

# CABALLO ROJO TRAIL DESIGN REVIEW SUBMITTAL

Submitted by Access for Bikes on behalf of Marin Council Boy Scouts of America  
to the Marin County Community Development Agency

## CABALLO ROJO TRAIL

CAMP TAMARANCHO  
MOUNTAIN BIKE  
TRAIL SYSTEM

MARIN COUNTY, CALIFORNIA

## DESIGN REVIEW SUBMITTAL

### DESIGN REVIEW REQUIREMENT

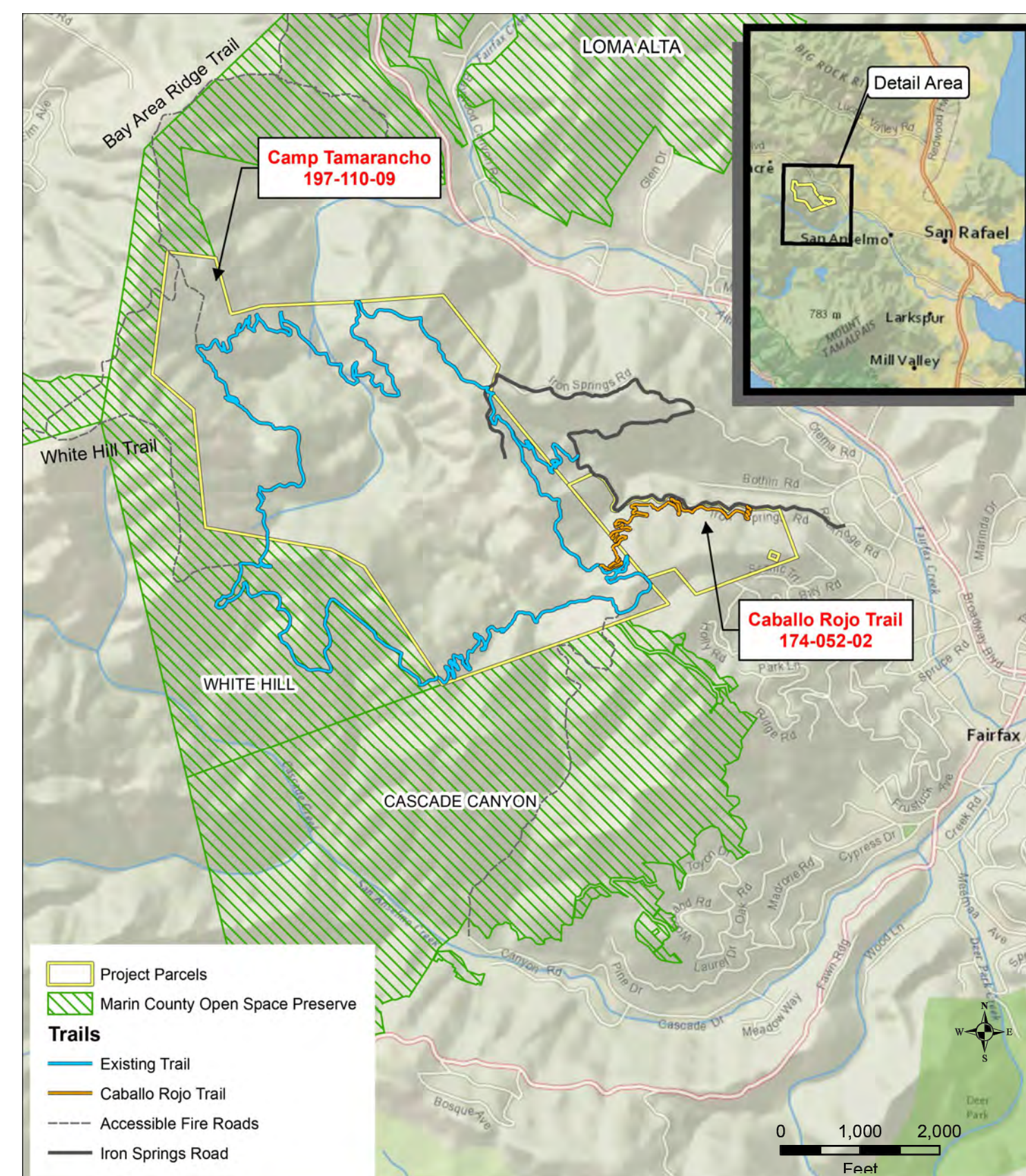
Marin County Design Review is required because the proposed 4-foot-wide by 24-foot-long trail bridge over ephemeral stream 4, will be 8 ½ feet above the top of bank, which is greater than the six-foot height limit allowed without Design Review. The proposed bridge will not be visible to neighbors nor passers-by on Iron Springs Road

#### Countywide General Plan Policy Bio 4.1 states:

- Minimum development setback on an ephemeral stream is 20 feet on either side of the channel (40-feet total).
- Allowed uses within the setback: driveway, road and utility [linear] crossings, if no other location is feasible

Requiring a 40-foot bridge for the Caballo Rojo Trail to completely cross development setback *would cause greater impacts* than allowing the trail within the 20-foot development setback, as is allowed for other linear crossings such as roads, driveways and utilities.

**FINDING:** To complete the objective of the project, all other trail crossing locations are either infeasible, or would cause greater environmental impacts.



VICINITY MAP

### PROJECT TEAM

#### Applicant: MARIN COUNCIL BOY SCOUTS OF AMERICA

Michael Dybeck, Executive Director  
225 West End Avenue  
San Rafael, CA 94901  
415-454-1081

#### Financial Supporters: FRIENDS OF TAMARANCHO

225 West End Avenue  
San Rafael, CA 94901  
415-454-1081

#### ACCESS FOR BIKES

Vernon Huffman, Executive Director  
2020 Sir Francis Drake  
Fairfax, CA 94930  
415- 259-7749

#### ADDITIONAL INDIVIDUAL CONTRIBUTORS

#### Property Owners

Suzanne and David Warner  
36 Professional Center Parkway  
San Rafael, CA 94901  
415-492-2020

### PROJECT CONSULTANTS

#### Planning and Environmental Design

PAUL CURFMAN, Environmental Planner and  
Professional Landscape Architect CA #3043  
Independent Consultant to WRA Inc.  
2169-G East Francisco Blvd.  
San Rafael, CA 94901  
415-637-8182

#### Permitting

WRA INC. ENVIRONMENTAL CONSULTANTS  
Matt Richmond, Principal in Charge  
Jeanine Strickland, PLA CA #4285  
2169-G East Francisco Blvd.  
San Rafael, CA 94901  
415-454-8868

#### Geotechnical Engineering

MILLER PACIFIC ENGINEERING GROUP  
Scott Stephens, Principal in Charge  
504 Redwood Blvd.  
Novato, CA 94947  
415-382-3444

#### Surveying

R. W. DAVIS and ASSOCIATES  
Professional Land Surveyor #6330  
45 Leveroni Ct.  
Novato, CA 94949  
415-883-9099

#### Structural Engineer

MARK WOODROW, P. E.  
Andersson|Woodrow  
Structural design and engineering  
415-453-3431

### PARCEL INFORMATION

#### Site Location

100 Iron Springs Road  
Fairfax, CA 94930

#### Parcel # and Size

174-052-02, 51.49 acres  
Parcel adjacent to the east side of  
Camp Tamarancho

#### Jurisdictions

County of Marin  
Town of Fairfax on three sides of  
parcel, including portions of Iron  
Springs Road.

#### Open Space Easement 2005-0046629

Recorded 23 June 2005  
>40-acres donated to the County  
December 28, 2004 for "educational,  
recreational, and open space uses  
that are compatible with the  
maintenance of the property as open  
space."

### SHEET INDEX

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DATE	ISSUES & REVISIONS	NO.
12/12/23	DESIGN REVIEW SUBMITTAL	

PROJECT #25182-1  
DATE: 12/12/23  
DRAWN BY:  
JEANINE STRICKLAND, PLA CA#4285  
CHECKED BY:  
PAUL CURFMAN, PLA CA #3043  
ORIGINAL DRAWING SIZE: 24 X 36

## COVER SHEET

SHEET

# L-1

# CABALLO ROJO TRAIL

## CAMP TAMARANCHO MOUNTAIN BIKE TRAIL SYSTEM

MARIN COUNTY, CALIFORNIA

# DESIGN REVIEW SUBMITTAL



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ORIGINAL DRAWING SIZE: 24 X 36

# PROJECT DESCRIPTION

SHEET

# L-2

## SETTING AND BACKGROUND INFORMATION

### Proponent

Marin Council Boy Scouts of America (MCBSA)  
Non-profit owners and operators of Camp Tamarancho.

### Camp Tamarancho

Established in 1945, the 410-acre outdoor youth education facility is west of the Project at 1,000 Iron Springs Road.

### Mountain Biking at Camp Tamarancho

Camp Tamarancho operates the 7.8-mile mountain bike trail system at no expense to Marin County. This helps to fulfill the County's outdoor recreation goals. Camp Tamarancho is a keystone property, linking the Town of Fairfax to the **Bay Area Ridge Trail** and surrounding fire roads in White Hill, Cascade Canyon, Loma Alta, and Gary Giacomini Open Space Preserves.

### Iron Springs Road

The narrow and winding road provides access to Camp Tamarancho, the mountain biking trails and neighboring properties. The lower paved portion is in Town of Fairfax and the upper unpaved portion is in Marin County jurisdiction.

### Friends of Tamarancho

Friends of Tamarancho (FOT) was formed by MCBSA to improve access to appropriate mountain biking trails in Camp Tamarancho. FOT offers season- and day-passes to fund trail maintenance (and now permitting). All cyclists must have an FOT trail pass to ride at Camp Tamarancho.

### High School Training

FOT provides a \$5 training pass for students to access the 7.8-mile mountain bike trail loop. The pass is good for the duration of enrollment at all local high schools including Archie Williams, San Rafael, Marin Catholic, Tam and Redwood. Marin high schools have produced some of the *highest-ranking mountain bikers* in California.

## CABALLO ROJO TRAIL CONSTRUCTION

**Staging Area:** 100 Iron Springs Rd. Private Driveway

**Primary Material Holding Area:** 100 Iron Springs Rd. Private Driveway

**Temporary Restroom:** 100 Iron Springs Rd. Private Driveway

### Secondary Material Transfer Area

Temporary deck on edge of Iron Springs Road at Stream 4 culvert. Deck will not impede culvert, stream flow or traffic. Deck removed upon construction completion.

### Sunday Noise Restrictions

Due to the short timeline available for construction, work on Sundays will continue with crews using hand tools only, to limit noise, for dirt work on trails.

### Stream Crossing Protections

- There will be no disturbance of any stream bed, nor stream banks, during construction.
- In crossing areas, streams will be lined with straw wattles along both banks during construction.
- A single designated temporary stream crossing will be required for all construction workers.
- Native seed, straw and jute netting will be installed over steep slopes before end of construction.

## CONSTRUCTION SCHEDULE - SEPTEMBER 1 THROUGH OCTOBER 15TH

WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6
9/1	9/13-14	9/20-21	9/27-28	10/4-5	10/11-12
End of nesting bird season. Flag trail and bridge layout. Install all required BMPs, including wattles along streams (2), (3A), (3B) and (4) and along stream 5. Stage and haul material for boardwalks	Plank (2), (3A) and (3B) Form bridge footings at stream (4) and pour concrete Lay out ramp footings, begin excavation Place ramp materials, at storm drain 4	Confirm environmental protections are in place and working Move and place bridge beams, begin plank and rail Form and pour ramp footings	Finalize bridge Ramp beams placed Hand dirt work on trials	Ramp Planking and railing Remove deck at stream 4 culvert Hand dirt work on trials	Install ramp railing Install all erosion control including seed, straw, wattles and jute fabric Compact trail surfaces
9/6-7 9/8	9/15	9/22	9/29	10/6	10/13
Set footings and stringers for (2), (3A) and (3B) Hand dirt work on trials	Hand dirt work on trials	Hand dirt work on trials	Hand dirt work on trials	Hand dirt work on trials	Hand dirt work to finish trail and all disturbed surfaces, Clean-up.

## KEY FEATURES OF THE CABALLO ROJO TRAIL PROJECT

### Caballo Rojo Project Purpose

The Caballo Rojo Project (Project) will improve safety on Iron Springs Road by minimizing the potential for downhill cycling collisions with cars on narrow road. The project would reduce downhill cycling by providing an alternative trail for experienced mountain bikers to that of using Iron Springs Road.

### Caballo Rojo Project Need

Residents and visitors use Iron Springs Road to access Camp Tamarancho. Mountain bikers currently pedal up and glide down the road. Residents are familiar with the twists and turns, though visiting parents driving kids to camp are not. The combination of faster downhill cyclists and unfamiliar visitors poses the potential for dangerous auto-cyclist collisions.

### Overall Trail Statistics

- 5,800 feet long with 29 switchbacks
- 370 vertical feet (Figure 2)
- Total area of permanent disturbance = 0.7 Acres
- Total volume of excavation = 655 Cubic yards (CY) [328 CY cut, PLUS fill placement of same material]

### Existing Trail - Upper Caballo Rojo

Constructed in 2015

- 4,500-feet with 22 switchbacks
- Environmental protections are in place to minimize erosion and protect habitat.
- Area of Permanent Disturbance = 0.51 Acres
- Volume of Excavation = 537 CY [266 CY cut, PLUS fill placement of same material]

### Proposed Trail - Lower Caballo Rojo

Proposed trail features include:

- 1,300 linear feet of new trail with seven switchbacks
- 24-foot-long bridge across ephemeral stream #4. (Pressure treated wood finish, no paint color.)
- Three new 16'-foot-long (2) and 18'-foot-long (1), free-span boardwalks over ephemeral streams #2, 3a and 3b. (Pressure treated wood finish, no paint color.)
- 60-foot-long trail ramp exiting to Iron Springs Road, painted in earth tones to blend with natural setting
- Environmental protections to minimize erosion and protect habitat are included in the project. Refer to Caballo Rojo Erosion Control and Sediment Management Plan (WRA, revised 2022)
- No changes are proposed to any existing structures
- Area of Permanent Disturbance = 0.19 Acres
- Volume of Excavation = 118 CY [59 CY cut, PLUS fill placement of same material]

### Proposed Intersection with Iron Springs Road

- The point of intersection selected for maximum sight distance of approximately 150-feet both up and down Iron Springs Road.
- Approaching cyclists will be elevated above the road for the best possible sight lines of the road.
- An intersection warning sign will be posted above the trail's last switchbacks to warn cyclists of the road intersection.
- Trail Crossing signs are also recommended for vehicles on Iron Springs Road.

## ENVIRONMENTAL PROTECTIONS INCLUDED IN THE PROJECT

### Best Environmental Alternative

All feasible alternatives to the proposed alignment would result in equal or greater impacts to biological resources as well as 'jurisdictional' (wetlands and waterway) features at the site. (WRA, Biological Site Assessment 2022).

### Geotechnical Assessment

Miller Pacific geotechnical assessment (2016) of both upper and lower Caballo Rojo Trail concluded:

- Construction of upper Caballo Rojo trail has not resulted in significant geologic or geotechnical issues
- The lower Caballo Rojo trail can use grading techniques similar to those used on the upper trail.
- Incorporate alignment adjustments to avoid two historic landslides leading up to the bridge over Stream 4 (completed as shown in see Figure 2),
- Incorporate retaining wall to support fill required for trail construction at the approach to the intersection with Iron Springs Road (completed in Figure 5).

### Very low potential for special-status species

Special-status species known to occur in this area have "little, to no potential, to occur at the Project site due to either lack of suitable habitat or the limited range of the species." (WRA 2022)

WRA plant biologists confirmed the absence of "special-status plants with the potential to be present in habitats found at the Project site" during surveys conducted in July of 2015 and in 2021.

### Tree Avoidance

Caballo Rojo trail alignment avoids trees and any significant impact to them. (WRA Arborist Report, 2016, updated 2023).

### No Tree Removal Permits Requested

**Tree removal permits** are not requested as the licensed Arborist could not identify significant impacts for construction of the Upper Caballo Rojo Trail nor anticipate any such impacts on Lower Caballo Rojo trail.

### Ephemeral streams

Only ephemeral streams (flow only during rain storms), are encountered by the Caballo Rojo trail. These streams do not support riparian vegetation, they do not support special status species, nor do they support sensitive natural community types (WRA 2022).

### No Anadromous Fishes

There are no anadromous fishes at the site, since Bothin Creek is under Bothin Avenue, in a culvert. Additional salmonid migration barriers are downstream in Fairfax and Corte Madera Creeks, all of which block access to San Francisco Bay (Marin County 2022).

### Protection of Federal and State Waters

Bridge and boardwalk structures would be constructed with hand tools and direct impacts to streams would be prevented by:

- installation of temporary foot bridges across ephemeral stream channels during construction,
- placement of straw wattles on either side of each stream feature, and
- additional erosion control measures in place before, during and after construction.

### MCSTOPPP EROSION AND SEDIMENT CONTROL PLAN Revised April 2022

Erosion Control features were installed at Stream 2, and 3A on October 26, 2015.

- "Trail remains stable and no sedimentation in nearby streams has been observed for six years (2015 -2022) indicating original design and construction were appropriate for site and effective at controlling erosion and sedimentation."
- New erosion control features, specifically straw wattles, shall be installed at all stream crossings and where the trail approaches the 20-foot setback that parallels Stream 5.

## ADVANCE CONSULTATIONS

### CDFW

In 2015 the California Department of Fish and Wildlife (CDFW) requested three boardwalks and a bridge be included at the four ephemeral stream crossings. On October 5, 2015, CDFW stated that a Lake or Streambed Alteration Agreement (Sect. 1602) would NOT be needed for the project.

### U.S Army Corps

On June 24, 2016 the U. S. Army Corps of Engineers representative confirmed that, "the plan of action to allow for continued use of the trail is to install wooden bridges that will clear-span the tributaries and result in no impacts to potentially jurisdictional waters of the U.S." He continued, "At this time, the Corps considers the investigation closed and that no permit is required."

### SFBRWQCB

The San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) will issue a Statewide General Waste Discharge Requirement (WDR) permit after other permits are issued.

