Codornices Creek Trail Connection Design

Conservancy Program(s)
San Francisco Bay Program

Project Type(s)
Access
Habitat Restoration or Enhancement

City(s)
Albany

County(s)
Alameda

Region(s)
San Francisco Bay

Trail Miles
0.13 Miles

Conservancy Contribution
$129,440

Total Project Cost
$129,440

Partner(s)
City of Albany
Restoration Design Group (RDG)

Assembly District(s)
15

State Senate District(s)
9

Congressional District(s)
13

State Coastal Conservancy

1330 Broadway 13th Floor
Oakland, CA 94612

Phone: 510-286-1015
Fax: 510-286-0470
www.scc.ca.gov

Description

To assist the City of Albany's development of the next phase of creek restoration and trail connection along Codornices Creek, the Conservancy contracted with a private design firm for engineering designs for creek enhancement and public access trail construction between 8th and 10th Streets along Codornices Creek. The Conservancy has funded previous creek restoration and trail construction projects in the adjacent downstream stretches of Codornices Creek and this design contract will build on the Conservancy's investment in this area. The design plans were completed in Dec. 2014.

Conservancy Staff: Brenda Buxton

Codornices Creek Trail Connection Project: 8th to San Pablo Avenue (SPA)						31 October 2014
Preliminary Estimate of Probable Construction Costs						
Project Element	**Task**	**Qty.**	**Unit**	**Unit Price**	**Subtotal**	**Total**
GENERAL CONDITIONS (~20% of and assumed $800,000 bid value)						
Mobilization / Demobilization	5% max. of bid	1	LS	$40,000.00	$40,000.00	
Bond	2% of bid	1	LS	$16,000.00	$16,000.00	
SWPPP	1.5% of bid	1	LS	$12,000.00	$12,000.00	
Layout Surveying	survey grade staking	1	LS	$7,500.00	$7,500.00	
Pre-Construction Reports	SWPPP, health/safety, staging	1	LS	$7,500.00	$10,000.00	
Construction Fencing	chain link temporary construction fencing	1,000	LF	$5.00	$5,000.00	
Traffic Control	5% of bid	1	LS	$40,000.00	$40,000.00	
					Subtotal	**$130,500.00**
SITE PREPARATION/DEMOLITION						
Clear/Grub						
	general clear/grub	24,500	SF	$0.50	$12,250.00	
	fell trees at 8th street	1	EA	$500.00	$500.00	
	fell and transplant trees west/east of ball field	4	EA	$500.00	$2,000.00	
	fell trees at 10th street to san pablo avenue	1	EA	$500.00	$500.00	
	vegetation disposal fees	1	LS	$5,000.00	$5,000.00	
					Subtotal	**$20,250.00**
Concrete Demolition, Haul/Dispose	*(add'l. costs for COB 10th St. Not Included)*					
	demo 8th St. sidewalk and curb west	32	TN	$250.00	$8,000.00	
	demo 8th St. sidewalk and curb east	26	TN	$250.00	$6,500.00	
	demo curb at parking east of 8th	105	LF	$30.00	$3,150.00	
	demo 8th St. AC	4,500	SF	$4.50	$20,250.00	
	demo existing dg path	550	SF	$2.00	$1,100.00	
	demo gate and fencing sections	1,100	LF	$4.00	$4,400.00	
	demo 10th St. sidewalk and curb west	15	TN	$250.00	$3,750.00	
	demo 10th St. sidewalk and curb east	22	TN	$250.00	$5,500.00	
	demo 10th St. AC	2,600	SF	$4.50	$11,700.00	
	demo concrete and AC at SPA	44	TN	$250.00	$11,000.00	
	concret debris haul (AC included in sf cost)	139	TN	$100.00	$13,900.00	
					Subtotal	**$89,250.00**
Miscellaneous Demolition						
	bollards	30	EA	$75.00	$2,250.00	
	drain inlets	2	EA	$750.00	$1,500.00	
	haul/disposal	50	TN	$100.00	$5,000.00	
					Subtotal	**$8,750.00**

GRADING						
Grading						
	excavate at 8th street for bioswale planters	150	CY	$50.00	$7,500.00	
	grading at community garden east of ball field	100	CY	$30.00	$3,000.00	
	excavate at 10th street	75	CY	$50.00	$3,750.00	
	rough and fine grading	24,500	SF	$0.40	$9,800.00	
					Subtotal	**$24,050.00**
SITE CONSTRUCTION AND FURNISHINGS						
Concrete and Drainage Structures	*(costs for SPA work are allowances only)*					
	rain garden planter walls 8th east	14	CY	$1,000.00	$14,000.00	
	rain garden planter walls 8th west	10	CY	$1,000.00	$10,000.00	
	rain garden planter curb and gutter 8th east	120	CY	$50.00	$6,000.00	
	rain garden planter curb and gutter 8th west	100	CY	$50.00	$5,000.00	
	drain inlets 8th street east and west	2	EA	$3,500.00	$7,000.00	
	8th St drain allowance (ramp and sidewalk)	1	LS	$2,500.00	$2,500.00	
	10th St drain allowance (ramp and sidewalk)	1	LS	$2,500.00	$2,500.00	
	SPA headwall allowance	1	LS	$45,000.00	$45,000.00	
	SPA area plinth for public art or signage	1	LS	$7,500.00	$7,500.00	
					Subtotal	**$99,500.00**
Paving	*(see DG paving for shoulders)*					
	sidewalk at 8th east	810	SF	$8.00	$6,480.00	
	sidewalk at 8th west	900	SF	$8.00	$7,200.00	
	concrete trail through community garden	800	SF	$8.00	$6,400.00	
	sidewalk at 10th east	100	SF	$8.00	$800.00	
	sidewalk at 10th west	300	SF	$8.00	$2,400.00	
	miscellaneous concrete detailing, ramp markers	1	LS	$2,500.00	$2,500.00	
	miscellaneous paving 8th to ball fields	1	LS	$2,500.00	$2,500.00	
	standard AC at 8th street	2,700	SF	$7.00	$18,900.00	
	permeable AC muti-use trail and 10th street	4,600	SF	$10.00	$46,000.00	
	sidewalk at SPA	1,300	SF	$8.00	$10,400.00	
	pavers at SPA landing	600	SF	$15.00	$9,000.00	
					Subtotal	**$112,580.00**
Decomposed Granite and Aggregate Paving						
	shoulders and seating off multi-use trail	650	SF	$10.00	$6,500.00	
	dg path, 8th street to ball fields and headwall	925	SF	$10.00	$9,250.00	
	aggregate paving (south of ball field area to 10th)	8,000	SF	$1.50	$12,000.00	
					Subtotal	**$27,750.00**

Boulders						
(sonoma moss rock $130/ton, no install)	boulders at 8th street headwall east retainage	10	TN	$300.00	$3,000.00	
	boulders at 8th street northeast tree retainage	7	TN	$300.00	$2,100.00	
	boulders at 10th street west	19	TN	$300.00	$5,550.00	
	boulders at 10th street east	9	TN	$300.00	$2,700.00	
	boulders at SPA	21	TN	$300.00	$6,300.00	
					Subtotal	**$19,650.00**
Log Edging and Benches						
	log benches along multi-use path 10th to SPA	40	LF	$150.00	$6,000.00	
	logs south of ball field	128	LF	$85.00	$10,880.00	
					Subtotal	**$16,880.00**
Fencing--Chain link						
assume south bank wall/fence west of SPA is	gate/fencing revisions at SE corner of sm. ball field	1	LS	$5,000.00	$5,000.00	
preserved/protected, fence at Dole Bldg. replaced	chain link fencing 10th street east to east headwall	40	LF	$50.00	$2,000.00	
					Subtotal	**$7,000.00**
Restoration Fence						
	rope and stake temporary trail side barrier	1,100	LF	$5.00	$5,500.00	
					Subtotal	**$5,500.00**
Railings						
	guardrail at 8th street east	50	LF	150	$7,500.00	
	guardrail at 10th street east	30	LF	150	$4,500.00	
	guardrail at 10th street west	20	LF	150	$3,000.00	
	headwall at SPA	40	LF	150	$6,000.00	
					Subtotal	**$21,000.00**
Signage / Pavement Striping						
	regulatory signs	1	LS	5,000	$5,000.00	
	striping (allowance)	1	LS	5,000	$5,000.00	
					Subtotal	**$10,000.00**
Interpretation	*(does not include design fees)*					
	interpretive signs	2	EA	7,500	$15,000.00	
	interpretive integrated with site work (allowance)	1	LS	20,000	$20,000.00	
					Subtotal	**$35,000.00**

Site Furnishings						
	bike rack	2	EA	1,500	$3,000.00	
	drinking fountain (allowance only)	1	LS	7,500	$7,500.00	
	trash receptacles (COB standard)	3	EA	2,500	$7,500.00	
	bollards at SPA	3	EA	2,000	$6,000.00	
	bollards at 10th street end (south)	6	EA	2,000	$12,000.00	
					Subtotal	**$36,000.00**
REVEGETATION / IRRIGATION						
Seeding						
	fine grading, harrow ripping, soil preparation	14,800	SF	$0.20	$2,960.00	
	seeding	14,800	SF	$0.50	$7,400.00	
					Subtotal	**$10,360.00**
Revegetation						
	seed and plant mix areas	3,225	SF	$2.00	$6,450.00	
	trees / 15 gallon	48	EA	$150.00	$7,200.00	
	large shrubs / 5 gallon	73	EA	$45.00	$3,285.00	
	shrubs / 1 gallon and D40	256	EA	$25.00	$6,400.00	
	mulch for plantings and paths (7,500 sf, 4" depth)	100	CY	$50.00	$5,000.00	
					Subtotal	**$28,335.00**
Irrigation						
(Meter NIC, assumes connection)	spray/rotor irrigation, pipe, quick couplers	17,000	SF	$1.50	$25,500.00	
	trees bubblers south ball field	1	LS	$2,500.00	$2,500.00	
	drip at 8th St	1,800	SF	$2.00	$3,600.00	
	point of connection allowance	1	EA	$5,000.00	$5,000.00	
	controller and electrical connections	1	LS	$7,500.00	$7,500.00	
					Subtotal	**$44,100.00**
Estimated Project Construction Subtotal						**$746,455.00**
Estimating Contingency (25%)						$186,613.75
Estimated Total Project Construction						**$933,068.75**

COST ASSUMPTIONS (partial list)	
Berkeley and Albany determination of the amount of work at 10th street will affect estimate	**NA**
10th St. North is completed by Belmont Village and is not included.	**NA**
Complete cost of SPA headwall, sidewalk, public art, and small plaza area are not covered. Basic allowance is offered.	**NA**
Meter for Irrigation is not included nor is power supply	**NA**
Lighting is not included and is assumed provided by senior housing developer, ball fields, and two cities	**NA**

CODORNICES CREEK TRAIL CONNECTION PROJECT

PUBLIC PROCESS AND TRAIL DESIGN - 8TH STREET TO SAN PABLO AVENUE

CITIES OF ALBANY AND BERKELEY, ALAMEDA COUNTY, CALIFORNIA

BID SET 1 NOVEMBER, 2014

CLIENT:

CALIFORNIA STATE COASTAL CONSERVANCY:
BRENDA BUXTON

ALBANY CITY COUNCIL:
JOANNE WILE, MAYOR
PETER MAASS, VICE MAYOR
MARGE ATKINSON, COUNCIL MEMBER
MICHAEL BARNES, COUNCIL MEMBER
ROCHELLE NASON, COUNCIL MEMBER

CITY OF ALBANY:
PENELOPE LEACH, CITY MANAGER
JEFF BOND, COMMUNITY DEVELOPMENT DIRECTOR
1000 SAN PABLO AVENUE
ALBANY, CA 94706
(510) 528-5760

PROJECT PLANNING TEAM:

CITY OF ALBANY
CITY OF BERKELEY
UNIVERSITY OF CALIFORNIA, BERKELEY

CONSULTANTS:

LANDSCAPE ARCHITECTURE:
RESTORATION DESIGN GROUP, LLC (RDG)
2612B EIGHTH STREET
BERKELEY, CA 94710
(510) 644-2798

CIVIL ENGINEERING:
SANDIS
636 9TH STREET
OAKLAND, CA 94607
(510) 873-8866

STRUCTURAL ENGINEERING:
KENNETH R. HUGHES, STRUCTURAL ENGINEER
3620 MT DIABLO BLVD. #203
LAFAYETTE, CA 94549
(925) 284-2808

SURVEY:
KISTER SAVIO & REI, INC.
825 SAN PABLO AVENUE
PINOLE, CA 94564
(510)222-4020

SHEET INDEX

CITY OF ALBANY:

Reviewed for general conformance with the Standard Specifications and Ordinances of the City of Albany.

Ray Chan,
RCE No. xxxxx, Exp. x-xx-xx

City Engineer and Public Works Director

By_____ Date: _____

APPROVED BY:

City of Albany

By:_____Date:_____

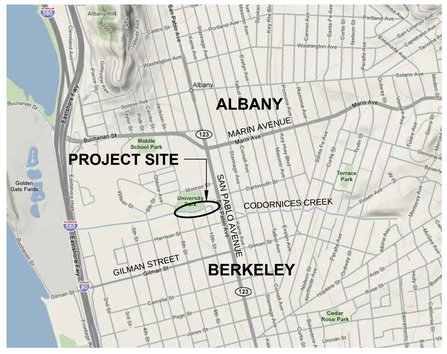
City of Berkeley

By:_____Date:_____

University of California

By:_____Date:_____

PROJECT LOCATION:



ABBREVIATIONS

AC	ASPHALT CONCRETE	MUTCD	MANUAL FOR UNIFORM TRAFFIC CONTROL DEVICES
ADA	AMERICANS WITH DISABILITIES ACT	N.I.C.	NOT IN CONTRACT
CLR	CLEAR	OC	ON CENTER
℄	CENTERLINE	O.R.	OWNER'S REPRESENTATIVE
COA	CITY OF ALBANY	PA	PLANTING AREA
COB	CITY OF BERKELEY	PP	PRESERVE AND PROTECT
DG	DECOMPOSED GRANITE	PT	POINT OF TANGENCY
(E)	EXISTING	R.O.W	RIGHT-OF-WAY
FG	FINISH GRADE	SW	SIDEWALK
FL	FLOW LINE	TB	TOP OF BANK
FS	FINISH SURFACE	TC	TOP OF CURB
GB	GRADE BREAK	TW	TOP OF WALL
HP	HIGH POINT	TBD	TO BE DETERMINED
LP	LOW POINT	TYP.	TYPICAL
L.O.W.	LIMIT OF WORK	UCB	UNIVERSITY OF CALIFORNIA BERKELEY
MM	MEET AND MATCH	UON	UNLESS OTHERWISE NOTED
MOU	MEMORANDUM OF UNDERSTANDING		

DATE	NO.	REVISIONS

DESIGN BY: BB / ES
DRAWN BY: ES / PR
CHECKED BY: BB
SCALE:
DATE: 1 NOVEMBER, 2014

Restoration Design Group, LLC
2612 Eighth Street, Suite B
Berkeley, CA 94710
T 510.644.2798 F 510.644.2799
www.restorationdesigngroup.com

CODORNICES CREEK TRAIL CONNECTION PROJECT
PUBLIC PROCESS AND TRAIL DESIGN - 8TH STREET TO SAN PABLO AVENUE

BID SET

COVER

SHEET T-1

CC4: BID SET - S:\PROJECTS\LOWER CODORNICES CREEK_PHASE IV\7 AUTOCAD\WORKING DRAWINGS\L-5-COVER.DWG
PLOTTED ON: 10/31/2014

NOTES

1. LIMIT OF WORK AND PROJECT PERIMETER FENCE LAYOUT SHALL BE DETERMINED BY O.R. AND CONTRACTOR AT PROJECT INITIATION. FENCING CAN BE ADJUSTED AND REALIGNED AS REQUIRED TO PROVIDE FOR PUBLIC SAFETY, SITE SECURITY AND CONSTRUCTION ACCESS.
2. MAINTAIN PROJECT PERIMETER FENCE FOR THE DURATION OF THE CONSTRUCTION PERIOD.
3. PROTECT ALL IMPROVEMENTS NOT NOTED FOR DEMOLITION.
4. PP ALL UTILITIES UNLESS OTHERWISE NOTED.
5. LEGALLY DISPOSE OF ALL MATERIAL CLEARED, GRUBBED, DEMOLISHED, OR SALVAGED BUT NOT UTILIZED FOR PROJECT OR ACCEPTED BY OWNER. STOCKPILE ALL MATERIALS NOTED ON PLANS FOR REUSE AS DIRECTED BY O.R.
7. PROVIDE STORM INLET PROTECTION MEASURES AT ALL DI'S WITHIN THE PROJECT SITE.
8. SALVAGE (E) IRRIGATION COMPONENTS AS FEASIBLE AND RETURN TO OWNER. SALVAGED COMPONENTS, IF DEEMED IN PROPER WORKING ORDER AND IF APPROVED BY O.R., MAY BE RE-USED IN PROJECT IRRIGATION INSTALLATION.
9. PROVIDE SWPPP AND ENSURE COMPLIANCE THROUGHOUT THE DURATION OF CONSTRUCTION.
10. SEE PLAN SET FOR ADDITIONAL NOTES.
11. THROUGHOUT SITE AND CREEK, REMOVE ALL LITTER AND DEBRIS AT THE COMPLETION OF THE PROJECT.
12. SURVEY FILE AVAILABLE AT COA UPON REQUEST.

LEGEND

- PROPERTY BOUNDARY
- CODORNICES CREEK MOU LINE
- LIMIT OF WORK (SHOWN SCHEMATICALLY)
- FENCING, GATES, WALLS, CURBS AND FOOTINGS TO BE REMOVED AND/OR SALVAGED.
- AREA TO BE CLEARED AND GRUBBED, SEE DEMOLITION NOTES.
- PAVING TO BE DEMOLISHED, SEE DEMOLITION NOTES AND SPECIFIC NOTES ON PLAN.
- TREES TO REMAIN
- UTILITY POLE, LIGHT POLE, AND GUY WIRE, PRESERVE AND PROTECT, UON.
- BOLLARD TO BE REMOVED
- TREE TO BE REMOVED / SALVAGED
- CONSTRUCTION ACCESS

RED OAK AVENUE

JACKSON STREET

IF UC ADDS THIS WORK TO PROJECT SCOPE, PREPARE SITE TO ACCEPT CROSSWALK AND CURB RAMP.

PP UTILITY STANDPIPES, STOP SIGN, LIGHT POST AND TREE IN THIS AREA. SAW-CUT CURB AND AC PAVING, CUT BACK SOD TO PREPARE FOR RAMP AND REMOVE/SALVAGE STOP SIGN FOR RELOCATION, SEE PLANS. PP / MODIFY IRRIGATION PER O.R. DIRECTION.

IF UCB ADDS THIS WORK TO PROJECT SCOPE, PREPARE SITE TO ACCEPT RAMP. ONE OR TWO TREE RELOCATIONS ARE POSSIBLE. CUT BACK SOD TO ALLOW FOR GRADING. PP / MODIFY IRRIGATION PER O.R. DIRECTION. PP SIGNAGE ALONG JACKSON ST. SIDEWALK.

PP DRAIN INLET (NOT SHOWN)

SAW CUT AND REMOVE ASPHALT TO ALLOW FOR IMPROVEMENTS, SEE PLANS. FINAL SAW-CUT LOCATION BY O.R.

PP CURB AND GUTTER

PP DRIVE RAMP

PP GAS LINE

CITY OF ALBANY AND UC BERKELEY

ABOVE THIS LINE, SITE LAYOUT ADDED TO BASE PLAN (VERIFY IN FIELD)

BELOW THIS LINE, BASE PLAN DERIVED FROM KSR SURVEY

PARTIALLY REMOVE MOUNDED SOIL TO ALLOW FOR SIDEWALK IMPROVEMENTS AND ROCKERY, SEE PLANS. REMOVE DYING OAK TREE.

REMOVE WOOD FENCE

SAW-CUT AND DEMOLISH CURB FROM THIS POINT - VERIFY IN FIELD WITH O.R.

REMOVE BOLLARDS AND SIGNAGE IN STREET, TYP. SALVAGE SIGNAGE AND RETURN TO OWNER IF REQUESTED.

SAW-CUT AND DEMOLISH CURB AND PARTIAL SIDEWALK FROM THIS POINT

PP UTILITIES, TYP.

PLANTING ISLAND

PP PAVING, PLANTING ISLAND, CURBS, SIGNAGE AND UTILITIES IN PARKING LOT, UON.

REMOVE UTILITY POLE IF DIRECTED BY UCB OR COA.

REMOVE TRELLIS AND GATE, SALVAGE WOOD TO UCB IF DIRECTED BY O.R.

REMOVE ALL NON-NATIVE PLANTS AND PP NATIVE PLANTS PER O.R. DIRECTION. PRUNE TREES AS DIRECTED BY O.R.

REMOVE WOOD FENCE FROM NEAREST POST PER O.R. DIRECTION, SALVAGE WOOD AND RETURN TO OWNER IF REQUESTED BY O.R.

PP UTILITY BOX

PP UTILITY POLE

PP CONCRETE PAVING AND FURNISHINGS AT BACK OF SIDEWALK

OAK TREE TO REMAIN, PRUNE AS DIRECTED BY O.R. CLEAR AND GRUB BY HAND UNDER TREES TO REMAIN, TYP.

PP CURB, UON

PP FENCE SECTIONS AND VINES PER O.R. DIRECTION.

DEMOLISH CONCRETE PAVING AND BOLLARDS. SALVAGE ALL SIGNAGE AND RETURN TO OWNER OR RELOCATE PER O.R. DIRECTION.

DEMOLISH DRAIN INLET, WEST SIDE OF 8TH STREET. PATCH (E) CONNECTION TO CULVERT.

DEMOLISH SPEED BUMP

PP TREES, UON

DEMOLISH DRAIN INLET, EAST SIDE OF 8TH STREET. PATCH (E) CONNECTION TO CULVERT.

PP TREE, TREE GRATE AND FRAME PER O.R. DIRECTION.

(E) BUCKEYE TREE TO REMAIN, PRUNE AS DIRECTED BY O.R.

IF OVERLOOK IS ADDED TO PROJECT SCOPE, REMOVE STEEL PIPE RAILING FROM TOP OF HEADWALL (HEADWALL IS EXISTING).

PP LIGHT POLE AND UTILITY BOX.

PP UTILITY POLE

PP CULVERT

PP BOLLARDS AND PAVING STRIP

PP ELECTRICAL TRANSFORMER AND CONCRETE PAD

IF PRIVATE PROPERTY OWNER AGREES TO PROPOSED IMPROVEMENTS, DEMOLISH CHAIN-LINK FENCE TO NEAREST POST PER O.R. DIRECTION, SEE PLANS. REMOVE POST FOOTINGS.

PP/ MODIFY OUTFALL DRAINS, SEE PLANS

(E) CODORNICES CREEK TRAIL

REMOVE TREE

USPS WALL

PP PLANTS IN THIS AREA

TRANSPLANT / PRUNE PLANTS AS DIRECTED BY O.R. AND ADJUST IRRIGATION AS REQUIRED; ENSURE IRRIGATION IS FULLY FUNCTIONING AT ALL TIMES DURING CONSTRUCTION.

SAW-CUT AND REMOVE CONCRETE SIDEWALK, CURB, GUTTER AND ASPHALT TO ALLOW FOR IMPROVEMENTS, SEE PLANS

REMOVE SIDEWALK AND CURB, BOTH SIDES OF 8TH STREET AS SHOWN.

PP SIDEWALK

10'-6"

USPS

SIDEWALK

8TH STREET

SIDEWALK

PP TRIM VINES ALONG FENCE PER O.R. DIRECTION. CLEAR AND GRUB BY HAND UNDER VINES.

PP FENCE SECTIONS AND VINES PER O.R. DIRECTION.

SELECTIVELY PRUNE PLANTS ALONG NEW PATH ALIGNMENT AS DIRECTED BY O.R.

DEMOLISH PATH. IF APPROVED BY O.R., SALVAGE AND STOCKPILE MATERIAL FOR USE UNDER AGGREGATE PAVING SOUTH OF BASEBALL FIELD, SEE PLANS.

REMOVE FENCING TO THE NEAREST POSTS PER O.R. DIRECTION TO ACCOMODATE OPENING AND CONCRETE PAVING PER PLANS.

ALBANY

BERKELEY

CODORNICES CREEK

PER O.R. DIRECTION, CLEAR AND GRUB TO TOP OF BANK , AND PP NATIVE PLANTS PER O.R. DIRECTION, TYP.

NO WORK IN CHANNEL

CITY OF BERKELEY

BUILDING

MATCHLINE

PREPARE 8'-10' WIDE TRAIL CONSTRUCTION CORRIDOR THROUGH COMMUNITY GARDEN AREA. COORDINATE ALL WORK WITH UCB AND COMMUNITY GARDEN REPRESENTATIVE (RICHARD REGISTER). WORK SHALL INCLUDE TRANSPLANTING TREES AND SHRUBS, MULCHING ALL AFFECTED VEGETATION, AND TEMPORARY IRRIGATION. SOIL REMOVAL OR RELOCATION AS DIRECTED BY O.R. ACTUAL CORRIDOR ALIGNMENT SHALL BE DETERMINED IN FIELD.

BUILDING

CB (SIDE OPENING) RIM=30.28 INV=N/A

SELECTIVE TRANSPLANT / REPLANT AND CLEAR AND GRUB ZONES. WORK IN THESE AREAS SHALL BE DIRECTLY SUPERVISED BY O.R. AND COMMUNITY GARDEN REPRESENTATIVE. IRRIGATE ALL TRANSPLANTS UNTIL FINAL PROJECT ACCEPTANCE.

CODORNICES CREEK MOU LINE

PP UTILITY POLE

PP CONCRETE WALKWAY / RAMP TO AC PAVING.

PP WOOD FENCING

PP DRAIN INLET AND PIPING

DUGOUT

SAW-CUT AND REMOVE CURB TO ALLOW FOR IMPROVEMENTS, SEE PLANS.

REMOVE BOLLARDS, TYP. GRIND TO FS OF AC AND FILL WITH CONCRETE GROUT TO MM AC FS.

REMOVE SURFACING TO ALLOW FOR PATH, SEE PLANS.

REMOVE FENCING TO NEAREST POSTS PER O.R. DIRECTION TO ACCOMODATE PAVING, SEE PLANS.

DEMOLISH FOOTPATH

CLEAR, GRUB AND GRADE FOOTPATH TO ACCEPT NEW ALIGNMENT. O.R. TO DIRECT IN FIELD. PP / RELOCATE LOG SEATING PER O.R. DIRECTION.

BALL FIELD

PP CONCRETE PAD

PP TRELLIS, REMOVE AND SALVAGE GATES TO UCB.

PP WOOD FENCING

PREPARE SURFACING BETWEEN FENCING AND BACKSTOP TO ACCEPT IMPROVEMENTS (BY OTHERS), SEE PLANS.

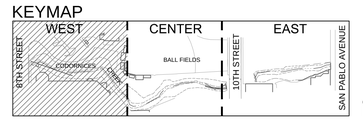
PER O.R. DIRECTION, CLEAR AND GRUB TO TOP OF BANK , AND PP NATIVE PLANTS PER O.R. DIRECTION.

REMOVE CHAIN-LINK FENCING AND ALL CONCRETE FOOTINGS AS DIRECTED BY O.R.

APPROXIMATE TOP OF BANK

DEMOLISH FOOTPATH

KEYMAP



0 10 20 Feet

DATE	NO.	REVISIONS

DESIGN BY: BB / ES
DRAWN BY: ES / PR
CHECKED BY: BB
SCALE: 1" = 10'-0"
DATE: 1 NOVEMBER, 2014

Restoration Design Group, LLC
2612 Eighth Street, Suite B
Berkeley, CA 94710
T 510.644.2798 F 510.644.2799
www.restorationdesigngroup.com

CODORNICES CREEK TRAIL CONNECTION PROJECT

PUBLIC PROCESS AND TRAIL DESIGN - 8TH STREET TO SAN PABLO AVENUE

BID SET

DEMOLITION (WEST)

SHEET L-1.1

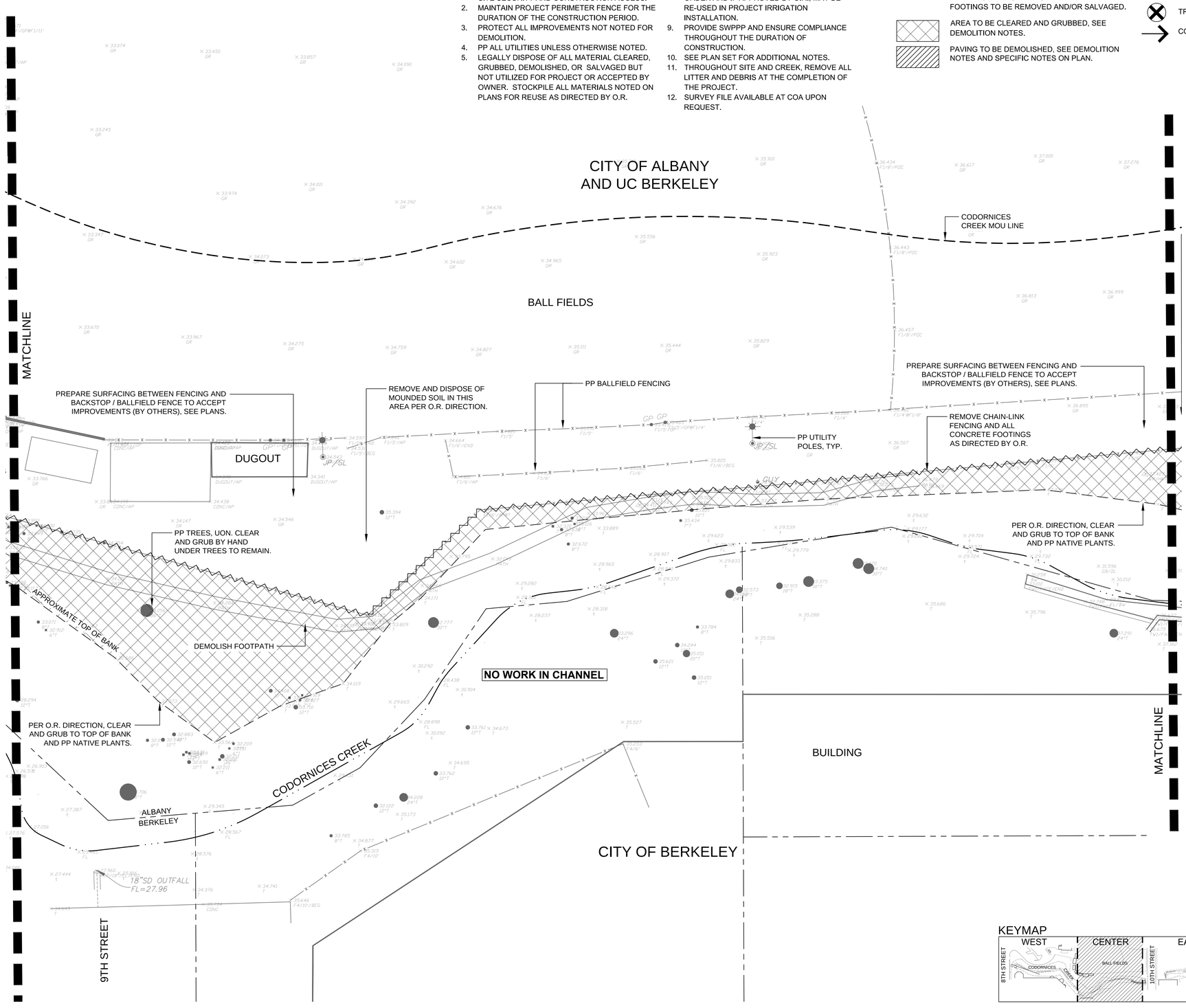
CC4: BID SET - S:\PROJECTS\LOWER CODORNICES CREEK_PHASE IV\7 AUTOCAD\WORKING DRAWINGS\LS-DEMO.DWG
PLOTTED ON: 10/31/2014

NOTES

1. LIMIT OF WORK AND PROJECT PERIMETER FENCE LAYOUT SHALL BE DETERMINED BY O.R. AND CONTRACTOR AT PROJECT INITIATION. FENCING CAN BE ADJUSTED AND REALIGNED AS REQUIRED TO PROVIDE FOR PUBLIC SAFETY, SITE SECURITY AND CONSTRUCTION ACCESS.
2. MAINTAIN PROJECT PERIMETER FENCE FOR THE DURATION OF THE CONSTRUCTION PERIOD.
3. PROTECT ALL IMPROVEMENTS NOT NOTED FOR DEMOLITION.
4. PP ALL UTILITIES UNLESS OTHERWISE NOTED.
5. LEGALLY DISPOSE OF ALL MATERIAL CLEARED, GRUBBED, DEMOLISHED, OR SALVAGED BUT NOT UTILIZED FOR PROJECT OR ACCEPTED BY OWNER. STOCKPILE ALL MATERIALS NOTED ON PLANS FOR REUSE AS DIRECTED BY O.R.
7. PROVIDE STORM INLET PROTECTION MEASURES AT ALL DI'S WITHIN THE PROJECT SITE.
8. SALVAGE (E) IRRIGATION COMPONENTS AS FEASIBLE AND RETURN TO OWNER. SALVAGED COMPONENTS, IF DEEMED IN PROPER WORKING ORDER AND IF APPROVED BY O.R., MAY BE RE-USED IN PROJECT IRRIGATION INSTALLATION.
9. PROVIDE SWPPP AND ENSURE COMPLIANCE THROUGHOUT THE DURATION OF CONSTRUCTION.
10. SEE PLAN SET FOR ADDITIONAL NOTES.
11. THROUGHOUT SITE AND CREEK, REMOVE ALL LITTER AND DEBRIS AT THE COMPLETION OF THE PROJECT.
12. SURVEY FILE AVAILABLE AT COA UPON REQUEST.

