Addendum No. 2

Bear Creek Redwoods Public Access Project

To: Request for Bid Recipients

From: Matt Brunnings

Date: April 3, 2018

Re: Addendum No. 2

Bidders must acknowledge receipt of the Addendum No. 2 by signing below and including this page in their bids. Addendum No. 2 consists of:

1. **Responses to questions issued during one of the mandatory pre-bid meetings that was not address in the first addendum or to questions received after the bid walks.**
   See attached Exhibit 1

2. **Amended Bid Package documents.**

   a. The following elements of the Project Bid Package have been amended:

      i. Bid Schedule (replace existing schedule with revised Bid Schedule)
         a. The bid item numbering in general has changed due to the addition of new bid items.
         b. Added Bid Item #10 - $25,000 allowance towards removal of additional trees. It is anticipated that additional larges tree will need to be removed in order to provide a safe line of sight from the proposed driveway.
         c. Bid Item #2.5 – Renamed it to Rock and Fabric (Per Detail I)
         d. Bid Item #2.7 - Changed units to EA from LS.
         e. Bid Item #2.12 – Changed units from LS to EA.
         f. Bid Item #3.22 – Increased quantity to 72 SF of dome panels.
         g. Bid Item #3.23 – Added new Bid Item "Truncated dome panels in resin pathway" 500 SF. Per County comments dome panels are needed along the north edge of the parking lot where there is flush curb.
         h. Bid Item #3.36 – Folding Bollard quantity increased to 4 per County comments.

      ii. Project Plan Set B – Alma College Parking Area and Trailhead

a. Replace existing Sheets C3.0, C4.0-C4.4, C5.0, L2.2, L5.1, and L5.4 with attached revised sheets.
    i. C3.0 – Changed striping and stall notes
    ii. C4.0 – 4.4 – Changed grading near concrete stairs, added enlargement detail of stairs, added spot elevations throughout, added note regarding culvert location and protection in places, minor revisions to sections and profiles.
    iii. C5.0 Revised pond overflow detail.
    iv. L2.2 added truncated domes along north edge of parking lot
    v. L5.1 revised Detail 4, truncated domes
    vi. L5.4 revised Detail 1 and Detail 3 to add a 4th bollard and associated striping.

iii. Project Plan Set D – Road and Trail Improvements
(Replace existing plan set with new plan set.)
a. Sheets C4, C6, C7, C14, C15, C16, and C17 are all now marked with a large X to clarify / confirm that the work on these sheets is not included in this contract. Roads 300 and 340 are the only ones receiving improvements as part of this contract.
b. Sheet C3 – Rock and Fabric per Detail I added to the legend to differentiate between that work and the Subgrade Stabilization work.

iv. Technical Spec Sections for Alma College Parking Area and Trailhead Project
a. Table of Contents: (revised Table of Contents attached)
    i. Revised the titles of Section 32 12 15 to Resin Paving and Aggregate Pathway, 32 13 43 to Permeable Concrete Paving and 33 41 00 to Storm Utility Drainage Piping and Culverts.
b. Section 03 30 00 Cast-In-Place Concrete:
    i. Delete paragraphs 2.1, 2.2, 3.1, and 3.3 in their entirety.
c. Section 13 00 00 Premanufactured Restroom: (revised section attached)
    i. Add Paragraph 1.01 in Part 1 General: “1.01 Contractor is responsible for excavation and site preparation. District will provide the restroom building. Manufacturer will deliver the restroom to the site, provide a crane, and install the restroom with Contractor’s assistance.”
d. Section 31 10 00 Site Clearing: (revised section attached)
    i. Replace paragraph 3.6 with new paragraph 3.6.
e. Section 31 20 00 Earth Moving (revised section attached)
    i. Replace paragraph 1.1A with new paragraph 1.1A.
    ii. Replace paragraph 3.13.C with new paragraph 3.13C.
    iii. Delete paragraph 3.15 in its entirety.
f. Delete Section 32 01 90 Landscape Maintenance
g. Section 31 17 13 Parking Bumpers: (revised section attached)
    i. Replace paragraph 2.1A with new paragraph 2.1A.
h. Section 31 17 23 Pavement Markings and Markers (revised section attached)
    i. Replace paragraph 1.1A with new paragraph 1.1A.
    ii. Add new paragraph 1.1B.

iii. Delete section 2.3 and 3.2 in their entirety.

i. Section 32 41 00 Storm Utility Drainage Piping and Culverts
   i. Remove section 2.5 in its entirety.

v. <u>Tech Spec Sections for Road and Trail Project</u>
   a. Replace existing Section 35 42 37 Rock Slope Protection with new section of the same name (attached)
      i. Additional information was added to the Rock Slope Protection Section 2.2F and to the Gabion Rock Base Section 3.6.

The undersigned has carefully examined the following Addendum No. 2:

_____	_____	_____
Contractor's Name	Company	Date

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ADDENDUM NO. 2 – EXHIBIT 1

BEAR CREEK REDWOODS PUBLIC ACCESS PROJECT

REMAINING QUESTIONS AND ANSWERS

1) **Q: Is there no regrading at the MP 216 slide location?**
   A: Correct only a rock wall.

2) **Q: What type of erosion control is needed along the road being repaired?**
   A: Erosion control for the roadway portion of the project will typically just take place at the specific work areas. The District does not anticipate needing erosion control measures along the roadway work.

3) Q: **What are the water plans for constructing the Webb Creek Bridge?**
   A: No dewatering from pier drilling can be put into the creek.

4) **Q: Are the truncated domes cast in place or surface mounted? Dimensions?**
   A: Please see new attached Tech Spec Section 32 17 16 more info on truncated domes Dimensions are provided on Sheet L5.1 Detail 4.

5) **Q: Is the striping paint or thermoplastic**
   A: The striping on Bear Creek Road is thermoplastic and the rest of the striping is paint.

6) **Q: Sheet SS-1 and C5.1 conflict with the STOP sign striping requirements.**
   A: Contractor shall locate the "STOP" marking 8' behind the limit line as indicated on SS-1.

7) **Q: How long are the wheel stops to be used on this project?**
   A: The wheel stops are 4' in length. See revised spec section.

8) **Q: Does the owner provide and pay for the SWPPP?**
   A: Yes, the District is developing the SWPPP and will file it for the WDID.

9) **Q: Who will provide and pay for tree pruning / Arborist / Botanist?**
   A: The contractor will need to pay for all costs associated with tree pruning done at their discretion. Tree removal work directed by the District will be paid for at T&M or at an agreed upon price out of the tree removal allowance bid item.

10) **Q: Is there a detail for the pond overflow? On Sheet C4.1 it says by others.**
    A: This contract will only install a utility box at the pond end of the new pipe. The overflow inlet will be installed following this project in another contract.

11) **Q: Some roadway bid Items are very low, are all the roads on the plans included in this project?**
    A: Only Road 300 and 340 are included in this project. See the attached revised plan set.

1. BID PROPOSAL FORM

(To be executed by Bidder and Submitted)

Project Name:	Bear Creek Redwoods Public Access Project
Location:	Bear Creek Redwoods Open Space Preserve
Budget Code:	
Scope of Work:	Retaining Wall, Road and Trail Improvements, Parking Lot, Webb Creek Bridge, Tank Removal
District Representative:	Matt Brunnings Midpeninsula Regional Open Space District 330 Distel Circle Los Altos, CA 94022 (650) 691-1200

The undersigned has carefully examined the site conditions for the Work, attended the Mandatory Pre-Bid Meeting, reviewed all documents in the Bid Package, including the Drawings, Plans and Specifications, accepts all terms and conditions of the Agreement, and has reviewed the following Addenda (fill in blanks below as appropriate to the number of Addenda issued for the project):

Addendum No._____, dated _____, 20_____,

Addendum No._____, dated _____, 20_____,

Addendum No._____, dated _____, 20_____.

1. BASE BID

Bid Proposal will be evaluated based on **Total Base Bid.** District may opt to award additional work based on unit pricing submitted herein. Bidders proposed Duration for Completion shall be for Total Base Bid. **Please reference D.3 Supplemental Conditions, Article Four, Paragraph K – Typical Work Scenario – Base Bid and Stand-Down Time for critical information required to complete the Bid Form.**

Item No.	Item Description	QTY.	Unit	Unit Price	Extension
1	General Conditions, Safety, Site Supervision & Insurance;	1	LS	$	$
2	Traffic Control	1	LS	$	$
3	Site SWPPP / BMP's	1	LS	$	$
4	Construction Staking	1	LS	$	$
5	Phytophthora Contamination Prevention Requirements	1	LS	$	$
6	Stand-down Time Allowance	1	LS	$50,000	$ 50,000

7	Allowance for removal and disposal of unforeseen hazardous materials	1	LS	$ 20,000	$ 20,000
8	Temporary protection of site trees to remain	1	LS	$	$
9	Access Road Improvements: Blade and place 4" of 90% compacted Class II AB between BC12 and Parking Lot Site	13,000	SF	$	$
10	Allowance for removal of site trees (At T&M)	1	LS	$ 25,000	$ 25,000
	SUB TOTAL SITE WIDE WORK			$	
1	**RETAINING WALL**		Unit	Unit Price	Extension
1.0	Mobilization / Demobilization	1	LS	$	$
1.1	Retaining Wall Project Area Per Retaining Wall plan set, including but not limited to the follow items: • Solider Pile Retaining Wall • Demolition and Disposal • 25 LF 24" Culvert • 50 LF 24" Slope Drain • Excavation and Grading • Rock Slope Protection	1	LS	$	$
	SUB TOTAL RETAINING WALL IMPROVEMENTS			$	
2	**ROAD IMPROVEMENTS**	QTY.	Unit	Unit Price	Extension
Road 300 and 340 Common Features					
2.0	Mobilization / Demobilization	1	LS	$	$
2.1	Supply and Place Gabion Rock	8	CY	$	$
2.2	Lime Treated Aggregate Base (4" thick)	140,000	SF	$	$
2.3	New Inboard Ditch	1,280	LF	$	$
2.4	Clean Inboard Ditch	930	LF	$	$
2.5	Rock and Fabric (per Detail I)	780	LF	$	$
2.6	Subgrade Stabilization	280	LF	$	$
2.7	Timber Headwall Protection	1	EA	$	$
2.8	Reshape Road Section	550	LF	$	$
2.9	Reverse Grade Dip with Knock Out	9	EA	$	$
2.10	Clean Ditch Relief Culvert	3	EA	$	$
2.11	Reverse Grade Dips	55	EA	$	$

2.12	Knicks	3	EA	$	$
2.13	Remove and Dispose of Two 8 FT dia. X 14 FT Long Steel Fuel Tank; Include Foundations and Pipes	1	LS	$	$
2.14	Work Area MP202 Per Sheet C3 and C8: • 60 LF 36" Culvert • 9 CY RSP • Demolition and Disposal • Earthwork • Rock Slope Buttress	1	LS	$	$
2.15	Work Area MP 205.1 Per Sheet C3: • 40 LF 18" DRC • 20 LF Downspout • 3 CY RED	1	LS	$	$
2.16	Work Area MP 206 Per Sheet C3 and C8: • 40 LF 24" DRC • 40 LF 24" Slope Drain • 7 CY Grading • 1 Timber Headwall Protection • 7 CY RED at Inlet and Outlet	1	LS	$	$
2.17	Work Area MP 207 Per Sheet C3 and C9: • 60 LF 18" Pipe • 40 LF 18" Slope Drain • 35 CY Grading • 1 Pipe Demolition • 20 CY Rock Buttress • 130 LF Rock-Lined Shoulder • 2 Tee Fittings	1	LS	$	$
2.18	Work Area MP 210 Per Sheet C3 and C9: • 190 LF Road Construction • 95 LF Extra AB Treatment • 20 LF 18" DRC • 1 Pipe Demolition and Disposal	1	LS	$	$
2.19	Work Area WW2 Per Sheet C3: • 40 LF DRC	1	LS	$	$
2.20	Work Area WW3 Per Sheet C3: • 30 LF 24" Culvert • 30 LF 24" Slope Drain	1	LS	$	$

2.21	Work Area WW3.1 Per Sheet C3: • 30 LF 18" DRC • 30 CY Grading	1	LS	$	$
2.22	Work Area WW4 Per Sheet C3: • 40 LF 24" Culvert • 6 CY RED/RIP	1	LS	$	$
2.23	Work Area MP 216 Per Sheet C3, C11, and C12: • 40 LF 36" Culvert • 15 CY RED/RIP • 70 CY Rock Debris Buttress	1	LS	$	$
2.24	Work Area MP 216.1 Per Sheet C3: • 40 LF 18" DRC • 3 CY RED/RIP	1	LS	$	$
2.25	Work Area MP 216.2 Per Sheet C3: • 170 LF Gabion Rock-Supply and Install • 170 LF Road Shaping	1	LS	$	$
2.26	Work Area MP 217 Per Sheet C3: • 500 LF Gabion Rock-Supply and Install • 500 LF Road Shaping	1	LS	$	$
2.27	Work Area MP 217.1 Per Sheet C3: • 30 LF 18" DRC • 4 CY RED/RIP	1	LS	$	$
2.28	Work Area MP 217.2 Per Sheet C3: • 30 LF 18" DRC • 4 CY RED/RIP	1	LS	$	$
2.29	Work Area MP 219 Per Sheet C3: • 30 LF 18" DRC • 4 CY RED/RIP	1	LS	$	$
2.30	Work Area MP 221 Per Sheet C3 and C13: • 40 LF 24" STC • 8 CY RED/RIP	1	LS	$	$
2.31	Work Area MP 221.1 Per Sheet C3: • 30 LF 18" DRC • 7 CY RED/RIP	1	LS	$	$
2.32	Work Area 225.1 Per Sheet C3 and C13:	1	LS	$	$

	• 20 LF 15" DRC • 30 LF 15" Slope Drain • 1 15" Tee Fitting • 1 Timber Headwall Protection • 10 CY Grading • 1 Drop Inlet with Traffic Rated Grate • 3 Anchor Assemblies				
2.33	Work Area 265 Per Sheet C5 and C17: • 150 LF Rock-Lined IBD • 60 LF 18" DRC • 1 Demolition of Existing Culvert • 3550 SF AC Paving • 145 LF AC Dike • 40 LF 24" DRC • 1 Timber Headwall Protection • 1 Drain Rock Berm • 1 Extend KO Down Road	1	LS	$	$
	SUB TOTAL ROAD IMPROVEMENTS			$	
3	**PARKING LOT AREA IMPROVEMENTS**		Unit	Unit Price	Extension
3.0	Mobilization / Demobilization	1	LS	$	$
3.1	Site Clearing and Grubbing	1	LS	$	$
3.2	Broken Asphalt Paving Removal or Recycle on site for Class II AB	20,000	SF	$	$
3.3	Scarify and Compact Existing Gravel Road	4,400	SF	$	$
3.4	Relocate Mortar Rocks and Other Boulders	1	LS	$	$
3.5	Removal of Existing improvements (site demo)	1	LS	$	$
3.6	Earth Moving	1	LS	$	$
3.7	Import Fill	705	CY	$	$
3.8	Excavate pit and install District furnished restroom	1	LS	$	$
3.9	Pond Overflow connection and vault	1	LS	$	$
3.10	Pond Overflow 30" HDPE Pipe	170	LF	$	$
3.11	Connection from new 30" HDPE Pipe to existing 60" culvert	1	LS	$	$

3.12	Driveway Entrance – AC Conform and Baserock	1	LS	$	$
3.13	Concrete Wheelstop	51	EA	$	$
3.14	¾" Open Graded Crushed Drain Rock (6" thick)	17,500	SF	$	$
3.15	Permeable Concrete Paving (6" thick)	11,500	SF	$	$
3.16	Permeable Concrete Paving with Macrofiber (6" thick)	6,000	SF	$	$
3.17	Parking Lot Signs – includes signs, poles and installation	5	EA	$	$
3.18	Parking Lot, driveway, and Sidewalk Paint Striping	1	LS	$	$
3.19	Concrete edger (flush curb)	800	LF	$	$
3.20	Concrete Curb Ramp (includes dome panel)	1	EA	$	$
3.21	Concrete vertical curb (6")	250	LF	$	$
3.22	Truncated Dome panels at crossing including concrete base	72	SF	$	$
3.23	Truncated dome panels in resin pathway	500	SF	$	$
3.24	Resin Paving pathway (2.5" over 6"AB)	17,000	SF	$	$
3.25	Aggregate Base Pathway (9" thick)	3,800	SF	$	$
3.26	Aggregate Base Shoulder (4" thick)	950	SF	$	$
3.27	Split rail fence (double)	105	LF	$	$
3.28	Wire Fence	650	LF	$	$
3.29	Installation of 10' redwood log (Provided by District)	8	EA	$	$
3.30	8' bench	3	EA	$	$
3.31	6' bench	2	EA	$	$
3.32	Installation of District provided Signs (Entrance sign and two informational signs)	3	EA	$	$
3.33	Reinstall Salvaged Gates	2	EA	$	$
3.34	Horse Hitching Post	1	EA	$	$
3.35	Bicycle Parking Bollard	2	EA	$	$
3.36	Folding Bollard	4	EA	$	$
3.37	Boot Brush	1	EA	$	$
3.38	Step Up Stone (2' x 2' x 4')	1	EA	$	$
3.39	Landscape Soil Preparation	1	LS	$	$
3.40	Street Light and Rectangular rapid flashing beacons per Pole	1	LS	$	$

	and Equipment schedule on sheet E-2 with ped push buttons				
3.41	Bear Creek Road pavement striping and markings	1	LS	$	$
3.42	Bear Creek Road crossing signage per E-2 and SS-1	1	LS	$	$
3.43	Electrical connection and service pedestal per sheet E-2 for RRFB (includes all conduit, wires, and pull boxes)	1	LS	$	$
	SUB TOTAL PARKING LOT AREA IMPROVEMENTS			$	
4	**WEBB CREEK BRIDGE**	Quantity	Unit	Unit Price	Extension
4.0	Mobilization / Demobilization	1	LS	$	$
4.1	Site clearing and grubbing	1	LS	$	$
4.2	Demolition of Existing Bridge	1	LS	$	$
4.3	Structure Excavation and Export	60	CY	$	$
4.4	Drilled Piers	1	LS	$	$
4.5	Concrete Abutments	1	LS	$	$
4.6	Furnish and Install Steel Girder Bridge (includes deck and railings)	1	LS	$	$
4.7	Roadway Excavation and Embankment	1	LS	$	$
4.8	Class II Aggregate Base for road and pullout (6" thick)	2,500	SF	$	$
	SUB TOTAL WEBB CREEK BRIDGE IMPROVEMENTS			$	
TOTAL BASE BID		$			
Deadline for Completion of the Work on site, including Demolition, Construction, Site Clean-up & Restoration.		Final Completion by October 24, 2018			

2. ADDITIVE ALTERNATE

In order for a Bid to be responsive, Bidder must submit an additive bid price for the Alternate listed below. **The basis of award for the contract is the Base Bid Total only.** The additive alternate listed below may or may not be awarded at the District's discretion.

Description	**Plan Detail #**	Quantity	Unit	Unit Price	Extension
Parking Lot Double Leaf Access Gate and Controller	Sheet 5.1, Detail 1 and Detail 3	1	LS		

3. UNIT PRICES

Unit Prices shall be used for adding or deleting work at the sole discretion of the District Representative, and may be exercised at any time during the execution of the Work. Unit pricing shall be utilized to complete additional grading, restoration & erosion control work.

Item No.	Description of Item	Unit	Unit Price
1	Stand Down Time – Equipment Operator*	Hour	$
2	Stand Down Time – Forman*	Hour	$
3	Stand Down Time – Laborer*	Hour	$
4	Earthwork – Grading	Hour	$
5	Tree Removal (trunk <12")	Per Tree	$
6	Tree Removal (trunk ≥12")	Per Tree	$
7	Straw Waddles / Fiber Roll	LF	$
8	Stabilized Construction Entrance / Exit	EA	$

***NOTE: Stand-Down time will be documented daily on site and compiled weekly into a change order against a set aside contract allowance. District will review actual Stand-Down time and hourly rates against Contractors' certified payroll.**

4. EXPERIENCE. List three recently (within last 5 years) completed jobs of comparable scope, the contract amount, names, and telephone numbers of contract officers. Use additional sheets as necessary.

NOTE: At Least one project listed must include specialized experience working adjacent to protected habitat.

Job/Project Name_____

Owner_____ Year _____ Contract Amt $_____

Contact _____ Phone_____

Project Description_____

_____

_____

_____

Job/Project Name_____

Owner_____Year _____ Contract Amt $_____

Contact _____ Phone_____

Project Description_____

_____

_____

_____

Job/Project Name_____

Owner_____Year _____ Contract Amt $_____

Contact _____ Phone_____

Project Description_____

_____

_____

5. **NONCOLLUSION CERTIFICATION.** The undersigned has executed and hereby submits the Noncollusion Affidavit (Attachment 3), in accordance with Public Contracts Code Section 7106.

6. **BID GUARANTEE.** No Bid will be considered unless accompanied by a guarantee in the amount of ten percent (10%) of the Total Base Bid), which shall be either a **BID BOND** (Attachment 4) written by an admitted surety satisfactory to the District in its sole discretion, a certified or cashier's check made payable to the District, or a cash deposit. In the event a successful bidder fails to satisfy all conditions for accepting the award (i.e. executed Agreement, provision of required bonds and proof of insurance) within the stated time limits, the District may declare the bidder's Bid Guarantee in default. Bidder acknowledges that the amount of actual damages the District would suffer in such event is extremely difficult and impractical to determine at this time by reason of the uncertainties, lapse of time, expense and loss of likely bidders resulting from the probable need to re-advertise and call for new bids.

Bidder agrees that the amount of such Bid Guarantee shall be kept by the District as liquidated damages and agrees that the District may then award the work to any other bidder or may call for new bids. All Bid Guarantees will be held until after an award is made, an Agreement entered into, and required bonds and proof of insurance provided, at which time they will be returned.

7. **DISCLOSURE.** The names of all persons financially interested in this Bid Proposal are as follows:

   Bidder, or any partner of Bidder, is a corporation, provide the legal name of the corporation, the state of its incorporation and the name and address of the President and of the Secretary. If Bidder is a partnership, provide name of the firm and names and addresses of all individual co-partners. Use additional sheets as necessary. If Bidder is an individual, provide the first and last name and address.

Name of Corporation:_____

State of Incorporation: _____

Name of Officer/ShareholderTitleAddress

_____

_____

_____

_____

Name of Bidder(s)/Partner(s) (If not a corporation)

_____

_____

_____

8. **WITHDRAWAL OF BIDS.** Bids may be withdrawn prior to the opening of bids only by a signed, written notice received by the District Representative prior to the commencement of the bid opening. In consideration of District's reliance on and consideration of this Bid Proposal, the undersigned agrees that such Bid Proposal shall be irrevocable upon opening and shall not be withdrawn for ninety (90) calendar days following the bid opening even though award may be made to another bidder. Thereafter, such bid shall be automatically relieved.

I make the above Bid and declare under penalty of perjury that the statements made in this Bid Proposal are true and correct.

FULLY EXECUTED at _____, _____
City State

on _____ _____, _____
Month Day Year

Signature[1] _____ Title _____

Name (please type or print) _____

Federal Employer I.D. Number _____

License Type _____

License Number _____ Expiration Date _____

DIR Number _____

Name of Firm _____

Mailing Address _____

City _____ State _____ Zip _____

Phone (Bus) _____ Phone (Cell) _____

Email _____

[1] An authorized person for the Bidder must sign this Bid Proposal. If the Bidder is a partnership, a general partner must sign. If the Bidder is a corporation, an authorized officer of the corporation must sign and a corporate resolution conferring such authority must be provided.

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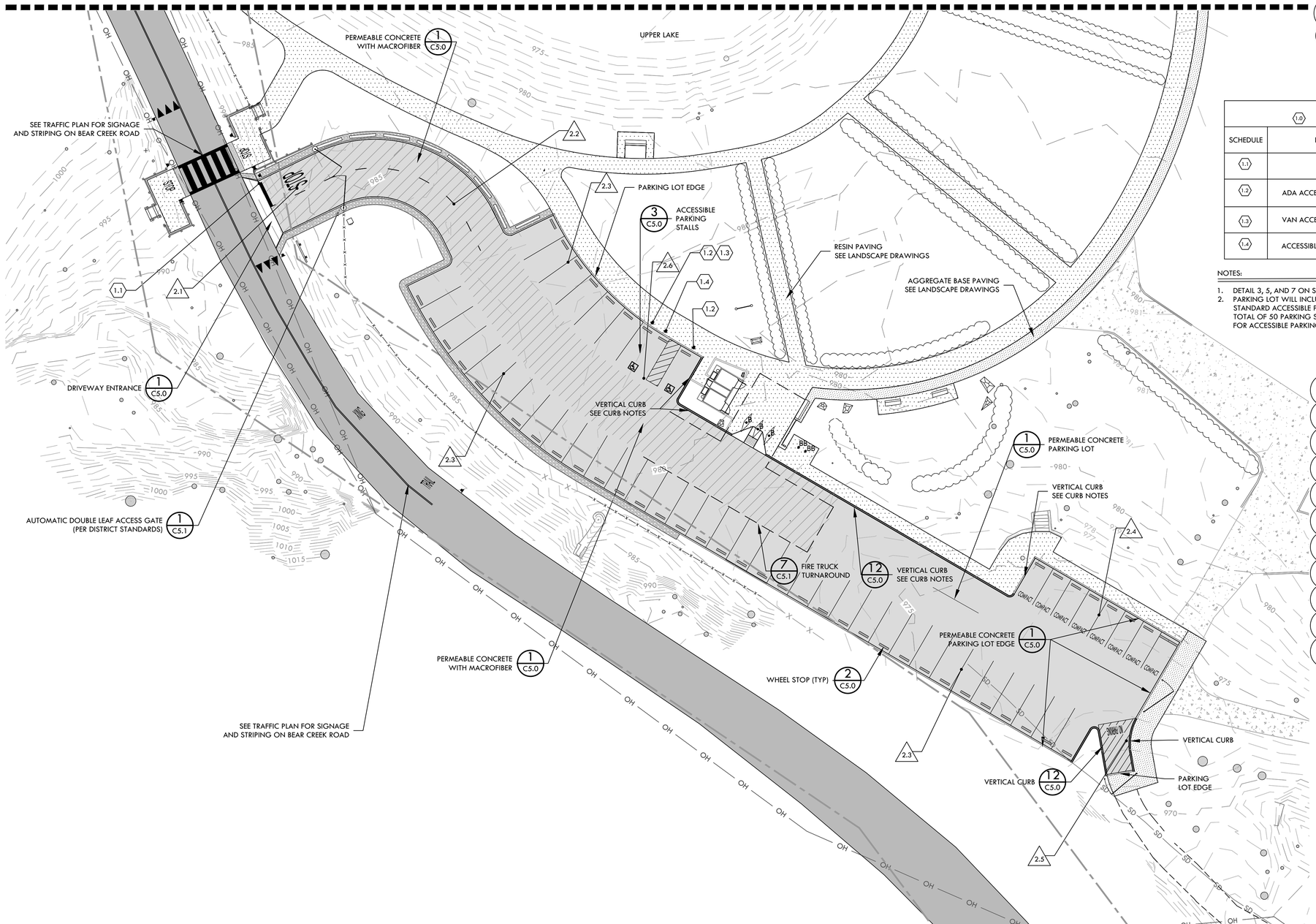


1 SIGNAGE, STRIPING, AND PAVEMENT PLAN-PARKING LOT LAYOUT

SCALE: 1" = 20' @ 24"X36"

PARKING STALLS	
PARKING STALL TYPE	QUANTITY
STANDARD	40
COMPACT	8
ACCESSIBLE	1
VAN ACCESSIBLE	1
TOTAL	50

△2

1.0 VEHICULAR SIGN SCHEDULE

SCHEDULE	DESCRIPTION	CA MUTCD DESIGNATION	NO. SIGNS	SIZE (W X H, INCHES)
1.1	STOP	R1-1	1	30 X 30
1.2	ADA ACCESSIBLE PARKING STALL	R99 AND R99B	2	8.5 X 8.5 AND 4.25 X 8.5
1.3	VAN ACCESSIBLE PARKING STALL	R7-8b	1	4.25 X 8.5
1.4	ACCESSIBLE PARKING AREA SIGN	R100B	1	17 X 22

NOTES:

1. DETAIL 3, 5, AND 7 ON SHEET C5.0 PROVIDES DETAILS ON SIGN MATERIALS AND INSTALLATION.
2. PARKING LOT WILL INCLUDE 40 STANDARD PARKING STALLS, 8 COMPACT PARKING STALLS, ONE STANDARD ACCESSIBLE PARKING STALL, AND ONE ACCESSIBLE VAN PARKING STALL. THERE WILL BE A TOTAL OF 50 PARKING STALLS, TWO OF WHICH SHALL CONFORM TO CBC SECTION 11B STANDARDS FOR ACCESSIBLE PARKING.

2.0 PAVEMENT STRIPING SCHEDULE

SCHEDULE	DESCRIPTION	NO.	DETAIL # SHEET #
2.1	STOP	1	5 C5.1
2.2	CENTERLINE DRIVEWAY	1	4 C5.1
2.3	PARKING STRIPE	39	4 C5.0
2.4	COMPACT PARKING STRIPE	7	6 C5.0
2.5	NO PARKING	1	6 C5.1
2.6	ACCESSIBLE PARKING STALLS	1	3 C5.0

NOTES:

1. FOR PARKING LETTERING, SEE THE FOLLOWING:
   1.1. ACCESSIBLE PARKING STALLS: DETAIL 3 C5.0
   1.2. PARKING STRIPE: DETAIL 4 C5.0
   1.3. COMPACT PARKING STRIPE: DETAIL 6 C5.0

NORTH

0 20' 40'

SCALE: 1" = 20' @ 24"X36"

CURB NOTES:

1. THE CURB IMMEDIATELY LEFT OF THE COMPACT PARKING STALLS SHALL TRANSITION UNIFORMLY FROM A 6" TALL VERTICAL CURB IN THE SOUTHWEST CORNER TO A FLUSH CURB IN THE NORTHEAST CORNER.
2. THE CURB TO THE RIGHT OF THE ACCESSIBLE PARKING SPACES SHALL TRANSITION FROM A 6" VERTICAL CURB TO A FLUSH CURB AT SEVERAL LOCATIONS, INCLUDING ON BOTH SIDES OF THE CURB RAMP AND AT THE UPPER RIGHT CORNER OF THE ACCESSIBLE PARKING STALL. SEE C4.4 FOR SPOT ELEVATIONS.

Midpeninsula Regional Open Space District

Alma College Parking Area and Trailhead

Bear Creek Redwoods Open Space Preserve
Santa Clara County, CA

HARRIS DESIGN

Landscape Architecture
Park & Recreation Planning
Urban Design

755 Folger Avenue
Berkeley, CA 94710
t: 510.647.3792
f: 501.647.3712
www.hd-la.com

Issued for	Rev	Date	Appr
50% SUBMITTAL		06/16/2017	
90% SUBMITTAL		10/10/2017	
100% SUBMITTAL		02/06/2018	
ADDENDUM #1	1	03/26/2018	
ADDENDUM #2	2	04/02/2018	

Seals and Signatures

REGISTERED PROFESSIONAL ENGINEER ROBYN L. COOPER NO. 73041 EXP. 12/31/18 CIVIL STATE OF CALIFORNIA

FALL CREEK ENGINEERING, INC.

1525 SEABRIGHT AVE
SANTA CRUZ, CA
95062

(831) 426-9054

Drawn by : ARS
Checked by : RLC

Drawing Title :

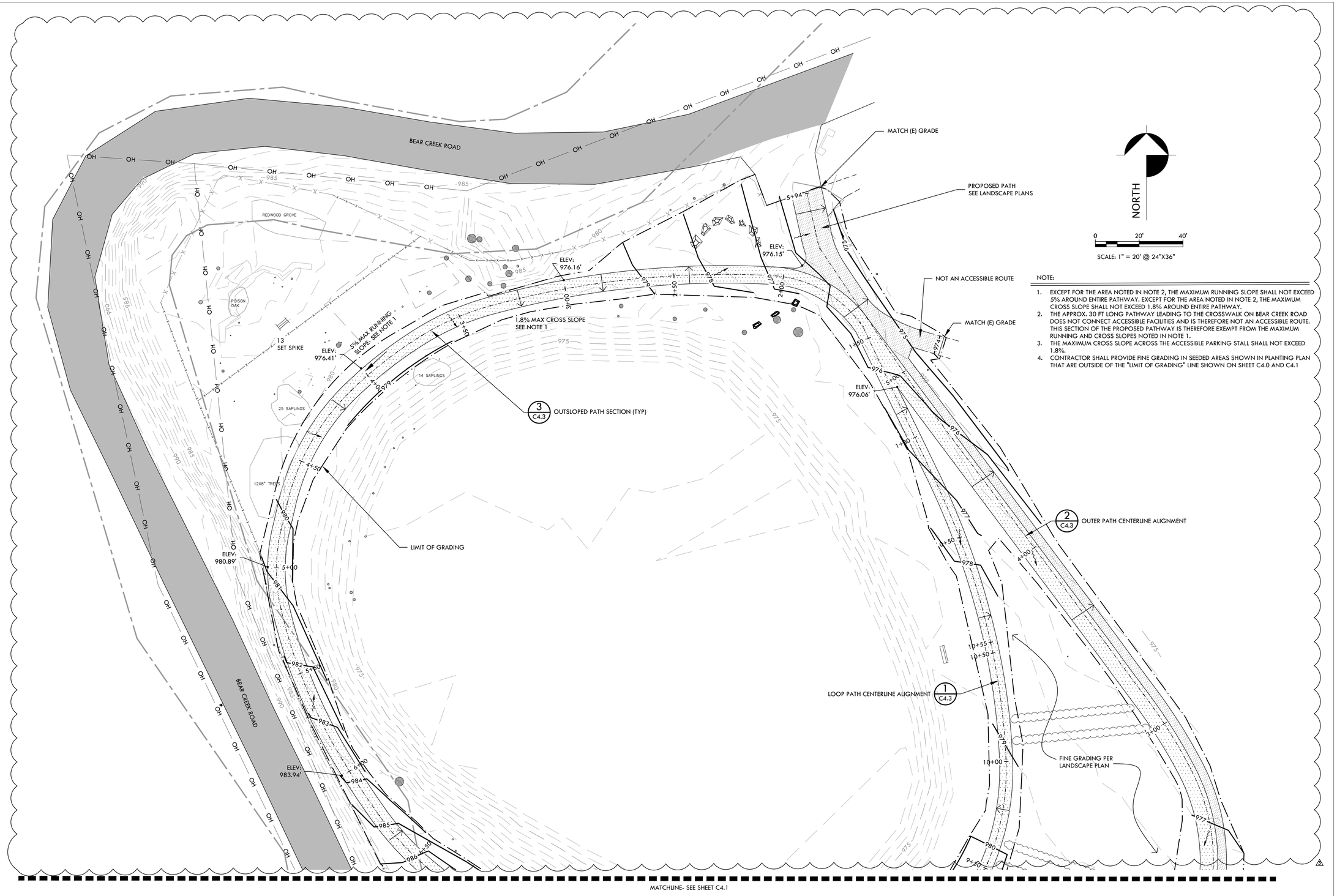
SIGNAGE, STRIPING, AND PAVEMENT PLAN-PARKING LOT LAYOUT

Date : 2/6/18

Scale : AS SHOWN

Project Number : 16.04

Sheet Number : C3.0



NORTH

0 20' 40'

SCALE: 1" = 20' @ 24"X36"

NOTE:

1. EXCEPT FOR THE AREA NOTED IN NOTE 2, THE MAXIMUM RUNNING SLOPE SHALL NOT EXCEED 5% AROUND ENTIRE PATHWAY. EXCEPT FOR THE AREA NOTED IN NOTE 2, THE MAXIMUM CROSS SLOPE SHALL NOT EXCEED 1.8% AROUND ENTIRE PATHWAY.
2. THE APPROX. 30 FT LONG PATHWAY LEADING TO THE CROSSWALK ON BEAR CREEK ROAD DOES NOT CONNECT ACCESSIBLE FACILITIES AND IS THEREFORE NOT AN ACCESSIBLE ROUTE. THIS SECTION OF THE PROPOSED PATHWAY IS THEREFORE EXEMPT FROM THE MAXIMUM RUNNING AND CROSS SLOPES NOTED IN NOTE 1.
3. THE MAXIMUM CROSS SLOPE ACROSS THE ACCESSIBLE PARKING STALL SHALL NOT EXCEED 1.8%.
4. CONTRACTOR SHALL PROVIDE FINE GRADING IN SEEDED AREAS SHOWN IN PLANTING PLAN THAT ARE OUTSIDE OF THE "LIMIT OF GRADING" LINE SHOWN ON SHEET C4.0 AND C4.1

1 GRADING AND DRAINAGE PLAN - POND LAYOUT

SCALE: 1" = 20' @ 24"X36"

Midpeninsula Regional Open Space District

Alma College Parking Area and Trailhead

Bear Creek Redwoods Open Space Preserve
Santa Clara County, CA

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50% SUBMITTAL		06/16/2017	
90% SUBMITTAL		10/10/2017	
100% SUBMITTAL		02/06/2018	
ADDENDUM #1	1	03/26/2018	
ADDENDUM #2	2	04/02/2018	

Seals and Signatures

REGISTERED PROFESSIONAL ENGINEER ROBYN L. COOPER NO. 73041 EXP. 12/31/18 CIVIL STATE OF CALIFORNIA

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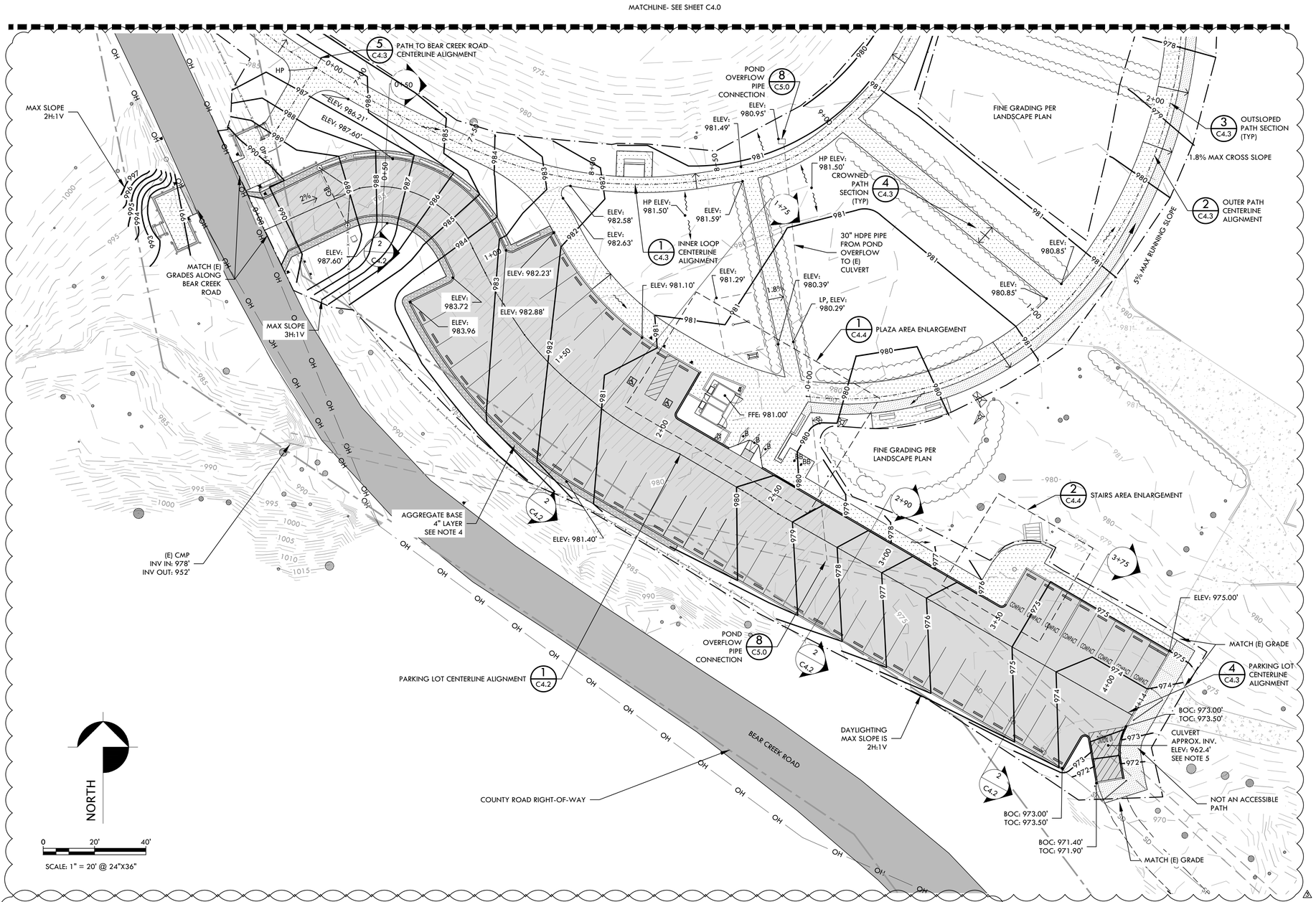
Drawn by : ARS
Checked by : RLC
Drawing Title :

GRADING AND DRAINAGE PLAN - POND LAYOUT

Date : 2/6/18
Scale : AS SHOWN
Project Number : 16.04
Sheet Number : C4.0



NOTES:

1. EXCEPT FOR THE AREAS NOTED IN NOTE 2, THE MAXIMUM RUNNING SLOPE SHALL NOT EXCEED 5% ON ALL PATHWAYS. EXCEPT FOR THE AREAS NOTED IN NOTE 2, THE MAXIMUM CROSS SLOPE SHALL NOT EXCEED 1.8% ON ALL PATHWAYS.
2. THE APPROX. 30 FT LONG PATHWAY LEADING TO THE CROSSWALK ON BEAR CREEK ROAD DOES NOT CONNECT ACCESSIBLE FACILITIES AND IS THEREFORE NOT AN ACCESSIBLE ROUTE. THIS SECTION OF THE PROPOSED PATHWAY IS THEREFORE EXEMPT FROM THE MAXIMUM RUNNING AND CROSS SLOPES NOTED IN NOTE 1. THE SAME IS TRUE FOR THE CONNECTION TO THE EXISTING SERVICE ROAD AT THE EAST END OF THE PARKING LOT AND FOR THE CONNECTION TO THE EXISTING SERVICE ROAD NEAR STATION 1+50 ON SHEET C4.0.
3. THE MAXIMUM CROSS SLOPE ACROSS THE ACCESSIBLE PARKING STALLS AND AISLE SHALL NOT EXCEED 1.8% IN ANY DIRECTION.
4. A 2'-6" WIDE 4" DEEP AGGREGATE BASE STRIP SHALL BE PLACED ALONG THE PERMEABLE CONCRETE PARKING LOT EDGE ON THE SOUTHERN END OF THE PARKING LOT IN ALL LOCATIONS WHERE THE PARKING LOT ELEVATION IS LOWER THAN THE TOE OF THE HILLSIDE. THE INTENT OF THIS STRIP IS TO PREVENT RUNOFF AND SEDIMENT FROM THE HILLSLOPE FROM ENTERING AND POTENTIALLY CLOGGING THE PERMEABLE PAVEMENT. THE AGGREGATE BASE STRIP IS NOT NEEDED WHERE THE PARKING LOT ELEVATION IS HIGHER THAN THE ADJACENT TOE OF THE HILLSLOPE.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING, FLAGGING, AND PROTECTING THE EXISTING CULVERT IN PLACE. THE GROUND COVER OVER THE CULVERT VARIES ALONG THE CULVERT LENGTH AND THE APPROXIMATE CULVERT INVERT ELEVATION IS KNOWN ONLY AT THE LOCATIONS INDICATED ON THE PLAN. REFER TO THE GEOTECHNICAL REPORT PREPARED BY BUTANO GEOTECHNICAL ENGINEERING AND DATED JULY 2017 FOR MORE INFORMATION ON THE LOCATION OF THE EXISTING CULVERT.