### Marin County DPW Grading Permit

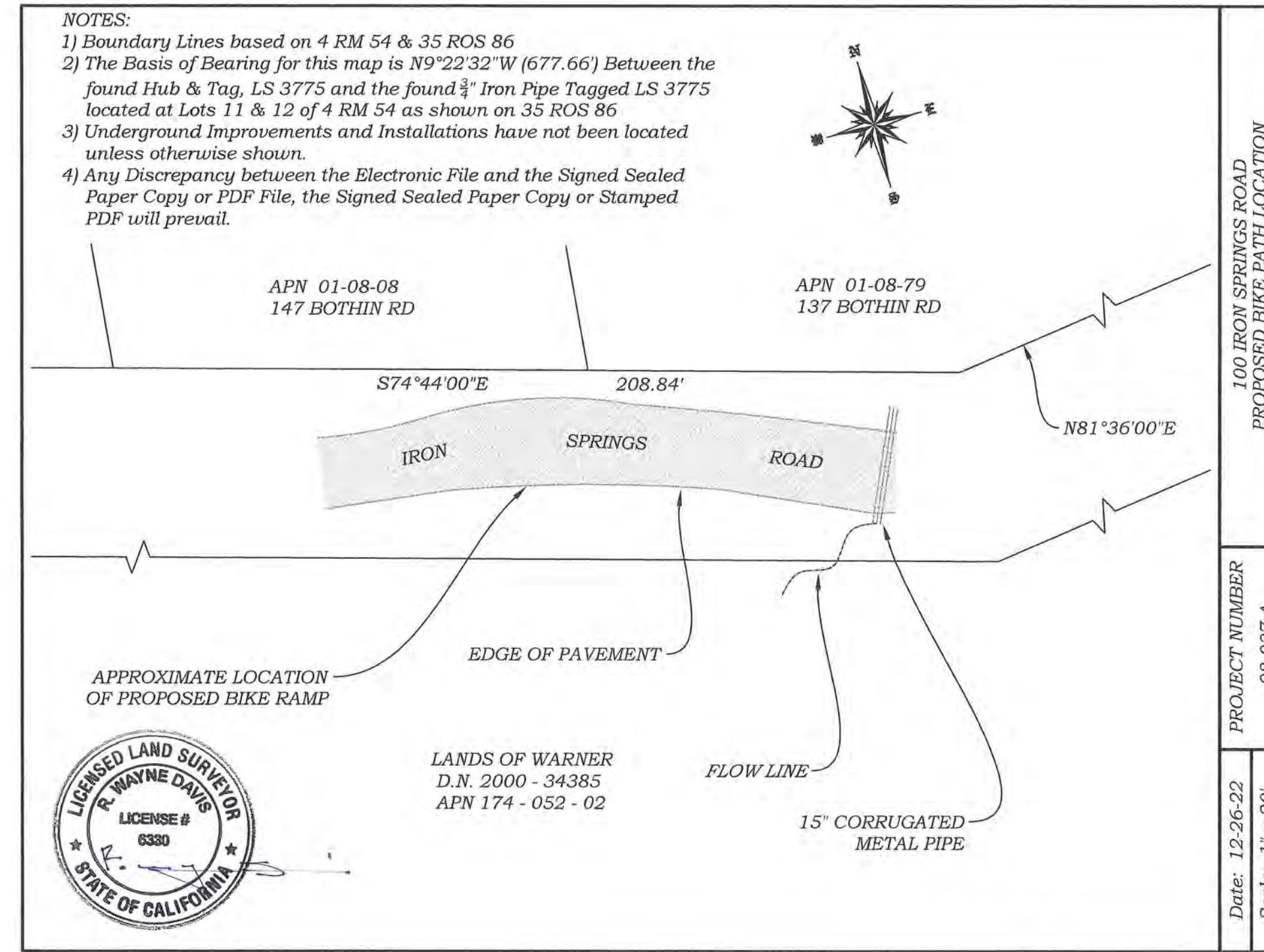
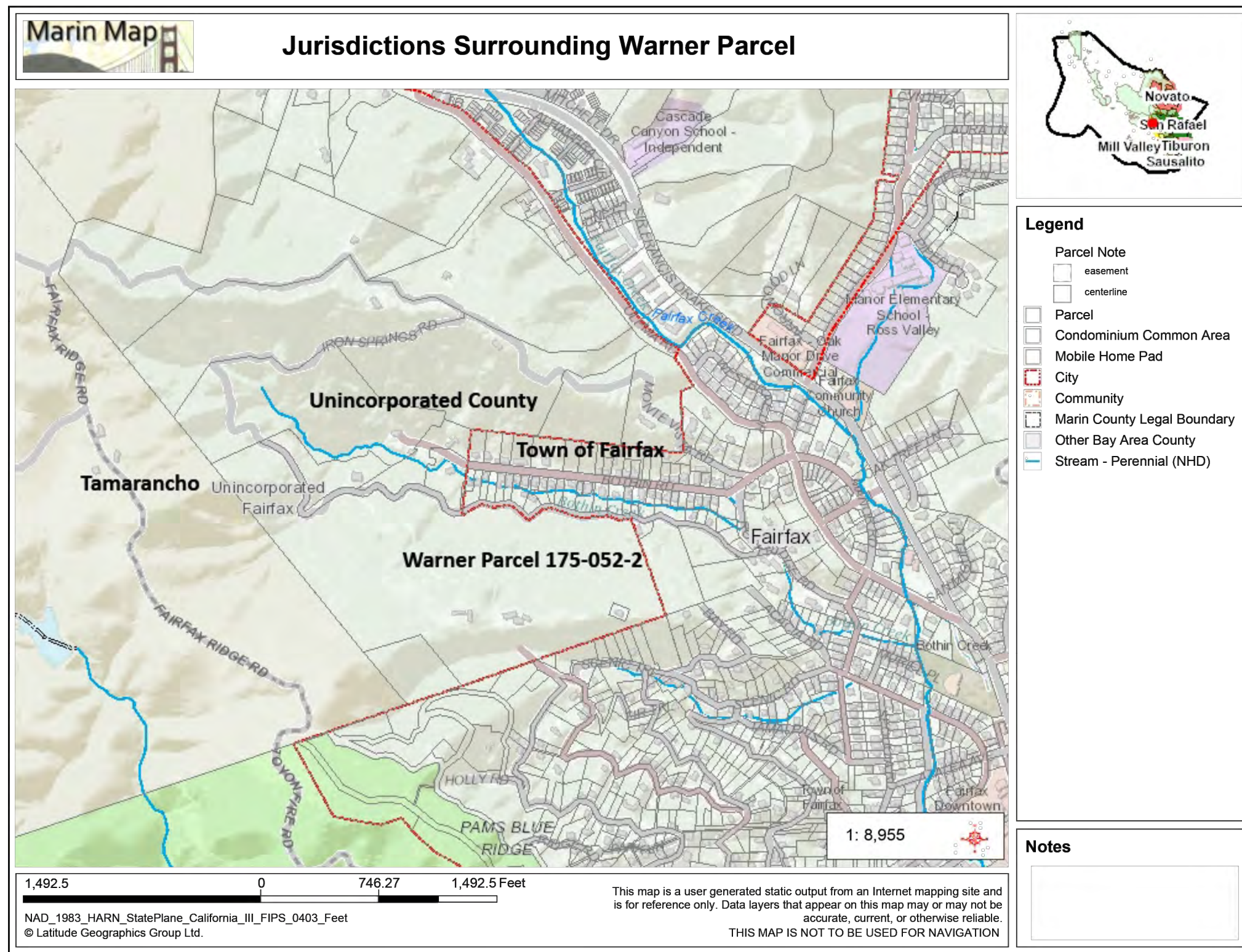
The Grading Permit application was approved by Marin County Department of Public Works on June 23, 2022.

**CABALLO ROJO  
TRAIL**

**CAMP TAMARANCHO  
MOUNTAIN BIKE  
TRAIL SYSTEM**

MARIN COUNTY, CALIFORNIA

**DESIGN REVIEW  
SUBMITTAL**



RECORDING REQUESTED BY:  
FIRST AMERICAN TITLE COMPANY OF MARIN  
AND WHEN RECORDED MAIL TO:  
DAVID WARNER AND SUZANNE WARNER  
181 Toyon Drive  
Fairfax, CA 94930

2000-0034385  
Recorded  
Official Records  
County of  
Marin  
JON G. THAYER  
Recorder

REC FEE 10.00  
TAX 506.00

THIS SPACE FOR RECORDER'S USE ONLY

Page 1 of 2

ESROW NO. 3-044907ME.mxd TITLE ORDER NO. 3-044907ME

**GRANT DEED**

THE UNDERSIGNED GRANTOR(S) DECLARE(S)  
**DOCUMENTARY TRANSFER TAX IS \$ 506.00**  
 computed on full value of property conveyed, or  
 computed on full value less value of liens or encumbrances remaining at time of sale.  
 Unincorporated area  City of, AND

FOR A VALUABLE CONSIDERATION, receipt of which is hereby acknowledged,  
ROSS J. CADENASSO AND LILLIAN R. CADENASSO, and their successors Trustee(s) of the Cadenasso Family Trust and EUGENE P. CADENASSO AND NORMA B. CADENASSO, Co-Trustees, or Successors Trustee(s) of the Cadenasso Family 1994 Revocable Trust dated 12/09/94, as the separate property of Eugene P. Cadenasso

hereby GRANT(s) to:  
DAVID WARNER AND SUZANNE WARNER, TRUSTEES OF THE WARNER FAMILY TRUST- 1997, U/T/A DATED SEPTEMBER 19, 1997

the real property in the County of Marin, State of California, described as:  
LEGAL DESCRIPTION ATTACHED HERETO AS EXHIBIT A AND MADE A PART HEREOF.

A.P. #174-050-06-07  
ALSO KNOWN AS: 50 ACRES ON IRON SPRINGS ROAD (APN: 174-050-68), FAIRFAX, CA 94930

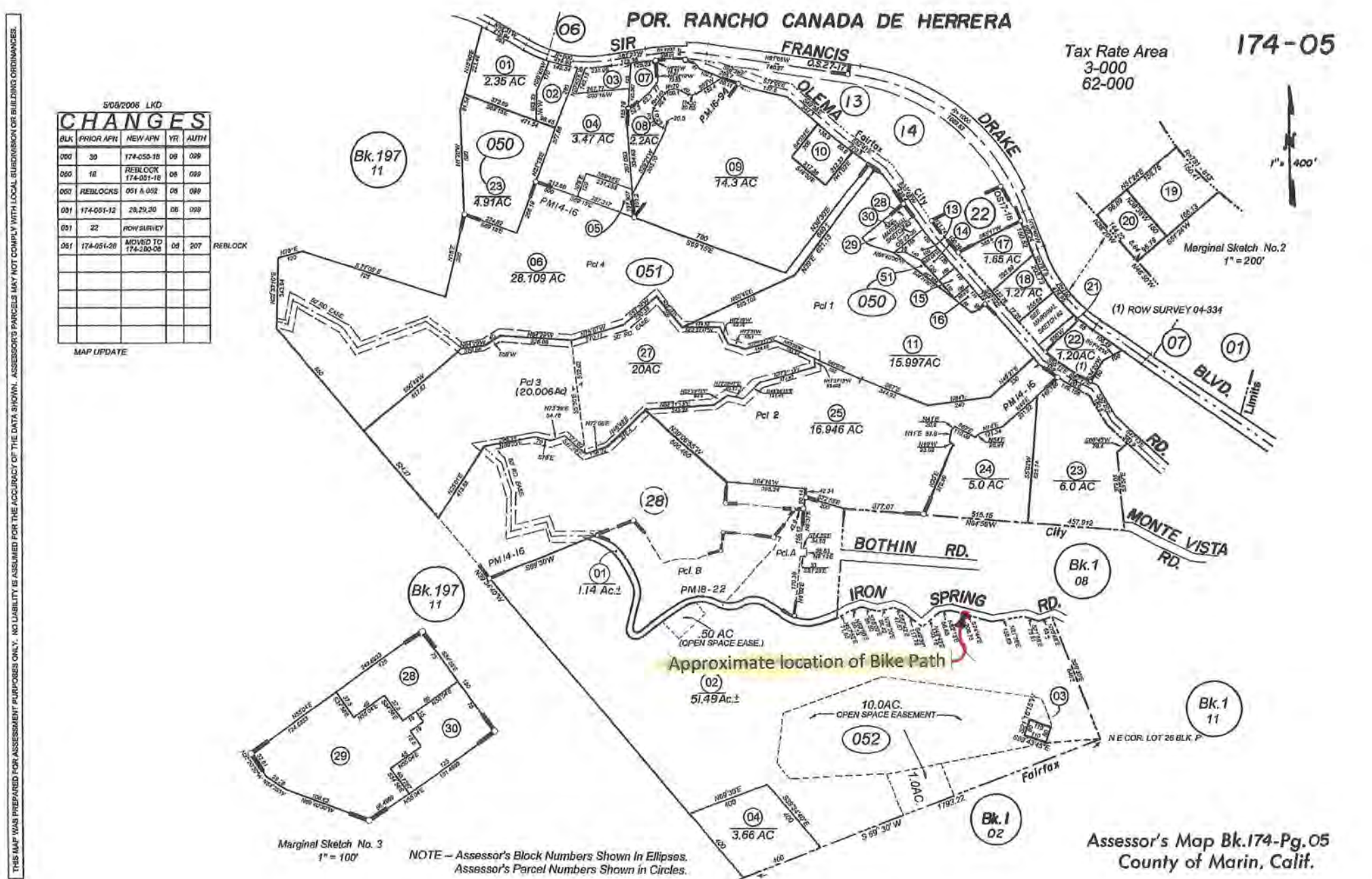
DATED June 21, 2000  
STATE OF CALIFORNIA  
COUNTY OF MARIN  
I, Myra Englekes  
a Notary Public in and for the State of California, personally appeared  
Ross J. Cadenasso, Lillian R. Cadenasso, Eugene P. Cadenasso, Norma B. Cadenasso  
before me, Myra Englekes,  
a Notary Public in and for the State of California, personally appeared  
Ross J. Cadenasso, Lillian R. Cadenasso, Eugene P. Cadenasso, Norma B. Cadenasso  
personally known to me (or proved to me on the basis of satisfactory evidence) to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.  
WITNESS my hand and official seal.

ROSS J. CADENASSO AND LILLIAN R. CADENASSO, and their successors Trustee(s) of the Cadenasso Family Trust  
Ross J. Cadenasso, Lillian R. Cadenasso, Eugene P. Cadenasso, Norma B. Cadenasso  
EUGENE P. CADENASSO AND NORMA B. CADENASSO, Co-Trustees, or Successors Trustee(s) of the Cadenasso Family 1994 Revocable Trust dated 12/09/94, as the separate property of Eugene P. Cadenasso  
Eugene P. Cadenasso, Norma B. Cadenasso  
EUGENE P. CADENASSO, CO-TRUSTEE  
NORMA B. CADENASSO, CO-TRUSTEE

Signature: Myra Englekes  
Mail tax statements to: SAME AS ABOVE

NOTARY PUBLIC-CALIFORNIA  
MYRA ENGLEKES  
COUNTY OF MARIN  
MY COMM. EXPIRES NOV. 28, 2005

Date: 12-26-22  
Scale: 1" = 20'



**EXHIBIT A LEGAL DESCRIPTION**

All that certain real property situate in the County of Marin, State of California, described as follows:

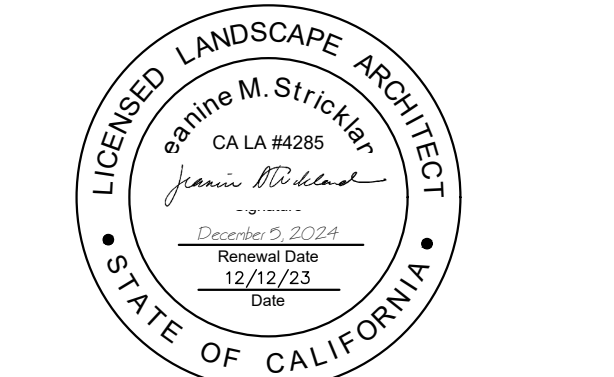
**PARCEL ONE:**  
BEGINNING at a point which bears South 69° 30' West 1200 feet more or less, from the intersection of the two courses, "North 84° 16' West 384.25 feet and South 5° 02' West 347.54 feet", as said courses are set forth in the Deed from Equitec Corp., a California corporation, to Merritt Pollock and William Gottschalk, Jr., recorded January 13, 1964 in Book 1768 of Official Records, at Page 436, Marin County Records, said point of beginning being on the Southwesterly line of the parcel described in said Deed, said Westerly line being defined in said Deed as being "North 39° 34' 40" West 3481.17 feet", thence from said point of beginning along the Southwesterly line as described in the above mentioned Deed, South 39° 34' 40" East to the most Westerly corner of the parcel described in the Deed from William Gottschalk, Jr. to Robert L. Gaut, et ux, recorded December 19, 1960 in Book 1422 of Official Records, at Page 578, Marin County Records; thence North 69° 30' East 400 feet and South 39° 34' 40" East 400 feet to the most Easterly corner of the above mentioned Gaut parcel, thence North 69° 30' East 1383.22 feet to the intersection of the courses, "South 20° 30' East 640 feet more or less" and "South 69° 30' West 1793.22 feet", as said courses are set forth in the Deed from Equitec Corporation, a California corporation to Merritt Pollock and William Gottschalk, Jr., recorded January 13, 1964 in Book 1768 of Official Records, at Page 436, Marin County Records, thence North 20° 30' West 640 feet, more or less, to the Easterly extremity of the course set forth as "North 70° 48' 30" East 65 feet more or less", in the above mentioned Deed to Pollock, et al; thence along the Northerly line of the above mentioned Deed, the following courses and distances: South 70° 48' 30" West 65 feet, more or less; North 71° 58' 45" West 78.81 feet; South 81° 38' West 158.63 feet; North 74° 44' West 208.75 feet; South 92° 13' West 88.65 feet; South 43° 42' 30" West 103.16 feet; North 49° 36' 30" West 117.16 feet; North 67° 42' 30" West 47.57 feet; South 78° 20' West 88.42 feet; North 76° 09' 15" West 88.50 feet; South 65° 40' 45" West 58.13 feet and South 57° 52' West 71.65 feet to a point which bears South 5° 02' West from the Southwesterly corner of Lot 1, Block 3, as shown upon that certain map entitled, "Map of Bothin Park", filed for record September 17, 1913 in Book 4 of Maps, at Page 54, Marin County Records; thence North 5° 02' East 10 feet more or less, to the most Southerly corner of Lot 1, in Block 4 of said map; thence in a Westerly direction along the Westerly extension of the Northerly line of Iron Springs Road as it now exists to a point which bears North 69° 30' East from the point of beginning; thence South 69° 30' West to the point of beginning.

EXCEPTING THEREFROM that portion conveyed by San Rafael Land Title Company, a corporation, to Marin Municipal Water District, by Deed recorded April 24, 1957 in Book 1109 of Official Records, at Page 283, Marin County Records.

ALSO EXCEPTING THEREFROM that portion lying within the lines of Iron Springs Road.

**PARCEL TWO:**  
A TEN foot easement for utility purposes lying Westerly of and adjacent to a line described as follows:  
BEGINNING at the Southwesterly corner of Lot 1, in Block 3, as shown on that certain map entitled, "Map of Bothin Park", filed for record September 17, 1913 in Book 4 of Maps at Page 54, Marin County Records; running thence South 5° 02' West 352 feet, more or less, to the Southerly line of Iron Springs Road, as said lot is shown on the above mentioned map.

**PARCEL THREE:**  
AN EASEMENT appurtenant to Parcel One herein and any subsequent subdivision thereof for roadway and utility purposes over that portion of Iron Springs Road, adjacent to and Northerly of the Northern boundary line of Parcel One above lying Easterly of a line drawn North 69° 30' East from the point of beginning of said Parcel One and Westerly of a line drawn South 5° 02' West from the Southern corner of Lot 1 in Block 4, as shown on the map therein referred to.