LEGEND

- PROPERTY BOUNDARY
- CODORNICES CREEK MOU LINE
- LIMIT OF WORK (SHOWN SCHEMATICALLY)
- FENCING, GATES, WALLS, CURBS AND FOOTINGS TO BE REMOVED AND/OR SALVAGED.
- AREA TO BE CLEARED AND GRUBBED, SEE DEMOLITION NOTES.
- PAVING TO BE DEMOLISHED, SEE DEMOLITION NOTES AND SPECIFIC NOTES ON PLAN.
- TREES TO REMAIN
- UTILITY POLE, LIGHT POLE, AND GUY WIRE, PRESERVE AND PROTECT, UON.
- BOLLARD TO BE REMOVED
- TREE TO BE REMOVED / SALVAGED
- CONSTRUCTION ACCESS



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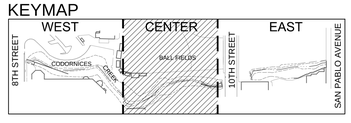

0 10 20 Feet

DATE	NO.	REVISIONS

DESIGN BY: BB / ES
DRAWN BY: ES / PR
CHECKED BY: BB
SCALE: 1" = 10'-0"
DATE: 1 NOVEMBER, 2014

Restoration Design Group, LLC
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CODORNICES CREEK TRAIL CONNECTION PROJECT

PUBLIC PROCESS AND TRAIL DESIGN - 8TH STREET TO SAN PABLO AVENUE

BID SET

DEMOLITION (CENTER)

SHEET L-1.2

CC4: BID SET - S:\PROJECTS\LOWER CODORNICES CREEK_PHASE IV\7 AUTOCAD\WORKING DRAWINGS\L1-5-DEMO.DWG
PLOTTED ON: 11/03/2014

NOTES

1. LIMIT OF WORK AND PROJECT PERIMETER FENCE LAYOUT SHALL BE DETERMINED BY O.R. AND CONTRACTOR AT PROJECT INITIATION. FENCING CAN BE ADJUSTED AND REALIGNED AS REQUIRED TO PROVIDE FOR PUBLIC SAFETY, SITE SECURITY AND CONSTRUCTION ACCESS.
2. MAINTAIN PROJECT PERIMETER FENCE FOR THE DURATION OF THE CONSTRUCTION PERIOD.
3. PROTECT ALL IMPROVEMENTS NOT NOTED FOR DEMOLITION.
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10. SEE PLAN SET FOR ADDITIONAL NOTES.
11. THROUGHOUT SITE AND CREEK, REMOVE ALL LITTER AND DEBRIS AT THE COMPLETION OF THE PROJECT.
12. SURVEY FILE AVAILABLE AT COA UPON REQUEST.

LEGEND

- PROPERTY BOUNDARY
- CODORNICES CREEK MOU LINE
- LIMIT OF WORK (SHOWN SCHEMATICALLY)
- FENCING, GATES, WALLS, CURBS AND FOOTINGS TO BE REMOVED AND/OR SALVAGED.
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- BOLLARD TO BE REMOVED
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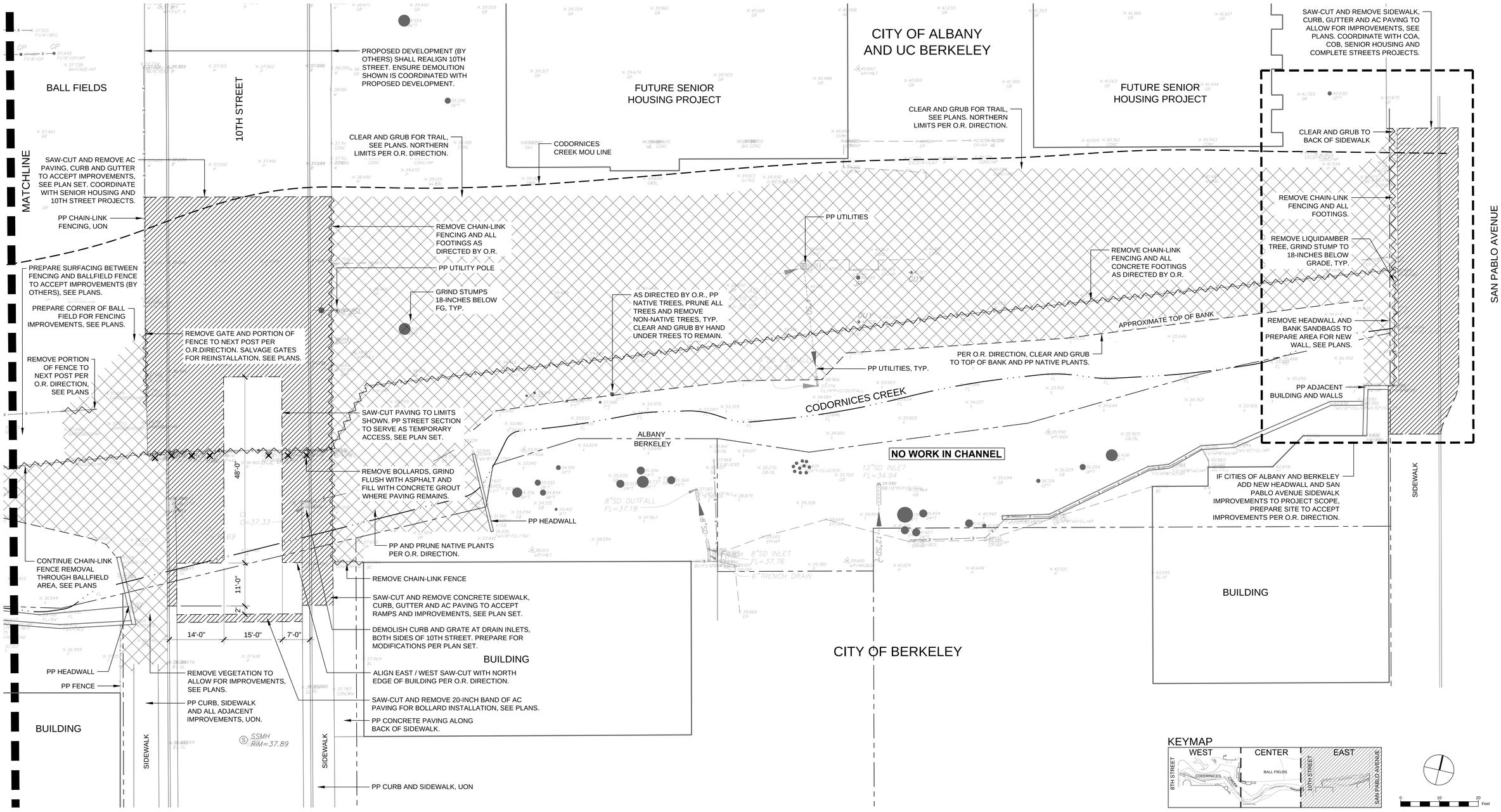

KEYMAP

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CODORNICES CREEK TRAIL CONNECTION PROJECT

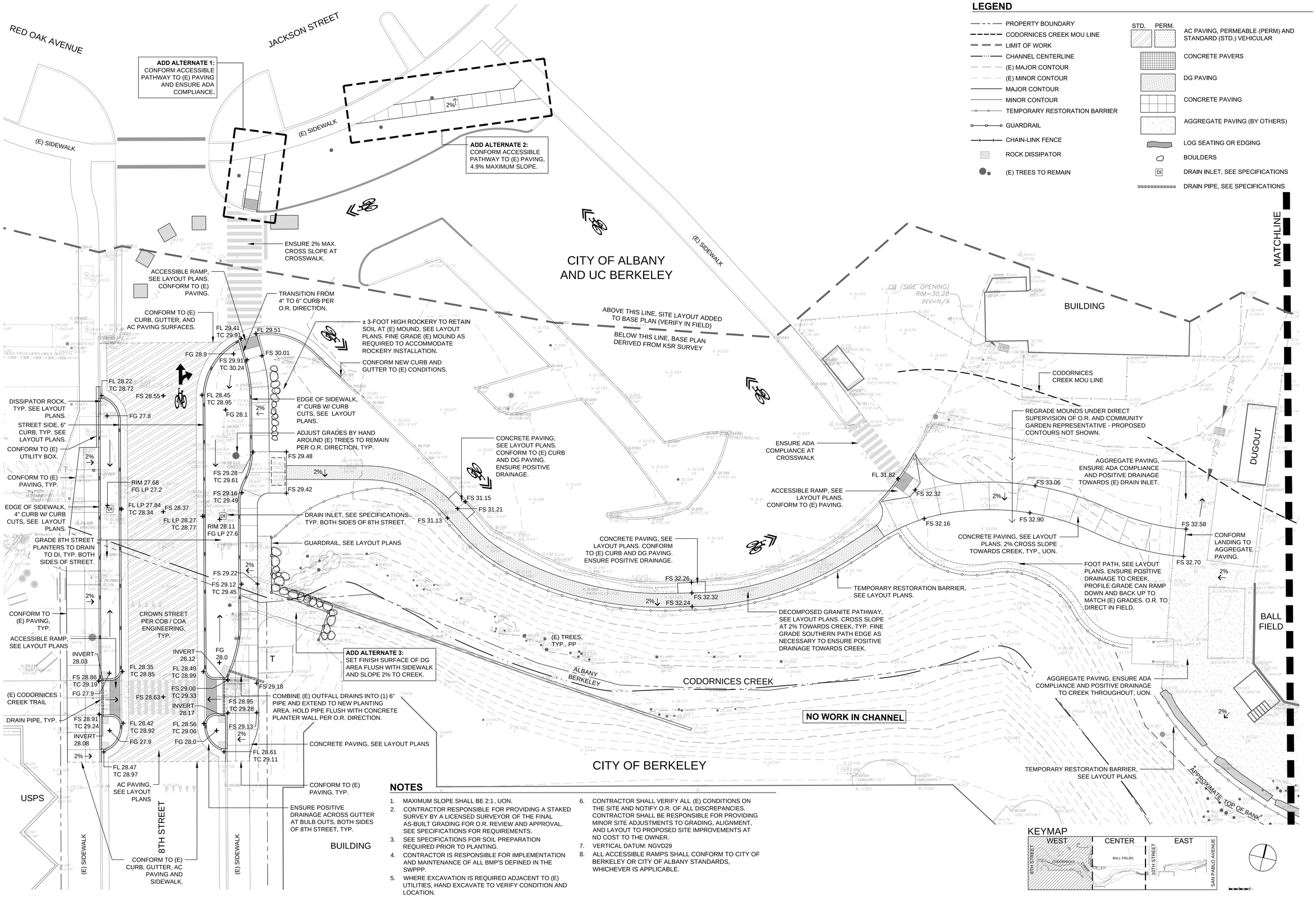
PUBLIC PROCESS AND TRAIL DESIGN - 8TH STREET TO SAN PABLO AVENUE

BID SET

DEMOLITION (EAST)

SHEET L-1.3

CC4: BID SET - S:\PROJECTS\LOWER CODORNICES CREEK, PHASE IV\7 AUTOCAD\WORKING DRAWINGS\LS-DEMO.DWG
PLOTTED ON: 10/31/2014



NOTES

1. MAXIMUM SLOPE SHALL BE 2:1, UON.
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3. SEE SPECIFICATIONS FOR SOIL PREPARATION REQUIRED PRIOR TO PLANTING.
4. CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTATION AND MAINTENANCE OF ALL BMP'S DEFINED IN THE SWPPP.
5. WHERE EXCAVATION IS REQUIRED ADJACENT TO (E) UTILITIES, HAND EXCAVATE TO VERIFY CONDITION AND LOCATION.
6. CONTRACTOR SHALL VERIFY ALL (E) CONDITIONS ON THE SITE AND NOTIFY O.R. OF ALL DISCREPANCIES. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING MINOR SITE ADJUSTMENTS TO GRADING, ALIGNMENT, AND LAYOUT TO PROPOSED SITE IMPROVEMENTS AT NO COST TO THE OWNER.
7. VERTICAL DATUM: NGVD29
8. ALL ACCESSIBLE RAMPS SHALL CONFORM TO CITY OF BERKELEY OR CITY OF ALBANY STANDARDS, WHICHEVER IS APPLICABLE.

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CODORNICES CREEK TRAIL CONNECTION PROJECT

PUBLIC PROCESS AND TRAIL DESIGN - 8TH STREET TO SAN PABLO AVENUE

BID SET

GRADING (WEST)

SHEET L-2.1

NOTES

1. MAXIMUM SLOPE SHALL BE 2:1, UON.
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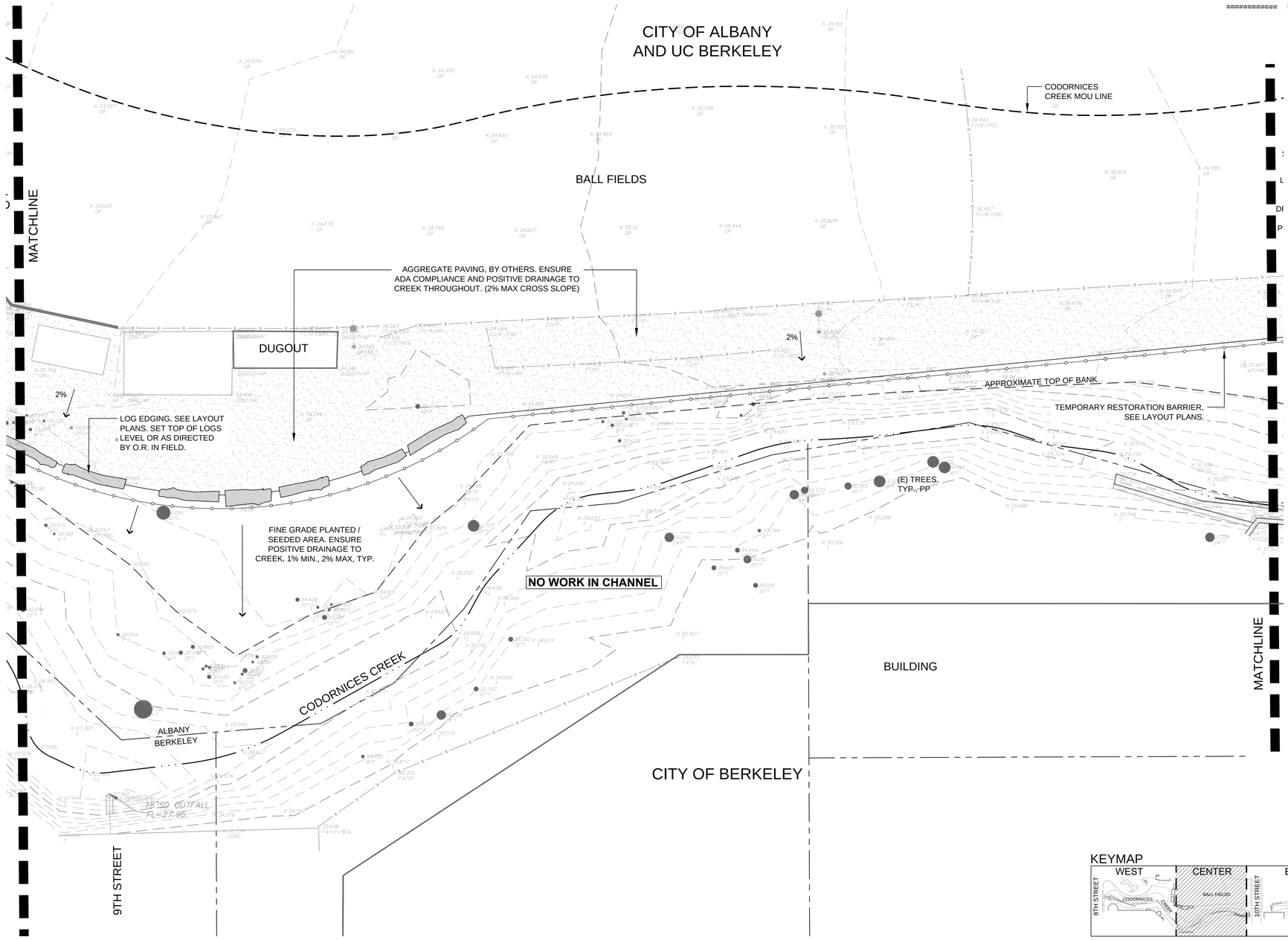
LEGEND

- PROPERTY BOUNDARY
- CODORNICES CREEK MOU LINE
- LIMIT OF WORK
- CHANNEL CENTERLINE
- (E) MAJOR CONTOUR
- (E) MINOR CONTOUR
- MAJOR CONTOUR
- MINOR CONTOUR
- TEMPORARY RESTORATION BARRIER
- GUARDRAIL
- CHAIN-LINK FENCE
- ROCK DISSIPATOR
- (E) TREES TO REMAIN

STD. PERM.

- AC PAVING, PERMEABLE (PERM) AND STANDARD (STD.) VEHICULAR
- CONCRETE PAVERS
- DG PAVING
- CONCRETE PAVING
- AGGREGATE PAVING (BY OTHERS)
- LOG SEATING OR EDGING
- BOULDERS
- DRAIN INLET, SEE SPECIFICATIONS
- DRAIN PIPE, SEE SPECIFICATIONS



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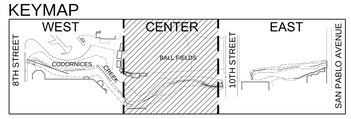

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CODORNICES CREEK TRAIL CONNECTION PROJECT

PUBLIC PROCESS AND TRAIL DESIGN - 8TH STREET TO SAN PABLO AVENUE

BID SET

GRADING (CENTER)

SHEET L-2.2

CC4: BID SET - S:\PROJECTS\LOWER CODORNICES CREEK_PHASE IV\7 AUTOCAD\WORKING DRAWINGS\LS-GRADING.DWG
PLOTTED ON: 10/31/2014

NOTES

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7. VERTICAL DATUM: NGVD29
8. ALL ACCESSIBLE RAMPS SHALL CONFORM TO CITY OF BERKELEY OR CITY OF ALBANY STANDARDS, WHICHEVER IS APPLICABLE.

LEGEND

- PROPERTY BOUNDARY
- CODORNICES CREEK MOU LINE
- LIMIT OF WORK
- CHANNEL CENTERLINE
- (E) MAJOR CONTOUR
- (E) MINOR CONTOUR
- MAJOR CONTOUR
- MINOR CONTOUR
- TEMPORARY RESTORATION BARRIER
- GUARDRAIL
- CHAIN-LINK FENCE
- ROCK DISSIPATOR
- (E) TREES TO REMAIN

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- AC PAVING, PERMEABLE (PERM) AND STANDARD (STD.) VEHICULAR
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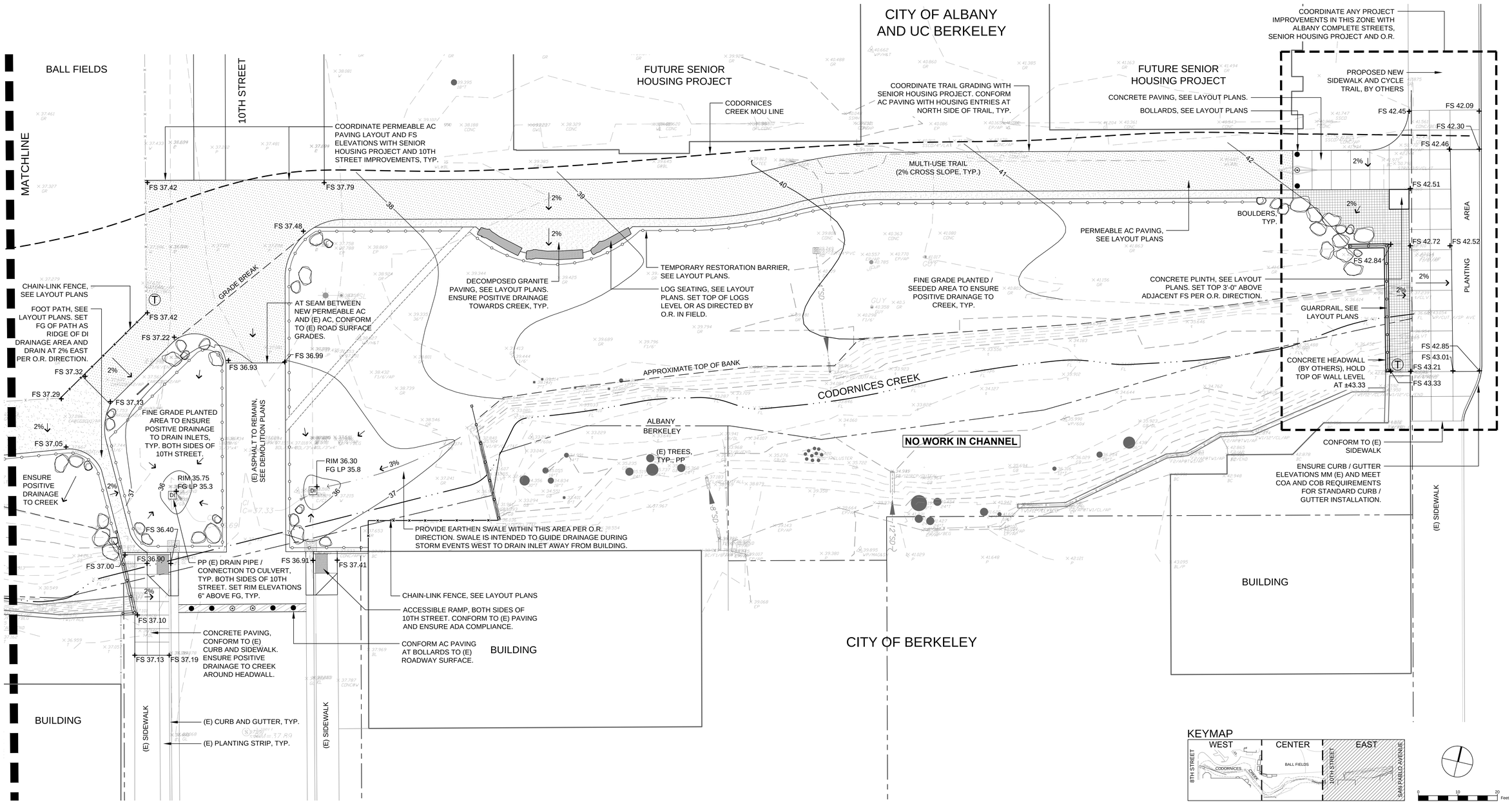

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CODORNICES CREEK TRAIL CONNECTION PROJECT

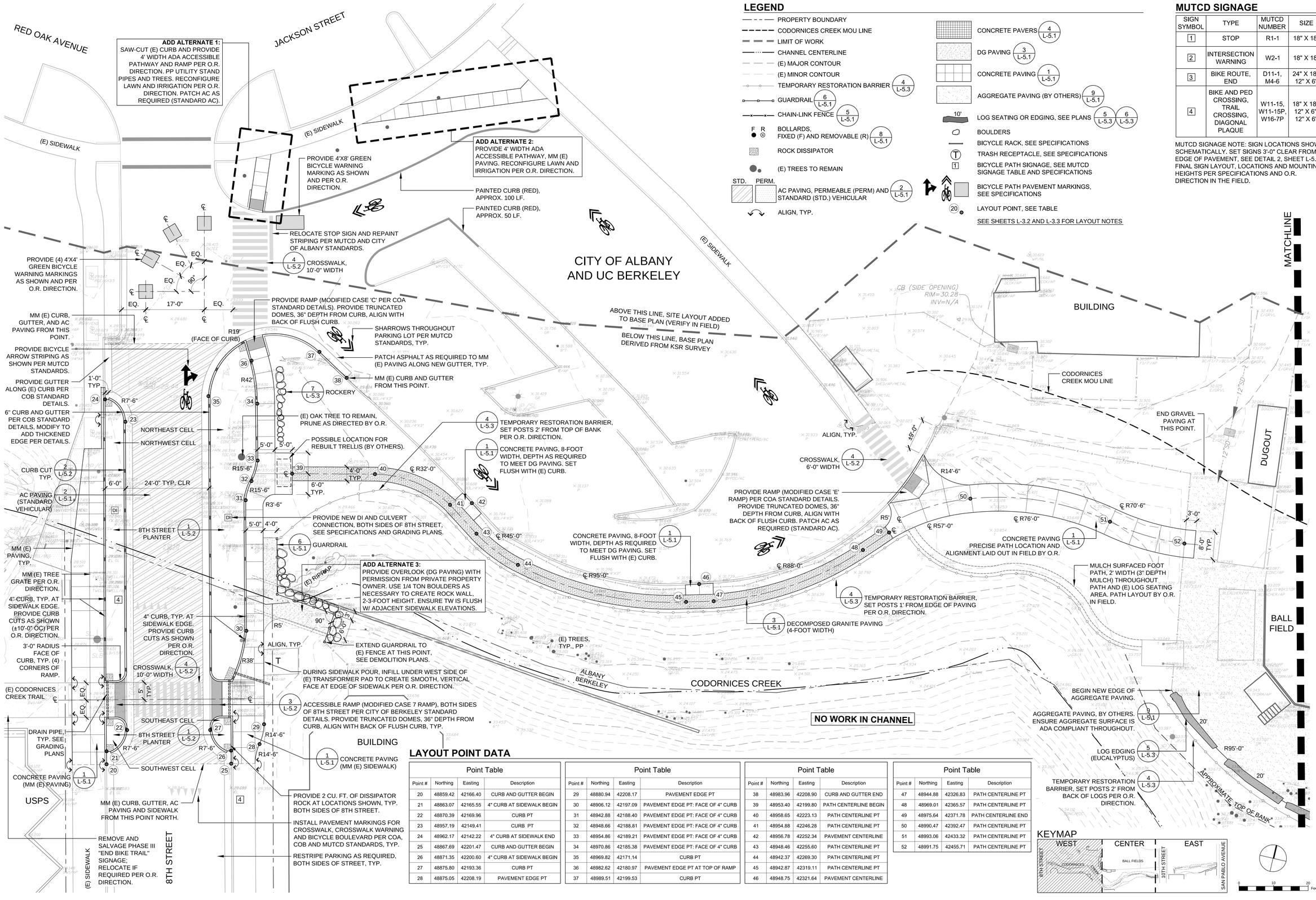
PUBLIC PROCESS AND TRAIL DESIGN - 8TH STREET TO SAN PABLO AVENUE

BID SET

GRADING (EAST)

SHEET L-2.3

CC4: BID SET - S:\PROJECTS\LOWER CODORNICES CREEK_PHASE IV\7 AUTOCAD\WORKING DRAWINGS\LS-GRADING.DWG
PLOTTED ON: 10/31/2014



LEGEND

- PROPERTY BOUNDARY
- CODORNICES CREEK MOU LINE
- LIMIT OF WORK
- CHANNEL CENTERLINE
- (E) MAJOR CONTOUR
- (E) MINOR CONTOUR
- TEMPORARY RESTORATION BARRIER (4 / L-5.3)
- GUARDRAIL (6 / L-5.1)
- CHAIN-LINK FENCE (5 / L-5.1)
- BOLLARDS, FIXED (F) AND REMOVABLE (R) (8 / L-5.1)
- ROCK DISSIPATOR
- (E) TREES TO REMAIN
- AC PAVING, PERMEABLE (PERM) AND STANDARD (STD.) VEHICULAR (STD. PERM. / 2 / L-5.1)
- ALIGN, TYP.
- CONCRETE PAVERS (4 / L-5.1)
- DG PAVING (3 / L-5.1)
- CONCRETE PAVING (1 / L-5.1)
- AGGREGATE PAVING (BY OTHERS) (9 / L-5.1)
- LOG SEATING OR EDGING, SEE PLANS (5 / L-5.3, 6 / L-5.3)
- BOULDERS
- BICYCLE RACK, SEE SPECIFICATIONS
- TRASH RECEPTACLE, SEE SPECIFICATIONS
- 1 BICYCLE PATH SIGNAGE, SEE MUTCD SIGNAGE TABLE AND SPECIFICATIONS
- BICYCLE PATH PAVEMENT MARKINGS, SEE SPECIFICATIONS
- 20 LAYOUT POINT, SEE TABLE

SEE SHEETS L-3.2 AND L-3.3 FOR LAYOUT NOTES

MUTCD SIGNAGE

SIGN SYMBOL	TYPE	MUTCD NUMBER	SIZE
1	STOP	R1-1	18" X 18"
2	INTERSECTION WARNING	W2-1	18" X 18"
3	BIKE ROUTE, END	D11-1, M4-6	24" X 18", 12" X 6"
4	BIKE AND PED CROSSING, TRAIL CROSSING, DIAGONAL PLAQUE	W11-15, W11-15P, W16-7P	18" X 18", 12" X 6", 12" X 6"

MUTCD SIGNAGE NOTE: SIGN LOCATIONS SHOWN SCHEMATICALLY. SET SIGNS 3'-0" CLEAR FROM EDGE OF PAVEMENT, SEE DETAIL 2, SHEET L-5.1. FINAL SIGN LAYOUT, LOCATIONS AND MOUNTING HEIGHTS PER SPECIFICATIONS AND O.R. DIRECTION IN THE FIELD.

LAYOUT POINT DATA

Point #	Northing	Easting	Description
20	48859.42	42166.40	CURB AND GUTTER BEGIN
21	48863.07	42165.55	4" CURB AT SIDEWALK BEGIN
22	48870.39	42169.96	CURB PT
23	48957.19	42149.41	CURB PT
24	48962.17	42142.22	4" CURB AT SIDEWALK END
25	48867.69	42201.47	CURB AND GUTTER BEGIN
26	48871.35	42200.60	4" CURB AT SIDEWALK BEGIN
27	48875.80	42193.36	CURB PT
28	48875.05	42208.19	PAVEMENT EDGE PT

Point #	Northing	Easting	Description
29	48880.94	42208.17	PAVEMENT EDGE PT
30	48906.12	42197.09	PAVEMENT EDGE PT: FACE OF 4" CURB
31	48942.88	42188.40	PAVEMENT EDGE PT: FACE OF 4" CURB
32	48948.66	42188.81	PAVEMENT EDGE PT: FACE OF 4" CURB
33	48954.86	42189.21	PAVEMENT EDGE PT: FACE OF 4" CURB
34	48970.86	42185.38	PAVEMENT EDGE PT: FACE OF 4" CURB
35	48969.82	42171.14	CURB PT
36	48982.62	42180.97	PAVEMENT EDGE PT AT TOP OF RAMP
37	48989.51	42199.53	CURB PT

Point #	Northing	Easting	Description
38	48983.96	42208.90	CURB AND GUTTER END
39	48953.40	42199.80	PATH CENTERLINE BEGIN
40	48958.65	42223.13	PATH CENTERLINE PT
41	48954.88	42246.28	PATH CENTERLINE PT
42	48956.78	42252.34	PAVEMENT CENTERLINE
43	48948.46	42255.60	PATH CENTERLINE PT
44	48942.37	42269.30	PATH CENTERLINE PT
45	48942.87	42319.11	PATH CENTERLINE PT
46	48948.75	42321.64	PAVEMENT CENTERLINE

Point #	Northing	Easting	Description
47	48944.88	42326.83	PATH CENTERLINE PT
48	48969.01	42365.57	PATH CENTERLINE PT
49	48975.64	42371.78	PATH CENTERLINE END
50	48990.47	42392.47	PATH CENTERLINE PT
51	48993.06	42433.32	PATH CENTERLINE PT
52	48991.75	42455.71	PATH CENTERLINE PT

KEYMAP

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CODORNICES CREEK TRAIL CONNECTION PROJECT

PUBLIC PROCESS AND TRAIL DESIGN - 8TH STREET TO SAN PABLO AVENUE

BID SET

LAYOUT (WEST)

SHEET L-3.1

NOTES

1. PROVIDE SHOP DRAWINGS AND AS-BUILTS AS NOTED IN SPECIFICATIONS.
2. CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS ON THE SITE AND NOTIFY O.R. OF ALL DISCREPANCIES. DIMENSIONS AS SHOWN ARE TO BE VERIFIED WITH THE O.R. PRIOR TO INSTALLING THE IMPROVEMENTS. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING MINOR SITE ADJUSTMENTS TO GRADING, ALIGNMENT, AND LAYOUT TO PROPOSED SITE IMPROVEMENTS AT NO COST TO THE OWNER.
3. PP AND RESTORE ALL EXISTING ADJACENT IRRIGATION EQUIPMENT AND SYSTEMS TO PROVIDE COMPLETE EFFICIENT HEAD TO HEAD COVERAGE.
4. SITE IMPROVEMENTS INCLUDING BUT NOT LIMITED TO: FENCES, PAVING AND BOLLARDS SHALL BE STAKED IN THE FIELD FOR REVIEW AND APPROVAL BY O.R. PRIOR TO INSTALLATION.