1 GRADING AND DRAINAGE PLAN- PARKING LOT LAYOUT

SCALE: 1" = 20' @ 24"X36"

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Drawing Title :

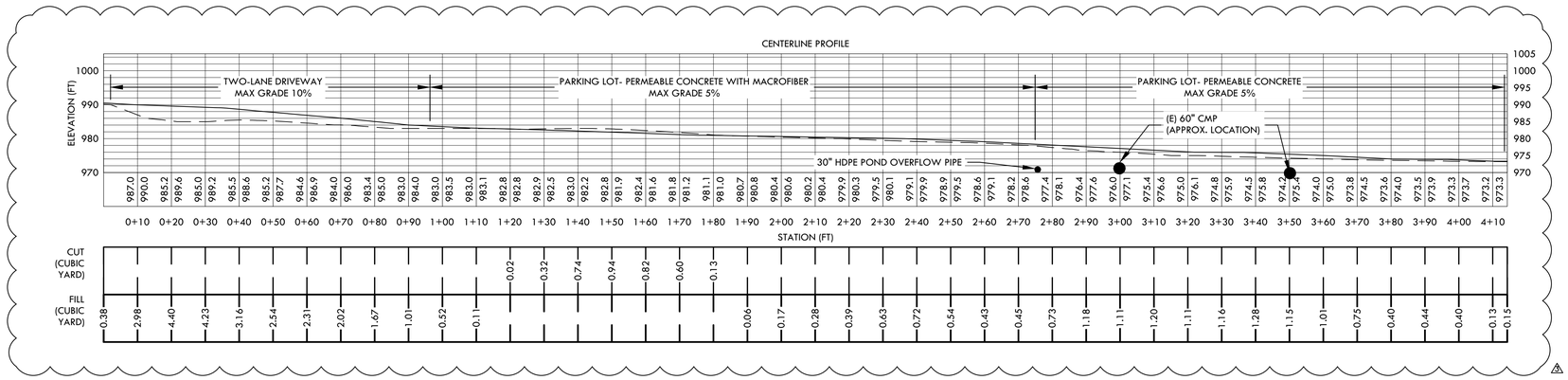
GRADING AND DRAINAGE PLAN- PARKING LOT LAYOUT

Date : 2/6/18

Scale : AS SHOWN

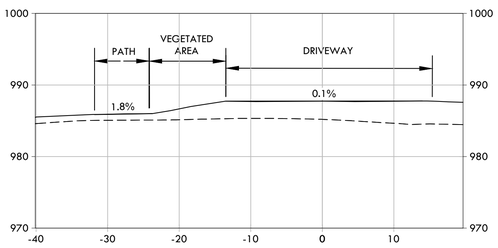
Project Number : 16.04

Sheet Number : C4.1

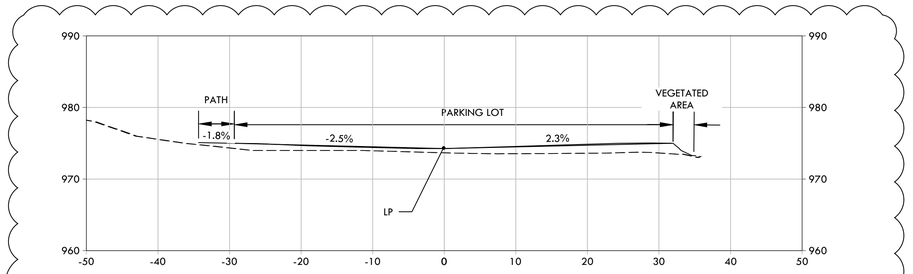


1 PARKING LOT AISLE CENTERLINE PROFILE

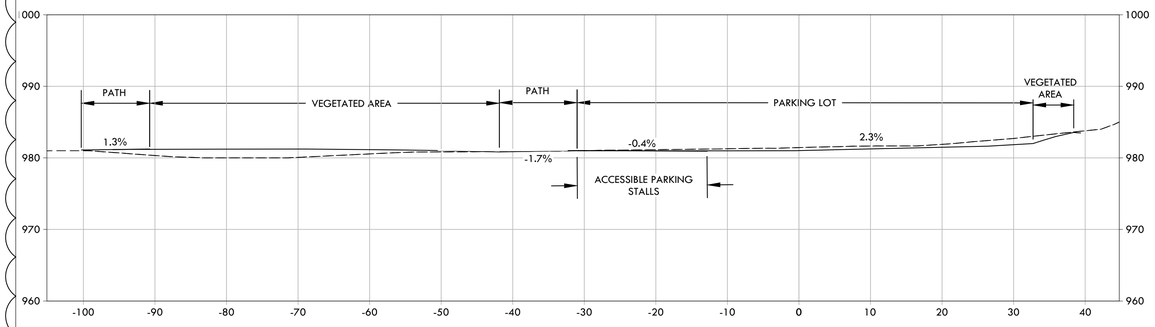
NO SCALE



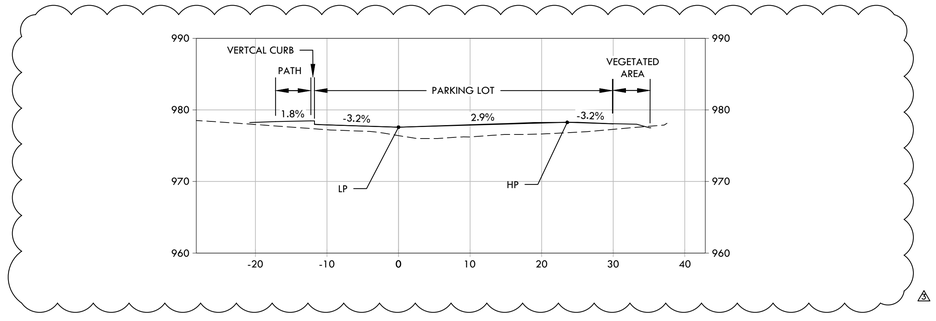
TYP DRIVEWAY ENTRANCE SECTION FOR STATIONS 0+00 TO 1+00



TYP PARKING SECTION FOR STATIONS 3+50 TO 4+00



TYP PARKING SECTION FOR STATIONS 1+00 TO 2+00



TYP PARKING SECTION WITH 6" CURB FOR STATIONS 2+00 TO 3+50

2 PARKING LOT CROSS SECTIONS (TYP)

NO SCALE

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Checked by : RLC

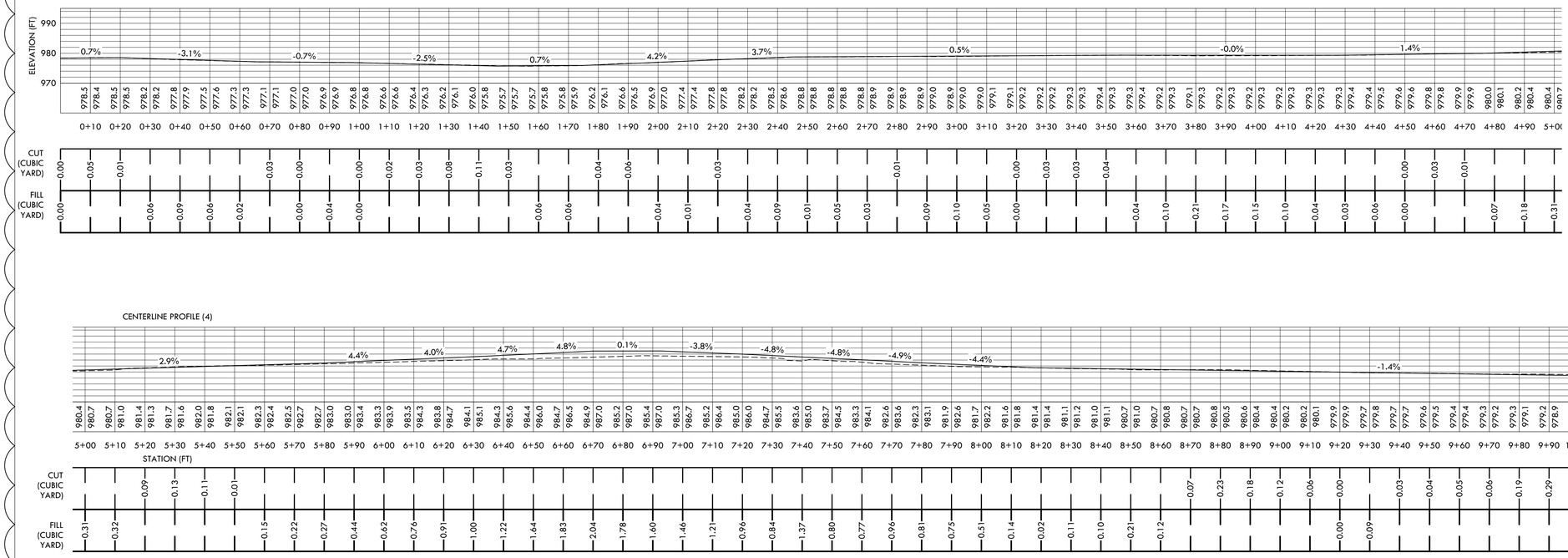
Drawing Title :
GRADING AND DRAINAGE PLAN- PARKING LOT SECTIONS AND PROFILES

Date : 2/6/18

Scale : AS SHOWN

Project Number : 16.04

Sheet Number : C4.2

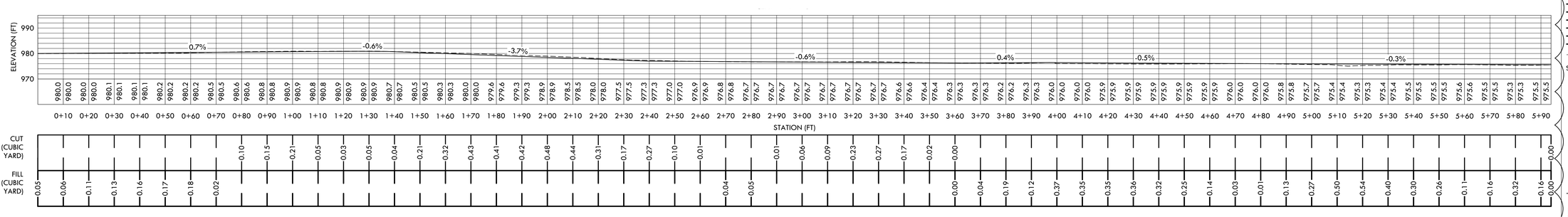


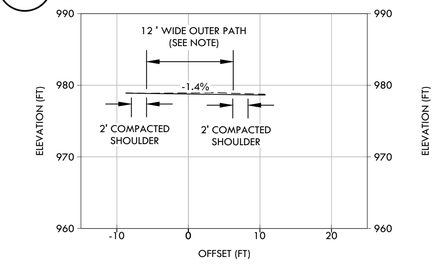
1 LOOP PATH CENTERLINE PROFILE

NO SCALE

2 OUTER PATH CENTERLINE PROFILE

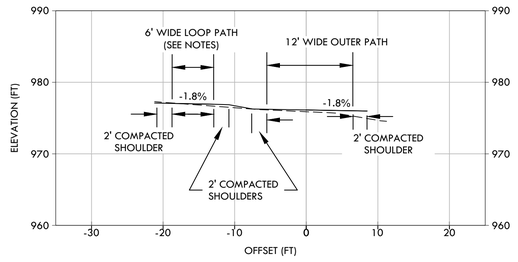
NO SCALE





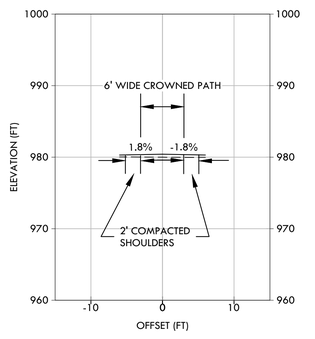
3 OUT SLOPPED PATH SECTIONS (TYP)

NO SCALE



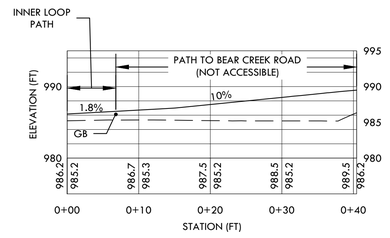
NOTES:

1. THE 12' WIDE OUTER PATH SHALL CONTAIN 8' OF RESIN PAVING AND 4' OF DG PAVING AND IS TYPICAL FROM STATIONS 0+00 TO 4+95 ALONG THE OUTER PATH CENTERLINE ALIGNMENT.
2. THE 6' WIDE LOOP PATH SHALL CONTAIN 6' OF RESIN PAVING AND IS TYPICAL FROM STATIONS 0+00 TO 1+24 AND STATIONS 7+93 TO 10+55 ALONG THE LOOP PATH CENTERLINE ALIGNMENT.
3. THE 8' WIDE LOOP PATH SHALL CONTAIN 8' OF RESIN PAVING AND IS TYPICAL FROM STATIONS 2+05 TO 6+70 AND STATIONS 6+90 TO 7+60 ALONG THE LOOP PATH CENTERLINE ALIGNMENT.
4. THE CROWNED PATH SHALL BE 6' WIDE RESIN PAVING.
5. THE PATH TO BEAR CREEK ROAD SHALL BE 10' WIDE RESIN PAVING.
6. A 2' COMPACTED SHOULDER SHALL BE INCLUDED ADJACENT TO ALL PATH SECTIONS EXCEPT WHERE IT WOULD INTERFERE WITH A STEEP SLOPE. AREAS WHERE THERE SHALL NOT BE A 2' SHOULDER ARE AT THE FOLLOWING LOCATIONS:
   - 6.1. ON THE NORTH SIDE OF THE PATH FROM STATIONS 3+00 TO 3+36 ON THE LOOP PATH ALIGNMENT.
   - 6.2. ON THE WEST SIDE OF THE PATH FROM STATIONS 5+00 TO 6+10 ON THE LOOP PATH ALIGNMENT.
7. AT LOCATION WHERE MULTIPLE PATHS INTERSECT, CONTRACTOR SHALL ENSURE A SMOOTH TRANSITION BETWEEN VARYING PATH WIDTHS AND SHALL MAINTAIN THE REQUIRED GRADES.



4 CROWNED PATH SECTIONS (TYP)

NO SCALE



5 PATH TO BEAR CREEK ROAD CENTERLINE PROFILE

NO SCALE

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Drawing Title :

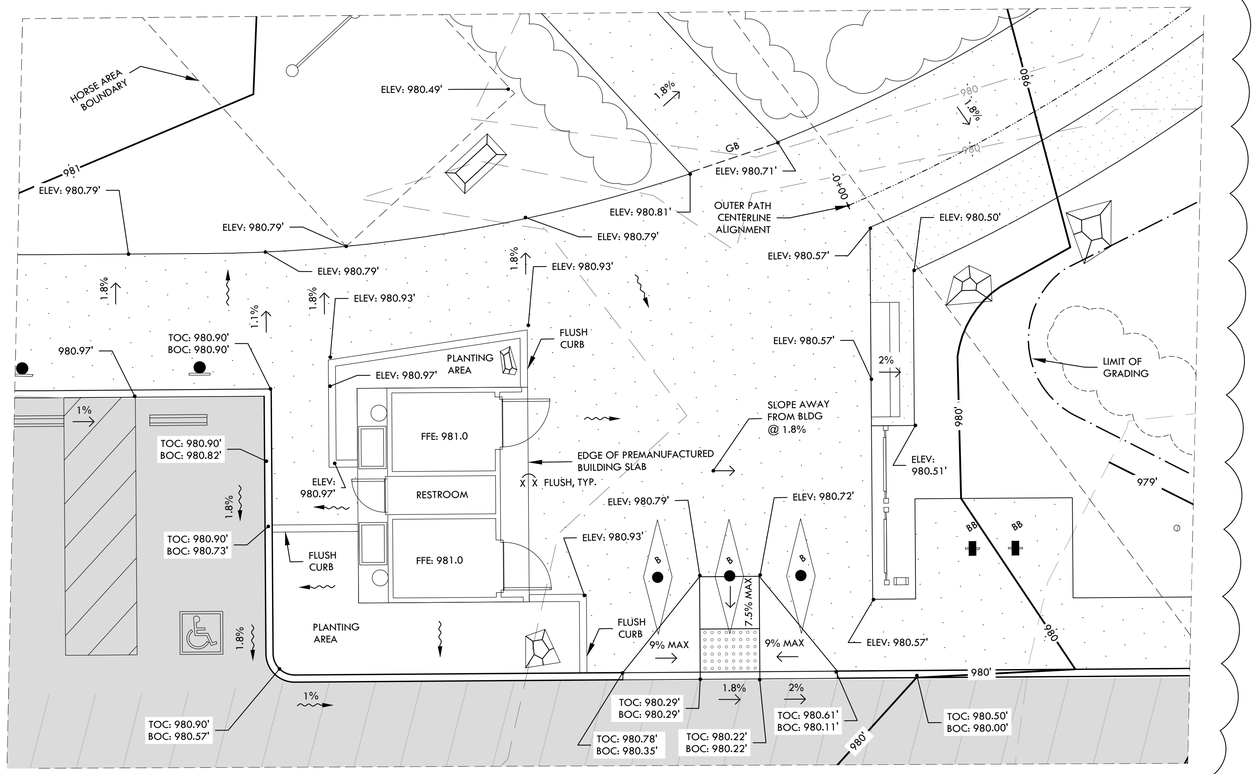
GRADING AND DRAINAGE PLAN- PATH SECTIONS AND PROFILES

Date : 2/6/18

Scale : AS SHOWN

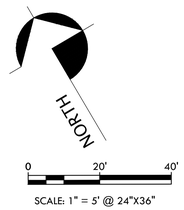
Project Number : 16.04

Sheet Number : C4.3

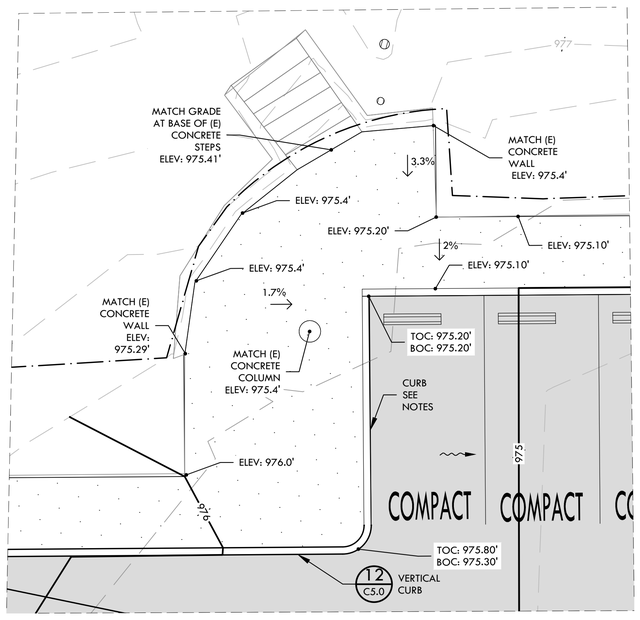


1 PLAZA AREA ENLARGEMENT

SCALE: 1" = 5' @ 24"X36"



SCALE: 1" = 5' @ 24"X36"



NOTES:

1. THE CURB TO THE LEFT OF THE COMPACT PARKING STALLS SHALL TRANSITION UNIFORMLY ALONG ITS LENGTH FROM A 6" TALL VERTICAL CURB AT THE SOUTHWEST END TO A FLUSH CURB AT THE NORTHEAST CORNER.

2 STAIRS AREA ENLARGEMENT

SCALE: 1" = 5' @ 24"X36"

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GRADING AND DRAINAGE PLAN- PLAZA AREA ENLARGEMENT

Date : 2/6/18

Scale : AS SHOWN

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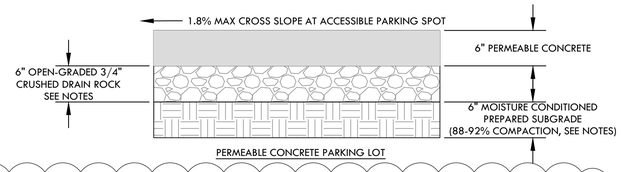
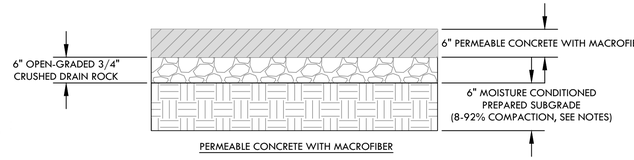
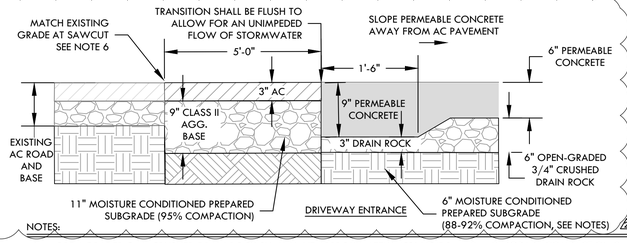
Sheet Number : C4.4



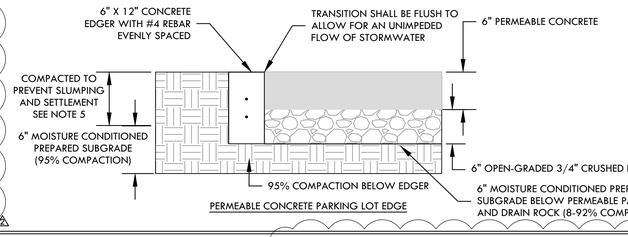
PERMEABLE CONCRETE PARKING LOT



PERMEABLE CONCRETE WITH MACROFIBER



DRIVEWAY ENTRANCE



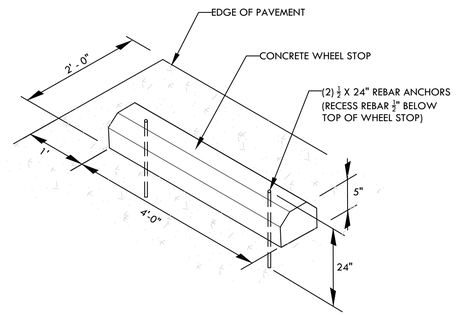
PERMEABLE CONCRETE PARKING LOT EDGE

NOTES:

1. OPEN-GRADED 3/4" CRUSHED DRAIN ROCK SHALL HAVE APPROXIMATELY 40% VOIDS TO ALLOW FOR STORMWATER INFILTRATION.
2. OPEN-GRADED CRUSHED DRAIN ROCK DOES NOT MOISTURE COMPACT. CONTRACTOR SHALL CONSOLIDATE THE DRAIN ROCK WITH A VIBRATORY COMPACTOR OR ROLLER.
3. SUBGRADE COMPACTION SHALL NOT EXCEED 92% AT 95% COMPACTION AND HIGHER, THE SOIL BECOMES IMPERMEABLE AND WILL NOT EFFECTIVELY DRAIN STORMWATER, THUS UNDERMINING THE EFFECTIVENESS OF THE PERMEABLE PAVEMENT.
4. ALL PARKING LOT PAVEMENT SHALL BE CAPABLE OF WITHSTANDING THE LOAD OF A 75,000 LB VEHICLE.
5. PERMEABLE CONCRETE PARKING LOT EDGE SHALL BE USED ALONG ALL FLUSH EDGES OF THE PARKING LOT PERIMETER EXCEPT FOR THE DRIVEWAY ENTRANCE. WHERE THE EDGE CONNECTS THE PERMEABLE PARKING LOT TO ADJACENT RESIN PAVING/AGGREGATE BASE PAVING, THE RESIN PAVING/AGGREGATE BASE PAVING SHALL CONFORM TO THE DETAIL FOR RESIN PAVING/ AGGREGATE BASE PAVING AS SHOWN IN THE LANDSCAPE PLANS.
6. CONTRACTOR SHALL SAWCUT THE EXISTING AC ROAD PER THE OWNER'S REPRESENTATIVE'S DIRECTION.

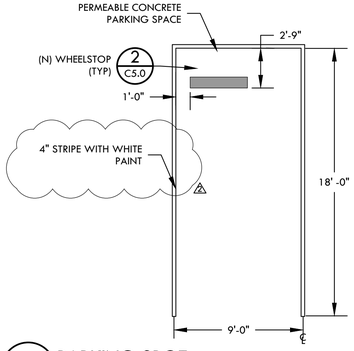
1 PAVING AND PARKING SECTIONS

SCALE: AS DIMENSIONED



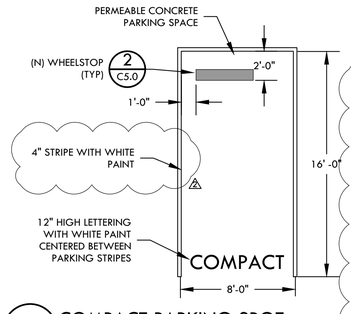
2 WHEEL STOP

SCALE: AS DIMENSIONED



4 PARKING SPOT

SCALE: AS DIMENSIONED

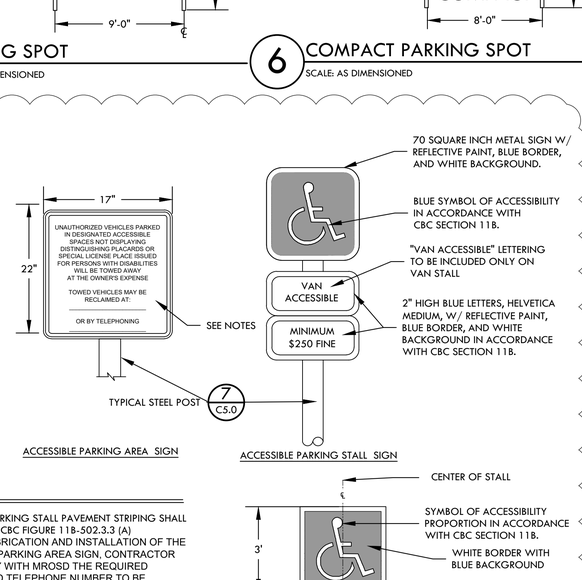


6 COMPACT PARKING SPOT

SCALE: AS DIMENSIONED

3 ACCESSIBLE PARKING STALLS

SCALE: AS DIMENSIONED



ACCESSIBLE PARKING AREA SIGN

ACCESSIBLE PARKING STALL SIGN

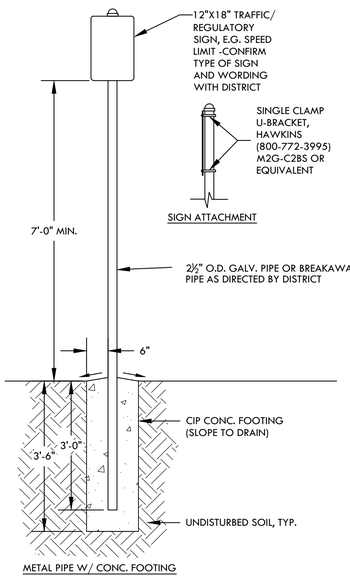
NOTES:

1. ACCESSIBLE PARKING STALL PAVEMENT STRIPING SHALL CONFORM TO CBC FIGURE 11B-502.3.3 (A)
2. PRIOR TO FABRICATION AND INSTALLATION OF THE ACCESSIBLE PARKING AREA SIGN, CONTRACTOR SHALL VERIFY WITH MROSD THE REQUIRED ADDRESS AND TELEPHONE NUMBER TO BE PERMANENTLY PLACED ON THE SIGN AND SHALL PROVIDE A SIGN WITH THOSE NUMBERS.
3. ACCESSIBLE PARKING AREA SIGN LETTERING SHALL BE 1" HIGH WHITE LETTER HELVETICA NARROW STYLE . LETTERING AND SIGN SHALL CONFORM TO CBC SECTION 11B-502.8.

ACCESSIBLE PARKING STRIPING

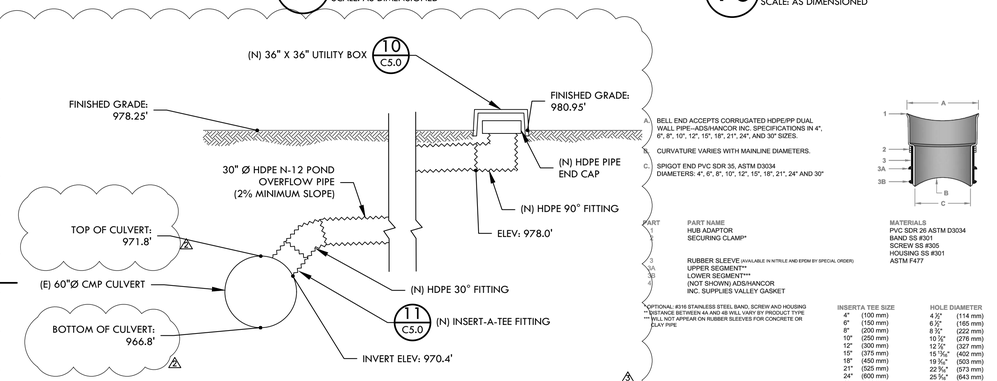
5 ACCESSIBLE PARKING SIGN AND STRIPING

SCALE: AS DIMENSIONED



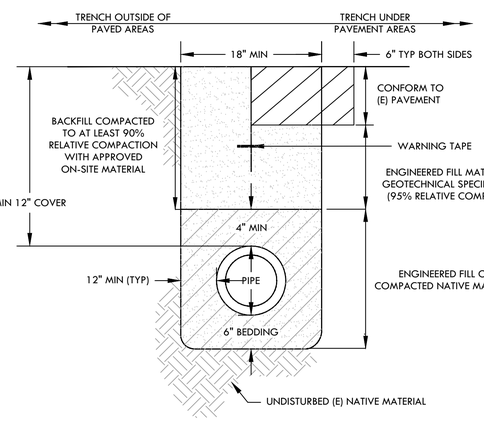
7 SIGN INSTALLATION

SCALE: AS DIMENSIONED



8 POND OVERFLOW PIPE CONNECTION

SCALE: AS DIMENSIONED

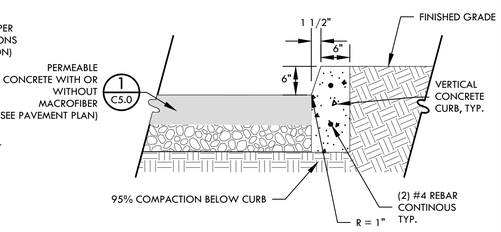


9 TYPICAL TRENCH DETAIL

SCALE: AS DIMENSIONED

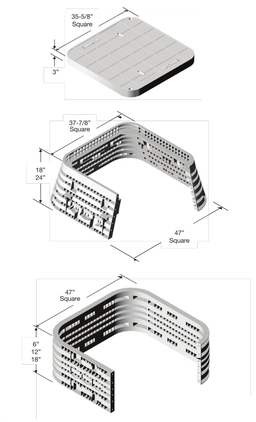
11 INSERT-A-TEE FITTING

SCALE: AS DIMENSIONED



12 VERTICAL CURB DETAIL

SCALE: AS DIMENSIONED



10 UTILITY BOX

SCALE: AS DIMENSIONED

Midpeninsula Regional Open Space District

Alma College Parking Area and Trailhead

Bear Creek Redwoods Open Space Preserve
Santa Clara County, CA

HARRIS DESIGN

Landscape Architecture
Park & Recreation Planning
Urban Design

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Berkeley, CA 94710
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f: 501.647.3712
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Issued for	Rev	Date	Appr
50% SUBMITTAL		06/16/2017	
90% SUBMITTAL		10/10/2017	
100% SUBMITTAL		02/06/2018	
ADDENDUM #1	1	03/26/2018	
ADDENDUM #2	2	04/02/2018	

Seals and Signatures

REGISTERED PROFESSIONAL ENGINEER — ROBYN L. COOPER — NO. 73041 EXP. 12/31/18 — CIVIL — STATE OF CALIFORNIA

FALL CREEK ENGINEERING, INC.

1525 SEABRIGHT AVE
SANTA CRUZ, CA
95062

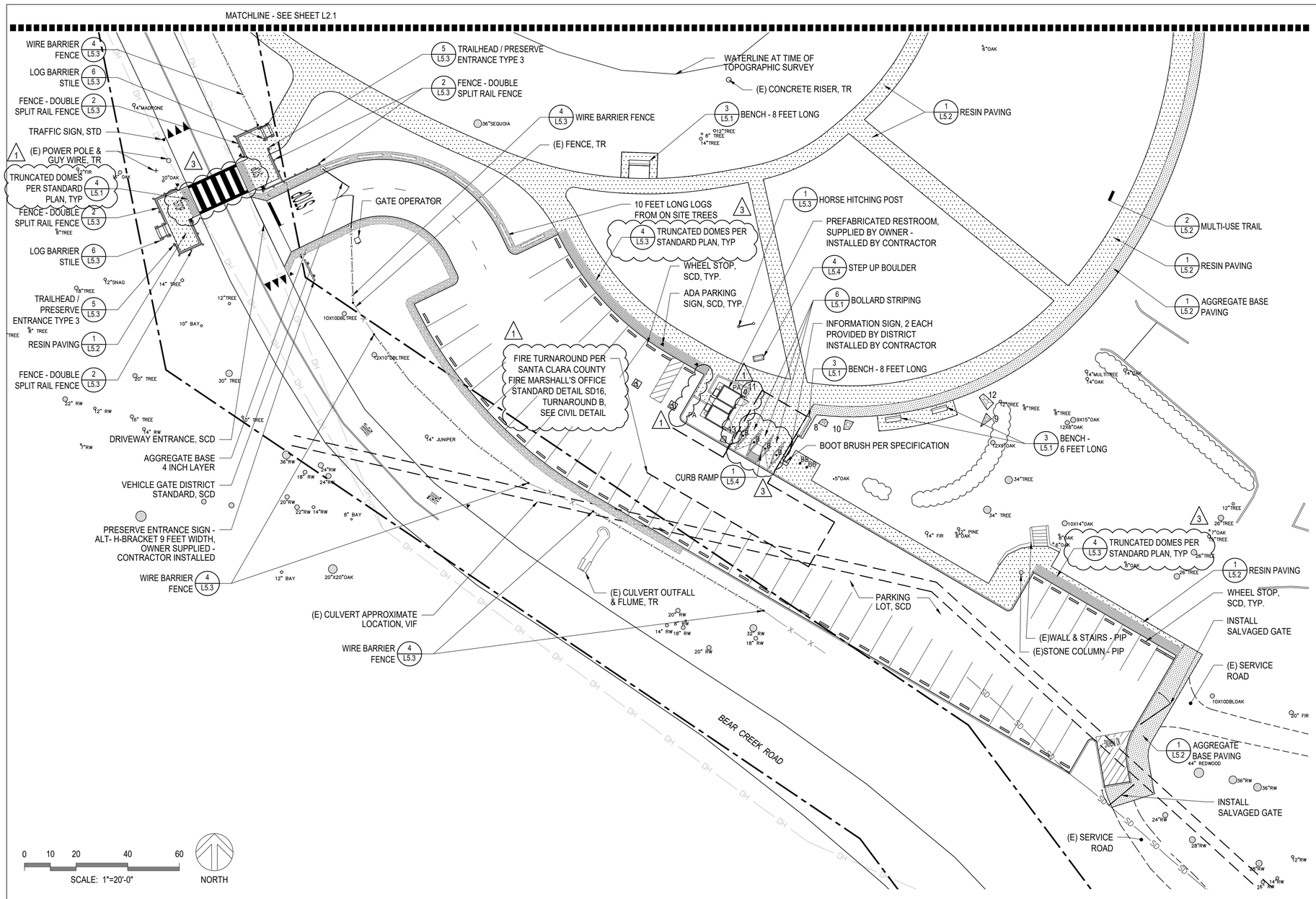
(831) 426-9054

Drawn by : ARS
Checked by : RLC
Drawing Title :

CIVIL DETAILS- PARKING LOT DETAILS

Date : 2/6/18
Scale : AS SHOWN
Project Number : 16.04

Sheet Number : C5.0



SITE CONSTRUCTION LEGEND

- RESIN PAVING — 1 L5.2
- AGGREGATE BASE PAVING — 1 L5.2
- TRUNCATED DOMES DETECTABLE WARNING SURFACE PER SPECIFICATIONS
- EXISTING WIRE FENCE
- PROPOSED WIRE FENCE — 4 L5.3
- BENCH, PER SPECIFICATIONS 8 FEET OR 6 FEET LONG AS SHOWN
- BB — BICYCLE BOLLARD PER SPECIFICATIONS
- 1 — NEW LOCATION FOR EXISTING BOULDER TO BE RELOCATED. SEE DEMOLITION PLAN FOR EXISTING LOCATIONS. — 5 L5.1
- •B — FOLDING BOLLARD — 2 L5.1
- EXISTING TREE TO REMAIN
- (E) — EXISTING
- PA — PLANTING AREA
- PIP — PROTECT IN PLACE
- SCD — SEE CIVIL DRAWINGS
- STD — SEE TRAFFIC DRAWINGS
- TR — TO REMAIN
- VIF — VERIFY IN FIELD
- BEAR CREEK ROAD RIGHT OF WAY PLOTTED FROM RECORD INFORMATION.

CONSTRUCTION NOTES

1. REFER TO SPECIFICATIONS FOR SITE FURNISHINGS.
2. SEE COVER SHEET FOR ADDITIONAL ABBREVIATIONS AND LEGEND.

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BLDG. PMT. REV.	1	01/26/18	BH
100% CD		02/02/18	BH
ADDENDUM #2	1	04/03/18	BH

Seals and Signatures

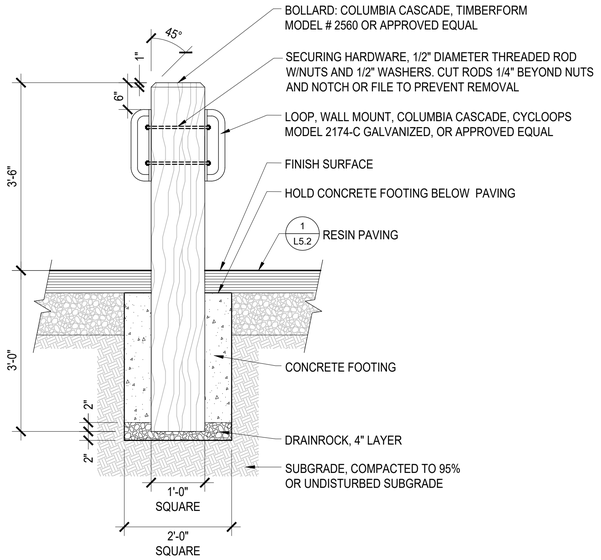
LICENSED LANDSCAPE ARCHITECT · WILLIAM S. HARRIS · 2439 · STATE OF CALIFORNIA · Signature 08-31-18 Renewal Date

Drawn by : ZD
Checked by : BH

Drawing Title :

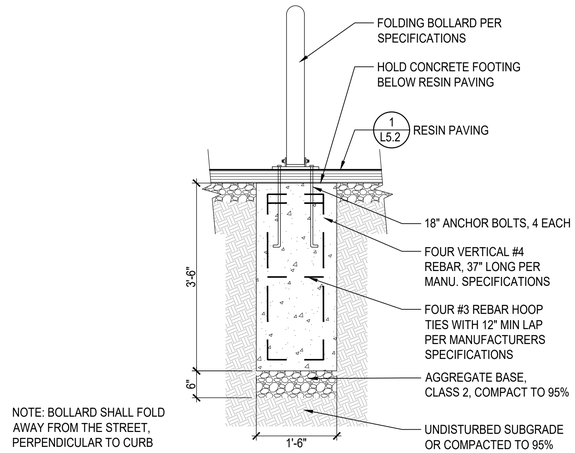
SITE CONSTRUCTION PLAN

Date : 02/02/18
Scale : 1" = 20'-0"
Project Number : 16.04
Sheet Number : L2.2



1 BICYCLE PARKING BOLLARD

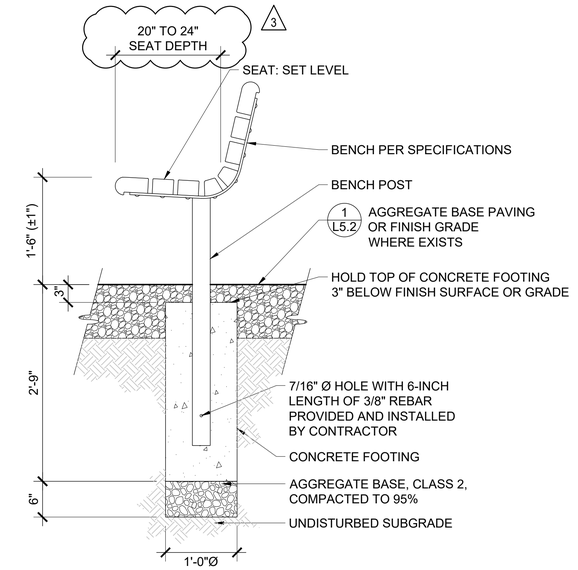
SCALE: 3/4"=1'-0"



NOTE: BOLLARD SHALL FOLD AWAY FROM THE STREET, PERPENDICULAR TO CURB

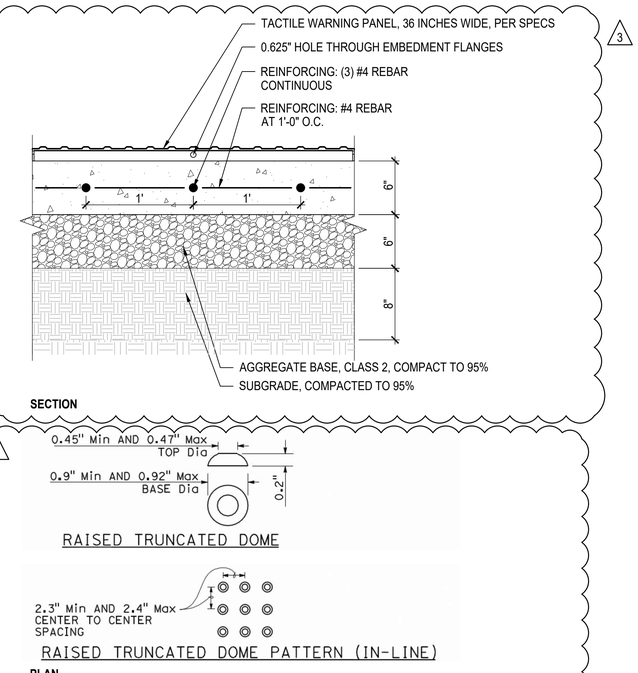
2 FOLDING BOLLARD

SCALE: 3/4"=1'-0"



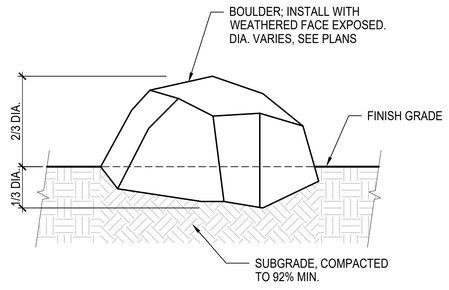
3 BENCH

SCALE: 1"=1'-0"



4 TRUNCATED DOME PER STANDARD PLAN A88A

SCALE: N.T.S.



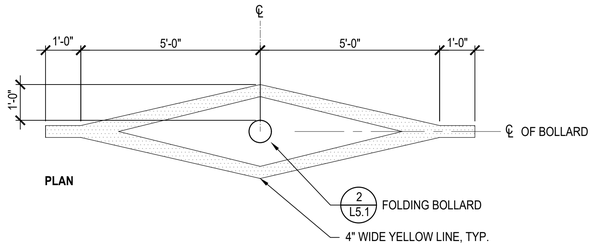
SECTION

NOTE:

INSTALL EXISTING BOULDERS TO BE RELOCATED IN SAME POSITION & TO SAME DEPTH AS EXISTING.

