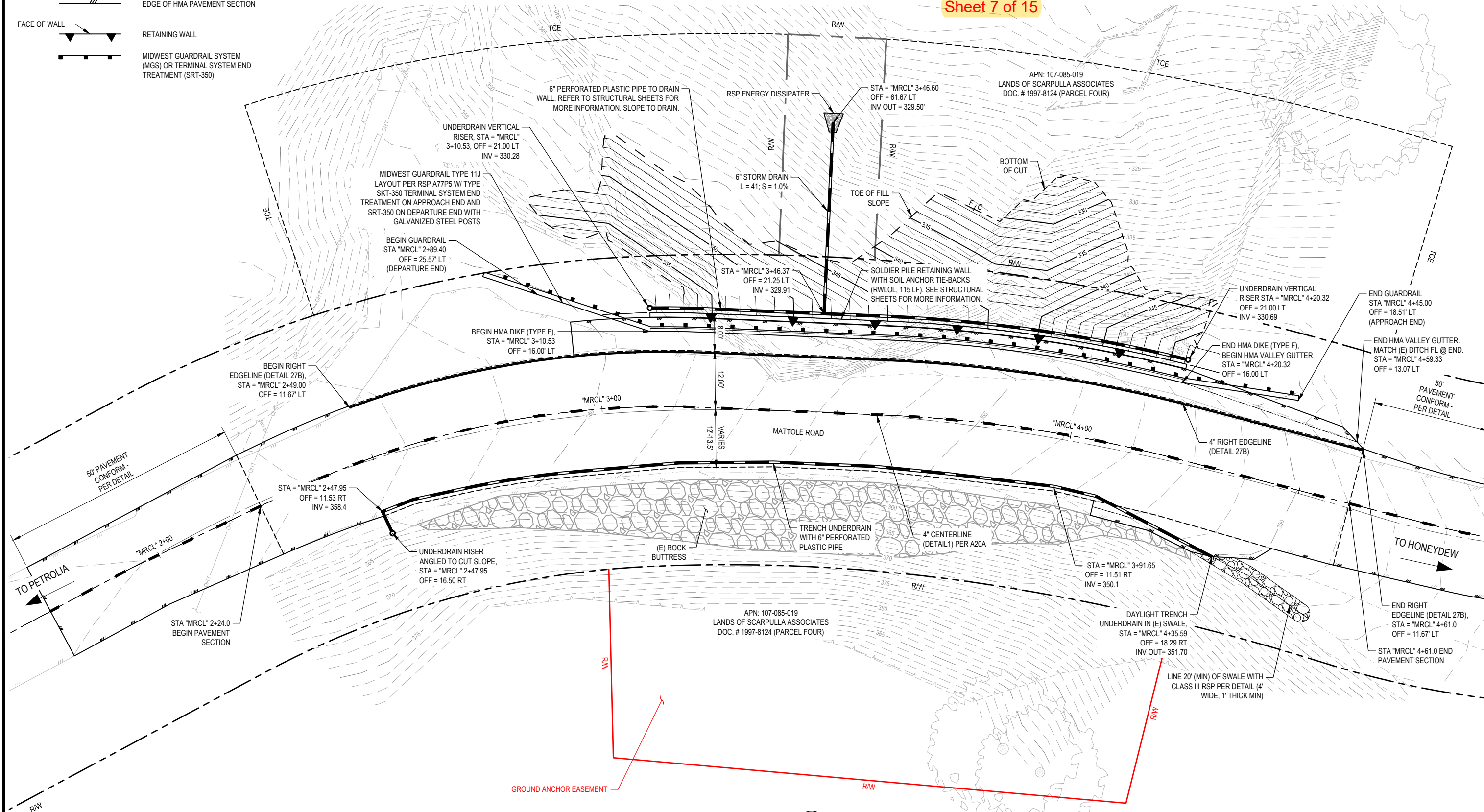
COUNTY OF HUMBOLDT DEPARTMENT OF PUBLIC WORKS	
STORM DAMAGE REPAIR MATTOLE ROAD PM 5.00 & 13.67	
PM 5.00 ROADWAY PLAN	

SHEET 6 OF 26

CCO No. 2
Sheet 7 of 15

LEGEND

- EDGE OF HMA PAVEMENT SECTION
- RETAINING WALL
- MIDWEST GUARDRAIL SYSTEM (MGS) OR TERMINAL SYSTEM END TREATMENT (SRT-350)



NOTE: THIS PLAN IS ACCURATE FOR EROSION CONTROL ONLY

DESIGN REVISION:
1/21/22



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718 Third Street
Eureka California 95501 USA
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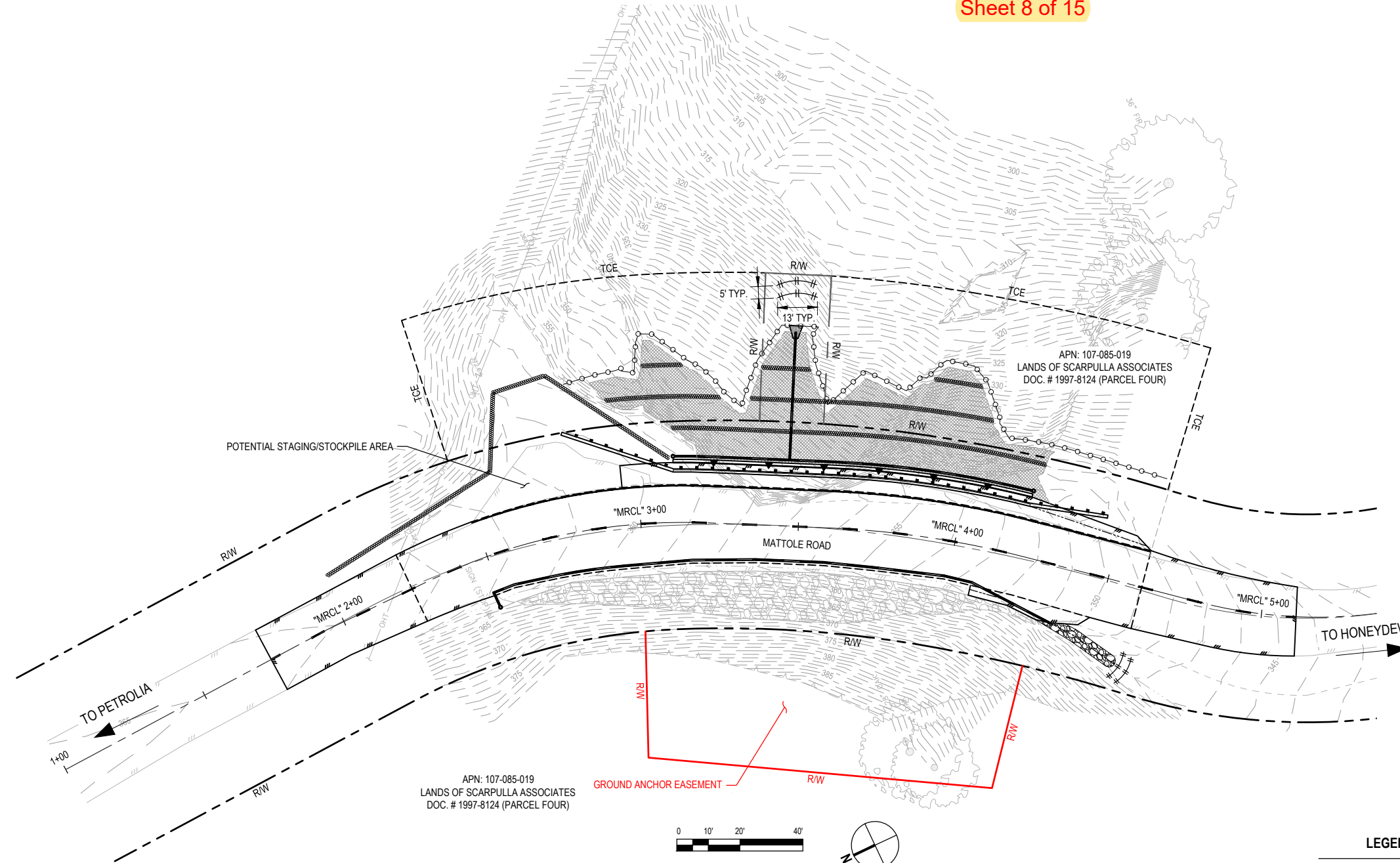
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ROAD NO: F3C010	MILE POST: 5.00 & 13.67
PROJECT NO.: ER-32LO(118) & ER-32LO(240)	DESIGNED BY: S.GOULD
CONTRACT NO.: 217224 & 217219	DRAWN BY: S.GOULD
DRAWING FILE NAME: 11189791_08-C104-EROSION CONTROL PLAN.dwg	REVIEWED BY: J.WOLF
PLOT DATE: 01/20/2022	Sheet: C-105
	APPROVED BY: J.WOLF

COUNTY OF HUMBOLDT DEPARTMENT OF PUBLIC WORKS
STORM DAMAGE REPAIR MATTOLE ROAD PM 5.00 & 13.67
PM 5.00 EROSION CONTROL PLAN

SHEET 8 OF 26

CCO No. 2
Sheet 8 of 15



LEGEND

	HAND SOWN SEED UNDER ROLLED EROSION CONTROL PRODUCT
	TEMPORARY CHECK DAMS
	TEMPORARY SILT FENCE
	FIBER ROLLS

CURVE TABLE						
CURVE #	BC TANGENT BEARING	RADIUS	DELTA	TANGENT	LENGTH	EC TANGENT BEARING
1	S 24°03'41" W	205.00	3°20'44"	5.99'	11.97'	S 27°24'25" W
3	S 27°24'25" W	320.00	11°35'05"	32.46'	64.70'	S 38°59'30" W