LEGEND

- PROPERTY BOUNDARY
- CODORNICES CREEK MOU LINE
- LIMIT OF WORK
- CHANNEL CENTERLINE
- (E) MAJOR CONTOUR
- (E) MINOR CONTOUR
- TEMPORARY RESTORATION BARRIER — 4 / L-5.3
- GUARDRAIL — 6 / L-5.1
- CHAIN-LINK FENCE — 5 / L-5.1
- BOLLARDS, FIXED (F) AND REMOVABLE (R) — 8 / L-5.1
- ROCK DISSIPATOR
- (E) TREES TO REMAIN
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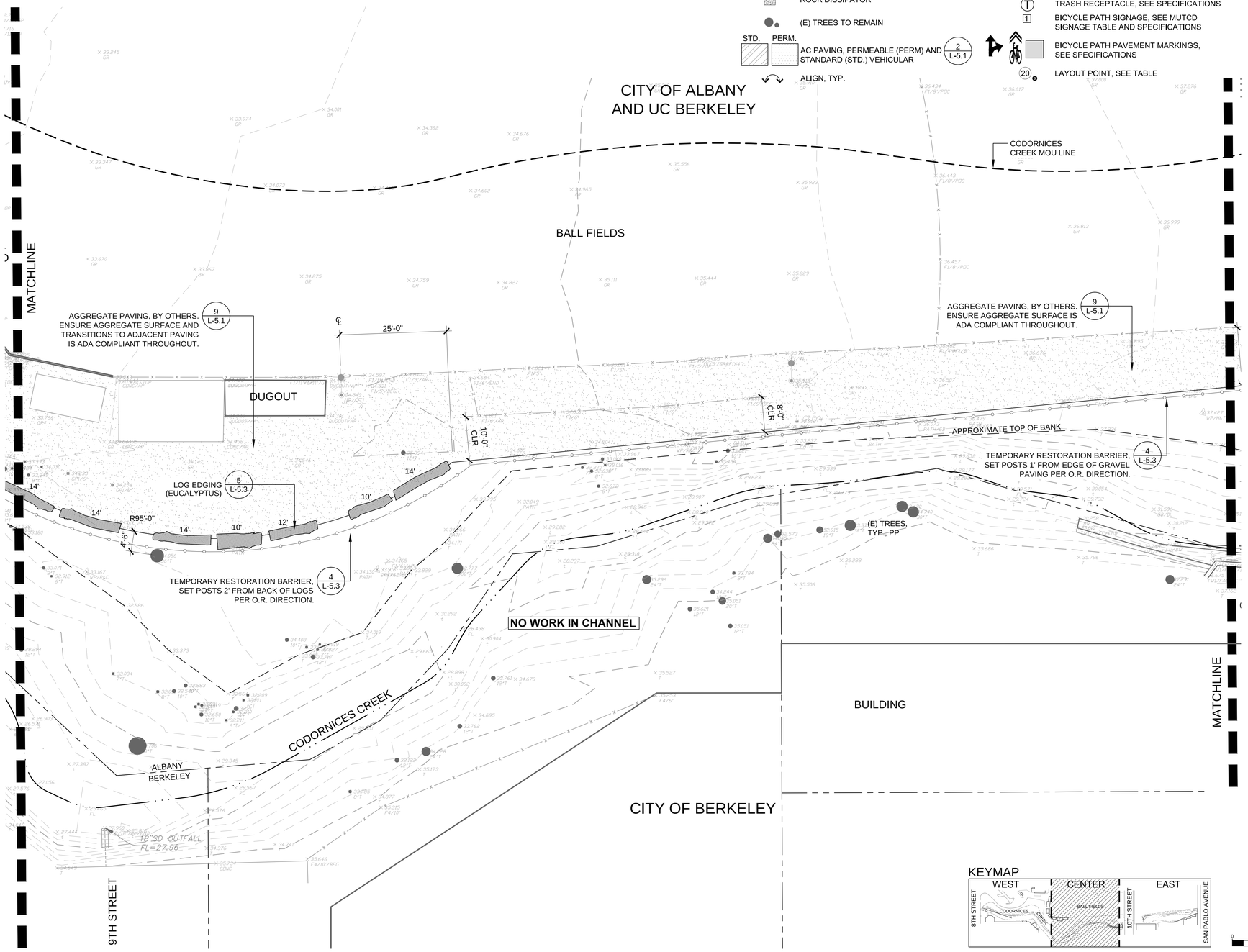
- ALIGN, TYP.
- CONCRETE PAVERS — 4 / L-5.1
- DG PAVING — 3 / L-5.1
- CONCRETE PAVING — 1 / L-5.1
- AGGREGATE PAVING (BY OTHERS) — 9 / L-5.1
- LOG SEATING OR EDGING, SEE PLANS — 10' — 5 / L-5.3 — 6 / L-5.3
- BOULDERS
- BICYCLE RACK, SEE SPECIFICATIONS
- TRASH RECEPTACLE, SEE SPECIFICATIONS
- BICYCLE PATH SIGNAGE, SEE MUTCD SIGNAGE TABLE AND SPECIFICATIONS — 1
- BICYCLE PATH PAVEMENT MARKINGS, SEE SPECIFICATIONS
- LAYOUT POINT, SEE TABLE — 20



KEYMAP

0 10 20 Feet

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CODORNICES CREEK TRAIL CONNECTION PROJECT

PUBLIC PROCESS AND TRAIL DESIGN - 8TH STREET TO SAN PABLO AVENUE

BID SET

LAYOUT (CENTER)

SHEET L3.2

CC4: BID SET - S:\PROJECTS\LOWER CODORNICES CREEK, PHASE IV\7 AUTOCAD\WORKING DRAWINGS\LS-LAYOUT.DWG
PLOTTED ON: 10/31/2014

NOTES

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- DG PAVING — 3 / L-5.1
- CONCRETE PAVING — 1 / L-5.1
- AGGREGATE PAVING (BY OTHERS) — 9 / L-5.1
- 10' LOG SEATING OR EDGING, SEE PLANS — 5 / L-5.3, 6 / L-5.3
- BOULDERS
- BICYCLE RACK, SEE SPECIFICATIONS
- TRASH RECEPTACLE, SEE SPECIFICATIONS
- 1 BICYCLE PATH SIGNAGE, SEE MUTCD SIGNAGE TABLE AND SPECIFICATIONS
- BICYCLE PATH PAVEMENT MARKINGS, SEE SPECIFICATIONS
- 20 LAYOUT POINT, SEE TABLE

LAYOUT POINT DATA

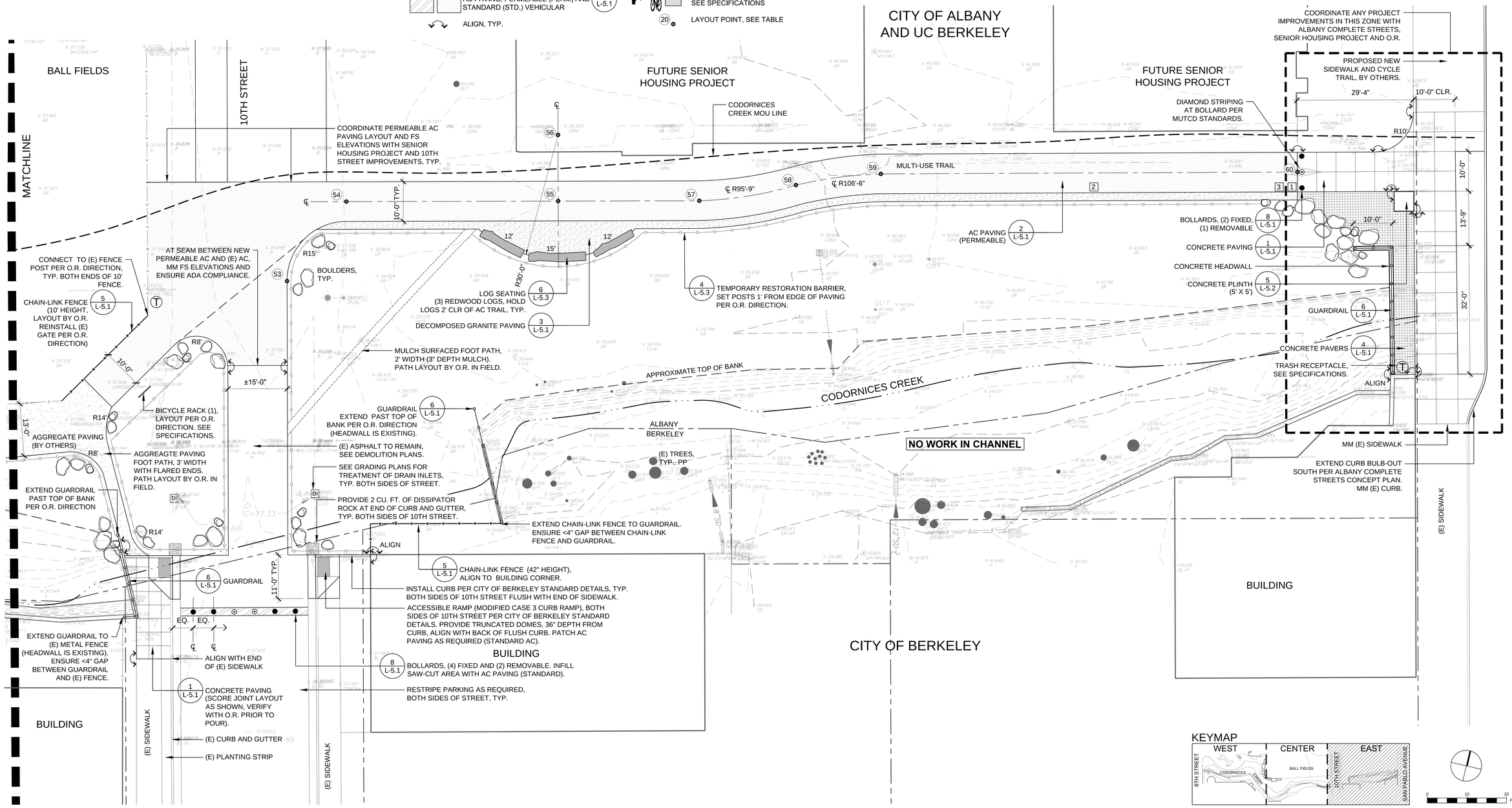
Point Table

Point #	Northing	Easting	Description
53	49067.51	42825.52	PAVEMENT EDGE PT
54	49090.40	42835.58	AC TRAIL CENTERLINE
55	49102.55	42887.64	AC TRAIL CENTERLINE
56	49118.80	42883.84	RADIUS POINT
57	49110.64	42922.31	AC TRAIL CENTERLINE PT
58	49119.98	42945.18	AC TRAIL CENTERLINE PT
59	49127.55	42965.44	AC TRAIL CENTERLINE PT
60	49151.65	43067.73	AC TRAIL CENTERLINE AT CONCRETE PAVING

MUTCD SIGNAGE

SIGN SYMBOL	TYPE	MUTCD NUMBER	SIZE
1	STOP	R1-1	18" X 18"
2	INTERSECTION WARNING	W2-1	18" X 18"
3	BIKE ROUTE, END	D11-1, M4-6	24" X 18", 12" X 6"
4	BIKE AND PED CROSSING, TRAIL CROSSING, DIAGONAL PLAQUE	W11-15, W11-15P, W16-7P	18" X 18", 12" X 6", 12" X 6"

MUTCD SIGNAGE NOTE: SIGN LOCATIONS SHOWN SCHEMATICALLY. SET SIGNS 3'-0" CLEAR FROM EDGE OF PAVEMENT, SEE DETAIL 2, SHEET L-5.1. FINAL SIGN LAYOUT, LOCATIONS AND MOUNTING HEIGHTS PER SPECIFICATIONS AND O.R. DIRECTION IN THE FIELD.



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CODORNICES CREEK TRAIL CONNECTION PROJECT

PUBLIC PROCESS AND TRAIL DESIGN - 8TH STREET TO SAN PABLO AVENUE

BID SET

LAYOUT (EAST)

SHEET L-3.3

CC4: BID SET - S:\PROJECTS\LOWER CODORNICES CREEK_PHASE IV\7 AUTOCAD\WORKING DRAWINGS\LS-LAYOUT.DWG
PLOTTED ON: 10/31/2014

NOTES

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16. INSTALL IRRIGATION COMPONENTS AS NOTED IN THE SPECIFICATIONS.
17. COORDINATE IRRIGATION POINT OF CONNECTION AND POWER SOURCE WITH CLIENT AND PROJECT PLANNING TEAM. PROVIDE ALL NECESSARY CONNECTIONS.

RED OAK AVENUE

JACKSON STREET

ADD ALTERNATE 1: RESEED LAWN TO MATCH (E)

ADD ALTERNATE 2: RESEED LAWN TO MATCH (E)

(E) SIDEWALK

CITY OF ALBANY AND UC BERKELEY

ABOVE THIS LINE, SITE LAYOUT ADDED TO BASE PLAN (VERIFY IN FIELD)

BELOW THIS LINE, BASE PLAN DERIVED FROM KSR SURVEY

MATCHLINE

BUILDING

CODORNICES CREEK MOU LINE

MULCH THESE AREAS UNDER DIRECT SUPERVISION OF O.R. AND COMMUNITY GARDEN REPRESENTATIVE.

DUGOUT

BALL FIELD

IRRIGATE SMALLER PLANTING AREAS BEHIND SIDEWALK WITH POP-UP SPRAY HEADS, SEE SPECIFICATIONS.

IRRIGATE 8TH STREET PLANTERS WITH DRIP IRRIGATION, SEE SPECIFICATIONS.

PLANTING MIX 'A' THROUGHOUT 8TH STREET PLANTERS, SEE SPECIFICATIONS.

8TH STREET

(E) MULTI-USE TRAIL

USPS

MULCH IN SMALL BULB OUTS, BOTH SIDES OF 8TH STREET, TYP.

MULCH BETWEEN CURB AND DG PAVING WHERE FENCE REMAINS, TYP.

(E) TREES, TYP., PP

NO WORK IN CHANNEL

IRRIGATE TREE WITH DRIWATER, SEE SPECIFICATIONS.

MULCH ALONG CREEK SIDE OF DG PAVING TO TOP OF BANK OR AS REQUIRED TO COVER ALL AREAS AFFECTED BY CONSTRUCTION.

CODORNICES CREEK

TEMPORARY RESTORATION BARRIER, SEE LAYOUT PLANS.

IRRIGATE LARGE SHRUBS AND TREES W/ BUBBLERS, SEE SPECIFICATIONS.

PLANTING LEGEND

	BOTANICAL / COMMON NAME	NOTES:
	QUERCUS AGRIFOLIA / COAST LIVE OAK	15 GALLON (RESTORATION FORM WITH MULTIPLE STEMS, TYPICAL)
	POPULUS FREMONTII / FREMONT POPLAR	15 GALLON SEE NOTES ON ROOT BARRIERS; (RESTORATION FORM WITH MULTIPLE STEMS, TYPICAL)
	ACER NEGUNDO / BOX ELDER	15 GALLON
	AESCULUS CALIFORNICA / BUCKEYE	15 GALLON (RESTORATION FORM WITH MULTIPLE STEMS, TYPICAL)
	SAMBUCUS MEXICANA / BLUE ELDERBERRY	5 GALLON
F	FRANGULA CALIFORNICA / COFFEEBERRY	5 GALLON
	HETEROMELES ARBUTIFOLIA / TOYON	5 GALLON

	BOTANICAL / COMMON NAME	NOTES:
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	MIX B (NATIVE PLANTS AND SEED)	
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+	JUNCUS PATENS / GREY RUSH	D-40
M	MIMULUS AURANTIACUS / STICKY MONKEY FLOWER	1 GALLON
	MUHLENBERGIA RIGENS / DEERGRASS	1 GALLON
C	RIBES SANGUINEUM / FLOWERING CURRANT	1 GALLON
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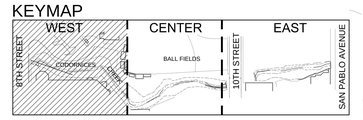
KEYMAP



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CODORNICES CREEK TRAIL CONNECTION PROJECT

PUBLIC PROCESS AND TRAIL DESIGN - 8TH STREET TO SAN PABLO AVENUE

BID SET

REVEGETATION (WEST)

SHEET L-4.1

CC4: BID SET - S:\PROJECTS\LOWER CODORNICES CREEK_PHASE IV\7 AUTOCAD\WORKING DRAWINGS\LS-REVEG.DWG
PLOTTED ON: 10/31/2014

PLANTING LEGEND

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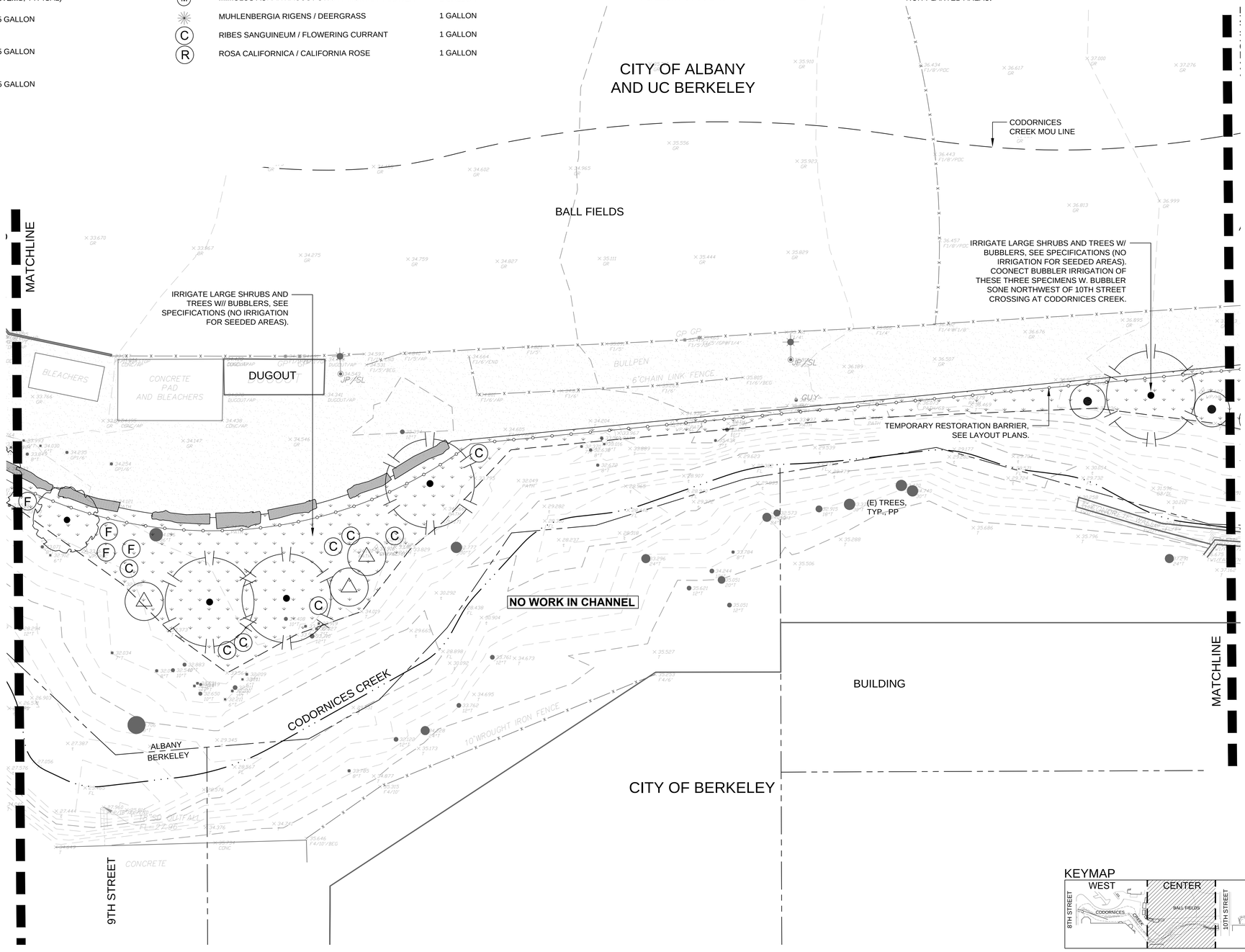

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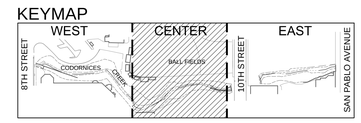

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CODORNICES CREEK TRAIL CONNECTION PROJECT

PUBLIC PROCESS AND TRAIL DESIGN - 8TH STREET TO SAN PABLO AVENUE

BID SET

REVEGETATION (CENTER)

SHEET L-4.2

CC4: BID SET - S:\PROJECTS\LOWER CODORNICES CREEK_PHASE IV\7 AUTOCAD\WORKING DRAWINGS\LS-REVEG.DWG
PLOTTED ON: 10/31/2014

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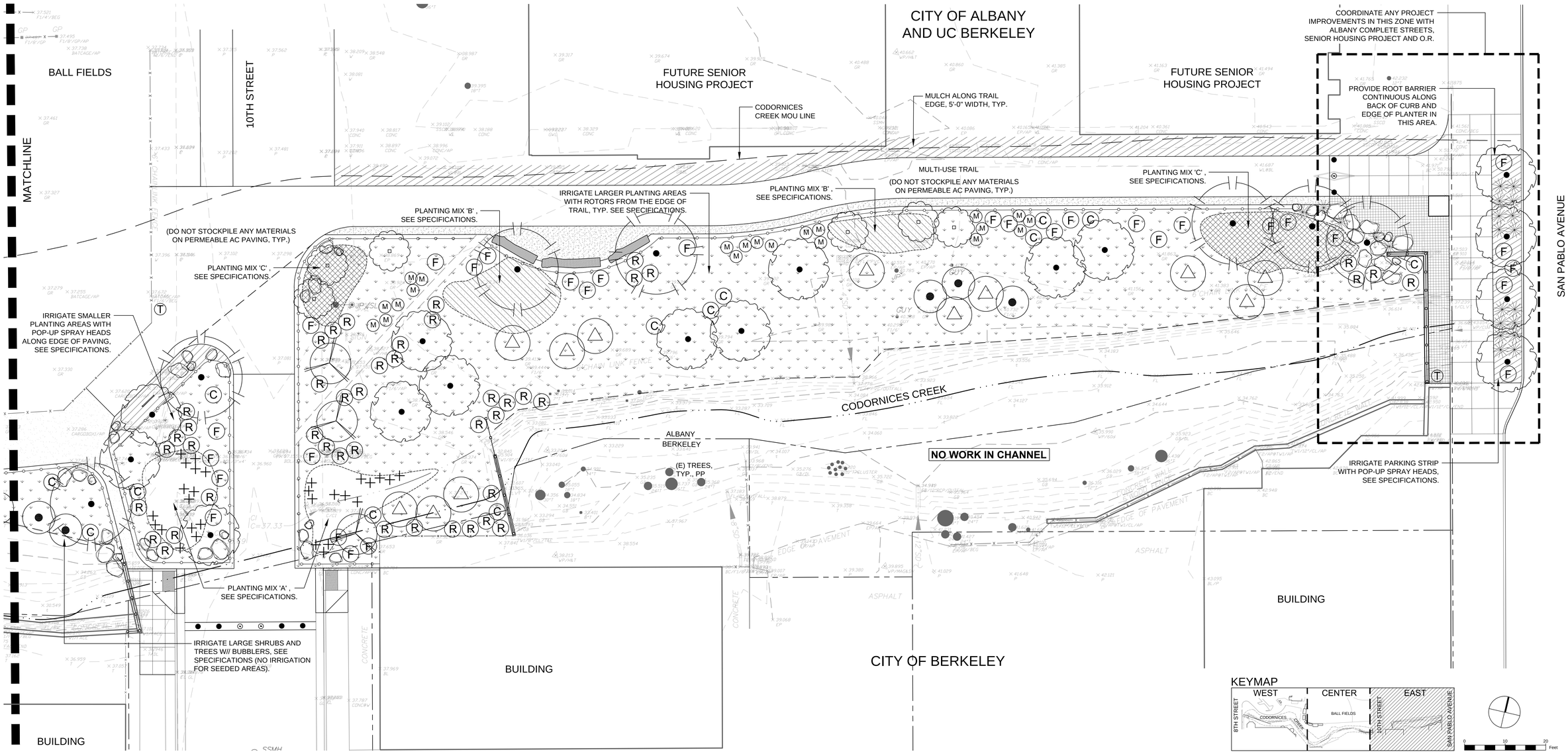

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CODORNICES CREEK TRAIL CONNECTION PROJECT

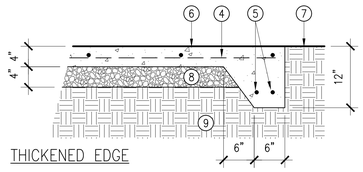
PUBLIC PROCESS AND TRAIL DESIGN - 8TH STREET TO SAN PABLO AVENUE

BID SET

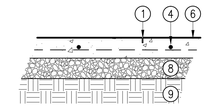
REVEGETATION (EAST)

SHEET L-4.3

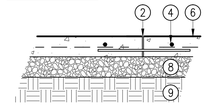
1. SCORE JOINT, 1" DEEP, 3/16" TO 1/4" WIDE, 1/8" RADIUS PER PLANS, CITY STANDARDS, OR O.R. DIRECTION.
2. CONSTRUCTION JOINT WITH 18" LONG, 5/8" DIAMETER SMOOTH, GALVANIZED STEEL DOWEL AT MID-DEPTH OF SLAB.
3. PRE-MOLDED EXPANSION JOINT FILLER WITH SEALANT TO PROTECT FILLER. 3/8" WIDTH WITH 18" LONG, 5/8" DIAMETER SMOOTH GALVANIZED STEEL DOWEL, 36" O.C. AT MID-DEPTH OF SLAB.
4. #4 REBAR @ 18" O.C. BOTH WAYS AT CENTER OF CONCRETE SLAB. PLACE BAR 3" +/- FROM EDGES AND EACH SIDE OF FORMED JOINTS.
5. (2) #4 REBAR @ BOTTOM OF THICKENED EDGE. KEEP 3" CLEAR FROM EDGES
6. CONCRETE PAVING. INSTALL THICKENED EDGES AROUND PERIMETER, UON. DIRECTIONAL BROOM FINISH, 90 DEGREES TO LINE OF TRAVEL PER O.R. DIRECTION.
7. FINISH GRADE OR FINISH SURFACE FLUSH WITH CONCRETE PAVING FINISH SURFACE.
8. BASE COURSE
9. COMPACTED SUBGRADE



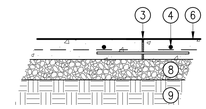
THICKENED EDGE



SCORE JOINT



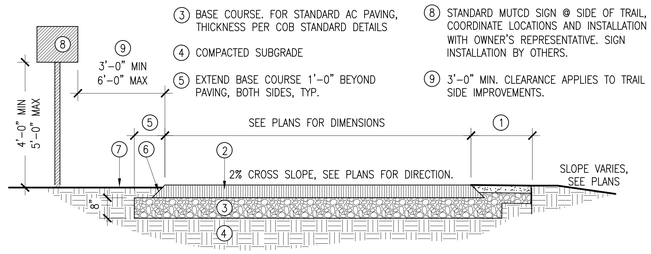
CONSTRUCTION JOINT



EXPANSION JOINT

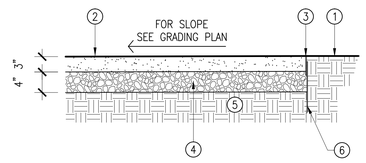
1 CONCRETE PAVING
SCALE: NTS

1. DECOMPOSED GRANITE SHOULDER AT MULTI-USE TRAIL, 2'-0" WIDTH ONE SIDE (SEE PLANS). HOLD FLUSH TO AC. (3 / L-5.1)
2. PERMEABLE AC PAVING, 4" DEPTH. FOR STANDARD AC PAVING, THICKNESS PER CITY OF BERKELEY STANDARD DETAILS.
3. BASE COURSE. FOR STANDARD AC PAVING, THICKNESS PER COB STANDARD DETAILS
4. COMPACTED SUBGRADE
5. EXTEND BASE COURSE 1'-0" BEYOND PAVING, BOTH SIDES, TYP.
6. FINISHED EDGE OF AC PAVING, BOTH SIDES. PROVIDE 45 DEGREE BEVEL AND SMOOTH, CONSISTENT TAMPED EDGE.
7. HOLD FG 1" BELOW FS, TYP. AT PERMEABLE AC. AT STANDARD AC, MM (E) PAVING.
8. STANDARD MUTCD SIGN @ SIDE OF TRAIL, COORDINATE LOCATIONS AND INSTALLATION WITH OWNER'S REPRESENTATIVE. SIGN INSTALLATION BY OTHERS.
9. 3'-0" MIN. CLEARANCE APPLIES TO TRAIL SIDE IMPROVEMENTS.



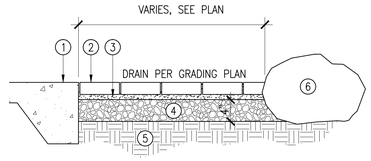
2 AC PAVING
SCALE: NTS

1. ADJACENT FINISH GRADE FLUSH TO DG SURFACE.
2. DECOMPOSED GRANITE PAVING
3. STEEL EDGING AT ALL EDGES ALONG PLANTING AREAS; OMIT WHERE DG ABUTS CONCRETE, AC OR LOG SEATING.
4. BASE COURSE
5. COMPACTED SUBGRADE
6. STAKE FOR STEEL EDGING



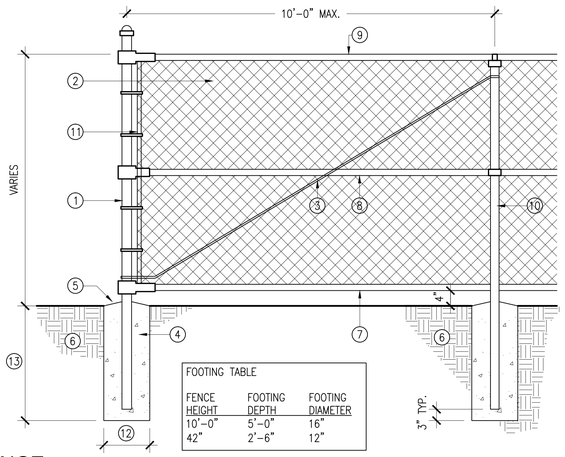
3 DECOMPOSED GRANITE PAVING
SCALE: NTS

1. ADJACENT FINISH GRADE (PAVING OR PLANTING AREA) FLUSH TO PAVER SURFACE.
2. CONCRETE PAVERS, SEE SPECIFICATIONS. CUT PAVERS AS REQUIRED TO MM CONCRETE PAVING AND SITE BOULDERS PER O.R. DIRECTION.
3. 1" SAND SETTING BED
4. BASE COURSE
5. COMPACTED SUBGRADE
6. BOULDER, CUT AND SCRIBE PAVERS TO FIT TIGHT AROUND BOULDERS, VERIFY W/ O.R.



