

CALIFORNIA COASTAL COMMISSION

South Coast District Office
301 E Ocean Blvd., Suite 300
Long Beach, CA 90802-4302
(562) 590-5071



W20c

5-21-0705 (City of San Clemente)

MAY 11, 2022

EXHIBITS

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2022.

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Project Location

Exhibit 1

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California Coastal
Commission



San Clemente Pedestrian Beach Trail

**Proposed location
of gabion protection
system (approx.)**

**Existing beach access trail (to be
realigned and reconstructed)**

**Exposed
sewer/recycled
water lines**

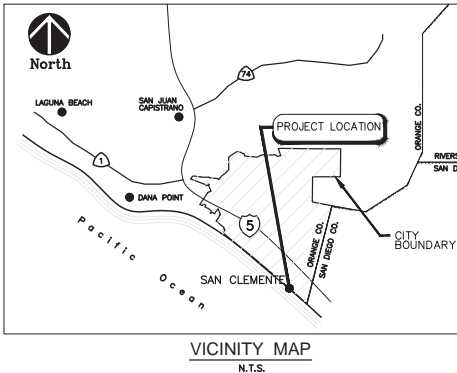
Railroad

CITY OF SAN CLEMENTE

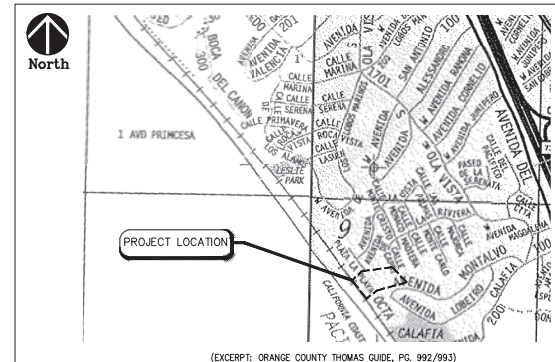
AVENIDA MONTALVO

CANYON AND TRAIL IMPROVEMENT

PROJECT NO. 16004



VICINITY MAP
N.T.S.



(EXCERPT: ORANGE COUNTY THOMAS GUIDE, PG. 992/993)

LOCATION MAP
N.T.S.

GENERAL NOTES – STORM DRAIN

1. ALL WORK SHALL CONFORM TO THE STANDARD PLANS AND SPECIFICATIONS OF THE CITY OF SAN CLEMENTE PUBLIC WORKS (CPW) AND STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, LATEST EDITION. ALL WORK SHALL BE SUBJECT TO THE CITY ENGINEER'S ACCEPTANCE AS A CONDITION OF COMPLETION OF WORK BY THE CONTRACTOR.
2. THE CONTRACTOR SHALL NOTIFY THE CITY OF SAN CLEMENTE'S INSPECTOR AT LEAST 48 HOURS PRIOR TO ANY CONSTRUCTION AT (949) 361-6131.
3. NOT USED.
4. NOT USED.
5. ALL CONCRETE IN REINFORCED CONCRETE STRUCTURES SHALL BE 4000 PSI (65-MPa-4500), PORTLAND CEMENT CONCRETE, WITH TYPE I CEMENT & MAX W/C RATIO OF 0.45 UNLESS NOTED OTHERWISE.
6. ALL PIPE LENGTHS ARE HORIZONTAL PROJECTS, UNLESS OTHERWISE SHOWN.
7. CONTRACTOR SHALL COORDINATE WITH AND OBTAIN PERMIT FROM CDPW FOR WORK INVOLVING CDPW FACILITIES.
8. LOCATIONS OF PUBLIC UTILITIES SHOWN HAVE BEEN DETERMINED FROM AVAILABLE INFORMATION. HOWEVER, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE THE TRUE LOCATION OF ANY EXISTING UTILITIES AND TO EXERCISE PROPER PRECAUTIONS TO AVOID INJURY OR DAMAGE THEREOF.
9. PRIOR TO THE PLACEMENT OF STORM DRAIN IMPROVEMENTS, THE CITY'S SOLS ENGINEER SHALL CERTIFY IN WRITING TO THE CITY'S INSPECTOR THAT THE STORM DRAIN SUBGRADE IS OF ADEQUATE STRENGTH TO SUPPORT THE STRUCTURES AND ANY ANTICIPATED LOADS.
10. ALL TRENCH EXCAVATIONS SHALL CONFORM TO STATE OF CALIFORNIA CONSTRUCTION SAFETY ORDERS.
11. NOT USED.
12. ALL FILL MATERIAL SHALL BE COMPACTED TO 90% RELATIVE COMPACTION IN ACCORDANCE WITH CITY STD. NO. WS-1 AS DETERMINED BY CALIFORNIA TEST METHOD 216F.
13. ALL MATERIALS TESTING FOR THE DRAINAGE FACILITIES SHALL BE PROVIDED BY THE CONTRACTOR OR DEVELOPER IN ACCORDANCE WITH THE NUMBER, LOCATION AND FREQUENCY REQUESTED BY THE CITY'S INSPECTOR.
14. ALL JOINT PIPE JOINTS SHALL BE INTEGRAL BELL WATER TIGHT UNLESS NOTED OTHERWISE.

PRIVATE ENGINEER'S NOTICE TO CONTRACTORS

1. THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITIES AND/OR STRUCTURES SHOWN ON THESE PLANS WERE OBTAINED BY A SEARCH OF THE AVAILABLE RECORDS. APPROVAL OF THESE PLANS BY THE OWNER DOES NOT CONSTITUTE A REPRESENTATION AS TO THE ACCURACY OR COMPLETENESS OF THE LOCATION OR THE EXISTENCE OF ANY UTILITY AND/OR STRUCTURE WITHIN THE LIMITS OF THIS PROJECT. THE CONTRACTOR IS REQUIRED TO TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE UTILITIES OF RECORD OR NOT OF RECORD OR NOT SHOWN ON THESE PLANS.
2. RELOCATION OR REMOVAL OF ANY EXISTING UTILITIES SHALL BE PERFORMED BY THE RESPECTIVE UTILITY OWNERS, AT THE EXPENSE OF THE CONTRACTOR.
3. THE GRADING CONTRACTOR SHALL SATISFY HIMSELF AS TO THE GRADING QUANTITIES AS SHOWN IN THE BID DOCUMENTS AS PART OF HIS BID.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL REQUIRED PERMITS PRIOR TO COMMENCEMENT OF GRADING OPERATIONS.
5. UNAUTHORIZED CHANGES & USES: THE ENGINEER PREPARING THESE PLANS WILL NOT BE RESPONSIBLE FOR, OR LIABLE FOR, UNAUTHORIZED CHANGES TO OR USES OF THESE PLANS. ALL CHANGES TO THE PLANS MUST BE IN WRITING AND MUST BE APPROVED BY THE PREPARER OF THESE PLANS.
6. CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS AND SHALL REPORT ALL DISCREPANCIES TO OWNER AND THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK. CONTRACTOR AGREES THAT HE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY. THAT THESE REQUIREMENTS SHALL APPLY CONTINUOUSLY AND SHALL NOT BE LIMITED TO NORMAL WORKING HOURS.

GENERAL NOTES – EROSION CONTROL

1. EQUIPMENT AND WORKERS FOR EMERGENCY WORK SHALL BE MADE AVAILABLE AT ALL TIMES DURING THE RAINY SEASON. NECESSARY MATERIALS SHALL BE AVAILABLE ON SITE AND STOCKPILED AT CONVENIENT LOCATIONS TO FACILITATE RAPID CONSTRUCTION OF TEMPORARY DEVICES WHEN RAIN IS IMMINENT.
2. EROSION CONTROL DEVICES SHALL NOT BE MOVED OR MODIFIED WITHOUT THE APPROVAL OF THE BUILDING OFFICIAL OR CITY ENGINEER.
3. ALL REMOVABLE EROSION PROTECTIVE DEVICES SHALL BE IN PLACE AT THE END OF EACH WORKING DAY WHEN THE 5-DAY RAIN PROBABILITY FORECAST EXCEEDS 40%.
4. AFTER A RAINFALL ALL SILT AND DEBRIS SHALL BE REMOVED FROM STREETS, CREEK BEDS AND BASINS.
5. GRADED AREAS ON THE PERMITTED AREA PERIMETER MUST DRAIN AWAY FROM THE FACE OF SLOPES AT THE CONCLUSION OF EACH WORKING DAY. DRAINAGE TO BE DIRECTED TOWARD DESIGN FACILITIES.
6. THE PERMITTEE SHALL BE RESPONSIBLE AND SHALL TAKE NECESSARY PRECAUTIONS TO PREVENT PUBLIC TRESPASS ONTO AREAS WHERE IMPOUNDED WATER CREATES A HAZARDOUS CONDITION.
7. (NOT USED)
8. ALL CONSTRUCTION VEHICLES OR EQUIPMENT, FIXED OR MOBILE OPERATED WITHIN 1000' OF A DWELLING SHALL BE EQUIPPED WITH PROPERLY OPERATING AND MAINTAINED MUFFLERS.
9. ALL OPERATIONS SHALL COMPLY WITH CITY CODED ORDINANCE DIVISION 6 (NOISE CONTROL).
10. STOCKPILING AND/OR VEHICLE STAGING AREAS SHALL BE LOCATED AS FAR AS PRACTICABLE FROM DWELLINGS.
11. EROSION CONTROL DEVICES WILL BE MODIFIED AS NEEDED AS THE PROJECT PROGRESSES, AND PLANS OF THESE CHANGES SUBMITTED FOR PLAN CHECK AS REQUIRED.
12. THE PLACEMENT OF ADDITIONAL DEVICES TO REDUCE EROSION DAMAGE WITHIN THE SITE IS LEFT TO THE DISCRETION OF THE FIELD ENGINEER.
13. THE CITY OR THEIR REPRESENTATIVE WILL OBSERVE EROSION CONTROL WORK AND WILL INFORM THE CONTRACTOR IF THE WORK IS NOT IN ACCORDANCE WITH THE APPROVED PLAN.