DESIGN REVISION:
1/21/22



BIGGS CARDOSA ASSOCIATES INC
BCA
STRUCTURAL ENGINEERS
1111 Broadway, Ste. 1510
Oakland, California 94607
510-625-9900

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CONTRACT NO.: 217224 & 217219	DRAWN BY: SMH
DRAWING FILE NAME: 20190481S101	REVIEWED BY: GPK
PLOT DATE: 1/20/2022	SHEET: S101
	APPROVED BY: AWR

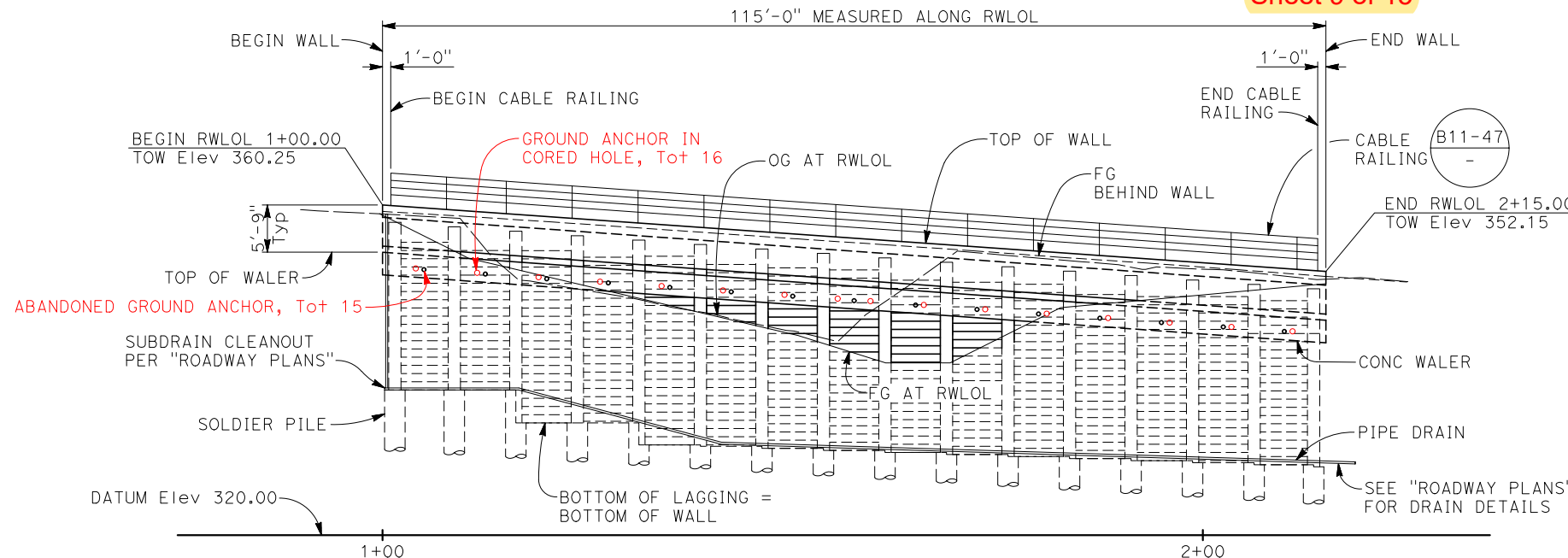
COUNTY OF HUMBOLDT DEPARTMENT OF PUBLIC WORKS
STORM DAMAGE REPAIR MATTOLE ROAD PM 5.00 & 13.67
PM 5.00 RETAINING WALL GENERAL PLAN

SHEET
10
OF
26

CCO No. 2
Sheet 9 of 15

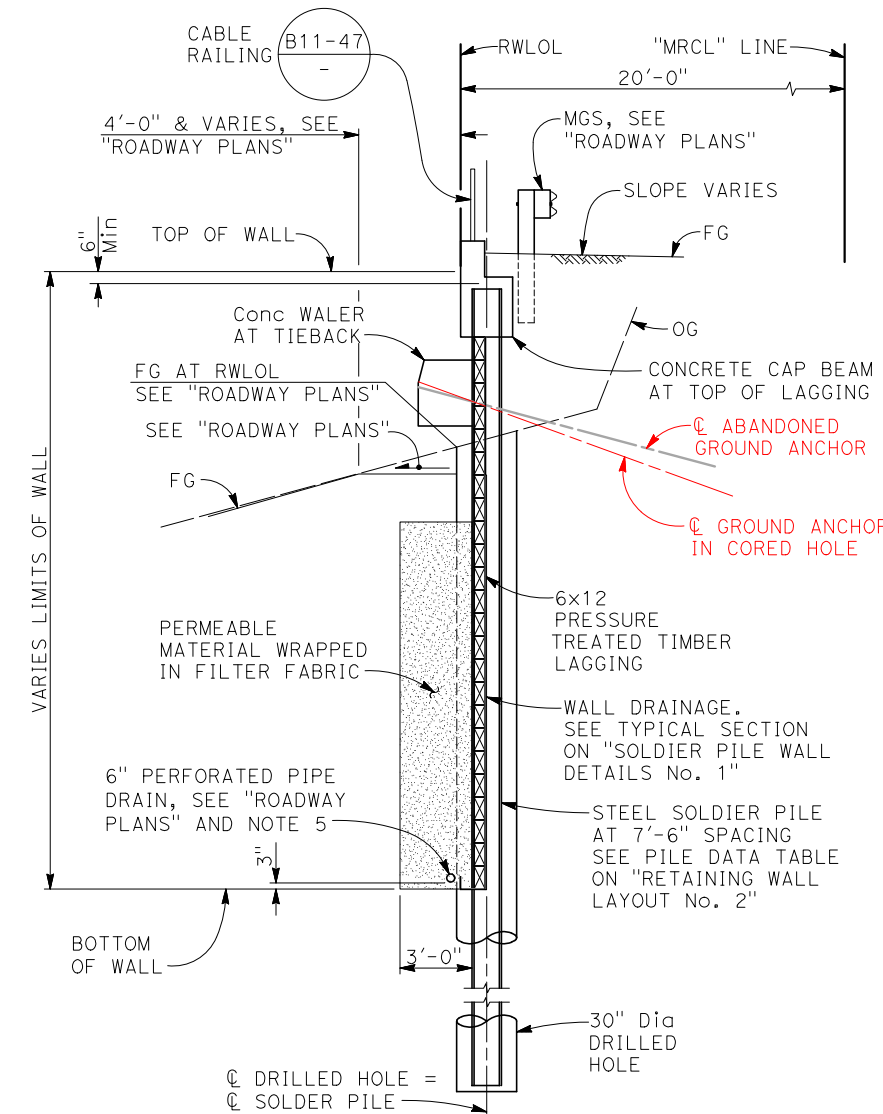
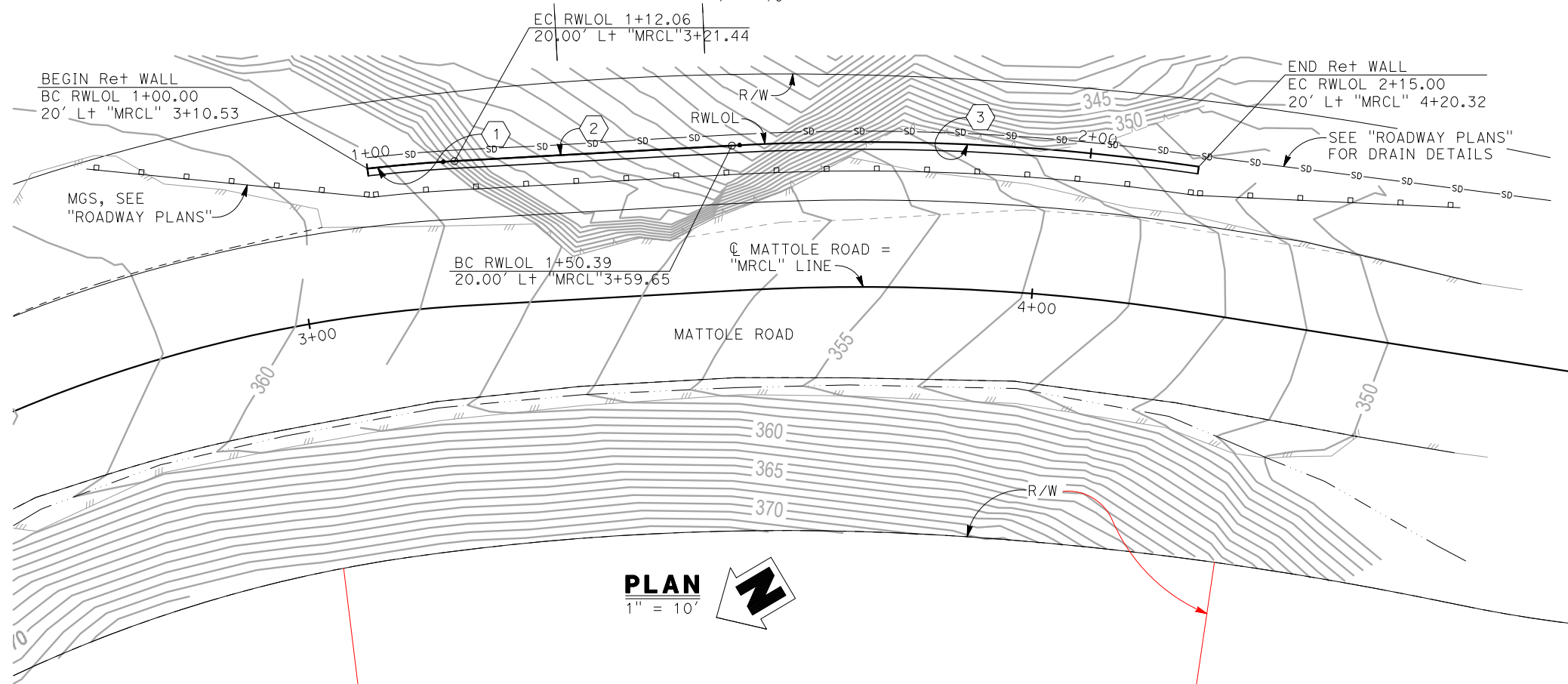
LINE TABLE		
LINE #	LENGTH	DIRECTION
2	38.33	S 27°24'25" W

- NOTES:
- Top of wall elevations shown are based on "ROADWAY PLANS". Verify elevations with "ROADWAY PLANS" prior to construction.
 - See "ROADWAY PLANS" for right-of-way, utility, drainage, roadway and layout information not noted.
 - Install cable railing full length of wall.
 - "MRCL" Line layout information shown is for informational purposes only, see "ROADWAY PLANS" for "MRCL" Line.
 - 6" perforated drain pipe to be 3" Cir of RWLOL. Slope drain at Min 1%.