4 CONCRETE PAVERS
SCALE: NTS

1. CORNER POST / END POST
2. GALVANIZED METAL WIRE MESH
3. POST BRACING TRUSS ROD AND FITTINGS AT CORNERS.
4. POST FOOTING, CONCRETE, SEE TABLE
5. SLOPE FOOTING TO DRAIN
6. COMPACTED SUBGRADE
7. BOTTOM RAIL
8. MID RAIL, FOR FENCE GREATER THAN 5' HIGH.
9. TOP RAIL
10. LINE POST
11. STRETCHER BAR, TYP.
12. FOOTING DIAMETER, SEE TABLE
13. FOOTING DEPTH FROM FG, SEE TABLE



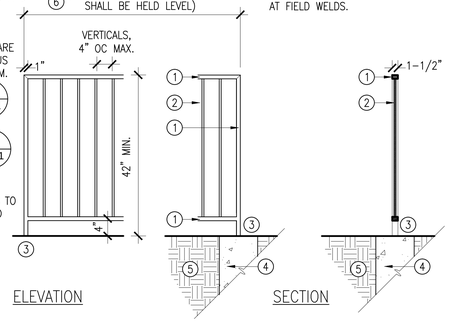
FOOTING TABLE

FENCE HEIGHT	FOOTING DEPTH	FOOTING DIAMETER
10'-0"	5'-0"	16"
42"	2'-6"	12"

5 CHAIN-LINK FENCE
SCALE: NTS

1. TOP AND BOTTOM RAIL AND VERTICAL POST MEMBERS SHALL BE STRUCTURAL TUBING: 1-1/2" X 1" X 3/16". ALL JOINTS SHALL BE WELDED AND GROUND SMOOTH.
2. PICKETS SHALL BE 1/2" X 1/2" SOLID SQUARE STEEL. WELD CONTINUOUS AROUND TOP AND BOTTOM.
3. POST CONNECTION AT PAVING OR FOOTING (7 / L-5.1)
4. CONCRETE FOOTING (7 / L-5.1)
5. COMPACTED SUBGRADE
6. ALL GUARDRAIL SECTIONS TO BE CONSISTENTLY SPACED PER O.R. DIRECTION.

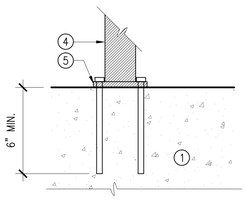
NOTES:
A. PROVIDE SHOP DRAWINGS.
B. ENTIRE GUARDRAIL SHALL BE HOT DIP GALVANIZED AFTER FABRICATION. TOUCH UP WITH GALVANIZED FINISH AT FIELD WELDS.



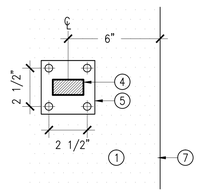
ELEVATION SECTION

6 GUARDRAIL
SCALE: NTS

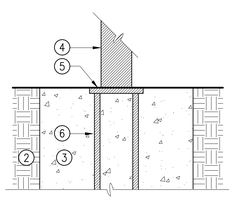
1. (E) CONCRETE PAVING
2. COMPACTED SUBGRADE
3. CONCRETE FOOTING, 10" DIAMETER, 30" DEPTH, WHERE POSTS ARE LOCATED OUTSIDE OF PAVING. OVER CULVERT AT 8TH STREET, WIDEN FOOTING AND DOWELL INTO TOP OF CULVERT AS DIRECTED BY O.R.
4. GUARDRAIL POST 1-1/2" X 1" X 3/16" FIELD WELD TO BASE PLATE. ALL JOINTS SHALL BE FULLY WELDED AND GROUND SMOOTH.
5. BASE PLATE 3/8" THICK, 3-1/2" SQUARE EMBEDDED STEEL PLATE WITH ANCHORS. AT (E) CONCRETE, ATTACH STEEL PLATE TO TOP OF CONCRETE AS SHOWN AND PER O.R. DIRECTION.
6. (4) #4 REBAR STUD ANCHORS, IN 2-1/2" SQUARE PATTERN. USE 12" LENGTH ANCHORS AT CONCRETE FOOTING. WELD TO BOTTOM OF BASE PLATE.
7. EDGE OF CONCRETE



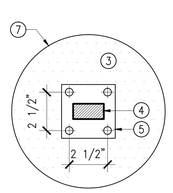
SECTION AT (E) CONCRETE PAVING



PLAN AT (E) CONCRETE PAVING

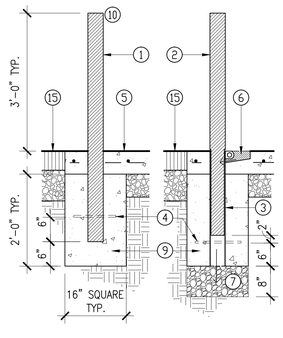


SECTION AT CONCRETE FOOTING

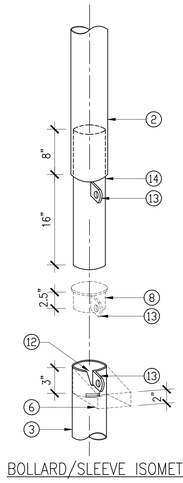


PLAN AT CONCRETE FOOTING

7 GUARDRAIL CONNECTION
SCALE: NTS

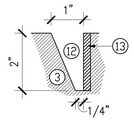


SECTION

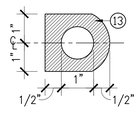


BOLLARD/SLEEVE ISOMETRIC

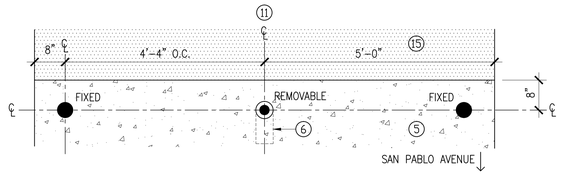
NOTE: INSTALL FIXED BOLLARDS, REMOVABLE BOLLARD PIPE SLEEVES AND FOOTINGS PRIOR TO FINAL PAVING. INSTALL PAVING FLUSH AND TIGHT TO BASE, AS SEPARATE POUR. PROTECT BOLLARDS AND SLEEVES WITH CLEAR PLASTIC AND TAPE TO MASK OFF ALL CONCRETE DURING PAVING INSTALLATION. AT 10TH ST., SAW CUT (E) ASPHALT TO ALLOW FOR INSTALLATIONS OF FOOTINGS, SEE PLANS. CORING AND SETTING AFTER PAVING INSTALLATION NOT ALLOWED.



SLOT ELEVATION



STAPLE ELEVATION

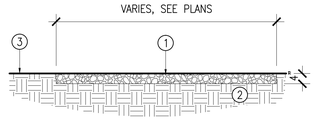


PLAN AT MULTI-USE TRAIL AT SAN PABLO AVENUE

1. STEEL PIPE BOLLARD (FIXED), 4 1/2" OUTSIDE DIAMETER SCHEDULE 40, WITH FLUSH WELDED CAP, SEE SPECIFICATIONS.
2. CUSTOM STEEL PIPE BOLLARD (REMOVABLE), 4 1/2" OUTSIDE DIAMETER SCHEDULE 40, WITH FLUSH WELDED CAP, SEE SPECIFICATIONS. ENSURE BOLLARD RESTS ON TOP OF SLEEVE, NOT #4 REBAR.
3. STEEL PIPE SLEEVE, 4 1/2" OUTSIDE DIAMETER SCHEDULE 40, CAST INTO FOOTING. SECURE WITH #4 REBAR. PROVIDE SLOT THAT ACCEPTS STAPLE FROM BOLLARD OR REMOVABLE HOLE COVER. ENSURE FREE DRAINING INTO DRAIN ROCK. SEE SLOT ENLARGEMENT.
4. #4 REBAR, HOLD 2" CLR FROM EDGE OF FOOTING. DRILL THROUGH REMOVABLE BOLLARD SLEEVE AND WELD HORIZONTALLY. WELD TO FIXED BOLLARD 6" ABOVE BASE.
5. PAVING, PROVIDE STANDARD MUTCD DIAMOND BOLLARD MARKING DETAIL AT CENTER BOLLARD ON MULTI-USE TRAIL, SEE PLANS.
6. SLOPED RECESS IN CONCRETE FOOTING FOR LOCK. PROVIDE 1/2" X 2" WEEP SLOT THROUGH PIPE SLEEVE AT BOTTOM OF RECESS TO ENSURE DRAINAGE THROUGH FOOTING, SEE ENLARGEMENT.
7. DRAIN ROCK
8. REMOVABLE HOLE COVER, (1) FOR EACH REMOVABLE BOLLARD; 1/4" STEEL PLATE, 4 1/2" DIAMETER, WELDED TO 4" OUTSIDE DIAMETER SCHEDULE 40 STEEL PIPE, W/ STAPLE.
9. CONCRETE FOOTING
10. WAYFINDING BOLLARD CAP, SEE SPECIFICATIONS.
11. INSTALL REMOVABLE BOLLARD ON CENTERLINE OF MULTI-USE TRAIL, 8" FROM EDGE OF CONCRETE PAVING. OFFSET FIXED BOLLARDS EQUIDISTANT FROM CENTER BOLLARD.
12. PROVIDE SLOT AS SHOWN AT TOP OF PIPE SLEEVE. SEE SLOT ELEVATION.
13. STAPLE (1) EACH WELDED TO REMOVABLE BOLLARD, SLEEVE & REMOVABLE HOLE COVER. 3/16" STEEL, 1" DIAMETER HOLE TO ACCEPT LOCK / CHAIN, ENSURE STAPLES ALIGN WHEN BOLLARD IS IN PLACE. SEE STAPLE AND SLOT ELEVATIONS.
14. INSERT 4" OUTSIDE DIAMETER SCHEDULE 40 PIPE INTO 4 1/2" OUTSIDE DIAMETER PIPE AND WELD SEAM CONTINUOUS.
15. AC PAVING (2 / L-5.1)

8 BOLLARD
SCALE: NTS

1. AGGREGATE PAVING, ENSURE SURFACE IS ADA COMPLIANT THROUGHOUT. CROSS SLOPE 2% TOWARD CREEK, SEE PLANS FOR GRADING. COMPACT TO 95% TYP. IF APPROVED BY O.R., SALVAGED MATERIAL FROM (E) GRAVEL PATH MAY BE USED UNDER AGGREGATE PAVING, SEE DEMOLITION PLANS.
2. COMPACTED SUBGRADE
3. ENSURE ADJACENT FINISH GRADE IS FLUSH TO AGGREGATE PAVING



9 AGGREGATE PAVING
SCALE: NTS

DATE	NO.	REVISIONS

DESIGN BY: BB / ES
DRAWN BY: ES / PR
CHECKED BY: BB
SCALE:
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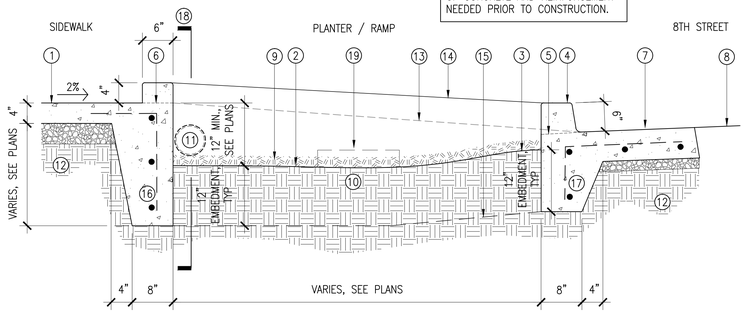
CODORNICES CREEK TRAIL CONNECTION PROJECT
PUBLIC PROCESS AND TRAIL DESIGN - 8TH STREET TO SAN PABLO AVENUE

BID SET

DETAILS

SHEET L-5.1

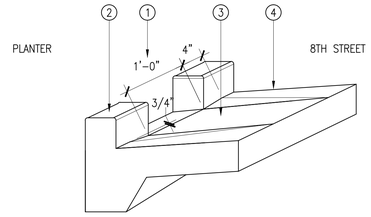
NOTE:
STRUCTURAL ENGINEER FINAL REVIEW OF CONCRETE AND REINFORCEMENT NEEDED PRIOR TO CONSTRUCTION.



SECTION ACROSS 8TH STREET PLANTER EAST (WEST SIMILAR)
(LOOKING SOUTH)

1. CONCRETE PAVING, THICKENED EDGE AS SHOWN AT 8TH STREET PLANTERS. (1 / L-5.1)
2. FG AT 8TH STREET PLANTER LOW POINT. ELEVATIONS NOTED ON PLANS INDICATE PLANTER LOW POINT.
3. DEPRESS FINISH GRADE OF SOIL 3" BELOW GUTTER FLOW LINE (CONTINUOUS) PER O.R. DIRECTION. SEE NOTES ON PLAN FOR LOCATIONS TO RECEIVE DISSIPATOR ROCK.
4. CONCRETE CURB PER CITY OF BERKELEY STANDARD DETAILS.
5. CURB CUT, SEE PLANS FOR LOCATIONS. (2 / L-5.2)
6. CURB CUT IN 4" CURB AT SIDEWALK, SEE PLANS
7. GUTTER PAN PER CITY OF BERKELEY STANDARD DETAILS, MODIFY TO ADD THICKENED EDGE AS SHOWN.
8. AC PAVING PER CITY OF BERKELEY STANDARD DETAILS.
9. MULCH, 2" DEPTH
10. NATIVE SITE SOIL, SEE SPECIFICATIONS.
11. PIPE UNDER RAMP (3 / L-5.2)
12. COMPACTED SUBGRADE
13. ACCESSIBLE RAMP FS (BEYOND) (3 / L-5.2)
14. CURB AT ACCESSIBLE RAMP, HEIGHT VARIES (3 / L-5.2)
15. ACCESSIBLE RAMP THICKENED EDGE (BEYOND) (3 / L-5.2)
16. AT CONCRETE PAVING THICKENED EDGE: #4 REBAR @12" O.C. VERTICAL, HOOK TOP 12". (3) #4 REBAR HORIZONTAL AS SHOWN.
17. AT GUTTER THICKENED EDGE: #4 REBAR @12" O.C. VERTICAL, HOOK TOP THROUGH GUTTER PAN AS SHOWN. (2) #4 REBAR HORIZONTAL AS SHOWN.
18. SECTION AT ACCESSIBLE RAMP (3 / L-5.2)
19. DI (SHOWN SCHEMATICALLY), SEE PLANS FOR LOCATIONS AND RIM ELEVATIONS

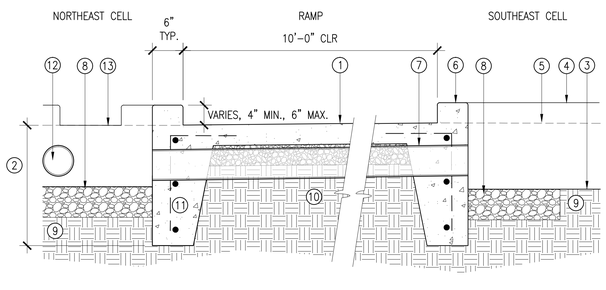
1 8TH STREET PLANTER
SCALE: NTS



1. CURB CUT, 1'–0" WIDE, CONTINUE GUTTER PAN SLOPE DOWN CURB CUT INTO PLANTING AREAS (6" CURB SHOWN). AT 4" CURB ALONG EDGE OF SIDEWALK, OMIT CURB CUT DEPRESSION PER O.R. DIRECTION. ENSURE POSITIVE DRAINAGE INTO PLANTING AREAS, TYP.
2. CURB PER CITY OF BERKELEY STANDARD DETAILS.
3. CURB CUT DEPRESSION. DEPRESS GUTTER PAN 3/4" ACROSS 4" ON BOTH SIDES OF CURB CUT AS SHOWN.
4. GUTTER PAN PER CITY OF BERKELEY STANDARD DETAILS.

2 CURB CUT
SCALE: NTS

NOTE:
STRUCTURAL ENGINEER FINAL REVIEW OF CONCRETE AND REINFORCEMENT NEEDED PRIOR TO CONSTRUCTION.

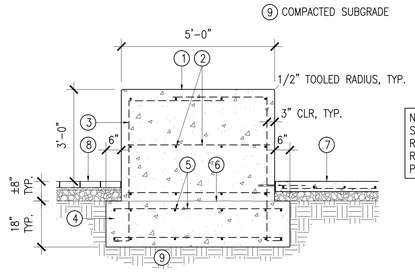


SECTION AT 8TH STREET RAMP EAST (WEST SIMILAR)
(LOOKING EAST)

1. CONCRETE PAVING AT RAMP, THICKENED EDGE AS SHOWN. SEE PLANS FOR SPOT ELEVATIONS AND TRUNCATED DOME LOCATIONS. DOWELL RAMP CONCRETE PAVING INTO GUTTER PAN AND SIDEWALK WITH #4 REBAR, 18" LENGTH, @ 18" OC. (1 / L-5.1)
2. THICKENED EDGE DEPTH VARIES, MM BOTTOM OF CONCRETE PAVING AND GUTTER THICKENED EDGES. ENSURE 12" MINIMUM EMBEDMENT. (1 / L-5.2)
3. FG AT 8TH STREET PLANTER LOW POINT, TYP. ELEVATIONS NOTED ON PLANS INDICATE PLANTER LOW POINT.
4. CONCRETE CURB AT SIDEWALK EDGE, 4" HEIGHT, TYP.
5. CONCRETE PAVING AT SIDEWALK (BEYOND), TYP. (1 / L-5.1)
6. CONCRETE CURB ALONG RAMP EDGE, TYP. SLOPE TOP TO MM 6" CURB HEIGHT ALONG 8TH STREET. (1 / L-5.2)
7. PIPE UNDER RAMP, 6" DIAMETER SOLID PVC SDR 35 OR EQUIVALENT. SEE PLANS FOR LOCATIONS AND INVERTS. END PIPE FLUSH WITH CONCRETE AS SHOWN AND PER O.R. DIRECTION.
8. DISSIPATOR ROCK, 2 CUBIC FEET AT EACH PIPE END, SET FLUSH WITH FG. PLACE ROCK PER O.R. DIRECTION.
9. NATIVE SITE SOIL, SEE SPECIFICATIONS.
10. COMPACTED SUBGRADE
11. AT RAMP CONCRETE PAVING THICKENED EDGES: #4 REBAR @12" O.C. VERTICAL, HOOK TOP 12". (3) #4 REBAR HORIZONTAL AS SHOWN.
12. 6" OUTLET PIPE FROM PRIVATE PROPERTY AT EAST SIDE OF 8TH STREET (SHOWN SCHEMATICALLY), SEE PLANS. CONTINUE DISSIPATOR ROCK BELOW OUTLET PIPE PER O.R. DIRECTION.
13. CURB CUT IN 4" CURB, SEE PLANS FOR LOCATIONS (2 / L-5.2)

3 ACCESSIBLE RAMP
SCALE: NTS

1. CONCRETE PLINTH. JOINTING AS DIRECTED BY O.R. IN FIELD. SLOPE TOP TO DRAIN PER O.R.
2. PLINTH HORIZONTAL REBAR: (4) #4 TOP, MID–HEIGHT AND BOTTOM AS SHOWN.
3. PLINTH VERTICAL REBAR: #4 REBAR AT 18" OC EACH FACE, 18" OVERLAP AT TOP, 6" HOOK AT BOTTOM.
4. CONCRETE FOOTING
5. FOOTING REBAR: #4 TOP AND BOTTOM HORIZONTAL LENGTHWISE AND CROSSWISE AS SHOWN.
6. COLD JOINT, CLEAN AND ROUGH.
7. CONCRETE PAVING, ENSURE POSITIVE DRAINAGE AWAY FROM PLINTH. DOWELL CONCRETE PAVING INTO PLINTH @ 18" OC WITH #4 REBAR DOWELL. PROVIDE EXPANSION JOINT AND FILLER PER CONCRETE PAVING DETAIL. (1 / L-5.1)
8. CONCRETE PAVERS, ENSURE POSITIVE DRAINAGE AWAY FROM PLINTH. (4 / L-5.1)
9. COMPACTED SUBGRADE



NOTE:
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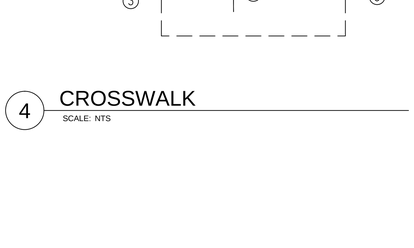
5 CONCRETE PLINTH
SCALE: NTS

1. CURB AND GUTTER
2. RAMP, SEE PLANS FOR TYPE AND LOCATION.
3. SIDEWALK
4. THERMOPLASTIC TRAFFIC MARKERS PER COA / COB STANDARDS.



4 CROSSWALK
SCALE: NTS

DATE	NO.	REVISIONS

DESIGN BY: BB / ES
DRAWN BY: ES / PR
CHECKED BY: BB
SCALE:
DATE: 1 NOVEMBER, 2014

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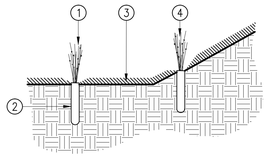
CODORNICES CREEK TRAIL CONNECTION PROJECT
PUBLIC PROCESS AND TRAIL DESIGN - 8TH STREET TO SAN PABLO AVENUE

BID SET

DETAILS

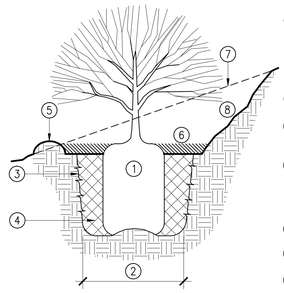
SHEET
L-5.2

CC4: BID SET - S:\PROJECTS\LOWER CODORNICES CREEK_PHASE IV\7 AUTOCAD\WORKING DRAWINGS\LS\LS-DETAILS.DWG
PLOTTED ON: 10/31/2014



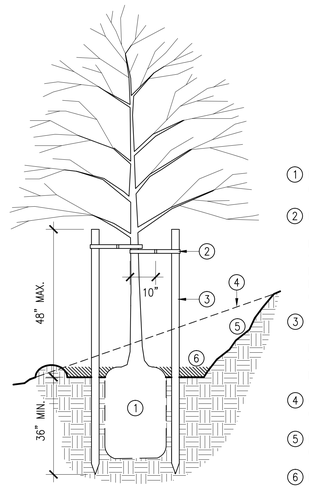
1. PLANT GROWN IN RESTORATION CONTAINER (SMALLER THAN 1 GALLON)
2. PLANTING PIT, EQUAL DIAMETER TO CONTAINER. USE DIBBLE OR HAND SPADE. SET CROWN ABOVE FINISH GRADE. PINCH NATIVE SOIL TIGHT AGAINST ROOTS.
3. MULCH / SEEDING, SEE PLANS AND SPECIFICATIONS. KEEP MULCH CLEAR OF CROWN.
4. SLOPED CONDITION – SET PLANT PLUMB

1 SMALL CONTAINER
SCALE: NTS



1. TREE OR SHRUB ROOTBALL (1 GALLON OR LARGER). SET CROWN 1–2" ABOVE FINISHED GRADE
2. PIT DIAMETER, TWO TIMES THE ROOTBALL DIAMETER. EXCAVATE PIT 2" SHALLOWER THAN CONTAINER, DEEPER BEYOND ROOTBALL. PLACE ROOTBALL ON CENTER MOUND AS SHOWN.
3. FRACTURE & SCARIFY EDGE OF PIT
4. NATIVE SOIL, HAND COMPACT IN 6" LIFTS
5. WATERING BASIN – DOWN SLOPE EDGE ONLY IN SLOPED CONDITION; COMPLETE PLANTING PIT PERIMETER IN LEVEL CONDITION
6. MULCH
7. ORIGINAL GRADE – SLOPED CONDITION
8. FINISHED GRADE – SLOPED CONDITION

2 LARGE CONTAINER
SCALE: NTS

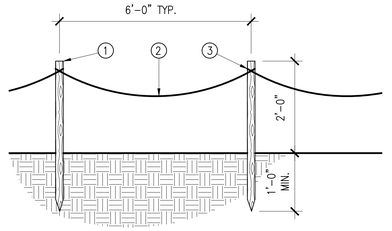


1. LARGE CONTAINER TREE (5 GALLON OR LARGER)
2. PROVIDE (2) ARBORTIE TREE TIES W/ 10" WIDE LOOPS AROUND TRUNK. SECURE ARBORTIES 4" MIN FROM TOP OF STAKES. DIRECTION AND APPROVAL OF INSTALLATION BY O.R.
3. TREE STAKES, SET VERTICAL OUTSIDE ROOTBALL. KEEP TOP OF STAKES 6" MIN CLEAR OF LIMBS.
4. ORIGINAL GRADE – SLOPED CONDITION
5. FINISH GRADE – SLOPED CONDITION
6. MULCH

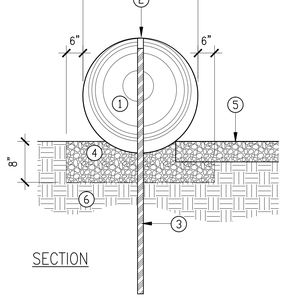
3 TREE STAKING
SCALE: NTS

1. WOOD POST, 2" DIAMETER
2. ROPE, 1/2" DIAMETER.
3. TIE CLOVE HITCH AT EACH POST, 2" BELOW TOP OF POST

NOTE: HOLD POSTS 12" OFF EDGE OF PAVING AND 2' FROM TOP OF BANK UON.



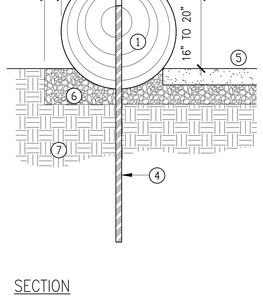
4 TEMPORARY RESTORATION BARRIER
SCALE: NTS



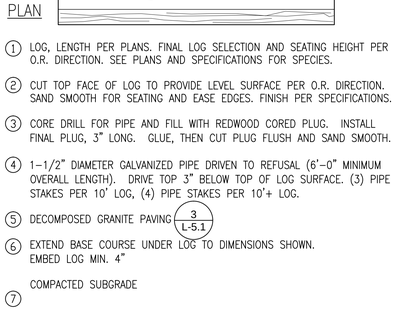
SECTION

1. LOG, LENGTH PER PLANS. LOG SELECTION PER O.R.
2. CORE DRILL FOR PIPE.
3. 1–1/2" DIAMETER GALVANIZED PIPE DRIVEN TO REFUSAL (6'–0" MIN. OVERALL LENGTH). DRIVE TOP 3" BELOW TOP OF LOG SURFACE. (2) PIPE STAKES PER 6'+ LOG, (3) PIPE STAKES PER 8'+ LOG, (4) PIPE STAKES PER 20'+ LOG.
4. BASE COURSE, EMBED LOG 4" MINIMUM.
5. AGGREGATE PAVING (9 / L-5.1)
6. COMPACTED SUBGRADE

5 LOG EDGING
SCALE: NTS



SECTION

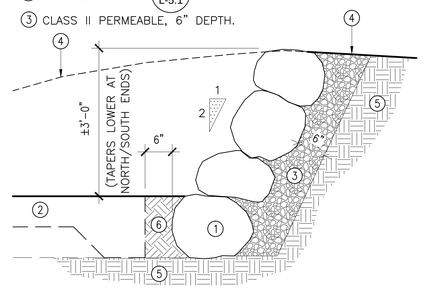


PLAN

1. LOG, LENGTH PER PLANS. FINAL LOG SELECTION AND SEATING HEIGHT PER O.R. DIRECTION. SEE PLANS AND SPECIFICATIONS FOR SPECIES.
2. CUT TOP FACE OF LOG TO PROVIDE LEVEL SURFACE PER O.R. DIRECTION. SAND SMOOTH FOR SEATING AND EASE EDGES. FINISH PER SPECIFICATIONS.
3. CORE DRILL FOR PIPE AND FILL WITH REDWOOD CORED PLUG. INSTALL FINAL PLUG, 3" LONG. GLUE, THEN CUT PLUG FLUSH AND SAND SMOOTH.
4. 1–1/2" DIAMETER GALVANIZED PIPE DRIVEN TO REFUSAL (6'–0" MINIMUM OVERALL LENGTH). DRIVE TOP 3" BELOW TOP OF LOG SURFACE. (3) PIPE STAKES PER 10' LOG, (4) PIPE STAKES PER 10'+ LOG.
5. DECOMPOSED GRANITE PAVING (3 / L-5.1)
6. EXTEND BASE COURSE UNDER LOG TO DIMENSIONS SHOWN. EMBED LOG MIN. 4"
7. COMPACTED SUBGRADE

6 LOG SEATING
SCALE: NTS

1. BOULDERS, 1/8 TON ROCK OR MIX OF 1/8 TON ROCK AND SMALLER ROCK AS DIRECTED. BATTER INTO TIGHT FIT ROCK FACE. STEP DOWN NORTH AND SOUTH ROCKERY ENDS.
2. CONCRETE PAVING (1 / L-5.1)
3. CLASS II PERMEABLE, 6" DEPTH.
4. (E) GRADE (SHOWN SCHEMATICALLY), SEE PLANS.
5. COMPACTED SUBGRADE
6. NATIVE SOIL, COMPACT TO 85% MAX.



7 ROCKERY
SCALE: NTS

DATE	NO.	REVISIONS

DESIGN BY: BB / ES
DRAWN BY: ES / PR
CHECKED BY: BB
SCALE:
DATE: 1 NOVEMBER, 2014

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CODORNICES CREEK TRAIL CONNECTION PROJECT
PUBLIC PROCESS AND TRAIL DESIGN - 8TH STREET TO SAN PABLO AVENUE

BID SET

DETAILS

SHEET L-5.3

SECTION 02230 - SITE CLEARING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Special Provisions, and other Technical Specification Sections apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Protecting existing trees to remain and providing Tree Protection Fencing
2. Installing Temporary Site Construction Fencing
3. Removal and salvage of Chain-link fencing and gate
4. Felling and removing existing trees
5. Clearing and grubbing vegetation above and below grade
6. Removing above and below-grade site improvements and site features including chain-link fencing
7. Disconnecting, capping or sealing, and abandoning site utilities
8. Temporary erosion and sedimentation control measures (SWPPP)
9. Hauling vegetation and site debris cleared and removed under this Specification Section to a City approved transfer station
10. Traffic and parking control

B. Related Sections include the following:

1. Division 2 Section "Earthwork and Drainage"
2. Division 2 Section "Revegetation and Irrigation"

1.3 DEFINITIONS

A. Owner or City refers to the City of Albany (COA), which is the lead agency. Owner or Owner's Representative (O.R.) for the project refers to the City of Albany Engineer or associates or agents.

B. Other Project Representatives include: City of Berkeley (COB), and the University of California Berkeley (UCB).

C. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2-inches in diameter; and free of subsoil, weeds, roots, toxic materials, or other non-soil materials.

D. Tree Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction by Tree Protection Fencing, and defined by the drip line of individual trees or the perimeter drip line of groups of trees, unless otherwise indicated.

E. Temporary Site Construction Fencing: Fencing used to secure Project Limit of Work, including footings, gates, and locks—may include sections of existing site fencing to remain.

1.4 MATERIAL OWNERSHIP

A. Except for stripped topsoil, artifacts, works of art, or materials indicated on the plans or in the specifications to remain COA, COB, or UCB property, cleared materials shall become Contractor's property and shall be removed from Project Site and disposed of in a legal manner. Any artifacts found on the site, whether noted or not on the plans, shall remain the property of the Owner unless otherwise determined. If the Owner or O.R. or agent chooses to relinquish ownership of any found element(s), it shall be the responsibility of the Contractor to dispose of the element(s) in a legal manner off-site.

1.5 SUBMITTALS

A. Contractor shall obtain, pay for, and submit all required local permits to complete the Work. (Regulatory permits from California Fish & Game, Regional Water Quality Control Board, U.S. Army Corps of Engineers, and NOAA Fisheries are not

required unless restoration work affecting Codornices Creek channel is proposed in addition to this trail project.)

B. Proposed Erosion Control Plan utilizing BMP's (Best Management Practices) which meet the lead permitting agency's requirements for Project Site construction erosion control. If agency requirements conflict the most stringent requirements shall be incorporated and met unless the permitting agency determines otherwise.

C. Proposed truck tire wash, dust control, and construction noise abatement plan.

D. Certification: From arborist, certifying 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.

E. Tree Pruning Schedule: Written schedule from arborist detailing scope and extent of pruning of trees to remain that interfere with or are affected by construction.

F. Maintenance Recommendations: From arborist, for care and protection of trees affected by construction during and after completing the Work.