LEGEND

---	RIGHT-OF-WAY
---	STORM DRAIN EASEMENT
---	STORM DRAIN PIPE CENTERLINE
---	EXISTING SEWER
---	EXISTING WATER
---	EXISTING GAS
---	EXISTING TELEVISION/CABLE
---	EXISTING TELEPHONE
---	EXISTING ELECTRICAL
---	WALL
---	BORING LOCATION (GEOTECHNICAL, FEB 2015)

ABBREVIATIONS

AC	ASPHALT CONCRETE	L	LENGTH
ADD'L	ADDITIONAL	LBCWD	LAGUNA BEACH COUNTY WATER DISTRICT
ADJ	ADJACENT	LCL	LAY OUT LINE
APWA	AMERICAN PUBLIC WORKS ASSOCIATION	LA	LEFT
BC	BEGINNING OF CURVE	LT	LEFT
BEG	BEGINNING	MANF	MANUFACTURER
BF	BOTH FACES	MAX	MAXIMUM
BO	BACK	MBOR	METAL BEAM GUARD RAIL
BTM	BOTTOM	MN	MINIMUM
CATV	CABLE TELEVISION	MIN	MINIMUM
CB	CATCH BASIN	N	NORTH, NORTHING
CD	CHANNEL	NO	NUMBER
CHNL	CAST-IN-PLACE	NTS	NOT TO SCALE
C.I.P.	CORROSION JOINT	O.C.	ON CENTER
CL	CENTERLINE	OCW	ORANGE COUNTY PUBLIC WORKS
CLR	CLEARANCE	OD	OUTER DIAMETER
CMP	CORRUGATED METAL PIPE	OPT	OPTIONAL
CONC	CONCRETE	OSP	OUTSIDE FACE
CONST	CONSTRUCTION	PVE	PAVEMENT
CT	COURT	PB	PULL BOX
CTRD	CENTERED	PC	PORTLAND CEMENT CONCRETE
DBL	DOUBLE	PP	PROTECT IN PLACE
DIA	DIAMETER	PP	POLYPROPYLENE PIPE (ASTM F2881)
DR	DRIVE	PRJ	PROJECT
DTL	DETAIL	PVC	POLYVINYL CHLORIDE
E	EAST, EASTING	R/W	RIGHT-OF-WAY
EA	EACH	RCP	REINFORCED CONCRETE PIPE
EF	END OF CURVE	RD	ROAD
EG	EXISTING GROUND	REINF.	REINFORCING
EJ	EXPANSION JOINT	REQ'D	REQUIRED
ELEV	ELEVATION	RIGHT	RIGHT
EQ	EQUAL	S	SOUTH, SLOPE
EQUIP	EQUIPMENT	SC	SOUTHERN CALIFORNIA EDISON
EW	EACH WAY	SD	STORM DRAIN
EXST	EXISTING	SLB	SLAB
FG	FINISHED GRADE	SQ	SQUARE
FL	FLOW LINE	STA	STATION
FS	FINISH SURFACE	STD	STANDARD
FT	FOOT	STR	STRUCTURE
FWD	FORWARD	SWM	SYMMETRIC
G	GAS	T&B	TOP AND BOTTOM
GB	GRADE BREAK	TC	TOP OF CURB
H	HEIGHT	TOP	TOP OF FOOTING
HPDE	HIGH DENSITY POLYETHYLENE	TW	TOTAL
HK	HORIZONTAL	UBC	UNIFORM BUILDING CODE
HP	HIGH POINT	UTL	UTILITY
ICBO	INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS	VAR.	VARIABLES
INT	INTERSECTION	VERT	VERTICAL
INV	INVERT	W	WEST, WIDTH
IRRG	IRRIGATION	W/O	WITHOUT
ISF	INSIDE FACE	W.M.	WELDED WIRE MESH
J	JUNCTION STRUCTURE	WY	WAY

DECLARATION OF RESPONSIBLE CHARGE

I HEREBY DECLARE THAT I AM THE ENGINEER OF WORK FOR THIS PROJECT, THAT I HAVE EXERCISED RESPONSIBLE CHARGE OVER THE DESIGN OF THE PROJECT AS DEFINED IN SECTION 6703 OF THE BUSINESS AND PROFESSIONS CODE, AND THAT THE DESIGN IS CONSISTENT WITH CURRENT STANDARDS.

I UNDERSTAND THAT THE CHECK OF PROJECT DRAWINGS AND SPECIFICATIONS BY THE CITY OF SAN CLEMENTE DOES NOT RELIEVE ME AS ENGINEER OF WORK, OF MY RESPONSIBILITIES FOR PROJECT DESIGN.

FIRM: STANTEC CONSULTING SERVICES INC.

ADDRESS: 38 TECHNOLOGY, SUITE 100

CITY, ST.: IRVINE, CA

TELEPHONE: (949) 973-6091

BY: [Signature]

DATE: 12/16/20

R.C.E. NO.: 65388

REGISTRATION EXPIRATION DATE: 9/30/21

ADJUSTED COORDINATES (FEET US)

STATION	NORTHING	EASTING	ELEVATION
P471	2150904.855	6168439.396	686.8618
SBCC	2147751.14	6131652.26	406.4625
100	2102241.455	6143501.51	163.295
101	2104223.496	6147448.126	455.2504
102	2104410.895	6147453.44	448.1893
103	2097419.819	6149567.207	110.0364
104	2097641.822	6146155.028	107.6126

ADJUSTED POSITIONS AND ELLIPSOID HEIGHTS (FEET US)

STATION	LATITUDE	LONGITUDE	ELLIP HT	GEOD HT
P471	33-33-43.637334	117-32-27.067998	575.8258	-111.0359
SBCC	33-33-10.789342	117-39-41.304010	293.3966	-113.0659
100	33-25-52.032770	117-37-14.388947	49.2833	-114.0117
101	33-26-02.258822	117-36-27.974682	341.4966	-113.7538
102	33-26-04.134818	117-36-27.940784	334.4422	-113.7471
103	33-24-54.768633	117-36-44.517253	-4.0597	-114.096
104	33-24-56.980370	117-36-42.217842	-6.4647	-114.0773

CONVERGENCE ANGLES (DMS) AND GRID FACTORS AT STATIONS

(GRID AZIMUTH = GEODITIC AZIMUTH - CONVERGENCE)

(ELEVATION FACTOR INCLUDES A GEODITIC HEIGHT CORRECTION AT EACH STATION)

STATION	CONVERGENCE	SCALE	X	ELEVATION	COMBINED
P471	-0-42-33.65	0.99996204	0.99997245	0.99993449	
SBCC	-0-46-32.27	0.99996142	0.99995596	0.99994739	
100	-0-44-55.12	0.99995558	0.99999764	0.99995322	
101	-0-44-46.03	0.99995556	0.99998366	0.9999332	
102	-0-44-46.01	0.99995558	0.99998400	0.99993967	
103	-0-44-53.85	0.99995514	1.00000019	0.99995534	
104	-0-44-53.85	0.99995516	1.00000031	0.99995547	
PROJECT AVG:	-0-44-46.35	0.99995724	0.99999817	0.99994641	

SHEET INDEX

1. TITLE SHEET & GENERAL NOTES
2. SHEET INDEX & CONSTRUCTION NOTES
3. PLAN AND PROFILE
4. CONSTRUCTION DETAILS
- 5-7. GABION DETAILS (1-3)
8. REVEGETATION PLAN

ACCEPTANCE OF PLANS/SPECIFICATIONS

THE CITY OF SAN CLEMENTE HEREBY ACCEPTS THESE PLANS/SPECIFICATIONS FOR CONSTRUCTION, AS BEING IN GENERAL COMPLIANCE WITH APPLICABLE STATUTES, CODES, STANDARDS OR GUIDELINES. RESPONSIBILITY FOR THE COMPLETENESS AND ACCURACY OF THE PLANS/SPECIFICATIONS AND RELATED DESIGNS, AND CONFORMANCE TO APPLICABLE STATUTES, CODES, STANDARDS OR GUIDELINES, RESIDES WITH THE ENGINEER AND ENGINEERING FIRM OF RECORD.

[Signature]
(SIGNED AND DATED BY AUTHORIZED CITY STAFF)

BASIS OF BEARING

THE BEARINGS OF THE FIELD SURVEY REFERENCED HEREON ARE BASED ON THE SIDELINE OF PLAZA LA PLAYA BEING NORTH 36°19'30" WEST PER TRACT NO. 2964, M.M. 90/1-4 (USED 6.75' OFFSET MONUMENTS)

BENCHMARK

QCS BM 3D-56-68
NGVD29, YEAR LEVELED: 1988, ELEVATION=16.582 FEET
FOUND 3 3/4" ALUMINUM BENCHMARK DISK STAMPED "36-56-68", SET IN THE SOUTHWEST CORNER OF A CONC. HEADWALL MONUMENT IS LOCATED ALONG THE NETLY SIDE OF THE ATCHISON TOPEKA SANTA FE RAILWAY, 0.8 MILES S.W. OF THE SAN CLEMENTE PIER, 92.8 FEET N.E. AND ACROSS THE TRACKS FROM LIFEGUARD TOWER #5 AND 49.5 FEET S.E. OF A FOOTPATH LEADING UP A BLUFF. MONUMENT IS SET 1.3 FEET BELOW THE HEIGHT OF THE TRACKS.

DATUM STATEMENT

THE COORDINATES OF THE FIELD SURVEY REFERENCED HEREON ARE ASSUMED LOCAL COORDINATES.

ALL DISTANCES SHOWN ARE GROUND, UNLESS NOTED OTHERWISE.