5 BOULDER PLACEMENT

SCALE: 1"=1'-0"



PLAN

6 BOLLARD STRIPING

SCALE: 1/2"=1'-0"

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100% CD		02/02/18	BH
ADDENDUM #2	3	04/03/18	BH

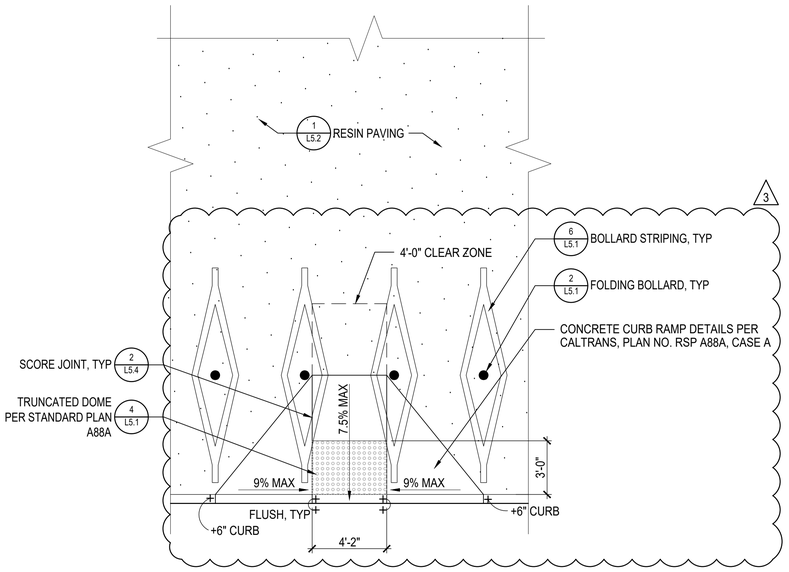
Seals and Signatures

LICENSED LANDSCAPE ARCHITECT
WILLIAM S. HARRIS 2978
08-31-18
STATE OF CALIFORNIA

Drawn by : ZD
Checked by : BH
Drawing Title :

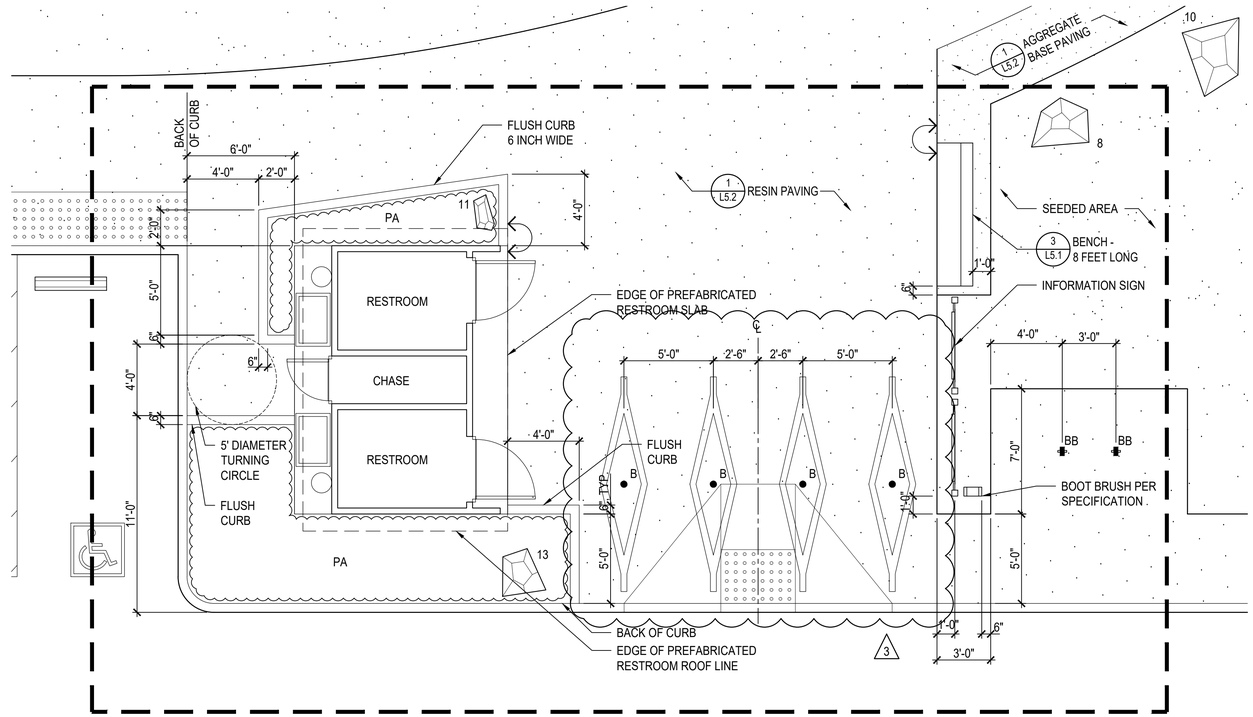
LANDSCAPE CONSTRUCTION DETAILS

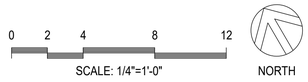
Date : 02/02/18
Scale : AS SHOWN
Project Number : 16.04
Sheet Number : L5.1



1 CURB RAMP

SCALE: 1/4"=1'-0"





LAYOUT LEGEND

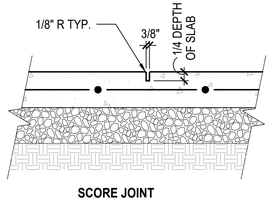
	ALIGN	EQ	EQUAL
BB	BICYCLE BOLLARD PER SPECIFICATIONS	PA	PLANTING AREA
B	FOLDING BOLLARD — 2 L5.1	TYP	TYPICAL

LAYOUT NOTES

1. SEE SHEET L3, LAYOUT PLAN FOR LAYOUT NOTES.

3 TRAILHEAD LAYOUT PLAN

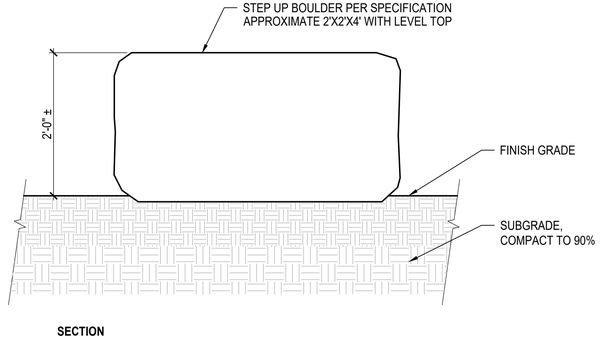
SCALE: 1/4"=1'-0"



SCORE JOINT

2 SCORE JOINT

SCALE: 1-1/2"=1'-0"



SECTION

4 STEP UP BOULDER

SCALE: 1"=1'-0"

Midpeninsula Regional Open Space District

Alma College Parking Area and Trailhead

Bear Creek Redwoods Open Space Preserve
Santa Clara County, CA

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100% CD		02/02/18	BH
ADDENDUM #2	1	04/03/18	BH

Seals and Signatures

LICENSED LANDSCAPE ARCHITECT
WILLIAM S. HARRIS #2618
STATE OF CALIFORNIA
08-31-18
RENEWAL DATE

Drawn by : ZD
Checked by : BH
Drawing Title :

LANDSCAPE CONSTRUCTION DETAILS

Date : 02/02/18
Scale : AS SHOWN
Project Number : 16.04
Sheet Number : L5.4

BEAR CREEK REDWOODS - PHASE ONE ROAD AND TRAIL IMPROVEMENTS

100% SUBMITTAL

VICINITY MAP
N.T.S. (GOOGLE)

REGIONAL MAP
N.T.S. (GOOGLE)

GENERAL NOTES

1. TOPOGRAPHIC MAPPING PROVIDED BY:

   A. GROUND SURVEY: WATERWAYS CONSULTING, INC.
   SURVEY DATES VARY
   (2016–2017)

   ELEVATION DATUM: BASED ON INDIVIDUAL ASSUMED LOCAL DATUM

   B. AERIAL SURVEY: SANTA CLARA COUNTY LIDAR CONTOURS
   PROVIDED BY MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

   ELEVATION DATUM: NAVD88

   BASIS OF BEARINGS: NAD83 CALIFORNIA STATE PLANES,
   ZONE III

2. ALL CONSTRUCTION AND MATERIALS SHALL CONFORM TO THE 2010 EDITION OF THE STATE OF CALIFORNIA STANDARD SPECIFICATIONS, ISSUED BY THE DEPARTMENT OF TRANSPORTATION (HEREAFTER REFERRED TO AS "STANDARD SPECIFICATIONS").

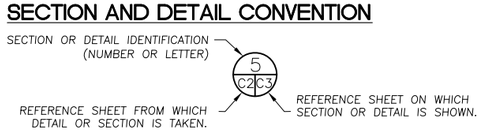
ABBREVIATIONS

AB	AGGREGATE BASE
AVG.	AVERAGE
C	CLEAN
CC	CONCRETE
CY	CUBIC YARDS
DIA.	DIAMETER
E	EXISTING
EG	EXISTING GROUND
ELEV.	ELEVATION
DI	DRAINAGE INLET
DRC	DITCH RELIEF CULVERT
FG	FINISHED GRADE
FT	FEET
HWP	HEADWALL PROTECTION
IBD	INBOARD DITCH
INV	INVERT
KN	KNICK
KO	KNOCK OUT
N	NEW
NIC	NOT IN CONTRACT
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
RC	RELATIVE COMPACTION
RED	ROCK ENERGY DISSIPATOR
RGD	REVERSE GRADE DIP
RIBD	ROCKED IBD
RIP	ROCK INLET PROTECTION
RS	ROCKED SHOULDER
RSP	ROCK SLOPE PROTECTION
SPK	SPIKE
STC	STREAM CULVERT
STD	STANDARD
SQ.FT.	SQUARE FOOT
T	TREE
T.B.D.	TO BE DETERMINED
TYP	TYPICAL
UNK	UNKNOWN
WSE	WATER SURFACE ELEVATION
YR	YEAR

TREE SPECIES

BM	BIGLEAF MAPLE
DF	DOUGLAS FIR
RC	RED CEDAR
WF	WHITE FIR

SECTION AND DETAIL CONVENTION



SHEET INDEX

** CALL BEFORE YOU DIG **

CONTACT UNDERGROUND SERVICE ALERT (USA)
PRIOR TO ANY CONSTRUCTION WORK 1-800-227-2600

WATERWAYS CONSULTING INC.

TIMOTHY C. BEST, CEG
ENGINEERING GEOLOGY AND HYDROLOGY

3/06/18 DATE

REGISTERED PROFESSIONAL ENGINEER ★ MATT W. WELD ★ No. 62235 Exp. 9-30-19 CIVIL ★ STATE OF CALIFORNIA

MATT W. WELD

PREPARED AT THE REQUEST OF:
MIDPENINSULA REGIONAL
OPEN SPACE DISTRICT

COVER

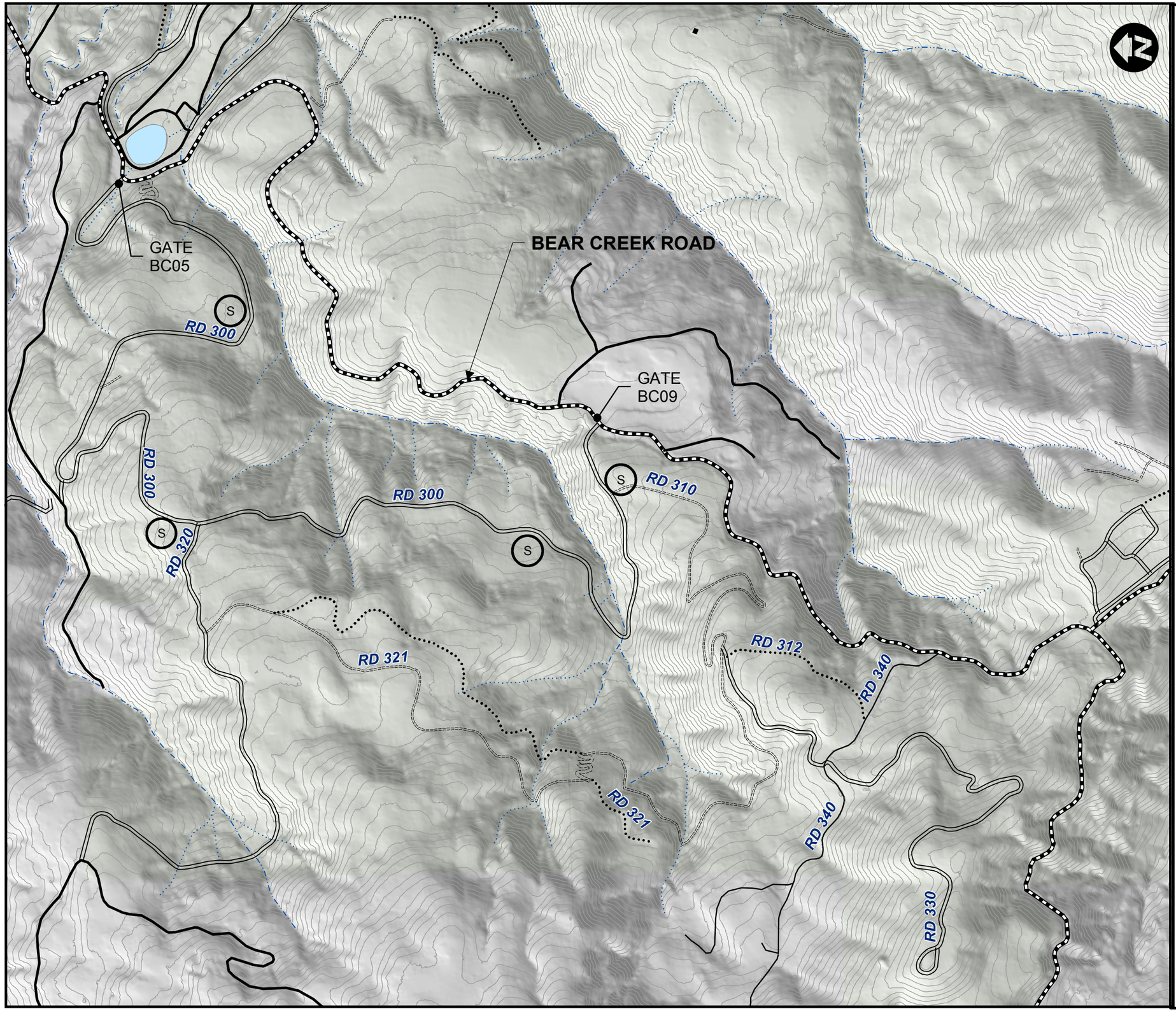
BEAR CREEK
REDWOODS - PHASE
ONE ROAD AND TRAIL
IMPROVEMENTS
100% SUBMITTAL

DESIGNED BY: –
DRAWN BY: –
CHECKED BY: M.W.W.
DATE: 03/06/2018
JOB NO.: 16–017

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

C1

1 OF 24



EXISTING ROADS + TRAILS

- Paved - Public
- Gravel - Private
- Primary Patrol Road
- ATV Patrol Road
- Legacy / closed

WATERCOURSES

- Perennial
- Intermittent
- Ephemerial

S Staging

GATE BC09 District Gates for Construction Access

Note: Gate BC 01 is located on Bear Creek Road just North of limit of view.

MATT W. WELD

REGISTERED PROFESSIONAL ENGINEER
MATT W. WELD
No. 62235
Exp. 9-30-19
CIVIL
STATE OF CALIFORNIA

3/06/18
DATE

1:8,000

Feet
0 200 400

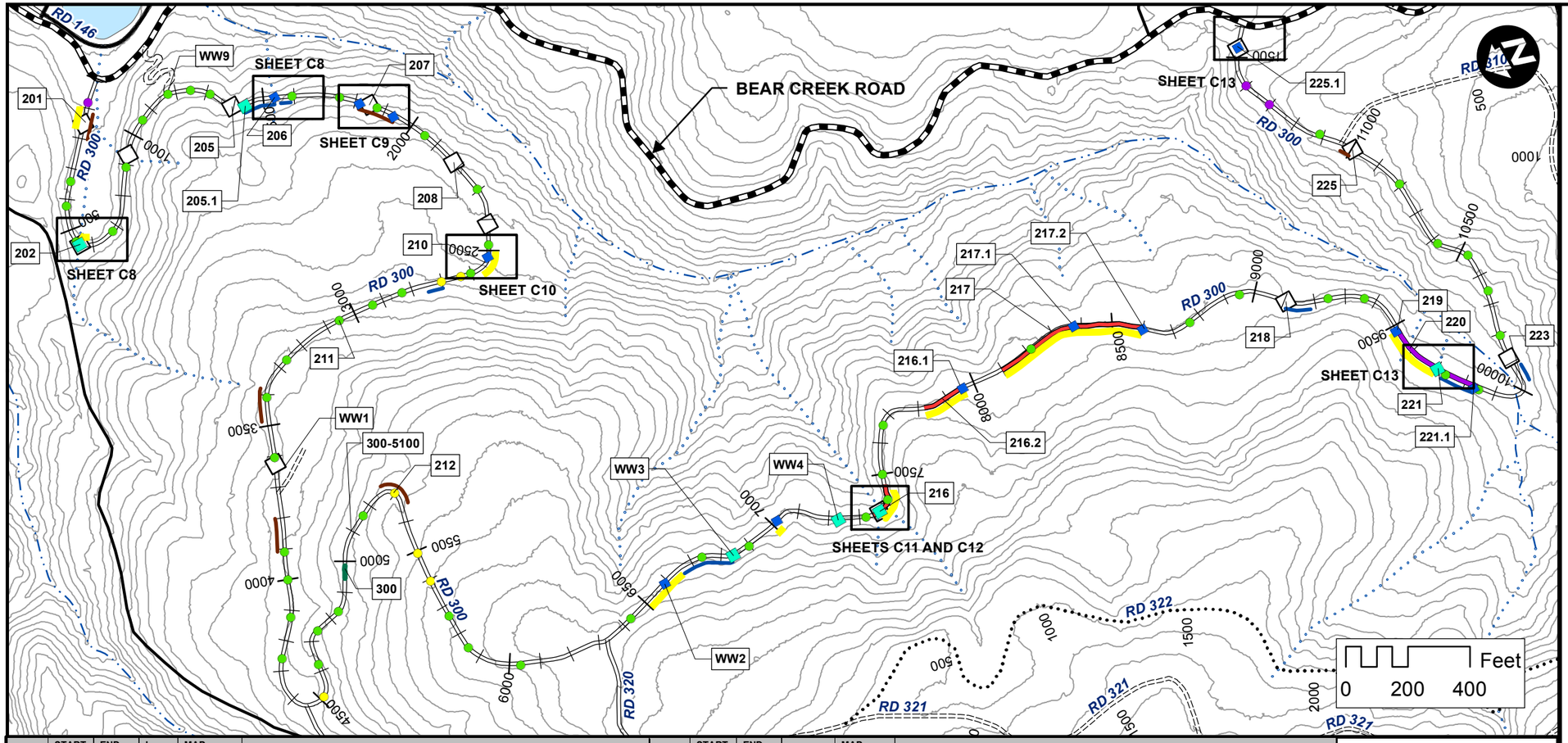
WATERWAYS CONSULTING, INC.
509A SWIFT ST.
SANTA CRUZ, CA 95060
PH: (831)421-9291//FAX: (888)819-6847
WWW.WATWAYS.COM

PREPARED AT THE REQUEST OF:
MIDPENINSULA REGIONAL
OPEN SPACE DISTRICT

OVERVIEW MAP

BEAR CREEK
REDWOODS - PHASE ONE
ROAD AND TRAIL
IMPROVEMENTS
100% SUBMITTAL

C2



ROAD	START STA	END STA	L (FT)	MAP POINT	NOTES
300	100	175	75		NIBD
	175			201	CLEAN DRC
	130	200	70		CONSTRUCT EARTHEN BERM AT OUTBOARD ROAD EDGE. HEIGHT = 18"
	550			MP202	36" DIA. X 60 LF STC, RED & CONSTRUCT ROCKSLOPE BUTTRESS (80 CY), PER DETAILED SITE PLAN
	550	585	35		NIBD
	1400			MP205	CLEAN DRC
	1440			MP205.1	18" DIA. X 40 LF DRC W/20LF DOWNSPOUT
	1440	1540	100		CIBD
	1540			MP206	24" DIA. X 40 LF STC W/40LF DOWNSPOUT AND 3 FT TALL X 4 FT LONG HEADWALL PROTECTION PER DETAILED SITE PLAN
	1550	1580	30		CIBD
	1810				INSTALL TWO (2) 18" DIA. X 30 LF DRC'S WITH 20 LF SLOPE DRAINS, PER DETAILED DESIGN SHEET
	1810	1940	130	MP207	RESHAPE ROADBED TO REMOVE HIGH POINT IN PROFILE AND INSLOPE BETWEEN DRC'S
	1810	1940	130		ROCK LINED SHOULDER
	1880				CONSTRUCT ROCKSLOPE BUTTRESS (20 CY)
	2185			MP208	CONSTRUCT 3 FT TALL X 4 FT LONG HWP
	2500	2575	75		NIBD
	2500	2700	200	MP210	REALIGN FALL-LINE ROAD REACH, PER DETAILED SITE PLAN
	2510				18" DIA X 20LF DRC
	2700	2750	50		CIBD
	3050			MP211	ADD 5 CY GABION ROCK AT OUTFALL OF RGD
	3500	3600	100		OUTSLOPE ROAD
	3620	3700	80	WW1	CIBD
	3800	3920	120		RESHAPE ROADBED
	4975			MP300	ADD 3 CY GABION ROCK AT OUTFALL OF RGD
	5100			MP300-5100	REMOVE AND DISPOSE OF TWO EXISTING FUEL TANKS, PER SPECIFICATIONS TO BE PROVIDED BY MROSD
	5250	5350	100	MP212	ENLARGE AND DEEPEN KNOCKOUT, WIDEN TURN, AND SLOPE ROAD BED TO SOUTH
	6500	6620	120		NIBD
	6600			WW2	18" X 40 LF DRC

ROAD	START STA	END STA	L (FT)	MAP POINT	NOTES
300	6620	6830	210		CIBD
	6830			WW3	INSTALL 24" X 30 LF STC W/30LF SLOPE DRAIN.
	6990	7020	30		NIBD
	7020			WW3.1	18" X 30 LF DRC. PLACE 30 CY FILL TO RAISE ROAD OVER CULVERT. FILL AVAILABLE LOCALLY
	7225			WW4	24" X 40 LF STC
	7350	7460	110		ROCK AND FABRIC PER DETAIL "I"
	7355	7450	95		NIBD
	7360			MP216	36" X 40 LF STC, PER DETAILED SITE PLAN
	7410	7440	30		CONSTRUCT ROCKSLOPE BUTTRESS (70 CY)
	7820	7990	170	MP216.2	ROCK AND FABRIC PER DETAIL "I"
	7820	7990	170		NIBD
	7960			MP216.1	18" X 40 LF DRC
	8100	8600	500	MP217	ROCK AND FABRIC AND RAISE ROAD PER DETAIL "I"
	8100	8600	500		NIBD
	8380			MP 217.1	18" X 30 LF DRC
	8600			MP217.2	REPLACE RGD WITH DRC, 18" X 30 LF
	9110	9185	75	MP218	CLEAN CULVERT AND CIBD
	9520			MP219	18" x 30 LF DRC
	9520	9700	180		NIBD.
	9520	9700	180		SUBGRADE STABILIZATION
	9700			MP221	24" X 40 LF STC, PER SKETCH
	9730	9830	100		CIBD
	9730	9830	100		SUBGRADE STABILIZATION
	9830			MP221.1	18" x 30 LF DRC
	10030	10080	50	MP223	CIBD FOR 50 LF FROM BRIDGE TO EXTG. CULVERT
	11000	11030	30	MP225	REESTABLISH OUTFALL DITCH. REGRADE ROAD TO DRAIN TO CULVERT
	11550			MP225.1	15" DIA. X 20 LF DRC, 4 FT TALL X 4 FT LONG HWP, 15" X 30 LF SLOPE DRAIN, AND CONCRETE DROP INLET PER DETAILED SECTION

1:4,800

PROPOSED FEATURES

- Reverse Grade Dip
- Ditch Relief Culvert
- Stream Crossing Culvert
- Knick
- Reverse Grade Dip with Knock Out
- (E) Culvert
- Construct Inboard Ditch
- Clean Inboard Ditch
- Reshape Road
- Subgrade Stabilization
- Rock and Fabric per Detail I (1)

NOTE: FEATURES SHOWN ON THE SIDE OF THE ROAD ARE FOR SCHEMATIC PURPOSES ONLY.

1 Map Point

EXISTING ROADS + TRAILS

- Paved - Public
- Gravel - Private
- Primary Patrol Road
- ATV Patrol Road
- Legacy / closed

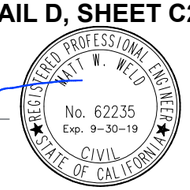
WATERCOURSES

- Perennial
- Intermittent
- Ephemerial

NOTES:

1. INSTALL AGGREGATE BASE ALONG ENTIRE LENGTH OF ROAD 300 (11600 LF) PER DETAIL D ON SHEET C20.

2. WHERE SUBGRADE STABILIZATION IS SPECIFIED, OVEREXCAVATE 4 INCHES AND INSTALL ADDITIONAL 4 INCHES OF COARSE AGGREGATE BASE, PER NOTES ON DETAIL D, SHEET C20.



MATT W. WELD — 3/06/18 DATE

REV.	DATE	DESCRIPTION	BY
1	3/27/18	Updated proposed features	M.L.B.
		symbology.	

WATERWAYS CONSULTING, INC.
WWW.WATWAYS.COM

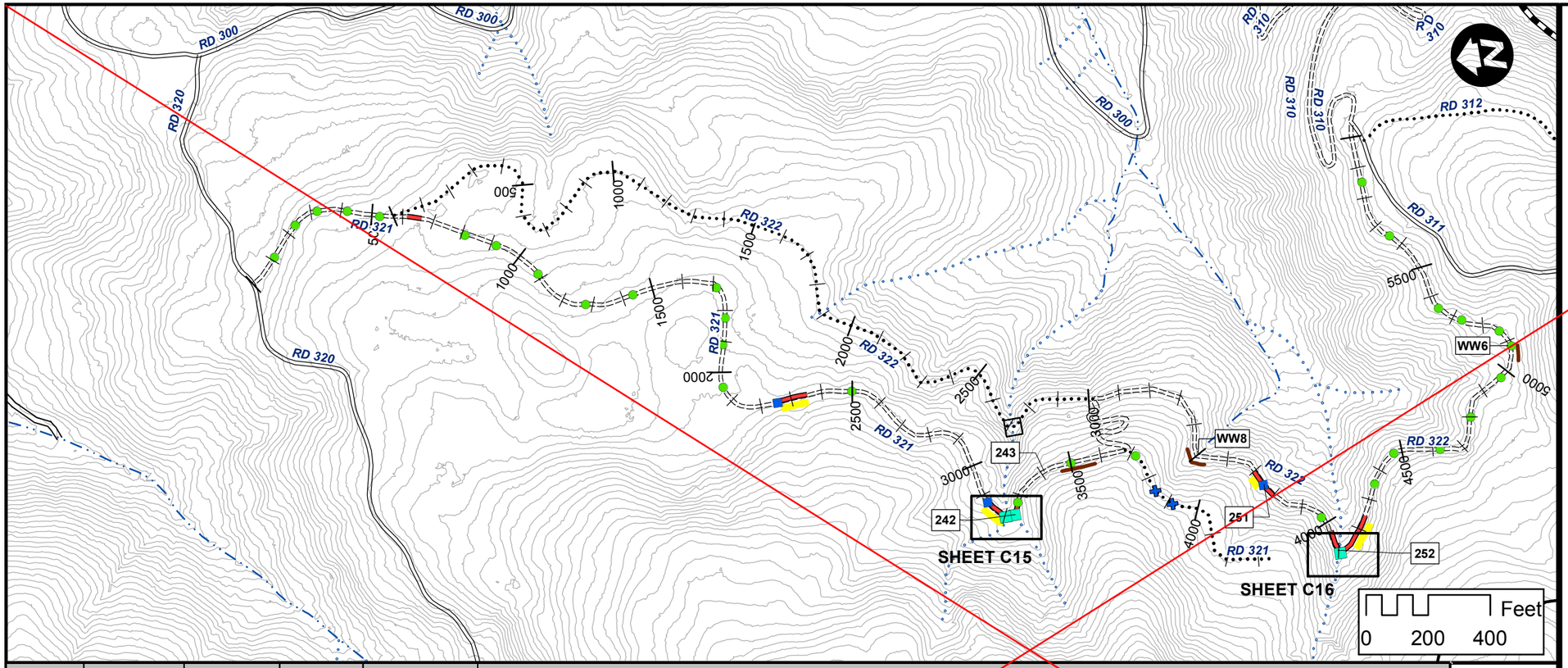
TIMOTHY C. BEST, CEG
ENGINEERING GEOLOGY AND HYDROLOGY
1002 Columbia Street, Santa Cruz, CA 95060
(831) 425-5822 (831) 425-5820 (fax)

PREPARED AT THE REQUEST OF:
MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

ROAD 300

BEAR CREEK REDWOODS - PHASE ONE ROAD AND TRAIL IMPROVEMENTS
100% SUBMITTAL

C3



ROAD	START STA	END STA	L (FT)	MAP POINT	Notes
321	610	660	60		SUBGRADE STABILIZATION
	2250				18" X 20 LF DRC
	2250	2350	100		NIBD
	2250	2350	100		SUBGRADE STABILIZATION
	3120	3200	80		NIBD
	3120			MP242	18" X 20 LF DRC
	3120	3350	230		SUBGRADE STABILIZATION
	3200				24" DIA X 40 LF STC
	3215				48" DIA X 40 LF STC
	3370	3470	100	MP243	REMOVE LOOSE FILL AND DEBRIS AT TOE OF CUT SLOPE TO GET 6 FT. WIDTH. OUTSLOPE
	3740				WATER BAR AND PULL FILL
	3910				WATER BAR
322	3475	3525	50	WW8	OUTSLOPE
	3710	3750	40		NIBD
	3750			MP251	18" DIA X 30 LF DRC
	3700	3800	100		SUBGRADE STABILIZATION
	4025	4250		MP252	225 LF SUBGRADE STABILIZATION
	4100				48" X 40 LF STC
	4100				RED
	4100				EXCAVATE INLET CHANNEL
	4120				18" X 30 LF DRC
	4120	4205	85		NIBD
	4205			MP252	25 LF SUBDRAIN
	4250				25 LF SUBDRAIN
	5060	5090	30	WW6	OUTSLOPE AND ROCK (4" LIME-TREATED AGGREGATE BASE) RECENTLY LEVELED TURNAROUND. APPROX. 1200 SF

PROPOSED FEATURES

- Reverse Grade Dip
- Ditch Relief Culvert
- Stream Crossing Culvert
- Knick
- Reverse Grade Dip with Knock Out
- Water Bar
- (E) Culvert
- Construct Inboard Ditch
- Clean Inboard Ditch
- Reshape Road
- Subgrade Stabilization

NOTE: FEATURES SHOWN ON THE SIDE OF THE ROAD ARE FOR SCHEMATIC PURPOSES ONLY.

1 Map Point

EXISTING ROADS + TRAILS

- Paved - Public
- Gravel - Private
- Primary Patrol Road
- ATV Patrol Road
- Legacy / closed

WATERCOURSES

- Perennial
- Intermittent
- Ephemerial

WATERWAYS CONSULTING, INC.
WWW.WATWAYS.COM
TIMOTHY C. BEST, CEG
ENGINEERING GEOLOGY AND HYDROLOGY
1002 Columbia Street, Santa Cruz, CA 95060
(831) 425-5822 (831) 426-5800 (fax)

PREPARED AT THE REQUEST OF:
MIDPENINSULA REGIONAL
OPEN SPACE DISTRICT

ROADS
321 & 322

BEAR CREEK
REDWOODS - PHASE ONE
ROAD AND TRAIL
IMPROVEMENTS
100% SUBMITTAL

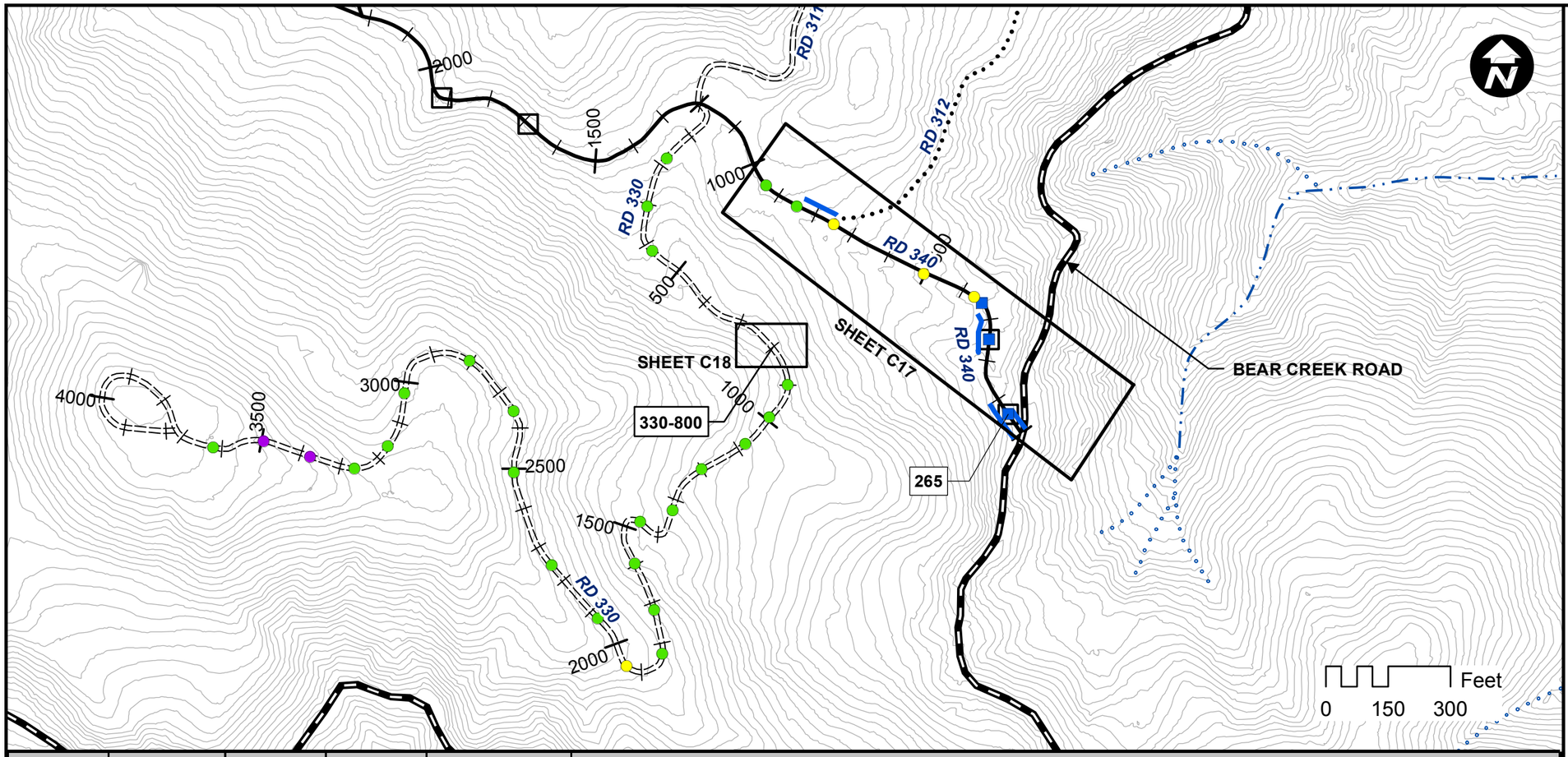
REGISTERED PROFESSIONAL ENGINEER
MATT W. WELD
No. 62235
Exp. 9-30-19
CIVIL
STATE OF CALIFORNIA

MATT W. WELD

3/06/18
DATE

1:4,800

C4



ROAD	START STA	END STA	L (FT)	MAP POINT	NOTES
~~330~~	~~800~~			~~MP330-800~~	~~EXCAVATE HILLSIDE AND REMOVE TREES TO RETAIN 10 FT. ROADWAY, PER DETAILED SITE PLAN~~
340	0	105	105		CIBD
	0	50	50		50 LF ROCK LINED IBD
	0	220		MP265	INSTALL 3550 SF NEW AC PAVING
	30	220	146		INSTALL 146 LF AC BERM
	105	205	100		100 LF ROCK LINED IBD
	260				24" X 40LF DRC AND TIMBER HEADWALL
	240	320	80		CIBD
	350			MP265	INSTALL DRAIN ROCK BERM ACROSS FLOWLINE, 1.5 AGGREGATE, 24" MIN HEIGHT, KEYED INTO BANKS
	360				18' X 40LF DRC AND CKO
	750				CKO, PLACE AB BERM
	750	830	50		CIBD

PROPOSED FEATURES

- Reverse Grade Dip
- Ditch Relief Culvert
- Knick
- Reverse Grade Dip with Knock Out
- (E) Culvert
- Construct Inboard Ditch
- Clean Inboard Ditch

1 Map Point

NOTE: FEATURES SHOWN ON THE SIDE OF THE ROAD ARE FOR SCHEMATIC PURPOSES ONLY.

EXISTING ROADS + TRAILS

- Paved - Public
- Gravel - Private
- Primary Patrol Road
- ATV Patrol Road
- Legacy / closed

WATERCOURSES

- Perennial
- Intermittent
- Ephemerial

MATT W. WELD

REGISTERED PROFESSIONAL ENGINEER
MATT W. WELD
No. 62235
Exp. 9-30-19
CIVIL
STATE OF CALIFORNIA

3/06/18
DATE

1:3,600

WATERWAYS CONSULTING, INC.
WWW.WATWAYS.COM

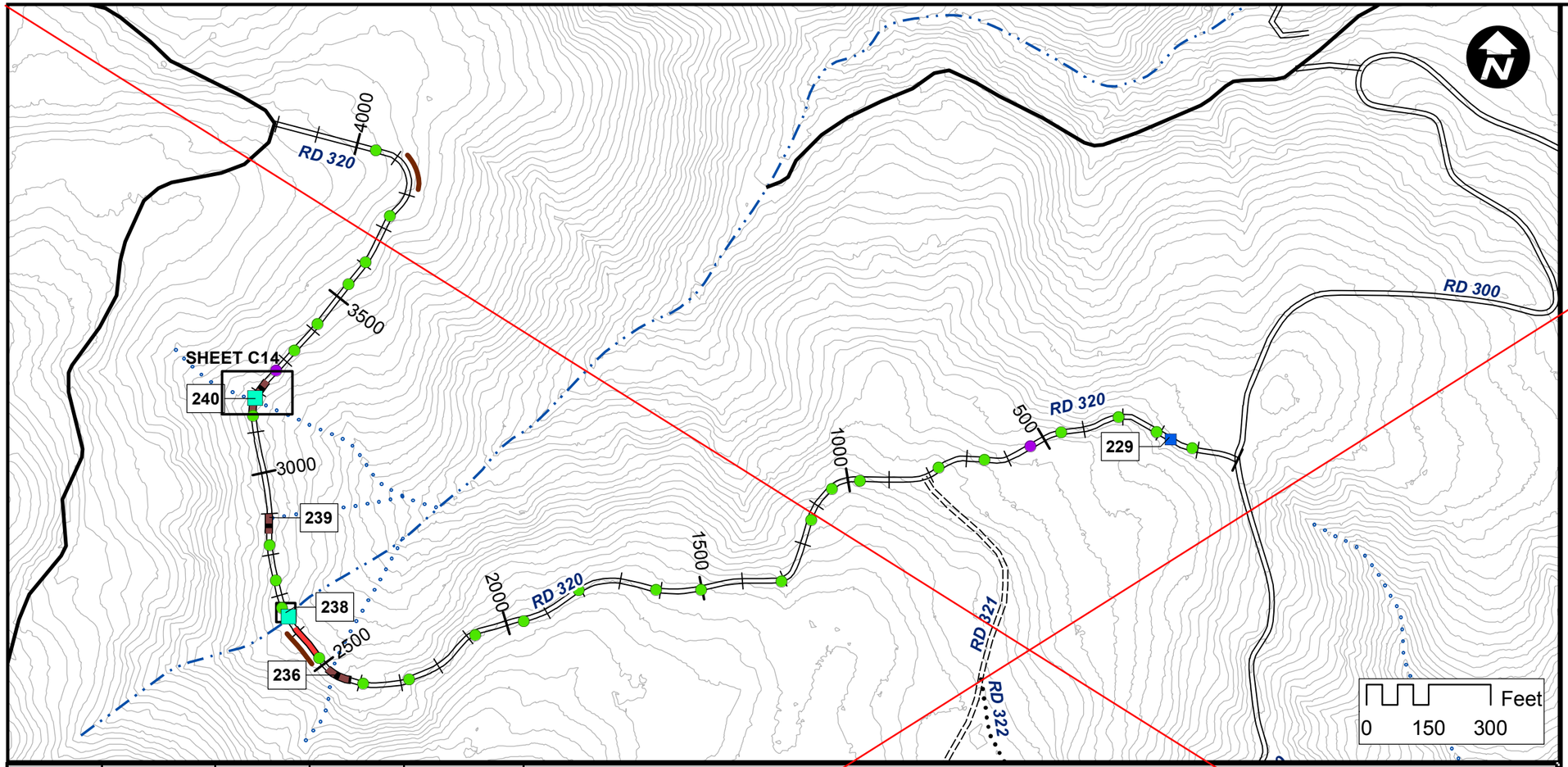
TIMOTHY C. BEST, CEG
ENGINEERING GEOLOGY AND HYDROLOGY
1002 Columbia Street, Santa Cruz, CA 95060
(831) 425-5822 (831) 426-5800 (fax)

PREPARED AT THE REQUEST OF:
MIDPENINSULA REGIONAL
OPEN SPACE DISTRICT

ROADS
330 & 340

BEAR CREEK
REDWOODS - PHASE ONE
ROAD AND TRAIL
IMPROVEMENTS
100% SUBMITTAL

C5



ROAD	START STA	END STA	L (FT)	MAP POINT	NOTES
320	181			MP229	24" X 30 LF DRC
	2440	2490	50	MP236	ADD ROCK ON EITHER SIDE OF EXISTING FORD
	2510	2610	100	MP237	SUBGRADE STABILIZATION
	2510	2610	100		OUTSLOPE
	2621			MP238	REALIGN 2" PVC AND REPLACE CULVERT WITH 36" X 30 LF STC
	2850	2900	35	MP239	KEEP EXISTING ROCK FORD BUT ADD AB FOR 35 LF
	3170	3240	70	MP240	ROCK ROAD
	3170	3240	70		ROCKED SHOULDER
	3180				RED
	3180				1/4 TON RSP SLOPE PROTECTION
	3180				INSTALL 50 LF OF SUBDRAIN
	3180				24" X 40LF STC
	3810				OUTSLOPE ROAD AT TURNAROUND

PROPOSED FEATURES

- Reverse Grade Dip
- Ditch Relief Culvert
- Stream Crossing Culvert
- Knick
- (E) Culvert
- Reshape Road
- Rock Road
- Subgrade Stabilization

NOTE: FEATURES SHOWN ON THE SIDE OF THE ROAD ARE FOR SCHEMATIC PURPOSES ONLY.