MIRRORED DEVELOPED ELEVATION

1" = 10'



**SOLDIER PILE WALL
TYPICAL SECTION**

1/4" = 1'-0"

2019048.1 (20190481S1)



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 Oakland, California 94607
 510-625-9900

DESIGN REVISION:
 1/21/22

ROAD NAME: MATTOLE ROAD	DESIGN SECTION: ENGINEERING	COUNTY OF HUMBOLDT DEPARTMENT OF PUBLIC WORKS	SHEET 11 OF 26
ROAD NO: F3C010	MILE POST: 5.00 & 13.67	STORM DAMAGE REPAIR MATTOLE ROAD PM 5.00 & 13.67	
PROJECT NO.: ER-32L0(118) & ER-32L0(240)	DESIGNED BY: RMY	PM 5.00 STRUCTURAL GENERAL NOTES & ABBREVIATIONS	
CONTRACT NO.: 217224 & 217219	DRAWN BY: SMH		
DRAWING FILE NAME: 20190481S102	REVIEWED BY: GPK		
PLOT DATE: 1/20/2022	SHEET: S102	APPROVED BY: AWR	

GENERAL NOTES LOAD AND RESISTANCE FACTOR DESIGN

DESIGN: AASHTO LRFD Bridge Design Specifications 6th Edition with Caltrans Amendments, preface dated January 2014 and Caltrans "Trenching and Shoring Manual" (Aug 2011)
 Geotechnical Report by Crawford & Associates, Inc., September 30, 2019.

REINFORCED CONCRETE & Reinf: ASTM Designation: A706
 fy = 60,000 psi
 f'c = 4,000 psi

STRUCTURAL STEEL: Steel Piles ASTM Designation: A572/A, A572M Grade 50 Min or A992/A992M GRADE 50
 Steel Plates ASTM Designation: ASTM A572/A572M Grade 50
 Concrete Anchors AWS D1.1
 Welding AWS D1.1

SOIL PARAMETERS: UNIT WEIGHT (γ) = 130 pcf
 Active Earth Pressure = 41 pcf
 Passive Earth Pressure = 2800 pcf "INTACT" MATERIAL
 Passive Arching Capability = 3.0
 Seismic Earth Pressure = 16H pcf
 Max Passive Pressure = 8,000 psf

LIVE LOAD Live Load Surcharge = 250 psf

TIMBER LAGGING: PRESSURE TREATED Douglas Fir No. 1 & Better, TIMBER TO BE FULL SAWN

PRESTRESSING STEEL:

Bars - ASTM Designation: A722 Type II (150 ksi)

Strand Tendons-ASTM Designation: A416
 (270 Ksi Low Relaxation steel)

FDL = Factored Design Load on Ground Anchor (kips)

FTL = Factored Test Load per anchor (Kips) = 1.0 FDL

LL = Lock-off Load (Kips) = 0.55 FDL

fpu = Minimum tensile strength of prestressing steel

As = Minimum cross sectional area of prestressing steel in ground anchor (square inch)

$$As(\text{Min}) = \frac{1.0 \text{ FTL}}{0.75 \text{ fpu}} \text{ (Strands)}$$

$$As(\text{Min}) = \frac{1.0 \text{ FTL}}{0.80 \text{ fpu}} \text{ (Bars)}$$

For FDL, see "GROUND ANCHOR DATA TABLE" on "RETAINING WALL LAYOUT No. 2" sheet

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 Sheet 10 of 15

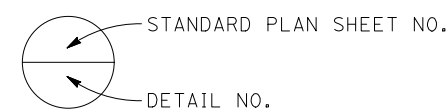
INDEX TO SOLDIER PILE WALL PLANS

SHEET NO.	TITLE
10	S101 PM 5.00 RETAINING WALL GENERAL PLAN
11	S102 PM 5.00 STRUCTURAL GENERAL NOTES & ABBREVIATIONS
12	S103 PM 5.00 RETAINING WALL LAYOUT No. 1
13	S104 PM 5.00 RETAINING WALL LAYOUT No. 2
14	S105 PM 5.00 SOLDIER PILE WALL DETAILS No. 1
15	S106 PM 5.00 SOLDIER PILE WALL DETAILS No. 2
16	S107 PM 5.00 GROUND ANCHOR DETAILS

2018 STANDARD PLANS

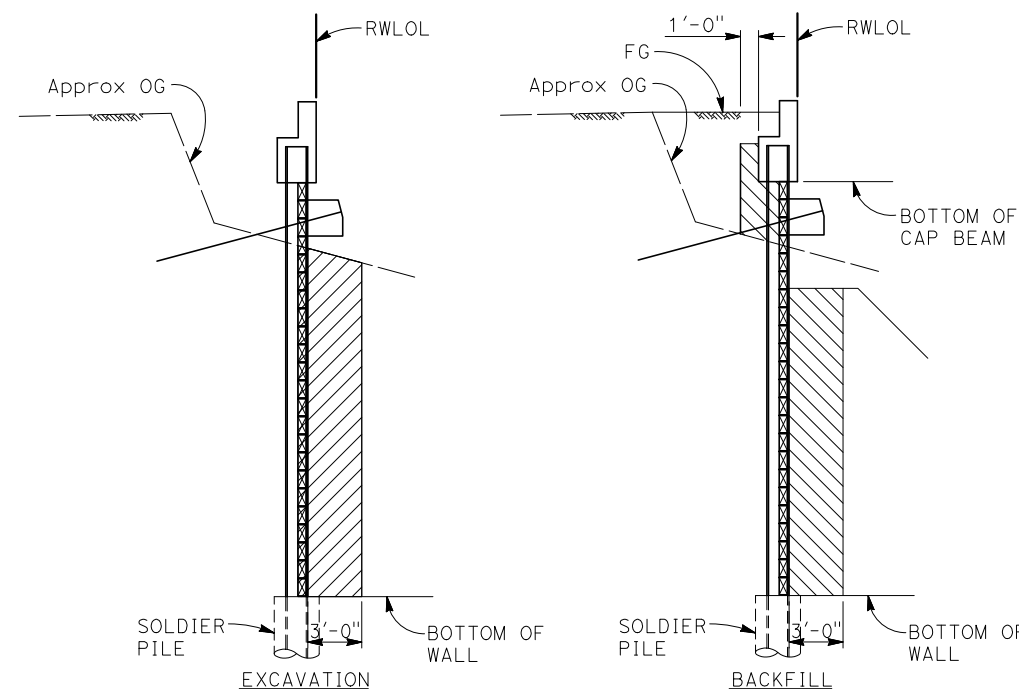
A3A	ABBREVIATIONS (SHEET 1 OF 3)
A3B	ABBREVIATIONS (SHEET 2 OF 3)
A3C	ABBREVIATIONS (SHEET 3 OF 3)
A10A	LEGEND - LINES AND SYMBOLS (SHEET 1 OF 5)
A10B	LEGEND - LINES AND SYMBOLS (SHEET 2 OF 5)
A10C	LEGEND - LINES AND SYMBOLS (SHEET 3 OF 5)
A10D	LEGEND - LINES AND SYMBOLS (SHEET 4 OF 5)
A10E	LEGEND - LINES AND SYMBOLS (SHEET 5 OF 5)
B0-3	BRIDGE DETAILS
B11-47	CABLE RAILING
D102	UNDERDRAINS

LEGEND



ABBREVIATIONS

CL	CENTER LINE
BOW	BOTTOM OF WALL
D/S	DOWN STATION
RWL	RETAINING WALL LAYOUT LINE
TOW	TOP OF WALL
U/S	UP STATION
GPR	GROUND PENETRATING RADAR



- STRUCTURE EXCAVATION (RETAINING WALL)
- STRUCTURE BACKFILL (SOLDIER PILE WALL)

SOLDIER PILE WALL

LIMITS OF PAYMENT FOR STRUCTURE EXCAVATION AND BACKFILL (SOLDIER PILE WALL)

NO SCALE

FINISH COAT ON ALL PILE SURFACES. LIMITS OF FINISH COAT EXTENDS FROM TOP OF PILE TO 5 FEET BELOW BOTTOM OF LAGGING FOR SOLDIER PILE, TYP