DATE OF FIELD SURVEY

4/18/13 - VFT01 ESTABLISH CONTROL
4/25/13 - VFT02 TOPO SURVEY



REV.	DATE	DESCRIPTION	BY	APP'D

REVISIONS

	38 TECHNOLOGY, SUITE 100 IRVINE, CA 92618 949.923.6091	stantec.com
PLANS PREPARED BY:		



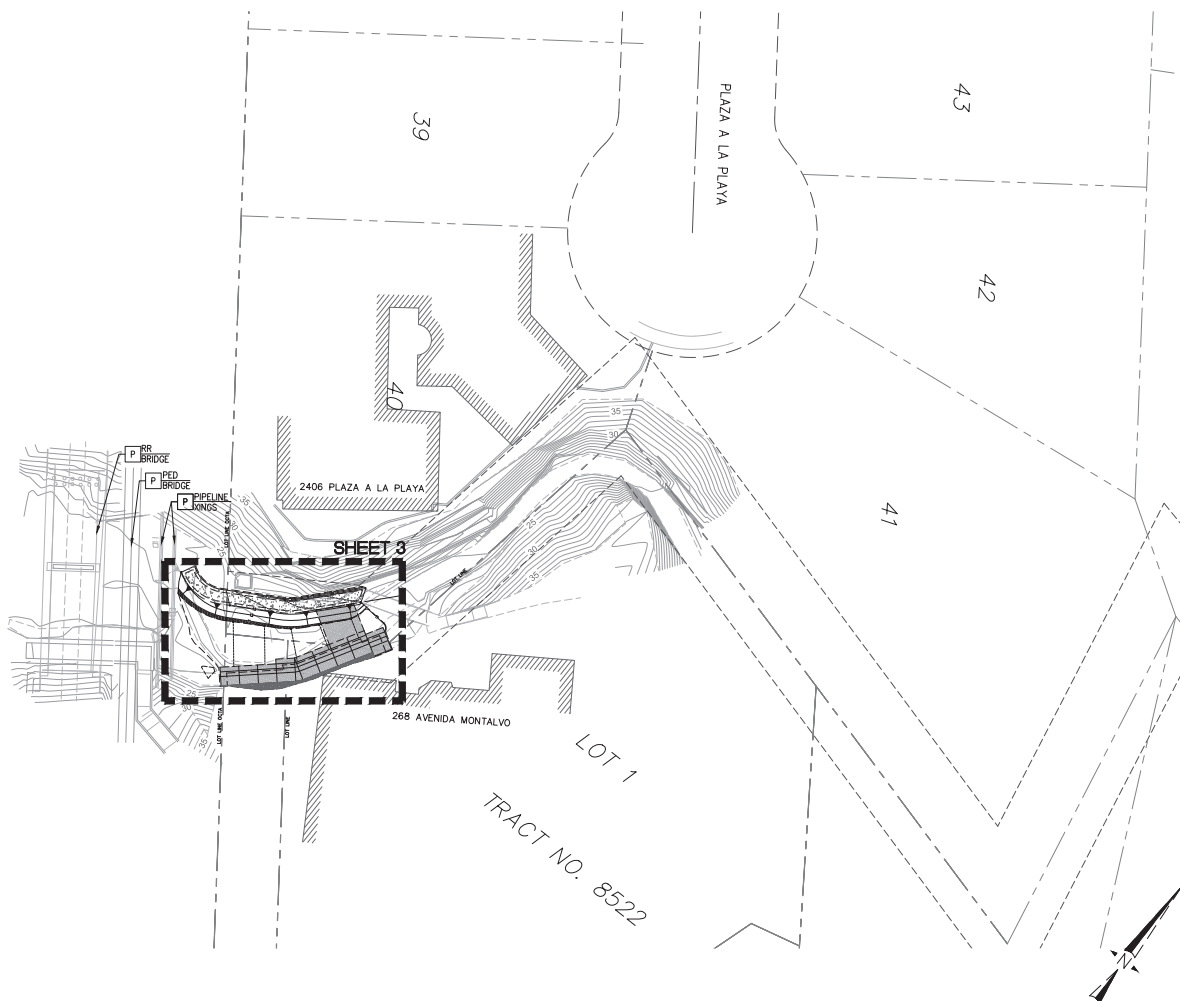
PLANS PREPARED UNDER THE DIRECTION OF:	DATE
[Signature]	12/16/20
ROGER T. CHUNG 065388 PROJECT MANAGER	

DRAWN BY:	DESIGNED BY:	CHECKED BY:
DJH	DJH	DDV

APPROVED:	DATE
[Signature]	12/16/20
D.T. REBENSCHNIGER 060091 ASSISTANT CITY ENGINEER	



TITLE SHEET & GENERAL NOTES AVENIDA MONTALVO CANYON AND TRAIL IMPROVEMENT PROJECT NO. 16004	CITY OF SAN CLEMENTE
--	----------------------



CONSTRUCTION NOTES AND QUANTITIES			
NO.	DESCRIPTION	QUANTITY	UNIT
CONSTRUCTION NOTES			
1	CLEAR AND GRUB	1	LS
2	UNCLASSIFIED EXCAVATION	66.67	CY
3	EXPORT EXCESS MATERIAL OFFSITE	131.98	CY
4	STRUCTURAL EXCAVATION	65.31	CY
5	STRUCTURE BACKFILL	36	CY
6	PCC WALKWAY WITH 5-FT CUTOFF WALLS PER DETAILS ON SHEET 4	63	LF
7	CHAIN LINK FENCE (H=6) PER SSPWC STD PLAN 600-3	43	LF
8	2'X2' RC CUTOFF WALL PER PLAN AND DETAILS ON SHEET 4	70	LF
9	18" GABION LINING PER PLAN AND DETAILS ON SHEET 5 & 6	15	SY
10	GABION RETAINING WALL (H=9) PER PLAN, PROFILE, & DETAILS ON SHEETS 5 & 6	18	LF
11	GABION RETAINING WALL (H=12) PER PLAN, PROFILE, & DETAILS ON SHEETS 5 & 6	36	LF
DEMOLITION NOTES			
P	PROTECT IN PLACE (ITEM PER PLAN)	N/A	LS
21	REMOVE CHAIN LINK FENCE	25	LF

SHEET INDEX MAP
SCALE 1"=20'



REV.		DATE:	DESCRIPTION	BY:	APP'D:	Stantec 38 TECHNOLOGY, SUITE 100 IRVINE, CA 92618 949.923.6091 stantec.com		PLANS PREPARED UNDER THE DIRECTION OF: ROGER T. CHUNG CES388 PROJECT MANAGER 12/10/20 DATE		DRAWN BY: AAF DESIGNED BY: DDV CHECKED BY: DDV	(SEE SHEET 1 OF 8)	 CITY OF SAN DIEGO		SHEET INDEX & CONSTRUCTION AVENIDA MONTALVO CANYON & TRAIL IMPROVEMENT PROJECT NO. 16004
REVISIONS						PLANS PREPARED BY:		APPROVALS						

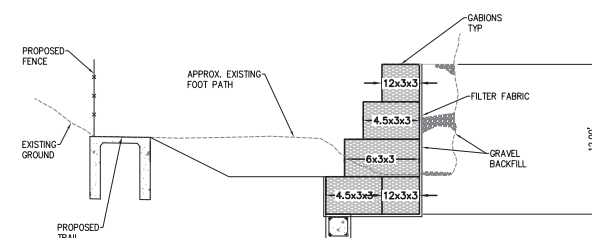
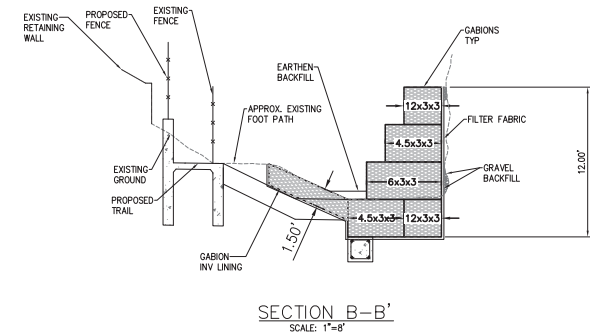
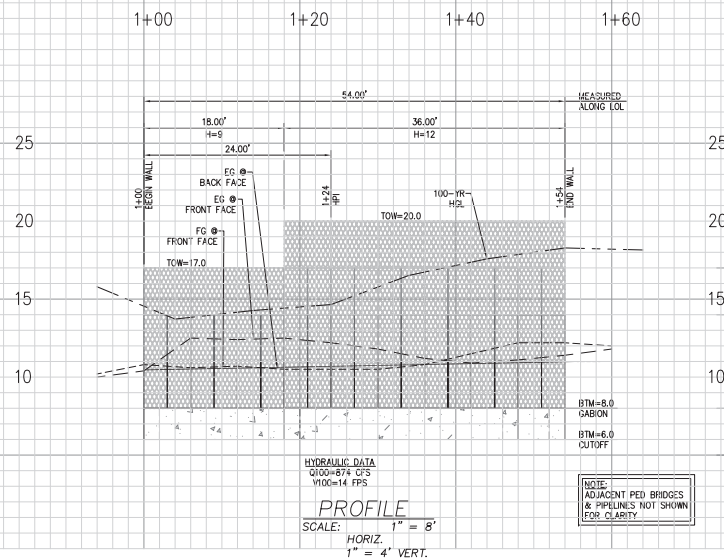
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Exhibit 2

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California Coastal
Commission