1 Map Point

EXISTING ROADS + TRAILS

- Paved - Public
- Gravel - Private
- Primary Patrol Road
- ATV Patrol Road
- Legacy / closed

WATERCOURSES

- Perennial
- Intermittent
- Ephemerial

MATT W. WELD

REGISTERED PROFESSIONAL ENGINEER
MATT W. WELD
No. 62235
Exp. 9-30-19
CIVIL
STATE OF CALIFORNIA

3/06/18
DATE

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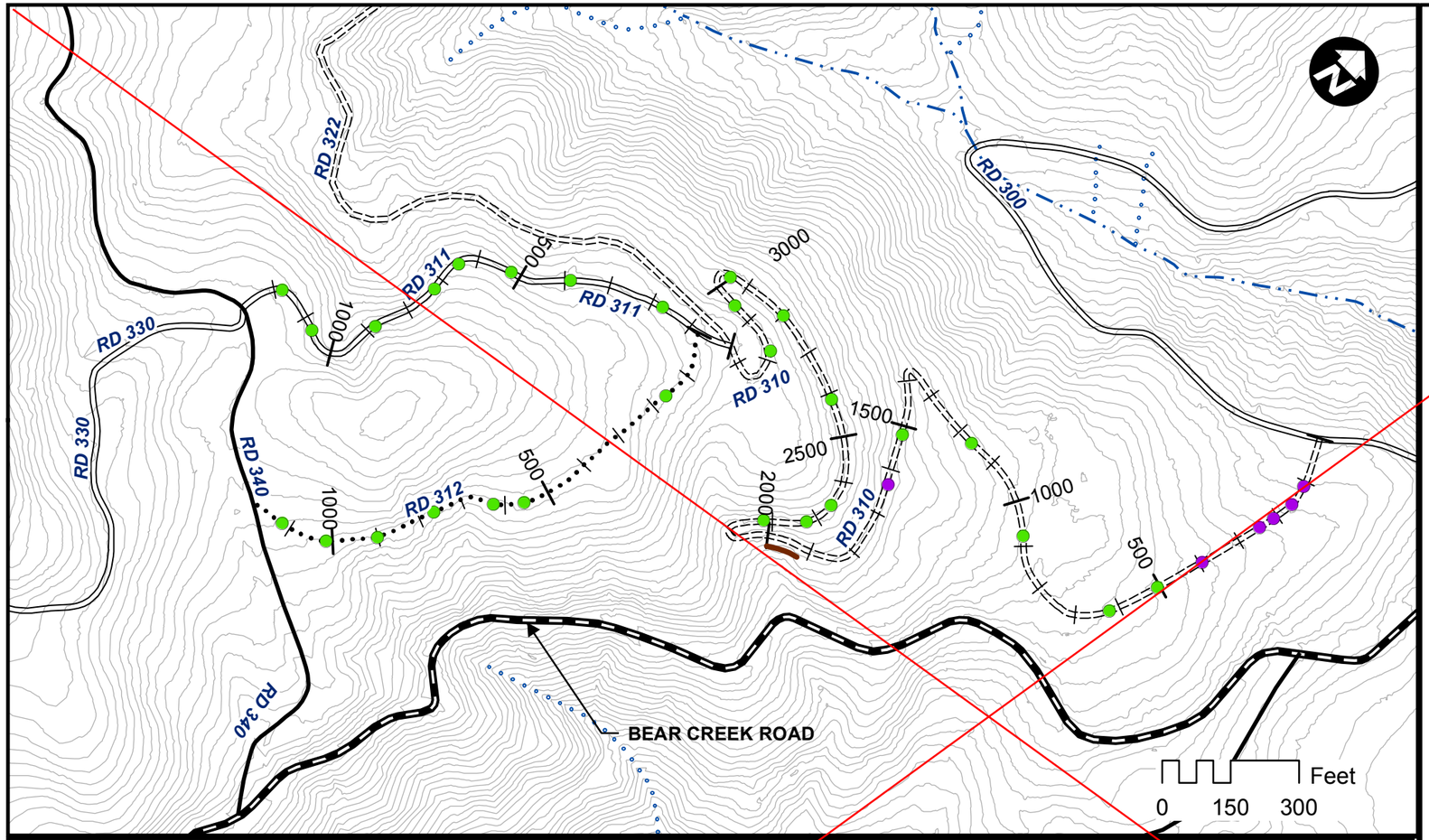
ENGINEERING GEOLOGY AND HYDROLOGY
1002 Columbia Street, Santa Cruz, CA 95060
(831) 425-5822 (831) 425-5820 (fax)

PREPARED AT THE REQUEST OF:
MIDPENINSULA REGIONAL
OPEN SPACE DISTRICT

ROAD 320

BEAR CREEK
REDWOODS - PHASE ONE
ROAD AND TRAIL
IMPROVEMENTS
100% SUBMITTAL

C6



ROAD	START STA	END STA	L (FT)	MAP POINT	NOTES
310	1925	2000	75		RESHAPE ROAD BED TO OUTSLOPE

PROPOSED FEATURES

- Reverse Grade Dip
- Knick
- Reshape Road

NOTE: FEATURES SHOWN ON THE SIDE OF THE ROAD ARE FOR SCHEMATIC PURPOSES ONLY.

1 Map Point

EXISTING ROADS + TRAILS

- Paved - Public
- Gravel - Private
- Primary Patrol Road
- ATV Patrol Road
- Legacy / closed

WATERCOURSES

- Perennial
- Intermittent
- Ephemerial

WATERWAYS CONSULTING, INC.
WWW.WATWAYS.COM
TIMOTHY C. BEST, CEG
ENGINEERING GEOLOGY AND HYDROLOGY
1002 Columbia Street, Santa Cruz, CA 95060
(831) 425-5852 (831) 426-5860 (fax)

PREPARED AT THE REQUEST OF:
MIDPENINSULA REGIONAL
OPEN SPACE DISTRICT

MATT W. WELD

REGISTERED PROFESSIONAL ENGINEER
MATT W. WELD
No. 62235
Exp. 9-30-19
CIVIL
STATE OF CALIFORNIA

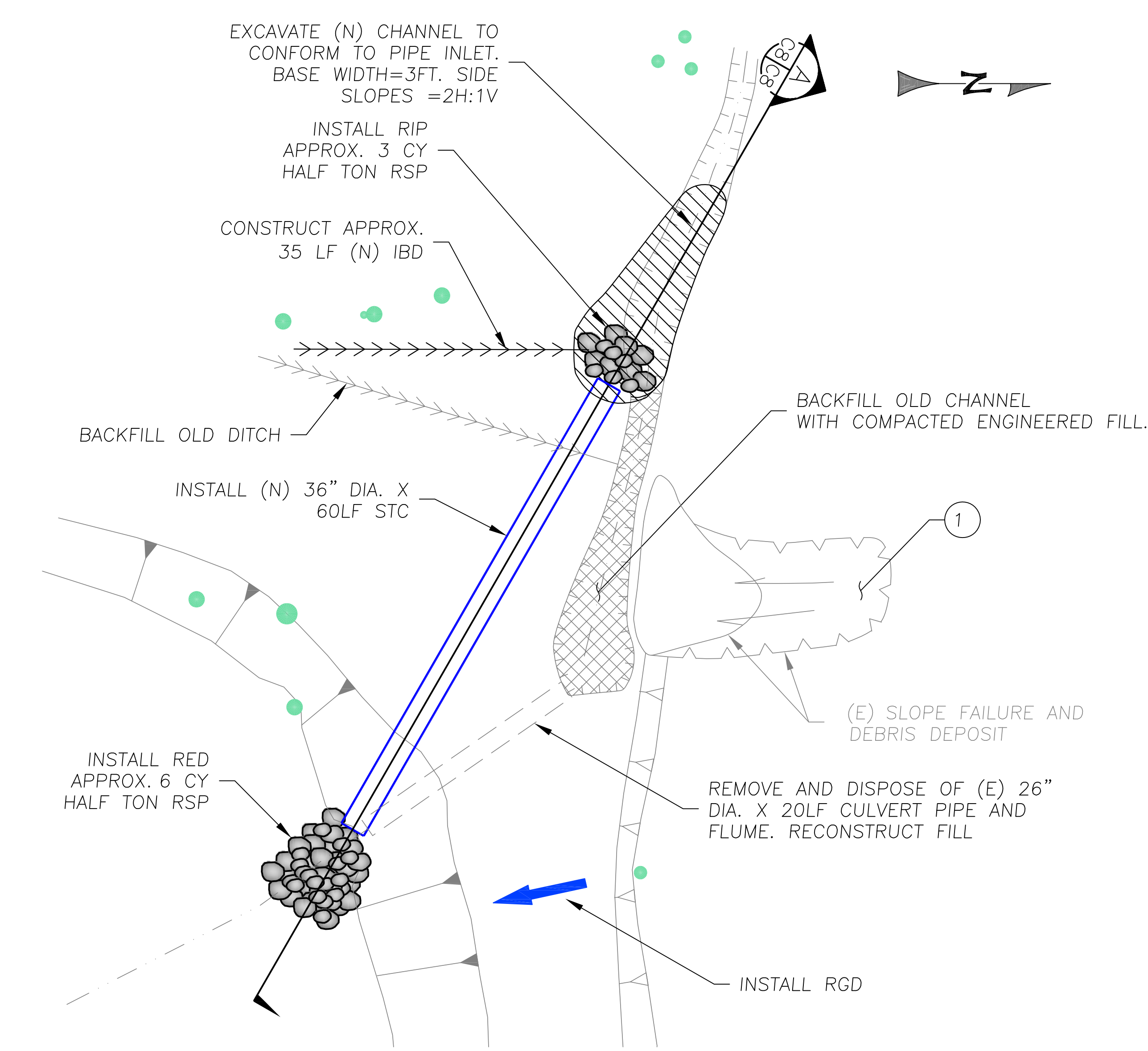
3/06/18
DATE

1:3,600

BEAR CREEK REDWOODS - PHASE ONE ROAD AND TRAIL IMPROVEMENTS 100% SUBMITTAL

ROADS 310, 311, & 312

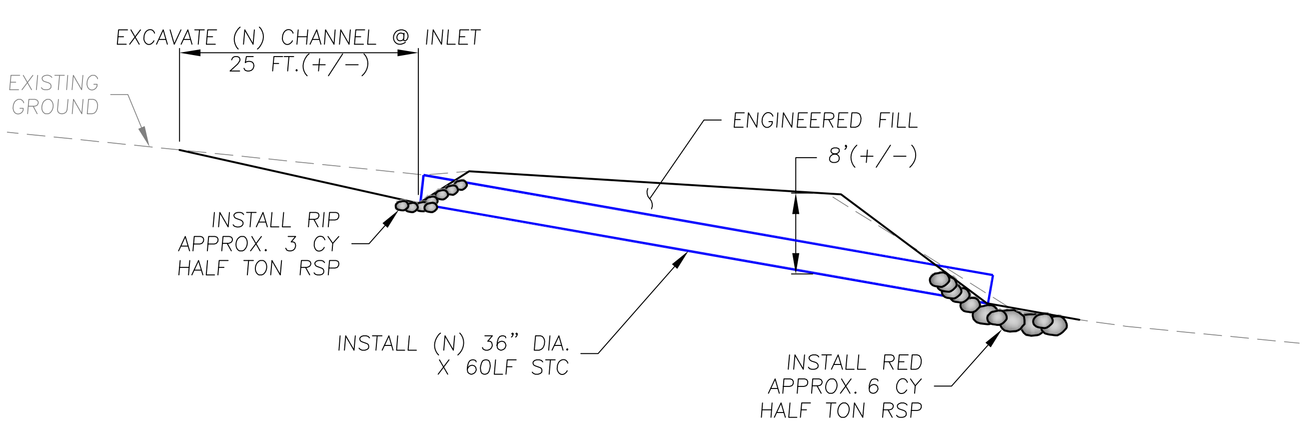
C7



MP202 - SITE PLAN

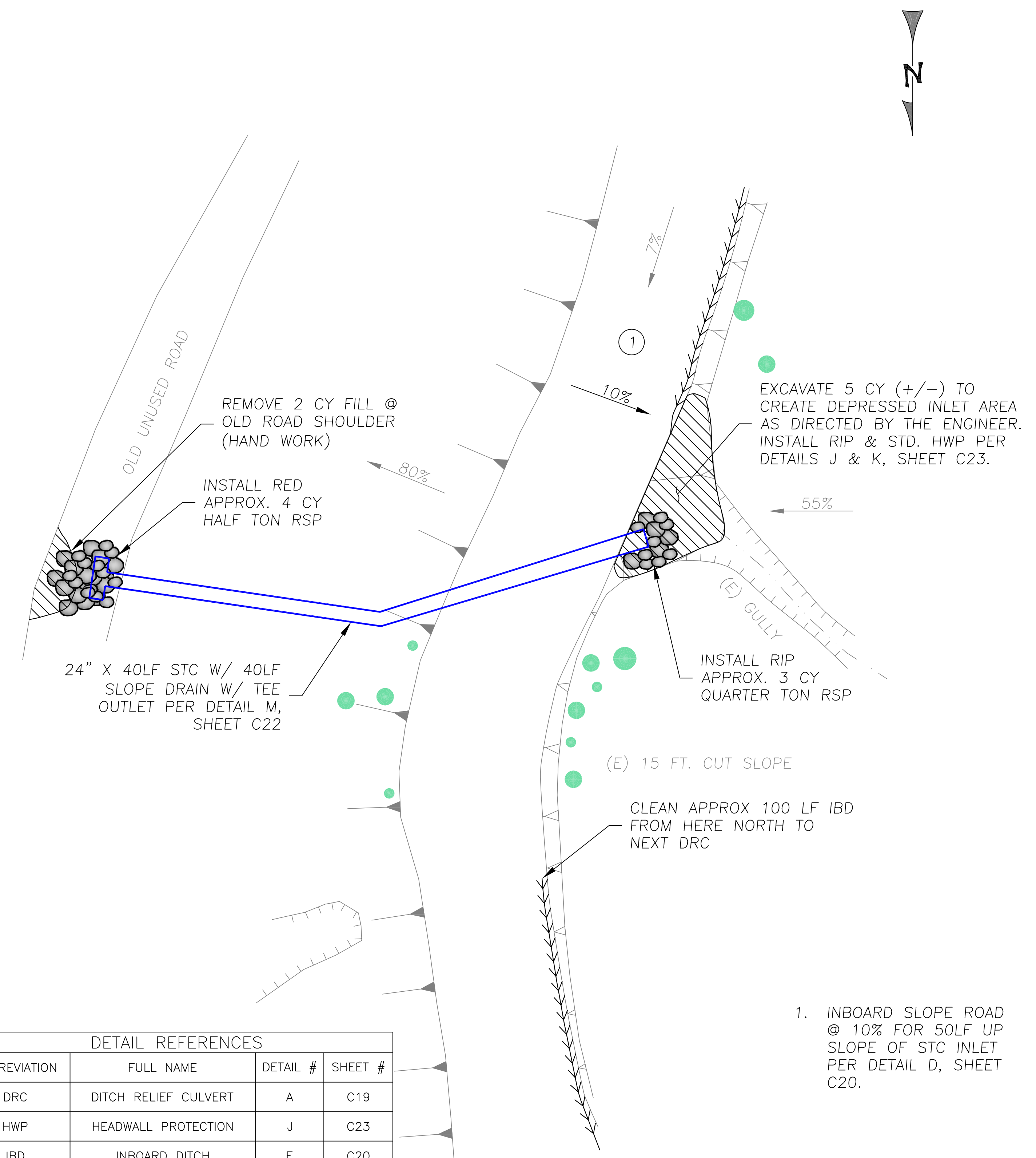
SCALE: 1" = 10'

1) STABILIZE (E) SLOPE FAILURE USING APPROX. 80 CY CALTRANS CLASS 1 RSP, IN ACCORDANCE WITH GEOTECHNICAL REPORT BY CMAG ENGINEERING, INC., PROJECT No. 16-120-SCL, DATED 7-6-2016.



MP202 CULVERT SECTION

SCALE: 1" = 10' A C8 C8



1. INBOARD SLOPE ROAD @ 10% FOR 50LF UP SLOPE OF STC INLET PER DETAIL D, SHEET C20.

DETAIL REFERENCES

ABBREVIATION	FULL NAME	DETAIL #	SHEET #
DRC	DITCH RELIEF CULVERT	A	C19
HWP	HEADWALL PROTECTION	J	C23
IBD	INBOARD DITCH	F	C20
RED	ROCK ENERGY DISSIPATOR	K	C23
RGD	REVERSE GRADE DIP	G	C21
RIBD	ROCKED IBD	F	C20
RS	ROCKED SHOULDER	E	C20
STC	STREAM CULVERT	H	C22

MP206 - SITE PLAN

SCALE: 1" = 10'

WATERWAYS CONSULTING INC.
TIMOTHY C. BEST, CEG

3/06/18 DATE

REGISTERED PROFESSIONAL ENGINEER MATT W. WELD No. 62235 Exp. 9-30-19 CIVIL STATE OF CALIFORNIA

MATT W. WELD

PREPARED AT THE REQUEST OF: MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

MP-202 + MP-206

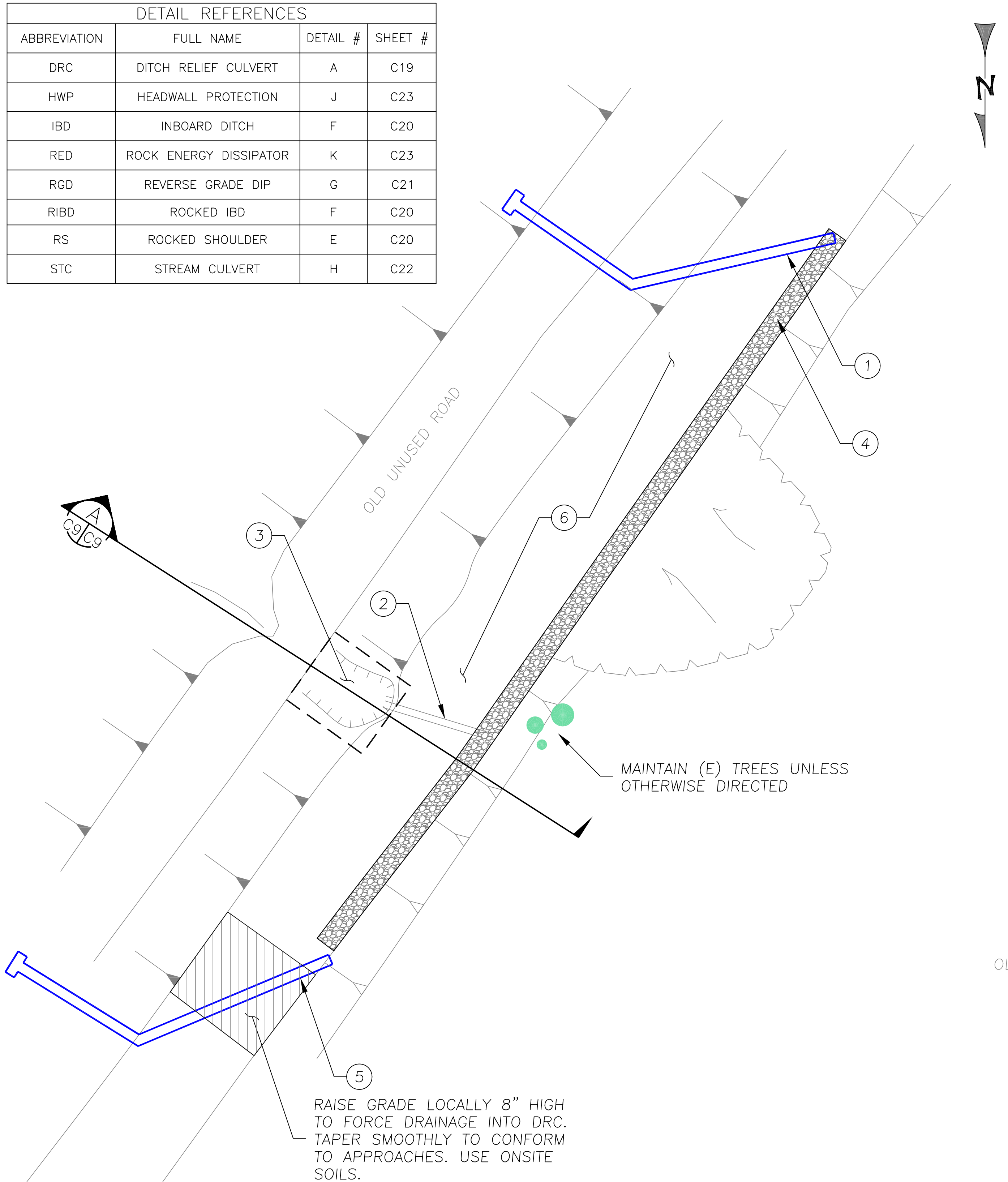
BEAR CREEK REDWOODS - PHASE ONE ROAD AND TRAIL IMPROVEMENTS 100% SUBMITTAL

DESIGNED BY: –
DRAWN BY: –
CHECKED BY: M.W.W.
DATE: 03/06/2018
JOB NO.: 16-017

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

C8

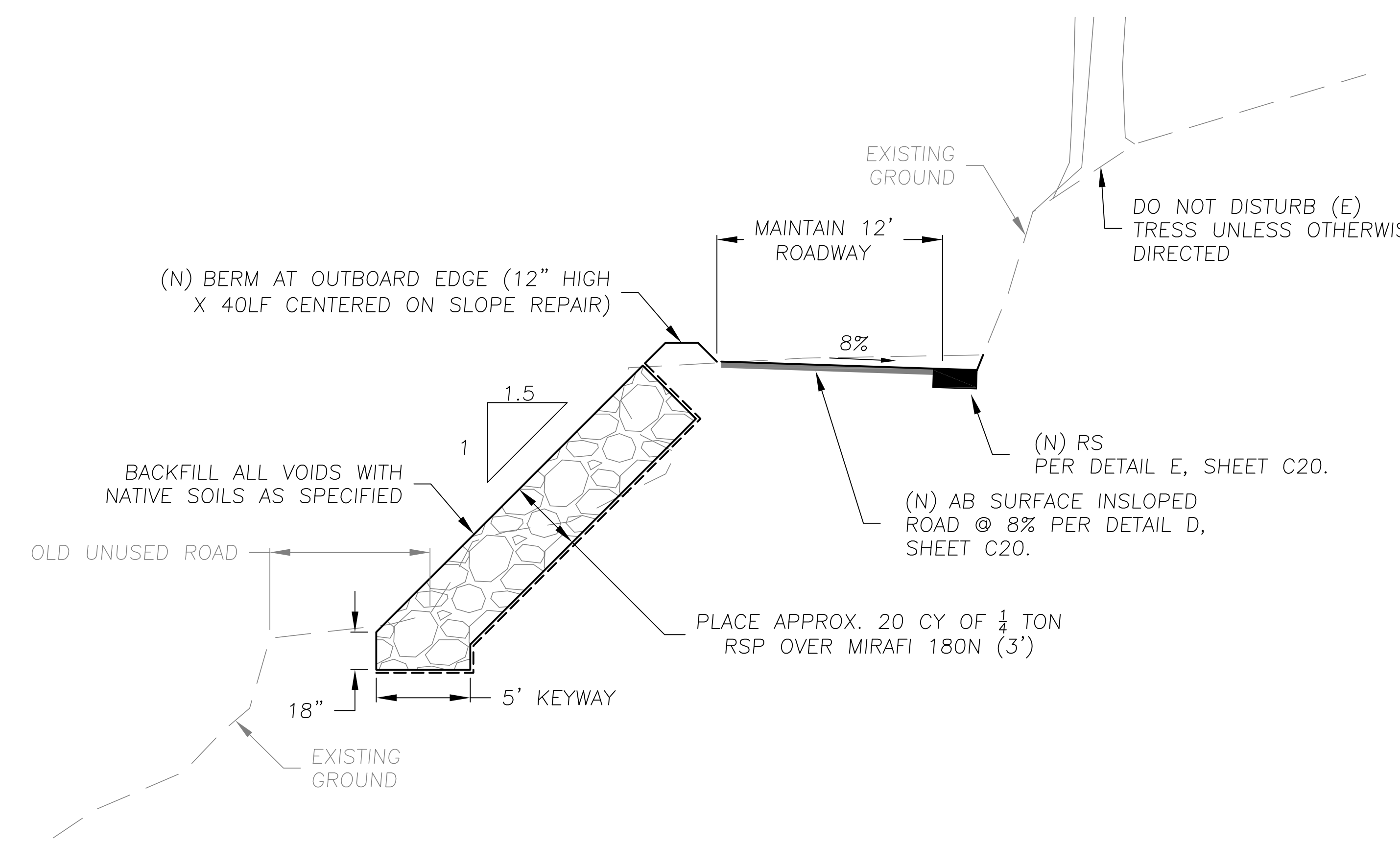
DETAIL REFERENCES			
ABBREVIATION	FULL NAME	DETAIL #	SHEET #
DRC	DITCH RELIEF CULVERT	A	C19
HWP	HEADWALL PROTECTION	J	C23
IBD	INBOARD DITCH	F	C20
RED	ROCK ENERGY DISSIPATOR	K	C23
RGD	REVERSE GRADE DIP	G	C21
RIBD	ROCKED IBD	F	C20
RS	ROCKED SHOULDER	E	C20
STC	STREAM CULVERT	H	C22



MP207 - SITE PLAN
SCALE: 1" = 10'

NOTES

1. INSTALL 18" DIA. X 30 LF DRC WITH 20' SLOPE DRAIN PER DETAIL M, SHEET C22. INSLOPE ROAD @ 8% APPROACHING INLET FOR 50 LF.
2. REMOVE AND DISPOSE (E) CULVERT.
3. CONSTRUCT (N) 1.5H:1V ROCK BUTTRESS AT GULLY. CONSTRUCT 5 FT. KEYWAY, SET 18 INCHES INTO COMPETENT MATERIAL AT BASE OF SLOPE.
   3.1. BUTTRESS WIDTH (ALONG ROAD) = 12 FT.
   3.2. BUTTRESS LENGTH (ALONG SLOPE) = 13.5 FT.
   3.3. THICKNESS PERPENDICULAR TO SLOPE = 3 FT.
4. CONSTRUCT APPROX. 130 LF (N) RS PER DETAIL E, SHEET C20.
5. INSTALL (N) 18" DIA. X 30 LF DRC WITH 20 LF SLOPE DRAIN PER DETAIL M, SHEET C22. REMOVE FILL AT OUTLET ON LOWER ROAD (APPROX. 8CY).
6. INSLOPE ROAD SECTION AND LOWER ROADBED TO ACHIEVE A UNIFORM PROFILE BETWEEN (N) DRC'S. MAX DEPTH OF EXCAVATION = 2FT. APPROX. CUT VOLUME = 35 CY.
7. ENGINEER TO INSPECT KEYWAY PRIOR TO ROCK PLACEMENT.



MP207 - SECTION AT ROCK BUTTRESS (A C9|C9)
SCALE: 1" = 5'

WATERWAYS CONSULTING INC.

3/06/18 DATE

MATT W. WELD

PREPARED AT THE REQUEST OF: MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

MP-207

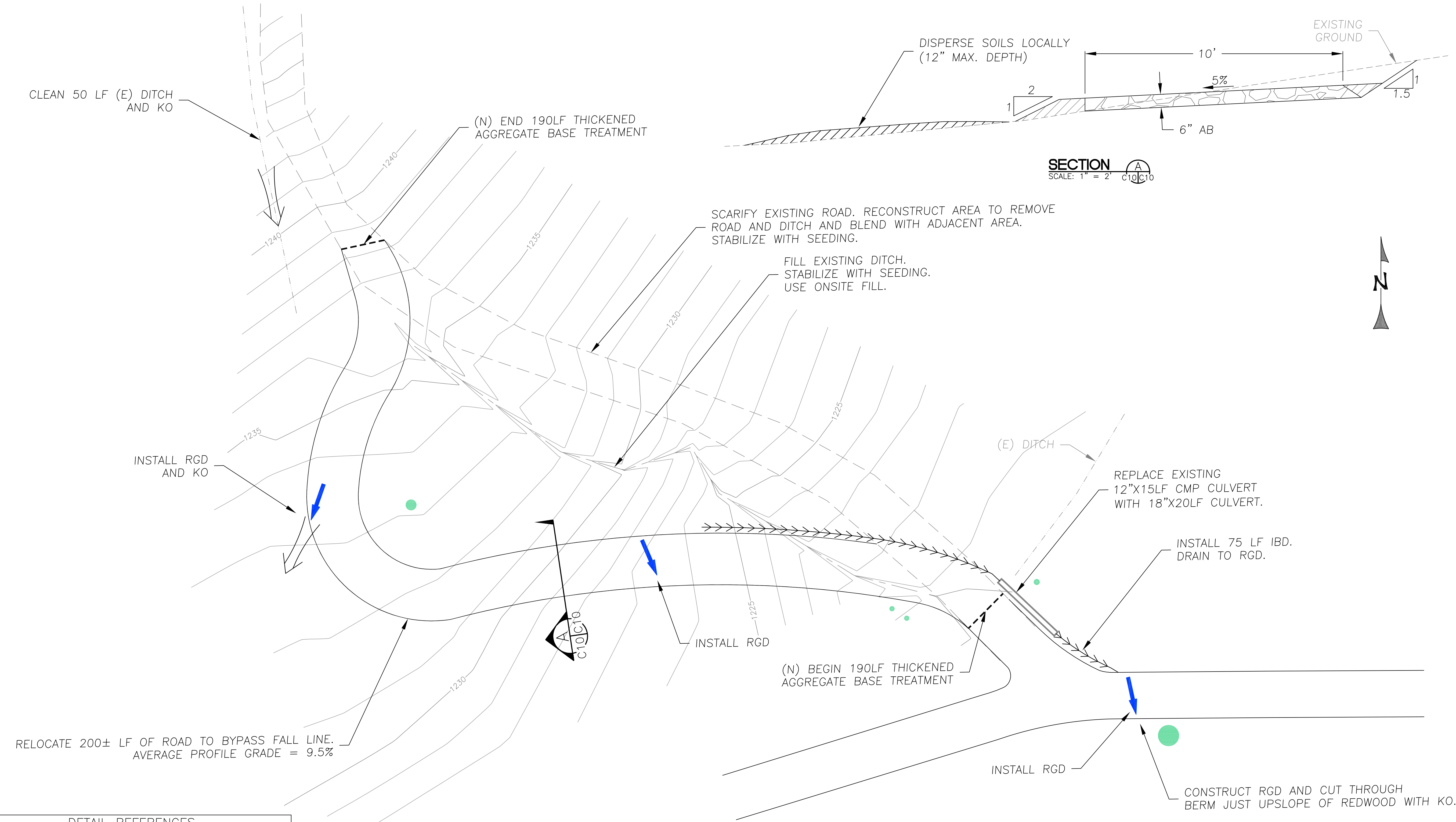
BEAR CREEK REDWOODS - PHASE ONE ROAD AND TRAIL IMPROVEMENTS 100% SUBMITTAL

DESIGNED BY: –
DRAWN BY: –
CHECKED BY: M.W.W.
DATE: 03/06/2018
JOB NO.: 16-017

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

C9

9 OF 24



DETAIL REFERENCES			
ABBREVIATION	FULL NAME	DETAIL #	SHEET #
DRC	DITCH RELIEF CULVERT	A	C19
HWP	HEADWALL PROTECTION	J	C23
IBD	INBOARD DITCH	F	C20
RED	ROCK ENERGY DISSIPATOR	K	C23
RGD	REVERSE GRADE DIP	G	C21
RIBD	ROCKED IBD	F	C20
RS	ROCKED SHOULDER	E	C20
STC	STREAM CULVERT	H	C22

MP 210 - SITE PLAN
SCALE: 1" = 10'

NOTE:
1. STRIP VEGETATION AND ORGANICS.
2. SCARIFY SUBGRADE TO 12" AND RECOMPACT TO 90% RC.
3. APPLY BASE ROCK (6").

WATERWAYS CONSULTING INC.
TIMOTHY C. BEST, CEG
MATT W. WELD
No. 62235 Exp. 9-30-19
REGISTERED PROFESSIONAL ENGINEER CIVIL STATE OF CALIFORNIA

DATE 3/06/18

PREPARED AT THE REQUEST OF: MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

MP-210

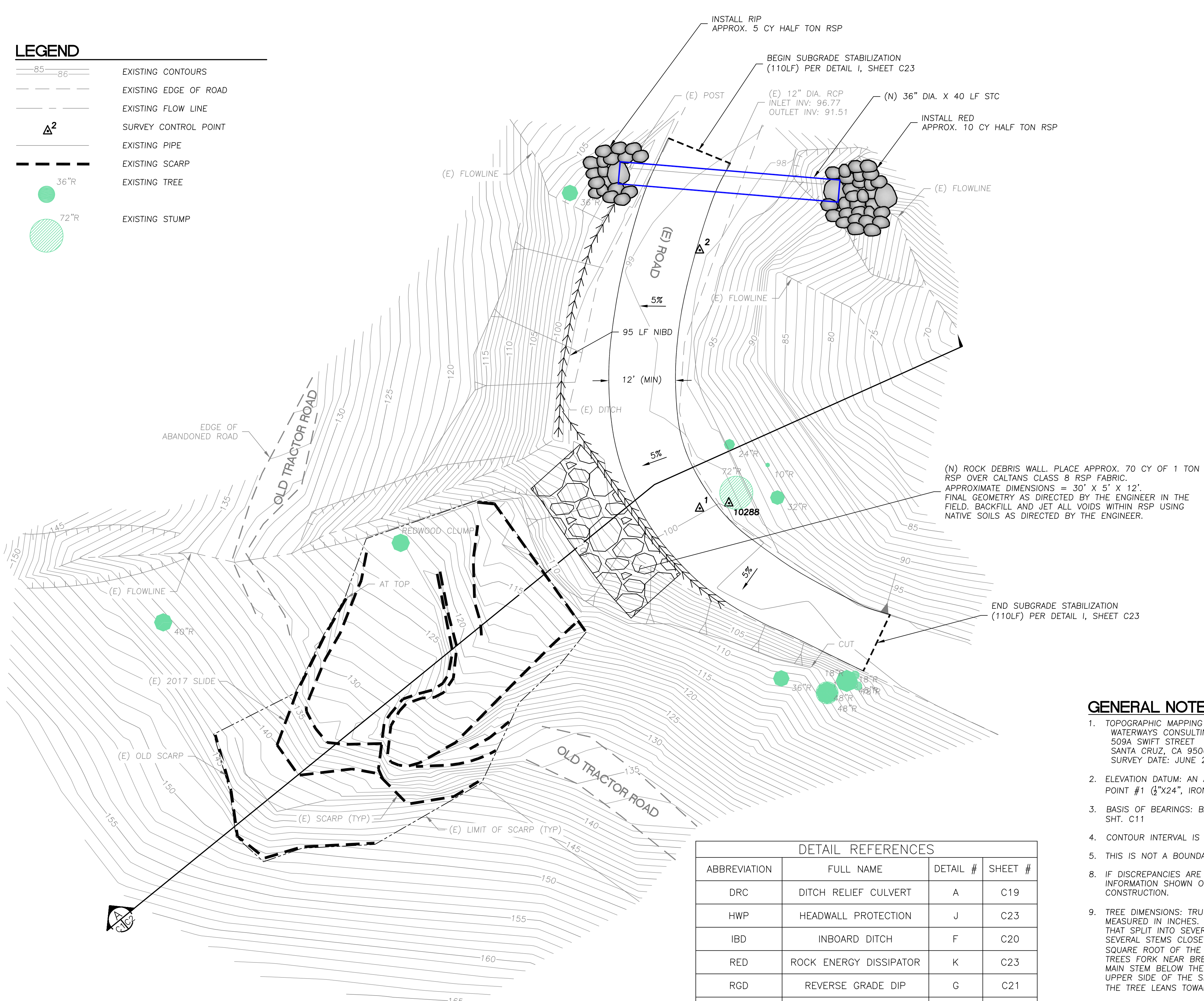
BEAR CREEK REDWOODS - PHASE ONE ROAD AND TRAIL IMPROVEMENTS 100% SUBMITTAL

DESIGNED BY: –
DRAWN BY: –
CHECKED BY: M.W.W.
DATE: 03/06/2018
JOB NO.: 16-017

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

LEGEND

85 — 86	EXISTING CONTOURS
— — — —	EXISTING EDGE OF ROAD
—— – ——	EXISTING FLOW LINE
△2	SURVEY CONTROL POINT
——	EXISTING PIPE
▬ ▬ ▬	EXISTING SCARP
36"R	EXISTING TREE
72"R	EXISTING STUMP



MP-216 SITE PLAN

SCALE: 1" = 10'

ABBREVIATION	FULL NAME	DETAIL #	SHEET #
DRC	DITCH RELIEF CULVERT	A	C19
HWP	HEADWALL PROTECTION	J	C23
IBD	INBOARD DITCH	F	C20
RED	ROCK ENERGY DISSIPATOR	K	C23
RGD	REVERSE GRADE DIP	G	C21
RIBD	ROCKED IBD	F	C20
RS	ROCKED SHOULDER	E	C20
STC	STREAM CULVERT	H	C22

Caption above table: DETAIL REFERENCES

GENERAL NOTES

1. TOPOGRAPHIC MAPPING WAS PERFORMED BY:
   WATERWAYS CONSULTING, INC.
   509A SWIFT STREET
   SANTA CRUZ, CA 95060
   SURVEY DATE: JUNE 21, 2017.
2. ELEVATION DATUM: AN ASSUMED ELEVATION OF 1000.00' WAS ESTABLISHED AT SURVEY CONTROL POINT #1 (½"X24", IRON ROD) SHOWN ON SHEET C11.
3. BASIS OF BEARINGS: BASIS OF BEARINGS BETWEEN POINTS #1 AND #2 IS N0°00'00"E, AS SHOWN ON SHT. C11
4. CONTOUR INTERVAL IS ONE FOOT. ELEVATIONS AND DISTANCES SHOWN ARE IN DECIMAL FEET.
5. THIS IS NOT A BOUNDARY SURVEY. PROPERTY LINES ARE NOT SHOWN HEREON.
8. IF DISCREPANCIES ARE DISCOVERED BETWEEN THE CONDITIONS EXISTING IN THE FIELD AND THE INFORMATION SHOWN ON THESE DRAWINGS, NOTIFY THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.
9. TREE DIMENSIONS: TRUNK DIAMETERS SHOWN REPRESENT DIAMETER AT BREAST HEIGHT (DBH), MEASURED IN INCHES. DBH IS MEASURED 4.5 FT ABOVE GROUND FOR SINGLE TRUNKS AND TRUNKS THAT SPLIT INTO SEVERAL STEMS CLOSE TO THE GROUND. THE DBH FOR TREES THAT SPLIT INTO SEVERAL STEMS CLOSE TO THE GROUND MAY BE CONSOLIDATED INTO A SINGLE DBH BY TAKING THE SQUARE ROOT OF THE SUM OF ALL SQUARED STEM DBH'S, UNLESS OTHERWISE NOTED. WHERE TREES FORK NEAR BREAST HEIGHT, TRUNK DIAMETER IS MEASURED AT THE NARROWEST PART OF THE MAIN STEM BELOW THE FORK. FOR TREES ON A SLOPE, BREAST HEIGHT IS REFERENCED FROM THE UPPER SIDE OF THE SLOPE. FOR LEANING TREES, BREAST HEIGHT IS MEASURED ON THE SIDE THAT THE TREE LEANS TOWARD. TREES WITH DBH LESS THAN 8" ARE TYPICALLY NOT SHOWN.

   12"P = 12" DBH PINE
10. TREE SPECIES ARE IDENTIFIED WHEN KNOWN. HOWEVER, FINAL DETERMINATION SHOULD BE MADE BY A QUALIFIED BOTANIST. REFER TO THE LEGEND FOR TREE SPECIES SYMBOLS.

    TREE SPECIES
    R REDWOOD
11. THE IMPROVEMENTS SHOWN HEREON ARE INTENDED TO PROVIDE TEMPORARY CONTROL OF DRAINAGE AND DEBRIS UNTIL A FORMAL GEOTECHNICAL INVESTIGATION AND SLOPE STABILITY PLAN CAN BE PREPARED. THESE IMPROVEMENTS ARE NOT INTENDED TO PROVIDE GLOBAL STABILITY TO THE FAILING SLOPE.

WATERWAYS CONSULTING INC.

TIMOTHY C. BEST, CEG

3/06/18 DATE

REGISTERED PROFESSIONAL ENGINEER MATT W. WELD No. 62235 Exp. 9-30-19 CIVIL STATE OF CALIFORNIA

MATT W. WELD

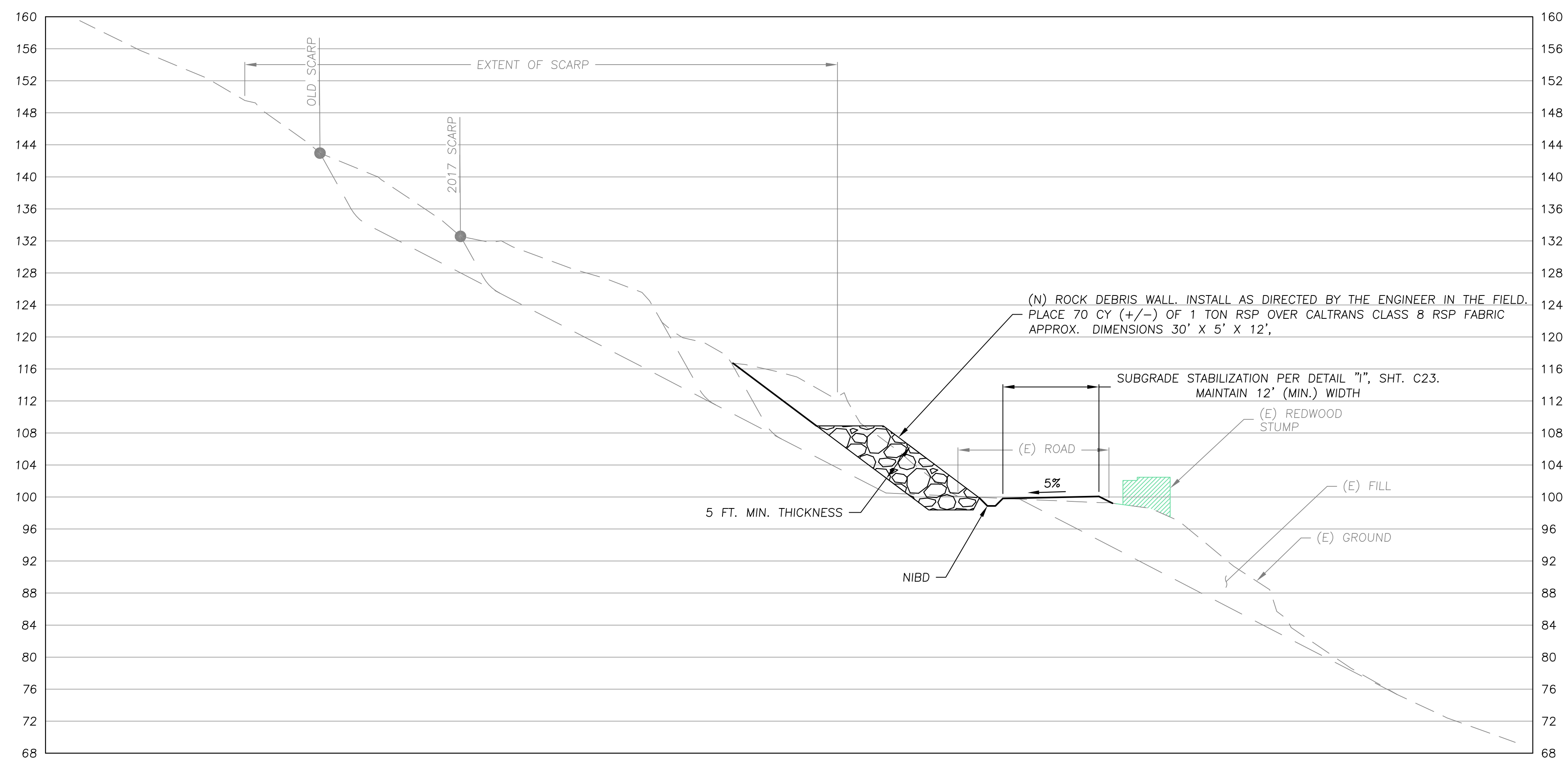
PREPARED AT THE REQUEST OF:
MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

MP-216 SITE PLAN

BEAR CREEK REDWOODS - PHASE ONE ROAD AND TRAIL IMPROVEMENTS 100% SUBMITTAL

DESIGNED BY: –
DRAWN BY: S.R.
CHECKED BY: M.W.W.
DATE: 03/06/2018
JOB NO.: 16-017

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



SECTION A C11 C12
SCALE: 1" = 10'

NOTES

PENDING FURTHER INVESTIGATION, REPAIR OPTIONS MAY INCLUDE:

1. CONCRETE BLOCK BUTTRESS
2. ROCK BUTTRESS
3. HILFIKER GRAVITY WALL
4. SOLDIER PIN WALL

WATERWAYS CONSULTING INC.