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**PROPERTY  
DESCRIPTION**

SHEET

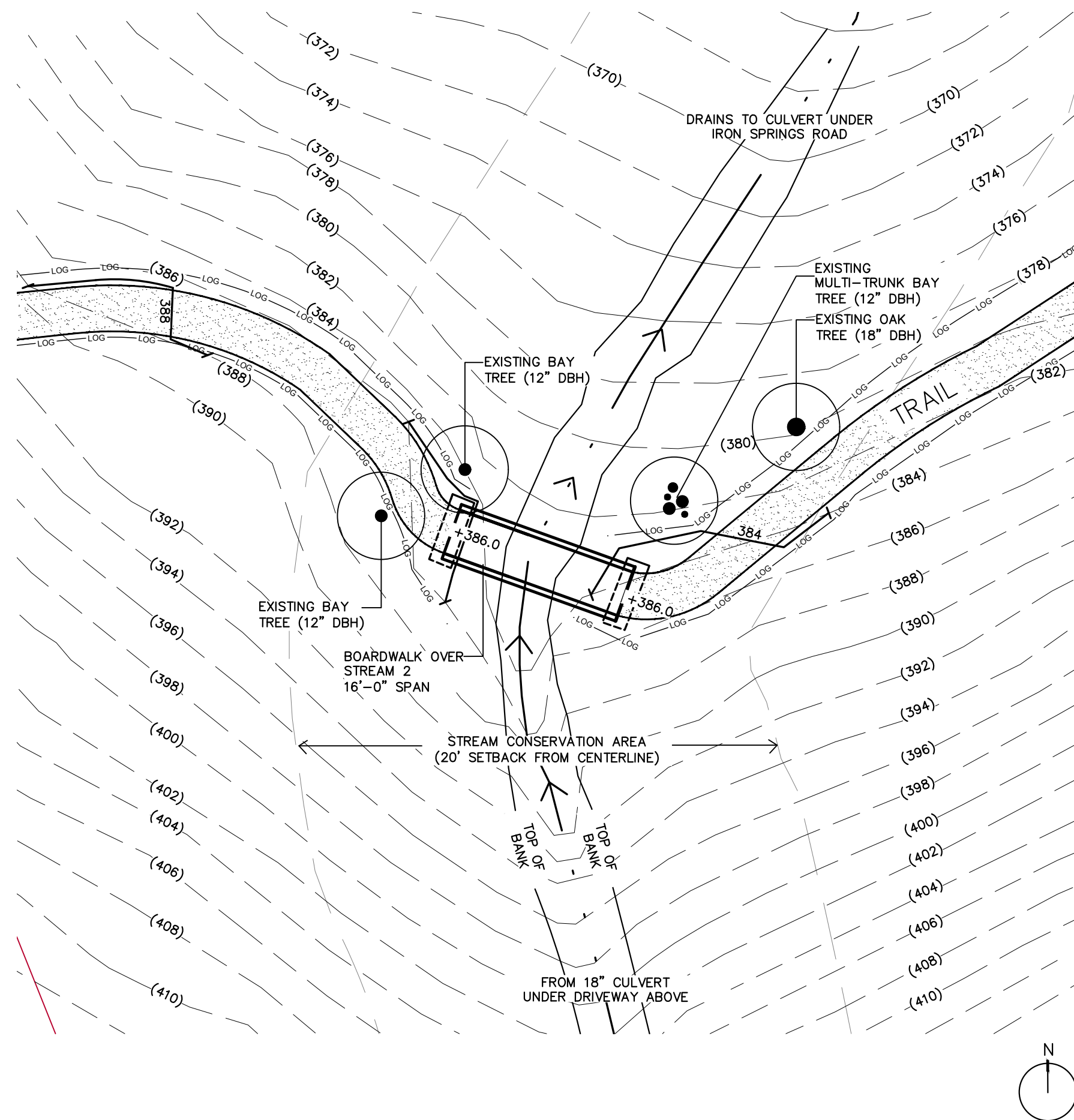


**CABALLO ROJO  
TRAIL**

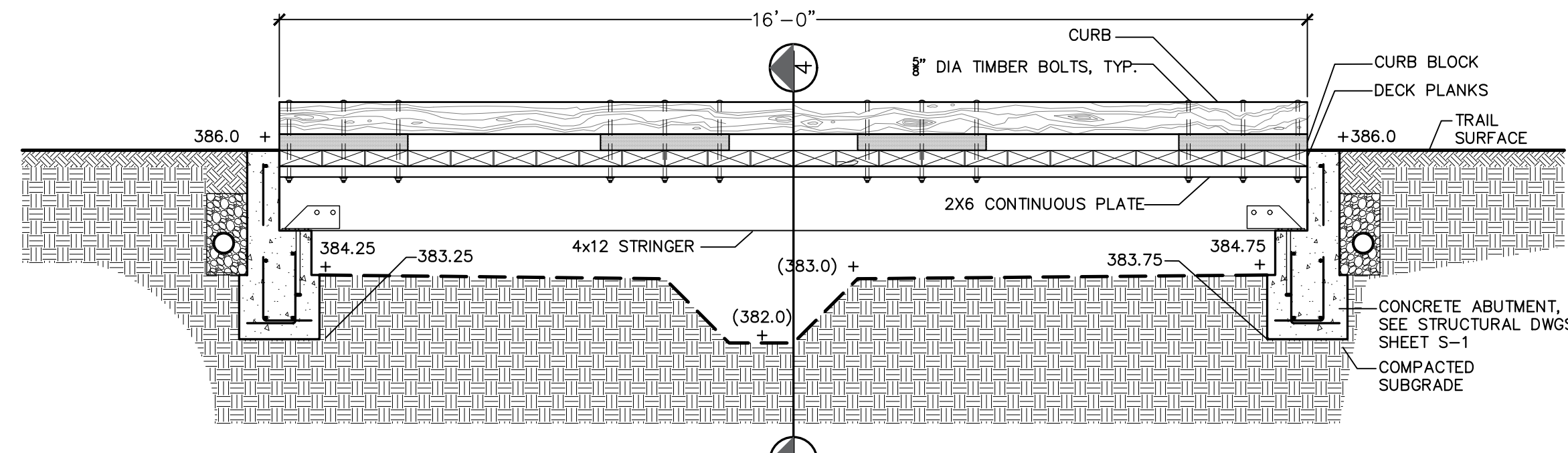
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**MARIN COUNTY, CALIFORNIA**

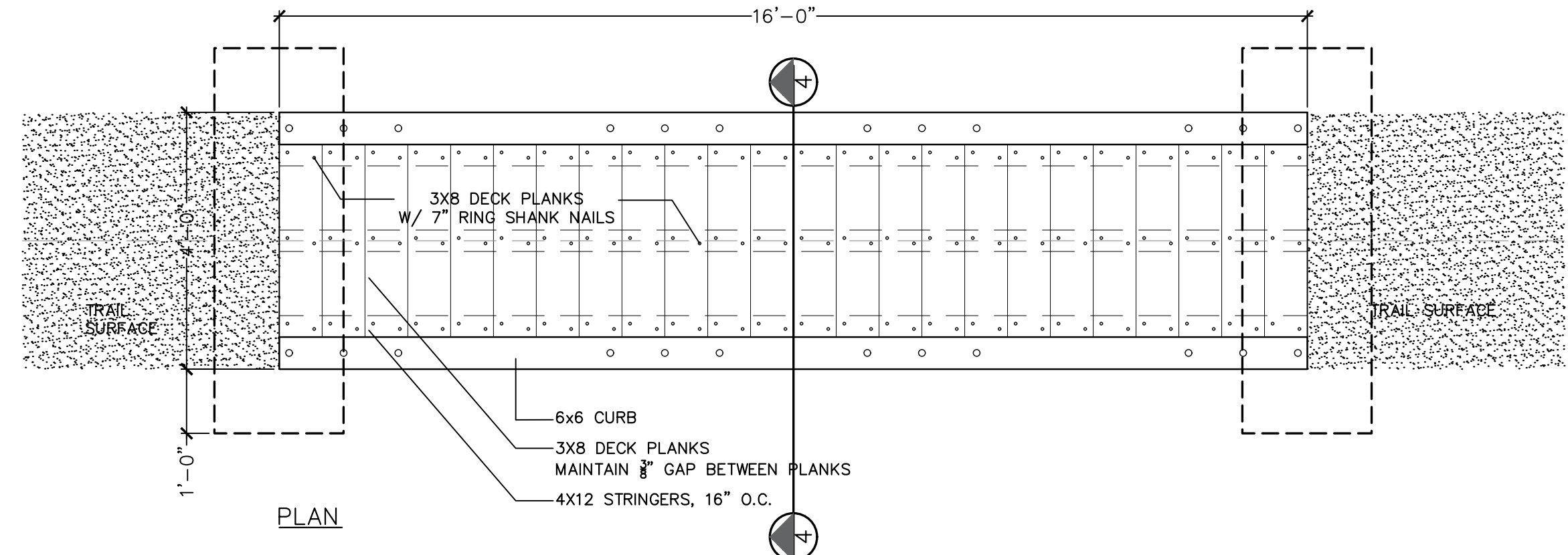
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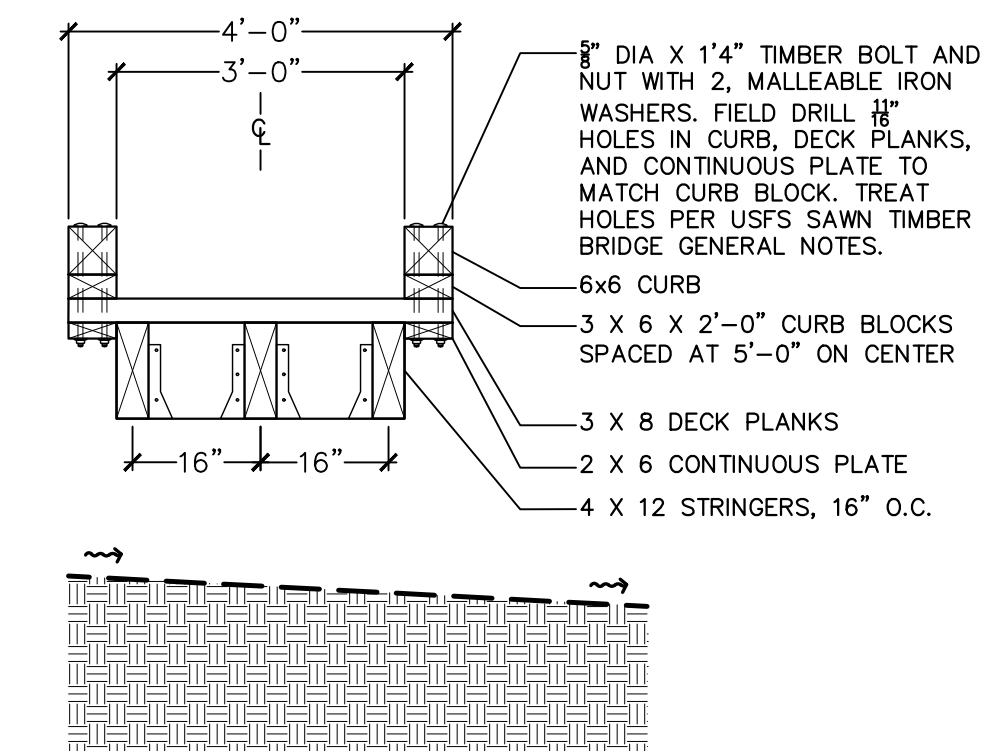
**1** STREAM 2 CROSSING – PLAN VIEW  
SCALE: 1" = 10'-0"



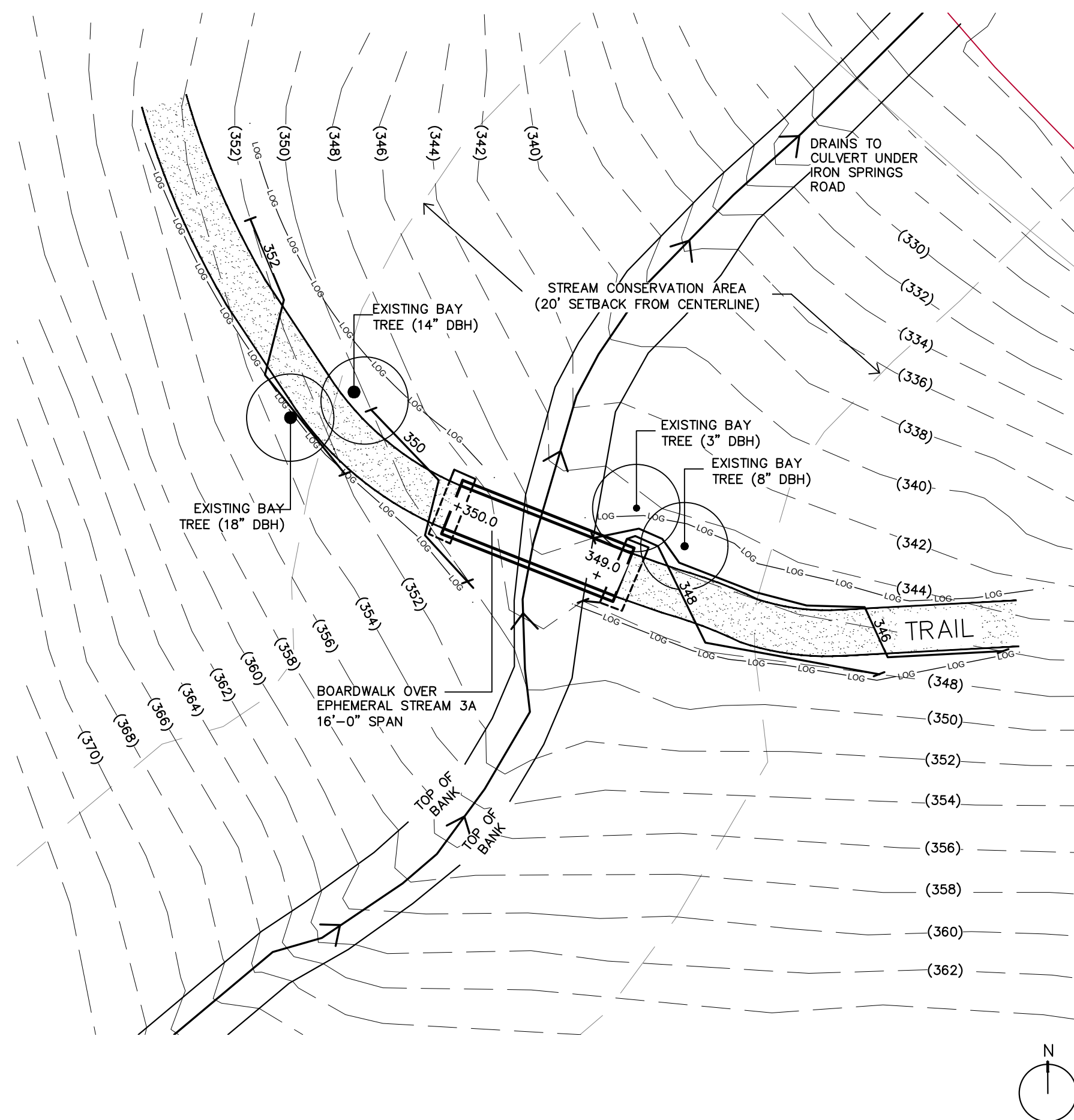
**2** STREAM 2 CROSSING – CROSS SECTION (LOOKING DOWNSTREAM)  
SCALE: 1/2" = 1'-0"



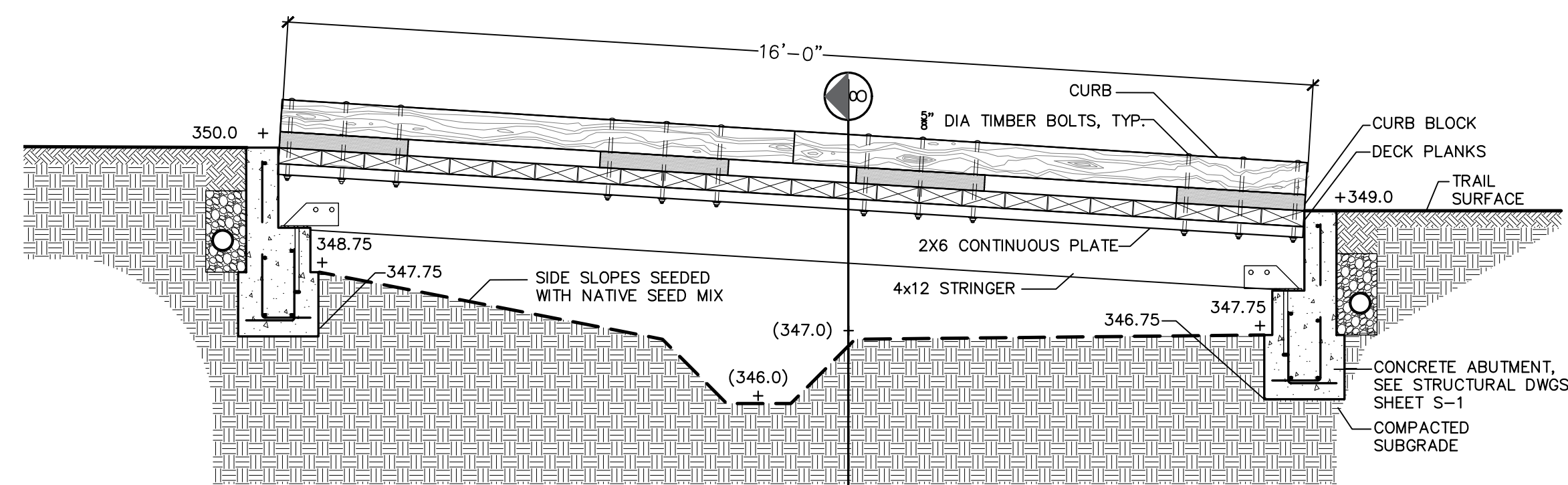
**3** STREAM 2 CROSSING – BOARDWALK PLAN  
SCALE: 1/2" = 1'-0"



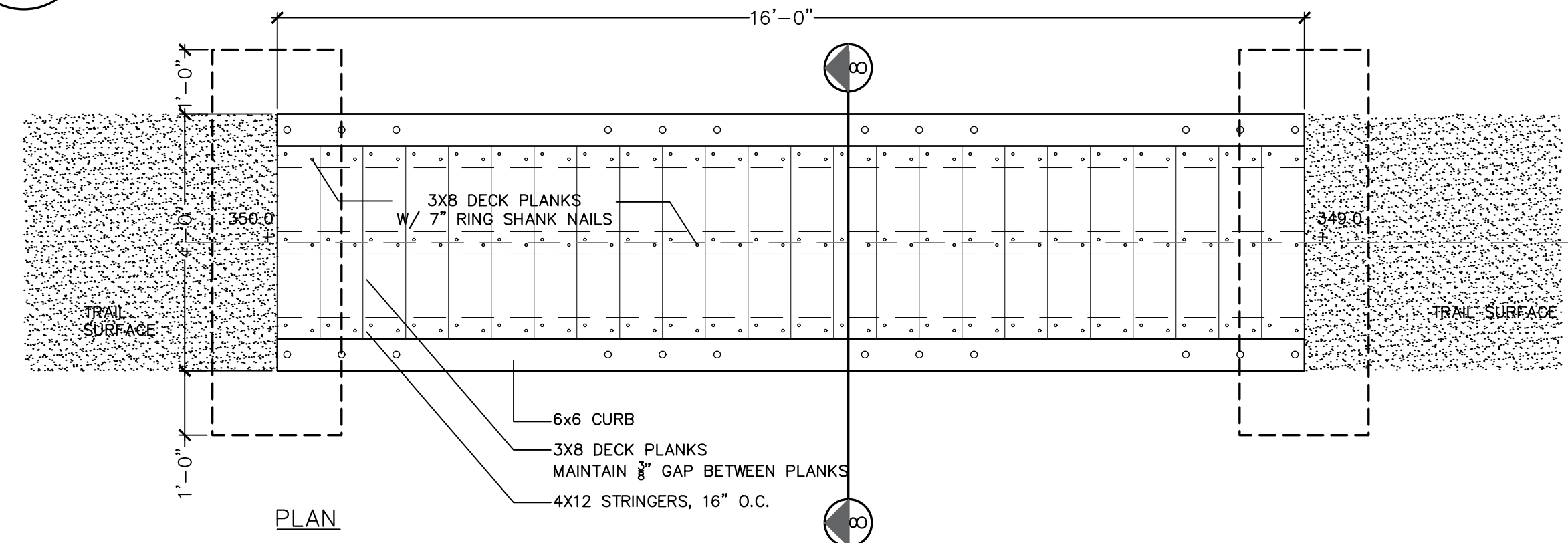
**4** CROSS SECTION (MID SPAN)  
SCALE: 1/2" = 1'-0"