UNDERCOAT ON ALL PILE SURFACES, TYP

LIMITS OF CLEAN AND PAINT STEEL SOLDIER PILE

NO SCALE

DESIGN REVISION:
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BAR IS ONE INCH ON ORIGINAL DRAWING	ROAD NAME: MATTOLE ROAD	DESIGN SECTION: COUNTY OF HUMBOLDT DEPARTMENT OF PUBLIC WORKS	SHEET 12 OF 26
	ROAD NO: F3C010	MILE POST: 5.00 & 13.67	
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	PROJECT NO.: ER-32LO(118) & ER-32LO(240)	DESIGNED BY: RMY	STORM DAMAGE REPAIR MATTOLE ROAD PM 5.00 & 13.67
	CONTRACT NO.: 217224 & 217219	DRAWN BY: SMH	
	DRAWING FILE NAME: 20190481S103	REVIEWED BY: GPK	
	PLOT DATE: 1/20/2022	SHEET: S103	APPROVED BY: AWR

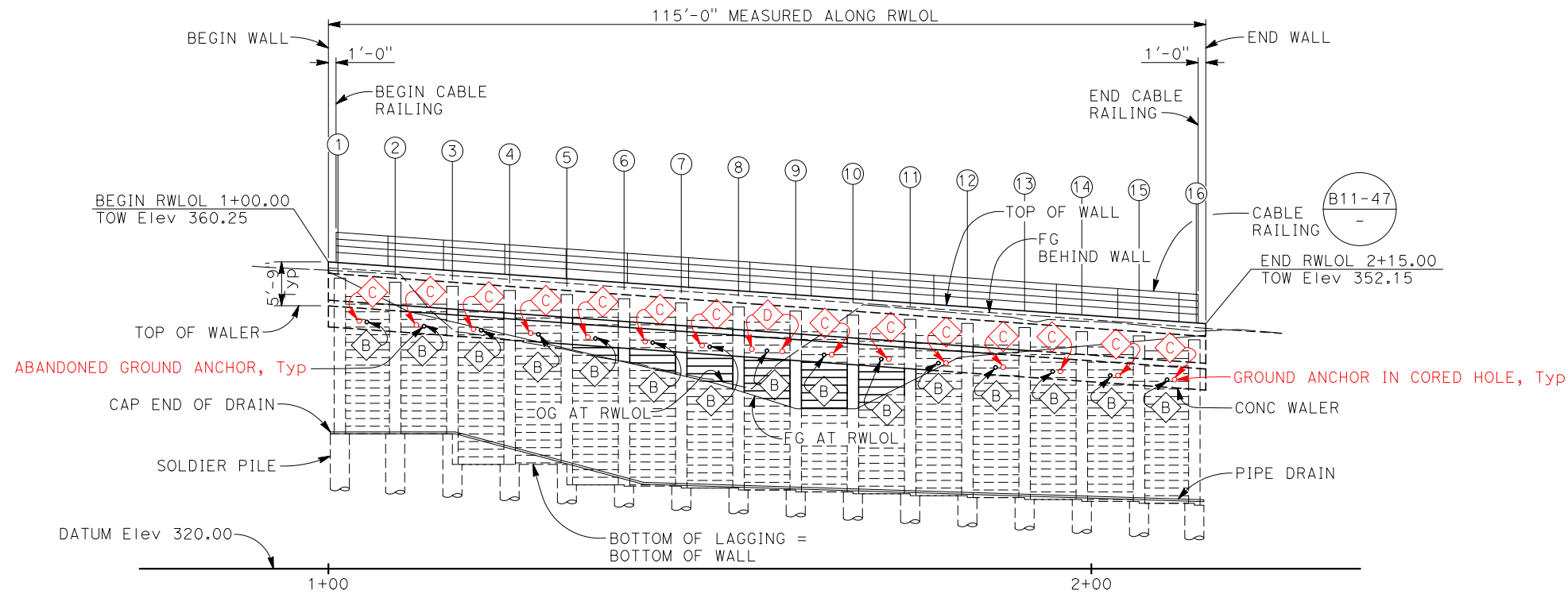
CCO No. 2
Sheet 11 of 15

LEGEND:

- ① Indicates Solder Pile No., see "PILE DATA TABLE"
- ⬡ Indicates GROUND ANCHOR TYPE, SEE "GROUND ANCHOR DATA TABLE"

NOTE:

1. Top of wall elevations shown are based on "ROADWAY PLANS", verify elevations with "ROADWAY PLANS" prior to construction.



MIRRORED DEVELOPED ELEVATION - PILE LAYOUT

1" = 10'



BAR IS ONE INCH ON ORIGINAL DRAWING
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

ROAD NAME: MATTOLE ROAD	DESIGN SECTION ENGINEERING
ROAD NO: F3C010	MILE POST: 5.00 & 13.67
PROJECT NO.: ER-32LO(118) & ER-32LO(240)	DESIGNED BY: RMY
CONTRACT NO.: 217224 & 217219	DRAWN BY: SMH
DRAWING FILE NAME: 20190481S104	REVIEWED BY: GPK
PLOT DATE: 1/20/2022	SHEET: S104
	APPROVED BY: AWR

COUNTY OF HUMBOLDT DEPARTMENT OF PUBLIC WORKS	SHEET 13 OF 26
STORM DAMAGE REPAIR MATTOLE ROAD PM 5.00 & 13.67	
PM 5.00 RETAINING WALL LAYOUT No. 2	

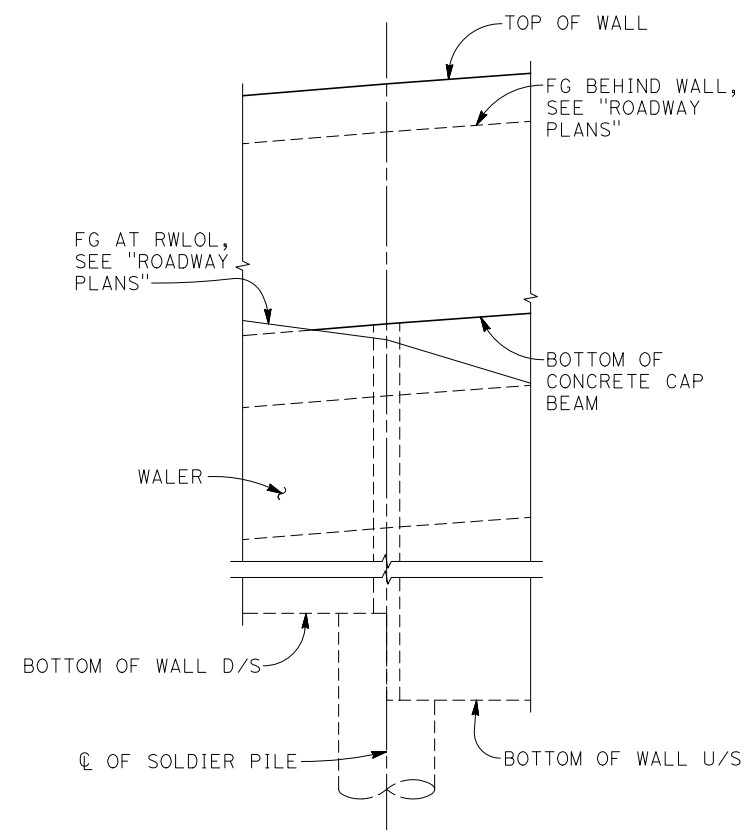
PILE DATA TABLE

PILE #	RWLOL STATION (FT)	PILE SECTION (FT)	TOP OF WALL ELEVATION (FT), SEE NOTE 1	DRILLED HOLE SIZE (IN)	PILE CUTOFF ELEVATION (FT)	BOTTOM OF WALL ELEVATION (FT), SEE (1) S104		PILE LENGTH (FT)	PILE TIP ELEVATION (FT)
						D/S	U/S		
BEGIN WALL	1+00.00	-	360.25	-	-	-	-	-	-
(1)	1+01.25	W16x100	360.16	30	358.16	-	337.71	45	313.16
(2)	1+08.75	W16x100	359.63	30	357.63	337.71	337.71	45	312.63
(3)	1+16.25	W16x100	359.11	30	357.11	337.71	333.68	45	312.11
(4)	1+23.75	W16x100	358.58	30	356.58	333.68	333.68	45	311.58
(5)	1+31.25	W16x100	358.05	30	356.05	333.68	331.00	45	311.05
(6)	1+38.75	W16x100	357.52	30	355.52	331.00	330.83	45	310.52
(7)	1+46.25	W16x100	356.99	30	354.99	330.83	330.58	45	309.99
(8)	1+53.75	W16x100	356.46	30	354.46	330.58	330.33	45	309.46
(9)	1+61.25	W16x100	355.94	30	353.94	330.33	330.08	45	308.94
(10)	1+68.75	W16x100	355.41	30	353.41	330.08	329.83	45	308.41
(11)	1+76.25	W16x100	354.88	30	352.88	329.83	329.58	45	307.88
(12)	1+83.75	W16x100	354.35	30	352.35	329.58	329.33	45	307.35
(13)	1+91.25	W16x100	353.82	30	351.82	329.33	329.08	45	306.82
(14)	1+98.75	W16x100	353.29	30	351.29	329.08	328.83	45	306.29
(15)	2+06.25	W16x100	352.77	30	350.77	328.83	328.58	45	305.77
(16)	2+13.75	W16x100	352.24	30	350.24	328.58	-	45	305.24
END WALL	2+15.00	-	352.15	-	-	-	-	-	-

- NOTES:
- Top of Wall elevations shown are based on "ROADWAY PLANS", verify elevations with "ROADWAY PLANS" prior to construction. Notify Engineer if top of wall elevations are higher than shown on plans.
 - Per the Geotechnical report by Crawford & Associates, Inc., dated April 2019, the ground anchor unbonded length shall extend at least 5 feet or H/5, whichever is greater (H = wall Height), beyond the "intact" material.
 - Abandon TYPE "B" ANCHORS. Remove nut on threaded bar to fully de-stress the anchors. Install anchorage enclosure and grout.
 - Where the anchor bond spacing is 4 foot or less, a strength reduction factor (to be determined by the contractor) shall be applied to the bond strength of the individual ground anchors to account for anchor load-transfer interaction.