MATT W. WELD
3/06/18
DATE

REGISTERED PROFESSIONAL ENGINEER MATT W. WELD No. 62235 Exp. 9-30-19 CIVIL STATE OF CALIFORNIA

PREPARED AT THE REQUEST OF:
MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

MP-216 SECTION

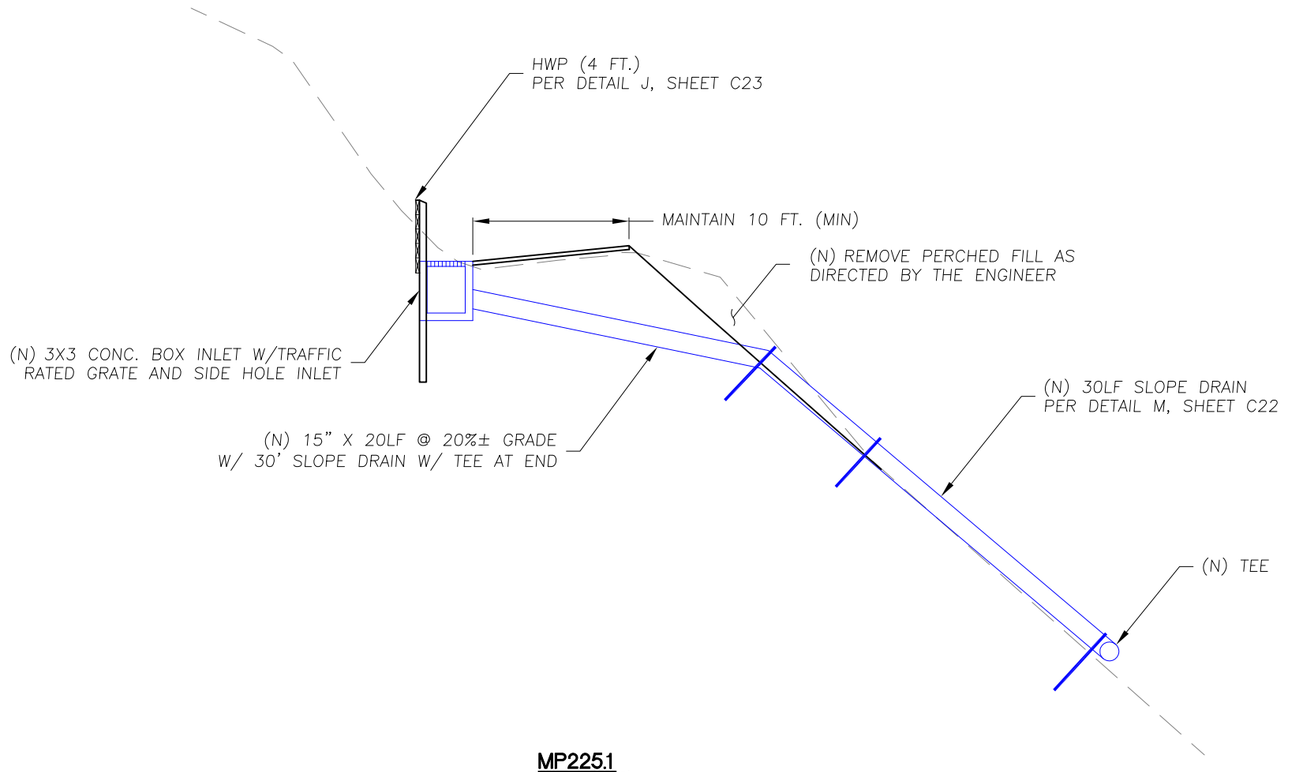
BEAR CREEK REDWOODS - PHASE ONE ROAD AND TRAIL IMPROVEMENTS
100% SUBMITTAL

DESIGNED BY: –
DRAWN BY: S.R.
CHECKED BY: M.W.W.
DATE: 03/06/2018
JOB NO.: 16-017

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

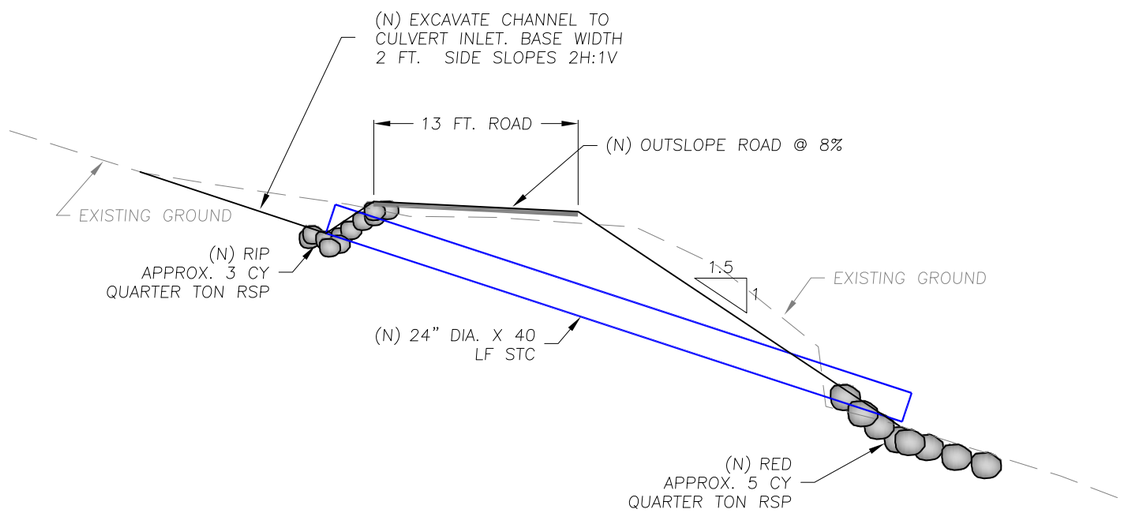
C12

12 OF 24



MP225.1
SCALE: 1" = 5'

DETAIL REFERENCES			
ABBREVIATION	FULL NAME	DETAIL #	SHEET #
DRC	DITCH RELIEF CULVERT	A	C19
HWP	HEADWALL PROTECTION	J	C23
IBD	INBOARD DITCH	F	C20
RED	ROCK ENERGY DISSIPATOR	K	C23
RGD	REVERSE GRADE DIP	G	C21
RIBD	ROCKED IBD	F	C20
RS	ROCKED SHOULDER	E	C20
STC	STREAM CULVERT	H	C22



MP221 - SECTION AT CULVERT
SCALE: 1" = 5'

WATERWAYS CONSULTING INC.
TIMOTHY C. BEST, CEG
ENGINEERING GEOLOGY AND HYDROLOGY

3/06/18 DATE

REGISTERED PROFESSIONAL ENGINEER ★ MATTHEW W. WELD ★ No. 62235 Exp. 9-30-19 ★ CIVIL ★ STATE OF CALIFORNIA

MATT W. WELD

PREPARED AT THE REQUEST OF:
MIDPENINSULA REGIONAL
OPEN SPACE DISTRICT

MP-221 + MP
225.1

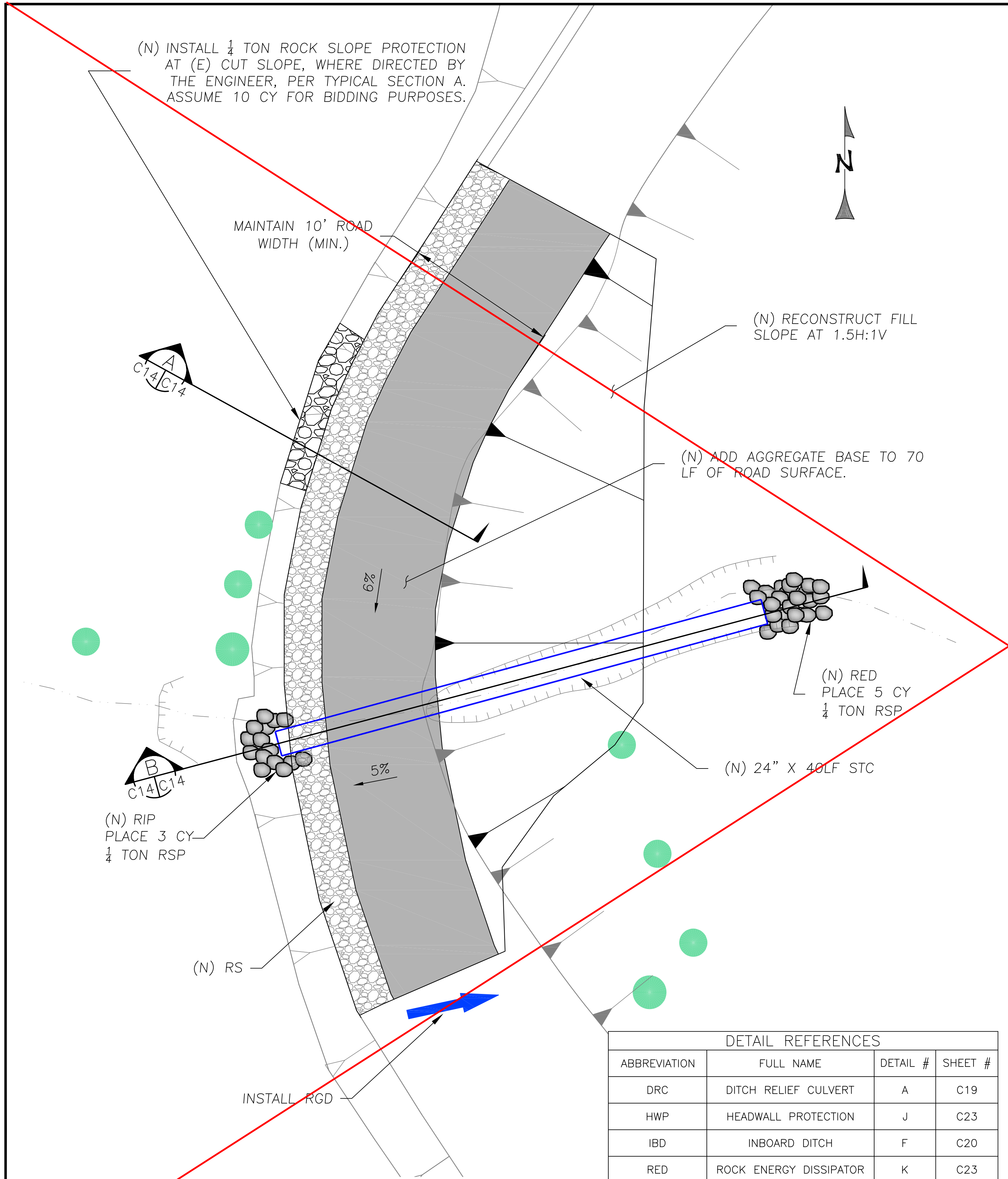
BEAR CREEK
REDWOODS - PHASE
ONE ROAD AND TRAIL
IMPROVEMENTS
100% SUBMITTAL

DESIGNED BY: –
DRAWN BY: –
CHECKED BY: M.W.W.
DATE: 03/06/2018
JOB NO.: 16-017

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

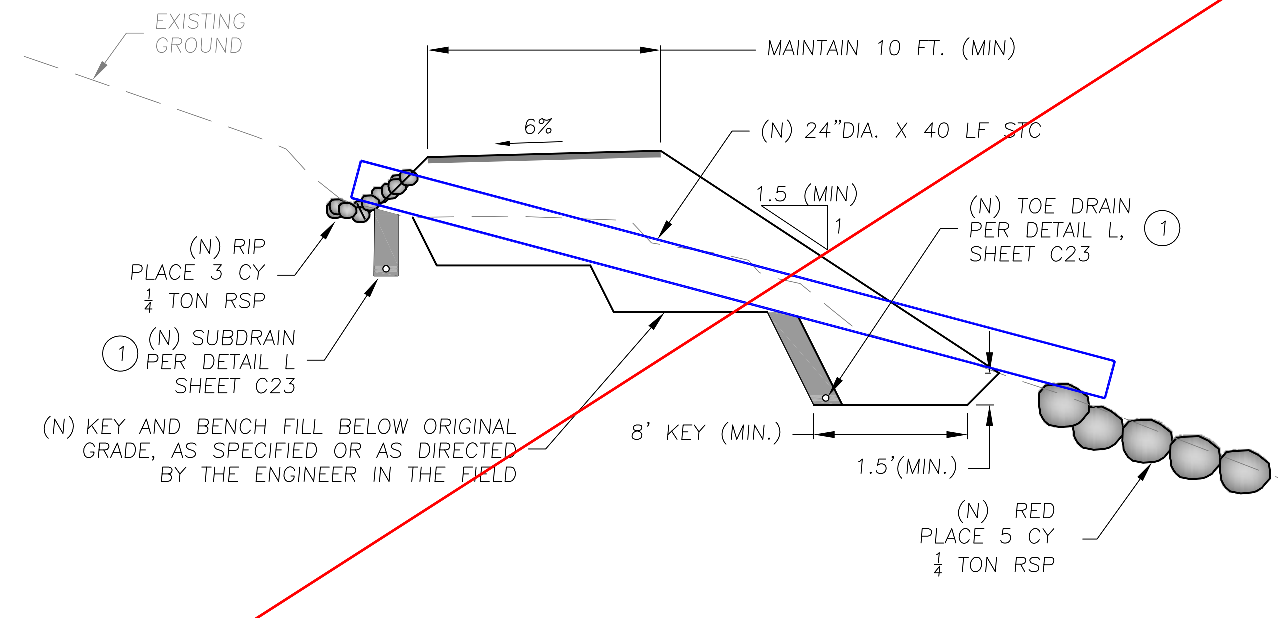
C13

13 OF 24

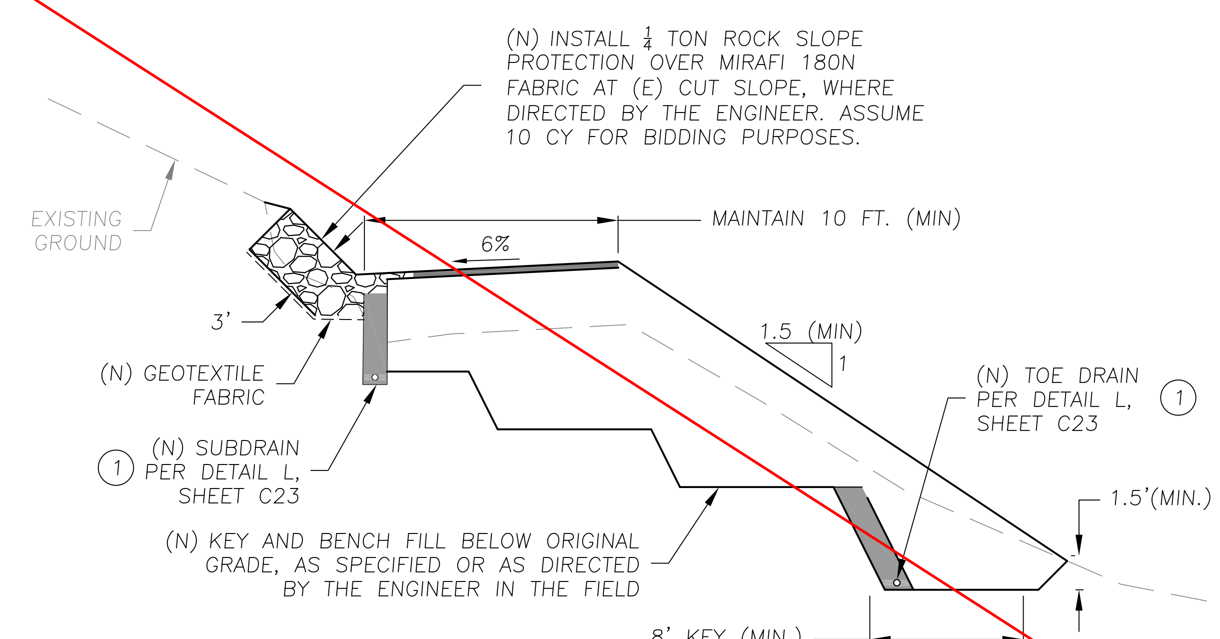


MP240 - SITE PLAN
SCALE: 1" = 5'

DETAIL REFERENCES			
ABBREVIATION	FULL NAME	DETAIL #	SHEET #
DRC	DITCH RELIEF CULVERT	A	C19
HWP	HEADWALL PROTECTION	J	C23
IBD	INBOARD DITCH	F	C20
RED	ROCK ENERGY DISSIPATOR	K	C23
RGD	REVERSE GRADE DIP	G	C21
RIBD	ROCKED IBD	F	C20
RS	ROCKED SHOULDER	E	C20
STC	STREAM CULVERT	H	C22



MP240 CULVERT SECTION B C14 C14
SCALE: 1" = 5'



1. DAYLIGHT LOCATIONS TO BE COORDINATED WITH THE ENGINEER.

MP240 SECTION A C14 C14
SCALE: 1" = 5'

WATERWAYS CONSULTING INC.

3/06/18 DATE

MATT W. WELD

PREPARED AT THE REQUEST OF: MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

MP-240

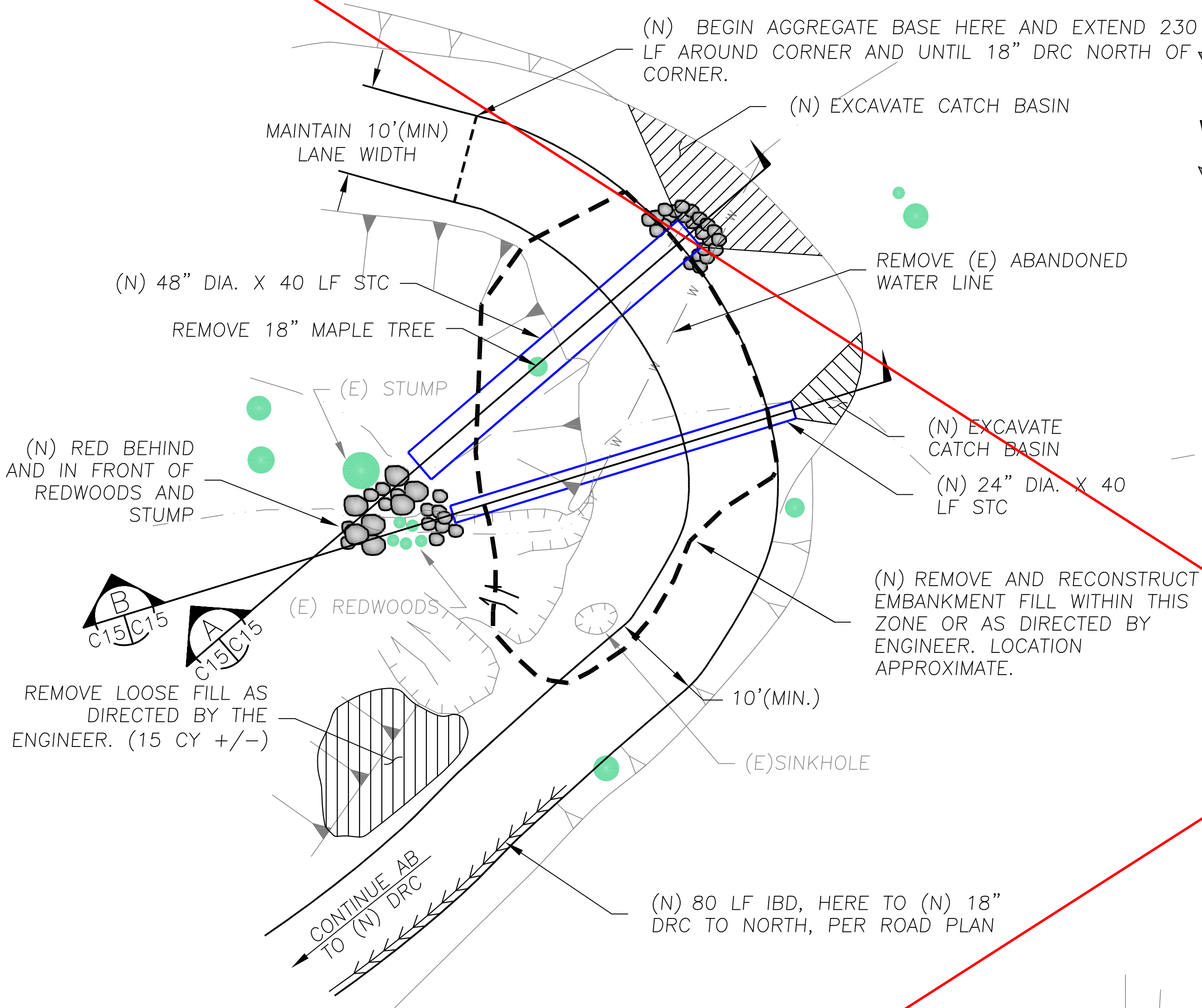
BEAR CREEK REDWOODS - PHASE ONE ROAD AND TRAIL IMPROVEMENTS 100% SUBMITTAL

DESIGNED BY: -
DRAWN BY: -
CHECKED BY: M.W.W.
DATE: 03/06/2018
JOB NO.: 16-017

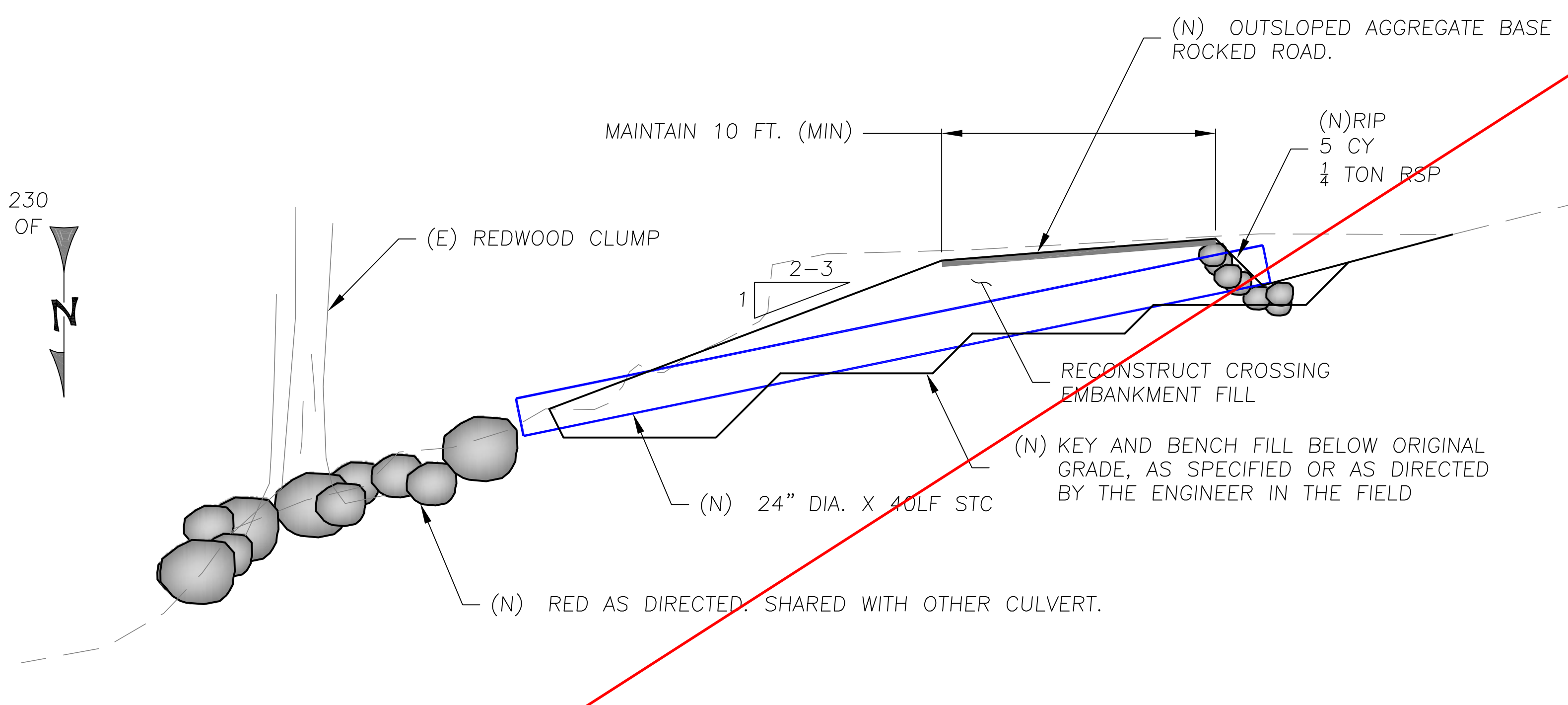
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

C14

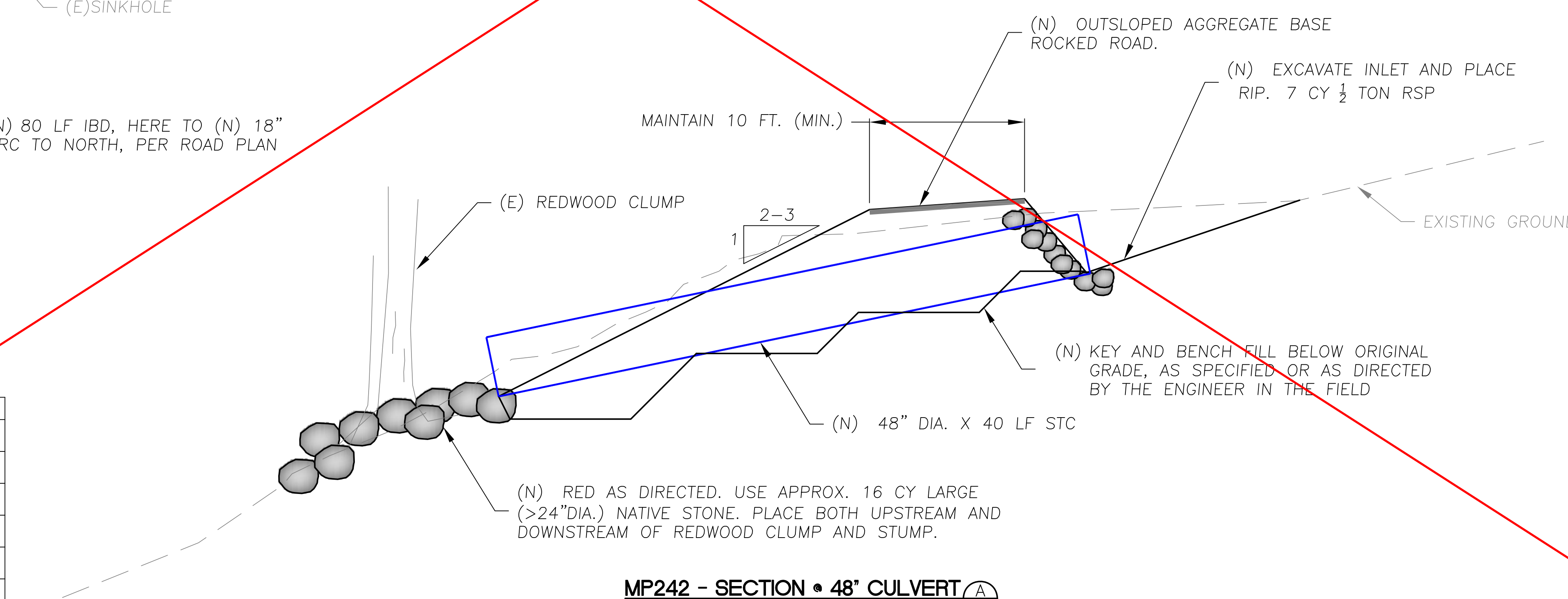
14 OF 24



MP242 - SITE PLAN
SCALE: 1" = 10'



MP242 - SECTION @ 24" CULVERT B C15 C15
SCALE: 1" = 5'



MP242 - SECTION @ 48" CULVERT A C15 C15
SCALE: 1" = 5'

DETAIL REFERENCES

ABBREVIATION	FULL NAME	DETAIL #	SHEET #
DRC	DITCH RELIEF CULVERT	A	C19
HWP	HEADWALL PROTECTION	J	C23
IBD	INBOARD DITCH	F	C20
RED	ROCK ENERGY DISSIPATOR	K	C23
RGD	REVERSE GRADE DIP	G	C21
RIBD	ROCKED IBD	F	C20
RS	ROCKED SHOULDER	E	C20
STC	STREAM CULVERT	H	C22

WATERWAYS CONSULTING INC.

3/06/18 DATE

MATT W. WELD

PREPARED AT THE REQUEST OF: MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

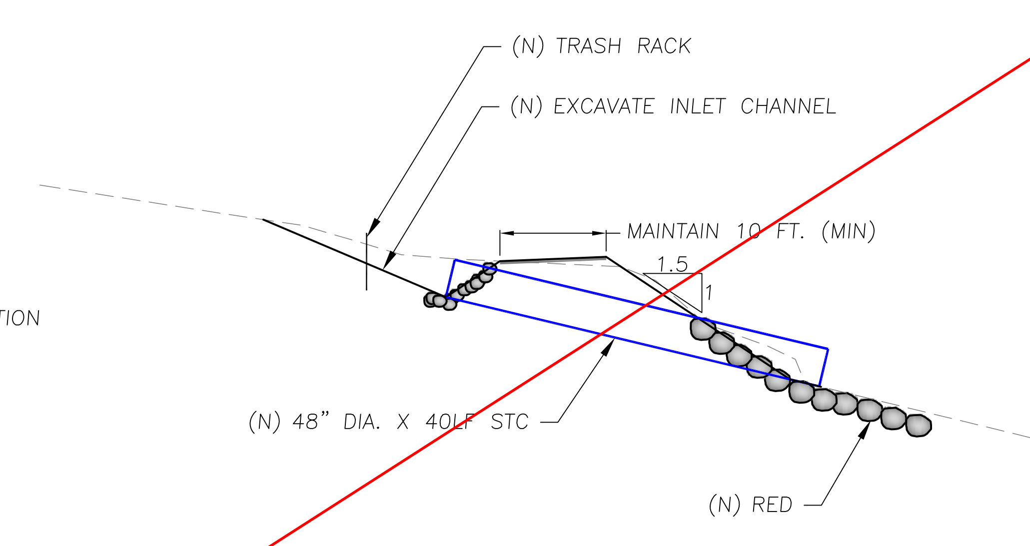
MP-242

BEAR CREEK REDWOODS - PHASE ONE ROAD AND TRAIL IMPROVEMENTS 100% SUBMITTAL

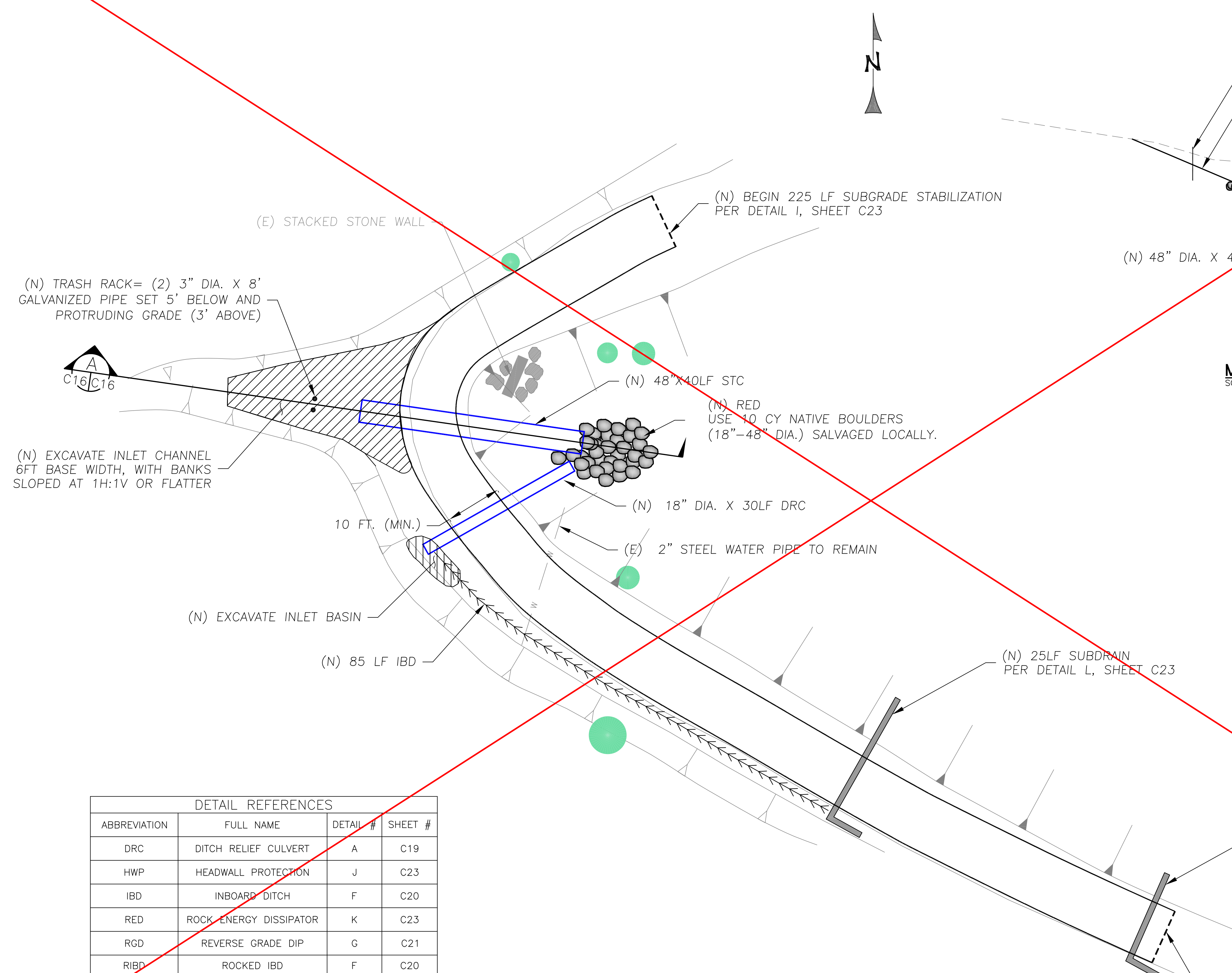
DESIGNED BY: -
DRAWN BY: -
CHECKED BY: M.W.W.
DATE: 03/06/2018
JOB NO.: 16-017

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

C15 15 OF 24



MP252 - SECTION AT CULVERT
SCALE: 1" = 10'



MP252 - SITE PLAN
SCALE: 1" = 10'

DETAIL REFERENCES

ABBREVIATION	FULL NAME	DETAIL #	SHEET #
DRC	DITCH RELIEF CULVERT	A	C19
HWP	HEADWALL PROTECTION	J	C23
IBD	INBOARD DITCH	F	C20
RED	ROCK ENERGY DISSIPATOR	K	C23
RGD	REVERSE GRADE DIP	G	C21
RIBD	ROCKED IBD	F	C20
RS	ROCKED SHOULDER	E	C20
STC	STREAM CULVERT	H	C22

WATERWAYS CONSULTING INC.

3/06/18 DATE

MATT W. WELD

PREPARED AT THE REQUEST OF:
MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

MP-252

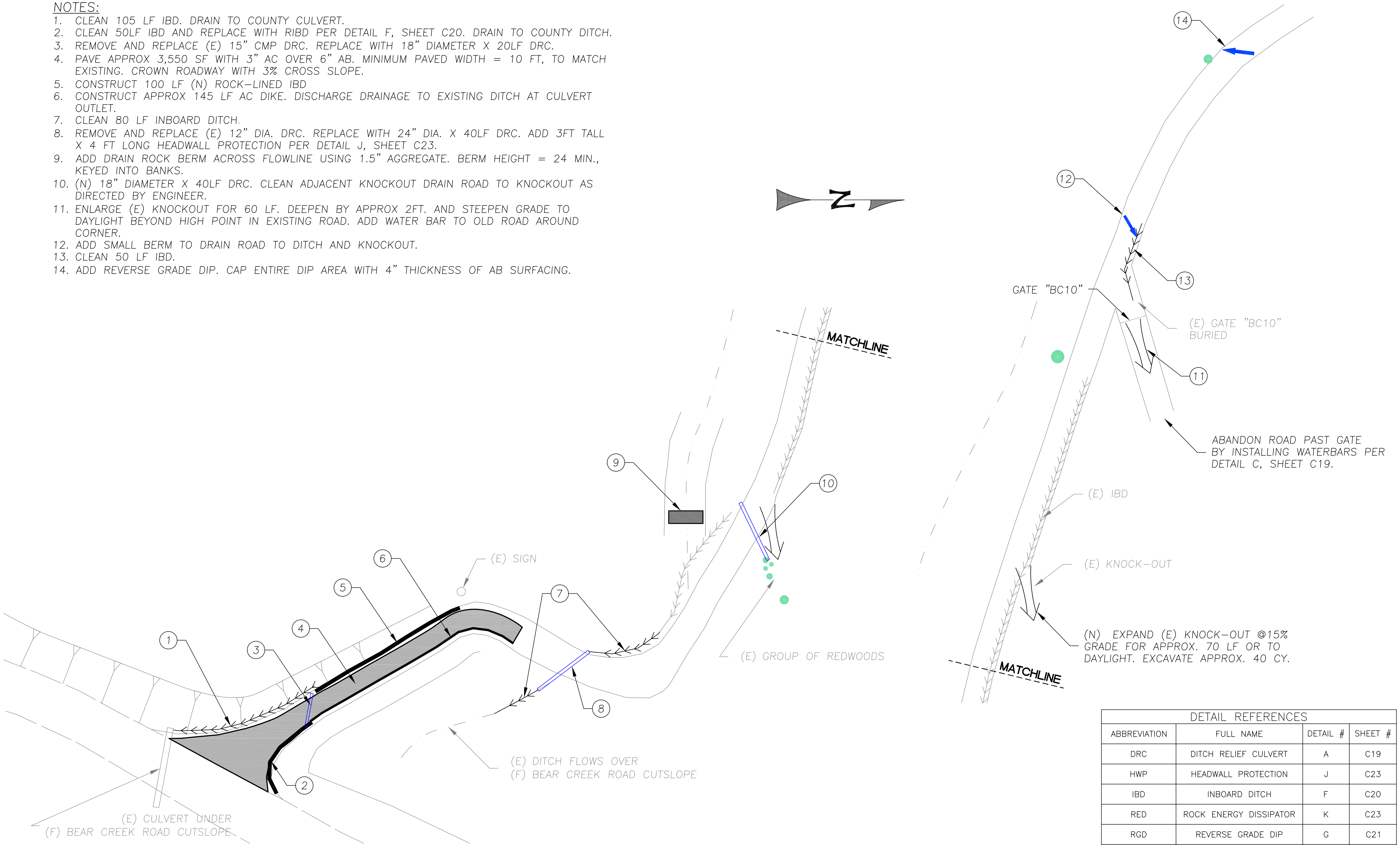
BEAR CREEK REDWOODS - PHASE ONE ROAD AND TRAIL IMPROVEMENTS
100% SUBMITTAL

DESIGNED BY: -
DRAWN BY: -
CHECKED BY: M.W.W.
DATE: 03/06/2018
JOB NO.: 16-017

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

NOTES:

1. CLEAN 105 LF IBD. DRAIN TO COUNTY CULVERT.
2. CLEAN 50LF IBD AND REPLACE WITH RIBD PER DETAIL F, SHEET C20. DRAIN TO COUNTY DITCH.
3. REMOVE AND REPLACE (E) 15" CMP DRC. REPLACE WITH 18" DIAMETER X 20LF DRC.
4. PAVE APPROX 3,550 SF WITH 3" AC OVER 6" AB. MINIMUM PAVED WIDTH = 10 FT, TO MATCH EXISTING. CROWN ROADWAY WITH 3% CROSS SLOPE.
5. CONSTRUCT 100 LF (N) ROCK-LINED IBD
6. CONSTRUCT APPROX 145 LF AC DIKE. DISCHARGE DRAINAGE TO EXISTING DITCH AT CULVERT OUTLET.
7. CLEAN 80 LF INBOARD DITCH.
8. REMOVE AND REPLACE (E) 12" DIA. DRC. REPLACE WITH 24" DIA. X 40LF DRC. ADD 3FT TALL X 4 FT LONG HEADWALL PROTECTION PER DETAIL J, SHEET C23.
9. ADD DRAIN ROCK BERM ACROSS FLOWLINE USING 1.5" AGGREGATE. BERM HEIGHT = 24 MIN., KEYED INTO BANKS.
10. (N) 18" DIAMETER X 40LF DRC. CLEAN ADJACENT KNOCKOUT DRAIN ROAD TO KNOCKOUT AS DIRECTED BY ENGINEER.
11. ENLARGE (E) KNOCKOUT FOR 60 LF. DEEPEN BY APPROX 2FT. AND STEEPEN GRADE TO DAYLIGHT BEYOND HIGH POINT IN EXISTING ROAD. ADD WATER BAR TO OLD ROAD AROUND CORNER.
12. ADD SMALL BERM TO DRAIN ROAD TO DITCH AND KNOCKOUT.
13. CLEAN 50 LF IBD.
14. ADD REVERSE GRADE DIP. CAP ENTIRE DIP AREA WITH 4" THICKNESS OF AB SURFACING.



MP265 - SITE PLAN
SCALE: 1" = 30'

DETAIL REFERENCES

ABBREVIATION	FULL NAME	DETAIL #	SHEET #
DRC	DITCH RELIEF CULVERT	A	C19
HWP	HEADWALL PROTECTION	J	C23
IBD	INBOARD DITCH	F	C20
RED	ROCK ENERGY DISSIPATOR	K	C23
RGD	REVERSE GRADE DIP	G	C21
RIBD	ROCKED IBD	F	C20
RS	ROCKED SHOULDER	E	C20
STC	STREAM CULVERT	H	C22

WATERWAYS CONSULTING INC.
TIMOTHY C. BEST, CEG
MATT W. WELD
DATE 3/06/18
REGISTERED PROFESSIONAL ENGINEER MATT W. WELD No. 62235 Exp. 9-30-19 CIVIL STATE OF CALIFORNIA

PREPARED AT THE REQUEST OF:
MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

MP-265

BEAR CREEK REDWOODS - PHASE ONE ROAD AND TRAIL IMPROVEMENTS
100% SUBMITTAL

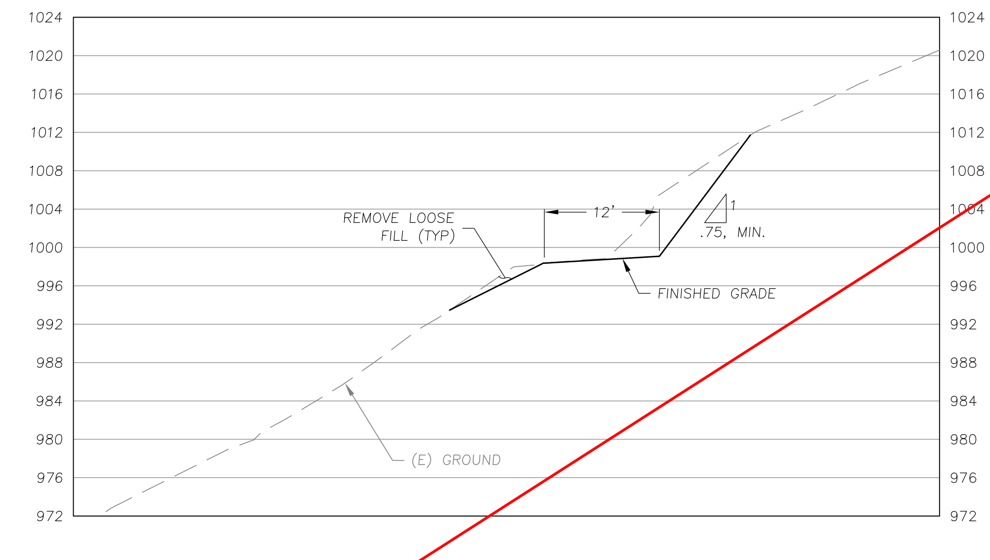
DESIGNED BY: -
DRAWN BY: -
CHECKED BY: M.W.W.
DATE: 03/06/2018
JOB NO.: 16-017

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

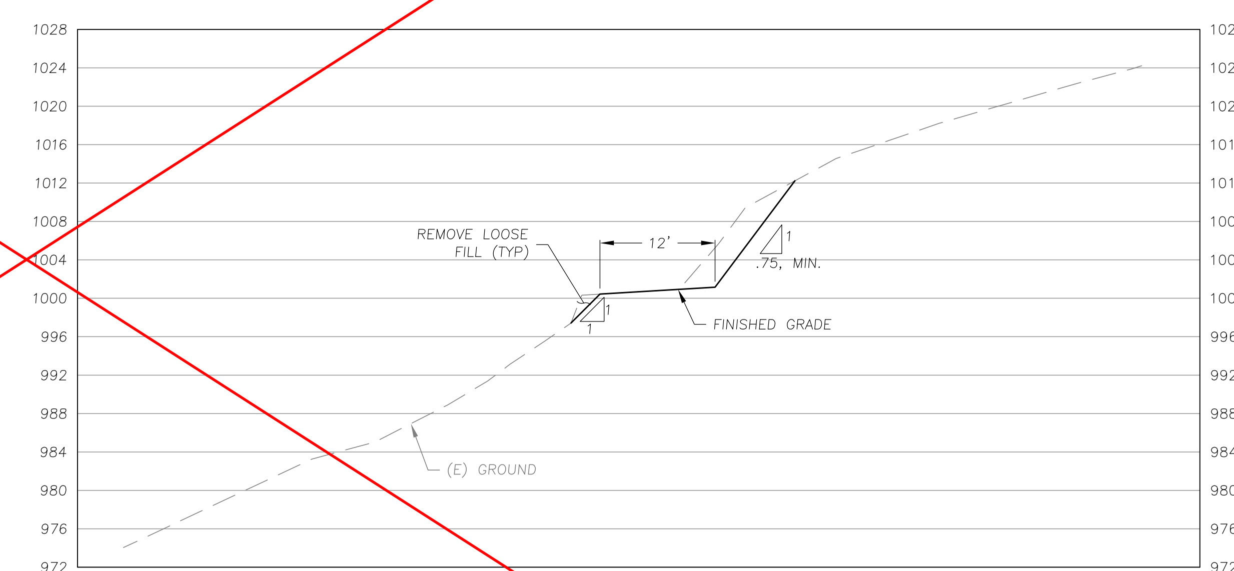
C17

NOTES:
SPREAD CLEAN SPOILS ALONG INSIDE EDGE OF ROAD TO OUT SLOPE ROAD AT 6%±.