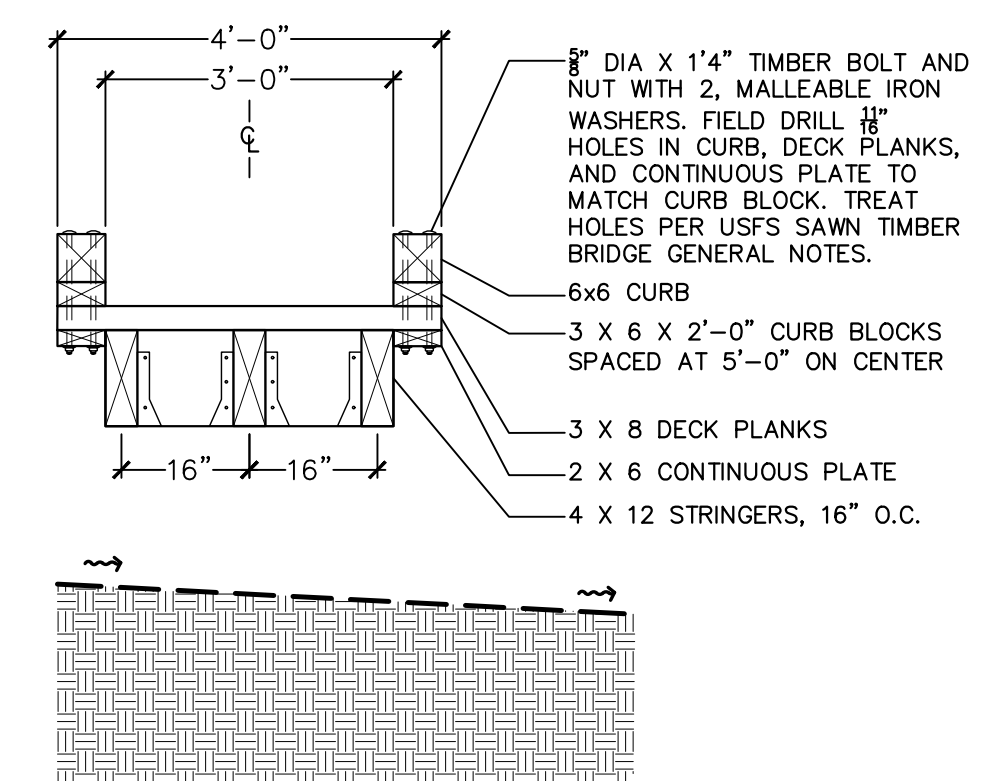
**5** STREAM 3A CROSSING – PLAN VIEW  
SCALE: 1" = 10'-0"



**6** STREAM 3A CROSSING – CROSS SECTION  
SCALE: 1/2" = 1'-0"



**7** STREAM 3A CROSSING – BOARDWALK PLAN  
SCALE: 1/2" = 1'-0"



**8** CROSS SECTION (MID SPAN)  
SCALE: 1/2" = 1'-0"



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CHECKED BY:  
PAUL CURFMAN, PLA CA #3043  
ORIGINAL DRAWING SIZE: 24 X 36

**TRAIL PLANS  
& SECTIONS  
CROSSING 2  
CROSSING 3A**

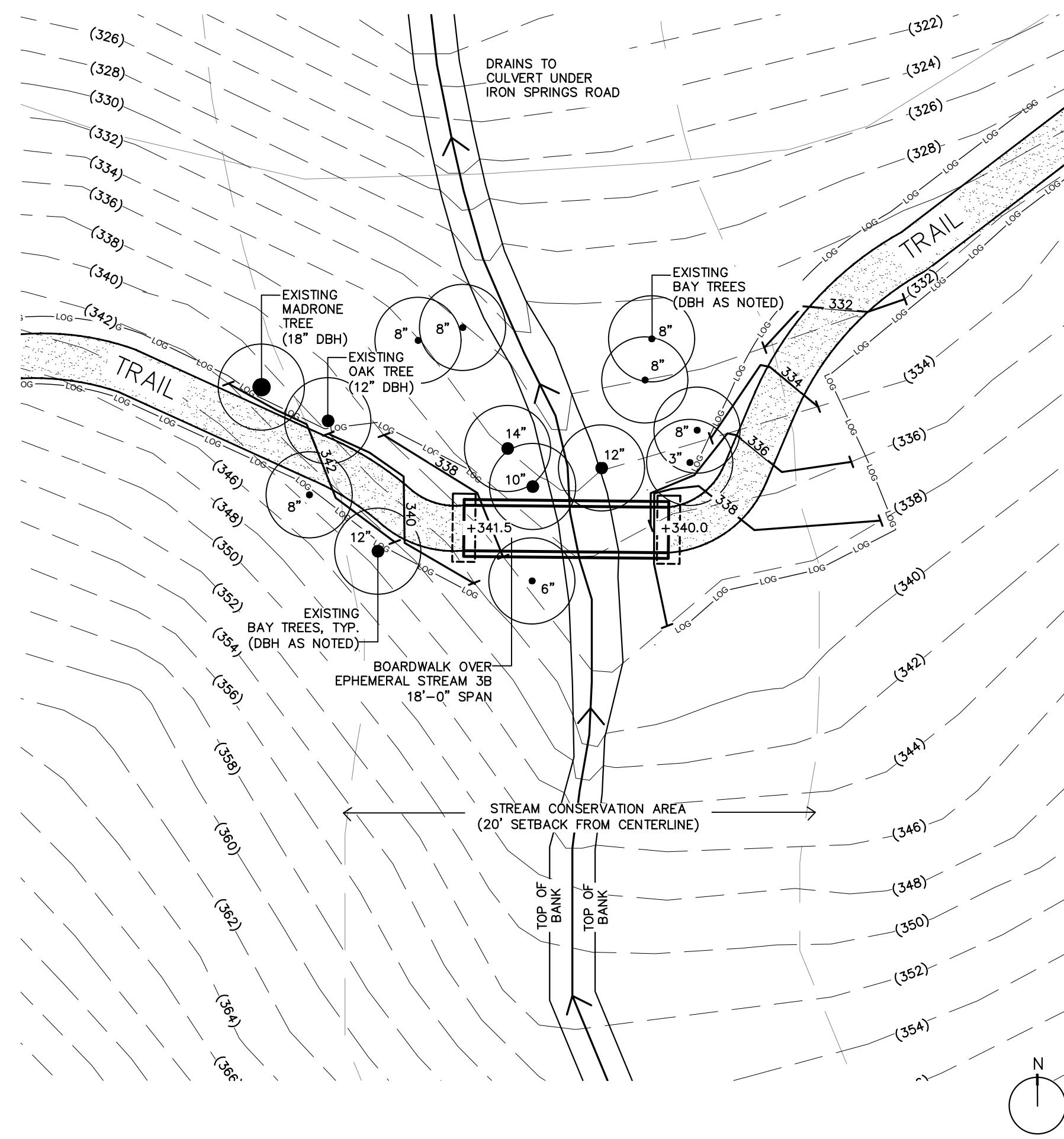
SHEET

**CABALLO ROJO  
TRAIL**

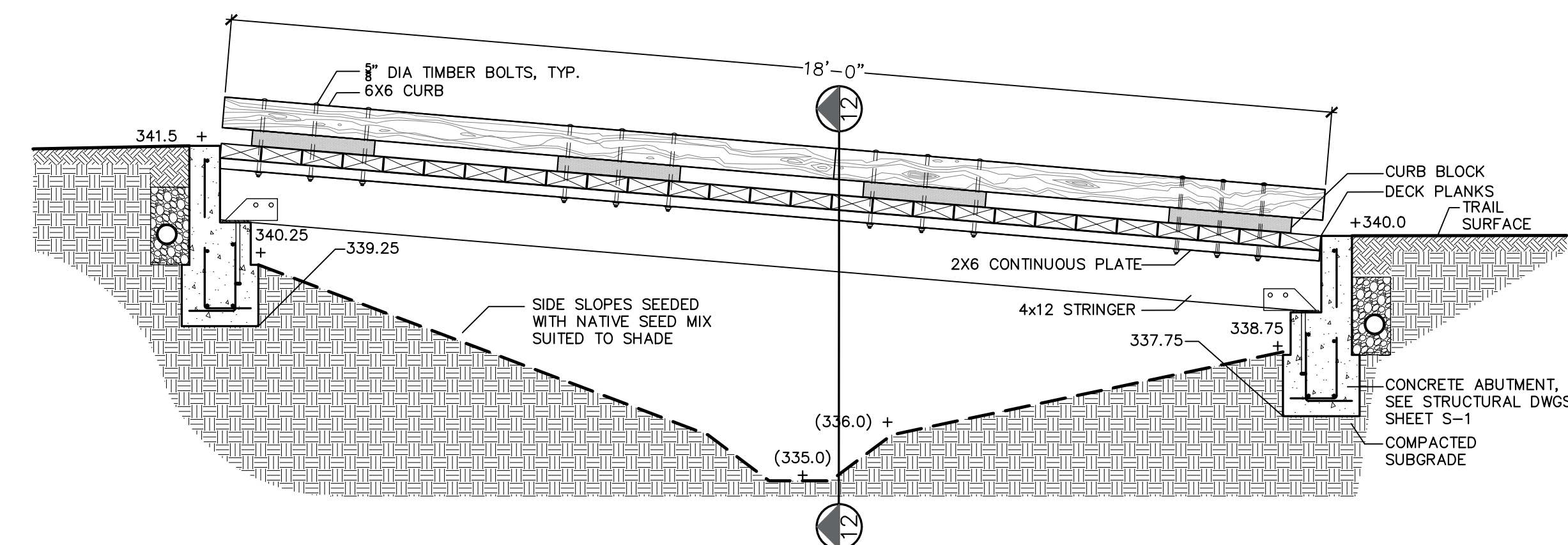
**CAMP TAMARANCHO  
MOUNTAIN BIKE  
TRAIL SYSTEM**

MARIN COUNTY, CALIFORNIA

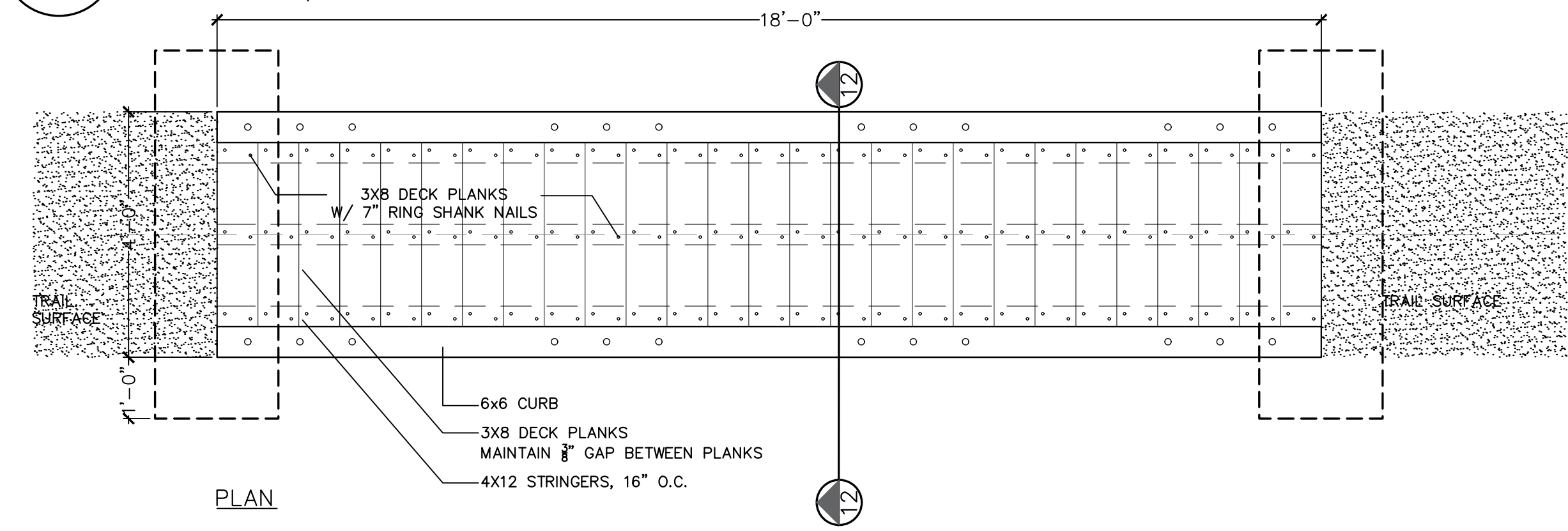
**DESIGN REVIEW  
SUBMITTAL**



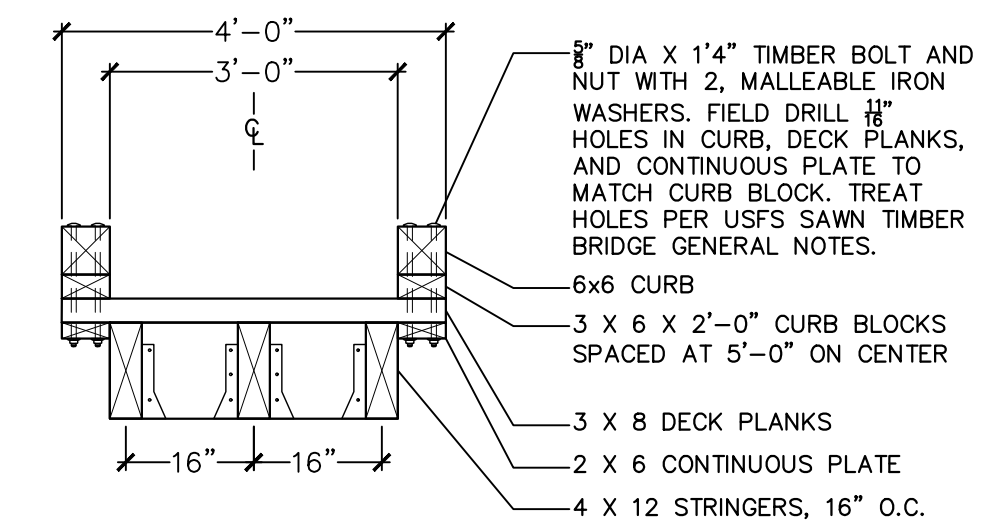
**9** STREAM 3B CROSSING – PLAN VIEW  
SCALE: 1" = 10'-0"



**10** STREAM 3B CROSSING – CROSS SECTION (LOOKING DOWNSTREAM)  
SCALE: 1/2" = 1'-0"



**11** STREAM 3B CROSSING – BOARDWALK PLAN  
SCALE: 1/2" = 1'-0"



**12** CROSS SECTION (MID SPAN)  
SCALE: 1/2" = 1'-0"



12/12/23	DESIGN REVIEW SUBMITTAL	
DATE	ISSUES & REVISIONS	NO.
PROJECT #25182-1		
DATE: 12/12/23		
DRAWN BY:		
JEANINE STRICKLAND, PLA CA#4285		
CHECKED BY:		
PAUL CURFMAN, PLA CA #3043		
ORIGINAL DRAWING SIZE: 24 X 36		