- LEGEND:
- (1) Indicates Soldier Pile No., see "PILE DATA TABLE"
 - (B) Indicates GROUND ANCHOR TYPE

GROUND ANCHOR TYPE	FACTORED DESIGN LOAD, FDL (kips)	MINIMUM UNBONDED LENGTH (FT) SEE NOTE 2
(B)	SEE NOTE 3	SEE NOTE 3
(C)	185	26'-0"
(D)	145 SEE NOTE 4	26'-0"



DETAIL (1) S104
1/2" = 1'-0"

DESIGN REVISION:
1/21/22

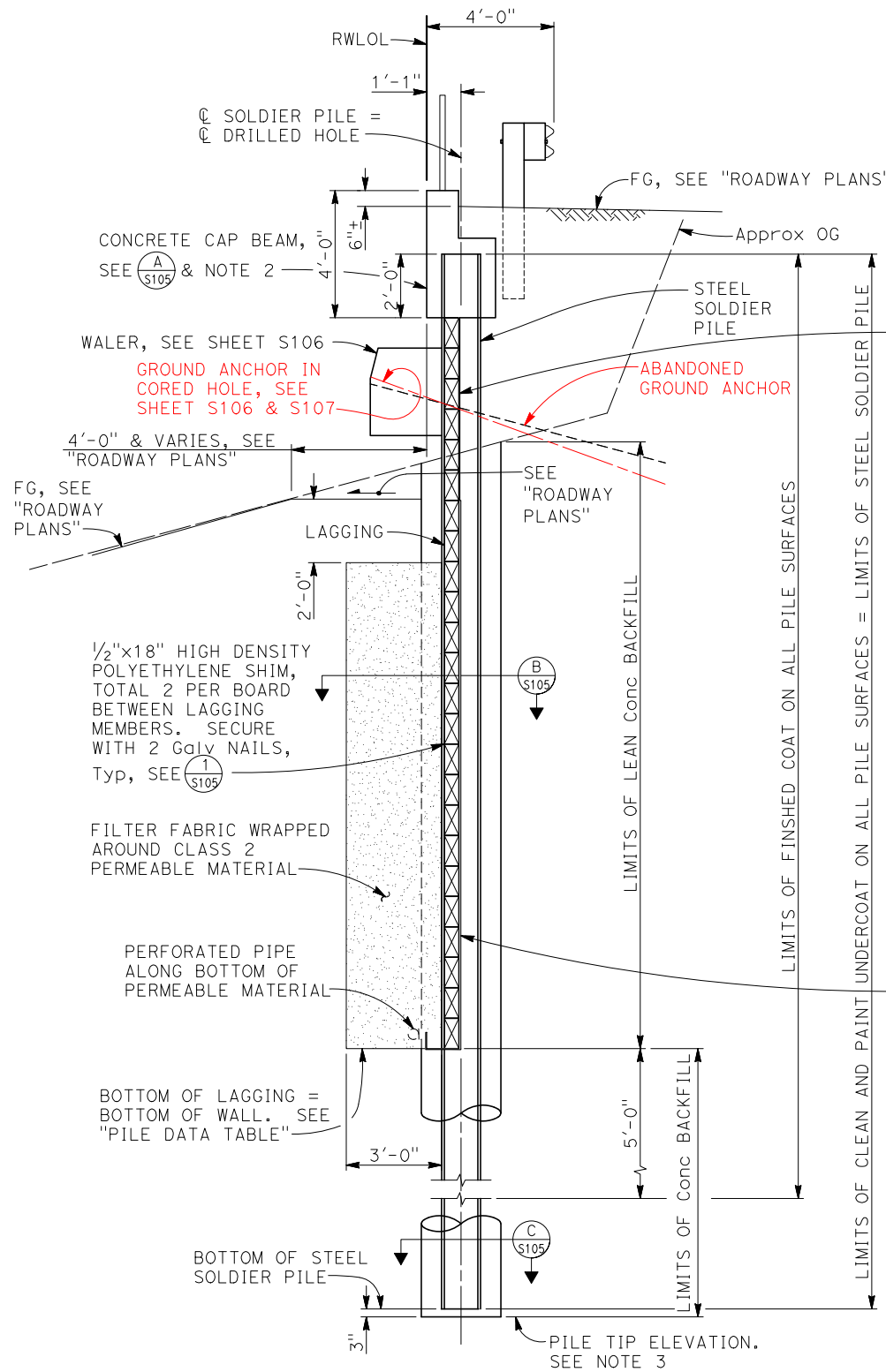


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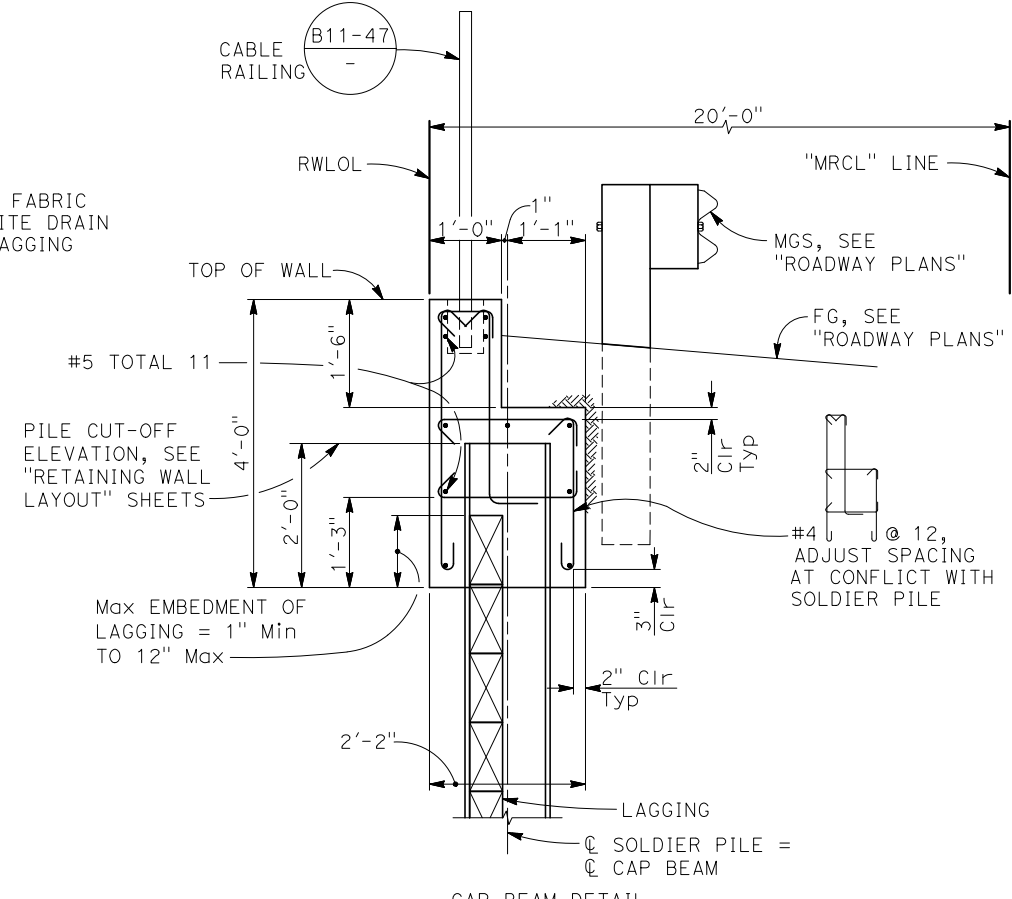
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	MILE POST: 5.00 & 13.67	STORM DAMAGE REPAIR MATTOLE ROAD PM 5.00 & 13.67	
DESIGNED BY: RMY DRAWN BY: SMH REVIEWED BY: GPK APPROVED BY: AWR	SHEET: S105		PM 5.00 SOLDIER PILE WALL DETAILS No. 1

- NOTES:
1. For "Pile Data Table", see "RETAINING WALL LAYOUT No. 2" sheet
2. Concrete cap beam must be $f'c = 3.6$ ksi @ 28 days.