MP 330-800 SITE PLAN
SCALE: 1" = 10'



SECTION B C18 C18
SCALE: 1" = 10'



SECTION A C18 C18
SCALE: 1" = 10'

GENERAL NOTES

1. TOPOGRAPHIC MAPPING WAS PERFORMED BY:
   WATERWAYS CONSULTING, INC.
   509A SWIFT STREET
   SANTA CRUZ, CA 95060
   SURVEY DATE: JUNE 21, 2017.
2. ELEVATION DATUM: AN ASSUMED ELEVATION OF 1000.00' WAS ESTABLISHED AT SURVEY CONTROL POINT #1 (½"X24", IRON ROD) SHOWN ON SHEET C18.
3. BASIS OF BEARINGS: BASIS OF BEARINGS BETWEEN POINTS #1 AND #2 IS N0°00'00"E, AS SHOWN ON SHT. C18
4. CONTOUR INTERVAL IS ONE FOOT. ELEVATIONS AND DISTANCES SHOWN ARE IN DECIMAL FEET.
5. THIS IS NOT A BOUNDARY SURVEY. PROPERTY LINES ARE NOT SHOWN HEREON.
8. IF DISCREPANCIES ARE DISCOVERED BETWEEN THE CONDITIONS EXISTING IN THE FIELD AND THE INFORMATION SHOWN ON THESE DRAWINGS, NOTIFY THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.
9. TREE DIMENSIONS: TRUNK DIAMETERS SHOWN REPRESENT DIAMETER AT BREAST HEIGHT (DBH), MEASURED IN INCHES. DBH IS MEASURED 4.5 FT ABOVE GROUND FOR SINGLE TRUNKS AND TRUNKS THAT SPLIT INTO SEVERAL STEMS CLOSE TO THE GROUND. THE DBH FOR TREES THAT SPLIT INTO SEVERAL STEMS CLOSE TO THE GROUND MAY BE CONSOLIDATED INTO A SINGLE DBH BY TAKING THE SQUARE ROOT OF THE SUM OF ALL SQUARED STEM DBH'S, UNLESS OTHERWISE NOTED. WHERE TREES FORK NEAR BREAST HEIGHT, TRUNK DIAMETER IS MEASURED AT THE NARROWEST PART OF THE MAIN STEM BELOW THE FORK. FOR TREES ON A SLOPE, BREAST HEIGHT IS REFERENCED FROM THE UPPER SIDE OF THE SLOPE. FOR LEANING TREES, BREAST HEIGHT IS MEASURED ON THE SIDE THAT THE TREE LEANS TOWARD. TREES WITH DBH LESS THAN 8" ARE TYPICALLY NOT SHOWN.

   12"P = 12" DBH PINE

10. TREE SPECIES ARE IDENTIFIED WHEN KNOWN. HOWEVER, FINAL DETERMINATION SHOULD BE MADE BY A QUALIFIED BOTANIST. REFER TO THE LEGEND FOR TREE SPECIES SYMBOLS.

TREE SPECIES
F FIR
M MADRONE
O OAK

TREE REMOVAL NOTES:
APPROXIMATE CENSUS OF TREES TO BE REMOVED:

COMMON NAME	NUMBER
FIR	2
MADRONE	1
OAK	1
TOTAL	4

LEGEND

- 85 86 — EXISTING CONTOURS
- △2 — SURVEY CONTROL POINT
- EXISTING CRACK
- EXISTING SCARP
- 18"O — EXISTING TREE
- 24"O — TREE TO BE REMOVED

DETAIL REFERENCES			
ABBREVIATION	FULL NAME	DETAIL #	SHEET #
DRC	DITCH RELIEF CULVERT	A	C19
HWP	HEADWALL PROTECTION	J	C23
IBD	INBOARD DITCH	F	C20
RED	ROCK ENERGY DISSIPATOR	K	C23
RGD	REVERSE GRADE DIP	G	C21
RIBD	ROCKED IBD	F	C20
RS	ROCKED SHOULDER	E	C20
STC	STREAM CULVERT	H	C22

WATERWAYS CONSULTING INC.
TIMOTHY C. BEST, CEG
ENGINEERING GEOLOGY AND HYDROLOGY
3/06/18 DATE
PROFESSIONAL ENGINEER MATT W. WELD No. 62235 Exp. 9-30-19 CIVIL STATE OF CALIFORNIA
MATT W. WELD

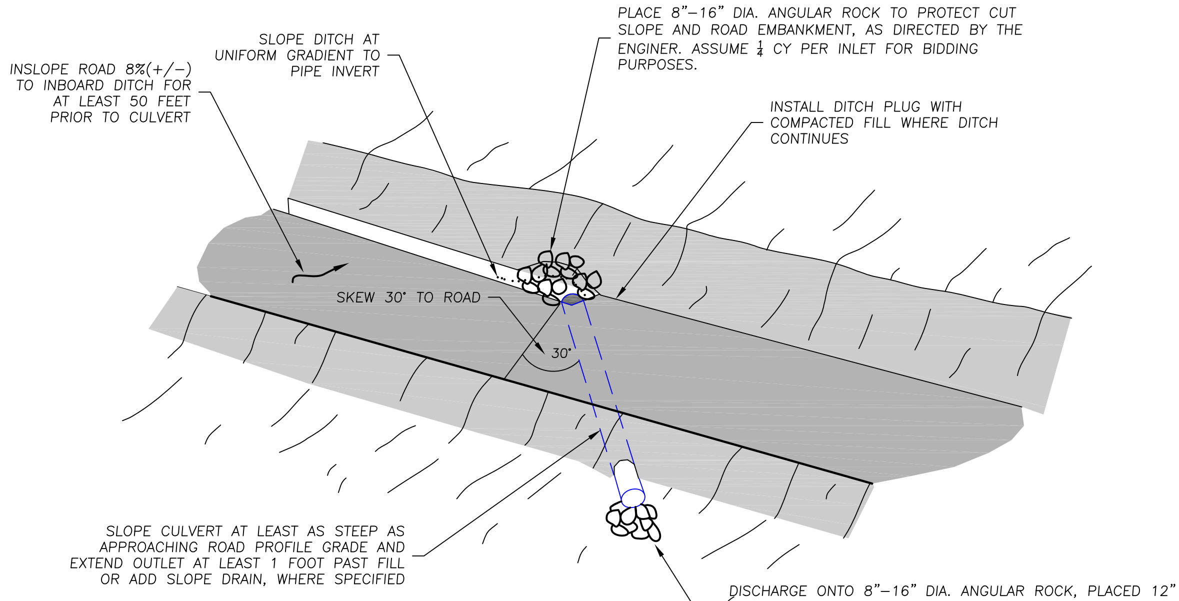
PREPARED AT THE REQUEST OF:
MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

MP 330-800

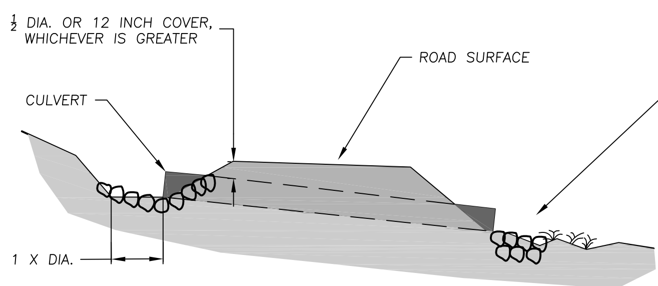
BEAR CREEK REDWOODS - PHASE ONE ROAD AND TRAIL IMPROVEMENTS
100% SUBMITTAL

DESIGNED BY: –
DRAWN BY: M.L.B.
CHECKED BY: M.W.W.
DATE: 03/06/2018
JOB NO.: 16-017

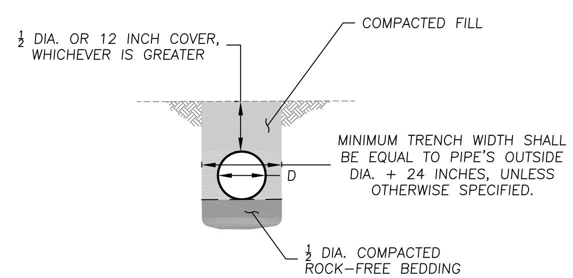
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"



SITE PLAN



CULVERT PROFILE



SECTION

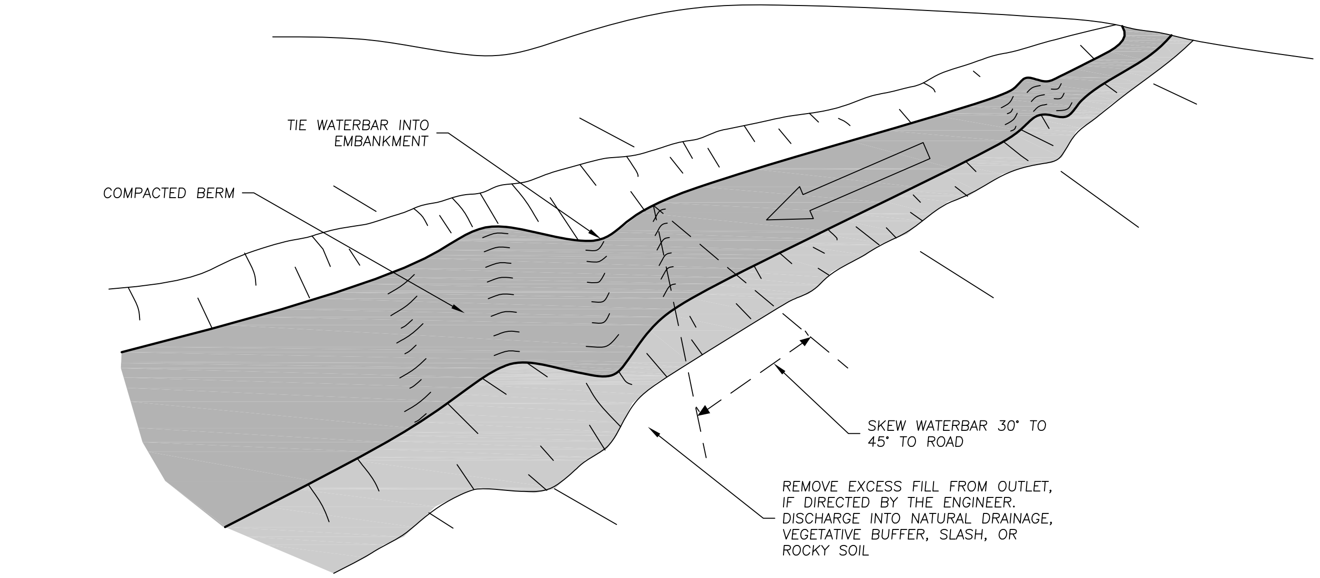
NOTES

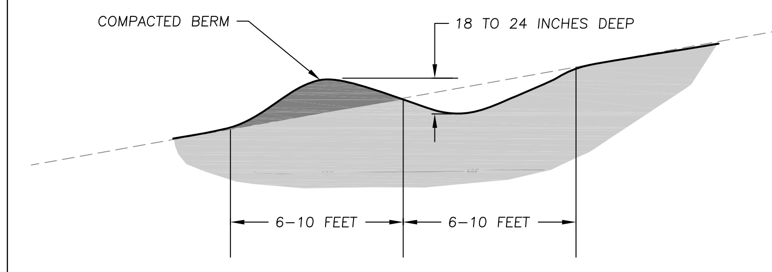
1. INSTALL DITCH RELIEF CULVERT (DRC) AT FLAGGED LOCATIONS OR AS IDENTIFIED ON PLANS.
2. DITCH RELIEF CULVERTS SHALL BE 18 INCH DIAMETER SMOOTH BORE, DOUBLE WALL HDPE (ASTM F2306) UNLESS OTHERWISE SPECIFIED, WITH WATER TIGHT FITTINGS CONFORMING TO ASTMD3212, WITH GASKETS CONFORMING TO ASTM F477. "ADS N-12 WT IB" PIPE MEETS THIS SPECIFICATION.
3. PLACE CULVERTS AT A 30 DEGREE SKEW ANGLE DOWN GRADE (WHERE FEASIBLE) WITH A GRADIENT EQUAL TO OR GREATER THAN THAT OF THE UPHILL ROAD PROFILE. EXTEND CULVERT OUTLETS A MINIMUM OF 1 FOOT BEYOND BASE OF ROAD FILL.
4. WHERE NECESSARY, OUTLET DITCH SHALL BE CONSTRUCTED AT A STEEPER GRADIENT THAN THE CULVERT, AT LEAST ONE PIPE DIAMETER IN WIDTH, AND WITH BANK TAPERED BACK TO A 1:1 OR FLATTER SLOPE.
5. THE CULVERT BEDDING SHALL BE PLACED TO A DEPTH OF ½ DIAMETER OF THE CULVERT, AND SHALL CONSIST OF APPROVED MINERAL SOIL, CONFORMING TO ASTM CLASS 1, 2, OR 3.
6. HE BACKFILL SHALL CONSIST OF APPROVED MINERAL SOIL, WITH NO ROCKS GREATER THAN 3 INCHES IN ANY DIMENSION PLACED CLOSER THAN 1 FOOT TO THE CULVERT. BACKFILL SHALL BE ADEQUATELY COMPACTED THROUGHOUT THE ENTIRE PROCESS TO 95 PERCENT ASTM 1557 UNLESS OTHERWISE SPECIFIED. DURING PLACEMENT AND COMPACTION OF FILL, THE MOISTURE CONTENT OF THE MATERIALS BEING PLACED SHALL BE MAINTAINED AS DIRECTED BY THE ENGINEER.
7. MINIMUM COVER SHALL BE THE GREATER OF 12" OR HALF THE PIPE DIAMETER.
8. PLACE A DITCH BLOCK IMMEDIATELY DOWNSLOPE OF THE CULVERT INTAKE TO PREVENT DITCH FLOW FROM BYPASSING THE PIPE INLET.
9. SPECIFICATIONS ARE INTENDED ONLY AS GUIDELINES; MODIFICATIONS MAY BE DIRECTED IN THE FIELD BY ENGINEER.

DITCH RELIEF CULVERT (A)
SCALE: N.T.S. C9,C17 C19

CLEAN DITCH RELIEF CULVERT

WHERE DITCH RELIEF CULVERTS ARE SPECIFIED TO BE CLEANED, THIS WORK SHALL CONSIST OF REMOVING ACCUMULATED SEDIMENT FROM THE INLET, CONTRIBUTING DITCH LINE, AND OUTLET FLOW PATH TO ESTABLISH A STABLE GEOMETRY OF UNOBSTRUCTED FLOW. ASSUME 1 CY OF EXCAVATION FOR BIDDING PURPOSES. GENERALLY, THIS WORK WILL REQUIRE HAND LABOR.





ROAD PROFILE

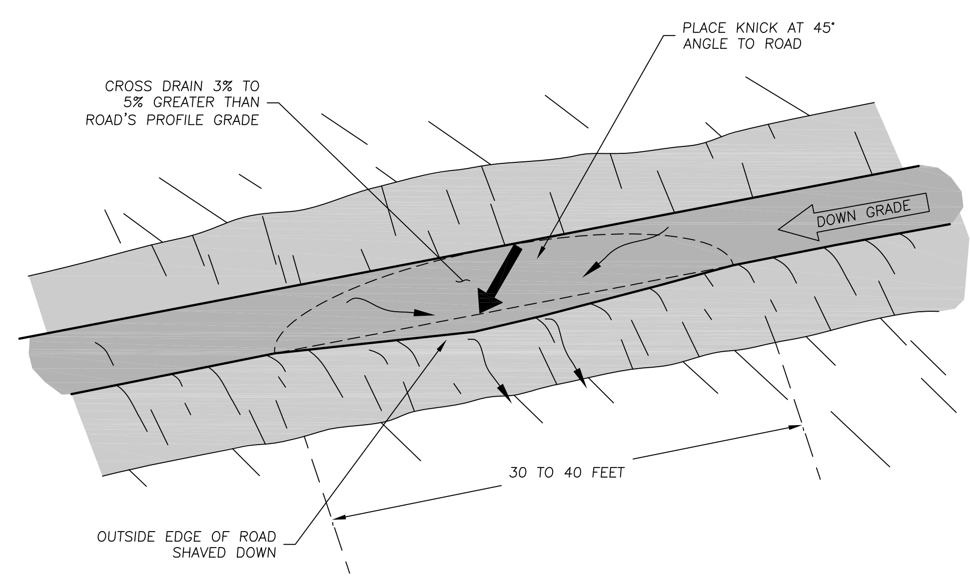
NOTES

1. LOCATE WATERBARS TO TAKE ADVANTAGE OF NATURAL DRAINAGE FEATURES AND MINIMIZE THE AMOUNT OF DISTURBANCE REQUIRED FOR WATERBAR CONSTRUCTION.
2. WATERBARS BEGIN AT THE INTERSECTION OF THE ROADBED SURFACE AND THE CUT SLOPE AND RUN THE ENTIRE WIDTH OF THE ROAD SURFACE PRISM.
3. WATERBAR LENGTH SHALL NOT EXCEED 1.5 TIMES THE WIDTH OF THE ROAD SURFACE.
4. SKEW WATERBARS APPROXIMATELY 45° TO ROAD ALIGNMENT.
5. CONSTRUCT FREE-FLOWING OUTLETS WITH MINIMUM 3% GRADE IN THE BOTTOM OF THE CHANNEL THAT DISCHARGES ONTO VEGETATIVE SURFACES OR LESS ERODIBLE MATERIAL WHERE POSSIBLE.
6. NATIVE MATERIALS USED TO CONSTRUCT DOWNSLOPE BERM SHALL BE COMPACTED WITH EQUIPMENT TO MINIMIZE WEAR RESULTING FROM TRESPASS AND/OR ADMINISTRATIVE USE.
7. CONSTRUCT WATERBAR DEPTH (MEASURED FROM THE BOTTOM OF THE WATERBAR CHANNEL TO THE TOP OF THE COMPACTED BERM) TO BETWEEN 18 AND 24 INCHES.

WATER BAR (C)
SCALE: N.T.S. C17 C19

NOTES

1. A KNICK IS A SEMI-CIRCULAR, SHAVED-DOWN SECTION OF THE OUTSIDE EDGE OF THE ROAD.
2. KNICK IS INSTALLED AT A 45-DEGREE ANGLE TO ROAD.
3. THE CENTER OF THE NICK IS OUTSLOPED 3 TO 5% GREATER THAN ROAD'S PROFILE GRADE.
4. DIP OUTLETS SHOULD BE LOCATED TO DRAIN INTO AREAS WITH ADEQUATE SEDIMENT FILTER QUALITY AND NON-ERODIBLE MATERIAL SUCH AS ROCK, SLASH, BRUSH, ETC.
5. DO NOT PUSH ANY FILL TO THE OUTLET OF THE KNICK.



KNICK (B)
SCALE: N.T.S. C19

WATERWAYS CONSULTING INC.

3/06/18 DATE

MATT W. WELD

PREPARED AT THE REQUEST OF:
MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

DETAILS (1 OF 5)

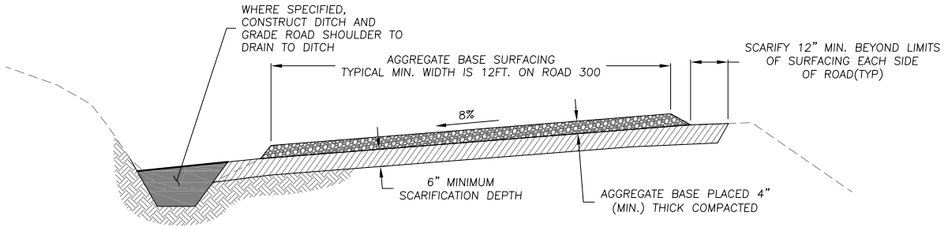
BEAR CREEK REDWOODS - PHASE ONE ROAD AND TRAIL IMPROVEMENTS 100% SUBMITTAL

DESIGNED BY:
DRAWN BY:
CHECKED BY:
DATE: 03/06/2018
JOB NO.: 16-017

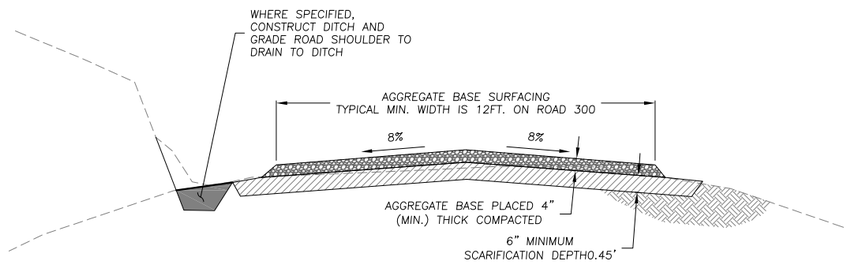
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

C19

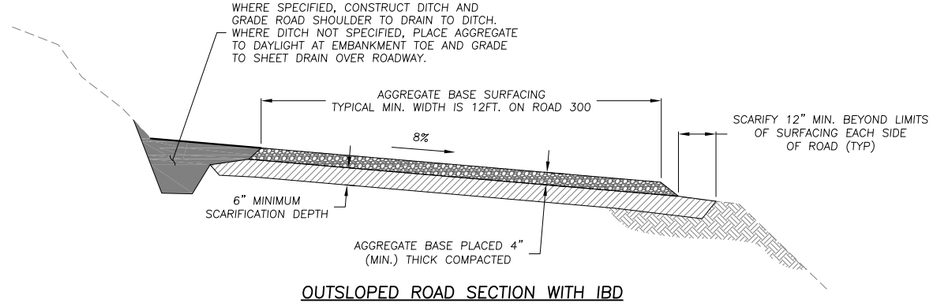
19 OF 24



INSLOPED ROAD SECTION (WITH IBD)



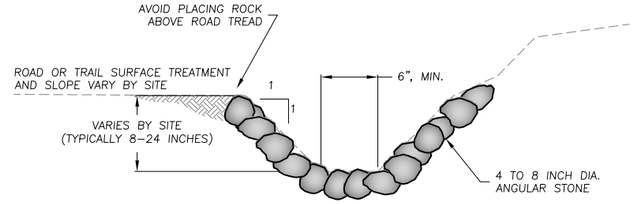
CROWNED ROAD SECTION WITH IBD



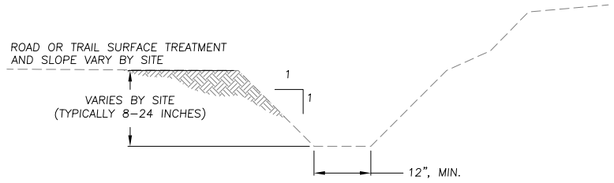
OUTSLOPED ROAD SECTION WITH IBD

NOTES
1. SCARIFY SUBGRADE BELOW ROAD SURFACING AND EXTENDING LATERALLY A MINIMUM OF 12 INCHES BEYOND PROPOSED SURFACING TO A DEPTH OF 6 INCHES, MOISTURE CONDITION AND COMPACT TO 90% RELATIVE COMPACTION.
2. OVER-EXCAVATION MAY BE REQUIRED IN LIMITED ARES OF POOR SUBGRADE CONDITIONS (E.G., UNSUITABLE SOILS OR EXCESSIVE MOISTURE) TO OBTAIN THE REQUIRED COMPACTION. THESE AREAS WILL BE IDENTIFIED BY THE ENGINEER IN THE FIELD. UNSUITABLE SOILS WILL BE DISPOSED ON SITE AT LOCATIONS TO BE FLAGGED BY THE ENGINEER AND REPLACED WITH LOCALLY SOURCED MINERAL SOILS.
3. WHERE "SUBGRADE STABILIZATION" IS SPECIFIED, REMOVE A MINIMUM OF 4 INCHES OF NATIVE MATERIAL, SCARIFY 6 INCHES, AND PLACE AN ADDITIONAL 4 INCH LIFT OF COMPACTED AGGREGATE BASE FOR A TOTAL OF 8 INCHES OF AGGREGATE BASE.
4. AGGREGATE BASEROCK SHALL CONSIST OF APPROVED 1-1/2" LIME-TREATED CLASS 2 AGGREGATE BASE. STEVENS CREEK QUARRY TYPICALLY PROVIDES A PRODUCT CONFORMING TO SPECIFICATIONS.
5. NEW AGGREGATE BASEROCK SHALL BE COMPACTED TO A MINIMUM 4" THICKNESS, UNLESS OTHERWISE SHOWN ON THE DRAWINGS OR DIRECTED BY THE ENGINEER, AND TO 95% RELATIVE COMPACTION.
6. PLACE ROCK TO THE PLAN DIMENSIONS SHOWN ON THE DRAWINGS. ENGINEER MAY DIRECT THE CONTRACTOR TO PLACE ROCK TO TO ADDITIONAL WIDTH AT TURNOUTS AND OTHER AREAS. THESE EXTRA AREAS WILL BE MEASURED SEPARATELY FOR PAYMENT.

TYPICAL AGGREGATE BASE ROCKED ROAD SECTIONS (D)
SCALE: N.T.S.
C8,C9,C13,C14,C15,C16,C20



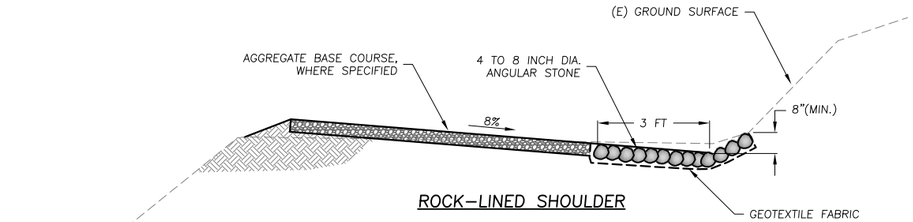
ROCK LINED DITCH



EARTHEN MATERIALS

NOTES
1. SLOPE DITCH TO DRAIN AT 3% MINIMUM PROFILE GRADE.
2. ARMOR DITCH WITH STONE WHERE SPECIFIED OR AS DIRECTED BY THE ENGINEER. MIRAFI 180N FILTER FABRIC MAY BE REQUIRED BENEATH THE STONE, WHERE DIRECTED BY THE ENGINEER IN THE FIELD.
3. THE ENGINEER MAY SPECIFIY VARIED DITCH DIMENSIONS AND LINING WHERE DITCH RELIEF CULVERTS ARE NOT TYPICALLY SPACED.

INBOARD DITCH (F)
SCALE: N.T.S.
C8,C10,C11,C15,C16,C17,C20



ROCK-LINED SHOULDER

NOTES
1. ROCKED SHOULDERS ARE TYPICALLY SPECIFIED WHERE WET CONDITIONS EXIST AND THERE IS INSUFFICIENT WIDTH OF ROADBED TO ALLOW AN IBD.
2. ROCKED SHOULDERS MAY BE SPECIFIED FOR USE WITH OR WITHOUT AGGREGATE BASE COURSE SPECIFIED OVER THE REMAINING ROAD SECTION.
3. PLACE 4"-8" DIAMETER STONE TO THE LINES AND GRADES SHOWN ON THE DRAWINGS. WITH TOP OF STONE FLUSH THE DESIGN FINISH GRADE OF THE ROAD SECTION. EXTEND THE ROCK A MINIMUM OF 8 INCHES UP THE CUT SLOPE, WHERE FEASIBLE.
4. PLACE ROCK OVER MIRAFI 180N, OR EQUIVALENT GEOTEXTILE FABRIC.
5. MAINTAIN POSITIVE SLOPE OF APPROX. 8% TOWARD THE SHOULDER, AS SHOWN.

ROCKED SHOULDER (E)
SCALE: N.T.S.
C9,C14,C20

WATERWAYS CONSULTING INC.
TIMOTHY E. BEST, CEG
ENGINEERING GEOLOGY AND HYDROLOGY
3032 Columbia Street, Santa Rosa, CA 95404
(707) 542-9500 • FAX (707) 542-7966 • e-mail: tim@waterways.net

DATE 3/06/18

MATT W. WELD

PREPARED AT THE REQUEST OF:
MIDPENINSULA REGIONAL
OPEN SPACE DISTRICT

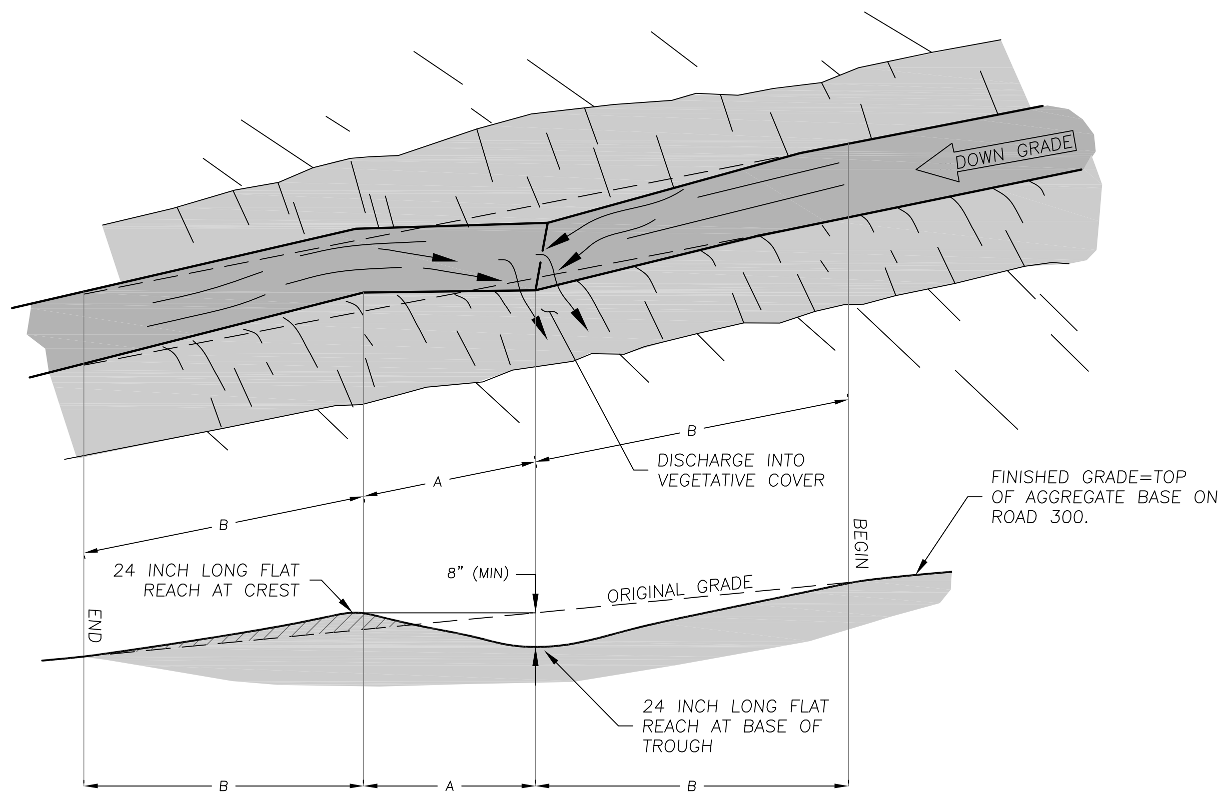
DETAILS
(2 OF 5)

BEAR CREEK
REDWOODS - PHASE
ONE ROAD AND TRAIL
IMPROVEMENTS
100% SUBMITTAL

DESIGNED BY:
DRAWN BY:
CHECKED BY:
DATE: **03/06/2018**
JOB NO.: 16-017

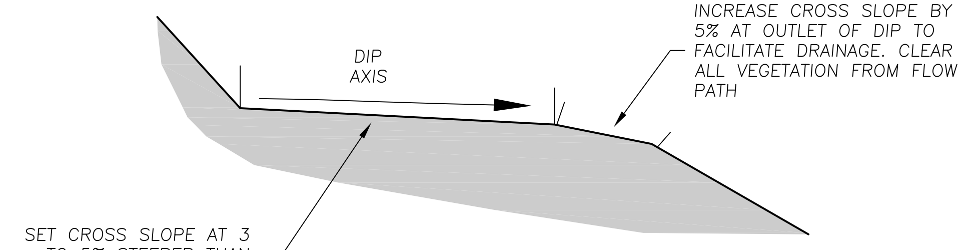
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

C20 | 20 OF 24

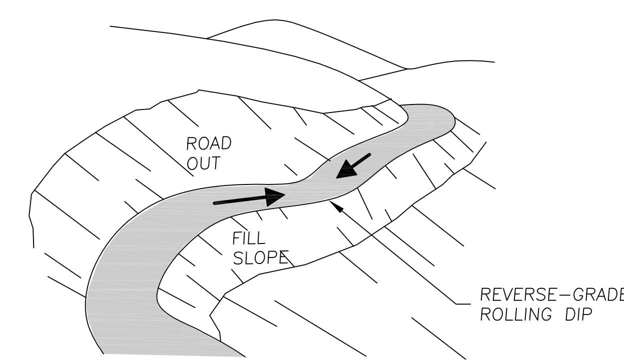


REVERSE GRADE DIP OVERVIEW

N.T.S.



ROAD SECTION



OBLIQUE VIEW

ROAD GRADE (%)	TROUGH	A: REVERSE GRADE	B: UP ROAD APPROACH DOWN ROAD TRAIL	
	MINIMUM DEPTH BELOW DONWSLOPE CREST	MINIMUM DISTANCE AND GRADE FROM TROUGH AXIS TO DOWNROAD CREST (FT)	DISTANCE FROM UP–ROAD START OF ROLLING DIP TO TROUGH AXIS (FT)	GRADE (%)
<5	8 INCHES	20 FT. AT 3%	20	8
5 TO 10			30	10
10 TO 15			50	19
15 TO 20			75	23

NOTES
1. REVERSE GRADE DIP LOCATIONS WILL BE FLAGGED BY THE ENGINEER IN THE FIELD, PRIOR TO START OF WORK.
2. THE ENGINEER AND DISTRICT SHALL BE NOTIFIED 5 DAYS PRIOR TO CONSTRUCTION OF THE FIRST REVERSE GRADE DIP SO THAT THE ENGINEER AND DISTRICT CAN ARRANGE TO BE ON SITE TO REVIEW INITIAL REVERSE GRADE DIP CONSTRUCTION FOR APPROVAL BEFORE THE CONTRACTOR PROCEEDS ON TO REMAINING REVERSE GRADE DIPS.
3. EXCAVATE THE UP ROAD HEAD BELOW THE EXISTING TREAD, WITH THE CREST AND DOWNROAD TAIL BUILT UP ON COMPACTED FILL.
4. CONSTRUCT DIP TO A MINIMUM OF 6 INCHES DEEP ACROSS THE ENTIRE WIDTH OF THE ROAD PRISM AND INCORPORATE A 2 FOOT LONG FLAT REACH AT THE BASE OF THE TROUGH (UNLESS OTHERWISE DIRECTED).
5. OUTSLOPE DIP AXIS 3%–5% STEEPER THAN ROAD/TRAIL GRADE. DIP AXIS MAY BE SKEWED DOWN ROAD AT 30 DEGREES TO FACILITATE INSTALLATION OF DIPS ON STEEPER ROAD GRADES.
6. LOCATE DIP OUTLETS TO DRAIN INTO AREAS WITH ADEQUATE SEDIMENT FILTER QUALITY AND NON–ERODIBLE MATERIAL SUCH AS ROCK, SLASH, BRUSH, ETC. WHERE DIRECTED BY THE ENGINEER, DIP OUTLETS WILL BE ARMORED WITH $\frac{1}{4}$ CY ROCK (4"–8" DIA).
7. WHERE NATURAL SLOPES EXCEED 50%, FILL SHALL NOT BE PUSHED OVER THE DIP OUTLET. A BACKHOE OR EXCAVATOR MAY BE REQUIRED TO PULL BACK FILL AT OUTLET OF EXISTING DIPS.
8. PLACE DIPS AT LOCATIONS SPECIFIED ON THE DRAWINGS, OR AS DIRECTED BY THE ENGINEER

REVERSE GRADE DIPS

SCALE: N.T.S.

G

C8,C10,C14 C21

WATERWAYS CONSULTING INC.

3/06/18 DATE

MATT W. WELD

PREPARED AT THE REQUEST OF:
MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

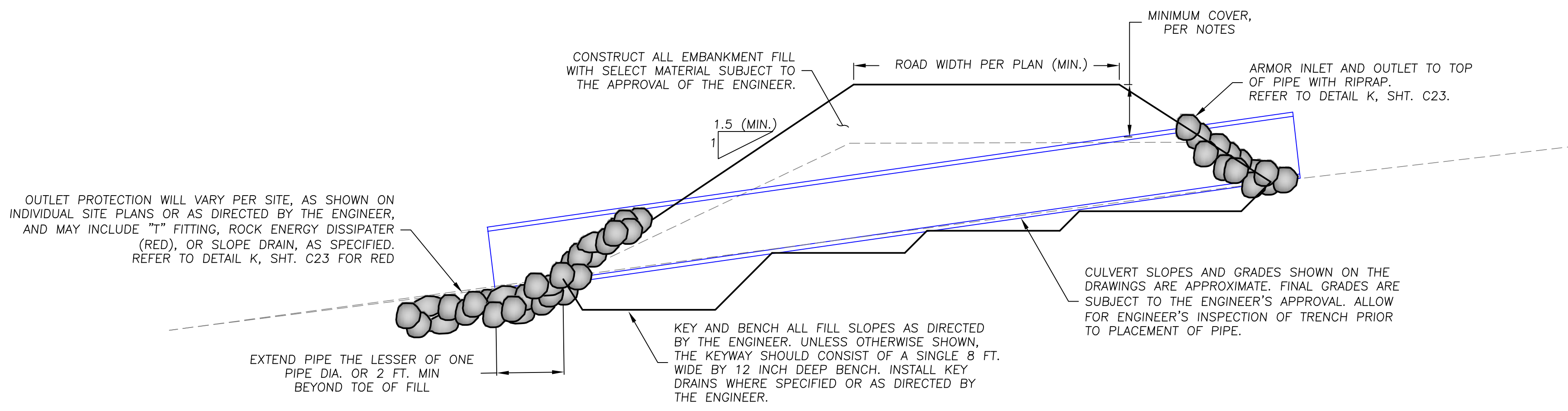
DETAILS (3 OF 5)

BEAR CREEK REDWOODS - PHASE ONE ROAD AND TRAIL IMPROVEMENTS 100% SUBMITTAL

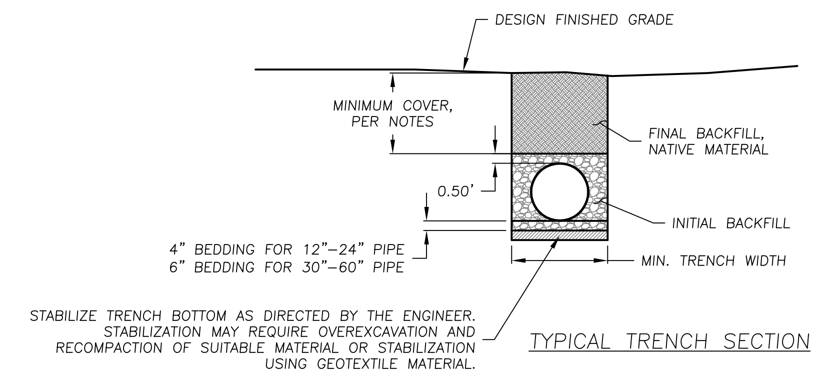
DESIGNED BY:
DRAWN BY:
CHECKED BY:
DATE: 03/06/2018
JOB NO.: 16–017

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

0 1"



CULVERT PROFILE



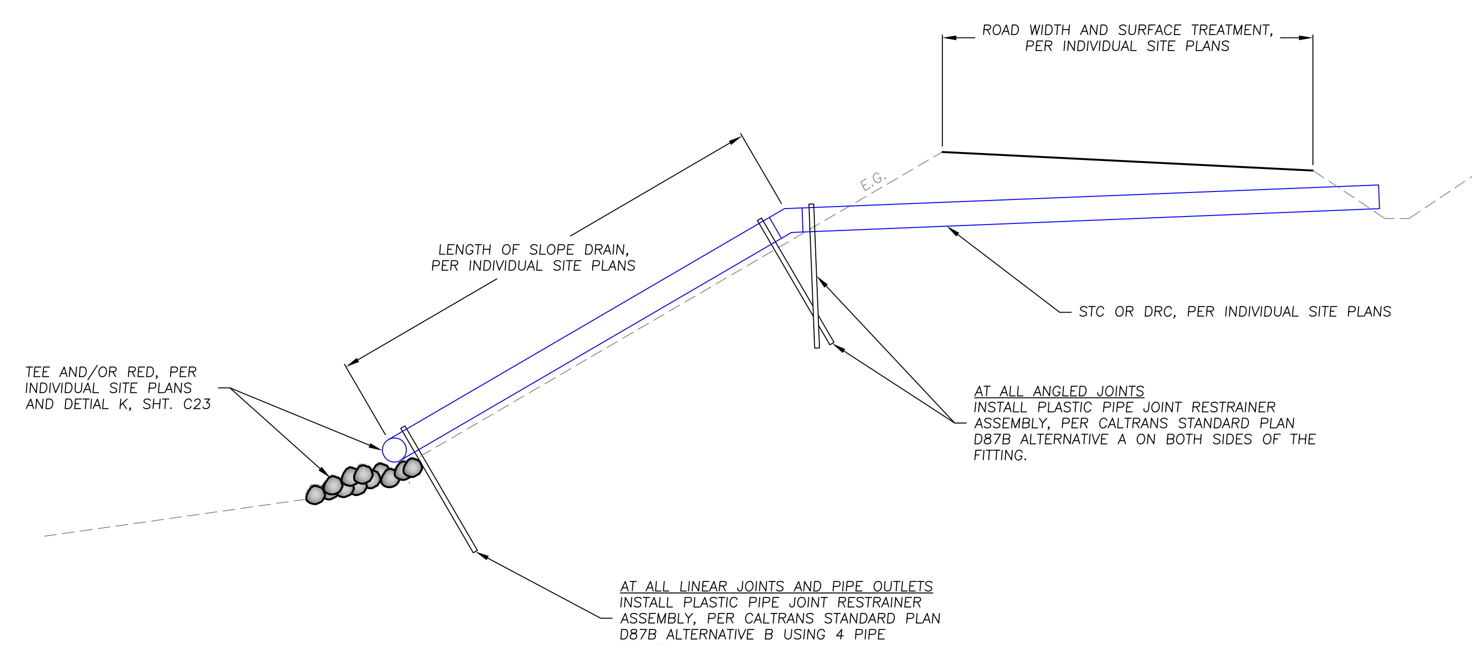
TYPICAL TRENCH SECTION

STREAM CROSSING CULVERT (H / C22)

SCALE: N.T.S. C8,C11,C14,C15,C16

NOTES:

1. UNLESS OTHERWISE SPECIFIED, ALL CULVERT AND SLOPE DRAINS SHALL BE "ADS N-12 WT" DUAL-WALLED HDPE PIPE WITH WATER-TIGHT BELL AND SOCKET FITTINGS WITH RUBBER GASKETS.
2. ALL PIPE INSTALLATION SHALL COMPLY WITH THE MANUFACTURER'S SPECIFICATIONS AND THESE DRAWINGS.
3. ALL PIPE SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321, "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST ADDITION.
4. MEASURES SHOULD BE TAKEN TO PREVENT MIGRATION OF NATIVE FINES INTO BACKFILL MATERIAL, WHEN REQUIRED. THIS MAY REQUIRE WRAPPING BEDDING AND BACKFILL IN GEOTEXTILE MEMBRANE, WHERE SPECIFIED OR AS DIRECTED BY THE ENGINEER.
5. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE, EXCAVATE TO THE DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH SUITABLE MATERIAL AS SPECIFIED BY THE ENGINEER. AS AN ALTERNATIVE AND AT THE DISCRETION OF THE ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A GEOTEXTILE MATERIAL.
6. BEDDING: SUITABLE MATERIAL SHALL BE CLASS 1, 2, OR 3 (ASTM D2321). NATIVE SOILS MAY BE USED, SUBJECT TO APPROVAL OF THE ENGINEER. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. UNLESS OTHERWISE NOTED BY THE ENGINEER, MINIMUM BEDDING THICKNESS SHALL BE 4" FOR 4"-24"; 6" FOR 30"-60".
7. INITIAL BACKFILL: INITIAL BACKFILL SHALL BE CLASS 1 OR 2, IN ACCORDANCE WITH ASTM D2321. NATIVE SOILS MAY BE USED, SUBJECT TO APPROVAL OF THE ENGINEER.
8. FINAL BACKFILL: SUITABLE MATERIAL SHALL BE LOCAL CLEAN MINERAL SOILS WITH NO ROCK LARGER THAN 3 INCHES.
9. MINIMUM COVER: MINIMUM COVER, H, IN NON-TRAFFIC APPLICATIONS (GRASS OR LANDSCAPE AREAS) IS 12" FROM THE TOP OF PIPE TO GROUND SURFACE. ADDITIONAL COVER MAY BE REQUIRED TO PREVENT FLOATATION. FOR TRAFFIC APPLICATIONS, MINIMUM COVER, H, IS 18" UP TO 36" DIAMETER PIPE AND 24" OF COVER FOR PIPES OVER 36" DIAMETER PIPE, MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TO TOP OF RIGID PAVEMENT.
10. CRITICAL DIP: INSTALL A CRITICAL DIP ON THE ROAD DOWN GRADE FROM THE CULVERT CROSSING, UNLESS OTHERWISE SPECIFIED ON THE DRAWINGS OR DIRECTED BY THE ENGINEER. CRITICAL DIP SHALL CONFORM TO STANDARD DIMENSIONS FOR A REVERSE GRADE DIP.