CONSTRUCTION NOTES

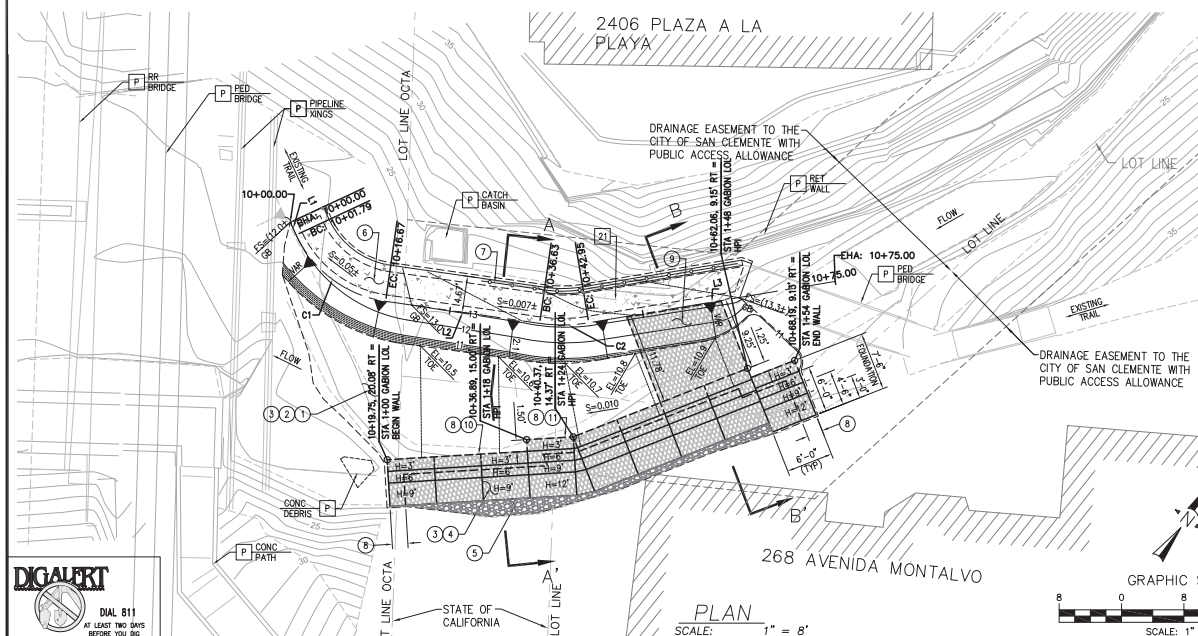
- 1 CLEAR AND GRUB
- 2 UNCLASSIFIED EXCAVATION
- 3 EXPORT EXCESS MATERIAL OFFSITE
- 4 STRUCTURAL EXCAVATION
- 5 STRUCTURE BACKFILL
- 6 RCC WALKWAY WITH 5-FT CUTOFF WALLS PER DETAILS ON SHEET 4
- 7 CHAIN LINK FENCE (H=6) PER SSPWC STD PLAN 600-3
- 8 2'X2' RC CUTOFF WALL PER PLAN AND DETAILS ON SHEET 4
- 9 18" GABION LINING PER PLAN AND DETAILS ON SHEET 5 & 6
- 10 GABION RETAINING WALL (H=9) PER PLAN, PROFILE, & DETAILS ON SHEETS 5 & 6
- 11 GABION RETAINING WALL (H=12) PER PLAN, PROFILE, & DETAILS ON SHEETS 5 & 6

DEMOLITION NOTES

- P PROTECT IN PLACE (ITEM PER PLAN)
- 21 REMOVE CHAIN LINK FENCE

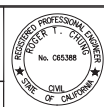
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LINE	LENGTH	BEARING
L1	1.79'	S62°38'33"E
L2	19.96'	N60°30'04"E
L3	32.05'	N42°50'41"E

CURVE DATA				
CURVE	LENGTH	RADIUS	DELTA	TANGENT
C1	14.88'	15.00'	56°51'23"	8.12'
C2	6.32'	20.50'	17°39'23"	3.18'



REV.	DATE	DESCRIPTION	BY	APP'D

Stantec
38 TECHNOLOGY, SUITE 100
IRVINE, CA 92618
949.723.6091 stantec.com



PLANS PREPARED UNDER THE DIRECTION OF:
ROGER T. CHUNG, C.E.S. 368
PROJECT MANAGER
12/10/20 DATE

DRAWN BY:
AAF
DESIGNED BY:
DDV
CHECKED BY:
DDV

(SEE SHEET 1 OF 8)

APPROVALS



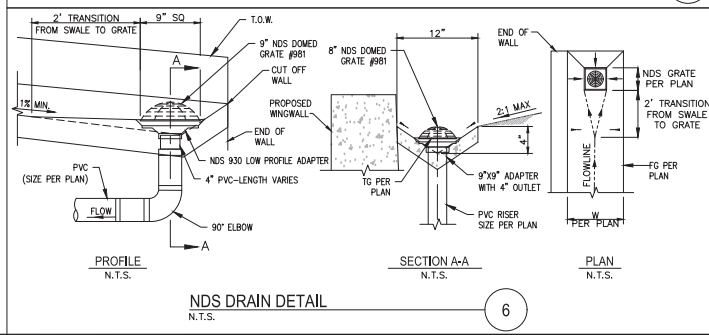
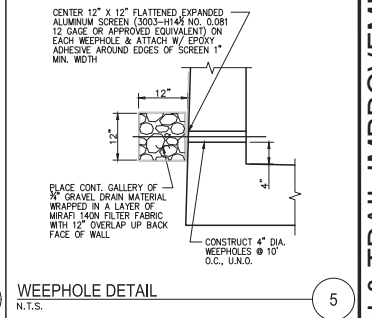
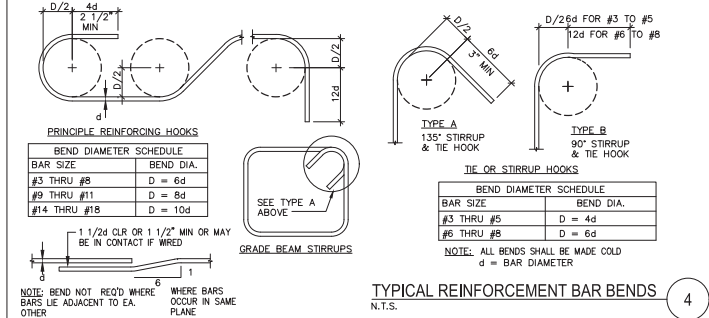
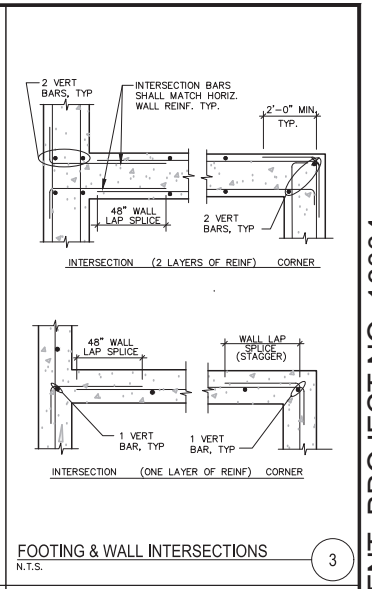
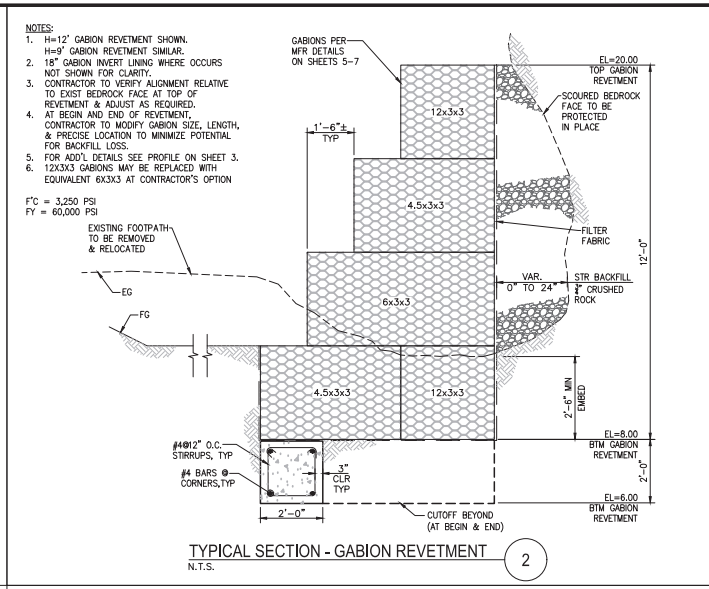
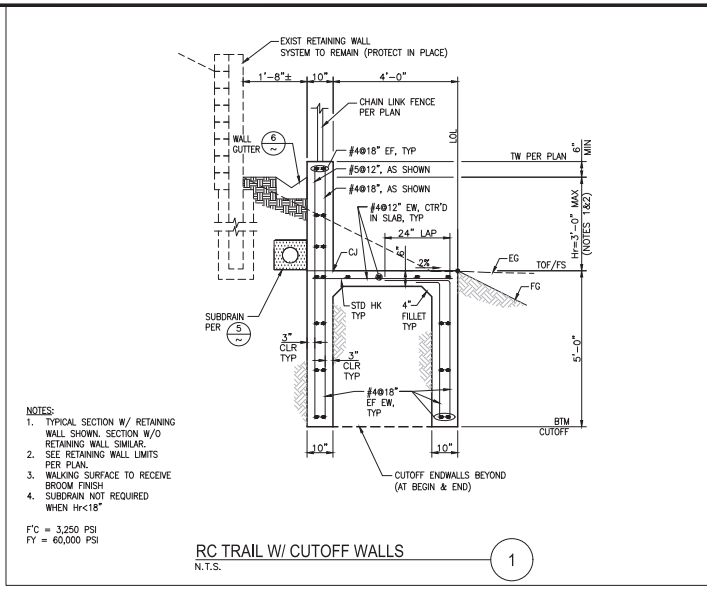
PLAN AND PROFILE
AVENIDA MONTALVO
CANYON & TRAIL IMPROVEMENT
PROJECT NO. 16004
CITY OF SAN CLEMENTE