**TRAIL PLANS  
& SECTIONS  
CROSSING 3B**

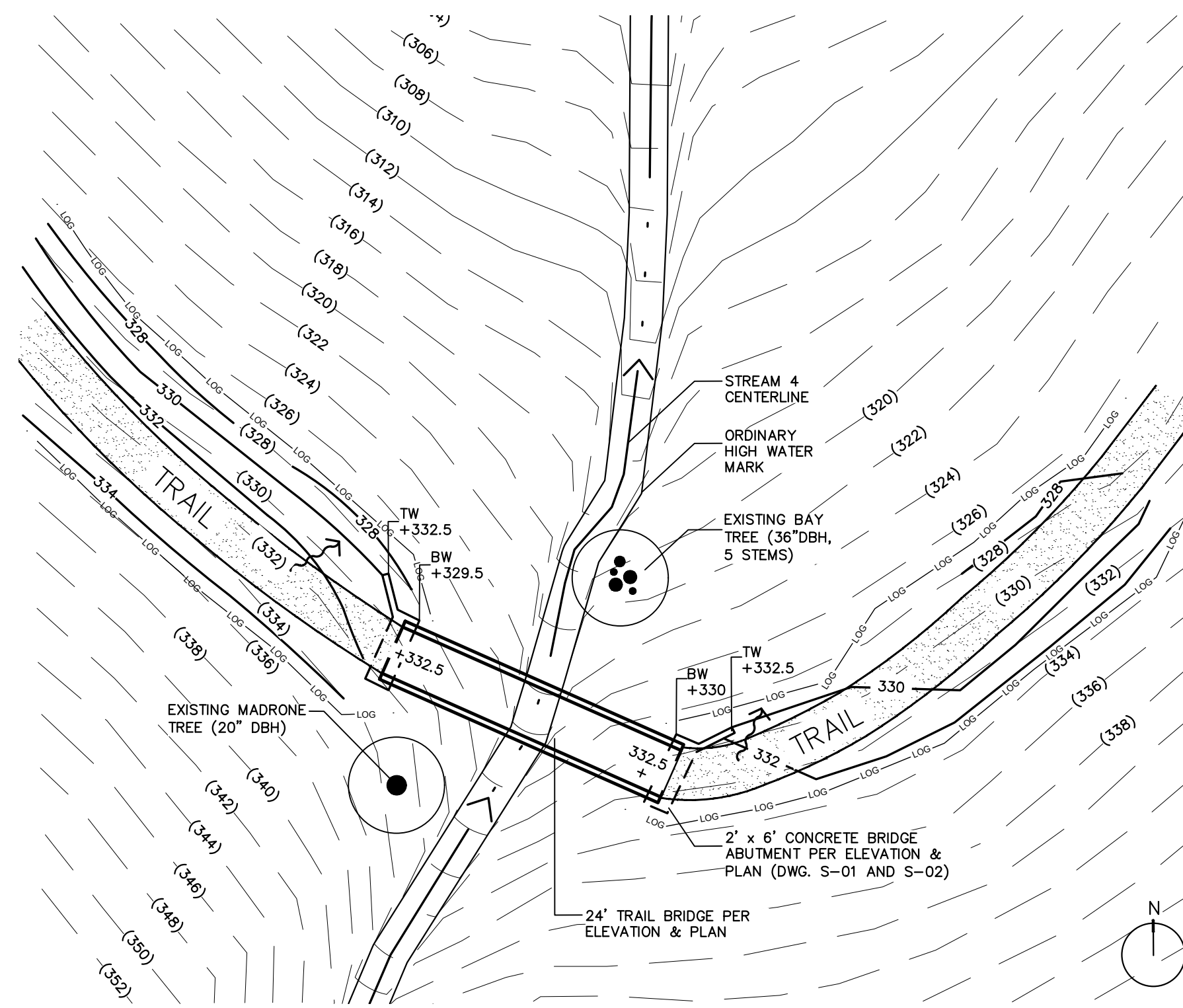
SHEET

**CABALLO ROJO  
TRAIL**

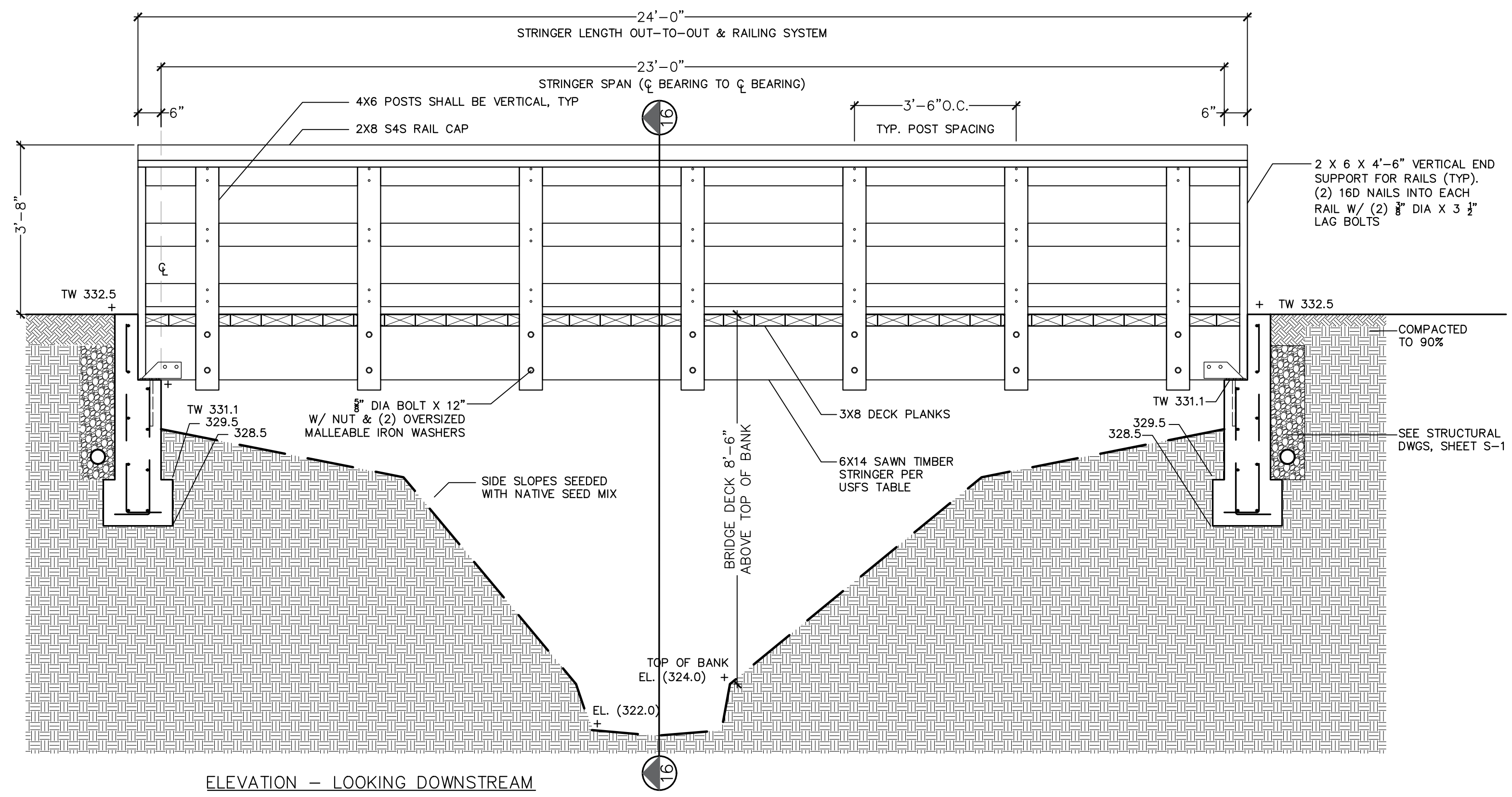
**CAMP TAMARANCHO  
MOUNTAIN BIKE  
TRAIL SYSTEM**

MARIN COUNTY, CALIFORNIA

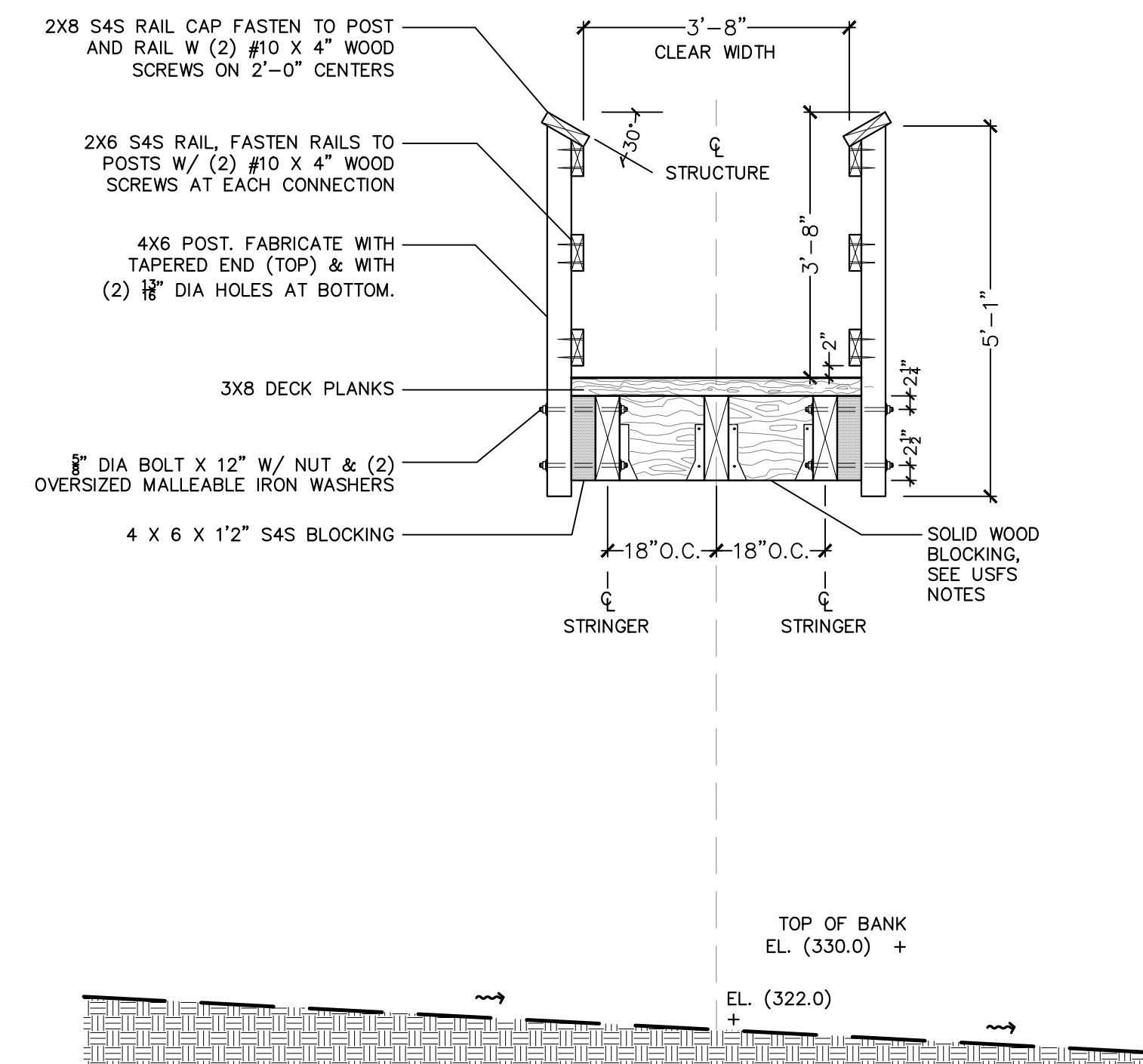
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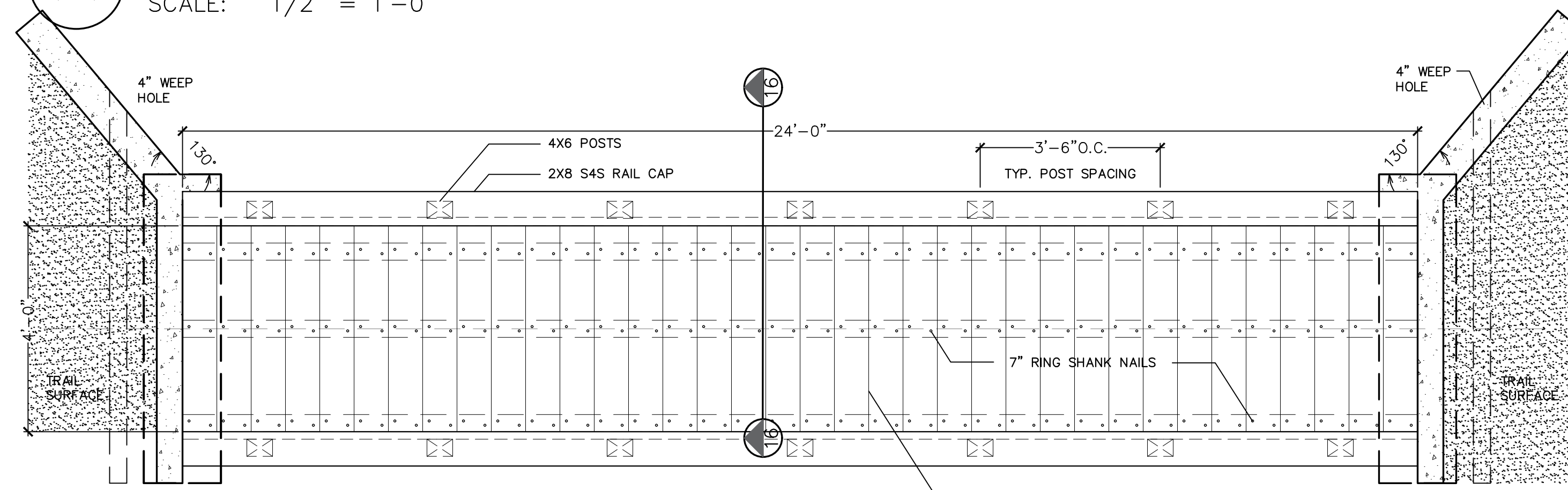
**13** STREAM 4 CROSSING – PLAN VIEW  
SCALE: 1" = 10'-0"



**14** STREAM 4 CROSSING – BRIDGE ELEVATION  
SCALE: 1/2" = 1'-0"



**16** BRIDGE CROSS SECTION  
SCALE: 1/2" = 1'-0"



**15** STREAM 4 CROSSING – BRIDGE PLAN  
SCALE: 1/2" = 1'-0"



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CHECKED BY:  
PAUL CURFMAN, PLA CA #3043  
ORIGINAL DRAWING SIZE: 24 X 36

**TRAIL PLANS  
& SECTIONS  
CROSSING 4**

SHEET

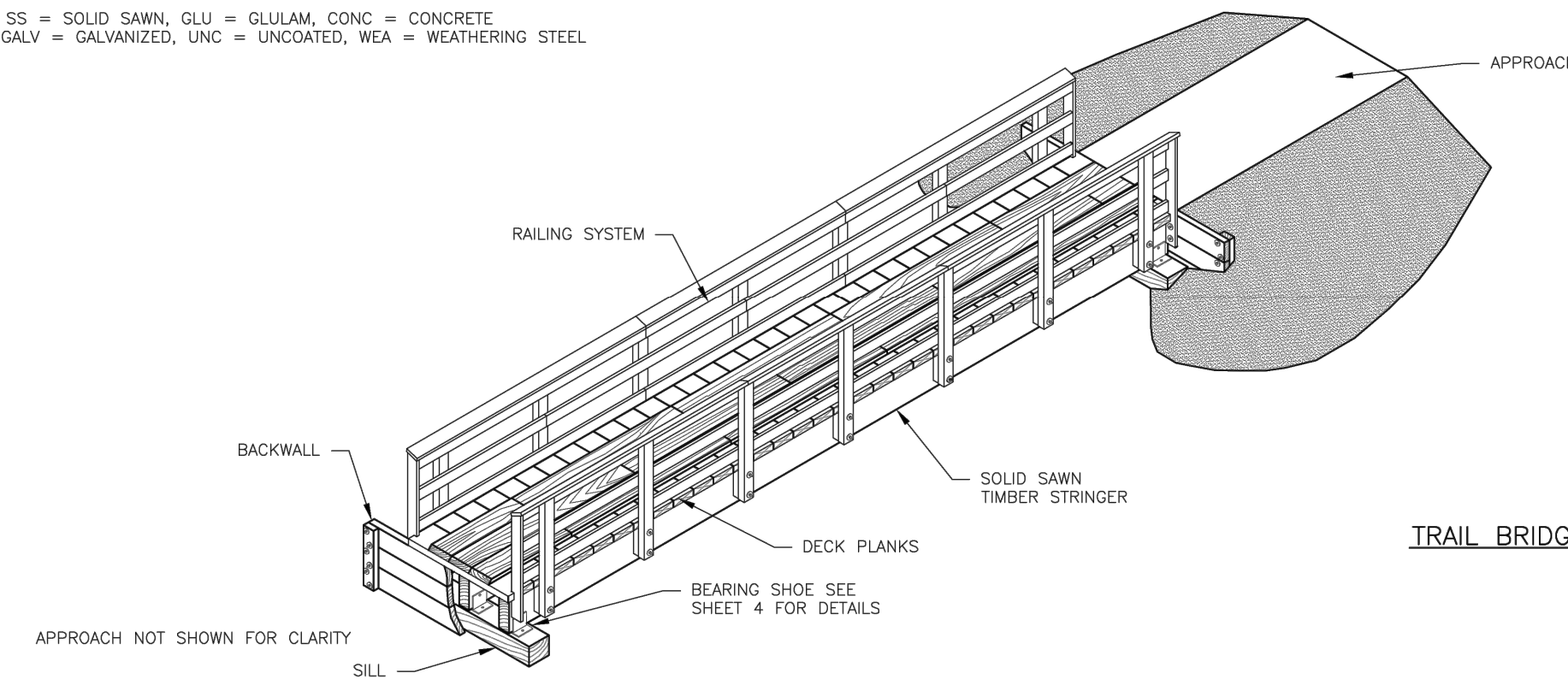
**CABALLO ROJO  
TRAIL**

**CAMP TAMARANCHO  
MOUNTAIN BIKE  
TRAIL SYSTEM**

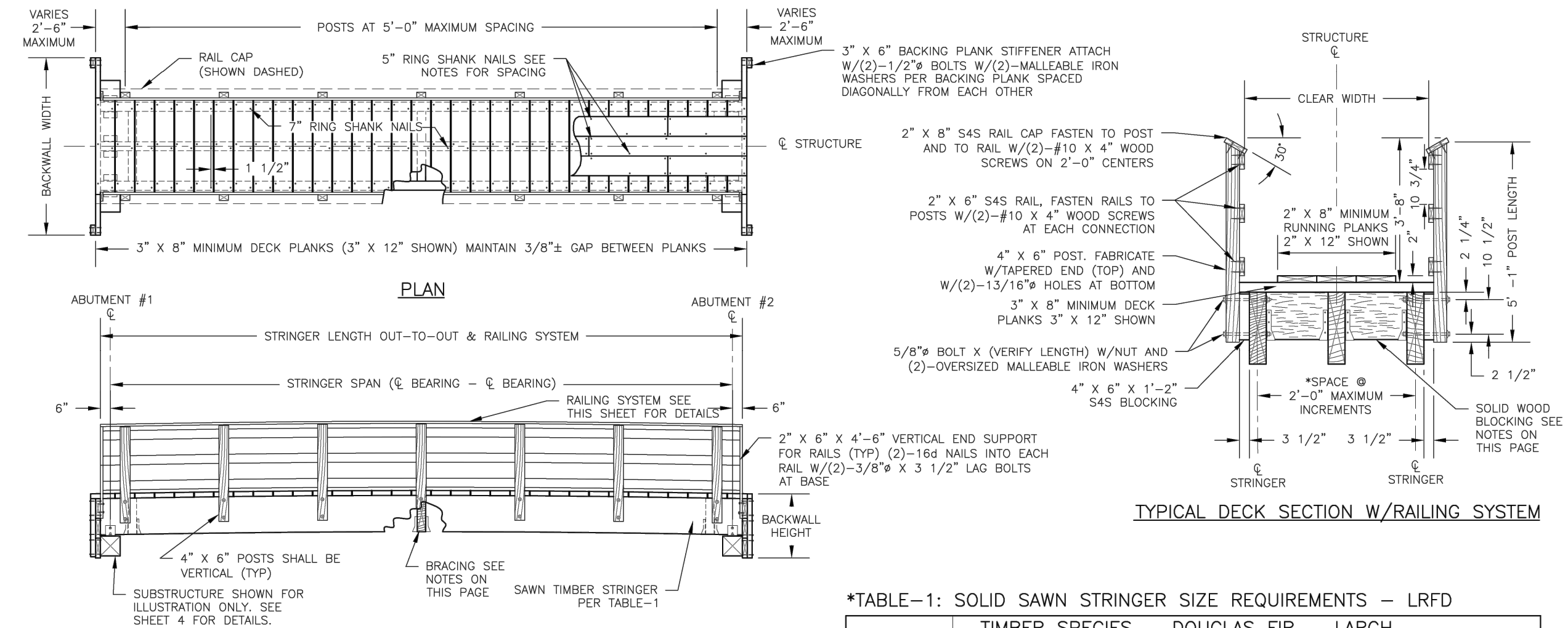
MARIN COUNTY, CALIFORNIA

**DESIGN REVIEW  
SUBMITTAL**

ABUTMENT MATERIAL TYPE: SS = SOLID SAWN, GLU = GLULAM, CONC = CONCRETE  
HARDWARE COATING TYPE: GALV = GALVANIZED, UNC = UNCOATED, WEA = WEATHERING STEEL