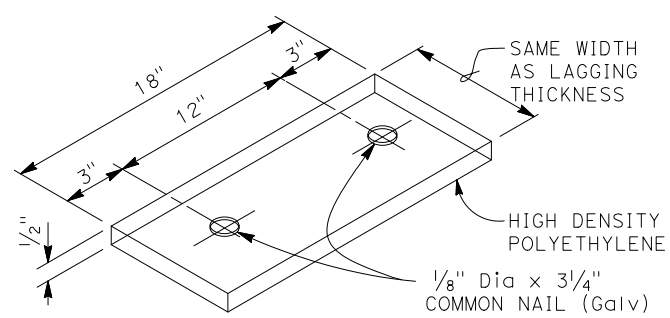
CCO No. 2
Sheet 13 of 15



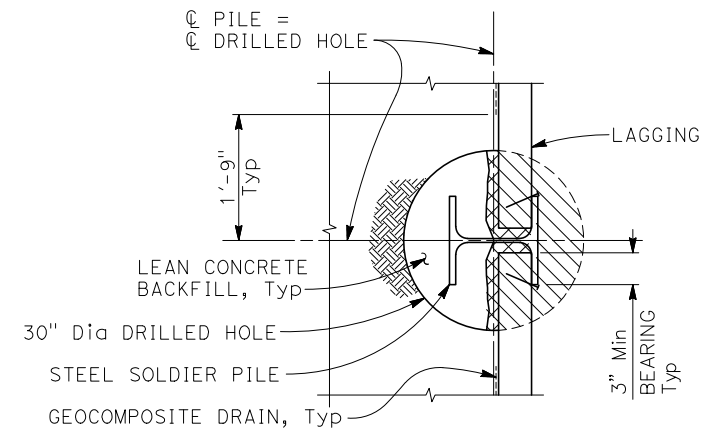
TYPICAL SECTION
3/8" = 1'-0"



SECTION A
3/4" = 1'-0"

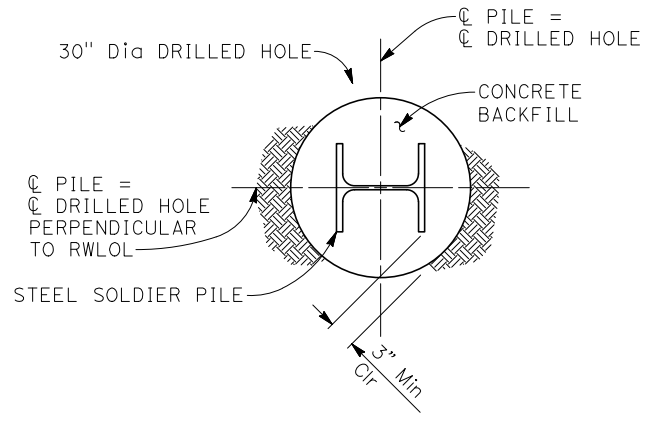


SHIM DETAIL
NO SCALE
1
S105



SECTION AT LAGGING
3/4" = 1'-0"

- LEAN CONCRETE TO BE CHIPPED AWAY AS REQUIRED FOR LAGGING INSTALLATION
- LIMITS OF FILL WITH STRUCTURAL BACKFILL AFTER LAGGING INSTALLATION



SECTION AT DRILLED HOLE
3/4" = 1'-0"

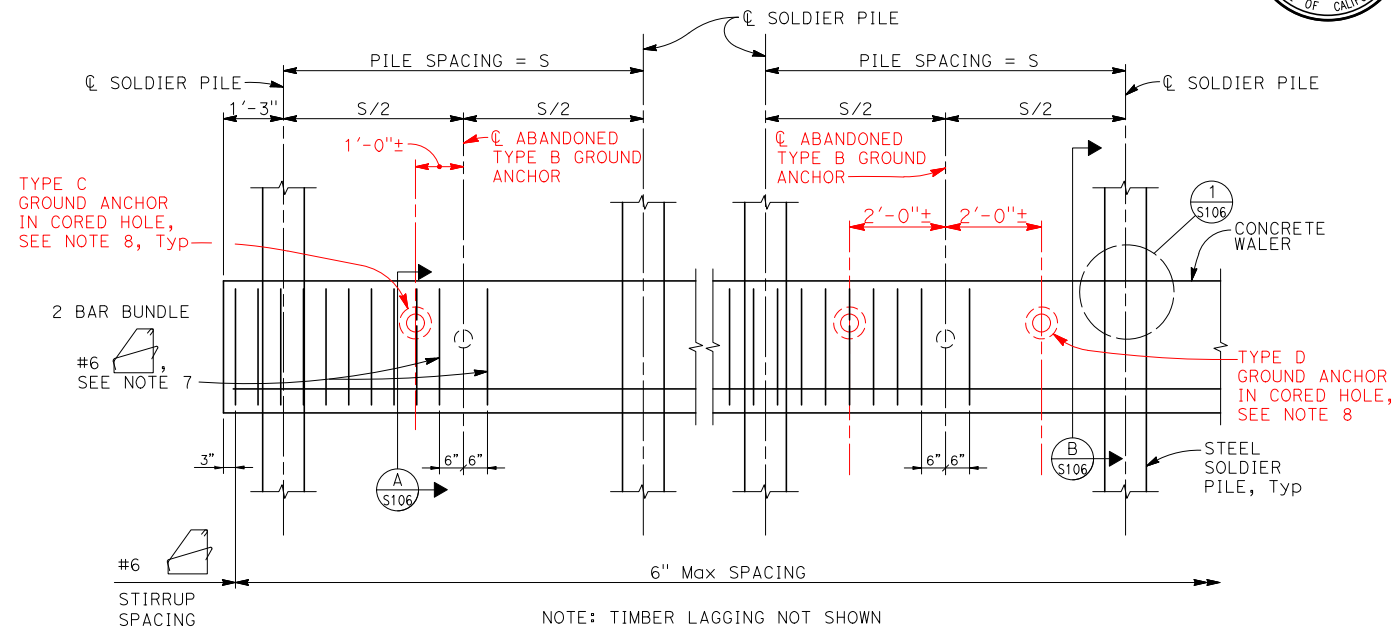


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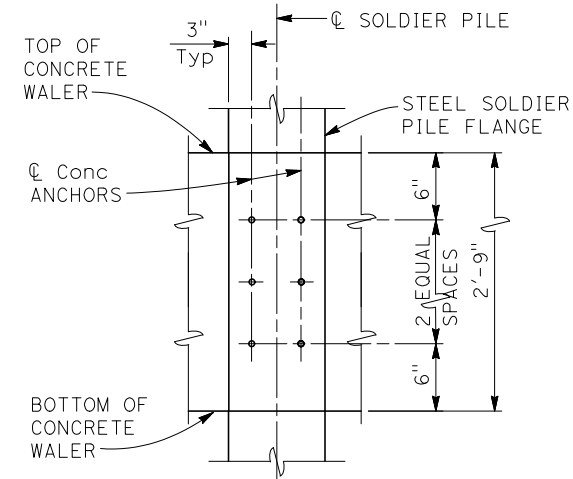
ROAD NAME: MATTOLE ROAD	DESIGN SECTION: ENGINEERING	COUNTY OF HUMBOLDT DEPARTMENT OF PUBLIC WORKS	SHEET 15 OF 26
ROAD NO: F3C010	MILE POST: 5.00 & 13.67	STORM DAMAGE REPAIR MATTOLE ROAD PM 5.00 & 13.67	
PROJECT NO.: ER-32LO(118) & ER-32LO(240)	DESIGNED BY: RMY	PM 5.00 SOLDIER PILE WALL DETAILS No. 2	
CONTRACT NO.: 217224 & 217219	DRAWN BY: SMH		
DRAWING FILE NAME: 20190481S106	REVIEWED BY: GPK		
PLOT DATE: 1/20/2022	SHEET: S106	APPROVED BY: AWR	

CCO No. 2
 Sheet 14 of 15



WALER PART ELEVATION

1/2" = 1'-0"