Exhibit 2

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California Coastal
Commission



REV.	DATE	DESCRIPTION	BY	APP'D

Stantec
38 TECHNOLOGY, SUITE 100
IRVINE, CA 92618
949.923.6091 stantec.com



PLANS PREPARED UNDER THE DIRECTION OF:
ROGER T. CHUNG CESS386
PROJECT MANAGER
12/10/20
DATE

DRAWN BY:
AAF
DESIGNED BY:
DDV
CHECKED BY:
DDV

(SEE SHEET 1 OF 8)
APPROVALS



CONSTRUCTION DE
AVENIDA MONTALVO
CANYON & TRAIL IMPROVEMENT
PROJECT NO. 16004
CITY OF SAN DIEGO

Exhibit 2
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California Coastal Commission

INSTALLATION NOTES FOR MACCAFERRI GALMAC® & PVC COATED GABION STRUCTURES

1. PRODUCT DESCRIPTION

- GALMAC® & PVC GABIONS ARE BASKETS MANUFACTURED FROM 8X10 DOUBLE TWISTED HEXAGONAL WOVEN STEEL WIRE MESH. HEAVILY GALMAC® COATED THEN PVC COATED, AS PER ASTM A975 (FIGS 1-4). GABIONS ARE FILLED WITH STONES AT THE PROJECT SITE TO FORM FLEXIBLE, PERMEABLE, MONOLITHIC STRUCTURES SUCH AS RETAINING WALLS, CHANNEL LININGS, AND WEIRS FOR EROSION CONTROL. PROJECTS. THE STEEL WIRE USED IN THE MANUFACTURE OF THE GABION IS HEAVILY GALMAC® COATED SOFT TEMPER STEEL. THE STANDARD SPECIFICATIONS FOR MESH-WIRE ARE SHOWN IN TABLE 2. THE GABION IS DIVIDED INTO CELLS BY DIAPHRAGMS POSITIONED AT APPROXIMATELY 3R (0.9m) CENTERS (FIG 2). TO REINFORCE THE STRUCTURE, ALL MESH PANEL EDGES ARE SELVEDGED WITH A WIRE HAVING A GREATER DIAMETER (TABLE 3). DIMENSIONS AND SIZES OF GALMAC® & PVC COATED GABIONS ARE SHOWN IN TABLE 1. GABIONS SHALL BE MANUFACTURED AND SHIPPED WITH ALL COMPONENTS MECHANICALLY CONNECTED AT THE PRODUCTION FACILITY.

2. MATERIALS

- BACKFILL MATERIAL SPECIFIED BELOW SHALL BE FREE DRAINING. BACKFILL MATERIALS SHALL BE APPROVED BY THE OWNER OR OWNER'S REPRESENTATIVE, AND SHALL MEET THE PHYSICAL PROPERTIES REQUIREMENTS DEFINED IN SECTION 7.1. AND SHALL BE CLEAN, FREE DRAINING CRUSHED STONE.
- COBBLES MATERIAL SHALL BE A CLEAN CRUSHED STONE OR GRANULAR FILL MEETING THE FOLLOWING GRADATION PER ASTM D422:

Sieve Size	Percent Passing
8"	100%
4"	0 to 5%

- GABION WALL UNITS SHALL BE GALMAC® & PVC COATED 8x10 HEXAGONAL DOUBLE TWIST WIRE MESH TYPE AS PER ASTM A975.

L=Length ft (m)	W=Width ft (m)	H=Height ft (m)	# of Cells
6 (1.8)	3 (0.9)	3 (0.9)	2
9 (2.7)	3 (0.9)	3 (0.9)	3
12 (3.6)	3 (0.9)	3 (0.9)	4
6 (1.8)	3 (0.9)	1.5 (0.45)	2
9 (2.7)	3 (0.9)	1.5 (0.45)	3
12 (3.6)	3 (0.9)	1.5 (0.45)	4
6 (1.8)	3 (0.9)	1 (0.3)	2
9 (2.7)	3 (0.9)	1 (0.3)	3
12 (3.6)	3 (0.9)	1 (0.3)	4
4.5 (1.4)	3 (0.9)	3 (0.9)	1

Mesh Type	"D" in (mm)	Tolerance	Wire Dia. in (mm)
8x10 GalMac® + PVC	3.25 (83)	±10%	0.106 (2.70) 0.146 (3.70)

	Lacing Wire	Mesh Wire	Selvedge Wire / Preformed Stiffeners
Wire Diameter Int. Ø in (mm)	0.087 (2.20)	0.106 (2.70)	0.134 (3.4)
Wire Tolerance (±) in (mm)	0.004 (0.10)	0.004 (0.10)	0.004 (0.10)
Min. GalMac® Qty. coil/ft (gm²)	0.70 (214)	0.80 (244)	0.85 (259)
Wire + PVC Ext. Ø in (mm)	0.127 (3.20)	0.146 (3.70)	0.174 (4.4)

- WIRE – ALL TESTS ON WIRE MUST BE PERFORMED PRIOR TO MANUFACTURING THE MESH. ALL WIRE SHALL COMPLY WITH ASTM A975. WIRE USED FOR THE MANUFACTURE OF GABIONS AND THE LACING WIRE, SHALL HAVE A MAXIMUM TENSILE STRENGTH OF 75,000psi (515MPa) AS PER ASTM A856/A856M, SOFT TEMPER STEEL.
- WOVEN WIRE MESH TYPE 8X10 – THE MESH AND WIRE CHARACTERISTICS SHALL BE IN ACCORDANCE WITH ASTM A975 TABLE 1. THE MESH TYPE 8X10, THE NOMINAL MESH OPENING D = 3.25in (83mm) (FIG 1) IS A 1:1. THE MINIMUM MESH PROPERTIES FOR STRENGTH AND FLEXIBILITY SHALL BE IN ACCORDANCE WITH THE FOLLOWING: MESH TENSILE STRENGTH SHALL BE 2900lb/r (43.3kN/m) MINIMUM WHEN TESTED IN ACCORDANCE WITH ASTM A975 SECTION 13.1.1. PUNCH TEST RESISTANCE SHALL BE A MINIMUM OF 5300lb (23.6kN) WHEN TESTED IN COMPLIANCE WITH ASTM A975 SECTION 13.1.4. CONNECTION TO SELVEDGES SHALL BE 1200lb/r (17.5kN/m) WHEN TESTED IN ACCORDANCE WITH ASTM A975.

3. FOUNDATION PREPARATION

- THE FOUNDATION ON WHICH THE GABIONS ARE TO BE PLACED SHALL BE LEVEL, AND GRADED TO THE ELEVATIONS AS SHOWN ON THE PROJECT CONSTRUCTION DRAWINGS. THE FOUNDATION FOR GABIONS SHALL BE LEVEL, SMOOTH, AND FREE OF SURFACE IRREGULARITIES. LOOSE MATERIAL, AND VEGETATION, IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS. APPROPRIATE MEASURES SHALL BE TAKEN FOR FILTERING AND DRAINAGE OF THE FOUNDATION, AS PER THE PROJECT SPECIFICATIONS (FILTER CLOTH, DRAIN WORKS, ETC.). GEOTEXTILES REQUIRED TO BE INSTALLED BEHIND GABION STRUCTURES SHALL COMPLY WITH THE REQUIREMENTS FOR SUBSURFACE DRAINAGE APPLICATIONS.