**TRAIL BRIDGE W/RAILING SYSTEM**



**TYPICAL DECK SECTION W/RAILING SYSTEM**

**\*TABLE-1: SOLID SAWN STRINGER SIZE REQUIREMENTS - LRFD**

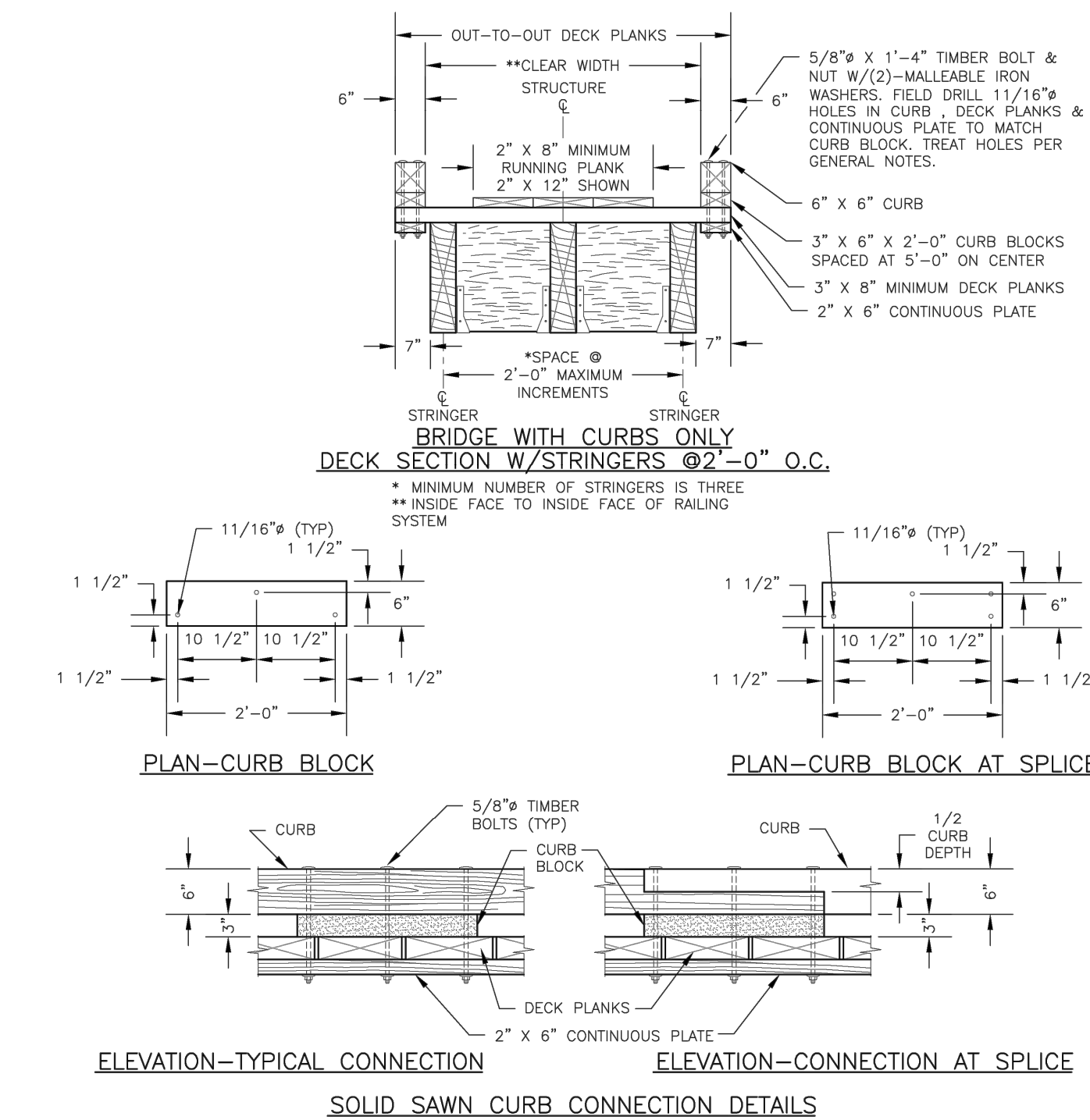
**STRINGER SPAN (FEET)	TIMBER SPECIES - DOUGLAS FIR - LARCH GRADE - NO.1			
	DESIGN LOADING IN POUNDS PER SQUARE FOOT		DESIGN LOADING IN POUNDS PER SQUARE FOOT	
	PEDESTRIAN LIVE LOAD	GROUND SNOW LOAD	150	200
•10	3" x 8"	3" x 10"	3" x 12"	4" x 10"
•15	4" x 10"	4" x 12"	4" x 14"	4" x 16"
•20	4" x 14"	6" x 12"	6" x 14"	6" x 16"
•25	6" x 14"	6" x 14"	6" x 16"	6" x 20"
•30	6" x 16"	6" x 18"	6" x 20"	8" x 20"

INSTALL BRACING WITHIN A DISTANCE OF THE DEPTH OF THE BEAM FROM THE CENTERLINE OF BEARING  
INSTALL BRACING WITHIN A DISTANCE OF THE DEPTH OF THE BEAM FROM THE CENTERLINE OF BEARING & MID-SPAN  
REQUIRED FOR THE SITE CONDITIONS  
\*\* STRINGER LENGTH EQUAL TO STRINGER SPAN PLUS ONE FOOT  
\*\*\* REQUIRES REGIONAL BRIDGE ENGINEER APPROVAL

SHEET 2 OF 4

13 USFS SAWN TIMBER STRINGER TRAIL BRIDGE DETAIL /  
STD 962-10-01  
NOT TO SCALE

14 USFS SAWN TIMBER STRINGER TRAIL BRIDGE DETAIL /  
STD 962-10-02a  
NOT TO SCALE



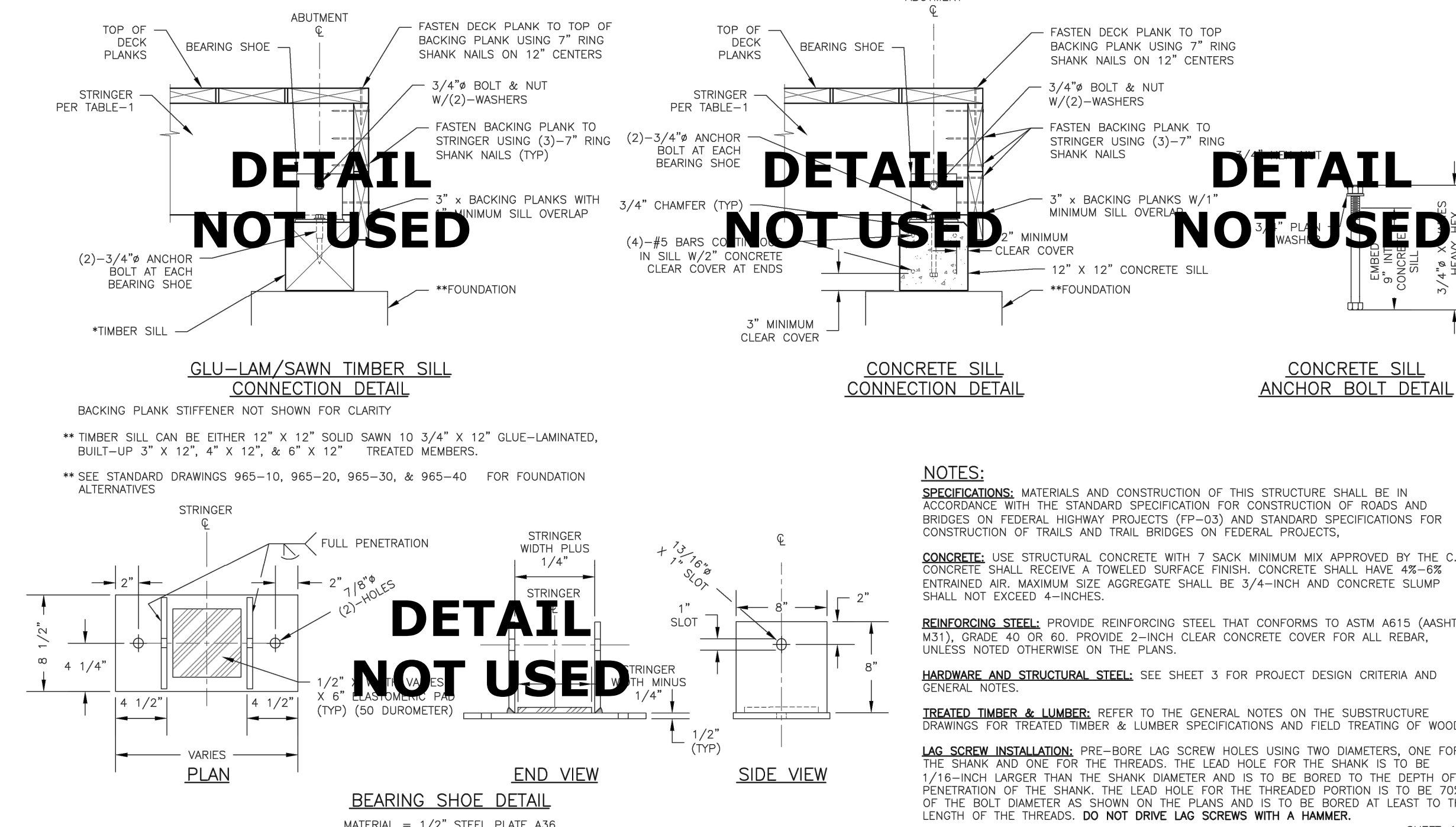
**SOLID SAWN CURB CONNECTION DETAILS**

**GENERAL NOTES:**

**SPECIFICATIONS:** MATERIALS AND CONSTRUCTION OF THIS STRUCTURE SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATION FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS (FP-03) AND STANDARD SPECIFICATIONS FOR CONSTRUCTION OF TRAILS AND TRAIL BRIDGES ON FEDERAL PROJECTS.  
**TIMBER & LUMBER:** SOLID SAWN TIMBER MEMBERS SHALL CONFORM TO THE REQUIREMENTS OF THE GRADING RULES AGENCY FOR THE SPECIES, TYPE, AND GRADE SPECIFIED BELOW.  
**DECK PLANKS, CURBS, SILLS, & BACKING PLANKS**  
- COASTAL REGION DOUGLAS FIR-LARCH ROUGH SAWN NO.1 GRADE, GRADING RULES AGENCY - WMPA, WCLB  
**RUNNING PLANKS**  
- COASTAL REGION DOUGLAS FIR-LARCH ROUGH SAWN NO.2 GRADE, GRADING RULES AGENCY - WMPA, WCLB  
**RAILS & POSTS (SEE PROJECT CRITERIA)**  
**UNTREATED**  
- REDWOOD, S4S, NO.1 GRADE GRADING RULES AGENCY - RIS  
- WESTERN RED CEDAR, S4S, SELECT STRUCTURAL GRADE GRADING RULES AGENCY - WMPA, WCLB  
**TREATED**  
- HEM-FIR/DOUGLAS FIR, S4S, NO.1 GRADE GRADING RULES AGENCY - WMPA, WCLB  
**TREATMENT:** SEE PROJECT CRITERIA FOR MEMBERS IDENTIFIED TO BE TREATED AND FOR TREATMENT TYPE. PRESERVATIVE TREATMENT SHALL BE IN ACCORDANCE WITH THE CURRENT AMERICAN WOOD PROTECTION ASSOCIATION (AWPA) SPECIFICATIONS USING THE TREATMENT MATERIALS LISTED BELOW. TREATMENT WILL COMPLY WITH THE REQUIREMENTS OF THE CURRENT EDITION OF WESTERN WOOD PRESERVERS INSTITUTE (WWPI) "BEST MANAGEMENT PRACTICES FOR THE USE OF TREATED WOOD IN AQUATIC ENVIRONMENTS".  
**STRINGERS, DECKING, RUNNING PLANKS, & RAILING SYSTEM, IF TREATED**  
- AWPA USE CATEGORY SYSTEM (U1) FOR USE CATEGORY 3B ABOVE GROUND-EXPOSED (UC3B)  
- PENTACHLOROPHENOL IN LIGHT OIL (TYPE C SOLVENT)  
- COPPER NAPHTHENATE (CuN) IN LIGHT OIL (TYPE C SOLVENT)  
**SILLS, BACKING PLANKS, CURBS, & TIMBER WALLS, IF TREATED**  
- AWPA USE CATEGORY SYSTEM (U1) FOR USE CATEGORY 4B GROUND CONTACT-HEAVY DUTY (UC4B)  
- PENTACHLOROPHENOL IN HEAVY OIL (TYPE A SOLVENT)  
- COPPER NAPHTHENATE (CuN) IN HEAVY OIL (TYPE A SOLVENT)  
**FIELD TREATMENT:** COPPER NAPHTHENATE (2% SOLUTION) SHALL BE FURNISHED FOR FIELD TREATING OF WOOD. ALL ABRASIONS AND FIELD CUTS - APPROVED BY THE C.O.R. - SHALL BE CAREFULLY TRIMMED AND GIVEN THREE BRUSH COATS OF THE FIELD TREATMENT SOLUTION. WHERE APPROVED FIELD DRILLING OF BOLT OR NAIL HOLES IS REQUIRED, THE HOLES SHALL BE FILLED WITH PRESERVATIVE PRIOR TO INSERTING THE FASTENERS.  
**HARDWARE AND STRUCTURAL STEEL:** SEE PROJECT DESIGN CRITERIA FOR STEEL HARDWARE FINISH. GALVANIZED OR UNFINISHED HARDWARE SHALL MEET THE REQUIREMENTS OF AASHTO M270, GRADE 36, WITH NUTS AND BOLTS CONFORMING TO ASTM A307, GRADE A WEATHERING STEEL AND HARDWARE SHALL MEET THE REQUIREMENTS OF AASHTO M270, GRADE 50W, WITH BOLTS AND NUTS CONFORMING TO ASTM A325, TYPE 3. USE MALLEABLE IRON WASHERS AGAINST WOOD UNLESS OTHERWISE NOTED.  
WHEN STRUCTURAL STEEL IS TO BE WELDED, THE WELDING PROCEDURE SHALL BE IN ACCORDANCE WITH AWS D1.1 AND SHALL BE SUITABLE FOR THE GRADE OF STEEL AND INTENDED USE OR SERVICE.  
**FABRICATION:** SUBMIT SHOP DRAWINGS FOR ALL BRIDGE COMPONENTS (EXCEPT TIMBER RUNNING PLANKS). SHOW ALL DIMENSIONS AND FABRICATION DETAILS FOR ALL CUT OR BORED TIMBER. FIELD DRILLING OF HOLES SHALL NOT BE ALLOWED UNLESS OTHERWISE NOTED ON THE PLANS.

SHEET 3 OF 4

15 USFS SAWN TIMBER STRINGER TRAIL BRIDGE DETAIL /  
STD 962-10-03a  
NOT TO SCALE



**BEARING SHOE DETAIL**

MATERIAL = 1/2" STEEL PLATE A36

**NOTES:**

**SPECIFICATIONS:** MATERIALS AND CONSTRUCTION OF THIS STRUCTURE SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATION FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS (FP-03) AND STANDARD SPECIFICATIONS FOR CONSTRUCTION OF TRAILS AND TRAIL BRIDGES ON FEDERAL PROJECTS.  
**CONCRETE:** USE STRUCTURAL CONCRETE WITH 7 SACK MINIMUM MIX APPROVED BY THE C.O. CONCRETE SHALL RECEIVE A TOWELED SURFACE FINISH. CONCRETE SHALL HAVE 4% ENTRAINMENT AIR. MAXIMUM SIZE AGGREGATE SHALL BE 3/4-INCH AND CONCRETE SLUMP SHALL NOT EXCEED 4-INCHES.  
**REINFORCING STEEL:** PROVIDE REINFORCING STEEL THAT CONFORMS TO ASTM A615 (AASHTO M31). GRADE 40 OR 60. PROVIDE 2-INCH CLEAR CONCRETE COVER FOR ALL REBAR, UNLESS NOTED OTHERWISE ON THE PLANS.  
**HARDWARE AND STRUCTURAL STEEL:** SEE SHEET 3 FOR PROJECT DESIGN CRITERIA AND GENERAL NOTES.  
**TREATED TIMBER & LUMBER:** REFER TO THE GENERAL NOTES ON THE SUBSTRUCTURE DRAWINGS FOR TREATED TIMBER & LUMBER SPECIFICATIONS AND FIELD TREATING OF WOOD  
**LAG SCREW INSTALLATION:** PRE-BORE LAG SCREW HOLES USING TWO DIAMETERS, ONE FOR THE SHANK AND ONE FOR THE THREADS. THE LEAD HOLE FOR THE SHANK IS TO BE 1/16-INCH LARGER THAN THE SHANK DIAMETER AND IS TO BE BORED TO THE DEPTH OF PENETRATION OF THE SHANK. THE LEAD HOLE FOR THE THREADED PORTION IS TO BE 20% OF THE BOLT DIAMETER AS SHOWN ON THE PLANS AND IS TO BE BORED AT LEAST TO THE LENGTH OF THE THREADS. DO NOT DRIVE LAG SCREWS WITH A HAMMER.

SHEET 4 OF 4

16 USFS SAWN TIMBER STRINGER TRAIL BRIDGE DETAIL /  
STD 962-10-04  
NOT TO SCALE

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DATE: 12/12/23  
DRAWN BY:  
JEANINE STRICKLAND, PLA CA#4285  
CHECKED BY:  
PAUL CURFMAN, PLA CA #3043  
ORIGINAL DRAWING SIZE: 24 X 36