G. Construction Staging Plan noting parking, stockpiling, and haul routes

1. Traffic Control: The Contractor shall submit three (3) copies of proposed traffic control plan to the COA, COB, and UCB engineering departments for approval at least five (5) working days prior to commencement of any project work. No work shall be started unless the Traffic Control Plan is approved by the COA, COB, and UCB. This plan shall be submitted in the form of a scaled, drafted, drawing locating the project area and all major and minor access and exits to and out of this area. The plan shall also include the immediate neighboring areas where the traffic shall be directly or indirectly affected as a result of construction in the project area.

2. The Traffic Control Plan shall be developed for various traffic situations and street configurations in the Project Site and surrounding areas in full conformance with the California Department of Transportation-California Manual on Uniform Traffic Control Devices-MUTCD, dated 2003 Revision 1, as amended to use in California, Part 6 Temporary Traffic Control for Construction and Maintenance Work Zone hereinafter referred to as Traffic Control Manual. Further, the Traffic Control Plan must identify any proposed street parking spaces that are needed for equipment fueling, maintenance or support to the construction.

3. At the main entry and exit points for construction access, the Contractor shall provide a 30" x 30" sign advising the public of the anticipated period of time that traffic delays may be anticipated. This sign shall also include name and telephone number of the Contractor along with starting and completion dates of the contract. Sign shall be erected days (7) days in advance of initiating any work.

4. If traffic is to be detoured over a centerline or detoured in advance of the Work, detour plan must be incorporated in the traffic control plan. COA, COB, and UCB Police, Fire, and Public Works Departments shall be notified at least 48 hours in advance of any work which will interfere with the normal flow of vehicular or pedestrian traffic. Intersection closure may only occur if, in the traffic plan, the two adjacent intersections remain open, unless otherwise approved by the Engineer.

5. All signs and devices proposed to warn, direct, and control traffic in the vicinity of the Work shall conform in size, shape, and color to the requirements set forth in the Traffic Control Manual mentioned above and approved by all COA, COB, and UCB Engineers in accordance with the Traffic Control Plan.

6. The full width of the traveled way shall be open for use by public traffic on Saturdays, Sundays, designated legal holidays, after 3:00 P.M. on Fridays and the day preceding designated legal holidays, and when construction operations are not actively in progress.

7. Cost of traffic controls, including flag person, shall be included and spread among appropriate bid items as determined by the Contractor.

8. Public parking on streets may be restricted as necessary if approved by COA, COB, and UCB.

9. Contractor shall furnish, erect, and maintain all signs including "No Parking" signs. All “No Parking” signs shall be placed as directed by the City Engineer(s) and posted no later than 48 hours or as directed by the Engineer(s) in advance of the time of need. “No Parking” signs shall bear the name of the Contractor and shall also specify the “No Parking” dates and locations.

10. Contractor shall replace within a 24 hour period any sign that has been damaged, lost, or worn out.

11. Responsible City Engineer(s) shall have authority to change the Traffic Control Plan and make recommendations through COA, COB, and UCB departments after the project has started and throughout the project duration.

12. Traffic Control and Parking requirements in COA, COB, and UCB shall conform to the COA, COB, and UCB permit conditions for street use and encroachment.

H. Contractor shall comply with COA, COB, and UCB traffic engineering recommendations within a 24 hour period or immediately if requested. Failure to comply with this item shall be enough reason for the City Engineer(s) or O.R. to stop the project.

I. Proposed Public Access Plan: Contractor shall prepare and provide a Public Access Plan addressing public access around the Project Site. Include fencing, gates, flagging, directional, informational, and regulatory signage.

J. Digital photographs submitted by the Contractor on CD(s), sufficiently detailed, of existing conditions of trees and plantings, adjoining construction, and site improvements that might be misconstrued as damage caused by site clearing.

K. Record drawings, in AutoCAD format, shall be prepared by the Contractor and identify and accurately locate capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.6 QUALITY ASSURANCE

A. Preconstruction Meeting: Conduct meeting at Project site to comply with specified requirements.

1. Before tree protection and trimming operations begin, meet with representatives of authorities having jurisdiction, Owner, O.R., consultants, and other concerned entities to review and receive approval for all tree protection and trimming procedures and responsibilities.

1.7 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 Owner or O.R. and/or other authorities having jurisdiction.

2. Provide alternate routes around closed or obstructed traffic ways if required by Engineer and/or authorities having jurisdiction.

B. Improvements on Adjoining Property: Authority for performing site clearing indicated on property adjoining Owner's property shall be obtained by Owner before award of Contract.

1. Do not proceed with work on adjoining property until confirming with O.R. that all conditions of Owner's permit for right of entry and construction have been satisfied.

C. Salvable Items: Carefully relocate items to be salvaged and store on Project Site until directed otherwise.

D. Utility Locator Service: Verify locations of existing utilities with utility locator service and as otherwise necessary before commencing site clearing.

E. Do not commence site clearing operations until all BMP's (Best Management Practices for erosion and sediment control) are in place and approved by O.R.

PART 2 PRODUCTS

2.1 MATERIALS

A. Satisfactory Soil Materials: Requirements for satisfactory soil materials are specified in Division 2 Section "Earthwork."

1. Obtain approved borrow materials off-site.

B. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2-inches in diameter; and free of weeds, roots, and toxic and other non-soil materials.

1. Obtain topsoil only from well-drained sites where topsoil is 4-inches deep or more; do not obtain from bogs or marshes.

C. Chain-Link Fence: Temporary Site Construction Fencing and Tree Protection Fencing. Metallic-coated steel chain-link fence fabric of 0.120-inch-diameter wire; a minimum of 72-inches high; with 1.9-inch-diameter line posts; 2-3/8-inch diameter terminal and corner posts; 1-5/8-inch diameter top rail; and 0.177-inch diameter bottom tension wire; with tie wires, hog ring ties, and other accessories for a complete fence system.

1. Temporary Site Construction Fencing: At gates, provide minimum 12-foot clear with, two hinged gates with industrial strength steel keyed locks. Provide Owner with (e) complete sets of keys.

D. Mulch: Organic, weed-free compost product, *Treeincarnation*, as supplied by Greenwaste Recycle Yard, Richmond, CA or O.R. approved equal.

PART 3 EXECUTION

3.1 PREPARATION

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

B. Provide three (3) days notice and allow one day for O.R. to locate and clearly flag trees and vegetation to remain or to be salvaged.

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

1. Restore damaged improvements to their original condition, as acceptable to O.R.

3.2 BMP'S—BEST MANAGEMENT PRACTICES (SWPPP)

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 requirements of authorities having jurisdiction.

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

C. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal at the completion of the project.

3.3 TREE PROTECTION AND FENCING

A. Temporary Fencing: Install temporary fencing around tree protection zones to protect remaining trees and vegetation from construction damage. Maintain temporary fence and remove when construction is complete. Install chain-link fence according to ASTM F 567 and manufacturer's written instructions.

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

C. Mulch areas inside Tree Protection Zones with 6-inch thick layer of mulch. Hold mulch back 12-inches from tree trunks.

D. Do not store construction materials, debris, or excavated material inside tree protection zones. Do not permit vehicles or foot traffic within Tree Protection Zones; prevent soil compaction over root systems.

E. Maintain tree protection zones free of all weeds, debris, and materials.

3.4 EXCAVATION

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

B. Do not excavate within Tree Protection Zones, unless otherwise indicated.

C. Where excavation for new construction is required within tree protection zones, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks and comb soil to expose roots.

D. Redirect roots in backfill areas where possible. If encountering large, main lateral roots, expose roots beyond excavation limits as required to bend and redirect them without breaking. If encountered immediately adjacent to location of new construction and redirection is not practical, cut roots approximately 3-inches back from new construction.

E. 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.

F. Where utility trenches are required within tree protection zones, tunnel under or around roots by drilling, auger boring, pipe jacking, or digging by hand.

G. 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.

3.5 RE-GRADING ADJACENT TO EXISTING TREES

A. Grade Lowering: Where new finish grade is indicated below existing grade around trees, slope grade away from trees as recommended by arborist, unless otherwise indicated.

B. Root Pruning: Prune tree roots exposed during grade lowering. Do not cut main lateral roots or taproots; cut only smaller roots. Cut roots with sharp pruning instruments; do not break or chop.

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

3.6 TREE PRUNING

A. Prune trees to remain that are affected by temporary and permanent construction.

B. Prune trees to remain to compensate for root loss caused by damaging or cutting root system. Provide subsequent maintenance during Contract period as recommended by arborist.

C. Pruning Standards: Prune trees according to ANSI A300 (Part 1)

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

E. Chip removed tree branches and spread over areas identified by O.R.

3.7 TRANSPLANTING / MANUAL MEANS WITH MECHANICAL ASSISTANCE

A. This specification is for transplanting with manual means with some mechanical assistance if available. This is not a specification for use of mechanical tree spades.

B. Prepare all plants for transplanting by root pruning (cutting roots near the point of the proposed transplant rootball limits with a sharpened professional spade and or pruning shears and saws) the fall season before transplanting is proposed. Select an appropriate size rootball diameter for the species and for the staffing and equipment available. Do not move the tree in anyway. After root pruning, mulch and water the plant.

C. Schedule transplanting to occur in the late fall after all deciduous trees are dormant.

D. Prepare new transplant location (new tree or shrub planting pit) prior to excavating (transplanting) the designated plant. Follow project Plans and Specifications. Ensure final plant location soil preparation and grades are reviewed and approved by O.R. Ensure water for transplanting is available and that mulch and topsoil or approved native soil is available to complete transplanting work.

E. Ensure utility locating services are used to mark existing utilities and confirm that proposed transplanting is safe and will not harm utilities.

F. Begin the transplanting by trimming the rootball on the same diameter (cut line) as the previous season's root pruning effort (if accomplished). Ensure the excavated rootball is feasible to move with the means available and specified. Severe roots both around and under the rootball, ensuring clean cuts made with sharp tools (saws, pruners, shovel or spade).

G. Prepare the plant for moving by gently rocking the rootball and laying underneath the rootball a durable tarp or burlap. It may be required to wrap the rootball in burlap and secure the rootball and burlap with heavy twine. Utilize manual means to transport the rootball and plant or use a small tractor or backhoe to left the rootball and transport it to the new location.

H. Ensure the bottom of the new planting pit is properly excavated and prepared to accept the transplanted plant and plant it at the height noted in the Plans and Specifications. Follow all standard and specified planting measures. Ensure ample water and mulch are used in the transplanting process.

I. Mulch and stake all newly transplanted plants to maintain their stability and to prevent damage to the roots, trunk, and branches.

3.7 TREE REPAIR AND REPLACEMENT

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

B. Remove and replace trees indicated to remain that die or are damaged during construction operations that an arborist and/or O.R. determines are incapable of restoring to normal growth pattern.

C. Provide new trees of 6-inch caliper size and of a species selected by O.R. when damaged trees more than 6-inches in caliper size, measured 12-inches above grade, are required to be replaced. Plant and maintain new trees as specified in Division 2 Section "Planting."

D. 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 augered soil and sand.

3.8 UTILITIES

A. Locate, identify, disconnect, and seal or cap off utilities indicated to be removed.

1. Arrange with utility companies to shut off any utilities affected by the Work.

2. Owner shall arrange to shut off indicated utilities when requested by Contractor.

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

1. Notify O.R. not less than two days in advance of proposed utility interruptions.

2. Do not proceed with utility interruptions without O.R.'s written permission.

C. Excavate for and remove underground utilities indicated to be removed.

D. Contractor shall verify that the utilities indicated to be removed on the Plans are not live by dye testing, smoke testing, television cameras and electronic locators from the creek banks to the plumbing fixtures. Obtain permission from property owner to enter and search for existing active connections to the drainage outlets or outfalls. Review results of investigation with O.R. prior to plugging or abandoning utility structures.

3.9 CLEARING AND GRUBBING

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

1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.

2. Cut minor roots and branches of trees indicated to remain in a clean and careful manner where such roots and branches obstruct installation of new construction.

3. Grind stumps of trees removed to 8-inches below finish grade on plans and leave roots intact.

4. Use only hand methods for grubbing within Tree 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.

3.11 SITE IMPROVEMENTS

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

B. Address utilities as noted on the Plans. Irrigation lines encountered shall be cut clean below grade, capped and flagged as directed by O.R.

C. Remove slabs, paving, curbs, gutters, aggregate base as indicated, and as required to complete the proposed improvements.

1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut length and depth of existing pavement to remain before removing existing pavement. Saw-cut faces vertically.

2. Paint cut ends of exposed steel reinforcement in concrete to remain to prevent corrosion.

3.12 CHAIN-LINK FENCE AND GATE

A. Chain-link fence as noted on the Plans shall be removed and/or salvaged as noted. O.R. may choose to salvage more fencing in field than is noted for salvage on Plans.

B. Ball field gate at southwest end of 10th Street in Albany (approx. 6'-0" ht.) shall be removed, salvaged for reinstallation, and prepared for new chain-link fencing installations (See Section 02821).

C. Adjacent ball field fencing (various heights) shall be cut back, realigned, and prepared for reinstallation and new installations (See Section 02821).

3.13 DISPOSAL

A. Disposal: Remove unsuitable and/or surplus soil material, topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.

1. Separate recyclable materials produced during site clearing from other non-recyclable materials. Store or stockpile Owner approved recyclable materials without intermixing with other materials and transport them to recycling facilities or use on the site as directed.

END OF SECTION 02230

SECTION 02300 – EARTHWORK and DRAINAGE

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Special Provisions, and other Technical Specification Sections apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Excavation, transport and disposal (if necessary) of soils (assume non-hazardous) from project area.
2. Excavating and backfilling for site improvements and existing creek channel.
3. Subgrade and base courses for site work.
4. Grading and preparing subgrades for concrete site improvements, paths, and riprap and boulder placements.
5. Soil preparation for planted areas.
6. Excavating and backfilling for trenches.
7. Installation of decomposed granite (D.G.) paving and base.
8. Installation of base course aggregate paving.
9. Install Drain Inlets in 8th Street planting strips.
10. Installation of PVC drain pipe.
11. Installation of drain rock (if required).

B. Related Sections include the following:

1. Division 2 Section "Site Clearing"

2. Division 2 Section "Revegetation and Irrigation"

3. Division 2 Section "Riprap and Boulders"

1.3 UNIT PRICES

A. Unit prices for earthwork are included in Special Provisions, "Bid Schedule".

B. Quantity allowances for earthwork are included in Special Provisions, "Bid Schedule".

1.4 DEFINITIONS

A. Owner or City refers to the City of Albany (COA), which is the lead agency. Owner or Owner's Representative (O.R.) for the project refers to the City of Albany Engineer or associates or agents.

B. Other Project Representatives include: City of Berkeley (COB), and the University of California Berkeley (UCB).

C. Backfill: Soil material or controlled low-strength 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.

D. Base Course: Course placed between the subgrade and concrete, asphalt, decomposed granite, aggregate, or concrete site improvements.

E. Bedding Course: Course placed over the excavated subgrade in a trench before laying pipe or sleeve.

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

G. In-Channel: Active Channel, Floodplain, and Banks.

H. In-Channel Work: Earthwork, use of heavy equipment, grading, demolition, and placement of fill in the creek channel.

I. Excavation: Removal of material encountered above finished and 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 O.R. Authorized additional excavation and replacement material will be paid on an extra work basis in accordance with the provisions of the Contract.

2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by O.R. Unauthorized excavation and required replacement to grade with import soil shall be made without additional compensation.

J. 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.

K. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below base course, drainage fill, or topsoil materials.

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

M. Native Soil: Existing site soil

N. General Fill: Soil selected from the excavations with the approval of the Soils Engineer, excluding only the black and dark brown expansive clays.

O. Select Fill: Imported soil materials used for select fill under structural elements (concrete paving, paved trails) and as backfill where General Fill is unsuitable.

P. Import Topsoil: Well-amended sandy loam provided by a certified, O.R. approved, commercial soil reseller. Imported soil shall not be from a project site or excavated from off-site borrow location.

Q. Compost: Organic, certified weed fee, and OMRI or USCC certified compost product approved by O.R.

1.5 SUBMITTALS

A. Product Data: For the following:

1. Each type of plastic warning tape.

2. Controlled low-strength material, including design mixture.

3. Imported Topsoil, one cubic foot sample.

4. Compost, one cubic foot sample.

5. Stabilizer Solutions Inc.; stabilizer and aggregate samples for D.G. Paving.

6. Base Course, Class II Permeable, Drain Rock, and Bedding Course.

7. Drain Inlets and piping for 8th Street planting strips.

8. PVC pipe products, fabrics, inlets and components.

B. Mock-up of Stabilized D.G. Paving (Decomposed Granite) surfacing. Coordinate D.G. aggregate analysis and product approval with Stabilizer Solutions Inc. prior to initiating mock-up. Provide 10-foot by 10-foot mock-up at designed depth, both with specified edging and without.

C. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:

1. Select Fill

2. Import Topsoil

3. Compost

D. Pre-excavation Photographs: Per specifications, submit digital photographs (1mb min. size each) on flash drive showing existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by earthwork operations. Submit before earthwork begins.

E. Specifications and certification sheets on Select Fill material.

1.6 QUALITY ASSURANCE

A. Geotechnical Testing Agency Qualifications: An independent testing agency qualified according to ASTM E 329 to conduct soil materials and rock-definition testing, shall be provide by Owner (ASTM D 3740 and ASTM E 548). See Special Provisions for special conditions of payment.

B. Pre-excavation Meeting: Conduct meeting at Project site to comply with specified requirements.

C. Soil-Testing Laboratory Qualifications: An independent laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.

1. Topsoil Analysis: Furnish soil analysis by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; sodium absorption ratio; deleterious material; pH; and mineral and plant-nutrient content of topsoil.

2. Report suitability of topsoil for vegetable garden plant growth. State recommended quantities of nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory topsoil.

1.7 PROJECT CONDITIONS

A. Soils Reports for Project site are available from the City.

1. The Contractor is responsible for using the data in the Soils Report to work with appropriate landfills for soils disposal if necessary.

2. Soils Reports will be made available for inspection by the Contractor upon request by the O.R.

B. Soils and Geotechnical Reports: Data on indicated subsurface conditions are not intended as representations of warranties of accuracy or continuity between soil borings. The Owner shall not be responsible for interpretations or conclusions drawn by Contractor from these Reports. Additional test borings and other exploratory operations may be made by the Contractor at no cost to Owner.

C. Geotechnical Engineering Observation: Contractor shall notify project geotechnical engineer through O.R. and schedule site excavation observation visit at the beginning of the work. After excavation of the slope, the Geotechnical Engineer shall observe the materials exposed in the cuts. Areas that exhibit loose, weak, wet, badly cracked, or compressible surface soils shall be further prepared by sub-excavating the unsuitable material until firm materials are encountered. The depths of these excavations shall be determined by the Geotechnical Engineer. Benches shall be cut into the ground to prepare the surface prior to receiving fill for the slope rebuilding. Fill materials used to rebuild the slope shall conform to Select Fill as specified. Select Fill for the slope rebuilding shall be compacted to at least 95 percent relative compaction as per ASTM D1557, except for the top 6-inches of the slope

surface, the compaction effort can be reduced to 90 percent relative compaction per ASTM D1557 to allow for roots of vegetation to take hold.

D. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by O.R. and then only after arranging to provide temporary utility services according to requirements indicated.

1. Notify O.R. not less than two days in advance of proposed utility interruptions.

2. Do not proceed with utility interruptions without O.R. written permission.

3. Contact utility-locator service for area where Project is located and mark all utilities within the project limits before excavating.

4. Notify O.R. of completion of Utility Locator's services prior to excavating.

E. Demolish and completely remove from site existing concrete and debris.

F. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.

PART 2 PRODUCTS

2.1 SOIL AND AGGREGATE MATERIALS

A. General: Provide imported borrow soil materials for all fill.

B. Satisfactory Soils: ASTM D 2487 Soil Classification Groups GW, GP, GM, GC, SW, SP, SC, SM, CL and ML; free of rock or gravel larger than 3-inches in any dimension, debris, waste, vegetation, and other deleterious matter.

C. Unsatisfactory Soils: ASTM D 2487 Soil Classification Groups OL, OH, CH, MH, and PT.

1. Unsatisfactory soils also include satisfactory soils not maintained within 4percent of optimum moisture content at time of compaction.

D. Base Course: Shall conform to Caltrans Class II aggregate base specification, latest edition. Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 95 percent passing a -1/2-inch sieve and not more than 8 percent passing a No. 200 sieve.

E. General Fill: Native soil from site for use as general site fill for the old creek channel and at locations with final slopes less than 5:1. For additional specification data see Soils Report.

F. Select Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve. No presence of chemicals or heavy metals. Fill placed at the site, shall not contain rocks or lumps larger than 3-inches in greatest dimension and shall contain no more than 15 percent rocks larger than 2-1/2-inches. Acceptable materials include (per ASTM D2488) SC, SM, GM (with a minimum of 30 percent fines in the sands and/or gravels), GC, CL, and ML.

G. Import Topsoil: Imported soil blend, specifically for raised vegetable beds. Imported Topsoil shall be a well-amended sandy loam, reviewed and provided by the City. Topsoil shall be a blend of sandy loam, chicken manure, general and grape compost, cocoa bean and rice hulls, and fir bark. Supplier shall be a certified, approved, commercial soil reseller, American Soil and Stone, Richmond, or approved equal. Imported soil shall not be from project site or excavated from off-site borrow location.

H. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve.

I. Stabilized D.G. (decomposed granite): Crushed granite aggregate (approximately 3/8-inch minus) per Stabilizer Solutions Inc. specification and approval. Color, golden buff color from an approved, local Bay Area supplier (American Soil & Stone or approved equal). Aggregate sample shall be submitted to Owner and Stabilizer Solutions Inc. for review and approval for use. Combine aggregate with Stabilizer Solutions Inc. stabilizer product in quantities as recommended by the manufacturer to complete the work. Stabilizer Solutions Inc. tel. 800.336.2468.

J. Drain Rock: 3/4 to 1-1/2–inch diameter, round, solid (not crushed) washed aggregate.

K. Class 2 Permeable: Caltrans Specification Section 68.

L. Compost: Organic, certified weed fee, and OMRI or USCC certified compost product approved by O.R. "Wondergrow" by American Soil & Stone (Richmond, CA, tel. 510.292.3000) or equal approved by O.R. Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 3/4-inch sieve; soluble salt content of 5 to 10 decisiemens/m;

not exceeding 0.5 percent inert contaminants and free of substances toxic to plants. Organic Matter Content: 25 percent of dry weight.

M. Sand: Fine aggregate, natural or manufactured sand (ASTM C33).

N. Mulch: See Specification Section 02230.

2.2 DRAIN PIPE AND DRAIN INLETS

A. Solid PVC Drain Pipe and Fittings: Caltrans Specification Section 68. Sizes per Plans.

B. Drain Inlets: (2) Christy Concrete U-21 GR 24KORS, with custom Knock-out to meet existing pipe size (pipe is connected directly to culvert). Coordinate specific product and specifications with both COB and COA engineers. Christy Concrete 800-486-7070.

2.3 FILTER FABRIC (IF REQUIRED)

A. Filter Fabric: Caltrans Specifications, Section 88, Engineering Fabrics. 100 percent polypropylene, non-woven, needle punched engineering fabric, Mirafi or approved equal.

2.4 GEOTEXTILE FABRIC (IF REQUIRED)

A. Geotextile Fabric: Mirafi 500X or approved equal.

2.5 DETECTABLE WARNING TAPE

A. 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 as follows or as required by jurisdictions:

1. Red: Electric; Blue: Water systems.

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 earthwork operations.

B. Preparation of subgrade for earthwork operations including removal of vegetation, topsoil, debris, obstructions, and deleterious materials from ground surface is specified in Division 2 Section "Site Clearing."

C. Protect and maintain erosion and sedimentation controls, which are specified in Division 2 Section "Site Clearing," during earthwork operations.

3.2 EXCAVATION

A. 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.

3.3 EXCAVATION FOR STRUCTURES AND SITE IMPROVEMENTS

A. Excavate to elevations and dimensions indicated 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. Clear subgrade by hand just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work. Use approved Select Fill if required to achieve specified compaction.

3.4 SUBGRADE PREPARATION

A. Soil subgrades in areas to receive Select Fill should be scarified a minimum of 6-inches, moisture conditioned to at least optimum moisture content and compacted to at least 90 percent relative compaction (per ASTM D1557).

B. The compacted surface should be firm and unyielding and should be protected from damage caused by traffic or weather.

C. Areas of unstable soils shall be over-excavated to competent soils or a minimum of 18-inches below finished subgrade elevation where competent soils are not encountered. The bottom of the excavation should then be completely covered with a ground stabilization Geotextile Fabric and backfilled with base course. Caltrans Class II permeable material may be allowed with O.R. approval. The Geotechnical Engineer should observe all weak and unstable areas during construction to determine if alternative subgrade stabilization procedures are more appropriate.

3.5 EXCAVATION FOR UTILITY TRENCHES

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

B. 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.

C. Clearance: 12-inches each side of pipe or conduit.

D. Trench Bottoms: Excavate trenches 4-inches deeper than bottom of pipe elevation to allow for bedding course.

E. Excavate trenches 6-inches deeper than elevation required in unyielding bearing material to allow for bedding course.

3.6 SUBGRADE INSPECTION

A. Notify O.R. when excavations have reached required subgrade.

B. If O.R. determines that unsatisfactory soil is present and/or not firm and unyielding, continue excavation and replace with compacted backfill or fill material as directed.

C. Prior to proof rolling, verify with O.R. that soil moisture content is optimal for achieving specified compaction. O.R. will determine the maximum dry density using AASHTO T 99, AASHTO T 272, or Caltrans Standards.

D. Proof-roll subgrade below site improvements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

1. Completely proof-roll subgrade in one direction**,** repeating proof-rolling in direction perpendicular to first direction. Continue proof rolling until 8 passes have been completed. Limit vehicle speed to 3 mph.

2. Proof-roll with a steel wheeled roller, minimum weight 10 tones.

3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by O.R., and replace with compacted backfill or fill as directed.

E. Authorized additional excavation and replacement material will be paid for according to Contract provisions for unit prices.

F. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by O.R., without additional compensation.

3.7 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavation under foundations or footings with additional concrete as specified above. Controlled density fill, with 28-day compressive strength of 1,000 psi, may be used when approved by O.R.

3.8 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials without intermixing. Place, grade, and shape stock piles to completely drain surface water. Cover to prevent windblown dust. Soils from specified areas required for resampling shall be separated and covered until final soil disposal determination.

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

2. Locate Stockpiles where approved by O.R.

3.9 BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:

1. Construction below finish grade including, where applicable, sub-drainage, damp-proofing, and waterproofing.

2. Surveying locations of underground utilities for Record Drawings.

3. Testing and inspecting underground utilities.

4. Removing concrete formwork.

5. Removing trash and debris.

6. Removing temporary shoring and bracing, and sheeting.

7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

B. Place backfill on subgrades that are firm and unyielding.

3.10 UTILITY TRENCH BACKFILL

A. Place backfill on subgrades that are firm and unyielding.

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. Backfill trenches excavated under footings and within 18-inches of bottom of footings with satisfactory soil; fill with concrete to elevation of bottom of footings. Concrete is specified in Division 3 Section "Cast-in-Place Concrete."

D. Place and compact initial backfill, free of particles larger than 1-inch in any dimension, to a height of 12-inches over the utility pipe or conduit.

1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.

E. Backfill voids with satisfactory soil while installing and removing shoring and bracing.

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.

3.11 SOIL FILL

A. Where fills are placed on slopes steeper than 5 horizontal to 1 vertical, the toe of the fill slope shall be keyed a minimum of 2-feet into competent, undisturbed native soil.

B. Fill slopes, over 5-feet in height, shall be notched (at least 2-feet into the existing slope) and keyed into native soil.

C. Keyways should be a minimum of 8-feet wide and sloped at a minimum of 2 percent towards the back of the keyway.

D. As fill placement proceeds, the fill slope shall be notched at least 2-feet into the existing slope.

E. The actual extents of keying and benching should be determined in the field at the time of construction by the Geotechnical Engineer.

F. Fill slopes should be overbuilt be a minimum of 2-feet and then trimmed back to finish grades.

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

1. Under planted areas, use satisfactory native soil material or imported topsoil.

2. Under Concrete Paving, D.G. Paving and Asphalt Paving, use satisfactory soil material.

3. Under Concrete paving, curb and gutter, and footings areas use Select Fill.

H. Place soil fill on firm and unyielding subgrades.

3.12 SOIL MOISTURE CONTROL

A. All Select Fill shall be moisture conditioned to 0 to 4 percent above optimum per ASTM D1557.

1. Do not place backfill or fill soil material on surfaces that are not firm or unyielding.

2. Remove and replace, or scarify and air dry otherwise satisfactory soil material that exceeds optimum moisture content by 4 percent and is too wet to compact to specified dry unit weight.

3.13 COMPACTION, COMPACTION MITIGATION, BACKFILL, SUBGRADE PREPARATION

A. 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.

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

C. Compact soil materials to the following percentages of maximum dry unit weight according to ASTM D 1557:

1. Under structures, slabs, steps, and pavements, scarify and re-compact top 12-inches of existing subgrade and each layer of backfill or fill soil material to 95 percent.

2. Under walkways, scarify and re-compact top 6-inches below subgrade and compact each layer of backfill or fill soil material to 95 percent relative compaction.

3. D.G. Paving and Aggregate Paving: scarify and re-compact top 12-inches of existing subgrade and each layer of backfill or fill soil material to 95 percent.

4. In unpaved and planted areas scarify and re-compact the top 6-inches below subgrade and compact each layer of backfill or fill soil material to a maximum 85 percent. Coordinate with excavation mitigation measures noted below.

5. For utility trenches in either paved or planted areas, compact each layer of initial and final backfill soil material to match the specified percentages noted above.

D. Compaction Mitigation: Mitigate demolition and grading work soil compaction of all site areas outside limits of paving. Provide complete post-construction mitigation of all site areas. Mitigation measures shall be submitted by Contractor to the O.R. for review and approval and shall include at a minimum:

1. Deep mechanical ripping with heavy duty, agricultural type tractor. Tractor and tines shall be capable to rip to a depth of 12-inches minimum and tines shall be spaced no more that 18-inches on center. Rip in at least two directions, 90 de-

grees to each other or as approved by O.R. O.R. reserves right to require third pass if Contractor is unable to achieve the desired results.

2. Remove by mechanically and manually raking final grade throughout all site areas and removing all debris, organic matter, larger than 3-inches in diameter unless otherwise approved by O.R.

3. Compaction testing to determine need for mitigation and the success of compaction mitigation measures shall be by the O.R. Goal is for soil profile compacted to approximately 85 percent relative compaction.

3.14 GRADING

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

1. Provide a smooth transition between adjacent existing grades and new grades.

2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Site Grading: Slope grades as shown on plans and to prevent ponding. Finish subgrades to required elevations within the following tolerances:

1. Pavements: Plus or minus ½-inch.

2. Transitions between Paved, Planted, and Lawn Areas: Plus or minus ½-inch.

3. Unpaved Areas: Plus or minus 1-inch.

4. Foot Trails: Plus or minus 1-inch.

3.15 BASE COURSE

A. Place aggregate base course on firm and unyielding subgrade.

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 6-inches or less in compacted thickness in a single layer.

3. 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.

4. 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.

C. Pavement Shoulders: Shoulders along edges of Asphalt, Concrete, and D.G. pavement shall be installed with base course per plans. Construct shoulders of satisfactory, free draining soil materials and compact simultaneously with each subbase and base layer to maximum 85 percent of maximum dry unit weight to allow for vegetation establishment.

3.16 D.G. PAVING (DECOMPOSED GRANITE)

A. Install D.G. Paving per Stabilizer Solutions (manufacturer) Specifications and Installation Procedures under direct observation of Stabilizer Solutions representative or other Stabilizer Solutions authorized representative.

B. Install only after steel edging is installed and has been approved by O.R.

C. Install only after O.R. review and approval of a successful D.G. Paving mock-up.

D. Compact soil area beneath path to 95 percent of maximum dry unit weight. Compact two 12-inch shoulders on each side or path or paving area edge at 90 percent to accommodate vegetation establishment. Once compaction is approved, excavate area for D.G. Path and Surfacing from compacted finish and subgrade with vertical sides. Over excavate only to the extent necessary to install steel edging and to minimize the re-compaction of shoulders adjacent to D.G. surfacing.

E. Ensure steel edging is fully supported on both faces prior to compacting adjacent fill and prior to installing D.G.

F. Install as noted on the Plans and per Manufacturer's recommendations.

3.17 DRAIN PIPE AND DRAIN INLETS

A. Install PVC Drain Pipe as noted on the plans and per Caltrans Specifications. Make connections to existing culvert as required. Where new connection point to culvert is required or recommended, provide new connection at no additional cost.