4. CONSTRUCTION

- ASSEMBLY – OPEN AND UNFOLD EACH GABION ON A FLAT, HARD SURFACE AND REMOVE ANY SHIPPING FOLDS IF NECESSARY. THIS CAN BE DONE BY PLACING THE FOLD OVER A 2" X 4" BOARD AND WALKING ALONG THE SIDES, LIFT UP THE SIDES, ENDS AND DIAPHRAGMS INTO A VERTICAL POSITION TO FORM AN OPEN BOX SHAPE (FIG 3). CONNECT THE EDGES OF THE GABION AND DIAPHRAGMS BY USING EITHER LACING WIRE OR RING FASTENERS (FIG 5a & 5b) THE USE OF PLIERS TO AID ASSEMBLY AND TYING OF THE UNITS USING THE LACING WIRE SUPPLIED WITH THE GABIONS IS NORMALLY RECOMMENDED.
- FASTENING PROCEDURE – WHEN USING LACING WIRE, CUT OFF A PIECE OF WIRE APPROXIMATELY 1.5 TIMES THE LENGTH OF THE EDGE TO BE TIED. LONGER EDGES SHALL BE JOINED BY SEVERAL LENGTHS OF WIRE. THE WIRES SHALL BE SECURED AROUND THE SELVEDGE WIRE OR HEAVIER EDGE WIRE, WHERE PRESENT, BY LOOPING AND TWISTING THE LACING WIRE AROUND ITSELF. PROCEED TYING WITH ALTERNATE DOUBLE AND SINGLE LOOPS. DOUBLE LOOPS SHALL BE MADE AT INTERVALS NOT GREATER THAN 6in (150 mm). FULL BASKETS TIGHTLY TOGETHER DURING THE TYING OPERATION, THE OTHER END OF THE WIRE SHALL BE SECURED BY AGAIN LOOPING AND TWISTING THE WIRE AROUND ITSELF. WHEN STEEL RING FASTENERS ARE USED, THE USE OF EITHER A MECHANICAL OR A PNEUMATIC FASTENING TOOL IS REQUIRED. SPACING OF THE RINGS SHALL BE IN ACCORDANCE WITH ASTM A975, TABLE 2 Minimum Strength Requirements of Mesh and Connectors. IN ANY CASE, RING FASTENERS SPACING SHALL NOT EXCEED 6in (150 mm). RINGS SHALL BE INSTALLED AT THE END AND CENTER DIAPHRAGMS AND ALONG ALL EDGES. CARE SHALL BE TAKEN TO ENSURE THE STEEL RING FASTENER IS COMPLETELY CLOSED AFTER INSTALLATION.
- INSTALLATION AND FILLING – GABIONS SHALL BE CONNECTED TOGETHER AND ALIGNED BEFORE FILLING THE BASKETS WITH ROCK. ROCKS FOR GABIONS MAY BE PRODUCED BY ANY SUITABLE QUARRYING METHOD, AND BY THE USE OF ANY DEVICE THAT YIELDS THE REQUIRED SIZES WITHIN THE GRADATION LIMITS CHOSEN. ROCKS SHALL BE HARD, ANGULAR TO ROUND, DURABLE AND OF SUCH QUALITY THAT THEY SHALL NOT DISINTEGRATE ON EXPOSURE TO WATER OR WEATHERING DURING THE LIFE OF THE STRUCTURE. GABION ROCKS SHALL RANGE BETWEEN 4-8in (100-200mm). THE RANGE IN SIZES MAY ALLOW FOR A VARIATION OF 5% OVERSIZE AND/OR 5% UNDERSIZE ROCK, PROVIDED IT IS NOT PLACED ON THE GABION'S EXPOSED SURFACE. IN ALL CASES, THE OVERSIZE ROCK SHALL NOT BE LARGER THAN 10in (250mm), AND THE UNDERSIZE ROCK SHALL NOT BE SMALLER THAN 2in (50mm). DURING THE FILLING OPERATION SOME MANUAL STONE PLACEMENT IS REQUIRED TO MINIMIZE VOIDS. THE EXPOSED FACES OF VERTICAL STRUCTURES MAY BE CAREFULLY HAND PLACED TO GIVE A NEAT, FLAT, AND COMPACT APPEARANCE. THE CELLS SHALL BE FILLED IN STAGES SO THAT LOCAL DEFORMATION MAY BE AVOIDED. THAT IS, AT NO TIME, SHALL ANY CELL BE FILLED TO A DEPTH EXCEEDING 1R (300mm) HIGHER THAN THE ADJACENT CELL (FIG 14a-14c). STIFFENERS OR CROSSTIES SHALL BE INSTALLED AS INDICATED (FIGS 12a & 12b, 13a & 13b), FIXED AT 1/3 AND 2/3 OF THE HEIGHT FOR 3R OR 1m GABIONS AS THE CELL IS BEING FILLED. IN 1.8R (500mm) HIGH UNITS STIFFENERS MAY BE FIXED AT THE HALF HEIGHT LEVEL. IF REQUIRED, PREFORMED CORNER STIFFENERS ARE INSTALLED AT 45° TO THE FACE/SIDE OF THE UNIT, EXTENDING AN EQUAL DISTANCE ALONG EACH SIDE BEING BRACED (APPROXIMATELY 1 ft (300 mm)). WHEN MORE THAN ONE LAYER OF GABIONS IS REQUIRED, IN ORDER FOR THE INDIVIDUAL UNITS TO BECOME INCORPORATED INTO ONE CONTINUOUS STRUCTURE, THE NEXT LAYER OF GABIONS MUST BE CONNECTED TO THE LAYER UNDERNEATH AFTER THIS LAYER HAS BEEN SECURELY CLOSED (FIG 15).
- CLOSING – TO ALLOW FOR SETTLEMENT, LEVEL OFF THE FILL 1.5-1.5in (25-40mm) ABOVE THE TOP OF THE MESH. FOLD THE LID DOWN AND PULL THE EDGES OF THE PANELS TO BE CONNECTED USING AN APPROPRIATE TOOL SUCH AS A LID CLOSER (FIG 9). THE LIDS SHALL BE TIGHTLY LACED ALONG ALL EDGES, ENDS AND DIAPHRAGMS IN THE SAME MANNER AS DESCRIBING UNITS (FIGS 6a & 6b, 10a & 10b). ADJACENT LIDS MAY BE SECURELY ATTACHED SIMULTANEOUSLY. ALL END WIRES SHALL THEN BE TURNED IN TO AVOID PROTRUSIONS.
- TESTING METHODS – TESTING METHODS AND FREQUENCY, AND VERIFICATION OF MATERIAL SPECIFICATIONS AND COMPACTION SHALL BE THE RESPONSIBILITY OF THE OWNER'S GEOTECHNICAL ENGINEER, UNDER THE DIRECTION OF THE OWNER. THE SHEAR STRENGTH TESTING OF REINFORCED BACKFILL SHALL BE REQUIRED FOR EVERY 1000sq PLACED OR IF THE NATURE OF BACKFILL SOIL VISUALLY CHANGES.

5. TECHNICAL REQUIREMENTS

- THE CONTRACTOR SHALL HAVE AN APPROVED SET OF CONSTRUCTION DRAWINGS AND CONTRACT SPECIFICATIONS ON-SITE AT ALL TIMES DURING CONSTRUCTION OF THE GABION WALL STRUCTURE.
- GABION SHALL BE PLACED AT THE LOCATIONS AND ELEVATIONS SHOWN ON THE PROJECT DRAWING SHEETS.
- TRACKED CONSTRUCTION EQUIPMENT SHALL NOT BE OPERATED DIRECTLY ON THE GABION WALL. A MINIMUM FILL THICKNESS OF 6in (150mm) IS REQUIRED FOR OPERATION OF TRACKED VEHICLES OVER THE GABION WALL. TURNING OF TRACKED VEHICLES SHALL BE KEPT TO A MINIMUM TO PREVENT DISPLACING THE FILL AND/OR THE GABION WALL.
- DRAINAGE
 - THE BACKFILL SURFACE SHALL BE GRADED AWAY FROM THE WALL FACE A MINIMUM OF 2 PERCENT SLOPE AND A TEMPORARY SOIL BERM SHALL BE CONSTRUCTED NEAR THE WALL CREST TO PREVENT SURFACE AND WATER RUNOFF FROM OVERTOPPING THE WALL. GRADING SHALL BE PERFORMED AT THE END OF EACH WORK DAY.
 - AT THE END OF EACH WORK DAY, BACKFILL SURFACE SHALL BE COMPACTED WITH A SMOOTH WHEEL ROLLER TO MINIMIZE PONDING OF WATER AND SATURATION OF THE BACKFILL.
 - THE ENGINEERING, DESIGN ANALYSIS, DETAILING AND MITIGATION OF BOTH SURFACE DRAINAGE AND SEEPAGE OF GROUNDWATER SHALL BE THE RESPONSIBILITY OF THE OWNER OR THE OWNER'S REPRESENTATIVE.
 - PERMANENT SURFACE WATER DIVERSION AND/OR COLLECTION SHALL BE AS REQUIRED AND PROVIDED BY THE OWNER OR OWNER'S REPRESENTATIVE.

7. DESIGN PARAMETERS

- DESIGN OF THE GABION WALL STRUCTURE IS BASED ON THE FOLLOWING ASSUMED SOIL PARAMETERS:

	EFFECTIVE FRICTION ANGLE	EFFECTIVE COHESION	MOIST UNIT WEIGHT
BACKFILL SOIL	--- DEGREES	---	--- pcf (--- kN/m3)
RETAINED SOIL	--- DEGREES	---	--- pcf (--- kN/m3)
FOUNDATION SOIL	--- DEGREES	---	--- pcf (--- kN/m3)

- MINIMUM REQUIRED FACTOR OF SAFETY (FS):

- WALL CHECKS

SLIDING	1.5
INTERNAL STABILITY	1.5
OVERTURNING	1.5
BEARING CAPACITY	2.0

- EXTERNAL STABILITY

GLOBAL STABILITY	1.3
------------------	-----

- TRAFFIC SURCHARGE = 250 psf

- GROUND WATER TABLE – GROUNDWATER/PHEATIC SURFACES NOT CONSIDERED IN WALL DESIGN. WATER SURFACE ASSUMED TO BE SUFFICIENTLY BELOW BOTTOM OF WALL AS NOT TO INFLUENCE INTERNAL AND EXTERNAL STABILITY.

- SEISMIC LOADING = NONE

8. SPECIAL PROVISIONS

- THE DESIGN PRESENTED HERE IN IS BASED ON SOIL PARAMETERS, FOUNDATION CONDITIONS, GROUNDWATER CONDITION, AND LOADING STATED IN SECTION 7.0 AND SHALL BE VERIFIED BY THE OWNER OR OWNER'S REPRESENTATIVE.
- WALL ELEVATION VIEWS AND LOCATIONS AND GEOMETRY OF EXISTING STRUCTURES AND GRADE ABOVE AND BELOW THE WALLS MUST BE VERIFIED BY THE OWNER OR OWNER'S REPRESENTATIVE PRIOR TO CONSTRUCTION.
- MACCAFERRI, INC. ASSUMES NO LIABILITY FOR INTERPRETATION OR VERIFICATION OF SUBSURFACE CONDITIONS, SUITABILITY OF SOIL DESIGN PARAMETERS AND INTERPRETATION OF SUBSURFACE GROUNDWATER CONDITIONS.
- THE OWNER OR OWNER'S REPRESENTATIVE IS RESPONSIBLE FOR REVIEWING AND VERIFYING THAT THE ACTUAL SITE CONDITIONS ARE AS DESCRIBED IN SECTION 7.0 PRIOR TO AND DURING CONSTRUCTION. THE OWNER OR OWNER'S REPRESENTATIVE SHALL BE ON-SITE TO ASSURE THE PROVISIONS IN THE CONSTRUCTION NOTES ARE FOLLOWED.
- IF ANY ROCK FORMATIONS AND/OR GROUNDWATER ARE ENCOUNTERED DURING CONSTRUCTION OF THIS WALL, IMMEDIATELY CONTACT THE OWNER OR OWNER'S REPRESENTATIVE.
- ANY REVISIONS TO DESIGN PARAMETERS STATED IN SECTION 7.0 OR STRUCTURE GEOMETRY SHALL REQUIRE DESIGN MODIFICATIONS PRIOR TO PROCEEDING WITH CONSTRUCTION.