**USFS  
SAWN TIMBER  
BRIDGE  
DETAILS**

SHEET



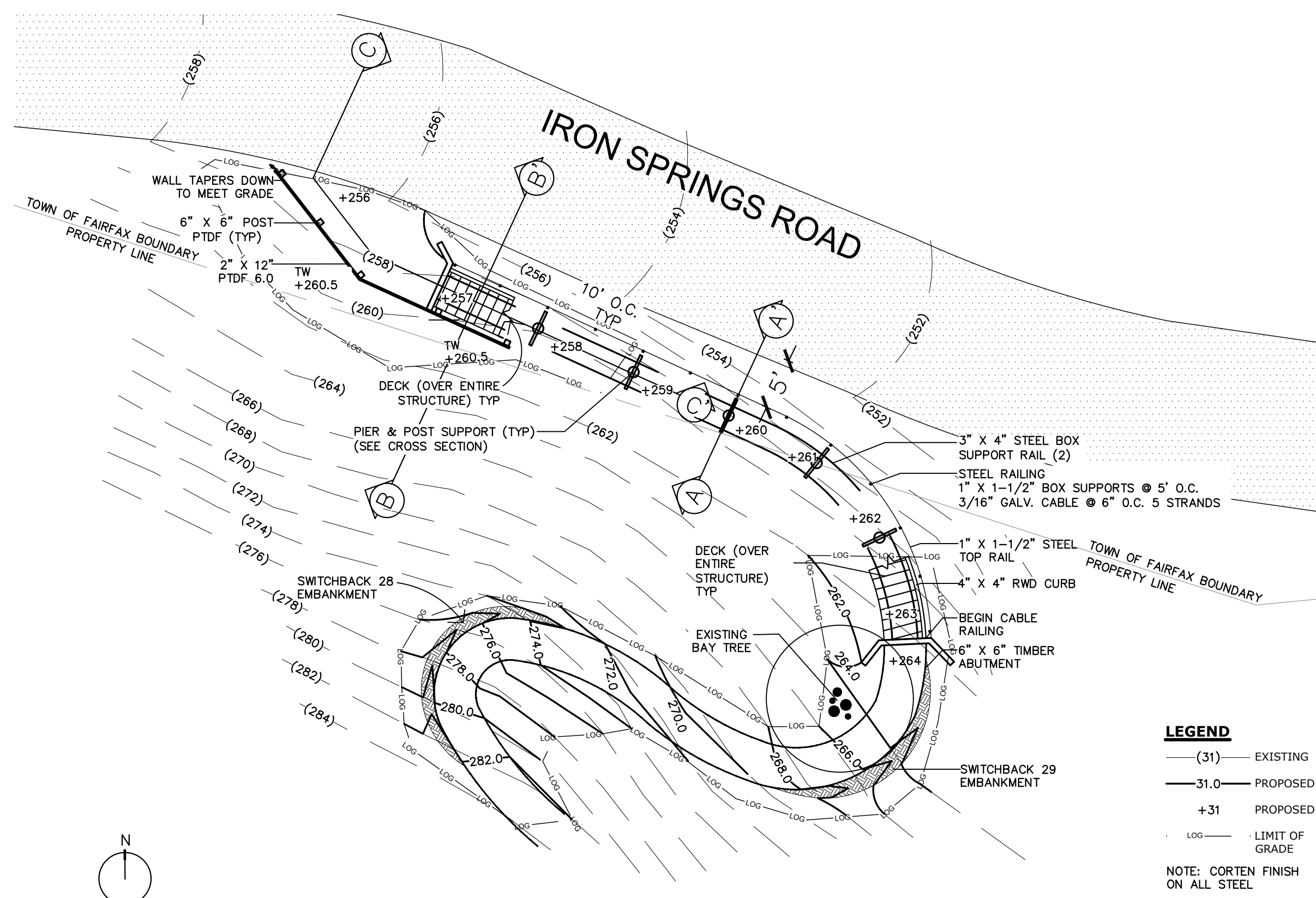


**CABALLO ROJO  
TRAIL**

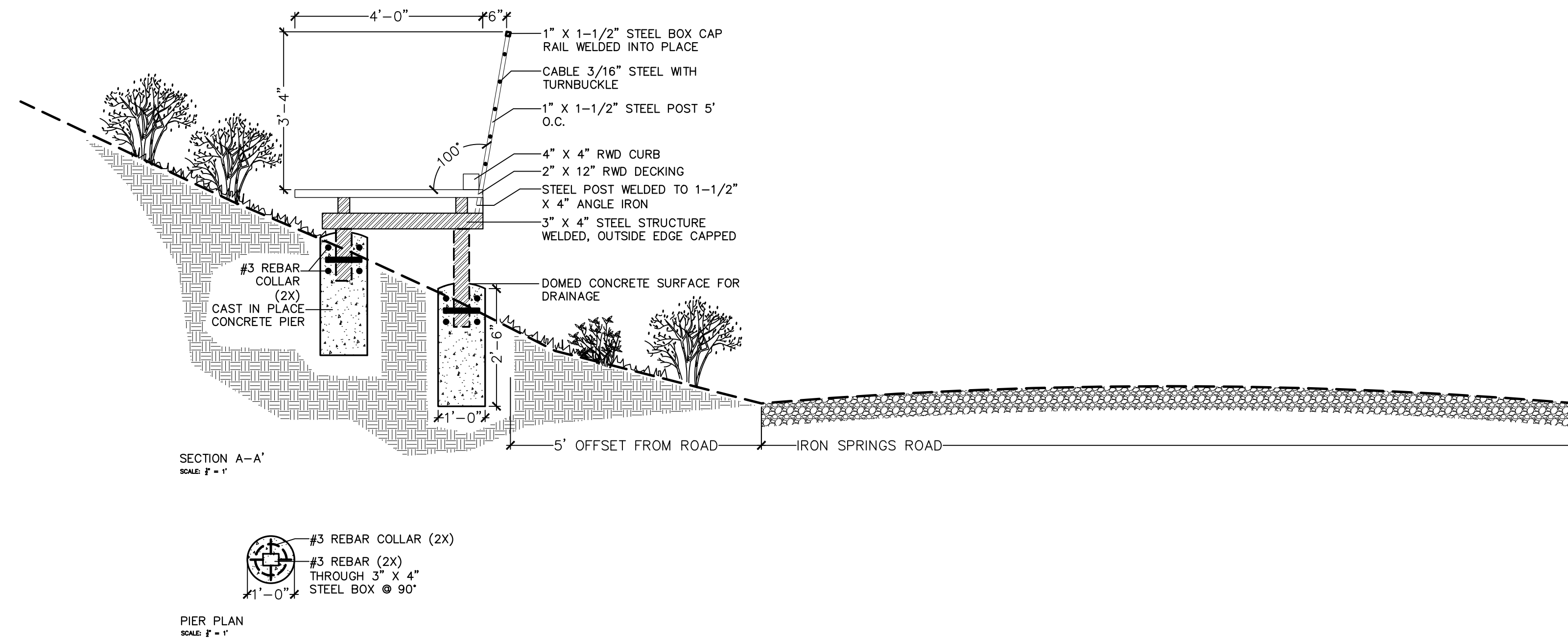
**CAMP TAMARANCHO  
MOUNTAIN BIKE  
TRAIL SYSTEM**

**MARIN COUNTY, CALIFORNIA**

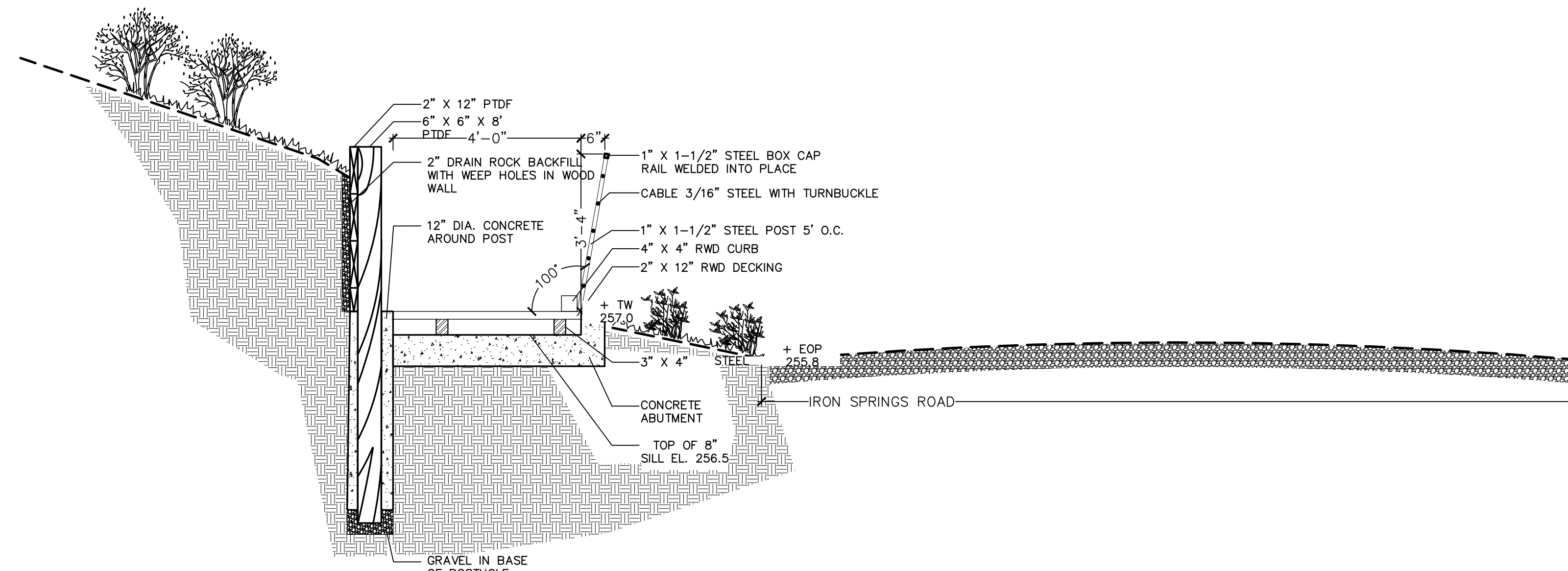
**DESIGN REVIEW  
SUBMITTAL**



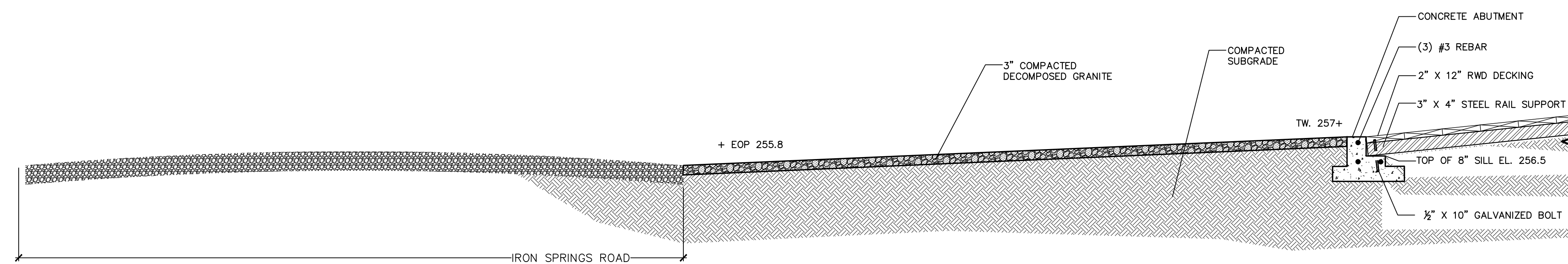
17 RAMP AT TRAIL'S END – PLAN VIEW  
SCALE: 1" = 10'-0"



18 SECTION A-A'  
SCALE: 1/2" = 1'-0"



19 SECTION B-B'  
SCALE: 1/2" = 1'-0"



20 SECTION C-C'  
SCALE: 1/2" = 1'-0"



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ORIGINAL DRAWING SIZE: 24 X 36

**RAMP AT  
TRAILS END**

SHEET

**DIVISION 01 - GENERAL REQUIREMENTS**

- ALL WORK SHALL COMPLY WITH THE 2022 CALIFORNIA BUILDING CODE (2021 IBC) AND LATEST EDITIONS OF THE GOVERNING LOCAL CODES AND ORDINANCES, AS APPLICABLE. ALL WORK AND MATERIALS ARE TO COMPLY WITH THE LATEST REQUIREMENTS OF ALL APPLICABLE CITY, COUNTY AND STATE CODES, LOCAL REGULATIONS, AND THE DIRECTION OF THE BUILDING OFFICIAL FOR SUCH BUILDING LAWS. ALL REGULATIONS AND DIRECTIONS ARE TO BE CONSIDERED AS PART OF THESE SPECIFICATIONS AND PLANS, EXCEPT WHERE EXCEEDED HEREIN.
- THE GENERAL CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND CONDITIONS AT THE PROJECT SITE BEFORE EXECUTING ANY WORK. THE GENERAL CONTRACTOR SHALL NOTIFY THE OWNER AND/OR THE AUTHORIZED AGENT OF THE OWNER OF ANY AND ALL DISCREPANCIES BEFORE PROCEEDING.
- EACH CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS REQUIRED BY LEGAL AUTHORITIES BEFORE PROCEEDING WITH THEIR PROSPECTIVE INSTALLATIONS. THE CONTRACTOR(S) SHALL ALSO ARRANGE AND PAY FOR ALL INSPECTIONS AND EXAMINATIONS REQUIRED BY THOSE AUTHORITIES (UNLESS AN AGREEMENT WITH THE OWNER STATES OTHERWISE).
- NUMERICAL DIMENSIONS SHALL TAKE PRIORITY OVER SCALED DIMENSIONS.
- THE STRUCTURE(S) IS DESIGNED TO BE A STABLE UNIT AFTER ALL COMPONENTS ARE IN PLACE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SHORING AND BRACING, AS NECESSARY.

**SPECIAL INSPECTIONS**

SPECIAL INSPECTION SHALL BE REQUIRED FOR THE FOLLOWING ITEMS: N/A

**STRUCTURAL OBSERVATION (AS REQUIRED, SEE STRUCTURAL DRAWINGS)**

THE OWNER SHALL EMPLOY THE ENGINEER OR ARCHITECT RESPONSIBLE FOR THE STRUCTURAL DESIGN, OR ANOTHER ENGINEER OR ARCHITECT DESIGNATED BY THE ENGINEER OR ARCHITECT RESPONSIBLE FOR THE STRUCTURAL DESIGN, TO PERFORM STRUCTURAL OBSERVATION IN CONFORMANCE WITH CBC SECTION 1704.6. OBSERVED DEFICIENCIES SHALL BE REPORTED IN WRITING TO THE OWNER'S REPRESENTATIVE, SPECIAL INSPECTOR, CONTRACTOR, AND THE BUILDING OFFICIAL. THE STRUCTURAL OBSERVER SHALL SUBMIT A WRITTEN STATEMENT TO THE BUILDING OFFICIAL INDICATING THAT THE SITE VISITS HAVE BEEN MADE AND IDENTIFYING ANY REPORTED DEFICIENCIES WHICH TO THE BEST OF THE STRUCTURAL OBSERVER'S KNOWLEDGE, HAVE NOT BEEN RESOLVED.

**DIVISION 02 - SITE WORK**

**EXCAVATIONS & FOUNDATIONS**

- THE GEOTECHNICAL REPORT IF APPLICABLE SHALL BE CONSIDERED A PART OF THESE PLANS AND A COPY SHALL BE AVAILABLE ON THE JOB SITE AT ALL TIMES.
- GEOTECHNICAL REPORT BY: MILLER PACIFIC ENGINEERING GROUP  
JOB NO: 1039.052  
DATE: 24 OCTOBER 2016
- ALL EXCAVATIONS, AND THE STABILITY THERE OF, SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. IN THE EVENT THAT EXCAVATIONS REVEAL UNUSUAL AND/OR UNSTABLE CONDITIONS, THE SERVICES OF A SOILS ENGINEER AND/OR GEOLOGIST MAY BE REQUIRED.
- TEMPORARILY CUT SLOPES SHALL CONSIST OF A 5 FT. MAXIMUM VERTICAL CUT WITH A 12:1 MAXIMUM TRANSITION SLOPE TO ORIGINAL GRADE, ABOVE 5 FT. (UNLESS SITE CONDITIONS OR AGENCY REQUIREMENTS DICTATE MORE RESTRICTIVE MEASURES).
- ALL STANDING WATER SHALL BE REMOVED FROM FOUNDATION EXCAVATIONS PRIOR TO PLACING CONCRETE.
- ALL EMBEDS IN CONCRETE OR MASONRY SHALL BE SET WITH TEMPLATES (AS REQUIRED) AND SECURELY TIED IN PLACE PRIOR TO INSPECTION.
- THE GEOTECHNICAL ENGINEER IS TO PROVIDE SITE INSPECTION SERVICES DURING THE EXCAVATION, DRILLING, AND CONSTRUCTION OF THE FOUNDATION AND GRADING PORTIONS OF THE PROJECT.

**RETAINING WALL BACKFILL & DRAINAGE**

- UNLESS NOTED OTHERWISE, NORMAL BACKFILL SHALL CONSIST OF FREE-DRAINING, NON-COHESIVE MATERIAL FOR A MINIMUM HORIZONTAL DISTANCE OF 12 INCHES BEHIND THE WALL. THE FREE-DRAINING MATERIAL SHALL EXTEND TO WITHIN 18 INCHES OF THE SURFACE OF THE BACKFILL. THE UPPER 18 INCHES SHALL CONSIST OF A COHESIVE TYPE SOIL COMPACTED TO SEAL OFF SURFACE DRAINING FROM THE WALL DRAIN.
- BACKFILL OPERATIONS SHALL BE POSTPONED UNTIL THE SPECIFIED GROUT AND/OR CONCRETE STRENGTH HAS BEEN FULLY ATTAINED. SHOULD EARLY BACKFILL BE REQUIRED, OPERATIONS BEHIND THE UNCURED WALL SHALL BE POSTPONED UNTIL ADEQUATE SHORING HAS BEEN DESIGNED, APPROVED BY THE BUILDING OFFICIAL, AND PROPERLY INSTALLED.
- WATERPROOFING SHALL BE INSTALLED ON ANY SURFACES OR OTHER AREAS REQUIRED BY THE OWNER, ARCHITECT, OR ENGINEER(S). UNLESS NOTED OTHERWISE, PERFORMANCE AND SERVICEABILITY OF THE WATERPROOFING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- UNLESS NOTED OTHERWISE, DRAINAGE SHALL BE PROVIDED THROUGH A 4-INCH PERFORATED PLASTIC PIPE PLACED AT THE BASE OF THE FREE-DRAINING MATERIAL AND SLOPED TO DRAIN AT 1% MINIMUM. THE PIPE SHALL BE INSTALLED IN A BLANKET OF NOT LESS THAN 12 INCHES SQUARE OF 1/2-INCH OR 3/4-INCH DRAIN ROCK IN A FILTER FABRIC ENVELOPE (E.G. MIFRY 140N). IF CALTRANS SPECIFICATION CLASS 2 PERMEABLE IS USED THE FILTER FABRIC ENVELOPE MAY BE OMITTED. THE PIPE SHALL BE PLACED WITH THE PERFORATIONS IN THE LOWER 1/2 OF THE PIPE CIRCUMFERENCE.
- THE PIPE SHALL BE RIGID PVC PIPE WITH AN SDR OF 35 OR EQUIVALENT. (NOTE: WEEP DRAINAGE MAY BE SUBSTITUTED FOR A PERFORATED PIPE, WHERE APPROVED BY THE ARCHITECT AND GEOTECHNICAL ENGINEER)

**DIVISION 03 - CONCRETE**

- ALL CONCRETE SHALL ATTAIN THE FOLLOWING MINIMUM 28-DAY COMPRESSIVE STRENGTHS (UNLESS NOTED OTHERWISE ON THE STRUCTURAL DRAWINGS):  
CONVENTIONAL CONTINUOUS & SPREAD FOOTINGS, STEM WALLS, RETAINING WALLS:  
2500 PSI (SPECIAL INSPECTION NOT REQUIRED)
- WATER USED IN MIXING CONCRETE SHALL BE POTABLE AND CLEAN AND FREE FROM INJURIOUS AMOUNTS OF OILS, ACIDS, ALKALIS, SALTS, ORGANIC MATERIALS OR OTHER SUBSTANCES THAT MAY BE DELETERIOUS TO CONCRETE AND REINFORCEMENT.
- CORING OF CONCRETE IS NOT PERMITTED, EXCEPT AS NOTED. NOTIFY THE STRUCTURAL ENGINEER IN ADVANCE OF ANY CORING OPERATIONS NOT SPECIFIED ON THE STRUCTURAL DRAWINGS.
- BEFORE CONCRETE IS PLACED CHECK WITH ALL TRADES TO INSURE PROPER PLACEMENT OF ALL OPENINGS, SLEEVES, CONDUITS, CURBS, ETC., RELATING TO THE WORK.

**DIVISION 05 - REINFORCING STEEL**

- REINFORCING BARS SHALL CONFORM TO THE FOLLOWING ASTM RATING AND GRADE TYPE FOR BAR SIZES LISTED, UNLESS NOTED OTHERWISE (SEE STRUCTURAL DRAWINGS):  
#4 AND SMALLER ASTM A615 GRADE 40 (MIN.)  
#5 AND LARGER ASTM A615 GRADE 60
- ALL REINFORCING STEEL SHALL BE PLACED IN CONFORMANCE WITH THE "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE"; (ACI 318 LATE AND THE "MANUAL OF STANDARD PRACTICE FOR REINFORCED CONCRETE CONSTRUCTION" (LATEST EDITION) BY C.R.S.I.)
- WELDING OF REINFORCEMENT SHALL NOT BE PERMITTED UNLESS SPECIFICALLY APPROVED BY THE ENGINEER.
- ALL REINFORCING BAR BENDS SHALL BE MADE COLD AND SHALL CONFORM TO C.R.S.I. RECOMMENDATIONS. HEATING OF BARS IS NOT PERMITTED.
- SPLICES IN CONCRETE (CLASS B TENSION SPLICE, U.N.O.)  
BAR SIZE MIN. LAP  
3 21"  
4 27"  
5 52"
- CONCRETE PROTECTION FOR REINFORCEMENT:  
REINFORCING STEEL SHALL HAVE THE FOLLOWING MINIMUM CONCRETE COVERAGE (UNLESS NOTED OTHERWISE ON THE STRUCTURAL DRAWINGS):  
A. CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH: 3"  
B. CONCRETE EXPOSED TO EARTH OR WEATHER:  
#6 BARS AND SMALLER: 1 1/2"

**DIVISION 06 - LUMBER FRAMING**

- ALL DIMENSIONED FRAMING LUMBER SHALL BE DOUGLAS FIR-LARCH, GRADE-MARKED BY WCLB OR WWPA RULES, FREE-OF-HEART-CENTER (FOHC), OF NOMINAL SIZES AND MINIMUM GRADES AS FOLLOWS, UNLESS NOTED OTHERWISE ON THE STRUCTURAL DRAWINGS:

4x AND LARGER BEAMS AND GIRDERS: PRESSURE TREATED NO. 1 OR BETTER  
SILL PLATES, ON CONCRETE: PRESSURE TREATED NO. 2 OR BETTER

THE MOISTURE CONTENT OF FRAMING LUMBER SHALL NOT EXCEED 19% (DRY) AT TIME OF FABRICATION AND INSTALLATION AND IN NO CASE SHALL THE MOISTURE CONTENT EXCEED 30% (PARTIALLY SEASONED) AT THE TIME OF DELIVERY TO THE JOB SITE.