B. Set pipe and rim elevations of new drain inlets as directed by COA/COA engineers and O.R.

3.18 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.

1. Scarify or remove and replace soil material to depth as directed by O.R.; reshape and re-compact.

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.

3.19 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove all excavated native soils, surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

END OF SECTION 02300

SECTION 02380 – RIPRAP AND BOULDERS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Special Provisions, and other Technical Specification Sections apply to this Section.

1.2 SUMMARY

A. This Section includes the following: Supply skilled experienced labor, materials, and equipment required to install:

1. Riprap at Proposed and Existing Headwalls: San Pablo Avenue and 10th Street (downstream west end only)
2. Riprap at 8th Street East Overlook
3. Riprap for Pipe Outfalls
4. Erosion Control Riprap (if required)
5. Boulder Placements
6. Coir Fabric Installation (if required)

B. Related Sections include the following:

1. Division 2 Section “Earthwork and Drainage”
2. Division 2 Section “Soil Bioengineering”
3. Division 2 Section "Site Furnishings"

1.3 DEFINITIONS

A. Owner or City refers to the City of Albany (COA), which is the lead agency. Owner or Owner’s Representative (O.R.) for the project refers to the City of Albany Engineer or associates or agents.

B. Other Project Representatives include: City of Berkeley (COB), and the University of California Berkeley (UCB).

1.4 SUBMITTALS

C. Proposed Riprap and Boulder types, sizes, color, quantities, gradation, and sources prior to delivering rock to the site. O.R. reserves the right to accompany Contractor to stone source or source quarry to select boulders for use on site.

D. Provide on-site mock-ups for the following, for review and approval prior to installation. Successfully approved mock-up elements can be incorporated into the final site product:

1. Riprap adjacent to Proposed Headwall: San Pablo Avenue. Mock-up can form part of the final installation if approved.

2. Riprap adjacent to Existing Headwall: 10th Street (downstream west only). Mock-up can form part of the final installation if approved.

3. Boulder placements. Mock-up can form part of the final installation if approved.

E. Sample fabric, coir type. Mock-up can form part of the final installation if approved.

1.5 INSPECTION

A. The Contractor shall obtain approval of the following prior to proceeding with construction:

1. Preparation of the sub-grade and prior to placement of Riprap and Boulders.

1.6 QUALITY ASSURANCE

A. Comply with California Department of Transportation (Caltrans) Standard Specifications, latest edition.

B. Pre-construction Meeting: Conduct meeting at Project Site to comply with specified requirements.

C. Ensure Riprap and Boulder placement equipment and personnel meet the requirements of the specifications for type and experience level.

PART 2 MATERIALS

2.1 RIPRAP

A. Grading of riprap shall meet the requirements of Caltrans Standard Specifications, Section 72-2, Grading of rock slope protection, Method B placement.

B. Riprap rock shall be of such shape as to form a stable protection structure of the required section. Rounded boulders or cobbles shall not be used. Flat or needle shapes rocks will not be accepted unless the thickness of the individual pieces is greater than 0.33 times the length. Porous and soft rocks shall not be allowed. In no instances will concrete or other "debris" rocks be allowed for riprap. The dry unit weight of each rock shall be 150 lbs/cf or greater. Sizes and weights are noted below:

Riprap Weight Tons	Riprap Weight Pounds	Riprap Size (approx. dim.), actual dim. varies with shapes (assumes 150lbs. cf)
NA	5-75 lbs.	Backing No. 3 / Caltrans. Rock sized by weight 0-5%-25 lb.; 25-75%-5 lb.; 90-100% 1 lb.

C. Angular Rock Backfill: Washed 3-inch angular rock.

D. Class 2 Permeable: Caltrans Specification Section 68.

E. Rock shall be composed of hard, durable, sound pieces having a specific gravity of not less than 2.5. Rock and quarry shall be approved by O.R. prior to acquisition.

2.2 BOULDERS

A. Boulders shall be select quality Syar Napa Basalt from the Syar Quarry in Napa. Boulders shall tend to angular forms and shall be selected for suitability as steps and seating. Cut, scarred, spalled, chipped, or broken boulders shall not be accepted. No sharp edges will be allowed. Boulders shall be hand selected by O.R. at the source, source quarry, or stone supplier facility if requested.

B. Boulders Sizes and Quantities: See Plans for locations, quantities and sizes noted below take precedence over Plan symbolism.

1. San Pablo Area (NW of Headwall): Total Boulders in Tons, 18

Quantity	Size by Weight
5	2.0 ton boulder
6	1.0 ton boulder
4	1/2 ton boulder

2. East of 10th Street (North and South): Total Boulders in Tons, 14

Quantity	Size by Weight
5	2.0 ton boulder
4	1.0 ton boulder

3. West of 10th Street including Existing Headwall (North and South of Creek): Total Boulders in Tons, 24

Quantity	Size by Weight
7	2.0 ton boulder
6	1.0 ton boulder
8	1/2 ton boulder

4. East of 8th Street: Total Boulders in Tons, 10

Quantity	Size by Weight
3	1.5 ton boulder
16	1/4 ton boulder
12	1/8 ton boulder

2.3 FABRIC (IF REQUIRED TO CONTROL EROSION ON OVER-STEEPENED SLOPES, HEADWALLS, OR OUTFALLS)

A. Fabric shall be coir type North American Green, C125BN, 100 percent biodegradable coconut fiber, see Section 02370, 2.1, A.

PART 3 EXECUTION

3.1 SUBGRADE PREPARATION

A. Areas where riprap is to be placed shall be graded to elevations shown on the Plans. The soil surface shall be smooth and free from any obstructions to provide adequate contact area between the soil and riprap.

3.2 RIPRAP

A. Riprap:

1. Place riprap as required, and as directed by O.R.

B. Riprap Thickness:

1. Local surface irregularities of the slope protection shall not vary from the planned slopes by more than 1-foot when measured at right angles to the slope.

3.3 BOULDER PLACEMENT

A. Prepare site to accept boulders as described on the Plans and as directed by O.R. Verify placement and boulder type and size with O.R. prior to installation. Boulders shall be placed after rough site grading has been completed, and prior to site paving operations. See Plans for additional information.

B. Contractor shall be required to use a track excavator with articulating thumb and zero clearance arm capable of picking up, rotating, handling, and setting 5 ton boulders from the top of bank without accessing the floodplain. Boulders shall be expertly set to ensure a high quality "garden level" of workmanship. Ensure tight, permanent fit between adjacent boulders, and between these rocks and adjacent concrete, asphalt, decomposed granite, and log edging placements.

C. Where required, trim and scribe edging for decomposed granite to fit boulder placements.

D. Contractor shall provide experienced and skilled stoneworkers/boulder setting operator and crew (min. two men) to work under direct observation of O.R.

E. O.R. shall direct the scheduling and placement of all boulders on the site. Work shall be scheduled to take no more than 2 days and a maximum of 12 hours of O.R. time.

F. Protect all site improvements during the setting of boulders.

END OF SECTION 02380

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Special Provisions, and other Technical Specification Sections apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Permeable asphalt paving (Caltrans Open Graded Asphalt Concrete)

2. Hot-mix asphalt paving and patching section for general street paving and connections

3. Pavement Markings (Per the cities of Albany, Berkeley, UC Berkeley, and MUTCD standards), and specific pavement markings as noted on the Plans and Specifications)

B. Related Sections include the following:

1. Division 2 Section "Earthwork and Drainage"

1.3 DEFINITIONS

A. Owner or City refers to the City of Albany (COA), which is the lead agency. Owner or Owner's Representative (O.R.) for the project refers to the City of Albany Engineer or associates or agents.

B. Other Project Representatives include: City of Berkeley (COB), and the University of California Berkeley (UCB).

C. Hot-Mix Asphalt Paving Terminology: Refer to ASTM D8 for definitions of terms

D. Caltrans: California Department of Transportation

E. MUTCD: Manual on Uniform Traffic Control Devices, latest edition

1.4 SYSTEM DESCRIPTION

A. Provide hot-mix asphalt paving according to materials, workmanship, and other applicable requirements of the Standard Caltrans Specifications.

1. Standard Specification: Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

1.5 SUBMITTALS

A. Product Data: For each type of product indicated. Include technical data and tested physical and performance properties.

B. Job-Mix Designs: Certification, by authorities having jurisdiction, of approval of each job mix proposed for the Work.

C. Samples: As requested by O.R. Coordinate paragraph below with qualification requirements retained in "Quality Assurance" Article.

D. Material Test Reports: For each paving material

E. Material Certificates: For each paving material, signed by manufacturers

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer

1. Manufacturer shall be a paving-mix manufacturer registered with and approved by Caltrans.

B. Testing Agency Qualifications: Qualified according to ASTM D 3666 for testing indicated, as documented according to ASTM E 548.

C. Regulatory Requirements:

1. State of California Code of Regulations (CCR)

2. State of California Construction Safety Orders, Latest Edition, (CAL/OSHA)

D. Standards:

1. State of California, Business and Transportation Agency, Department of Transportation's "Standard Specifications" (CSS)

2. Federal Specifications (FS)

3. American Society for Testing and Materials (ASTM)

E. Asphalt-Paving Publication: Comply with AI MS-22, "Construction of Hot Mix Asphalt Pavements," unless more stringent requirements are indicated.

F. Preconstruction Meeting: Conduct meeting at Project site to comply with specified requirements.

1. Review proposed sources of paving materials, including capabilities and location of plant that will manufacture hot-mix asphalt.

2. Review condition of subgrade and preparatory work.

3. Review requirements for protecting paving work, including restriction of traffic during installation period and for remainder of construction period.

4. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Asphalt concrete materials shall be stored, proportioned and mixed in accordance with CSS Section 39.3, PROJECT CONDITIONS.

B. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp or if the following conditions are not met:

1. Prime and Tack Coats: Minimum surface temperature of 60 degrees F.

2. Slurry Coat: Comply with weather limitations of ASTM D 3910.

3. Revise temperature below to suit Project. Thicker asphalt base courses may be placed if surface temperature exceeds freezing.

4. Asphalt Base Course: Minimum surface temperature of 40 degrees F and rising at time of placement.

5. Asphalt Surface Course: Minimum surface temperature of 60 degrees F at time of placement.

C. Utilities: Verify all utilities and drainage systems have been installed and approved prior to commencing the work. Verify each of the utility companies having facilities within the work area have notified the O.R. that the utility installation has satisfactorily passed acceptance tests.

D. Pavement Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40 degrees F for oil-based materials, 50 degrees F for water-based materials, and not exceeding 95 degrees F.

PART 2 PRODUCTS

2.1 AGGREGATES

A. General: Use materials and gradations that have performed satisfactorily in previous installations.

B. Alternatives: Alternative aggregate materials such as recycled glass may be approved. Contractor to submit any alternative products for review and approval by O.R.

C. Coarse Aggregate: CSS Section 26, Class 2, 3/4-inch maximum size.

D. Fine Aggregate: CSS Section 39.2. Aggregate for Type A asphalt concrete shall conform to the 1/2-inch maximum medium grading specified in Section 39-2.02 of CSS. Type B using Type B aggregate with 1/2-inch maximum, medium grading, and steam refined paving asphalt meeting requirements of CSS Section 92, Grade AR4000.

1. For hot-mix asphalt, limit natural sand to a maximum of 20 percent by weight of the total aggregate mass.

2.2 ASPHALT MATERIALS

A. Asphalt Concrete shall be Type A and shall conform to provisions in Section 39, Asphalt Concrete of the CSS.

B. Asphalt Binder: Emulsified asphalt diluted with water, CSS Section 94, Type SS1.

C. Prime Coat: Liquid asphalt, CSS Section 93, Grade SC-70

D. Tack Coat: CCS Section 37-1, Fog Type using SS1 asphaltic emulsion

E. Water: Potable

2.3 AUXILIARY MATERIALS

A. Sand: ASTM D 1073, Grade No. 2 or No. 3

B. Joint Sealant: ASTM D 3405, hot-applied, single-component, polymer-modified bituminous sealant.

C. Pavement Marking Paint: For standard striping provide latex, waterborne emulsion, lead and chromate free, ready mixed, complying with FS TT-P-1952, with drying time of less than 3 minutes. For roadway symbols comply with MUTCD and City of Albany, Berkeley, UCB, and MUTCD Standards.

1. Standard Pavement Markings: White, or other as indicated. Meet City of Albany, Berkeley, UCB, and MUTCD Standards.

2. Special Green Painted Bicycle Route Marking: Green, per MUTCD. Meet MUTCD specifications and requirements.

D. Glass Beads: AASHTO M 247, Type 1

2.4 ASPHALT MIX FOR 8TH STREET AND AC PATCHING (NON-PERMEABLE)

A. Hot-Mix Asphalt: Dense, hot-laid, hot-mix asphalt plant mixes approved by authorities having jurisdiction and designed according to procedures in AI MS-2, "Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types."

1. Provide mixes with a history of satisfactory performance in geographical area where Project is located.

2. Provide mixes complying with composition, grading, and tolerance requirements in ASTM D 3515 for the following nominal, maximum aggregate sizes:

a. Base Course: 3/4-inch maximum

b. Surface Course: 1/2-inch maximum

B. Emulsified-Asphalt Slurry: ASTM D 3910, Type II, conforming to Section 37-2 of CSS, consisting of emulsified asphalt, fine aggregate and mineral fillers.

2.5 PERMEABLE ASPHALT MIX FOR BIKE PATH FROM SAN PABLO AVE. TO 10TH ST.

A. Permeable Asphalt: Shall conform to Caltrans Specification Section 39-2.02, Open Graded Asphalt Concrete.

B. Permeable Asphalt: Shall meet the applicable conditions of this and other related Specifications.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that subgrade is dry and in suitable condition to support paving and imposed loads.

B. Proof-roll sub-base using heavy, pneumatic-tired rollers to locate areas that are unstable or that require further compaction.

C. Proceed with paving only after unsatisfactory conditions have been corrected.

3.2 PATCHING

A. Hot-Mix Asphalt Pavement: Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 12-inches into adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Re-compact existing unbound-aggregate base course to form new subgrade.

B. Portland Cement Concrete Pavement: Break cracked slabs and roll as required to reseat concrete pieces firmly.

1. Pump hot under-sealing asphalt under rocking slabs until slab is stabilized or, if necessary, crack slab into pieces and roll to reseat pieces firmly.

2. Remove disintegrated or badly cracked pavement. Excavate rectangular or trapezoidal patches, extending into adjacent sound pavement, unless otherwise

indicated. Cut excavation faces vertically. Re-compact existing unbound-aggregate base course to form new subgrade.

C. Tack Coat: Apply uniformly to vertical surfaces abutting or projecting into new, hot-mix asphalt paving at a rate of 0.05 to 0.15 gallons per square yard.

1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.

2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

D. Patching: Fill excavated pavements with hot-mix asphalt base mix and, while still hot, compact flush with adjacent surface.

3.3 REPAIRS

A. Leveling Course: Install and compact leveling course consisting of hot-mix asphalt surface course to level sags and fill depressions deeper than 1-inch in existing pavements.

1. Install leveling wedges in compacted lifts not exceeding 3-inches thick.

B. Crack and Joint Filling: Remove existing joint filler material from cracks or joints to a depth of 1/4-inch.

1. Clean cracks and joints in existing hot-mix asphalt pavement.

2. Use emulsified-asphalt slurry to seal cracks and joints less than 1/4-inch wide. Fill flush with surface of existing pavement and remove excess.

3. Use hot-applied joint sealant to seal cracks and joints more than 1/4-inch wide. Fill flush with surface of existing pavement and remove excess.

3.4 SURFACE PREPARATION

A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.

1. Sweep loose granular particles from surface of unbound-aggregate base course. Do not dislodge or disturb aggregate embedded in compacted surface of base course.

A. Prime Coat: Apply uniformly over surface of compacted unbound-aggregate base course at a rate of 0.15 to 0.50 gallons per square yard. Apply enough material to penetrate and seal but not flood surface. Allow prime coat to cure for 72 hours minimum.

1. If prime coat is not entirely absorbed within 24 hours after application, spread sand over surface to blot excess asphalt. Use enough sand to prevent pickup under traffic. Remove loose sand by sweeping before pavement is placed and after volatiles have evaporated.

2. Protect primed substrate from damage until ready to receive paving.

3.5 HOT-MIX ASPHALT INSTALLATION

A. Permeable Asphalt for Multi-use Trail: See Plans for section. Ensure base course installation per Plans is completely installed and approved by O.R. prior to initiating the Permeable Asphalt installation.

1. Ensure installation is completely covered and sealed from dirt and debris intrusion for the duration of the project until Substantial Completion.

2. Follow conditions and requirements for general asphalt placement as appropriate for Permeable Asphalt installation.

B. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.

1. Place hot mix asphalt and compact in layers in conformance with Section 39 of CSS Standard Specifications.

2. Spread mix at minimum temperature of 250 degrees F.

3. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes, unless otherwise indicated.

4. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.

C. Place paving in consecutive strips not less than 10-feet wide unless infill edge strips of a lesser width are required.

1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete a section of asphalt base course before placing asphalt surface course.

D. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

3.6 JOINTS

A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions with same texture and smoothness as other sections of hot-mix asphalt course.

1. Clean contact surfaces and apply tack coat to joints.

2. Offset longitudinal joints, in successive courses, a minimum of 6-inches.

3. Offset transverse joints, in successive courses, a minimum of 24-inches.

4. Construct transverse joints as described in AI MS-22, "Construction of Hot Mix Asphalt Pavements."

5. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.

6. Compact asphalt at joints to a density within 2 percent of specified course density.

3.7 COMPACTION

A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot hand tampers or vibratory-plate compactors in areas that are inaccessible to rollers.

1. Complete compaction of asphalt before mix temperature cools to 185 degrees F.

2. Complete compaction of Permeable Asphalt when AC is at a range between 210 and 230 degrees F.

B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for

indicated crown, grade, and smoothness. Correct all lay-down and rolling operations to comply with requirements.

C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:

1. Average Density: 96 percent of reference laboratory density according to AASHTO T 245, but not less than 94 percent nor greater than 100 percent.

2. Average Density: 92 percent of reference maximum theoretical density according to ASTM D 2041, but not less than 90 percent nor greater than 96 percent.

D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.

E. Edge Shaping / Finished Edge Condition at Trail: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.

F. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact asphalt by rolling to specified density and surface smoothness.

G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.8 INSTALLATION TOLERANCES

A. Thickness: Compact each course to produce the thickness indicated within the following tolerances:

1. Base Course: Plus or minus 1/2-inch

2. Surface Course: Plus 1/4-inch, no minus

B. Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:

1. Base Course: 1/4-inch

2. Surface Course: 1/8-inch

3. Delete below if no crowned pavement surfaces are required.

4. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4-inch.

3.9 PAVEMENT MARKING

A. Install per Section 85 of the CSS.

B. Install as noted on the Plans and per City of Albany, Berkeley, UCB, and MUTCD Standards.

C. Do not apply pavement-marking paint until layout, colors, and placement have been verified with O.R.

D. Allow paving to age for 30 days before starting pavement marking.

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

F. 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 mm.

1. Broadcast glass spheres uniformly into wet pavement markings at a rate of 6 lb. per gallon.

3.10 FIELD QUALITY CONTROL

A. Testing Agency: Owner may engage a qualified independent testing and inspecting agency to perform field tests and inspections and to prepare test reports.

1. Testing agency will conduct and interpret tests and state in each report whether tested Work complies with or deviates from specified requirements.

B. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

C. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined according to ASTM D 3549.

D. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.

E. In-Place Density: Testing agency will take samples of un-compacted paving mixtures and compacted pavement according to AASHTO T 168.

1. Reference maximum theoretical density will be determined by averaging results from four samples of hot-mix asphalt-paving mixture delivered daily to site, prepared according to ASTM D 2041, and compacted according to job-mix specifications.

2. In-place density of compacted pavement will be determined by testing core samples according to ASTM D 1188 or ASTM D 2726.

a. One core sample will be taken for every 1000 square yards or less of installed pavement, with no fewer than 3 cores taken.

b. Field density of in-place compacted pavement may also be determined by nuclear method according to ASTM D 2950 and correlated with ASTM D 1188 or ASTM D 2726.

F. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

3.11 DISPOSAL

A. Except for material indicated to be recycled, remove excavated materials from Project site and legally dispose of them in an EPA-approved landfill.

1. Do not allow excavated materials to accumulate on-site.

END OF SECTION 02741

SECTION 02821 - CHAIN-LINK FENCE

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Special Provisions, and other Technical Specification Sections apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Chain-Link Fence (heights vary from 3-1/2-feet to 10-feet). See Plans for locations and notes regarding Chain-Link Fence.

2. Installation of salvaged Chain-link fencing sections and gate.

B. Related Sections include the following:

1. Division 2 Section "Earthwork and Drainage"

2. Division 3 Section "Cast-in-Place Concrete"

1.3 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide chain-link fences capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Minimum Post Size and Maximum Spacing for Wind Velocity Pressure: Determine based on mesh size and pattern specified, and on the following minimum design wind pressures and according to Chain Link Fence Manufacturers Institute (CLFMI) WLG 2445:

a. Wind Speed: 80 mph

b. Fence Height: varies see Plans

c. Line Post Group: IA, ASTM F 1043, Schedule 40 steel pipe

d. Wind Exposure Category: As dictated by local conditions, standards, and codes.

2. Determine minimum post size, group, and section according to ASTM F 1043 for framework up to 10-feet high, and post spacing not to exceed 10-feet.

B. ASTM:

1. A120: Standard Specification for Pipe, Steel, Black and Hot-Dipped Galvanized Welded and Seamless, for Ordinary Uses.

2. A123-84: Standard Specification for Hot-Dipped Galvanized Welded on Iron and Steel Products.

3. A153-84: Standard Specification for Pipe, Steel, Black and Hot-Dipped Galvanized Iron and Steel Hardware.

4. A392-84: Standard Specification for Hot-Dipped Galvanized Chain Link Fence Fabric.

C. Chain Link Fence Manufacturer's Institute (CLFMI)

D. Industrial Steel Guide for Fence, Rails, Posts, and Accessories

E. California State Standard Specification

F. Lightning Protection System: Maximum grounding-resistance value of 25 ohms under normal dry conditions.

1.4 DEFINITIONS

A. Owner or City refers to the City of Albany (COA), which is the lead agency. Owner or Owner's Representative (O.R.) for the project refers to the City of Albany Engineer or associates or agents.

B. Other Project Representatives include: City of Berkeley (COB), and the University of California Berkeley (UCB).

1.5 SUBMITTALS

A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for chain-link fences.

1. Fence and gate posts, rails, and fittings

2. Salvaged Gate reinstallation detail

3. Chain-link fabric, reinforcements, and attachments

4. Hardware for fence and gate

B. Shop Drawings: For all fence heights and for gate. Show locations and dimensions of two fence heights, connections to existing fence sections, posts, rails, tension wires, and details of extended posts, hardware, accessories, and gate. Indicate materials, dimensions, sizes, weights, and finishes of components. Include plans, elevations, sections, details of post anchorage and concrete footing dimensions, attachment, bracing, and other required installation and operational clearances. Where noted, match existing fencing and show attachment to or condition where proposed fencing meets existing fences.

   1. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified State of California licensed structural engineer responsible for their preparation.

C. Samples for Verification: For each type and finish of chain-link fence

D. Product Certificates: For each type of chain-link fence and the galvanized finishing, signed by product manufacturer or fabricator.

   1. Strength test results for framing according to ASTM F 1043.

E. Mock-ups: Provide full-scale fence section mock-ups, on-site, for each fence type and for gate for review and to demonstrate installation of the approved Shop Drawing design. Mock-up location and size shall be determined by Contractor and O.R. Mock-ups, if approved, can be used as an approved section of the final fence installation.

F. Qualification Data: Installer and fabricator

G. Installation instructions and/or drawings

H. Field quality-control test reports

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed chain-link fences similar in material, design, and extent to those indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

1. Engineering Responsibility: Preparation of data for chain-link fences, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.

B. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a member company of the International Electrical Testing Association or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.

1. Testing Agency's Field Supervisor: Person currently certified according to NETA ETT, or the National Institute for Certification in Engineering Technologies, to supervise on-site testing specified in Part 3.

C. Mock-ups: Build mock-ups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation. Approved mock-ups may become part of the completed Work if prior approval is obtained by O.R.

1. Include individual mock-up (approximately 8-10 foot length of fence) for each fencing type. Comply with specified requirements and existing conditions.

a. Approval of mock-ups is also for other material and construction qualities specifically approved by O.R. in writing.

b. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mock-ups unless such deviations are specifically approved by O.R. in writing.

D. Preconstruction Meeting: Conduct meeting at Project site to comply with specification requirements.

1.7 PROJECT CONDITIONS

A. Field Measurements: Verify layout information for chain-link fences shown on drawings in relation to property survey and existing structures. Verify dimensions by field

measurements. Verify location and alignment of existing fences to remain and/or to be integrated into the new fencing layout. Contact O.R. if any inconsistencies or conflicts exist.

B. Interruption of Existing Utility Service: Do not interrupt utility services to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify O.R. no fewer than five days in advance of proposed interruption of utility services.

2. Do not proceed with interruption of utility services without O.R. written permission.

PART 2 PRODUCTS

2.1 CHAIN-LINK FENCE (3-1/2-FOOT AND 10-FOOT)

A. 3-1/2-foot Height Fence: As shown on Plans. Provide new fence posts, frame, and fencing fabric. Provide fasteners to complete the installation. Ensure the final product is complete and intact.

B. 10-foot Height Fence: As shown on Plans, modifying the corner of the small ball field (southeast corner at 10th St.) as noted on the Plans. Provide new fence posts, frame, and fencing fabric. Provide fasteners to complete the installation. Ensure the final product is complete and intact.

C. Footings:

1. See plans and details for footing depths and diameter, and additional requirements.

2.2 CHAIN-LINK GATES

A. Reinstalled existing gate (~6'-0" height) at southwest corner of 10th in Albany. Gate shall be salvage from existing location. New gate posts shall be installed as noted, to accommodate salvaged gate. Verify existing gate dimensions and condition in field with O.R. Match all materials and finishes. Provide locking hasp. Lock by others.

2.3 CHAIN-LINK FENCE FABRIC

A. General: Fabric heights as noted in specifications, measured from finish grade. Provide fabric in one-piece heights measured between top and bottom of outer edge of selvage knuckle. Comply with ASTM A 392, CLFMI CLF 2445, and requirements indicated below:

1. Steel Wire Fabric: Zinc coated wire, 9 gauge core, 0.148 inch diameter—8 gauge finish.

    a. Mesh Size: 2-inch diamond

    b. Weight of Zinc Coating: ASTM A 392, Type II, Class 1, 1.2 oz./sq. ft. with zinc coating applied before weaving.

    c. Coat selvage ends of fabric that is metallic coated before the weaving process with manufacturer's standard clear protective coating.

2.4 FENCE FRAMING

A. Posts and Rails: Schedule 40, fusion bonded poly vinyl chloride (PVC) black color. Comply with ASTM F 1043 for framing, ASTM F 1083 for Group IC round pipe, and the following:

1. Group: IA, round steel pipe

2. Fence Height: as noted or to match existing or adjacent fencing as directed

3. Strength Requirement: Heavy industrial according to ASTM F 1043

4. Post Diameter and Thickness: According to ASTM F 1043 ASTM F 1083

    a. Top, Bottom, and Intermediate Rails: 1.66-inches O.D.

    b. Line Post: 2.875-inches O.D.

    c. End, Corner and Pull Post: 4.0-inches

    a. Coating for Steel Framing: Zinc Coating, Type C, Zn-5-Al-MM alloy, consisting of not less than 1.8-oz./sq. ft. coating

2.5 TENSION WIRE

A. General: Provide horizontal tension wire at the following locations:

1. Location: Extended along top and bottom of fence fabric

B. Zinc-Coated Steel Wire: 7 gauge, 0.177-inch diameter, marcelled tension wire complying with ASTM A 817, ASTM A 824, and the following:

1. Zinc Coating: Type II**,** zinc coated (galvanized) by hot-dip process, with the minimum coating as noted in ASTM A 153 with zinc weights per Table 1 of ASTM A 153, unless specified otherwise.

2.6 FITTINGS

A. General: Comply with ASTM F 626

B. Accessories: Unless otherwise specified, shall be galvanized in accordance with ASTM A153.

2.7 FENCE GROUNDING

A. Conductors: Bare, solid wire for No. 6 AWG and smaller; stranded wire for No. 4 AWG and larger.

1. Material above Finished Grade: Copper or as required by local codes

2. Material on or below Finished Grade: Copper

3. Bonding Jumpers: Braided copper tape, 1 inch wide, woven of No. 30 AWG bare copper wire, terminated with copper ferrules.

B. Connectors and Grounding Rods: Comply with UL 467

1. Connectors for Below-Grade Use: Exothermic welded type

a. Grounding Rods: Copper-clad steel, 5/8 by 96-inches, provide protective cap if above ground.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with O.R. present, for compliance with requirements for a verified survey of property lines and legal boundaries, site clearing, earthwork, pavement work, and other conditions affecting performance.

1. Do not begin installation before final grading is completed, unless otherwise permitted by O.R.

2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Stake locations of fence lines and terminal posts. Do not exceed intervals of 50-feet between stakes. Indicate locations of utilities, irrigation system components, underground structures, benchmarks, and property monuments.

3.3 GENERAL INSTALLATION

A. Install chain-link fencing to comply with ASTM F 567 and more stringent requirements specified.

1. Install fencing on established boundary lines inside property line as approved and directed by Owner or O.R.

3.4 CHAIN-LINK FENCE INSTALLATION

A. Post Excavation: Drill or hand-excavate holes for posts to dimensions noted on approve shop-drawings, in firm, undisturbed soil.

B. Post Setting: Set posts in concrete footings at spacing noted on approve shop drawings, into firm, undisturbed soil.

1. Verify that posts are set plumb, aligned, and at correct height and spacing, and held in position during setting with concrete or mechanical devices.

2. Concrete Fill: Place concrete (Class B min.) around posts to dimensions required by engineer in shop drawings and vibrate or tamp for consolidation. Protect

aboveground portion of posts from concrete splatter, and clean off all debris on posts.

3. Exposed Concrete: Extend 3-inches above grade; shape and smooth to shed water.

C. Terminal Posts: Locate terminal end and corner posts per ASTM F 567 and terminal pull posts at changes in horizontal or vertical alignment of 15 degrees or more.

D. Line Posts: Space line posts uniformly at 10-feet o.c., or as directed by O.R.

E. Reinstallation of Salvaged Gate:

1. Salvaged Gate shall be installed as noted on Plans an per O.R. direction in the field. Ensure gate swing both ways to full gate width opening and is free and clear of finish grades and other improvements. Provide (2) new Terminal Posts for gate posts. Ensure gate installation meets with O.R. approval.

F. Post Bracing and Intermediate Rails: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Install braces at end posts and at both sides of corner and pull posts.

1. Locate horizontal braces at mid-height of fabric 6-feet or higher, on fences with top rail and at ⅔ fabric height on fences without top rail. Install so posts are plumb when diagonal rod is under proper tension.

G. Tension Wire: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Pull wire taut, without sags. Fasten fabric to tension wire with 0.120-inch diameter hog rings of same material and finish as fabric wire, spaced a maximum of 24-inches o.c. Install tension wire in locations indicated before stretching fabric.

1. Top Tension Wire: Install tension wire through post cap loops

2. Bottom Tension Wire: Install tension wire within 6-inches of bottom of fabric and tie to each post with not less than same diameter and type of wire.

H. Top Rail: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Run rail continuously through line post caps, bending to radius for curved runs and terminating into rail end attached to posts or post caps fabricated to receive rail at terminal posts. Provide expansion couplings as recommended in writing by fencing manufacturer.

I. Bottom Rails: Install, spanning between posts.

J. Chain-Link Fabric: Apply fabric to enclosing framework as directed by O.R. Leave 1-inch between finish grade or finish surface and bottom selvage, unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Anchor to framework so fabric remains under tension after pulling force is released.

K. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, and pull posts with tension bands spaced not more than 15-inches o.c.

L. Tie Wires: Use wire of proper length to firmly secure fabric to line posts and rails. Attach wire at 1 end to chain-link fabric, wrap wire around post a minimum of 180 degrees, and attach other end to chain-link fabric per ASTM F 626. Bend ends of wire to minimize hazard to individuals and clothing.

1. Maximum Spacing: Tie fabric to line posts at 12-inches o.c.—to braces at 24-inches o.c.

M. Fasteners: Install nuts for tension bands and carriage bolts on the side of the fence opposite the fabric side. Peen ends of bolts or score threads to prevent removal of nuts.