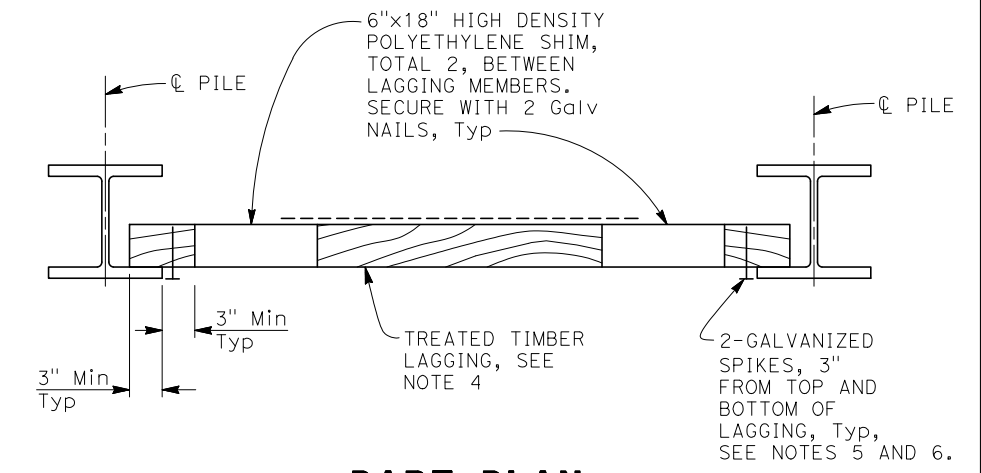


DETAIL 1

NO SCALE

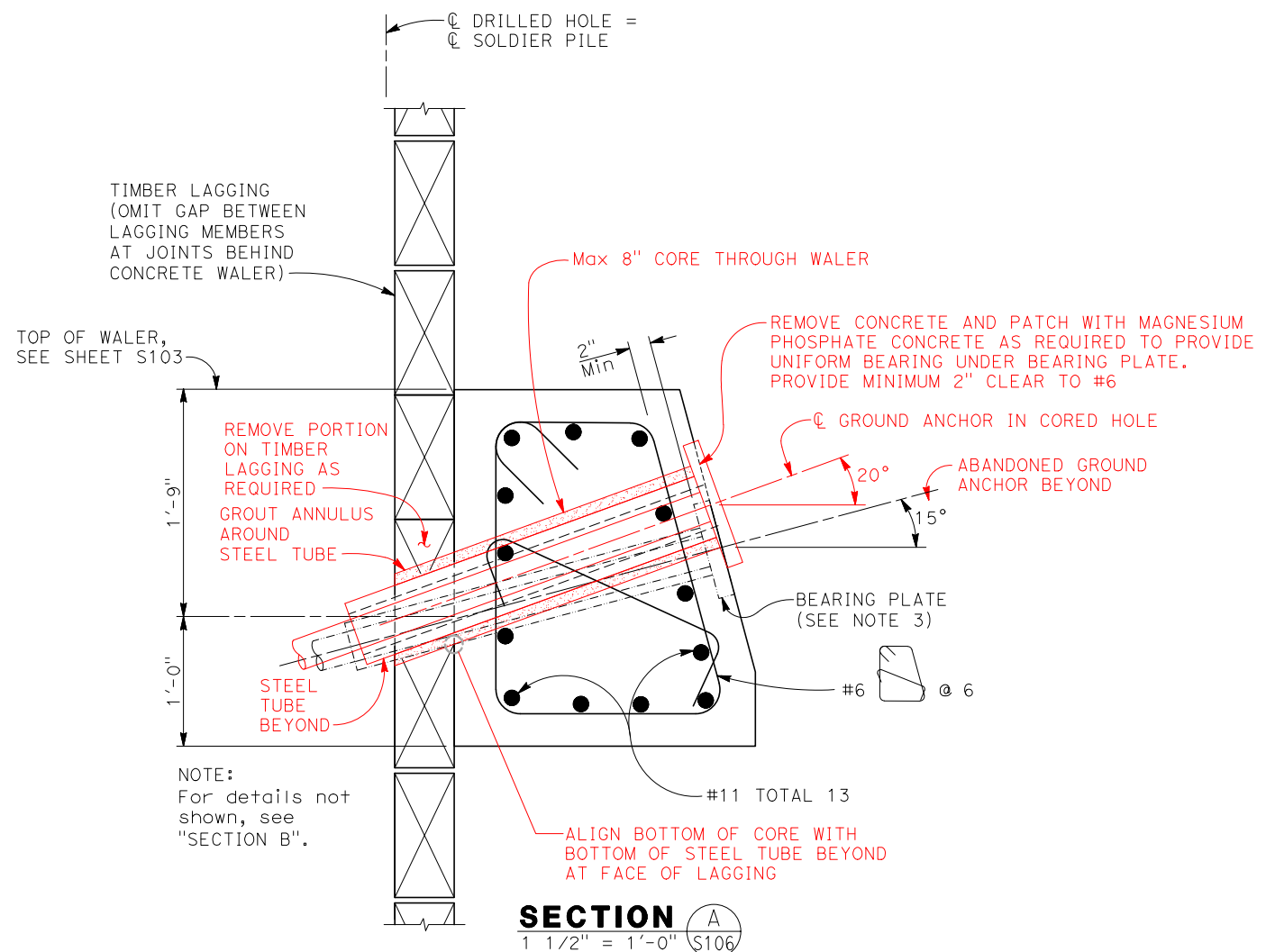
1
S106

- NOTES:
1. For concrete waler location, see "SOLDIER PILE WALL SECTION" shown on "SOLDIER PILE WALL DETAILS" sheet.
 2. Concrete walers may be poured to face of lagging.
 3. Bearing plates may be recessed or on face of concrete waler.
 4. No clipping of timber lagging corners allowed.
 5. Use 40d Galv wire spikes for 6x12 lagging.
 6. Spikes shall not be bent.
 7. Place stirrups 1/2" clear of anchorage tube.
 8. Prior to coring, locate existing stirrups by GPR scanning or similar method. Relocate core horizontally maximum 2" so core will only cut one #6 stirrup.



PART PLAN

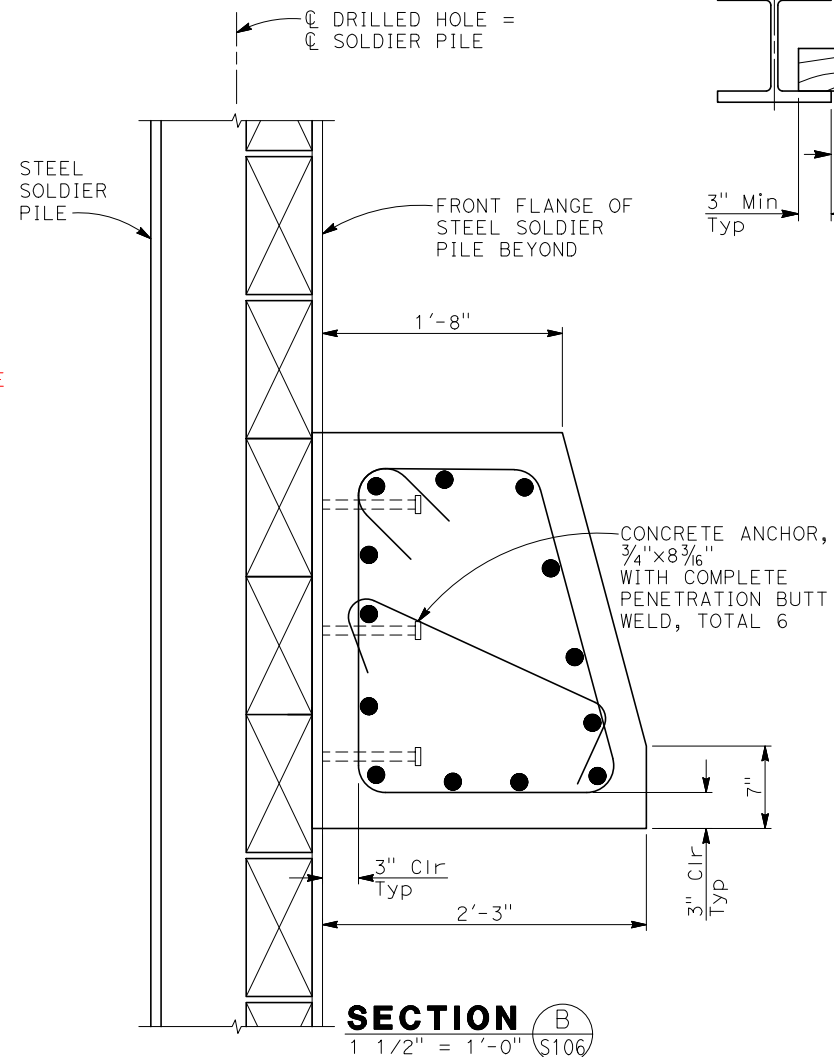
NO SCALE



SECTION A

1 1/2" = 1'-0"

A
S106



SECTION B

1 1/2" = 1'-0"

B
S106

2019048.1 (20190481S6)



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ROAD NAME: MATTOLE ROAD	DESIGN SECTION: ENGINEERING	COUNTY OF HUMBOLDT DEPARTMENT OF PUBLIC WORKS	SHEET 16 OF 26
ROAD NO: F3C010	MILE POST: 5.00 & 13.67	STORM DAMAGE REPAIR MATTOLE ROAD PM 5.00 & 13.67	
PROJECT NO.: ER-32LO(118) & ER-32LO(240)	DESIGNED BY: RMY		
CONTRACT NO.: 217224 & 217219	DRAWN BY: JJD		
DRAWING FILE NAME: 20190481S107	REVIEWED BY: GPK		
PLOT DATE: 1/20/2022	SHEET: S107	APPROVED BY: AWR	

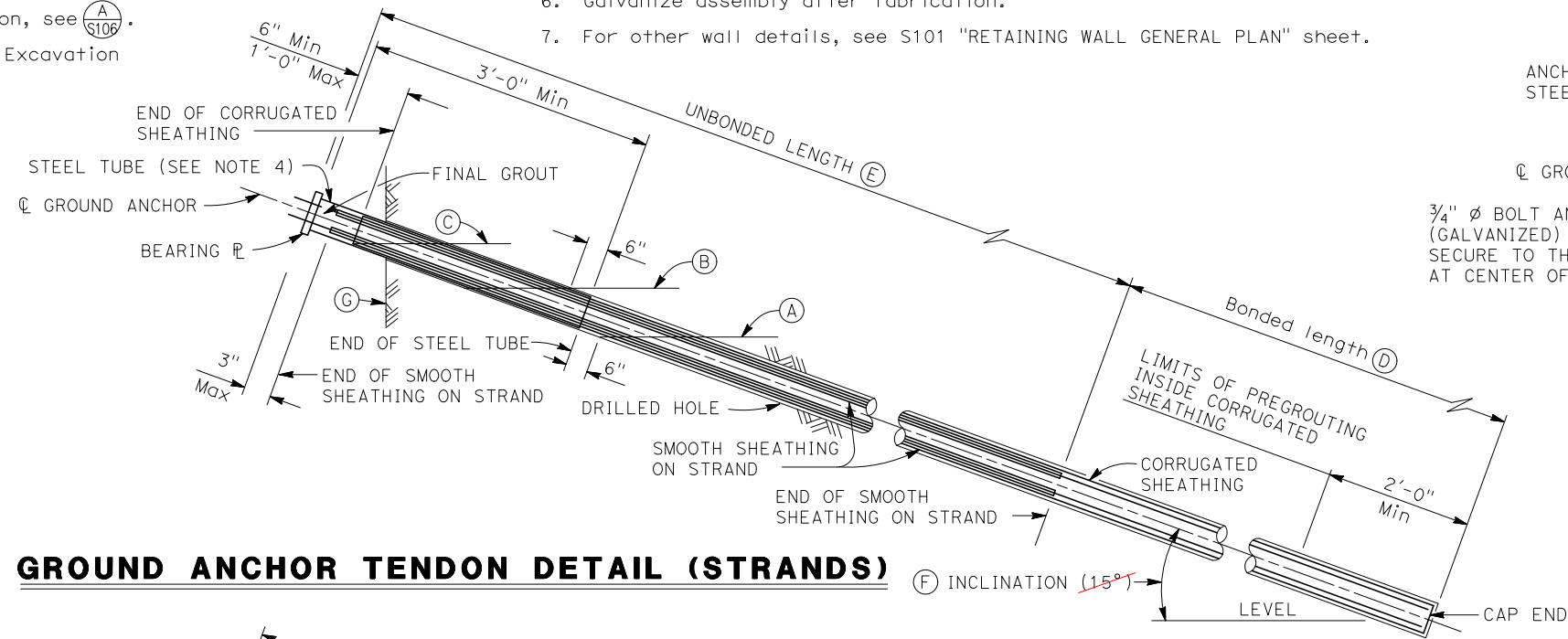
NOTES:

- (A) Level of initial grouting for drilled hole 6" in diameter or smaller
- (B) Level of secondary grouting
- (C) Level of initial grouting inside corrugated sheathing
- (D) Bonded length shall be determined by the contractor
- (E) For unbonded length, see "RETAINING WALL LAYOUT No. 2"
- (F) For inclination, see (A/S107).
- (G) Face of Wall Excavation

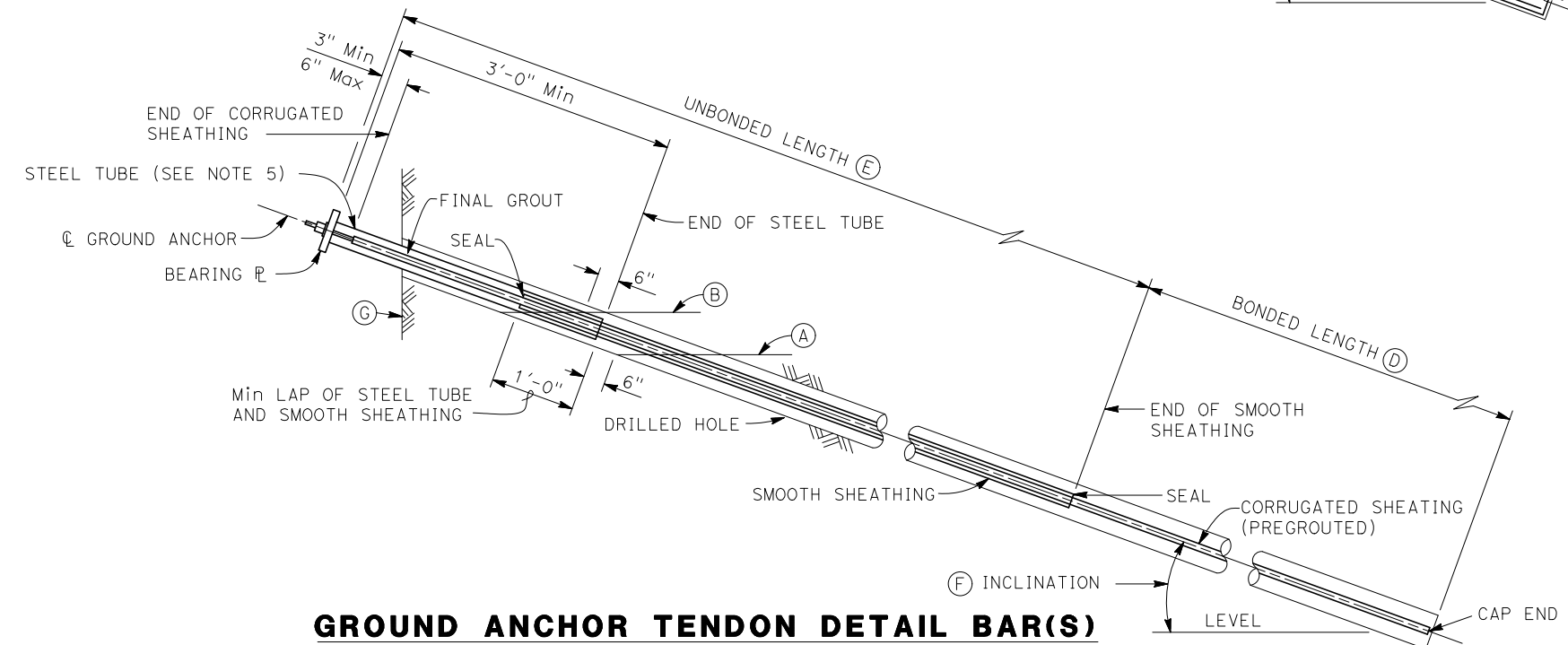
NOTES:

1. Anchorage enclosure shall only be used when anchor head assembly is not enclosed in concrete.
2. Anchorage enclosure shall have provisions to allow injecting grout at low end and venting at high end. Galvanize after fabrication.
3. Silicone sealant to cover full width of flange.
4. Steel tube (Min thickness = 1/4") welded to bearing plate. Galvanize assembly after fabrication
5. Steel tube welded to bearing plate. Inside diameter of steel tube (Min thickness = 1/4") to be 1" greater than outside diameter of smooth sheathing.
6. Galvanize assembly after fabrication.
7. For other wall details, see S101 "RETAINING WALL GENERAL PLAN" sheet.

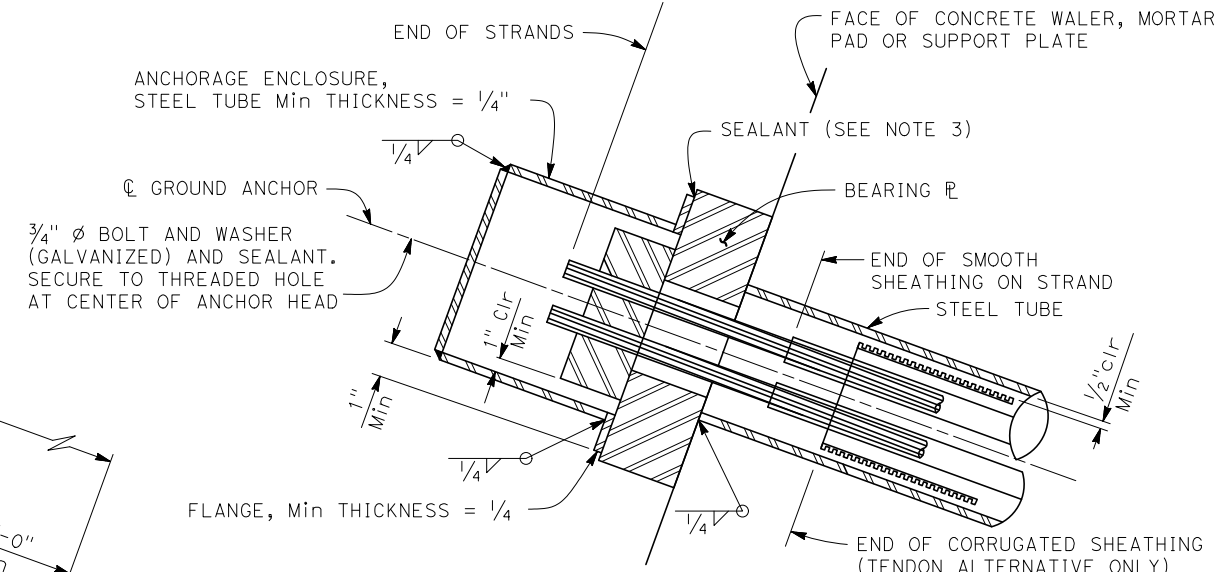
CCO No. 2
 Sheet 15 of 15



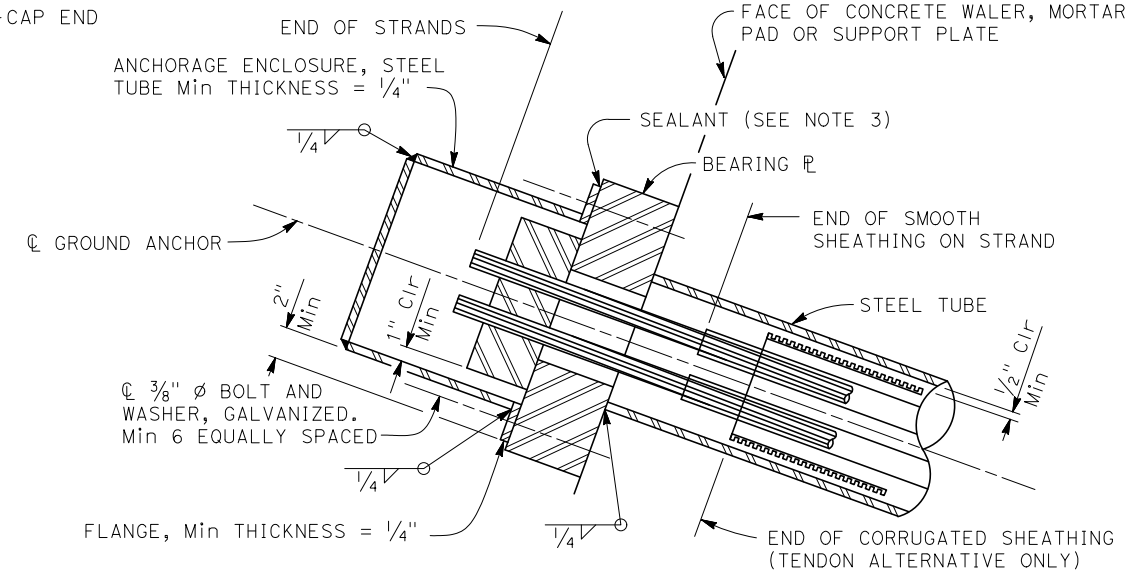
GROUND ANCHOR TENDON DETAIL (STRANDS)



GROUND ANCHOR TENDON DETAIL BAR(S)



ALTERNATIVE X



ALTERNATIVE Y

ANCHORAGE ENCLOSURE DETAILS

NOTE:
 THE CONTRACTOR MUST VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIAL

2019048.1 (20190481S1)