REV.	DATE:	DESCRIPTION	BY:	APP'D:
REVISIONS				



PLANS PREPARED UNDER THE DIRECTION OF:

 ROGER T. CHUNG, CESS368
 PROJECT MANAGER

DRAWN BY:
AAF
 DESIGNED BY:
DDV
 CHECKED BY:
DDV

(SEE SHEET 1 OF 8)

APPROVALS

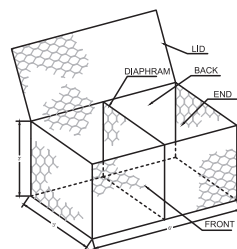
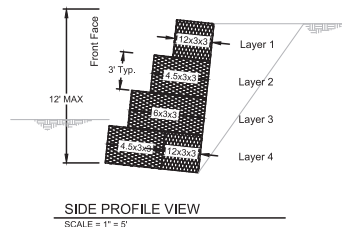
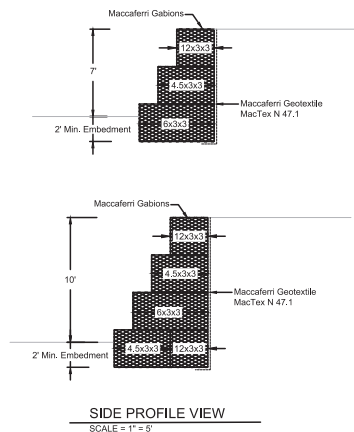


GABION DETAILS
 AVENIDA MONTALVO
 CANYON & TRAIL IMPROVEMENT
 PROJECT NO. 16004
 CITY OF SAN DIEGO

Exhibit 2
 Page 5 of 8

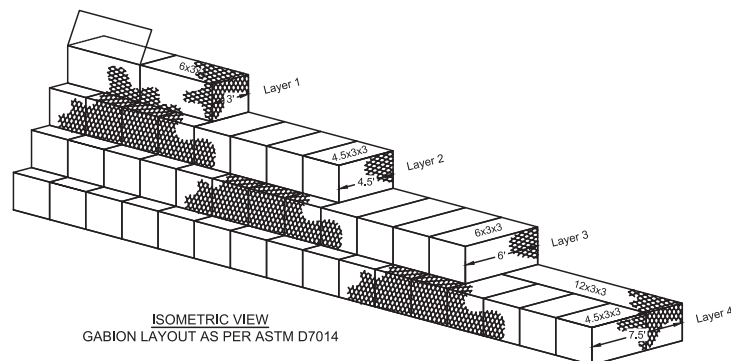


A MONTALVO CANYON & TRAIL IMPROVEMENT, PROJECT NO. 16004

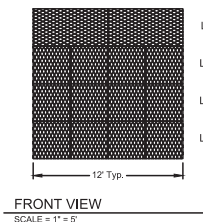


Assembled Unit
Maccaferri Gabion (6x3x3)

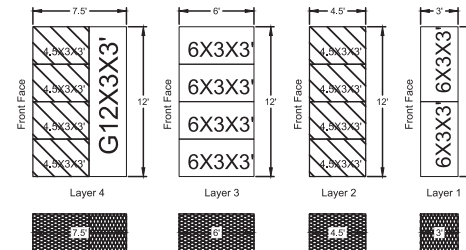
Takeoff for 54' Long Wall				
Layer #	4.5x3x3	6x3x3	9x3x3	12x3x3
1	-	2	-	2
2	12	3	-	-
3	6	12	-	-
4	12	8	-	2



ISOMETRIC VIEW
GABION LAYOUT AS PER ASTM D7014



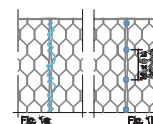
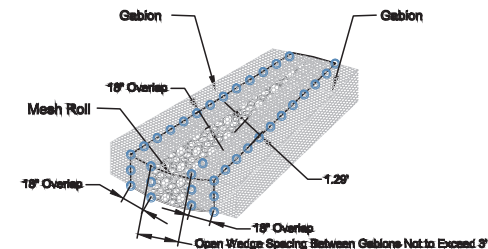
FRONT VIEW
SCALE = 1" = 5'



PLAN VIEW
SCALE = 1" = 5'

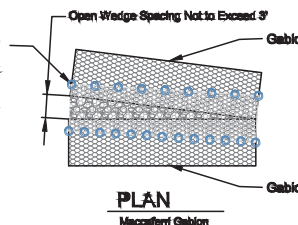
NOTES:

1. Place the Gabion Mesh Roll on bottom
2. Place the adjacent Gabions
3. Fill the gap between wedges with stone.
4. Fold the Gabion Mesh Roll panel to top so that gap is fully covered with a minimum overlap of 18".
5. Connect to the Mesh Panel roll to adjacent gabion lids using spenax rings or lacing wire while maintaining a minimum overlap of 18".



CONNECTION DETAILS

Mesh Panel to be Overlapped
Tightly Laced Using Lacing Wire
(Fig. 1a) and/or Fastened Using
Spenax Rings (See Connection
Details)



PLAN

Maccaferri Gabion

Maccaferri Inc. assumes no responsibility for the design and construction of the project. The user of this design is responsible for the design and construction of the project.				Typical Wedge Detail Maccaferri Gabions		Project		Page		MACCAFERRI	
Drawn By	AAE	Designed By	DDV	Checked By	DDV	Project No.	16004	Sheet No.	1/1	Project Name	NOT FOR CONSTRUCTION
Project No.	16004	Sheet No.	1/1	Project Name	NOT FOR CONSTRUCTION						

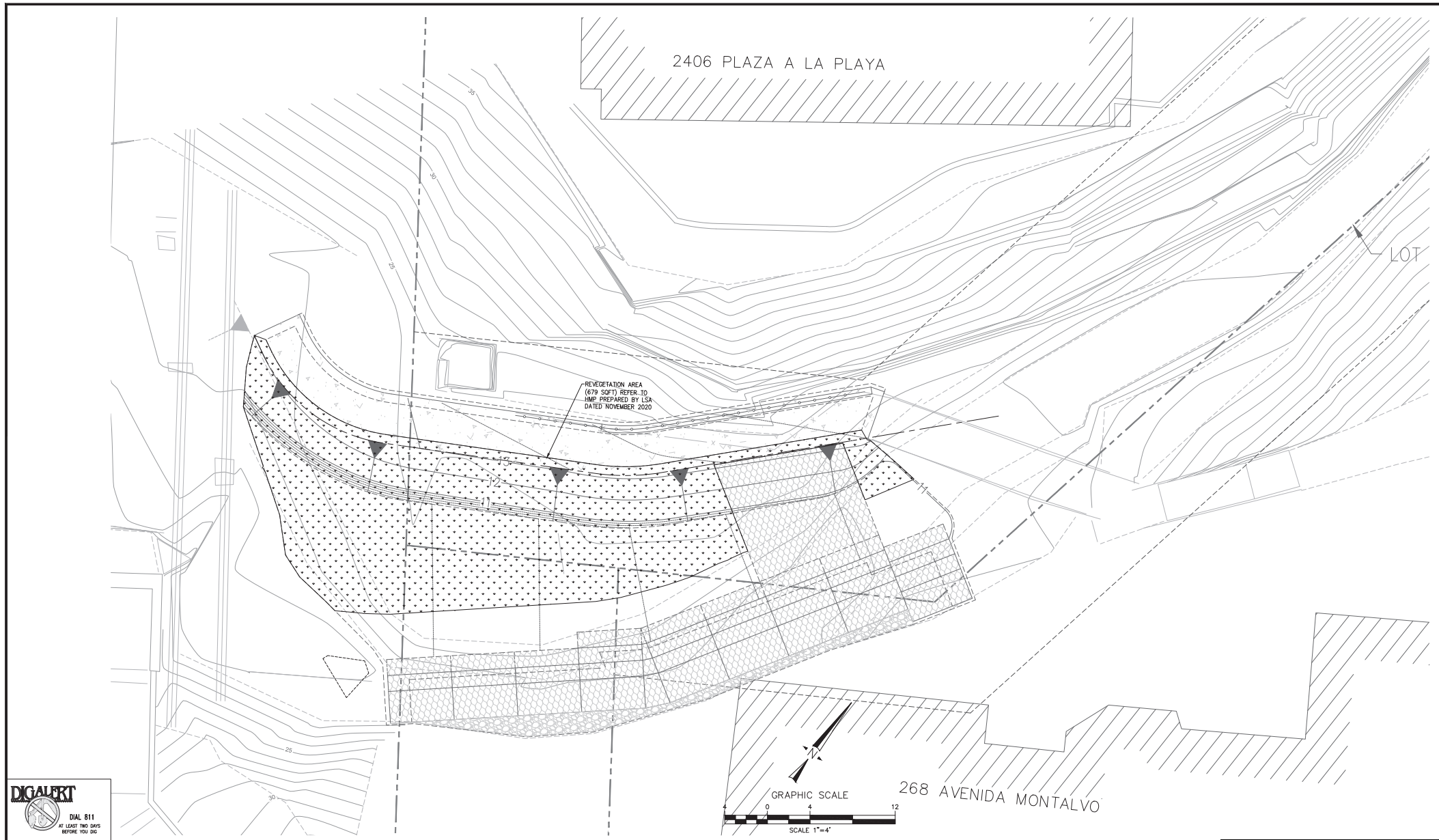


Stantec 38 TECHNOLOGY, SUITE 100 IRVINE, CA 92618 949.723.6091 stantec.com				PLANS PREPARED UNDER THE DIRECTION OF: ROGER T. OHLING CES3368 PROJECT MANAGER		DRAWN BY: AAE DESIGNED BY: DDV CHECKED BY: DDV		(SEE SHEET 1 OF 8) APPROVALS		CITY OF SAN C	
REVISIONS				PLANS PREPARED BY:		APPROVALS		APPROVALS		APPROVALS	

Exhibit 2

Page 6 of 8

California Coastal Commission



REV.	DATE:	DESCRIPTION	BY:	APP'D:
REVISIONS				

Stantec
38 TECHNOLOGY, SUITE 100
IRVINE, CA 92618
949.723.6091 stantec.com



PLANS PREPARED UNDER THE DIRECTION OF:
Roger T. Chung
ROGER T. CHUNG CES388
PROJECT MANAGER
12/10/20
DATE

DRAWN BY:
AAF
DESIGNED BY:
DDV
CHECKED BY:
DDV

(SEE SHEET 1 OF 8)
APPROVALS



REVEGETATION PL
AVENIDA MONT
CANYON & TRAIL IMP
PROJECT NO. 16004
CITY OF SAN CL

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Exhibit 2

Page 7 of 8

California Coastal Commission

UNPACKING & ASSEMBLY PROCESS

Maccaferri Gabions Are Delivered To The Job Site In Bundles. They Are Compressed And Strapped In The Factory For Easier Shipping And Handling.