N. Cantilevered 3 Strand Cap: Provide per existing to match Type D.

3.5 GROUNDING AND BONDING

A. Fence Grounding: Install at maximum intervals of 500-feet except as follows:

B. Fence Openings: Ground fence on each side of opening. Bond across openings except openings indicated as intentional fence discontinuities. Use No. 2 AWG wire buried minimum 18-inches below finished grade.

C. Protection at Crossings of Overhead Electrical Power Lines: Ground fence at location of crossing and at a maximum distance of 150-feet on each side of crossing.

D. Grounding Method: At each grounding location, drive a grounding rod vertically until the top is 6-inches below finished grade. Connect rod to fence with No. 6 AWG conductor. Connect conductor to each fence component at the grounding location, including the following:

E. Connections: Make connections so possibility of galvanic action or electrolysis is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.

1. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer in order of galvanic series.

2. Make connections with clean, bare metal at points of contact. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.

3. Make aluminum-to-galvanized-steel connections with tin-plated copper jumpers and mechanical clamps.

4. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

3.6 FIELD QUALITY CONTROL

A. Grounding-Resistance Testing: Engage a qualified independent testing and inspecting agency to perform field quality-control testing.

1. Grounding-Resistance Tests: Subject completed grounding system to a megger test at each grounding location. Measure grounding resistance not less than two full days after last trace of precipitation, without soil having been moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural grounding resistance. Perform tests by two-point method according to IEEE 81.

2. Excessive Grounding Resistance: If resistance to grounding exceeds specified value, notify O.R. promptly. Include recommendations for reducing grounding resistance and a proposal to accomplish recommended work.

3. Report: Prepare test reports certified by a testing agency of grounding resistance at each test location. Include observations of weather and other phenomena that may affect test results.

END OF SECTION 02821

SECTION 02870 - SITE FURNISHINGS

GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Special Provisions, and other Technical Specification Sections apply to this Section.

1.2 SUMMARY

A. This Section includes (but is not limited to) the following furnishings:

1. Log Edging (south of ball field)
2. Log Seating (east of 10th Street)
3. Bike Racks
4. Trash Receptacles
5. Bollards, Fixed and Removable
6. Regulatory Signs—Manual on Uniform Traffic Control Devices (California MUTCD, 2012 Edition).
7. Steel Edging (Select Sections of DG Paving)
8. Restoration Fence (Rope and Stake)

B. Related Sections include the following:

1. Division 2 Section "Earthwork and Drainage"
2. Division 3 Section "Cast-in-Place Concrete"

C. Products furnished to Owner, but not installed under this Section, include extra pipe sleeves, bench slats, and anchor bolts for all site furnishings.

1.3 DEFINITIONS

A. Owner or City refers to the City of Albany (COA), which is the lead agency. Owner or Owner's Representative (O.R.) for the project refers to the City of Albany Engineer or associates or agents.

B. Other Project Representatives include: City of Berkeley (COB), and the University of California Berkeley (UCB).

1.4 SUBMITTALS

A. Product Data: Provide for each type of product indicated. Include construction and fabrication details, material descriptions, dimensions of individual components and profiles, finishes, field-assembly requirements, installation details, and warranty data.

B. Shop Drawings: Provide drafted, scaled, sketches in 11x17 format of the following elements.

1. Fixed and Removable Bollards
2. MUTCD Signs and Posts and Footings
3. Bike Rack and Trash Receptacle Mounting
4. Log Seating and Log Edging
5. Steel Edging
6. Restoration Fence (Stake and Rope)

C. Samples for Verification: For each type of exposed finish required, prepared on Samples not less than 6-inch long for linear components and 4-inch square for sheet components.

D. Material Certificates: For site furnishings, signed by manufacturer

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of site furnishing through one source from a single manufacturer.

PART 2 PRODUCTS

2.1 SITE FURNISHINGS

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

B. Bike Rack: Columbia Cascade Cycloops #2170-7-E-G, ribbon type rack. Schedule 40 steel pipe, 2-3/8-inch (o.d.), hot-dipped galvanized finish. Embed mount into (2) CIP concrete footings, 12" diameter by 24" depth.

C. Trash Receptacle: City of Berkeley Standard trash/recycle unit with standard finish, color satin black to match Bridge paint. Two (2) total, locate as directed by O.R. and as shown on the Plans. Provide vandal proof fasteners into concrete surfacing or separate concrete footings to complete mounting, for review and approval by O.R. Berkeley Can Model No. 97-0270, Paseo by Forms+Surfaces, 800.451.0410 or approved equal. Ensure match with existing, provide in black powder coated finish.

D. Bollards:

1. Columbia Cascade, Timberform custom versions of standard Timberform metal bollards (Columbia Cascade drawings No. E-46186-R, 2 pages). All welded construction. Grind welds smooth. Hot-dipped galvanized finish after complete fabrication.

    a. Model No. 2190-R-G-M (Fixed)—Provide and install (6) six total.

    b. Model No. 2190-RC-G-M (Removable)—Provide (3) two total. Provide (3) three lockable Bollard Hole Covers. Ensure free draining condition at the base of the sleeve. Locks by O.R.

E. Regulatory Signs:

1. Provide signs as noted on Plans.

2. Signs shall meet MUTCD and Caltrans Standards. Mount on City of Berkeley and/or City of Albany Standard steel posts as directed by O.R. Signs shall meet all requirements of CalDAG standards, latest edition and City Standards (COB and COA).

F. Steel Edging (for DG Paving):

1. Colmet #1007, 3/16-inch thick by 4-inch height steel edging, unpainted. Complete sections with integral steel stakes. Provide edging on both sides of DG Paving except at shoulder of the Multi-use Trail (See Plans) where only the creekside edge of the DG shall be edged in steel (between San Pablo and 10th). Colmet 800.829.8225

G. Anchors, Fasteners, Fittings, and Hardware: Manufacturer's standard, corrosion-resistant-coated or non-corrodible materials; commercial quality; tamperproof, vandal and theft resistant; concealed, recessed, and capped or plugged. Provide as required for site and street furnishings' assembly, mounting, and secure attachment.

1. Anti-theft Hold-Down Brackets: For securing site and street furnishings to substrate; two per unit.

2. Sleeves for furnishings: Provide galvanized steel sleeves as required to complete the Work.

H. Non-shrink, Nonmetallic Grout: Premixed, factory-packaged, non-staining, non-corrosive, nongaseous grout complying with ASTM C 1107. Provide grout, recommended in writing by manufacturer, for exterior applications.

I. Wood Construction General:

1. Pressure Treated Wood: Douglas fir #2 or better, straight members without twisting, bowing, or checking. Pressure Treatment: CCA "green tint"—no other tint or colored PT wood shall be accepted, including the brown/reddish tone (Truitt & White 510.841.0511, or approved equal).

J. Fasteners: Nails shall be common, galvanized, (10d nails or larger as required for fencing rails). Screws shall be heavy duty, galvanized finish, vandal resistant where requested. All metal components for wood construction shall be hot-dipped galvanized as approved by Owner's Representative, unless otherwise noted.

K. Log Edging: Salvaged logs from local sources (i.e., Greenwaste Recycle Yard, Richmond, CA). Logs shall be Eucalyptus, 24-inch diameter logs without side branching, bark stripped, and cut into minimum 10-foot to 20-foot lengths, or as directed by O.R.

L. Log Seating: Salvaged logs from local sources (i.e., Greenwaste Recycle Yard, Richmond, CA). Logs shall be Redwood, 24-inch diameter logs without side branching, bark stripped, and cut into minimum 12-foot to 15-foot lengths, or as directed by O.R.

M. Restoration Fence: Stake and rope fence per detail. If Restoration Fence is eliminated by its acceptance as a Deduct Alternate, provide the alternate, Stake and Rope Fence. Stakes shall be constructed of 2-inch diameter tree stakes cut and driven to refusal. Finished height shall be 24-inches above grade. Attach a single strand of 1/2-inch sisal rope to each stake and knot in place. O.R. shall provide direction on-site.

2.2 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for O.R. and Metal Products" for recommendations for applying and designating finishes.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.4 STEEL AND GALVANIZED STEEL FINISHES

A. PVC Finish: Manufacturer's standard, UV-light stabilized, mold-resistant, slip-resistant, matte-textured, dipped or sprayed-on, PVC-plastisol finish, with flame retardant added; complying with coating manufacturer's written instructions for pretreatment, application, and minimum dry film thickness.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for correct and level finished grade, mounting surfaces, installation tolerances, and other conditions affecting performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with manufacturer's written installation instructions, unless more stringent requirements are indicated. Complete field assembly of site and street furnishings, where required.

B. Install site furnishings level, plumb, true, and securely anchored at locations indicated on the plans.

C. Post Setting: When specified, set cast-in support posts in concrete footing with smooth top, shaped to shed water. Protect portion of posts above footing from concrete splatter. Verify that posts are set plumb or at correct angle and are aligned and at correct height and spacing. Hold posts in position during placement and finishing operations until concrete is sufficiently cured.

D. Posts Set into Voids in Concrete: Form or core-drill holes for installing posts in concrete to depth recommended in writing by manufacturer of site and street furnishings and 3/4 inch larger than OD of post. Clean holes of loose material, insert posts, and fill annular space between post and concrete with non-shrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions, with top smoothed and shaped to shed water.

E. Pipe Sleeves: Use steel pipe sleeves preset and anchored into concrete for installing posts. After posts have been inserted into sleeves, fill annular space between post and sleeve with non-shrink, nonmetallic grout, mixed and placed to comply with manufacturer's written instructions, with top smoothed and shaped to shed water.

F. Bollards: Install fixed and removable bollards per Plans. Plans call for Columbia Cascade type bollards with custom fabrication. Ensure bollard installations meet City requirements for installation, servicing, and access. Provide minor fabrication and detailing changes at no charge. Set bollards and removable bollard sleeve into concrete footings. Prior to concrete pour, cover bollards completely with heavy gauge plastic with finished taped edges prior to concrete pour to protect galvanized finish and emblems. Ensure removable bollards are installed with specified recess for hasp and lock. See Plans.

G. Regulatory Signs: Install per applicable codes, MUTCD California 2012 and City Standards and as directed by O.R. and the Cities of Albany and Berkeley.

H. Trash Receptacles: Mount where noted on Plan. Install either continuous circular or square 4-inch concrete slab or up to (4) individual concrete footings (minimum 10-inch diameter by 24" depth) per receptacle as directed by O.R. and as required to meet manufacturer's installation recommendations. Utilize vandal resistant fasteners for all connections. Install plumb and level. Set base elevation under O.R. direction.

I. Bike Rack: Embed mount in concrete footings as noted in Specifications and per manufacturer's recommendations. Mount on paved or aggregate surface, as shown on Plans. Contractor to provide all mounting hardware. Layout by O.R. in field.

J. Steel Edging (for DG Paving): Excavate Decomposed Granite Paving cross-section from compacted subgrade and set steel edging and stake in place. Ensure straight, plumb, and level sections with smooth, even transitions between sections. Maximum ¼-inch deflection per 10'-0" section. Support both sides of steel edging to ensure edging does not deflect or bow during the installation of DG.

K. Restoration Fence (Rope and Stake: Install per detail under direction from O.R.

3.3 CLEANING

A. After completing the work in this section, inspect all components. Remove spots, dirt, and debris. Repair damaged finishes to match original finish or replace component.

END OF SECTION 02870

SECTION 02930 – REVEGETATION and IRRIGATION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Special Provisions, and other Technical Specification Sections apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Planting Installation
2. Bidder Design Irrigation System Plans
3. Irrigation Installation
4. Native Plant and Seed Mixes
5. Seeding with Native Seed Mix
6. Seeding with Lawn Mix (if required)

B. Related Sections include the following:

1. Division 2 Section "Site Clearing"
2. Division 2 Section "Earthwork and Drainage"
3. Division 2 Section "Soil Bioengineering"

1.3 DEFINITIONS

A. Owner or City refers to the City of Albany (COA), which is the lead agency. Owner or Owner's Representative (O.R.) for the project refers to the City of Albany Engineer or associates or agents.

B. Other Project Representatives include: City of Berkeley (COB), and the University of California Berkeley (UCB).

C. Balled and Burlapped Stock: Plants dug with firm, natural balls of earth in which they are grown, with ball size not less than diameter and depth recommended by ANSI Z60.1 for type and size of tree or shrub required; wrapped, tied, rigidly supported, and drum-laced as recommended by ANSI Z60.1.

D. Bare-Root Stock: Plants with a well-branched, fibrous-root system developed by transplanting or root pruning, with soil or growing medium removed, and with not less than minimum root spread according to ANSI Z60.1 for kind and size of plant required.

E. Container-Grown Stock: Healthy, vigorous, well-rooted plants grown in a container with well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for kind, type, and size of plant required.

F. Finish Grade: Elevation of finished surface of planting soil.

G. Subgrade: Surface or elevation of native subsoil remaining after completing excavation, or top surface of a fill or backfill, before placing planting soil.

H. Plant: Any woody or herbaceous plant specified for the project.

1.4 SUBMITTALS

A. Product Data and Samples: For each type of product indicated, including seed mixes.

B. Product Certificates: For each type of manufactured product, signed by product manufacturer, and complying with the following:

1. Manufacturer's certified analysis for standard products.

2. Analysis of other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.

C. Qualification Data: For planting Contractor and irrigation Contractor.

D. Planting Schedule: Indicating anticipated planting dates.

E. Bidder Design Irrigation System Drawings: Professionally drafted, scaled, irrigation plan and materials schedule, accurately depicting a proposed Bidder Design Irrigation System which meets requirements noted on Plans and in the

Specifications. Provide Bidder Design Irrigation System Drawings in clear, legible, form, drafted in AutoCAD on same project titleblock sheets, scale, and sheet size as that used by the Project Design Team. Include Point of Connection, Backflow Preventer, Automatic Controller, Electrical Connection to Power by others, Flow meters if requested.

F. Irrigation System Record Drawings: Professionally drafted, scaled, irrigation plan and materials schedule, accurately depicting the As-Built Irrigation Plan installed conditions on-site. Can be drafted and clouded revisions to the Bidder Design Irrigation System Plans in AutoCAD. Provide Record (As-Built) Drawings in clear, legible, form, drafted in AutoCAD on same project titleblock sheets provided by the project design team.

G. Maintenance Instructions: Recommended procedures to be established by Owner for maintenance of plants during a calendar year. Submit before expiration of required maintenance periods.

1.5 QUALITY ASSURANCE

A. Planting and Irrigation Contractor Qualifications: A qualified landscape and irrigation Contractor(s) whose work has resulted in successful establishment of plants and irrigation system installations.

1. Field Supervision: Require Contractor to maintain an experienced full-time supervisor on Project site when planting and irrigation work is in progress.

B. Provide quality, size, genus, species, and variety of plants indicated, complying with applicable requirements in ANSI Z60.1, "American Standard for Nursery Stock."

1. Contractor to indicate source of plant material. Selection of plants will be made by O.R., who will tag plants at their place of growth before they are prepared for transplanting. If designated supplier does not have sufficient quality of quantity of acceptable stock, additional supplier(s) to be designated by contractor.

C. Tree and Shrub Measurements: Measure according to ANSI Z60.1 with branches and trunks or canes in their normal position. Do not prune to obtain required sizes. Take caliper measurements 6-inches above ground for trees up to 4-inch caliper size, and 12-inches above ground for larger sizes. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip-to-tip.

D. Observation: O.R. may observe trees and shrubs either at place of growth or at site before planting for compliance with requirements for genus, species, variety, size,

and quality. O.R. retains right to observe trees and shrubs further for size and condition of balls and root systems, insects, injuries, and latent defects and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.

1. Notify O.R. of sources of planting materials two weeks in advance of delivery to site.

E. Pre-installation Meeting: Conduct meeting at Project site to comply with specified requirements.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver freshly dug plants.

1. Immediately after digging up bare-root stock, pack root system in wet straw, hay, or other suitable material to keep root system moist until planting.

B. Do not prune trees and shrubs before delivery, except as approved by O.R. Protect bark, branches, and root systems from sun scald, drying, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of plants during delivery. Do not drop plants during delivery.

C. Handle planting stock by root ball.

D. Deliver plants after preparations for planting have been completed and install immediately. If planting is delayed more than six hours after delivery, set plants trees in shade, protect from weather and mechanical damage, and keep roots moist.

1. Heel-in bare-root stock. Soak roots in water for two hours if dried out.

2. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.

3. Do not remove container-grown stock from containers before time of planting.

4. Water root systems of plants stored on-site with a fine-mist spray. Water as often as necessary to maintain root systems in a moist condition.

1.7 COORDINATION

A. Planting Restrictions: Coordinate planting periods with creek restoration restrictions, and maintenance periods to provide required maintenance from date of Substantial Completion.

B. Provide tree and shrub watering during Warranty Period. Provide schedule and methods to Owner for review.

C. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit.

D. Coordinate irrigation connections for water and electrical service with O.R.

E. No Planting or Seeding shall be installed prior to the installation of the irrigation system in working order.

1.8 WARRANTY

A. Plant Warranty: Warrant project plants, for the warranty period indicated in the Specifications, against defects including death and unsatisfactory growth, except for defects resulting from lack of adequate maintenance, neglect, or abuse by Owner, or incidents that are beyond Contractor's control.

1. Warranty Period for Plants: As noted in the Specifications.

2. Remove dead plants immediately. Replace immediately unless required to plant in the succeeding planting season.

3. Replace plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.

4. Plant replacements shall be limited to one replacement per specified plant, except for losses or replacements due to failure to comply with Specifications and Plans.

B. Irrigation Warranty: Warrant project irrigation work for the warranty period indicated in the Specifications, against breakage and defects, except for defects resulting from lack of adequate maintenance, neglect, or abuse by the Owner, or incidents that are beyond Contractor's control.

1.9 MAINTENANCE

A. Plants: Maintain for the following maintenance period by pruning, cultivating, watering, weeding, fertilizing, restoring planting saucers, tightening and repairing stakes and guy supports, and resetting to proper grades or vertical position, as required to establish healthy, viable plantings. Restore or replace damaged tree wrappings.

   1. Maintenance Period: Three months following Final Acceptance by Owner.

B. Irrigation: Maintain system until Final Acceptance by Owner.

PART 2 PRODUCTS

2.1 TREE AND PLANT MATERIAL

A. General: Furnish nursery-grown trees and shrubs complying with ANSI Z60.1, with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock free of disease, insects, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.

B. Grade: Provide trees and shrubs of sizes and grades complying with ANSI Z60.1 for type of trees and shrubs required. Trees and shrubs of a larger size may be used if acceptable to O.R., with a proportionate increase in size of roots or balls.

C. Label at least one tree and one plant of each variety and caliper with a securely attached, waterproof tag bearing legible designation of botanical and common name.

D. If formal arrangements or consecutive order of trees or plants is shown, select stock for uniform height and spread, and number label to assure symmetry in planting.

2.2 TREES

A. Trees: Single and multi-stem trees as appropriate for the site conditions and species. Verify specific tree forms with O.R. Select for well-balanced crown, and intact leader; comply with ANSI Z60.1 for type of trees required.

   1. Provide container-grown trees

   2. Branching Height: One-half of tree height in single stemmed trees, multi-stemmed restoration form trees shall have branching closer to the base.

2.3 PLANTS

A. Form and Size: Normal-quality, well-balanced, plants, of type, height, spread, and shape required, complying with ANSI Z60.1. Provide and container-grown plants. All plants shall be healthy, vigorous, fully leafed and well-branched specimens. Strongly rooted plants shall be provided. All plants from a Certified, California licensed nursery vendor specializing in native plants. Plants deemed unhealthy or lacking in vigor shall be rejected by the Engineer and replaced with same species (from a different nursery if necessary). Plant types and sizes and planting methods are noted on the Plans and Specifications.

B. Container Types and Sizes:

Supercell (SC)	(1.5" dia. X 8.25" deep, similar to Plug)
D16	(2" dia. X 7" deep)
D40	(2.5" dia. X 10" deep)
TB4	(4" sq. X 10" deep)
TP4	(4" sq. X 14" deep)
1 Gallon	(standard nursery size)
5 Gallon	(standard nursery size)
15 Gallon	(standard nursery size)

2.4 NATIVE PLANT AND SEED MIXES

A. Seed provided by Hedgerow Farms, Winters, CA, tel. 530-662-6847. Native container plants from approved nursery specializing in native plant propagation.

1. Mix A: 8th Street

Species	Common Name	Rate or Quantity
Achillea millefolium	Yarrow	0.3 lbs./Ac
Festuca rubra	Red Fescue	10 lbs./Ac
Phacelia californica	Phacelia	0.5 lbs./Ac
Heracleum lanatum	Cow Parsnip	12 / D40 container
Iris douglasiana	Douglas Iris	36 / 1 gallon container

2. Mix A: 10th Street

Species	Common Name	Rate or Quantity

Achillea millefolium	Yarrow	0.3 lbs./Ac
Festuca rubra	Red Fescue	10 lbs./Ac
Phacelia californica	Phacelia	0.5 lbs./Ac
Heracleum lanatum	Cow Parsnip	7 / D40 container
Iris douglasiana	Douglas Iris	20 / 1 gallon container

3. Mix B:

Species	Common Name	Seed Rate
Achillea millefolium	Yarrow	0.3 lbs./Ac
Stipa pulchra	Purple-Needle Grass	12 lbs./Ac
Lupinus succulentus	Arroyo Lupine	3 lbs./Ac
Eschscholzia californica	Seed	2 lbs./Ac

4. Mix C:

Species	Common Name	Seed Rate
Stipa pulchra	Purple-Needle Grass	10 lbs./Ac
Achillea millefolium	Yarrow	0.3 lbs./Ac
Festuca rubra	Red Fescue	4 lbs./Ac
Eschscholzia californica	Seed	1.5 lbs./Ac
Eriophyllum stoechadifolium	Seaside Wooly Sunflower	12 / D40 container

2.5 NATIVE SEED MIX

A. Provided by Hedgerow Farms, Winters, CA, tel. 530-662-6847.

Botanical Name (Common Name)	Ecotype/Origin	Approx. Live Seeds/ Bulk LB	Approx. Live Seeds/ SF	Bulk LB/AC
Stipa pulchra (Purple Needlegrass)	Contra Costa County: Los Vaqueros Watershed	61,562	16.96	12
Stipa lepida (Foothill Needlegrass)	Marin County: Ring Mountain	258,768	23.76	4

Bromus carinatus (California Brome)	Santa Clara County: Arastradero Preserve	66,721	6.13	4
Festuca rubra 'Molate' (Red Fescue)	Contra Costa County: Point Molate	300,000	13.77	2
Elymus triticoides (Creeping Wildrye)	Contra Costa County: Martinez Marsh	110,596	5.08	2
		Totals:	**85.29**	**27**

2.6 MULCH AND STRAW

A. Mulch: 100% recycled tree green waste material from local arborist work. Treeincarnation® brand all wood mulch, Richmond Greenwaste Recycling Yard, Richmond, CA, tel. 510.527.8733.3000).

B. Straw: For use as mulch for seeded areas (except at Lawns). Rice straw type, certified weed-free.

2.7 COMPOST: See Earthwork Specification 02300

2.8 IRRIGATION MATERIALS

A. Irrigation System shall be a Bidder Design system per Plan, provided by certified irrigation professional.

B. Components shall be commercial-grade. Piping and Sleeving shall be PVC. Mainlines shall be Schedule 40 and laterals shall be Class 200. Fittings shall be Schedule 40 except at the Point of Connection where all fittings shall be Schedule 80. Sleeving shall be Schedule 80, oversized to accommodate laterals, mainline, and wiring.

C. Large Site Irrigation Area and along Trail Corridor: Provide large rotor heads zoned on valves separated from smaller sprayheads and tree bubblers. Rotors shall be 12-inch pop-up type of a size appropriate to provide complete coverage. It is anticipated that the majority of the corridor can be irrigated from the edge of trail. Provide Hunter I Series, Toro, or approved equal.

D. Tree and Shrub Bubblers: South of the Ball Fields to NW corner of 10th Street and Codornices Creek (see Plans), provide bubbler heads, Toro or approved equal, one per plant. Calibrate tree bubblers to receive an appropriate larger quantity of water (up to twice) on the same bubbler nozzle.

E. Smaller Site Irrigation Areas: Provide sprayheads for smaller areas of the site as noted on the Plans. Typical areas are at 6th and 8th Street and along the south property line along the USPS property. Zone all sprayheads on separate valves, with matched precipitation 12-inch pop-up style heads with radii and spray patterns as required to provide even and complete coverage. Provide Toro 570 PRX-com series with precision nozzles with auto shut-off feature.

F. Drip Irrigation at 8th Street Planting Strips: Whether these areas are traditional planting strips or rain gardens (design by others) they require drip irrigation. Provide Toro DL 2000 Series or approved equal. Provide all necessary materials including but not limited to: in-line drip emitter tubing, flush valve, fittings, PVC piping, valve boxes.

G. Tree Bubblers: Where only trees require irrigation, provide (1) Toro brand bubbler at each new tree noted on the Plans. Zone tree bubblers on separate valves from rotors and sprayheads. Pipe Class 200 lateral lines to each dripline assembly.

H. Zone Valves: Plastic, automatic remote control valves, wired to a centralized controller for the entire project site. Provide Rainbird or Irritrol brand automatic valves. Install valves in Black plastic, lockable Carson boxes.

I. Quick Couplers: Provide and install within the project area as shown on the Plans as directed and approved by the O.R. Install in 10-inch round, black plastic, lockable Carson boxes or approved equal. Provide Owner with (2) Swivel Ells and (2) Keys. Install valves in Black plastic, lockable Carson boxes.

J. Point of Connection(s) and backflow preventor components shall be per code and to commercial standards. Note (2) on site. Provide (2) Febco (1-1/2" and 1") backflow preventers. Fittings shall be Schedule 80. Install in above ground lockable enclosures of galvanized expanded metal mesh on 4-inch concrete slab. Provide all electrical connection components.

K. Flow Meters: Provide (2) Grainger flow meters or approved equal. At existing University Village 1-1/2-inch connection (near 6th Street), provide Grainger #3FKP8; at the 1-inch connection (near 8th Street), provide Grainger #3FKP2.

L. Controller: Automatic controller (1) Irritrol brand or approved equal, with an additional (3) three zone capability for future expansion. Provide one controller for the entire project site. Note that rotor, sprayhead, tree bubbler, and drip irrigation shall all be on separate zones. Coordinate power with UCB. Provide all electrical connection components and labor. Controller cabinet shall be lockable, galvanized metal pedestal mounted on concrete base: Irritrol type or approved equal. Locate per UCB, potentially in Maintenance Shop Building.

M. Provide complete O+M (Operations and Maintenance Manual for the irrigation equipment and system use and maintenance.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine areas to receive plants and irrigation for compliance with requirements and conditions affecting installation and performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PLANTING AREA PREPARATION

A. Coordinate work with Earthwork and Bioengineering Specifications.

B. No herbicide or pesticides shall be used on the site.

C. Protect structures, utilities, sidewalks, pavements, and other facilities, and lawns and existing plants from damage caused by planting operations.

D. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

E. Lay out individual tree and shrub locations and areas for multiple plantings. Stake locations, outline areas, adjust locations when requested, and obtain O.R. acceptance of layout before planting. Use 6-foot tall stakes for each tree, and 2-foot tall stakes for each shrub. Alternatively, outline shrub planting areas with survey tape. Make minor adjustments as required.

3.3 CONTAINER PLANTING PIT PREPARATION

A. Coordinate work with Earthwork and Soil Bioengineering Specification.

B. If required for planting, cut coir fabric as directed by O.R. to accept container plantings.

C. Ensure excess soil from planting operations is distributed to areas outside of the coir fabric area. Do not place soil on coir.

D. Loosen subgrade of planting pits. Remove stones larger than 3-inches in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose off site.

E. Finish Grading-Areas Outside Coir: Grade planting beds to a smooth, uniform surface plane with loose, uniformly fine texture. Rake and remove ridges and fill depressions to meet finish grades.

F. Restore planting pits if eroded or otherwise disturbed after finish grading and before planting.

3.4 TREE AND PLANT EXCAVATION

A. Pits and Trenches: Excavate circular pits with sides sloped inward. Trim base of pit or trench leaving center area raised slightly to support root ball and assist in drainage. Do not further disturb base. Scarify sides of plant pit smeared or smoothed during excavation.

1. Excavate plant pits as shown on details.

B. Obstructions: Notify O.R. if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.

1. Hardpan Layer: Drill 6-inch diameter holes into free-draining strata or to a depth of 10-feet, whichever is less, and backfill with a 50/50 mix of free-draining excavated soil and Bedding Course material (See Earthwork Specification).

C. Drainage: Notify O.R. if subsoil conditions evidence unexpected water seepage or retention in tree or shrub pits.

D. Fill excavations with water and allow them to percolate away before positioning trees.

3.5 TREE AND PLANT PLANTING AND PRUNING

A. Set trees and plants plumb and in center of pit or trench as noted on details.

1. Remove containers, burlap, and wire baskets from tops of root balls and partially from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not plant trees or shrubs if root ball is cracked or broken before or during planting operation.

2. Place planting soil around root ball in layers, tamping to settle mix and eliminate voids and air pockets. When planting pit is approximately one-half backfilled water thoroughly before placing the remainder of backfill. Repeat watering until no more water is absorbed. Water again after placing and tamping final layer of planting soil.

3. After creating a watering basin for each planting, secure cut coir sections (if present) at each plant to prevent erosion.

4. Stake per Plans and ArborTie Green manufacturers recommended procedure for knots and dimensions.

5. Provide 1x2 stake at each Container Plant, per O.R. direction.

B. Plant and Mulch Areas Layout: Provide mulch for all plants on site unless otherwise noted. Mulch all soil areas not designated for seeding.

1. Trees, throughout site will generally be sited as noted on the Plans. O.R. reserves the right to request Contractor relocations of trees prior to Contractor moving specified trees into planting areas noted on Plans at no cost to Owner.

2. Creek Bank and Floodplain Areas: O.R. shall layout all plants on site. O.R. shall use discretion in plant layout, in some areas clustering plants into sub-zones and creating contrasting zones of open mulch. In other site areas within a particular zone O.R. may layout plants in random, disbursed manner.

C. Mulch Areas and Individually Mulched Plants: Provide Mulch for all container trees and shrub plantings. Provide 4-inch thick layer of mulch at all trees and shrubs. Mulch only as directed by O.R. or as noted on Plans. Provide 4-foot diameter mulch circle at trees and 2-foot diameter mulch circle at each shrub. In areas where shrubs are clustered and no seeding is specified, provide a contiguous area of mulch. No bare areas (areas without either mulch or seeding) shall be left on site at the completion of planting and restoration work.

D. Coordinate site mulching with Earthwork and Soil Bioengineering Specifications, Plans, and Details.

E. Prune trees and shrubs ONLY if directed by O.R.

3.6 SEEDING—NO CHANNEL RESTORATION WORK IS INCLUDED

A. Prepare areas for seeding as noted in Earthwork Specification.

B. Seeding:

1. If requested, seeding shall be performed under direct observation of the O.R.

2. All areas affected by project limits of work shall be seeded per notes on Plans.

3. Soil seed bed shall be prepared from the final, O.R. approved, graded soil condition prepared by the Contractor. No seed bed preparation shall be initiated until the final grading for the project is accepted.

4. Seed bed preparation shall include the following:

    a. Use a "Furst" Harrow (8'-0" wide) dragged behind an ATV or other approved tractor with a laborer holding a chain off the back to direct the harrow along the 2:1 slopes above the floodplain. Harrow in both east/west and north/south directions. Provide two passes, then review results with O.R. One additional pass or spot tilling may be required.

    b. Rake out all debris and litter and dispose of legally. Rocks and woody material greater than 2.5-inches in diameter shall all be removed from the site.

    c. Where seeding areas are too narrow to accommodate the Harrow, use commercial grade rototiller and hand rake soil areas to meet conditions noted in "a" and "b" above.

5. Seeding: Do not seed during rainy weather or when soil temperatures are below 40 degrees Fahrenheit.

6. Presoak seeds for 24 hours immediately before seeding. Change water three times, at eight-hour intervals, to prevent anaerobic damage.

7. Seeding shall be broadcast with a belly grinder and steel raked into the subgrade.

8. Use a "Furst" Harrow as noted above to cover and settle the seed into the prepared seed bed (In narrow areas hand rake). Provide one pass over the entire seeded area, either by mechanical harrow or manually with steel rake. Ensure an even 1/4-inch soil cover over seed. If areas without seed are identified, re-broadcast additional seed per the specifications.