SLOPE DRAIN (M / C22)

SCALE: 1" = 4' C8,C9,C13

WATERWAYS CONSULTING INC.

TIMOTHY C. BEST, CEG

3/06/18 DATE

MATT W. WELD

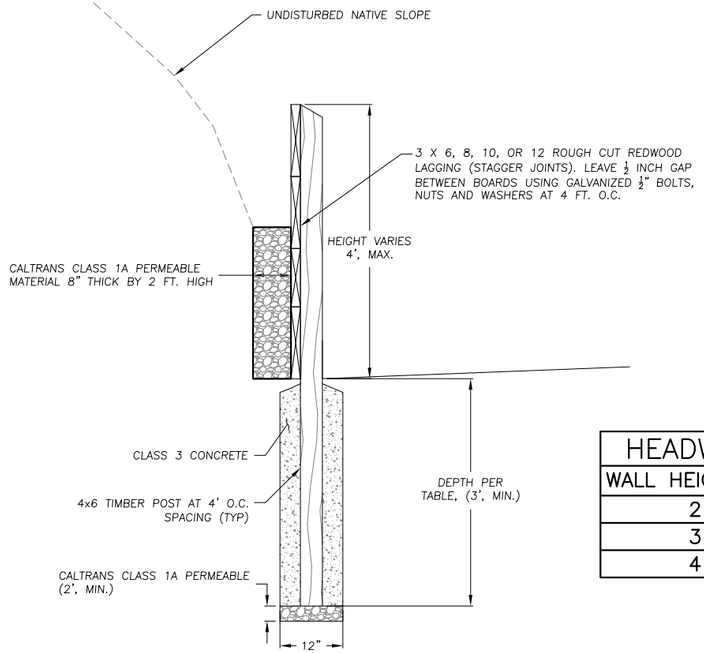
PREPARED AT THE REQUEST OF:
MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

DETAILS (4 OF 5)

BEAR CREEK REDWOODS - PHASE ONE ROAD AND TRAIL IMPROVEMENTS 100% SUBMITTAL

DESIGNED BY: -
DRAWN BY: -
CHECKED BY: M.W.W.
DATE: 03/06/2018
JOB NO.: 16-017

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

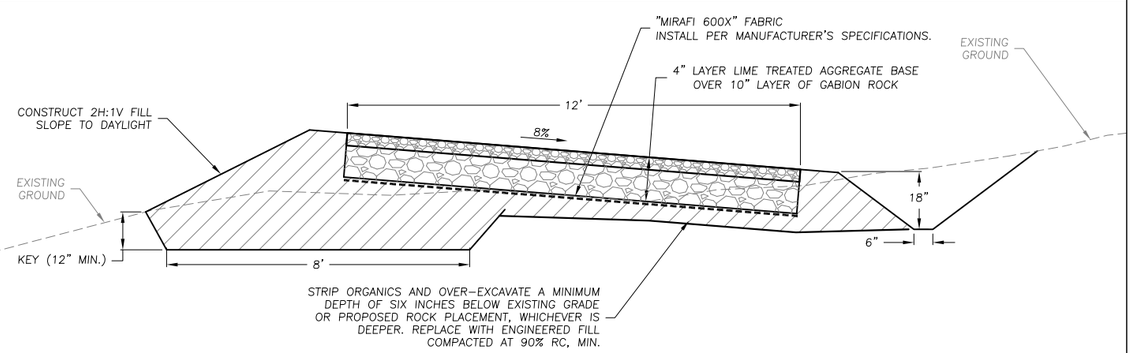


HEADWALL PROTECTION	
WALL HEIGHT(FT.)	PIER DEPTH
2	4
3	6
4	7

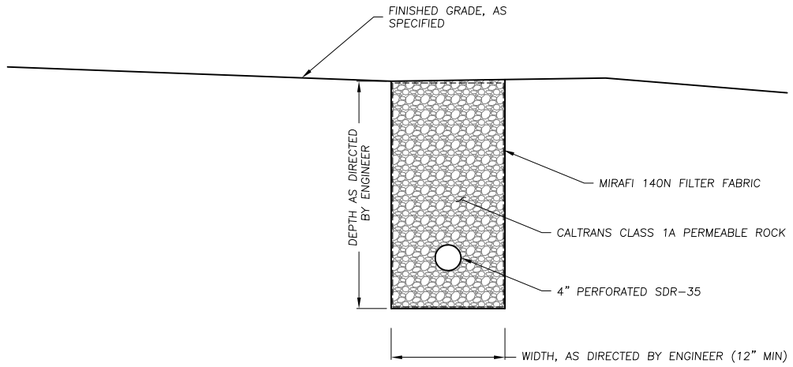
NOTES

1. STRIP SLOPE AND ROAD/DITCH LINE OF ALL LOOSE MATERIAL AND GRADE ROAD/DITCH TO FINISH SLOPE PRIOR TO CONSTRUCTION OF HEADWALL PROTECTION.
2. CLASS 3 CONCRETE SHALL CONSIST OF 505 LBS OF PORTLAND CEMENT PER CUBIC YARD AND HAVE A COMPRESSIVE STRENGTH OF NOT LESS THAN 2000 PSI.

HEADWALL PROTECTION DETAIL (J)
SCALE: 1" = 1' C8,C13,C23



ROCKED ROAD TO DRC (I)
SCALE: 1" = 2' C11,C23



SUBDRAIN (L)
SCALE: N.T.S. C14,C16,C23

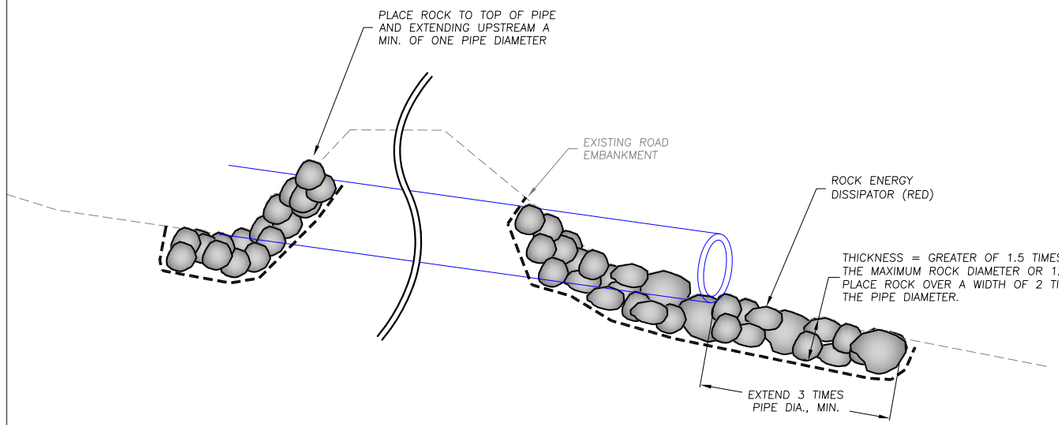


TABLE 1 – INLET/OUTLET PROTECTION STONE		
PIPE DIAMETER	D50 ROCK SIZE	
	DIAMETER	WEIGHT
<18"	8"	LIGHT
24"	12"	1/4T
36"	24"	1/2T
48"	30"	1/2-1T+

NOTES

1. THIS DETAIL APPLIES TO STREAM CROSSING CULVERTS ONLY. THIS DETAIL DOES NOT APPLY TO DITCH RELIEF CULVERTS.
2. ARMOR INLET AND OUTLET TO THE TOP OF THE CULVERT WITH ROCK RIPRAP, AS SHOWN.
3. RIPRAP SHALL CONSIST OF SOUND, DURABLE, ANGULAR ROCK CONFORMING TO SECTION 72-2.02, MATERIALS OF THE STATE STANDARD SPECIFICATIONS FOR THE ROCK SIZE CLASS SPECIFIED.
4. ROCK SIZE CLASSES NOT DESIGNATED BELOW SHALL BE AS SHOWN ON THE DRAWINGS, OR AS DIRECTED BY THE ENGINEER.
5. OVER EXCAVATE CHANNEL IN AREAS SPECIFIED TO RECEIVE ROCK. KEY ROCK A MINIMUM OF 1.5 TIMES THE MAXIMUM ROCK DIAMETER INTO BED AND BANKS, UNLESS OTHERWISE SPECIFIED.
6. PLACE A NON-WOVEN GEOTEXTILE FABRIC BETWEEN ROCK AND SOIL WHERE SPECIFIED OR DIRECTED BY THE ENGINEER.
7. ALIGN DISSIPATER WITH NATURAL DRAINAGE PATH.
8. THE ROCK SIZES SPECIFIED IN TABLE 1 ARE TYPICAL. INDIVIDUAL SITE REQUIREMENTS MAY VARY, AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.
9. PERIMETER OF ROCK SHALL CONFORM TO ADJACENT UNDISTURBED GRADE.

ROCK ENERGY DISSIPATOR (RED) (K)
SCALE: N.T.S. C8,C13,C14,C15,C16,C23

WATERWAYS CONSULTING INC.

TIMOTHY E. BEST, CEG
ENGINEERING GEOLOGY AND HYDROLOGY
3032 Columbia Street, Santa Rosa, CA 95404
(707) 542-9500 • Fax (707) 542-7966 • e-mail: tim@waterwaysgeo.com

3/06/18 DATE

REGISTERED PROFESSIONAL ENGINEER ★ MATTHEW W. WELD ★ No. 62235 Exp. 9-30-19 ★ CIVIL ★ STATE OF CALIFORNIA

MATT W. WELD

PREPARED AT THE REQUEST OF:
MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

DETAILS (5 OF 5)

BEAR CREEK REDWOODS - PHASE ONE ROAD AND TRAIL IMPROVEMENTS
100% SUBMITTAL

DESIGNED BY:	–
DRAWN BY:	–
CHECKED BY:	M.W.W.
DATE:	03/06/2018
JOB NO.:	16-017

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

C23 | 23 OF 24

GENERAL NOTES

1. PREPARED AT THE REQUEST OF:
   MIDPENNINSULA REGIONAL OPEN SPACE DISTRICT
   0330 DISTEL CIRCLE
   LOS ALTOS, CA 94022

1. THE "DISTRICT" SHALL BE MIDPENINSULA REGIONAL OPEN SPACE DISTRICT. THE ENGINEER SHALL BE WATERWAYS CONSULTING, OR THEIR DESIGNATED REPRESENTATIVE. THE "CONTRACTOR" SHALL BE THE DISTRICT OR INDEPENDENT CONTRACTOR TO PERFORM THE WORK DESCRIBED HEREIN. THE ENGINEER HAS BEEN RETAINED BY THE DISTRICT AND IS NOT AFFILIATED WITH THE CONTRACTOR.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR FOLLOWING ANY REQUIREMENTS OF THE DISTRICT'S GENERAL AND SUPPLEMENTAL CONDITIONS FOR THE PROJECT.
3. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO BE FULLY INFORMED OF AND TO COMPLY WITH ALL LAWS, ORDINANCES, CODES, REQUIREMENTS AND STANDARDS WHICH IN ANY MANNER AFFECT THE COURSE OF CONSTRUCTION OF THIS PROJECT, THOSE ENGAGED OR EMPLOYED IN THE CONSTRUCTION AND THE MATERIALS USED IN THE CONSTRUCTION.
4. ALL CONSTRUCTION AND MATERIALS SHALL CONFORM TO THE DRAWINGS, SPECIFICATIONS, AND THE 2010 EDITION OF THE STATE OF CALIFORNIA STANDARD SPECIFICATIONS, ISSUED BY THE DEPARTMENT OF TRANSPORTATION (HEREAFTER REFERRED TO AS "STANDARD SPECIFICATIONS").
5. PROVIDE, AT CONTRACTOR'S SOLE EXPENSE, ALL MATERIALS, LABOR AND EQUIPMENT REQUIRED TO COMPLY WITH ALL APPLICABLE PERMIT CONDITIONS AND REQUIREMENTS.
6. CULTURAL RESOURCES: IN THE EVENT THAT HUMAN REMAINS AND/OR CULTURAL MATERIALS ARE FOUND, ALL PROJECT–RELATED CONSTRUCTION SHALL CEASE WITHIN A 100–FOOT RADIUS. THE CONTRACTOR SHALL, PURSUANT TO SECTION 7050.5 OF THE HEALTH AND SAFETY CODE, AND SECTION 5097.94 OF THE PUBLIC RESOURCES CODE OF THE STATE OF CALIFORNIA, NOTIFY THE SANTA CLARA COUNTY CORONER IMMEDIATELY.

EXAMINATION OF JOB SITE, DRAWINGS AND SPECIFICATIONS

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE PROJECT DOCUMENTS WITH CONDITIONS AT THE SITE AND SHALL VERIFY EXISTING GRADES, ELEVATIONS AND CONDITIONS PRIOR TO COMMENCING WORK. ANY DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER AND SHALL BE RESOLVED BEFORE PROCEEDING WITH THE WORK. ANY DEVIATION, SUBSTITUTION OR ALTERATION TO THE WORK SHALL BE SUBJECT TO REVIEW AND APPROVAL BY THE ENGINEER. WHEN IT IS FOUND THAT FIELD CONDITIONS ARE NOT AS SHOWN ON THE DRAWINGS, THE CONTRACTOR MUST MAKE REVISIONS AND/OR ADJUSTMENTS TO THE SATISFACTION OF THE ENGINEER/OWNER PRIOR TO FURTHER CONSTRUCTION.
2. THE CONTRACTOR SHALL EXAMINE CAREFULLY THE PROJECT AREA, THE DRAWINGS AND SPECIFICATIONS. THE SUBMISSION OF A BID SHALL BE CONCLUSIVE EVIDENCE THAT THE CONTRACTOR HAS INVESTIGATED AND IS SATISFIED AS TO THE CONDITIONS TO BE ENCOUNTERED, AS TO THE CHARACTER, QUALITY, AND SCOPE OF WORK TO BE PERFORMED, THE QUANTITIES OF MATERIALS TO BE FURNISHED AND AS TO THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS.
3. IN THE EVENT THAT ANY UNUSUAL CONDITIONS NOT COVERED BY THE DRAWINGS AND SPECIFICATIONS ARE ENCOUNTERED DURING THE WORK, THE ENGINEER SHALL BE IMMEDIATELY CONTACTED FOR DIRECTIONS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO IMMEDIATELY NOTIFY THE ENGINEER UPON DISCOVERY OF ANY CONFLICTS BETWEEN DRAWINGS AND FIELD CONDITIONS.
4. THE CONTRACTOR SHALL RECOGNIZE THAT THE CONDITIONS SHOWN ON THE DRAWINGS MAY DIFFER FROM THE ACTUAL PHYSICAL SITE. DIMENSIONS ARE APPROXIMATE. BEFORE PROCEEDING WITH THE WORK, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO EVALUATE THE SITE IN RELATION TO THE DRAWINGS AND SPECIFICATIONS AND REPORT ANY DISCREPANCIES TO THE DISTRICT AND THE ENGINEER.
5. THE CONTRACTOR MUST ATTEND A PRE–BID MEETING WITH THE ENGINEER PRIOR TO SUBMITTING A PROPOSAL TO COMPLETE THE PROPOSED WORK. THE CONTRACTOR MAY BE REQUIRED TO ATTEND A PRE–CONSTRUCTION MEETING WITH THE ENGINEER PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. THE PURPOSE OF THESE MEETINGS IS TO ALLOW THE CONTRACTOR TO ASK QUESTIONS CONCERNING THE WORK AND TO MAKE SURE THE CONTRACTOR UNDERSTANDS THE SCOPE OF WORK, PERMIT CONDITIONS AND ENVIRONMENTAL CONSTRAINTS.
6. AT ALL TIMES DURING PROJECT CONSTRUCTION ACTIVITIES, COPIES OF THE APPROVED FINAL DRAWINGS, SPECIFICATIONS, AND PERMITS SHALL BE MAINTAINED AT THE CONSTRUCTION JOB SITE (WHERE SUCH COPIES SHALL BE AVAILABLE FOR PUBLIC REVIEW) AND ALL PERSONS INVOLVED WITH THE CONSTRUCTION SHALL BE BRIEFED ON THE CONTENT AND MEANING OF EACH PRIOR TO COMMENCEMENT OF CONSTRUCTION.

MAPPING

1. TOPOGRAPHIC MAPPING PROVIDED BY:
   GROUND SURVEY: WATERWAYS CONSULTING, INC.
   SURVEY DATES VARY (2016–2107)
   AERIAL SURVEY: SANTA CLARA COUNTY LIDAR COUNTOURS PROVIDED BY MIDPENINSULA REGIONAL OPEN SPACE DISTRICT
2. ELEVATION DATUM:
   GROUND BASED MAPS ARE BASED ON INDIVIDUAL ASSUMED LOCAL DATUM
   AERIAL MAPPING: NAVD88
   BASIS OF BEARINGS: NAD83 CALIFORNIA STATE PLANES, ZONE III
3. ELEVATIONS AND DISTANCES SHOWN ARE IN FEET AND DECIMALS THEREOF. CONTOUR INTERVAL VARIES.
4. THIS IS NOT A BOUNDARY SURVEY. PROPERTY LINES, IF SHOWN, WERE COMPILED FROM RECORD INFORMATION AND FROM FIELD TIES TO EXISTING BOUNDARY MONUMENTATION. THE LOCATION OF THESE LINES IS SUBJECT TO CHANGE, PENDING THE RESULTS OF A COMPLETE BOUNDARY SURVEY.
5. THE DISTRICT SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF ALL PROPERTY LINES AND EASEMENTS AND CONFIRMING THAT PROPOSED PROJECT ELEMENTS ARE LOCATED ON DISTRICT OWNED LANDS OR ARE COORDINATED WITH OWNERS AND APPROPRIATE PERMISSIONS ARE GRANTED FOR THE WORK.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION STAKING AND LAYOUT, UNLESS OTHERWISE SPECIFIED.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION AND PRESERVATION OF ALL SURVEY MONUMENTS OR PROPERTY CORNERS. DISTURBED MONUMENTS SHALL BE RESTORED BACK TO THEIR ORIGINAL LOCATION AND SHALL BE CERTIFIED.
8. MAINTAIN A CURRENT, COMPLETE, AND ACCURATE RECORD OF ALL AS–BUILT DEVIATIONS FROM THE CONSTRUCTION AS SHOWN ON THESE DRAWINGS AND SPECIFICATIONS, FOR THE PURPOSE OF PROVIDING THE ENGINEER OF RECORD WITH A BASIS FOR THE PREPARATION OF RECORD DRAWINGS.
9. TREE DIMENSIONS: TRUNK DIAMETERS SHOWN ARE APPROXIMATE. TREE TRUNK DIMENSIONS MAY BE SHOWN OUT–OF–SCALE FOR PLOTTING CLARITY. CAUTION SHOULD BE USED IN DESIGNING NEAR TREE TRUNKS. THERE ARE LIMITATIONS ON FIELD ACCURACY, DRAFTING ACCURACY, MEDIUM STRETCH AS WELL AS THE "SPREAD" OR "LEANING" OF TREES. REQUEST ADDITIONAL TOPOGRAPHIC DETAIL WHERE CLOSE TOLERANCES ARE ANTICIPATED. INDIVIDUAL TREES ARE NOT TYPICALLY LOCATED WITHIN DRIPLINE CANOPY AREAS SHOWN.

EXISTING UNDERGROUND UTILITIES

1. CALL UNDERGROUND SERVICE ALERT (1–800–642–2444) TO LOCATE ALL UNDERGROUND UTILITY LINES PRIOR TO COMMENCING CONSTRUCTION.
2. PRIOR TO BEGINNING WORK, CONTACT ALL UTILITIES COMPANIES WITH REGARD TO WORKING OVER, UNDER, OR AROUND EXISTING FACILITIES AND TO OBTAIN INFORMATION REGARDING RESTRICTIONS THAT ARE REQUIRED TO PREVENT DAMAGE TO THE FACILITIES.
3. EXISTING UTILITY LOCATIONS SHOWN ARE COMPILED FROM INFORMATION SUPPLIED BY THE APPROPRIATE UTILITY AGENCIES AND FROM FIELD MEASUREMENTS TO ABOVE GROUND FEATURES READILY VISIBLE AT THE TIME OF SURVEY. LOCATIONS SHOWN ARE APPROXIMATE. THE CONTRACTOR IS CAUTIONED THAT ONLY ACTUAL EXCAVATION WILL REVEAL THE DIMENSIONS, SIZES, MATERIALS, LOCATIONS, AND DEPTH OF UNDERGROUND UTILITIES.
4. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE LOCATION AND/OR PROTECTION OF ALL EXISTING AND PROPOSED PIPING, UTILITIES, TRAFFIC SIGNAL EQUIPMENT (BOTH ABOVE GROUND AND BELOW GROUND), STRUCTURES, AND ALL OTHER EXISTING IMPROVEMENTS THROUGHOUT CONSTRUCTION. IF THE CONTRACTOR FAILS TO ADEQUATELY PROTECT THE UTILITIES, ANY RESULTING DAMAGE SHALL BE REPAIRED AT CONTRACTOR'S COST.
5. PRIOR TO COMMENCING FABRICATION OR CONSTRUCTION, DISCOVER OR VERIFY THE ACTUAL DIMENSIONS, SIZES, MATERIALS, LOCATIONS, AND ELEVATIONS OF ALL EXISTING UTILITIES AND POTHOLE THOSE AREAS WHERE POTENTIAL CONFLICTS ARE LIKELY OR DATA IS OTHERWISE INCOMPLETE.
6. TAKE APPROPRIATE MEASURES TO PROTECT EXISTING UTILITIES DURING CONSTRUCTION OPERATIONS. CONTRACTOR IS SOLELY RESPONSIBLE FOR THE COST OF REPAIR/REPLACEMENT OF ANY EXISTING UTILITIES DAMAGED DURING CONSTRUCTION.
7. UPON LEARNING OF THE EXISTENCE AND/OR LOCATIONS OF ANY UNDERGROUND FACILITIES NOT SHOWN OR SHOWN INACCURATELY ON THE PLANS OR NOT PROPERLY MARKED BY THE UTILITY OWNER, IMMEDIATELY NOTIFY THE UTILITY OWNER AND THE CITY BY TELEPHONE AND IN WRITING.
8. UTILITY RELOCATIONS REQUIRED FOR THE CONSTRUCTION OF THE PROJECT FACILITIES WILL BE PERFORMED BY THE UTILITY COMPANY, UNLESS OTHERWISE NOTED.

INSPECTIONS

1. ANY TESTS, INSPECTIONS, SPECIAL OR OTHERWISE, THAT ARE REQUIRED BY THE BUILDING CODES, LOCAL BUILDING DEPARTMENTS, OR THESE PLANS, SHALL BE DONE BY AN INDEPENDENT INSPECTION COMPANY. JOB SITE VISITS BY THE ENGINEER DO NOT CONSTITUTE AN OFFICIAL INSPECTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT THE REQUIRED TESTS AND INSPECTIONS ARE PERFORMED.
2. ALL WORK SHALL BE SUBJECT TO OBSERVATION, TESTING AND APPROVAL BY DISTRICT AND ENGINEER, IN ADDITION TO INSPECTIONS REQUIRED BY REGULATORY AGENCIES.
3. THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER A MINIMUM OF 7 DAYS PRIOR TO COMMENCEMENT OF WORK AND A MINIMUM OF 4 DAYS IN ADVANCE OF REQUIRED INSPECTIONS. THE GEOTECHNICAL ENGINEER SHALL ALSO BE NOTIFIED AT LEAST FOUR (4) WORKING DAYS PRIOR TO ANY SITE CLEARING OR GRADING SO THAT THE WORK IN THE FIELD CAN BE COORDINATED WITH THE GRADING CONTRACTOR, AND ARRANGEMENTS FOR TESTING AND OBSERVATION CAN BE MADE. THE PROJECT ENGINEER (ENGINEER) SHALL BE PROVIDED AN OPPORTUNITY TO REVIEW PROJECT DRAWINGS WITH THE CONTRACTOR DURING THE PRE–CONSTRUCTION MEETING TO EVALUATE IF RECOMMENDATIONS HAVE BEEN PROPERLY INTERPRETED. THE ENGINEER SHALL ALSO PROVIDE KEYWAY EXCAVATION AND EARTHWORK OBSERVATIONS. THIS ALLOWS THE ENGINEER TO CONFIRM ANTICIPATED SOIL CONDITIONS AND EVALUATE CONFORMANCE WITH OUR RECOMMENDATIONS AND PROJECT DRAWINGS. IF THE ENGINEER IS NOT PROVIDED THIS OPPORTUNITY THEY ASSUME NO RESPONSIBILITY FOR MISINTERPRETATION OF THE RECOMMENDATIONS.
4. REGULATORY AGENCIES MAY REQUIRE A FINAL GRADING COMPLIANCE LETTER. WE CAN ONLY OFFER THIS LETTER IF WE ARE CALLED TO THE SITE TO OBSERVE AND TEST, AS NECESSARY, ANY GRADING AND EXCAVATION OPERATIONS FROM THE START OF CONSTRUCTION. WE CANNOT PREPARE A LETTER IF WE ARE NOT AFFORDED THE OPPORTUNITY OF OBSERVATION FROM THE BEGINNING OF THE GRADING OPERATION. THE CONTRACTOR MUST BE MADE AWARE OF THIS AND EARTHWORK TESTING AND OBSERVATION MUST BE SCHEDULED ACCORDINGLY. PLEASE CONTACT OUR OFFICE.
5. IF UNFORSEEN CONDITIONS ARE ENCOUNTERED DURING CONSTRUCTION, OR IF THE PROPOSED CONSTRUCTION WILL DIFFER FROM THAT PLANNED AT THIS TIME, THE ENGINEER SHALL BE NOTIFIED SO THAT SUPPLEMENTAL RECOMMENDATIONS CAN BE GIVEN.

CONSTRUCTION OBSERVATION SCHEDULE

1. IN ADDITION TO OBSERVATIONS OF WORK, ENGINEER WILL FLAG THE LOCATION OF PROPOSED FEATURES.
2. REQUIRED OBSERVATIONS BY ENGINEER SHALL INCLUDE, BUT NOT BE LIMITED TO:
   - FINAL DRAINAGE FEATURE LOCATIONS (INCLUDING RGD'S, KNICKS, ETC.), PRIOR TO INSTALLATION
   - COMPLETED CULVERT TRENCHES PRIOR TO PLACEMENT OF CULVERTS OR BEDDING MATERIALS
   - LIMITS OF GRADING, EXCAVATION AND SPOIL PLACEMENT
   - SUBGRADE PRIOR TO PLACEMENT OF ROCK OR FABRIC
   - KEYWAYS AND DRAINS FOR EMBANKMENT CONSTRUCTION
   - LIMITS OF PROPOSED BORROW SITES
   - BMP'S, INCLUDING DIVERSION AND DEWATERING SYSTEMS, PRIOR TO SITE DISTURBING ACTIVITIES
   - FILL PLACEMENT AND COMPACTION ENERGY DISSIPATER SHAPE AND POSITION

SCHEDULE

1. PROJECT SCHEDULE: PRIOR TO COMMENCEMENT OF WORK, SUBMIT TO THE ENGINEER FOR REVIEW AND APPROVAL A DETAILED CONSTRUCTION SCHEDULE. DO NOT BEGIN ANY CONSTRUCTION WORK UNTIL THE PROJECT SCHEDULE AND WORK PLAN IS APPROVED BY THE ENGINEER. ALL CONSTRUCTION SHALL BE CLOSELY COORDINATED WITH THE ENGINEER SO THAT THE QUALITY OF WORK CAN BE CHECKED FOR APPROVAL. PURSUE WORK IN A CONTINUOUS AND DILIGENT MANNER TO ENSURE A TIMELY COMPLETION OF THE PROJECT.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGN, PERMITTING, INSTALLATION, AND MAINTENANCE OF ANY AND ALL TRAFFIC CONTROL MEASURES DEEMED NECESSARY.

SAFETY

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR GENERAL SAFETY DURING CONSTRUCTION. ALL WORK SHALL CONFORM TO PERTINENT SAFETY REGULATIONS AND CODES. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR FURNISHING, INSTALLING, AND MAINTAINING ALL WARNING SIGNS AND DEVICES NECESSARY TO SAFEGUARD THE GENERAL PUBLIC AND THE WORK, AND PROVIDE FOR THE PROPER AND SAFE ROUTING OF VEHICULAR AND PEDESTRIAN TRAFFIC DURING THE PERFORMANCE OF THE WORK. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR COMPLIANCE WITH ALL APPLICABLE PROVISIONS OF OSHA IN THE CONSTRUCTION PRACTICES FOR ALL EMPLOYEES DIRECTLY ENGAGED IN THE CONSTRUCTION OF THIS PROJECT.
2. CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS, AND CONSTRUCTION CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD DESIGN PROFESSIONAL HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTION LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF DESIGN PROFESSIONAL. NEITHER THE PROFESSIONAL ACTIVITIES OF CONSULTANT NOR THE PRESENCE OF CONSULTANT OR HIS OR HER EMPLOYEES OR SUB–CONSULTANTS AT A CONSTRUCTION SITE SHALL RELIEVE THE CONTRACTOR AND ITS SUBCONTRACTORS OF THEIR RESPONSIBILITIES INCLUDING, BUT NOT LIMITED TO, CONSTRUCTION MEANS, METHODS, SEQUENCE, TECHNIQUES OR PROCEDURES NECESSARY FOR PERFORMING, SUPERINTENDING OR COORDINATING ALL PORTIONS OF THE WORK OF CONSTRUCTION IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND APPLICABLE HEALTH OR SAFETY REQUIREMENTS OF ANY REGULATORY AGENCY OR OF STATE LAW.
3. CONTRACTOR IS REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.
4. THE CONTRACTOR SHALL CONFORM TO THE RULES AND REGULATIONS OF THE CONSTRUCTION SAFETY ORDERS OF THE CALIFORNIA DIVISION OF OCCUPATIONAL SAFETY AND HEALTH PERTAINING TO EXCAVATION AND TRENCHES THE CALIFORNIA CODE OF REGULATIONS TITLE 8, SUBCHAPTER 4 CONSTRUCTION SAFETY ORDERS, ARTICLE 6 EXCAVATION.

STAGING AND ACCESS

1. AUTHORIZED CONSTRUCTION ACCESS POINTS, ROUTES, AND STAGING AREAS ARE SHOWN ON THE DRAWINGS. CONSTRUCTION ACCESS AND STAGING AREAS WILL BE RESTRICTED TO EXISTING ROADS AND PREVIOUSLY CLEARED TURNOUTS OR LANDINGS, UNLESS OTHERWISE AUTHORIZED BY THE DISTRICT'S REPRESENTATIVE.
2. IMPACTS TO THE ACCESS ROUTES MUST BE MINIMIZED AND DISTURBANCE ALONG THE ACCESS ROUTE SHALL BE RESTORED TO PRE–CONSTRUCTION CONDITIONS UPON PROJECT COMPLETION.
3. THE CONTRACTOR SHALL CAREFULLY PRESERVE THE SURROUNDING PROPERTY BY CONFINING OPERATIONS WITHIN THE LIMITS OF WORK. CONSTRUCTION WORK OR EQUIPMENT OPERATIONS SHALL NOT BE CONDUCTED OUTSIDE THE DESIGNATED WORK AREA BOUNDARY WITHOUT APPROVAL OF THE DISTRICT.
4. KEYS WILL BE PROVIDED BY THE DISTRICT TO ALLOW CONTRACTOR ACCESS AT GATES "BC01", "BC05", AND "BC09".
5. THROUGH ROAD ACCESS OVER EXISTING DISTRICT ROADS SHALL BE MAINTAINED. IF THROUGH ACCESS CANNOT BE MAINTAINED, A SCHEDULE FOR CLOSURE MUST BE APPROVED BY A DISTRICT REPRESENTATIVE.

HOUSEKEEPING

1. MAINTAIN THE SITE IN A NEAT AND ORDERLY MANNER THROUGHOUT THE CONSTRUCTION PROCESS. STORE ALL MATERIALS WITHIN APPROVED STAGING AREAS.
2. CONSTRUCTION WATER IS AVAILABLE NEAR GATE "BCO1" AND WILL BE IDENTIFIED AT THE PREBID MEETING.
3. THE CONTRACTOR SHALL MAINTAIN GOOD CONSTRUCTION SITE HOUSEKEEPING CONTROLS AND PROCEDURES (E.G., CLEAN UP ALL LEAKS, DRIPS, AND OTHER SPILLS IMMEDIATELY; KEEP MATERIALS COVERED AND OUT OF THE RAIN (INCLUDING COVERING EXPOSED PILES OF SOIL AND WASTES); DISPOSE OF ALL WASTES PROPERLY, PLACE TRASH RECEPTACLES ON SITE FOR THAT PURPOSE, COVER OPEN TRASH RECEPTACLES DURING WET WEATHER, REMOVE ALL CONSTRUCTION DEBRIS FROM THE SITE. THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN ALL VEHICLES AND EQUIPMENT AND TO INSPECT THEM FREQUENTLY FOR LEAKS.
4. EQUIPMENT WASHING, REFUELING, AND/OR SERVICING SHALL NOT TAKE PLACE EXCEPT WITH APPROPRIATE PRECAUTIONS TO AVOID FUEL SPILLS, AT LEAST 100 FEET AWAY FROM THE POND AND ADJACENT STREAM CHANNELS, FOR VEHICLE AND EQUIPMENT MAINTENANCE.
5. PETROLEUM PRODUCTS AND OTHER HAZARDOUS MATERIALS SHALL BE STORED OFFSITE.
6. SWEEP UP ANY SPILLED DRY MATERIALS IMMEDIATELY. USE ONLY WATER FOR DUST CONTROL.
7. CLEAN UP ANY SPILLS ON A DIRT AREA BY DIGGING UP AND PROPERLY DISPOSING OF CONTAMINATED SOIL AT AN APPROPRIATE FACILITY.

WATERWAYS CONSULTING INC.

TIMOTHY C. BEST, CEG
ENGINEERING GEOLOGY AND HYDROLOGY

3/06/18
DATE

REGISTERED PROFESSIONAL ENGINEER
MATT W. WELD
No. 62235
Exp. 9–30–19
CIVIL
STATE OF CALIFORNIA

MATT W. WELD

PREPARED AT THE REQUEST OF:
MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

NOTES

BEAR CREEK REDWOODS – PHASE ONE ROAD AND TRAIL IMPROVEMENTS
100% SUBMITTAL

DESIGNED BY:	–
DRAWN BY:	–
CHECKED BY:	M.W.W.
DATE:	03/06/2018
JOB NO.:	16–017

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

TECHNICAL SPECIFICATIONS
TABLE OF CONTENTS

SECTION ~~13100~~ 13 00 00
PRECAST CONCRETE RESTROOM BUILDING

PART 1 GENERAL

1.01 GENERAL

Contractor is responsible for excavation and site preparation. District will provide the restroom building. Manufacturer will deliver the restroom to the site, provide a crane, and install the restroom with Contractor's assistance.

1.02 SCOPE

This specification covers the manufacture, shipping, and installation of one precast concrete restroom facility.

1.03 STANDARDS

ASTM C33	Concrete Aggregates
ASTM C39	Method of Test for Compressive Strength of Cylindrical Concrete Specimens
ASTM CMS	Method of Test for Slump of Concrete
ASTM C150	Standard Specification for Portland Cement
ASTM C192	Method of Making and Curing Test Specimens in the Laboratory
ACI 1211.1	Recommended Practice for Selecting Proportions for Normal and Heavyweight Concrete
PCI MNL 116	Quality Control for Plants and Production of Precast Pre-stressed Concrete Products

1.04 MANUFACTURER CRITERIA

The manufacturer supplying the requested precast concrete multi-flush facility must meet the following:

A. Manufacturer must be ISO 9001 certified at the time of bid.

B. Manufacturing plant must be PCI certified at the time of bid.

C. Manufacturer must not have defaulted on any contract within the last five years.

D. Manufacturer shall provide stamped, engineered drawings prior to award of contract.

E. Manufacturer must be pre-approved prior to bidding.

F. Manufacturer must show four (4) examples of precast concrete facilities produced, installed, and in use as an example of their ability to perform on this contract.

Preselected manufacturers meeting these criteria are:

CXT, Incorporated, Spokane Industrial Park, 3808 North Sullivan Road, Building 7, Spokane, WA 99216, Phone: 800-696-5766

1.05 DESIGN CRITERIA

The restroom facility shall be designed to meet the following criteria. Calculations and Engineer's stamped drawings shall be submitted and approved by the City prior to manufacture of the building.

A. Snow Load: The restroom facility will be engineered to withstand a 120 pound per square foot snow load.

B. Wind Load: The restroom facility shall be engineered to withstand a 100 mile per hour wind load.

C. Earthquake: The restroom facility shall be engineered to withstand the effects of a Zone Four earthquake.

D. Additional Design Standards: The restroom facility shall be designed to meet the requirements of the Americans with Disabilities Act Requirements and Uniform Federal Accessibility Standards as of the date of this specification.

PART 2 MATERIALS

2.01 RESTROOM

A. Restroom shall be constructed of Precast concrete, and shall be the “Tioga with Chase Double Vault” model, as available from CXT Precast Products (800) 696-5766.

B. Exterior walls shall have a “Barnwood” texture with a San Beige color.

C. Roof shall be “cedar shake” texture and “Nuss Brown” color.

D. Restroom shall comply with ADA and California Title 24 requirements for accessibility.

F. Restroom shall come complete with wheelchair symbol sign, combination men’s/women’s signs, and shall also have Braille text.

2.01 CONCRETE

A. Concrete - General

1. The concrete mix design will be designed to ACI 2.11.1 to produce concrete of good workability.

2. Concrete will contain a minimum of 610 pounds of cement per cubic yard. Cement will be a low alkali type I or III conforming to ASTM C-150.

3. Coarse aggregates used in the concrete mix design will conform to ASTM C33 with the designated size of coarse aggregate #67.

4. Minimum water/cement ratio will not exceed 0.45. Slump will not exceed 4 inches.

5. Air-entraining admixtures will conform to ASTM C260. Water reducing admixtures will conform to ASTM C494, Type A. Other admixtures will not be used without customer approval.

B. Colored Concrete

1. Color additives will conform to ASTM C979. 12”x12”x1” color samples of each color and texture shall be submitted to the Ditrict for approval.

2. The following will contain colored concrete:
   a. Roof panels
   b. Walls
   c. Screen paneled. Metal frames

3. The same brand and type of color additive will be used throughout the manufacturing process.

4. All ingredients will be weighed and the mixing operation will be adequate to ensure uniform dispersion of the color.

C. Cold Weather Concrete

1. Cold weather concrete placement will be in accordance with ACI 306.

2. Concrete will not be placed if ambient temperature is expected to be below 35 degrees F. during the curing period unless heat is readily available to maintain the surface temperature of the concrete at least 45 degrees F.

3. Materials containing frost or lumps of frozen materials will not be used.

D. Hot Weather Concrete

The temperature of the concrete will not exceed 80 degrees F. at the time of placement and when the ambient reaches 90 degrees F. the concrete will be protected with moist covering.

E. Concrete Reinforcement

1. All reinforcing steel will conform to ASTM A615. All welded wire fabric will conform to ASTMA 185.

2. All reinforcement will be new, free of dirt, oil, paint, grease, loose mill scale and loose or thick rust when placed.

3. Details not shown of drawings or specified will be to ACI318.

4. Steel reinforcement will be centered in the cross-sectional area of the walls and will have at least 1 inch of cover on the under surface of the floor and roof.

5. The maximum allowable variation for center-center spacing of reinforcing steel will be 1/2 inch.

6. Full lengths of reinforcing steel will be used when possible. When splices are necessary on long runs, splices will be alternated from opposite sides of the components for adjacent steel bars. Lap bars #4 or smaller a minimum of 12 inches. Lap bars larger than #4 a minimum of 24 bar diameters.