**FRAMING CONNECTORS**

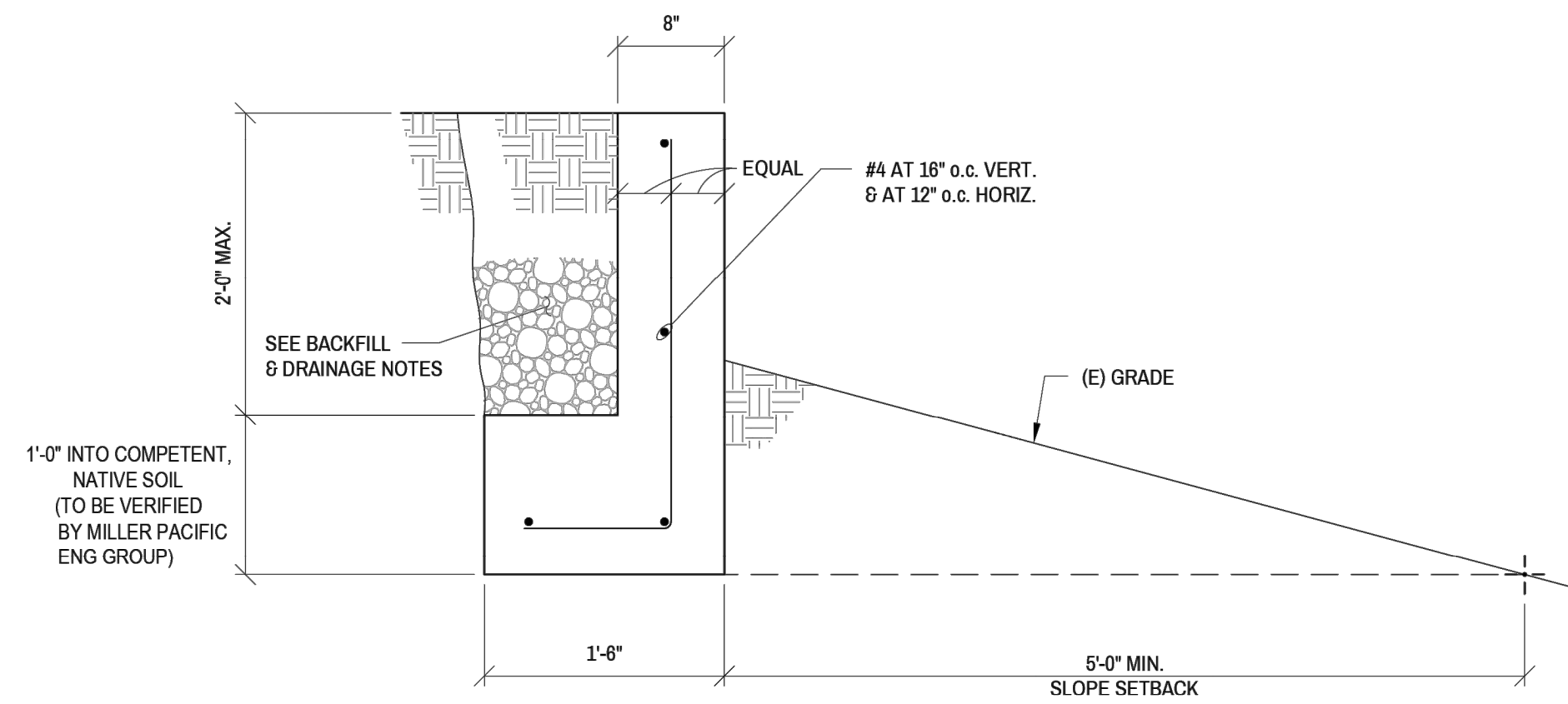
ALL METAL FRAMING CONNECTORS SHALL BE MANUFACTURED BY SIMPSON STRONG-TIE, INC. WITH CONNECTORS PER SIMPSON STRONG-TIE SPECIFICATIONS

**FASTENERS IN WOOD FRAMING**

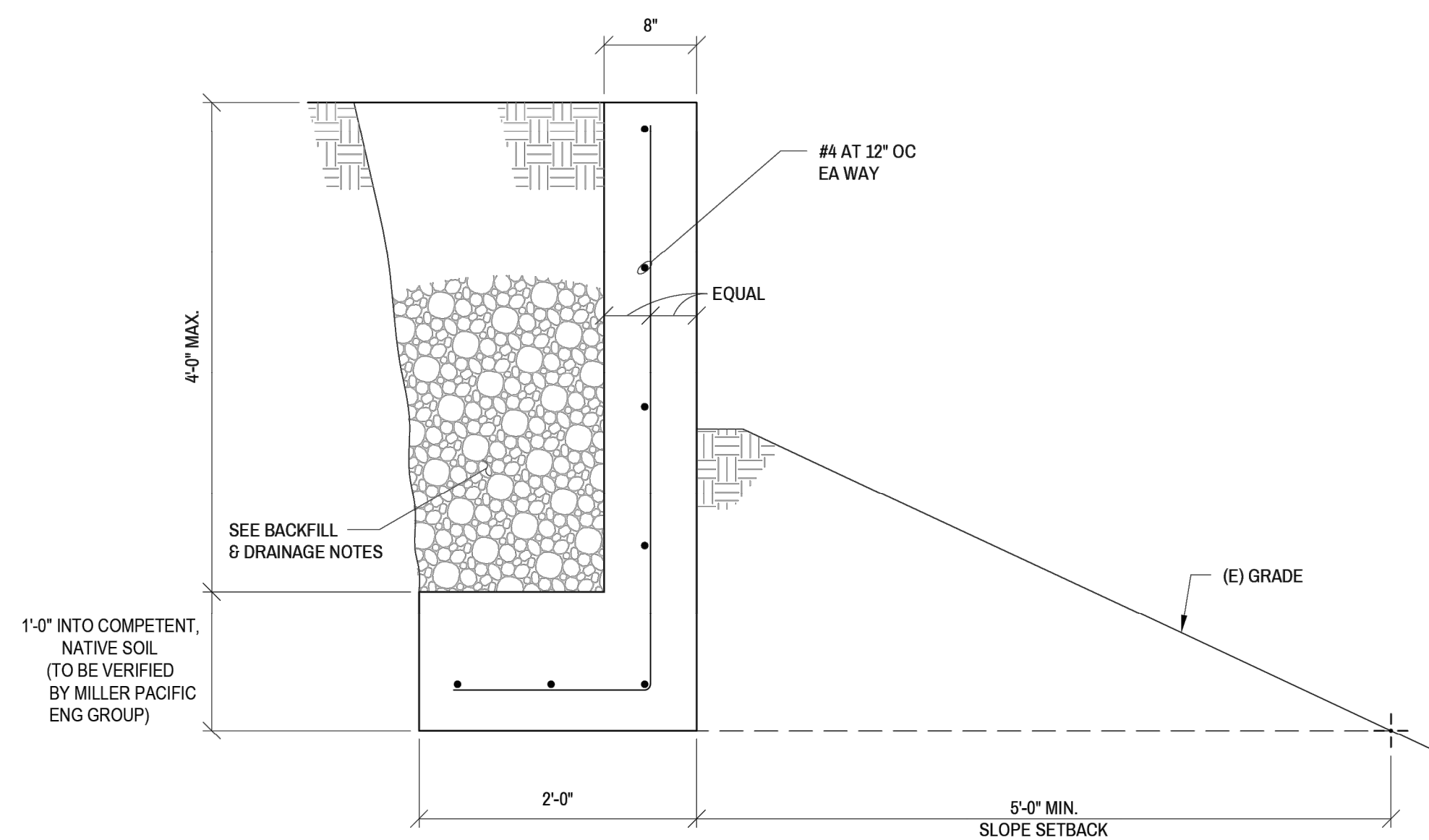
- NAILS FOR ALL CONNECTIONS SPECIFIED AND/OR DETAILED ON THE STRUCTURAL OR ARCHITECTURAL DRAWINGS SHALL BE COMMON WIRE NAILS (NOT BOX OR SINKER NAILS) UNLESS NOTED OTHERWISE.
- ALL BOLTS IN WOOD FRAMING SHALL BE STANDARD MACHINE BOLTS (ASTM A307).
- BOLTS OR LAG SCREWS WITHOUT METAL SIDE PLATES SHALL HAVE STANDARD CUT WASHERS UNLESS NOTED OTHERWISE.
- BOLT HOLES IN WOOD SHALL BE DRILLED 1/32" MINIMUM TO 1/16" MAXIMUM GREATER IN DIAMETER THAN THE DIAMETER OF THE BOLT.
- LAG SCREWS SHALL BE TURNED WITH A WRENCH (NOT DRIVEN) INTO A PRE-DRILLED LEAD HOLE HAVING A DIAMETER EQUAL TO APPROXIMATELY 2/3 OF THE SHANK DIAMETER. THE CLEARANCE HOLE FOR THE SHANK SHALL HAVE THE SAME DIAMETER AND DEPTH AS THE UNTHREADED SHANK. SOAP OR OTHER LUBRICANT MAY BE USED TO PREVENT DAMAGE TO THE LAG SCREW.

**METAL CONNECTORS AND TREATED LUMBER (CBC 2304.10.5)**

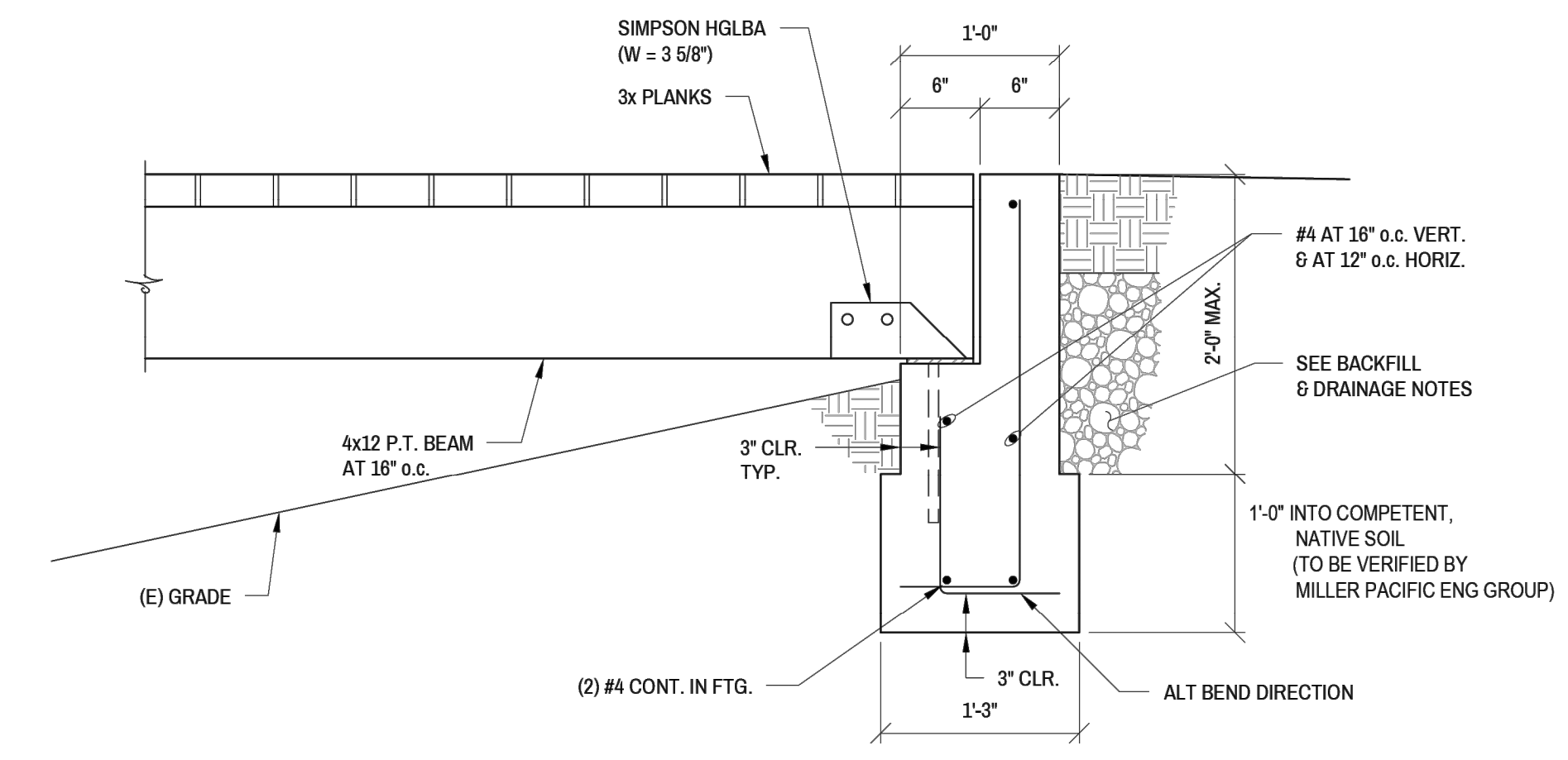
- FASTENERS, INCLUDING NUTS AND WASHERS, IN CONTACT WITH PRESERVATIVE-TREATED WOOD OR FIRE-RETARDANT-TREATED WOOD IN EXTERIOR, WET, OR DAMP CONDITIONS SHALL BE OF HOT-DIPPED ZINC-COATED GALVANIZED STEEL, STAINLESS STEEL, SILICON BRONZE OR COPPER. STAPLES SHALL BE OF STAINLESS STEEL.  
EXCEPTION: PLAIN CARBON STEEL FASTENERS, INCLUDING NUTS AND WASHERS, IN SBX/DOT AND ZINC BORATE PRESERVATIVE-TREATED WOOD IN AN INTERIOR, DRY ENVIRONMENT SHALL BE PERMITTED.
- FASTENERS OTHER THAN NAILS, STAPLES, TIMBER RIVETS, WOOD SCREWS AND LAG SCREWS SHALL BE PERMITTED TO BE OF MECHANICALLY DEPOSITED ZINC-COATED STEEL WITH COATING WEIGHTS IN ACCORDANCE WITH ASTM B695, CLASS 55 MINIMUM.
- CONNECTORS THAT ARE USED IN EXTERIOR APPLICATIONS AND IN CONTACT WITH PRESERVATIVE-TREATED WOOD SHALL HAVE COATING TYPES AND WEIGHTS IN ACCORDANCE WITH THE TREATED WOOD OR CONNECTOR MANUFACTURER'S RECOMMENDATIONS. IN THE ABSENCE OF MANUFACTURER'S RECOMMENDATIONS, NOT LESS THAN ASTM A653, TYPE G185 ZINC-COATED GALVANIZED STEEL, OR EQUIVALENT, SHALL BE USED.
- FASTENINGS, INCLUDING NUTS AND WASHERS, FOR WOOD FOUNDATIONS SHALL BE AS REQUIRED IN AWC PW6.
- ALL CONNECTORS AND FASTENERS MUST BE MADE OF THE SAME MATERIAL WHEN USING STAINLESS STEEL OR HOT-DIP GALVANIZED STEEL CONNECTORS.
- ALL FIELD CUTS AND BORINGS IN PRESERVATIVE-TREATED LUMBER SHALL BE TREATED PER AWPA M4.



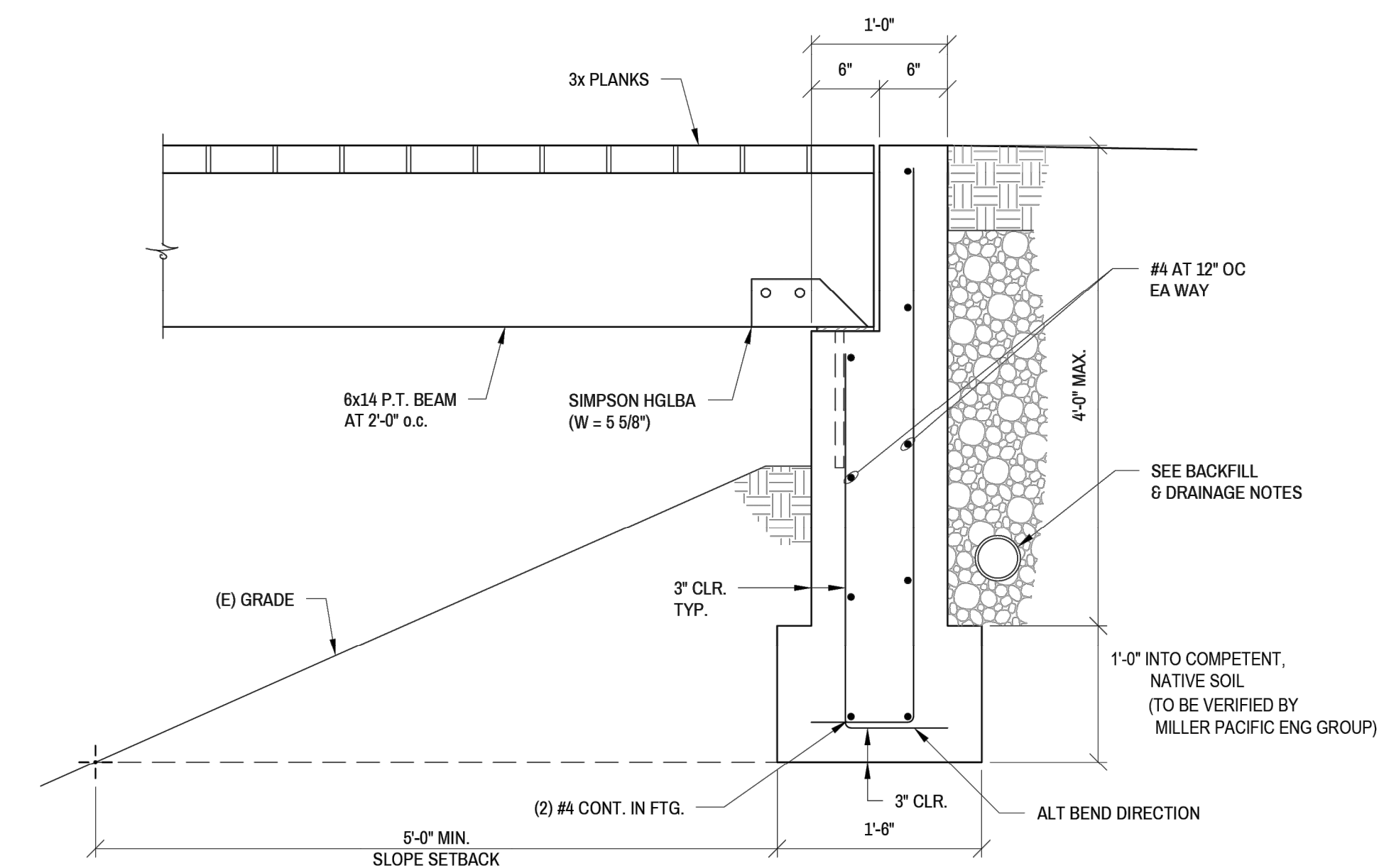
4 WING/RETURN WALL - STREAM CROSSINGS 2 & 3  
SCALE: 1" = 1'-0"



2 WING/RETURN WALL - STREAM CROSSING 4  
SCALE: 1" = 1'-0"



3 BOARDWALK ABUTMENT - STREAM CROSSINGS 2 & 3  
SCALE: 1" = 1'-0"



1 BRIDGE ABUTMENT - STREAM CROSSING 4  
SCALE: 1" = 1'-0"