9. Mulch seeded areas with a continuous layer of sterile straw mulch, 2 tons minimum for project site. Blow mulch onto banks from hydro-seeder, with tackifier. Or, crimp straw mulch with sheepsfoot roller into the final graded soil. Ensure soil profile is not compacted beyond 85 percent during process.

10. Secure seeded areas from pedestrians and vehicular access for a minimum of 90 days after seed has been applied with continuous, 4-foot tall orange plastic snow fencing with rebar stakes (#5 size) and orange plastic protective caps.

11. Seed and subgrade shall be kept moist until germination occurs and seasonal rains ensure steady water supply. If late fall and winter rains do not maintain moist soil and vigorous seed growth conditions Contractor is responsible for manual irrigation of the seeded area.

12. Seeding in the floodplain and upland banks shall be completed by October 15th in the year of initiation of construction. Seeding in certain Native Planting Mix areas (see Revegetation Plan) may be seeded after October 15th.

3.7 IRRIGATION

A. Install the complete, approved Bidder Design Irrigation System. Comply with current commercial industry standards and details for irrigation installation, testing, and tolerances.

B. Provide all necessary electrical power connections to City provided power source.

C. Layout of system to be field staked and reviewed and approved by O.R. prior to installation. Contractor will be responsible for adjustments to the approved system in the field to provide complete irrigation coverage. Ensure irrigation system layout and operation accommodates revegetation efforts and effectively waters all plantings and seeded areas.

D. System design intent is noted on the Plans. Spraying from Trail to south with ½ heads is acceptable if coverage is complete. Smaller areas are to be irrigated with spray heads in standard layout manner.

E. Drip Tubing: Ensure irrigation system work achieves evenly matched drip flow rates and water distribution. Provide emitter and tube to each plant in drip irrigation area.

F. Install mainline with 18-inch cover, and laterals with minimum 12-inch cover. Install heads and valve boxes flush and plumb to adjacent features as directed by O.R. Group all valves and quick couplers in neat, level, evenly spaced rows as directed by O.R.

G. Provide all connections, wire, and sleeving to client provided power and water sources.

H. Provide O.R. with pressure test on all mainline sections from Point of Connection to valves. System shall hold 125 psi for one hour. Provide coverage test prior to planting installation.

I. Coordinate Point of Connection and Controller locations and connections with O.R.

3.8 CLEANUP AND PROTECTION AND DISPOSAL

A. During planting and seeding operations keep adjacent pavements and improvements clean and the work area in an orderly condition.

B. Protect plants and seeded areas from damage due to Contractor operations, operations by subcontractors and trades, and general site access. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged planting and seeded areas.

C. Disposal: Remove surplus soil, and waste materials, including excess subsoil, unsuitable soil, irrigation debris, and general debris, and legally dispose all off Owner's property.

END OF SECTION 02930

SECTION 03301 - CAST-IN-PLACE CONCRETE and PRECAST CONCRETE PAVERS

GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Special Provisions, and other Technical Specification Sections apply to this Section.

1.2 SUMMARY

A. This Section includes (but is not limited to) the following:

1. Cast-in-place concrete, including reinforcement, concrete materials, mixture design, placement procedures, and finishes.

2. Precast concrete pavers, layout, placement procedures, and finishes.

B. Related Sections include the following:

1. Division 2 Section "Site Clearing"

2. Division 2 Section "Earthwork and Drainage"

3. Division 2 Section "Chain Link Fencing"

4. Division 2 Section "Site Furnishings"

1.3 DEFINITIONS

A. Owner or City refers to the City of Albany (COA), which is the lead agency. Owner or Owner's Representative (O.R.) for the project refers to the City of Albany Engineer or associates or agents.

B. Other Project Representatives include: City of Berkeley (COB), and the University of California Berkeley (UCB).

1.4 SUBMITTALS

A. General: In addition to the following, comply with submittal requirements in ACI 301

B. Product Data: For each type of product indicated

C. Design Mixtures: For each concrete mixture submit the following:

1. Method for determining proposed mix
2. Gradation of fine and coarse aggregates
3. Proportion of all ingredients
4. Water/Cement Ratio
5. Slump, ASTM C143
6. Certification of chloride content of admixtures
7. Air content of freshly mixed concrete, ASTM C231
8. Strength at 28 days
9. Chloride ion content of concrete

D. Submit Concrete Design Mixes to Special Inspector and Structural Engineer for review and approval.

E. Submit Concrete Paver and Bedding Sand samples

F. Submit shop drawings for reinforcement layout for review and approval by O.R.

G. Concrete Paving Mock-up: Prepare one general concrete pavement mock-up, approximately 4-inch deep by 36-inch square, or as required to convey the concrete design intent, type, finish, jointing, called for in the Plans. Mock-up shall remain on site after review and approval until the project is completed. Mock-up shall NOT become part of the Work. Contractor shall dispose of mock-up off-site at the close of the project. Approved mock-up shall serve as quality control benchmarks for concrete work. Construct mock-up only after approval of mix design, finish, and jointing. Coordinate location of mock-up with O.R.

H. Concrete Paver Mock-up: Prepare concrete paver mock-up, approximately 48-inch square, or as required to convey the paver design intent, base course and bedding sand course, paver type, finish, jointing, called for in the Plans. Mock-up shall remain on site after review and approval until the project is completed. Mock-up shall NOT become part of the Work. Contractor shall dispose of mock-up off-site at the close of the project. Approved mock-up shall serve as quality control benchmarks for

concrete work. Construct mock-up only after approval of mix design, finish, and jointing. Coordinate location of mock-up with O.R.

I. Provide mock-ups at least 3-weeks prior to scheduled installation. Contractor to ensure sufficient time for concrete to cure, be reviewed, corrected if necessary, and for additional mock-ups to be poured and cured without affecting project concrete schedule.

1.5 QUALITY ASSURANCE

A. Owner shall provide on-site inspection of concrete pour, sampling, and testing for all structural concrete: walls, abutments, and footings. Coordinate inspection with O.R.

B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

C. Source Limitations: Obtain each type of cement of the same brand from the same manufacturer's plant, obtain aggregate from one source, and obtain admixtures through one source from a single manufacturer.

D. Comply with ACI 301, "Specification for Structural Concrete," including the following sections, unless modified by requirements in the Contract Documents:

1. "General Requirements"

2. "Formwork and Formwork Accessories"

3. "Reinforcement"

4. "Concrete Mixtures"

5. "Handling, Placing, and Constructing"

E. Comply with ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

F. Comply with Concrete Paver Institute (CPI) standards and recommendations for paver installation.

G. Comply with latest edition of the following standards and regulations:

1. American Society for Testing and Materials (ASTM)

2. California Department of Transportation (Caltrans) Standard Plans (CSP) and Standard Specifications (CSS)

3. Local requirements where applicable

PART 2 PRODUCTS

2.1 FORMWORK

A. Furnish formwork and formwork accessories according to ACI 301

2.2 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 40 for #3 and #4 bars, and Grade 60 for larger bars, deformed. Except for straight bars, fabricate all reinforcing elements off-site.

2.3 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source throughout Project:

1. Portland Cement: ASTM C 150, Type II

B. Normal-Weight Aggregate: ASTM C 33, graded, 3/4-inch nominal maximum aggregate size

C. Water: Potable

2.4 ADMIXTURES

A. Air-Entraining Admixture: ASTM C 260

B. Chemical Admixtures: Admixtures, when used, shall be certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A

2. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D

3. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F

C. Tone: Commercial lamp black, approximately 1 lb. per cubic yard, or as recommended by manufacturer and City to provide slight grey tone to new concrete. For City of Albany and City of Berkeley sidewalk, curb and gutter provide lamp black as specified in City Standards or 1 lb. per cubic yard if O.R. requests. Ensure all new concrete is matching, in type and tone, to new concrete standards for each City.

2.5 RELATED MATERIALS

A. Vapor Retarder: Multi-ply reinforced polyethylene sheet, ASTM E 1745, Class C, or polyethylene sheet, ASTM D 4397; not less than 10 mil thick.

B. Pre-formed Joint-Filler: ASTM D 1751, asphalt-saturated cellulose fiber, or ASTM D 1752, cork or self-expanding cork.

2.6 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming; manufactured for application to fresh concrete.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.

C. Water: Potable

D. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

2.7 CONCRETE MIXTURES

A. Comply with ACI 301 requirements for concrete mixtures. Refer to submittal requirements in this Section.

B. Normal-Weight Concrete: Prepare design mixes, proportioned according to ACI 301, as follows:

1. Minimum Compressive Strength: 3,000 psi at 28 days

2. Maximum Water-Cementitious Materials Ratio: 0.45

3. Slump Limit: 4-inches, plus or minus 1-inch

4. Air Content: Maintain within range permitted by ACI 301. Do not allow air content of slabs to receive troweled finishes to exceed 3 percent.

2.8 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and ASTM C 1116, and furnish batch ticket information.

1. When air temperature is above 90 degrees F, reduce mixing and delivery time to 60 minutes.

2.9 CONCRETE PAVER AND BEDDING SAND

A. Pavers: Basalite SF-RIMA Pavers, 8x8 inch square, natural color.

B. Bedding Sand: Clean, non-plastic natural sand from crushed rock. ASTM C33, meeting the following criteria:

SIEVE SIZE		**PERCENT PASSING**
3/8 INCH		100
No. 4		95 to 100
No. 8		80 to 100
No. 16		50 to 85
No. 30		25 to 60
No. 50		10 to 30
No. 100		2 to 10

PART 3 EXECUTION

3.1 FORMWORK

A. Design, construct, erect, brace, and maintain formwork according to ACI 301.

B. Obtain approval from O.R. for Formwork and Reinforcing 48 hours prior to placing concrete.

3.2 STEEL REINFORCEMENT

A. Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

B. Clearance: Maintain minimum clear distance between reinforcing steel and face of concrete as follows or as noted on details:

1. Concrete footing formed against earth: 3-inches

2. Vertical Concrete: 2-inches (not to earth)

3. Slabs: 3-inches for earth, 2-inches elsewhere

C. Coordinate with Owner provided ICBO-Certified Special Inspector to inspect reinforcing steel installation on-site prior to placement of concrete. O.R. shall be present with the inspector to observe and approve all formwork prior to the concrete placement.

D. Coordinate with the certified report from the inspector verifying placement of reinforcing steel in accordance with drawings.

3.3 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete. Jointing shall be as shown and as approved in site mock-up.

B. Construction Joints: Use only as approved by O.R. Install so strength and appearance of concrete are not impaired. No construction joints shall be allowed within a seatwall segment, or within a landing slab.

C. Score Joints: Locations as noted on the Plans. Layout for review by O.R. in the field on day of pour.

1. Form tooled score joints after initial floating by grooving and finishing each edge of joint with grooving tool. Repeat grooving of contraction joints after applying surface finishes.

2. Eliminate grooving tool marks (flat margin adjacent to groove) on concrete surfaces by apply lightest possible broom finish (as approved by O.R. in Mock-up).

3. When concrete is cured, grind and wire brush smooth all concrete edges and joints.

D. Expansion Joints: Install expansion joints only if required, shown on Plans, and/or directed by O.R. Expansion joints may be required in concrete slabs as determined in the field by the O.R. and Contractor shall provide at no additional cost.

1. Extend pre-formed joint fillers full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.

2. Furnish joint fillers in one-piece lengths for full width being placed. Lace or clip joint filler sections where more than one is required to meet the conditions.

3. Protect top of joint filler with "Zip Strip" type cap.

4. Remove "Zip Strip" type cap when concrete is cured and grind and wire brush smooth all edges and joints.

3.4 CONCRETE PLACEMENT

A. Comply with ACI 301 for measuring, batching, mixing, transporting, and placing concrete.

B. Do not add water to concrete during delivery, at Project site, or during placement.

C. Consolidate concrete with mechanical vibrating equipment.

3.5 FINISHING FORMED SURFACES

A. Smooth-Formed Finish: Cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defective areas. Remove fins and other projections exceeding ⅛-inch.

1. Street Improvements shall be installed per this specification and the City of Albany and City of Berkeley Standard Detail or as required by O.R.

B. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.6 FINISHING UNFORMED SURFACES

A. General: Comply with ACI 302.1R for screeding, re-straightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Screed surfaces with a straightedge and strike off. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane before excess moisture or bleed water appears on surface.

1. Do not further disturb surfaces before starting finishing operations

2. Street Improvements shall be installed per this specification and the City of Berkeley Detail Specification No. 20, dated 05/88.

C. Non-Slip Broom Finish: Apply a light, highly detailed, non-slip broom finish to all horizontal surfaces. Immediately after float finishing, slightly texture concrete surface by brooming with fine fiber-bristle broom as noted on the Plans or as directed by O.R. Follow direction from O.R. as noted in the approved Mock-up.

1. Apply to all horizontal concrete surfaces.

2. Broom finish shall be installed in custom, banded or checkerboard pattern as directed by O.R. in field.

3.7 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and with ACI 301 for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

D. Curing Methods: Cure formed and unformed concrete for at least seven days by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following:

a. Water

b. Continuous water-fog spray.

c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12-inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

3.8 FIELD QUALITY CONTROL

A. Testing Agency: Owner shall engage a qualified independent testing and inspecting agency to sample materials, perform tests, and submit test reports during concrete placement according to requirements specified in this Article. Contractor shall coordinate installation process with Owner's testing agency.

B. Tests: Shall be performed according to ACI 301

1. Testing Frequency: One composite sample shall be obtained for each 100 cu. yd. or fraction thereof of each concrete mix placed each day.

3.9 PAVER INSTALLATION

A. Complete base course installation per Concrete or Asphalt Paving, ensuring 95% relative compaction throughout.

1. Spread Bedding Sand evenly over base course and screed to 1-inch depth.

2. Lay pavers in pattern shown on the drawings. Maintain straight and square joint lines and even paver surface.

3. Joints shall be determined by precast tabs on individual pavers.

4. Create overall layout area dimensions to prevent the need to cut any pavers greater than 50% in any dimension. No thin wedge sections will be allowed. Cut pavers with masonry saw.

5. Use low amplitude, high frequency (min. 75 hertz) plate vibrator, capable of 5,000 lbs. force. Vibrate pavers while sweeping sand on top of pavers, ahead of the vibrator. Continue until paver joints are full of sand.

6. Sweep off excess sand.

7. Final surface elevations shall not deviate more than 3/8-inch in 10'-0" linear feet in any direction. Surface elevations shall be set 1/8-inch to 1/4-inch above all adjacent paving, utility vaults, concrete collars, drainage inlets.

B. Tests: Shall be performed according to ACI 301

1. Testing Frequency: One composite sample shall be obtained for each 100 cu. yd. or fraction thereof of each concrete mix placed each day.

3.10 REPAIRS

A. Remove and replace concrete that does not comply with requirements in this Section and/or does not meet with O.R. approval.

END OF SECTION 03301

SECTION 05521 - PIPE and TUBE RAILINGS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Special Provisions, and other Technical Specification Sections apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Steel guardrails near headwall structures at 8th Street, East and 10th Street, both East and West. No work is included for the existing headwall at San Pablo Avenue West.

2. Miscellaneous metal elements to complete the work, including embed plates and adhesive.

B. Related Sections include the following:

1. Division 3 Section "Cast-in-Place Concrete"

2. Division 2 Section "Site Furnishings"

1.3 DEFINITIONS

A. Owner or City refers to the City of Albany, which is the lead agency. Owner or Owner's Representative (O.R.) for the project refers to the City of Albany Engineer or associates or agents.

B. Other Project Representatives include: City of Berkeley (COB), and the University of California Berkeley (UCB).

1.4 SUBMITTALS

A. Product Data: For the following:

1. Non-shrink grout and anchoring cement

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

1. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Samples for Verification: For each type of exposed finish required.

1. Sections of guardrail frame and picket

2. Embed plate and anchor assembly

1.5 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of walls, stairs, walkways, and other construction contiguous with railings by field measurements before fabrication and indicate measurements on Shop Drawings.

1.6 COORDINATION AND SCHEDULING

A. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including concrete inserts, anchor bolts, and items with integral anchors that are to be embedded in concrete. Deliver such items to Project site in time for installation.

B. Schedule installation to coordinate with other work. Do not support railings temporarily by any means that do not satisfy structural performance requirements.

PART 2 PRODUCTS

2.1 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

B. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails, unless otherwise indicated.

2.2 STEEL AND IRON

A. Structural Tubing (Tube Steel): ASTM A500, size per Plans, hot-dip galvanized finish.

B. Plates, Shapes, and Bars: ASTM A 36/A 36M, all embedded steel plates shall be hot-dip galvanized finish.

C. Castings: Either gray or malleable iron, unless otherwise indicated.

1. Gray Iron: ASTM A 48/A 48M, Class 30, unless another class is indicated.

2. Malleable Iron: ASTM A 47/A 47M.

2.3 FASTENERS

A. General: Provide the following:

1. Steel Railings: Plated steel fasteners complying with ASTM B 633, Class Fe/Zn 25 for electrodeposited zinc coating.

B. Fasteners for Anchoring Railings to other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and as approved by Owner**.**

1. Provide tamper-resistant flat-head machine screws for exposed fasteners, unless otherwise indicated.

C. Anchors: Where required, provide cast-in-place anchors, fabricated from corrosion-resistant materials with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and equal to four times the load imposed when installed in concrete, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.

2.4 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

B. Shop Primers: If required, provide primers that comply with Division 9 Section "High-Performance Coatings."

C. Non-shrink, Nonmetallic Grout: Factory-packaged, non-staining, non-corrosive, nongaseous grout complying with ASTM C 1107. Acceptable material is Embecco 885 Grout. Provide grout specifically recommended by manufacturer for exterior applications.

D. Epoxy Anchoring Adhesive: Simpson brand, SET Epoxy-Tie, two-part epoxy-based adhesive. ASTM C-881.

2.5 FABRICATION

A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, anchorage, and ADA Code compliance.

B. Assemble railings in the shop, no field splicing or assembly shall occur unless approved by O.R.

C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32-inch, unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

D. Form work true to line and level with accurate angles and surfaces.

E. Fabricate connections in a manner to exclude water. Provide weep holes where water may accumulate.

F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.

G. Connections: Fabricate railings with welded connections, unless otherwise indicated.

H. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.

2. Obtain fusion without undercut or overlap.

3. Remove flux immediately.

4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.

I. Form changes in direction as detailed

J. Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

K. Close exposed ends of railing members with prefabricated end fittings.

L. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work, unless otherwise indicated.

2.6 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast. Provide exposed fasteners with finish matching appearance, including color and texture, of railings.

2.7 STEEL AND IRON FINISHES

A. Galvanized Railings:

1. Hot-dip galvanized steel and iron railings after fabrication.

2. Comply with ASTM A 123/A 123M for hot-dip galvanized railings.

3. Comply with ASTM A 153/A 153M for hot-dip galvanized hardware.

B. Fill vent and drain holes that will be exposed in the finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.

PART 3 EXECUTION

3.1 INSTALLATION, GENERAL

A. Fit exposed connections together to form tight, hairline joints.

B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.

1. Do not weld, cut, or abrade surfaces of railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.

2. Set posts plumb within a tolerance of 1/16-inch in 3-feet.

3. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed ½ inch in 12-feet.

C. Corrosion Protection: Coat concealed surfaces of metal that will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

D. Adjust railings before anchoring to ensure matching alignment at abutting joints.

E. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.2 RAILING CONNECTIONS

A. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in Part 2 "Fabrication" whether welding is performed in the shop or in the field.

B. Weld rebar stud anchors to embedded steel plates

3.3 ADJUSTING AND CLEANING

A. Clean by washing thoroughly with clean water and soap and rinsing with clean water.

B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

C. Epoxy: Mask off all concrete and metal work and all other work potentially affected by the work. Ensure no epoxy residue is visible at the completion of the project. Use solvents or other cleaners as necessary to completely remove the epoxy residue. Replace site improvements affected by the epoxy.

3.4 PROTECTION

A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

B. Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION 05521

APPENDIX

CITY OF BERKELEY STANDARD PLANS: Available on Request

- Standard Driveway Approach
- Sidewalk, Curb, Gutter

CITY OF ALBANY STANDARD PLANS: Available on Request

- Standard Driveway Approach
- Sidewalk, Curb, Gutter

COLUMBIA CASCADE BOLLARD DETAIL: Available on Request

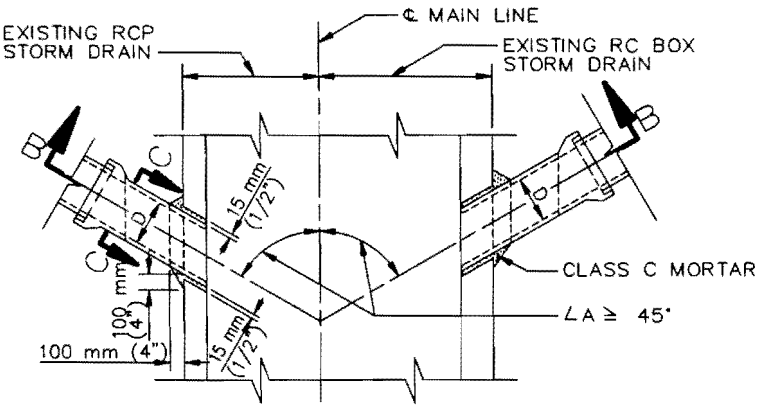
- Columbia Cascade Drawings No. E-46186-R (2 pages)
  Contact, Park Pacific 800-460-7275 (Gordon Jurgenson)

COLUMBIA CASCADE BIKE RACK DETAIL: Available on Request

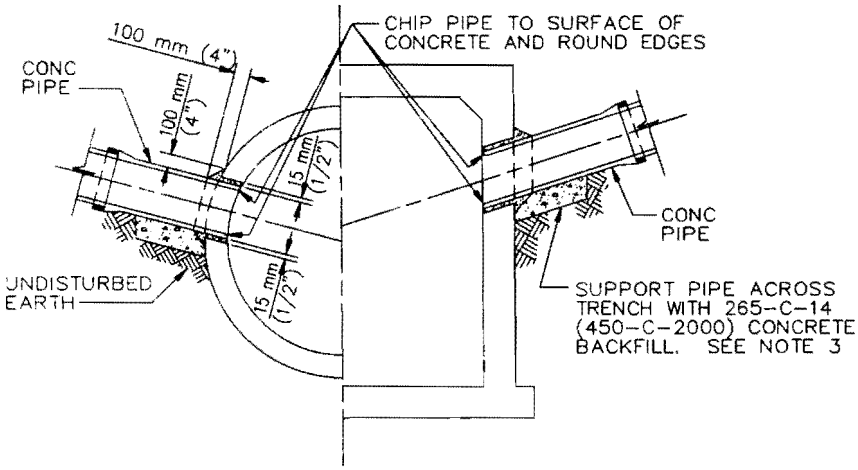
- Columbia Cascade Drawings No. W-2170-5 (1 page)
  Contact, Park Pacific 800-460-7275 (Gordon Jurgenson)

PIPE CONNECTION TO EXISTING STORM DRAINS DETAIL

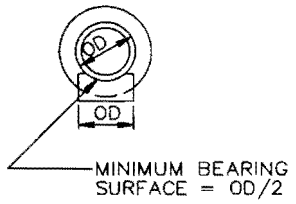
- Connection to (e) Culvert



PLAN



SECTION B – B

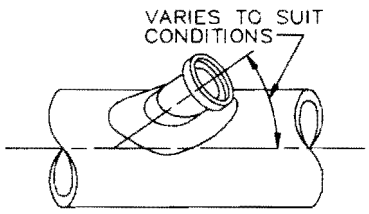


SECTION C – C

CASE 1

PLAIN CONCRETE PIPE

D = 600 mm (24") MAX



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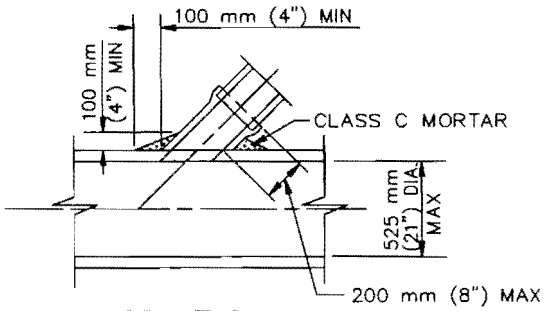
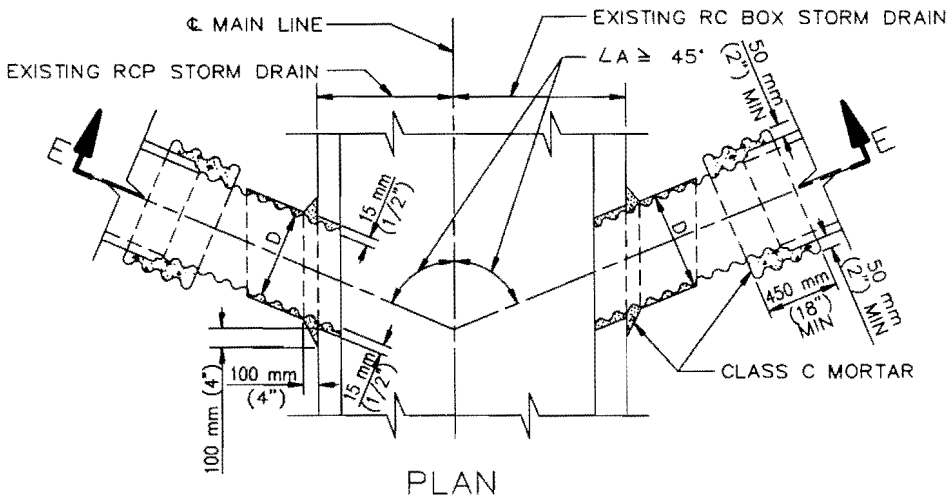


SECTION

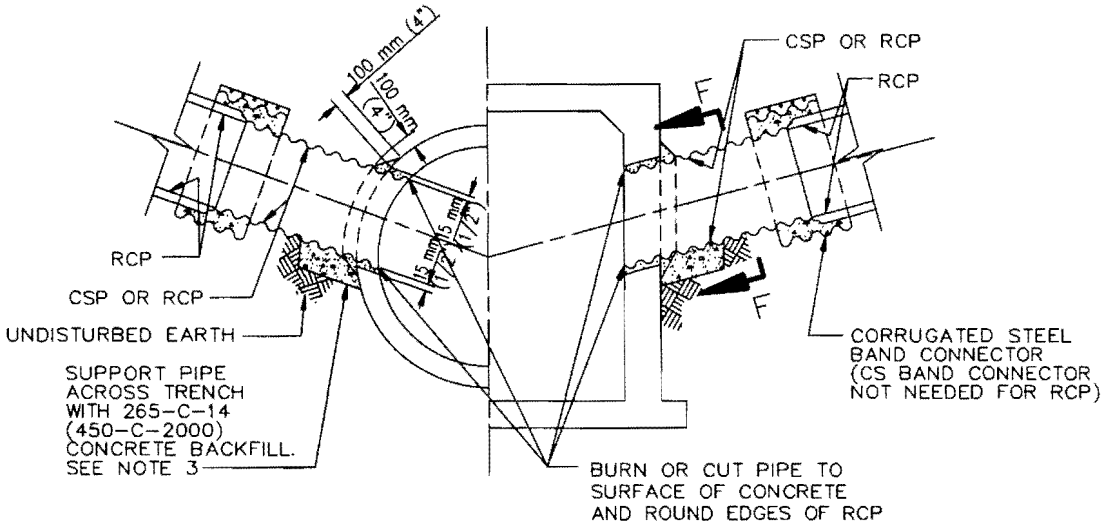
CASE 2

SADDLE CONNECTION

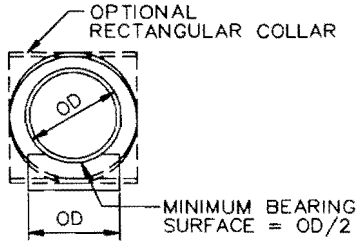
STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION		
PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1984 REV. 1996	**PIPE CONNECTIONS TO EXISTING STORM DRAINS** USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION	STANDARD PLAN METRIC **335-1** SHEET 1 OF 3



PLAN



SECTION E – E



SECTION F – F

DIAMETER OF CSP	MIN GAGE
375 mm (15") – 525 mm (21")	16
600 mm (24")	14

CASE 3

RCP OR CSP

D = 600 mm (24") MAX

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION	STANDARD PLAN METRIC
PIPE CONNECTIONS TO EXISTING STORM DRAINS	**335–1**
	SHEET 2 OF 3

NOTES

CASE 1 AND CASE 3

1. OUTSIDE DIAMETER OF THE CONNECTOR PIPE SHALL NOT BE GREATER THAN 1/2 THE INSIDE DIAMETER OF THE RCP MAIN LINE.
2. INSIDE DIAMETER D OF THE CONNECTOR PIPE SHALL NOT BE GREATER THAN 600 mm (24").
3. THE MINIMUM OPENING INTO THE EXISTING STORM DRAIN SHALL BE THE OUTSIDE DIAMETER OF THE CONNECTING PIPE PLUS 30 mm (1"). THE CONCRETE BACKFILL SUPPORTING THE CONNECTING PIPE MAY BE OMITTED IF THE PIPE IS LAID ON UNDISTURBED EARTH TO STORM DRAIN WALL.
4. ALL CSP AND FITTINGS SHALL BE GALVANIZED. BAND CONNECTORS MAY BE 2 GAGES LIGHTER THAN THE PIPE, BUT WITH A MINIMUM GAGE OF 16. THEY SHALL BE CONNECTED AT THE ENDS BY ANGLES HAVING MINIMUM DIMENSIONS OF 50 mm x 50 mm x 5 mm (2"x2"x3/16") AND 140 mm (5 1/2") BOLTS.
5. WHEN JOINING A RCP CONNECTOR PIPE TO A CSP CONNECTOR PIPE, THE INSIDE DIAMETER D OF THE CSP SHALL BE AT LEAST EQUAL TO BUT NOT MORE THAN 75 mm (3") GREATER THAN THAT OF THE RCP.
6. CONNECTOR PIPES SHALL BE NOT MORE THAN 1.5 m (5') ABOVE THE INVERT.
7. CONNECTOR PIPES SHALL ENTER MAIN LINE RCP RADIALLY.
8. WHEN CONNECTING TO A RCB, SPPWC 333 SHALL BE USED IF THE TOP OF THE CONNECTOR PIPE IS LESS THAN 300 mm (12") BELOW THE SOFFIT OF THE RCB OR THE FLOW LINE OF THE PIPE IS LESS THAN 330 mm (13") ABOVE THE FLOOR OF THE RCB AT THE INSIDE FACE.

CASE 2

9. SADDLE CONNECTIONS SHALL BE USED WHEN CONNECTING TO PIPES 525 mm (21") OR LESS IN DIAMETER WITHOUT THE USE OF JUNCTION STRUCTURES OR PRECAST Y BRANCHES.
10. TRIM OR CUT SADDLE TO FIT SNUGLY OVER THE OUTSIDE OF THE MAIN PIPE SO ITS AXIS WILL BE ON THE LINE AND GRADE OF THE CONNECTING PIPE.
11. THE OPENING INTO THE PIPE SHALL BE CUT AND TRIMMED TO FIT THE SADDLE SO THAT NO PART WILL PROJECT WITHIN THE BORE OF THE SADDLE PIPE.
12. THE CONNECTOR PIPE SHALL BE SUPPORTED AS SHOWN IN CASE 1 AND CASE 3.

Codornices Creek: San Pablo Avenue Gateway

Plant Palette

Images | **Representative Species**

Riparian Areas, Bioswales, and Rain Gardens


Alnus rhombifolia / WHITE ALDER
Juncus patens / COMMON RUSH
Carex pansa / MEADOW SEDGE
Cornus sericea / DOGWOOD
Festuca rubra / RED FESCUE
Rosa californica / CALIFORNIA ROSE

Upland Areas


Aesculus californica / CALIFORNIA BUCKEYE
Quercus agrifolia / CALIFORNIA LIVE OAK
Arctostaphylos spp. / MANZANITA
Nassella pulchra / PURPLE NEEDLEGRASS
Festuca rubra / RED FESCUE
Leymus triticoides / CREEPING WILDRYE

Gateway Plaza


Iris douglasiana / *DOUGLAS IRIS*
Escholzia californica / CALIFORNIA POPPY
Mimulus aurantiacus / STICKY-MONKEYFLOWER
Ceanothus grisius / YANKEE POINT
Lupinus spp. / LUPINE
Festuca spp. / NO MOW FESCUE TURF BLEND

Soil Bioengineering



Salix laevigata / RED WILLOW
Salix lucida ssp. lasiandra / YELLOW WILLOW
Salix lasiolepis / ARROYO WILLOW
Cornus sericea / DOGWOOD