7. Reinforcing bars will be bent cold. No bars partially embedded in concrete will be field bent unless approved by the customer.

2.02 SEALERS AND CURING COMPOUNDS

A. Curing compounds, if used, will be colorless, complying with ASTM C309, Type I or 1-D.

B. Weatherproofing sealer for exterior of building will be a clear water repellent penetrating sealer.

2.03 CAULKING, GROUT, ADHESIVE AND SEALER

A. All caulking will remain flexible and non-sag at temperatures from -40 to +140 degrees Fahrenheit.

B. Interior joints will be caulked with a paintable polyurethane sealant.

C. Exterior joints will be caulked with a tri-polymer sealant caulk that compliments the exterior color.

D. Grout will be a non-shrink type and will be painted to match the color of surrounding concrete as nearly as possible.

E. Epoxy concrete adhesive will be two component, rigid, non-sag gel adhesive for bonding to dry or damp surfaces, moisture insensitive.

F. Cement base coating is formulated with a very fine aggregate system and a built-in bonding agent.

2.04 PAINT

A. All paints and materials shall conform to all Federal specifications or be similar "top-of-the-line-components." Paints will not contain more than .06 percent by weight of lead.

B. Type of paints for precast concrete toilet facility

1. Inside concrete surfaces

a. Interior floors will be a 1-part water based epoxy with a silica sand suspension to provide uniform texture. The color will be gray.

b. Interior walls and ceilings will be a modified acrylic, water repellent penetrating stain. The color will be white.

2. Metal surfaces both inside and out: DTM ALKYD

3. Exterior concrete surfaces

a. Exterior slab will be clear sealer
b. Exterior walls and roof will be a water repellent penetrating stain in the same color as the walls or roof followed by a clear acrylic anti-graffiti sealer.

2.05 GRAB BARS

Grab bars will be 18 gauge, Type 316L stainless steel with 1-1/2 inch clearance. Grab bars will each be able to withstand 300 pound top loading.

2.06 TOILET PAPER DISPENSERS

Dispensers will be constructed of 1/4 inch thick, type 316L stainless steel. Dispenser will be capable of holding six (6) standard rolls of toilet paper. Toilet paper holder fastening system will be able to withstand 300 pound top loading.

2.07 HEAVY DUTY FIBERGLASS DOORS & DOOR FRAMES

A. Doors and doors frames shall be dark brown colored and made of ABS textured material. Doors to have 1 ½" thick rigid block urethane core. Doors by Corrim Company or approved equal.

B. Door Jamb depth shall be 5 ¾", dark brown color with a minimum 15 mils thick of gel coat. Door jambs to be cast in concrete.

C. Door Hinges: Door hinges shall be with dull chrome plated 4-1/2" x 4-1/2", adjustable tension, automatic-closing, 3 per door. Hinges shall be made of 316L stainless steel.

D. Lockset

1. Lockset shall meet ANSI A156.2 Series 4000, Grade 1 cylindrical lockset for exterior door. Lockset shall be made of 316L stainless steel.

2. Lever handle both inside and out. Either handle operates latch unless outside handle is locked by inside push button. Push button will automatically release when inside lever handle is turned or door is closed. Inside lever always active. Emergency slot on exterior so door can be unlocked from outside with a coin, screwdriver or etc.

E. Dead Bolt: Deadbolt will be a Lori Lock standard model with a double cylinder, 2 ¾" backset. The cylinder will be a standard 1-1/8" Schlage Mortise cylinder with compression ring. All components shall be made of 316L stainless steel.

F. Door Stop: Doorstop will have a 316L Stainless Steel base, U.S. 26D finish with gray rubber 2-7/16" diameter bumper with a 1" projection.

G. Door Sweep: Door sweep will be provided at the bottom of door and will be an adjustable brush type.

2.08 MIRROR

Mirror to be 18" x 24" stainless steel.

2.09 WALL VENT

Wall vent will be cast into the concrete wall. The units' frame and components shall be made of 316L stainless steel. The louver will be inverted Y. Provide an insect screen on or attached to the louver.

2.10 FLOOR DRAIN

A. Floor Drain manufacture shall be Smith Model # 2005 or approved equal

B. Drain shall have galvanized cast iron body.

2.10 WINDOWS

A. Windows and cleanout cover frames will be constructed from 316L stainless steel.

B. Window glazing will be 1/4 inch thick translucent pebble finished polycarbonate.

2.10 PLUMBING

A. Waste and vent material will be ABS or PVC plastic and will be plumbed to meet Uniform Building Codes.

PART 3 MANUFACTURE

3.01 CONCRETE

A. Mixing and delivery of concrete will be in accordance with ASTM C94, section 10.6 through 10.9 with the following additions:

1. Aggregate and water shall be adjusted to compensate for differences in the saturated surface-dry condition.

2. Concrete will be discharged as soon as possible after mixing is complete. This time will not exceed 30 minutes.

B. Placing and Consolidating Concrete: Concrete will be consolidated by the use of mechanical vibrators. Vibration will be sufficient to accomplish compaction but not to the point that segregation occurs.

C. Concrete Finishes:
1. Interior floor and exterior slabs will be floated and troweled. A light broom finish will be applied to the exterior and interior slabs.

D. Cracks and Patching

1. Cracks in concrete components which are judged to affect the structural integrity of the building will be rejected.

2. Small holes, depressions and air voids will be patched with a suitable material. The patch will match the finish and texture of the surrounding surface.

3. Patching will not be allowed on defective areas if the structural integrity of the building is affected.

E. Curing and Hardening Concrete: Concrete surfaces will not be allowed to dry out from exposure to hot, dry weather during initial curing period.

3.02 FINISHING AND FABRICATION

A. Structural Joints

1. Wall components will be joined together with two welded plate pairs at each joint. Each weld plate will be 6 inches long and with one pair located in the top quarter and one pair in the bottom quarter of the seam. Weld plates will be anchored into the concrete panel and welded together with a continuous weld. The inside seams will be a paintable caulk. The outside seams will use a caulk in a coordinating building color PRECAST or clear.

2. Walls and roof will be joined with weld plates, 3 inches x 6 inches, located at each building corner.

3. The joint between the floor slab and walls will be joined with a grout mixture on the inside, a matched colored caulk on the outside and two weld plates 6 inches long per wall.

B. Painting/Staining

1. An appropriate curing time will be allowed before paint is applied to concrete.

2. Some applications may require acid etching. A 30% solution of hydrochloric acid shall be used, flushed with water and allowed to thoroughly air dry.

3. Painting will not be done outside in cold, frosty or damp weather.

4. Painting will not be done outside in winter unless the temperature is 50° F. or higher.

5. Painting will not be done in dusty areas.

6. Schedule of finishes

a. Inside concrete surfaces

1) Inside floors will be 1 coat of 1-part water based epoxy with a silica sand suspension to provide uniform texture.

2) Interior walls and ceilings will be 2 coats of a modified acrylic, water repellent penetrating stain, followed by 1 coat of clear sealer.

b. Metal surfaces both inside and out

1) 2 coats of DTM ALKYD.

c. Exterior concrete surfaces

1) Exterior slab will be 1 coat of clear sealer

2) Exterior walls will be 2 coats of water repellent penetrating stain in the same color as the walls or roof followed by 1 coat of clear acrylic anti-graffiti sealer.

3.02 TESTING

A. The following tests will be performed on concrete used in the manufacture of the toilet facility. All testing will be performed in a PCI certified laboratory. Testing will only be performed by qualified individuals who have been certified ACI Technician Grade 1. Sampling will be in accordance with ASTM C172.

1. The slump of the concrete will be performed on the first batch of concrete in accordance with ASTM C143. This slump will be in the 3"- 4" range.

2. The air content of the concrete will be checked per ASTM C231 on the first batch of concrete. The air content will be in the range of 5.5% +/-1%.

3. Cylinders shall be taken to test the concrete compressive strength. The compressive strength of the cylinders will be tested to ASTM C39.

a. One (1) cylinder for release, one (1) for 7 days and one (1) for 28 days shall be prepared.

b. The release must be a minimum strength of 2500 psi, the 7 day must be a minimum of 4500 psi and the 28 day must be a minimum of 5000 psi.

4. A copy of all test reports are to be sent to the Inspector as soon as the 28-day test results are available.

PART 4 DELIVERY AND INSTALLATION

A. Work by the Contractor

1. The Contractor shall prepare the building foundation pad in accordance with the approved building and site plans and specifications.

    a. Cut and recompact subgrade to 95% relative compaction subject to testing by the District.

    b. Install 6 inch minimum section of Class 2 gravel, 3/4 inch minus roadbase and compact to 95% compaction. Finish pad shall be level and true to grade in accordance with the plan section.

2. The Contractor shall provide:

    a. Exact location by stakes or other approved method.

    b. Clear and level site free of overhead and/or underground obstructions.

    c. Access to the building pad for truck delivery and sufficient area for the crane to install and the equipment to perform the contract requirements.

B. Work by Manufacturer

    1. Delivery and Installation:

        Manufacturer shall deliver to the site the precast concrete restroom facility and install it on the prepared pad in accordance with the layout and grade stakes provided.

        a. Proper notice and coordination for delivery and setup shall be provided by the Contractor. Notice shall be provided 45 days in advance of delivery date. Actual delivery date shall be coordinated with the Contractor and Engineer.

        b. Delivery to site made on normal highway trucks and trailers. Crane for unloading and setting concrete facility in proper place shall be provided and coordinated by the manufacturer.

    2. Prior to leaving the site, the manufacturer’s field representative Contractor, and Engineer shall fully and completely inspect the toilet facility for compliance with the approved plans and specifications. Restroom shall be a turnkey facility ready for use.

PART 5 WARRANTY

A. The manufacturer shall provide a written warranty covering the structure for a period of one year from date of acceptance by the City. The manufacturer warrants that all goods sold pursuant hereto will, when delivered and installed, conform to specifications set

forth above. Goods shall be deemed accepted and meeting specifications unless notice identifying the nature of any non-conformity is provided to the manufacturer in writing within one (1) year of delivery. The manufacturer, at its option, will repair or replace the goods or issue credit for the customer provided it is first given the opportunity to inspect such goods.

B. This warranty shall not apply to any goods, which have been subject to misuse, negligence, acts of God or accidents.

END OF SECTION

SECTION 31 10 00

SITE CLEARING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Protecting existing vegetation to remain.
2. Removing existing vegetation.
3. Clearing and grubbing.
4. Stripping and stockpiling topsoil.
5. Removing above- and below-grade site improvements.
6. Disconnecting, capping or sealing site utilities.
7. Temporary erosion- and sedimentation-control measures.

1.2 MATERIAL OWNERSHIP

A. Except for stripped topsoil and other materials indicated to be stockpiled or otherwise remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.3 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from the District and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed traffic ways if required by the District or authorities having jurisdiction.

B. Salvable Improvements: Carefully remove items indicated to be salvaged and store on the District's premises where indicated.

C. Utility Locator Service: Notify utility locator service for area where Project is located before site clearing.

D. Do not commence site clearing operations until temporary erosion- and sedimentation-control and plant-protection measures are in place.

E. The following practices are prohibited within protection zones:

1. Storage of construction materials, debris, or excavated material.
2. Parking vehicles or equipment.
3. Foot traffic.
4. Erection of sheds or structures.
5. Impoundment of water.
6. Excavation or other digging unless otherwise indicated.
7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Section 312000 "Earth Moving."

1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction.

B. Locate and clearly identify trees, shrubs, and other vegetation to remain or to be relocated.

C. Protect existing site improvements to remain from damage during construction.

1. Restore damaged improvements to their original condition, as acceptable to the District.

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

A. Provide temporary erosion- and sedimentation-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings and requirements of authorities having jurisdiction.

B. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

C. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until permanent vegetation has been established.

D. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.3 TREE AND PLANT PROTECTION

A. General: Protect trees and plants remaining on-site according to requirements in Section 015639 "Temporary Tree and Plant Protection."

B. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations, in a manner approved by Architect.

3.4 EXISTING UTILITIES

A. Locate, identify, disconnect, and seal or cap utilities indicated to be removed or abandoned in place.

1. Arrange with utility companies to shut off indicated utilities.

B. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by the District or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Architect not less than two days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Architect's written permission.

3.5 CLEARING AND GRUBBING

Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.

1. Use only hand methods for grubbing within protection zones.

B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.

1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches, and compact each layer to a density equal to adjacent original ground.

3.6 TOPSOIL STRIPPING

A. Remove sod, grass, and weeds before stripping topsoil.

B. Strip topsoil in a manner to prevent intermingling with underlying subsoil or other waste materials.

C. Stockpile topsoil away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water.

D. All soil shall be placed in planting areas onsite. Location to be approved by District Representative.

E. Contractor shall strip, stockpile, and place native topsoil in sufficient quantities to provide a minimum six-inch layer throughout all areas to be planted and/or seeded.

3.7 SITE IMPROVEMENTS

A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.

3.8 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off the District's property.

B. Separate recyclable materials produced during site clearing from other nonrecyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities. Do not interfere with other Project work.

END OF SECTION 311000

SECTION 31 30 00

TREE AND SHRUB REMOVAL AND TRIMMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Contractor, Subcontractors, and/or suppliers providing goods or services referenced in or related to this Section shall also be bound by the Documents identified in Division 01 Section “Summary”, Paragraph 1.1A, entitled “Related Documents.”

1.2 SUMMARY

A. This Section includes the specific protection, fertilization, and trimming of trees that interfere with, or are affected by, execution of the Work, whether temporary or new construction.

B. Related Sections include the following:

1. Division 1 Section "Summary" for limits placed on Contractor's use of the site.
2. Division 31 Section "Site Clearing" for temporary tree protection, removal limits of trees, shrubs, and other plantings affected by new construction.
3. Division 31 Section "Earth Moving" for site excavation, backfilling, compacting and grading requirements, and soil materials.
4. Division 32 Section "Plants" for tree and shrub planting and transplanting, tree support systems, and soil materials.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

C. Certification from a qualified arborist that trees indicated to remain have been protected during construction according to recognized standards and that trees were promptly and properly treated and repaired when damaged.

D. Maintenance Recommendations from a qualified arborist for care and protection of trees affected by construction during and after completing the Work.

1.4 QUALITY ASSURANCE

A. Arborist Qualifications: An arborist certified by the International Society of Arboriculture or licensed in the jurisdiction where Project is located.

B. Tree Pruning Standards: Comply with ANSI A300, "Trees, Shrubs, and Other Woody Plant Maintenance--Standard Practices," unless more stringent requirements are indicated.

C. Preconstruction Conference: Conduct conference at Project site to comply with requirements in Division 1.

1. Before starting tree protection and trimming, meet with representatives of authorities having jurisdiction, Owner, Architect, consultants, and other concerned entities. Review tree protection and trimming procedures and responsibilities. Notify participants at least three working days before convening conference. Record discussions and agreements and furnish a copy to each participant.

PART 2 - PRODUCTS

2.1 DRAINAGE FILL: Selected crushed stone, or crushed or uncrushed gravel, washed, ASTM D 448, Size 24, with 90 to 100 percent passing a 2-1/2-inch sieve and not more than 10 percent passing a 3/4-inch sieve.

2.2 TOPSOIL: Conform to Division 32 Section “Planting Preparation”.

2.3 FILTER FABRIC: Refer to Division 31, Section “Trenching and Backfill”, “Filter Fabric” paragraph.

2.4 FERTILIZER

A. The fertilizer shall be injected into the soil as an aqueous suspension or solution.

B. The fertilizer shall contain nitrogen, phosphorus and potassium in a 3:1:1 ratio. (Three times the amount of nitrogen as phosphorus and potassium). Suitable analysis would include 28-9-9, 18-6-6 or 12-4-4.

C. At least 75% of the nitrogen in the fertilizer shall be derived from a slow release source such as Urea form Sulfur coated Urea or IBDU.

D. The salt index of the fertilizer shall not exceed 35.

E. SAND: Refer to Division 31

F. PERLITE: Horticultural, inorganic perlite.

PART 3 - EXECUTION

3.1 PREPARATION

A. Construction fence: Install construction fence located as indicated or outside the drip line of trees to protect remaining vegetation from construction damage. Refer to Division 31, Section “Site Clearing” of this Specification.

B. Protect tree root systems from damage due to noxious materials caused by runoff or spillage while mixing, placing, or storing construction materials. Protect root systems from flooding, eroding, or excessive wetting caused by dewatering operations.

C. Do not store construction materials, debris, or excavated material within the drip line of remaining trees. Do not permit vehicles or foot traffic within the drip line; prevent soil compaction over root systems.

D. Do not allow fires under or adjacent to remaining trees or other plants.

3.2 EXCAVATION

A. Install sheeting, shoring or other protective support systems to minimize sloping or benching of excavations.

B. Do not excavate within drip line of trees to remain, unless otherwise indicated.

C. Where excavation for new construction is required within drip line of trees to remain, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks and comb soil to expose roots or utilize an air spade to expose roots.

1. Relocate roots in backfill areas where possible. If encountering large, main lateral roots, expose roots beyond excavation limits as required to bend and relocate them without breaking. If encountered immediately adjacent

to location of new construction and relocation is not practical, cut roots approximately 3 inches back from new construction.

2. Do not allow exposed roots to dry out before placing permanent backfill. Provide temporary earth cover or pack with peat moss and wrap with burlap. Water and maintain in a moist condition. Temporarily support and protect roots from damage until they are permanently relocated and covered with soil.

D. Where utility trenches are required within drip line of trees, tunnel under or around roots by drilling, auger boring, pipe jacking, or digging by hand.

1. Root Pruning: Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities. Cut roots with sharp pruning instruments; do not break or chop.

3.3 REGRADING

A. Grade Lowering: Where new finish grade is indicated below existing grade around trees, slope grade beyond drip line of trees. Maintain existing grades within drip line of trees.

B. Minor Fill: Where existing grade is 6 inches or less below elevation of finish grade, fill with topsoil. Place topsoil in a single uncompacted layer and hand grade to required finish elevations.

C. Moderate Fill: Where existing grade is more than 6 inches, but less than 12 inches, below elevation of finish grade, place drainage fill, filter fabric, and topsoil on existing grade as follows:

1. Carefully place drainage fill against tree trunk or restraint and extend to dripline on all sides. Depth – typical 8”.
2. Place filter fabric with edges overlapping 6 inches minimum.
3. Place fill layer of topsoil to finish grade. Do not compact drainage fill or topsoil. Hand grade to required finish elevations.

3.4 TREE PRUNING AND FERTILIZATION

A. Prune and fertilize all designated trees and shrubs.

B. Prune to compensate for root loss caused by damaging or cutting root system.

C. Pruning Standards: Prune trees according to ANSI A300 and National Arborists Association as follows, to remove dead, diseased, decayed and obviously weak branches.

1. Type of Pruning: Crown cleaning and thinning (Class II), and crown raising, where designated branches are to be removed to provide additional head room. D.

D. Cut branches with sharp pruning instruments; do not break or chop.

E. All designated trees are to be pruned and fertilized. Fertilizer rates are based on the nitrogen content of the fertilizer. Determine fertilizer rates by the crown spread technique – based on the soil surface area beneath the crown. Apply 3 lbs. of actual nitrogen per 1000 sq. ft. of soil surface beneath the crown and 3' beyond the dripline of the tree.

F. The fertilizer shall be applied using a hydraulic sprayer operating at 200 psi and an injection probe that will permit subsurface placement of the fertilizer solution. Injection holes should be two to three feet apart and 12 inches deep. Begin injection site two to three feet from the trunk and work out to three feet beyond the drip line of the branches

3.5 SOIL ENHANCEMENT

A. Soil Enhancement shall consist of drilling holes in the soil throughout the tree root zone of existing trees to remain, and backfilling with porous soil amendments to relieve the problems of poorly oxygenated soils and poor soil structure caused by soil compaction.

B. Vertical holes, 24 inches deep, shall be made in the soil of the tree root zone using a power drill having a 2 inch auger. These holes shall be spaced 3 feet apart in a grid pattern at a point starting 2 feet away from the trunk base to 10 feet beyond the dripline of the tree canopy.

C. The vertical hole shall be filled to the top with a soil mixture consisting of equal parts (1/3 each) of perlite, sand and screened topsoil. This soil mixture shall be placed in the vertical hole by use of a funnel or by hand raking, whichever is more efficient for the contractor. If the latter is the preferred method however, the contractor shall take precaution against storing the soil amendments for long periods of time (6 hour maximum) on the ground surface within the tree root zone before working it into the vertical holes that were previously made.

3.6 TREE REPAIR AND REPLACEMENT

A. Promptly repair trees damaged by construction operations within 24 hours. Treat damaged trunks, limbs, and roots according to written instructions of the qualified arborist.

B. Remove and replace dead and damaged trees that the qualified arborist determines to be incapable of restoring to a normal growth pattern.

1. Provide new trees of the same size and species as those being replaced; plant and maintain as specified in Division 32 Section "Plants."

C. Aerate surface soil, compacted during construction, 10 feet beyond drip line and no closer than 36 inches to tree trunk. Drill 2-inch diameter holes a minimum of 12 inches deep at 24 inches o.c. Backfill holes with an equal mix of augured soil and sand.

3.7 DISPOSAL OF WASTE MATERIALS

A. Burning is not permitted.

B. Disposal: Remove excess excavated material, displaced trees, and excess chips from Owner's property.

END OF SECTION 311300

SECTION 31 20 00

EARTH MOVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Preparing subgrades for slabs-on-grade, walks, pavements, turf and grasses, and plants.
2. Excavating and backfilling for buildings and structures.
3. Base course for walks and pavements.
4. Excavating and backfilling for utility trenches.
5. Compaction testing

1.2 DEFINITIONS

A. Backfill: Soil material used to fill an excavation.

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Base Course: Aggregate layer placed between the prepared subgrade and paving.

C. Bedding Course (Pipe Bedding): Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

E. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

F. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by District's Representative. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.

2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by District's Representative. Unauthorized excavation, as well as remedial work directed by District's Representative, shall be without additional compensation.

G. Fill: Soil materials used to raise existing grades.

H. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

I. Subbase Course: Not used in this project

J. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, base, drainage fill, drainage course, or topsoil materials.

K. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.3 QUALITY ASSURANCE

A. Preexcavation Conference: Conduct conference at Project site with the Project Engineer and Geotechnical Engineer.

B. All grading activities shall comply with the requirements of the Geotechnical Engineering Report prepared by Butano Geotechnical Engineering, dated July 2017. The Geotechnical Engineering Report shall govern all grading activities.

1.4 PROJECT CONDITIONS

A. Utility Locator Service: Notify utility locator service for area where Project is located before beginning earth moving operations.

B. Do not commence earth moving operations until plant-protection measures specified in Section 015639 "Temporary Tree and Plant Protection" are in place.

C. Soil cannot be removed from within the Restricted Property (all areas except campground and balloon spur) without a Soil Management Plan and Health and Safety Plan approved by the DTSC.

1. Grading along the beach access path is located through an area identified as “Restricted Area per DTSC”

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory Soils: Soils approved by the project geotechnical engineer. See project geotechnical report for more information.

C. Unsatisfactory Soils: Soils not approved by the project geotechnical engineer.

D. Base Course: Class 2 Aggregate Base conforming to Section 26 of the Caltrans Standard Specifications

E. Engineered Fill: In general, on-site soils with an organic content of less than 3 percent by weight, free of any hazardous or deleterious materials, and meeting the gradation requirements below may be used as general engineered fill to achieve project grades, except when special material is required.

Engineered fill material should not contain rocks or lumps larger than 3 inches in greatest dimension, should not contain more than 15 percent of the material larger than 1-1/2 inches, and should contain at least 10 percent passing the No. 200 sieve. In addition to these requirements, import fill should have a low expansion potential as indicated by Plasticity index of 12 or less, or Expansion Index of less than 20.

Some of the on-site sandy soils may not meet the above minimum 10% fine grained material specification (% passing the #200 sieve). Contractor shall notify the District Representative if soils to be used for fill do not meet the fine grained material specification. These soils may be used for the berming and land-forming, but should not be used under pavements or structures unless authorized by District Representative.

All import fills should be approved by the project geotechnical engineer prior to delivery to the site. At least five (5) working days prior to importing to the site, a representative sample of the proposed import fill should be delivered to the project geotechnical laboratory for evaluation.

F. Bedding Course (Pipe Bedding): Free draining sand approved by the project geotechnical engineer.

G. Drainage Course: Free draining, clean drain rock or 3/8 inch pea gravel where vapor transmission through slabs is unfavorable. Where moisture transmission is not an issue, on site soils or clean drain rock approved by the project geotechnical engineer shall be use.

H. Backfill: Free draining sand approved by the project geotechnical engineer, unless concrete or sand-cement slurry is specified and approved by the project geotechnical engineer.

2.2 ACCESSORIES

A. Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility; colored to comply with local practice or requirements of authorities having jurisdiction.

B. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored to comply with local practice or requirements of authorities having jurisdiction.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.

B. Protect and maintain erosion and sedimentation controls during earth moving operations.

C. Surface vegetation and organic laden soils should be stripped to an estimated depth of 3 inches.

1. Required stripping depth should be determined in the field and approved by the District Representative.

3.2 EXCAVATION, GENERAL

A. All areas that are to support engineered fill, building foundations, concrete slabs-on-grade, or pavements should be subexcavated at least 18 inches below existing grade. Subexcavations should extend 5 feet beyond the perimeters of buildings and at least 3 feet beyond the perimeters of concrete slabs and pavements.

B. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

C. Stormwater Infiltration Basins: All excavation under the bottom of the stormwater basins should be excavated to within 2 inches of the grades indicated in the plans. The excavation within the infiltration zone shall not be compacted. Cut and fill slopes should be constructed at no greater than 4:1 (horizontal to vertical).

3.3 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.

B. Excavations at Edges of Tree- and Plant-Protection Zones:

1. Excavate by hand to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
2. Cut and protect roots according to requirements in Section 015639 "Temporary Tree and Plant Protection."

3.4 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.5 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.

B. Where utilities extend beyond Park property, excavate trenches as prescribed by jurisdictional agency. For excavation of water and sewer utilities outside of Park property, follow MCWD Specification Section 02223 “Trenching, Backfilling, and Compacting.”

C. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit unless otherwise indicated.

1. Clearance: As indicated in the design plans.

D. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.

E. Trenches in Tree- and Plant-Protection Zones:

1. Hand-excavate to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
2. Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities.
3. Cut and protect roots according to requirements in Section 015639 "Temporary Tree and Plant Protection."

F. The maximum allowable length of open trench shall be 600 feet, or the distance necessary to accommodate the amount of pipe installed in a single day, whichever is less. Within developed areas, the length of open trench may be restricted as determined by the encroachment permit from the city or the agency having jurisdiction.

3.6 SUBGRADE INSPECTION

A. Proof-roll subgrade below the building slabs and pavements with a pneumatic-tired dump truck to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

B. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by District’s Representative, without additional compensation.

3.7 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi, may be used when approved by District's Representative.

1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by District's Representative.

3.8 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.9 UTILITY TRENCH BACKFILL

A. Place backfill on subgrades free of mud, frost, snow, or ice.

B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

C. Trenches under Footings: Trenches under footings are not expected.

D. Trenches near footings: Utility trenches shall be deepened so that the bearing surfaces are below an imaginary plane having an inclination of 1.5:1 (horizontal to vertical). This imaginary plane should be drawn extending upward from the bottom edge of the adjacent utility trench.

E. Pipe zone backfill: Place and compact initial backfill of satisfactory soil (free draining sand) to a height of 12 inches over the pipe or conduit. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit.

1. Backfill in lifts of 8 inches of uncompacted thickness. Compact to 90 percent relative compaction.

2. In areas to be paved, backfill in lifts of 6 inches of uncompacted thickness. The upper 8 inches of backfill should be compacted to a minimum of 95 percent relative compaction.

3. Coordinate backfilling with utilities testing.

F. Place and compact final backfill of satisfactory soil to final subgrade elevation.

G. Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

3.10 SOIL FILL

A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

B. Place and compact fill material in layers to required elevations as follows:

1. Under grass and planted areas, use satisfactory soil material.
2. Under walks and pavements, use satisfactory soil material.
3. Under steps and ramps, use engineered fill.
4. Under building slabs, use engineered fill.
5. Under footings and foundations, use engineered fill.

3.11 SOIL MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to between 1 and 3 percent of optimum moisture content.

1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.12 COMPACTION OF SOIL BACKFILLS AND FILLS

A. Engineered fills consisting of on-site or imported soils should be compacted to a minimum of 90 percent relative compaction. The moisture content of the material should be brought to between 1 and 3 percent above the laboratory optimum value before compaction is performed.

B. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

C. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

D. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 1557:

1. Under walkways and pavements, scarify and compact top 8 inches below subgrade and compact each layer of backfill or fill soil material at 95 percent.
2. For utility trenches, refer to Section 3.9 Utility Trench Backfill above.

E. Where fill is to be placed on existing slopes with an inclination of 5:1 (horizontal to vertical) or steeper, the fill should be keyed and benched into the existing slope per Detail 1 on Sheet C7-01.

3.13 GRADING

A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

B. Generally, permanent cut and fill slopes in sandy soil should be constructed at inclination no steeper than 3:1 (horizontal to vertical).

C. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:

1. Turf or Unpaved Areas: Plus or minus 1 inch
2. Walks: Plus or minus 1/10 inch
3. Pavements: Plus or minus 1/10 inch

D. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch when tested with a 10-foot straightedge.

3.14 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

A. Place base course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place base course under pavements and walks as follows:

1. Shape base course to required crown elevations and cross-slope grades.
2. Place base course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
3. Compact base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.

3.15 FIELD QUALITY CONTROL

A. Testing Agency: The Contractor will engage a qualified geotechnical engineering testing agency to perform tests and inspections.

B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.

C. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by District's Representative.

D. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.16 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.17 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off the District's property.

END OF SECTION 312000

SECTION 32 17 13

PARKING BUMPERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes wheel stops.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 PARKING BUMPERS

A. Concrete Wheel Stops: Precast, steel-reinforced, air-entrained concrete, 4000-psi minimum compressive strength, 4-1/2 inches high by 9 inches wide by 48 inches long. Provide chamfered corners, transverse drainage slots on underside, and a minimum of two factory-formed or -drilled vertical holes through wheel stop for anchoring to substrate.

1. Mounting Hardware: Galvanized-steel spike or dowel, 1/2-inch diameter, 10-inch minimum length.

2. Color: Standard Concrete

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Install wheel stops according to manufacturer's written instructions unless otherwise indicated.

B. Securely anchor wheel stops to pavement with hardware in each preformed vertical hole in wheel stop as recommended in writing by manufacturer.

END OF SECTION 321713

SECTION 32 17 23

PAVEMENT MARKINGS AND MARKERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes painted markings applied to concrete pavement, in the parking lot.

B. For pavement markings on Bear Creek Road, see plan sheet SS-1.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For each exposed product and for each color and texture specified.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide painted markings by the following:

1. Aexcel Inc.
2. Benjamin Moore & Co.
3. Color Wheel Paints & Coatings.
4. Columbia Paint & Coatings.
5. Conco Paints.
6. Coronado Paint; Division of INSL-X Products Corporation.
7. Diamond Vogel Paints.
8. Dunn-Edwards Corporation.
9. Ennis Traffic Safety Solutions, Inc.
10. Frazee Paint.
11. General Paint.
12. Kwal Paint.

13. M.A.B. Paints.
14. McCormick Paints.
15. Miller Paint.
16. Parker Paint Mfg. Co. Inc.
17. PPG Industries.
18. Pratt & Lambert.
19. Rodda Paint Co.
20. Rohm and Haas Company; a subsidiary of The Dow Chemical Company.
21. Scott Paint Company.
22. Sherwin-Williams Company (The).
23. Approved Equivalent

2.2 PAVEMENT-MARKING PAINT

A. Pavement-Marking Paint: MPI #32, alkyd traffic-marking paint.

1. Color: As indicated.

B. Pavement-Marking Paint: MPI #97, latex traffic-marking paint.

1. Color: As indicated.

C. Glass Beads: AASHTO M 247, Type 1 made of 100 percent recycled glass.

PART 3 - EXECUTION

3.1 PAVEMENT MARKING

A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with District's Representative.

B. Allow paving to age for a minimum of 30 days before starting pavement marking.

C. Sweep and clean surface to eliminate loose material and dust.

D. Apply paint with mechanical equipment to produce pavement markings, of dimensions indicated, with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils.

1. Apply graphic symbols and lettering with paint-resistant, die-cut stencils. Apply paint so that it cannot run beneath the stencil.
2. Broadcast glass beads uniformly into wet markings at a rate of 6 lb/gal.

END OF SECTION 321723

SECTION 354237
ROCK SLOPE PROTECTION

SECTION 354237
ROCK SLOPE PROTECTION

1. GENERAL

1.1 DESCRIPTION

A. Work within this section shall include furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in placing, Rock Slope Protection (RSP), Rock Slope Buttresses, Rock Energy Dissipaters, Rock Inlet Protection, backing layers, backfill and geotextile fabric where shown on the Drawings, specified herein, or as otherwise directed by the Engineer. Stone protection, rock slope protection, and riprap are interchangeable in these Specifications and Drawings.

B. All loading, transport, temporary stockpiling, processing and mixing of stone materials to achieve designated gradations, washing, on-site hauling, excavation, preparation of sub-grade, placement, embedment, backfill, grading, compaction, finish grading, clean-up, and off-haul and disposal of excess materials needed to install all Rock Slope Protection work, where incorporated in the work, shall be considered as included in the applicable bid item unit price, and no additional compensation will be allowed.

C. The location, alignment, angles, elevations, grades, slopes, dimensions, etc. of the proposed treatments, and structures as described in this section are shown on the Project Plans to provide a basis for construction and bidding purposes. The Engineer is expected to make minor revisions and provide direction in the field to fit any varying field conditions. The Contractor shall include all costs for working under the direction of the Engineer in his/her bid for this work, as no additional compensation will be allow therefore.

D. The Contractor is hereby notified that the Engineer may direct the Contractor to place additional stone materials (not shown on the Plans) at select locations within the project work treatment areas to fit existing conditions at the time of construction. Any such additional stone materials and placement shall be considered as included in the unit prices paid for the designated stone materials as described elsewhere in these Technical Specifications and no additional compensation shall be allowed for.

E. Related sections:

1. Section 334000, Storm Drainage Facilities
2. Section 312319, Dewatering
3. Section 312316, Stripping and Excavation

1.2 SUBMITTALS

A. Submit to the Engineer, for review, the following:

1. Manufacturer's product data and installation instructions for specified geotextile fabrics.

2. Certified weights of the rock delivered to the site.
3. Certificate(s) and other material testing data as necessary to validate the source of the Rock Materials and their conformance with the Standard Specifications and these Technical Specifications. Include all applicable test results for grading, specific gravity, resistance to degradation, absorption, durability index, and soundness (as described elsewhere in these Technical Specifications).
4. A representative 5 cubic yard sample of each of the proposed Rock Materials specified herein shall be delivered to the site for inspection and approval of the Engineer, ten days prior to delivery of the remainder of material to the project site. The Engineer reserves to the right to reject said materials.
5. Sampling and Testing Assistance. Any difference of opinion between the Engineer and the Contractor shall be resolved by dumping and checking the gradation of the two random truck loads of rock. Mechanical equipment, a sorting site and labor needed to assist in checking gradation shall be provided by the Contractor at no additional cost to the Client.

1.3 QUALITY ASSURANCE

A. Tolerances. Place rock to a vertical tolerance of minus 2 to plus 3 inches.

B. Subgrade Preparation. Prior to placement of rock, Engineer shall verify subgrade preparation, and placement of fabric for rock. Where backing is shown on the Drawings, Engineer shall verify subgrade preparation and backing placement prior to placement of outer rock course.

2. PRODUCTS

2.1 MATERIALS

A. Salvaged Rock Material. Native rock found on site may be salvaged for reuse, subject to compliance with the material requirements for the intended use, and subject to the approval by the Engineer. The Engineer may require the Contractor to provide testing (e.g. gradation curve, hardness, etc.) to ensure that materials are suitable for reuse. Salvaged creek bed material shall be placed on a hardened surface or other suitable material (i.e. steel plate, pavement, filter fabric) in order to protect the said material from contamination or mixing with other soils, earthen material and debris. The Engineer may, at his sole discretion, waive certain testing requirements to facilitate the Contractor's use of locally salvaged materials.

B. Rock materials and gradation shall conform to Section 72-2.02 Materials of the State Standard Specifications. Stones shall be sound, durable, hard, resistant to abrasion and free from laminations, weak cleavage planes, and the undesirable effects of weathering. It shall be of such character that it will not readily disintegrate from the action of air, water, or the typical conditions experienced during handling and placing. All aggregate material shall be clean and free from deleterious impurities, including alkali, earth, clay, refuse, and adherent coatings.

C. Rock size classes not designated below shall be as shown on the Drawings, or as directed by the Engineer. All stone, rock, aggregate materials, and soils imported to the site shall be from a certified "Weed Free" source approved by the District.

D. RSP. Comply with Section 72 of the State Standard Specifications for the rock classes indicated on the Drawings. RSP shall be sub-angular to angular.

E. Gabion Rock. Comply with Section 72-2.02B of the State Standard Specifications for Class No. 2 rock gradation for Method B placement. Gabion rock shall be angular.

F. Rock Slope Protection Fabric. Rock slope protection fabric shall conform to the notes on the Drawings.

3. EXECUTION

3.1 GENERAL

A. All rock materials shall be placed in such a manner as to smoothly conform to adjacent graded areas. Smaller rock shall be chinked into the margins of larger rock placements, as necessary to conform to earthwork and prevent migration of fines from adjacent graded areas into the rock matrix.

3.2 ROCK SLOPE PROTECTION FABRIC

A. Place a layer of geotextile fabric below the first rock layer, where shown on the Drawings. At the time of installation, the geotextile shall be rejected if it has defects, rips, holes, flaws, deterioration, or damage incurred during manufacture, transportation, or storage. Prepare surface to receive the geotextile to a relatively smooth condition, free of obstructions, depressions, debris, and soft or low density pockets of material. Place geotextile with the long dimension parallel to flow and laid smooth and free of tension, stress, folds, wrinkles, or creases. Place the strips to provide a minimum width of 18 inches of overlap for each joint. Remove the temporary pins as rock is placed to relieve tensile stress. Any geotextile fabric that is damaged during its installation shall be replaced by the Contractor at no cost to Owner.

3.3 ROCK SLOPE PROTECTION

A. Install Rock Slope Protection in accordance with Section 72 of the State Standard Specifications Method A, as modified below, and to the lines and the minimum dimensions shown on the Drawings. Where specified, place Backing per Method B and spread so as not to damage the bottom layer of the geotextile fabric. Place rock so as to minimize the number of voids. Rock shall be placed in lifts with a thickness not exceeding the D100 of the specified stone. Each lift shall be backfilled to half its depth with native granular soils, prior to placement of the subsequent lift. Backfill shall be placed in a manner that does not interfere with direct rock to rock contact of successive lifts. Backfill shall be placed to match the finished surface of the RSP and water-jetted to fill all voids, as directed by the Engineer.

3.4 ENERGY DISSIPATORS

A. The specified geometry and volume of rock shown on the Drawings at Rock Energy Dissipators is approximate. Final dimensions and rock volume may be adjusted in the field, at the direction of the Engineer, to suit field conditions.

B. Rock will not be allowed to be "dumped". Following Engineer's approval of fabric underlayment (if shown on the Drawings), the rock shall be placed as directed by the Engineer for a natural appearance, which may require hand placement of rock. The Contractor shall take all necessary measures to protect fabric, or blanket from damage (if such material is damaged the product shall be repaired per the manufacturer's recommendations, and as directed by the Engineer). All rock is to be placed to minimize the potential for movement when flow is induced into the channel and this will be accomplished by interlocking the angular nature of the rock with itself, and by placing larger stones first, with direct stone to stone contact, and then chinking the voids with the smaller materials.

C. The energy dissipator geometry shall conform to the finished grades of the slopes on all sides. Local surface irregularities of the rock rip-rap shall not vary from the planned slopes by more than four inches (4-in) measured at right angles to the slope.

3.5 ROCK LINED CHANNEL OR ROCKED ROAD SHOULDER

A. Rock will not be allowed to be "dumped". Following Engineer's approval of fabric underlayment (if shown on the Drawings), the rock shall be placed as directed by the Engineer such that rocks are tightly abutting one another, which may require hand placement of rock. The Contractor shall take all necessary measures to protect fabric, or blanket from damage (if such material is damaged the product shall be repaired per the manufacturer's recommendations, and as directed by the Engineer). All rock is to be placed to minimize the potential for movement when flow is induced into the channel and this will be accomplished by interlocking the angular nature of the rock with itself, with direct stone to stone contact, and then chinking the voids with the smaller materials. The geometry shall conform to the finished grades of the slopes and road surface on all sides. Local surface irregularities of the rock rip-rap shall not vary from the planned slopes by more than four inches (4-in).

3.6 GABION ROCK BASE

A. Where gabion rock is shown on the Drawings as a base course, the gabion rock shall be installed following approval of subgrade (including chokers) and geosynthetic fabric. The Contractor shall take all necessary measures to protect fabric from damage (if such material is damaged the product shall be replaced or repaired per the manufacturer's recommendations, and as directed by the Engineer). Local surface irregularities of the gabion rock shall not vary from the planned grades by more than two inches (2-in) as measured perpendicular to the slope.

4. MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Rock Slope protection (RSP), Gabion Rock Base, Rocked Buttresses, Rock Energy Dissipators (RED's), Rock Inlet Protection at stream crossing or ditch relief culverts, and Rocked Shoulders or Ditches shown or noted on the Drawings shall not be independently measured for payment. The cost of this work shall be included in the lump sum price for the related work.

B. Where additional rock slope protection (not shown on the Drawings) is placed at the request of the Engineer to form slope protection, energy dissipators, or inlet protection, this Rock Slope Protection will be measured by the cubic yard, independent of Class of rock, calculated to the nearest cubic yard.

C. Where additional rock lined ditch or rocked shoulder (not shown on the Drawings) is placed at the request of the Engineer, this work will be measured by the linear foot of constructed rock lined ditch or rocked shoulder, installed in accordance with the notes and details on the Drawings and approved by the Engineer.

D. Volumetric measurements will be determined from the dimensions as shown on the Drawings or the dimensions constructed as directed by the Engineer. Materials placed in excess of these dimensions will not be included the measurement for payment. Surface areas will be measured to the horizontal limits parallel to the ground surface.

E. Excavation and backfill for rock slope protection will not be separately measured for payment.

4.2 PAYMENT

A. No separate payment will be made for Rock Slope protection (RSP), Rocked Buttresses, Gabion Rock Base Course, Rock Energy Dissipators (RED), Rock Inlet Protection, and Rocked Shoulders or Ditches shown on the Drawings. All costs in connection with this work will be considered incidental to the lump sum contract price for the associated work or "Map Point".

B. Additional Rock Slope Protection, rock energy dissipators, or rocked inlet protection, measured as specified above, will be paid for at the contract price per cubic yard, which price will be payment in full for furnishing all labor, materials, tools, equipment, and incidentals necessary to complete the riprap placement, including subgrade preparation, geotextile fabric, processing work, backfill of voids, excavation and fill.

C. Additional Rock lined ditch or rocked shoulder that is not shown on the Drawings, but that is constructed at the request of the Engineer, measured as specified above, will be paid for at the contract price per linear foot, which price will be payment in full for furnishing all labor, materials, tools, equipment, and incidentals necessary to complete the construction of the rocked shoulder or rock lined ditch, including subgrade preparation, geotextile fabric, processing work, backfill of voids, excavation and fill.

D. No separate payment will be made for excavation and backfill incidental to slope protection work. All costs in connection with this work will be considered incidental to the cost of construction of the associated slope protection work.

E. Payment for rock not shown on the Drawings, but placed at the request of the Engineer, will be made under:

Pay Item		Pay Unit
Rock Slope Protection	(light class)	CY
RSP (1/4 Ton)		CY
RSP (1/2 Ton)		CY
RSP (1 Ton)		CY
Rock Lined Ditch		LF
Rocked Shoulder		LF

END OF SECTION