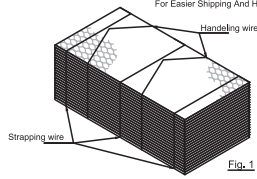


Fig. 1

1. Open And Unfold The Gabions One By One On A Flat, Hard Surface. Eliminate All Folds Due To The Packaging.

2. Pull Up The Sides And The Diaphragms To Form An Open Box. Be Sure The Top Of The Face And The Side Are At The Same Level.

3. Fold By Hand The End Of The Reinforcing Wire Of The Main Unit And The Diaphragms Allowing The Gabion To Stand By Itself.

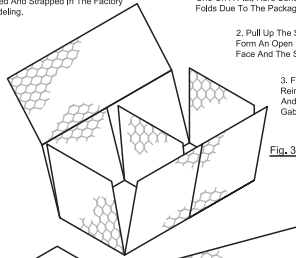


Fig. 3

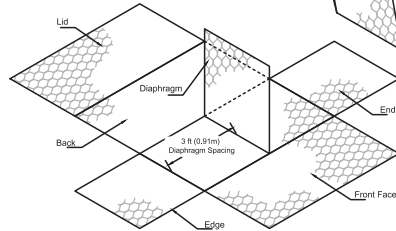


Fig. 2

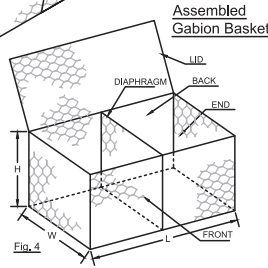


Fig. 4

Assembled Gabion Basket

REINFORCING DETAIL

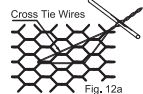


Fig. 12a

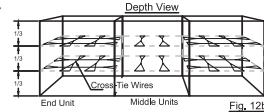


Fig. 12b

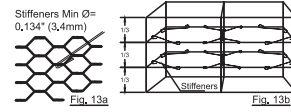


Fig. 13a

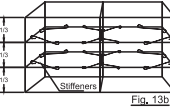
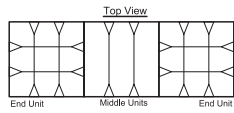
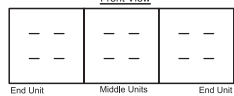


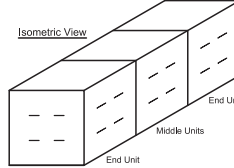
Fig. 13b



Top View



Front View



Isometric View

FILLING PROCESS

Phase 1

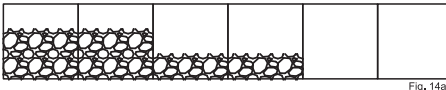


Fig. 14a

Phase 2

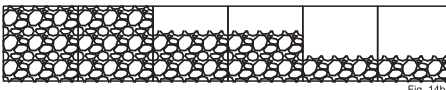


Fig. 14b

Phase 3

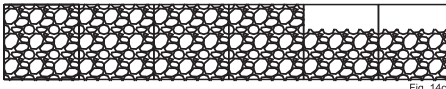
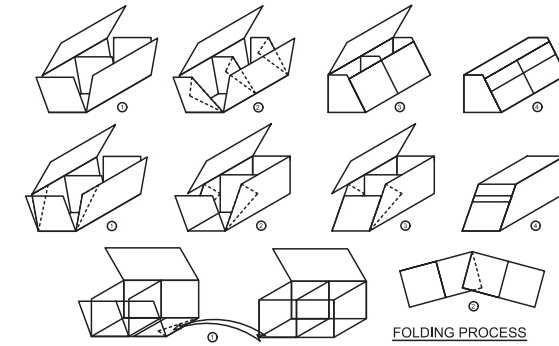


Fig. 14c



FOLDING PROCESS

CLOSING PROCESS

4. Edges Are Joined Together, Using The Appropriate Lacing Techniques. Manual: Continuous Wire Looped Tightly Around Every Other Mesh Opening, Alternating Single And Double Loops (Fig. 5a).

Mechanical: Using A Pneumatic Or Hand Power Tool, Employing Stainless Steel "C" Shaped Fasteners, For Continuity And Strength, The Recommended Spacing Is 6in, Max 150mm (Fig. 5b).

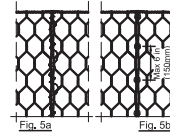


Fig. 5a

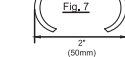


Fig. 7



Fig. 8

- 1.) Spenax Fastener $\varnothing = 2in$ (50mm) open and 3/4in (20mm) closed.
- 2.) Spenax Fastener has 170Kg/mm² Breaking Load
- 3.) Spenax Fastener Wire $\varnothing = 0.120in$ (3mm)

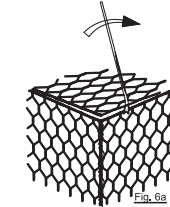


Fig. 6a

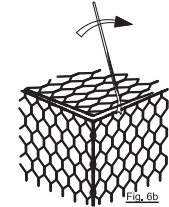


Fig. 6b

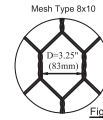


Fig. 11a

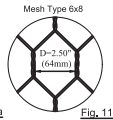


Fig. 11b

The Tolerance Of The Mesh Opening "D", (The Distance Between The Axis's Of Two Parallel Twists) Is According To ASTM A975



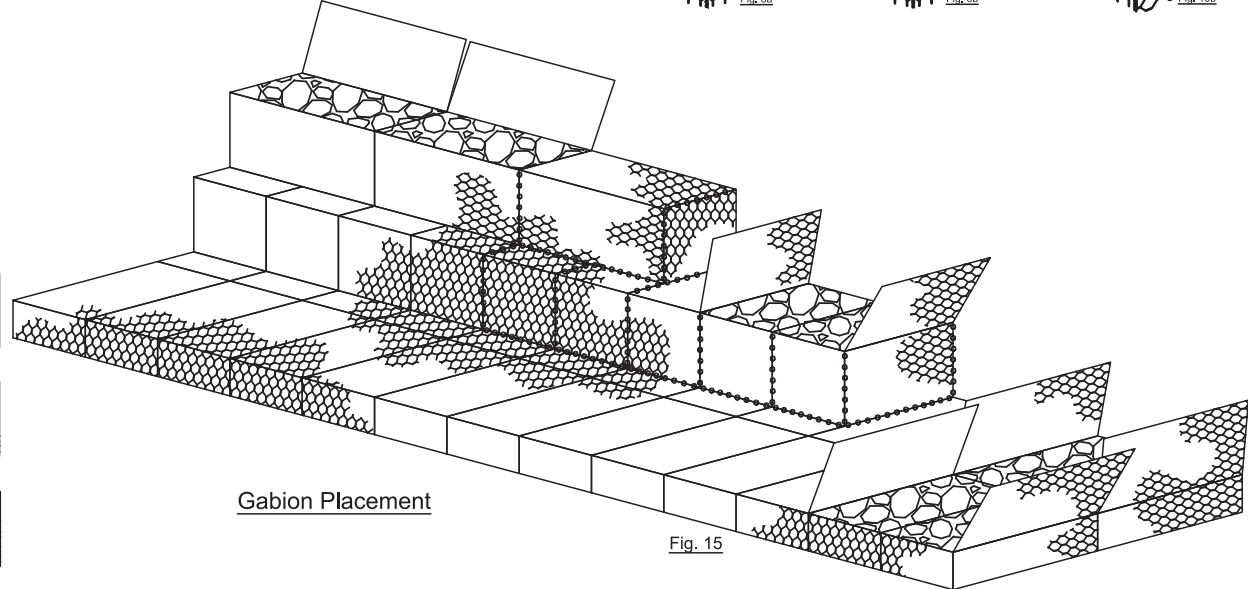
Fig. 9



Fig. 10a



Fig. 10b



Gabion Placement

Fig. 15



REV.	DATE:	DESCRIPTION	BY:	APP'D:
REVISIONS				

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PLANS PREPARED UNDER THE DIRECTION OF:
Roger T. Chung
ROGER T. CHUNG CES388
PROJECT MANAGER

12/10/20
DATE

DRAWN BY: AAF
DESIGNED BY: DDV
CHECKED BY: DDV
(SEE SHEET 1 OF 8)



GABION DETAILS
AVENIDA MONTA
CANYON & TRAIL IMP
PROJECT NO. 16004
CITY OF SAN CI

Exhibit 2
Page 8 of 8



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Project Area

Exhibit 3

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Pedestrian Access Easement

Vertical Stairway down the Bluff

**Beach Access Trail and
Railroad Underpass**

Pedestrian Bridge Crossing the Channel

Exhibit 4

Page 2 of 2



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Exhibit 5

Page 1 of 2



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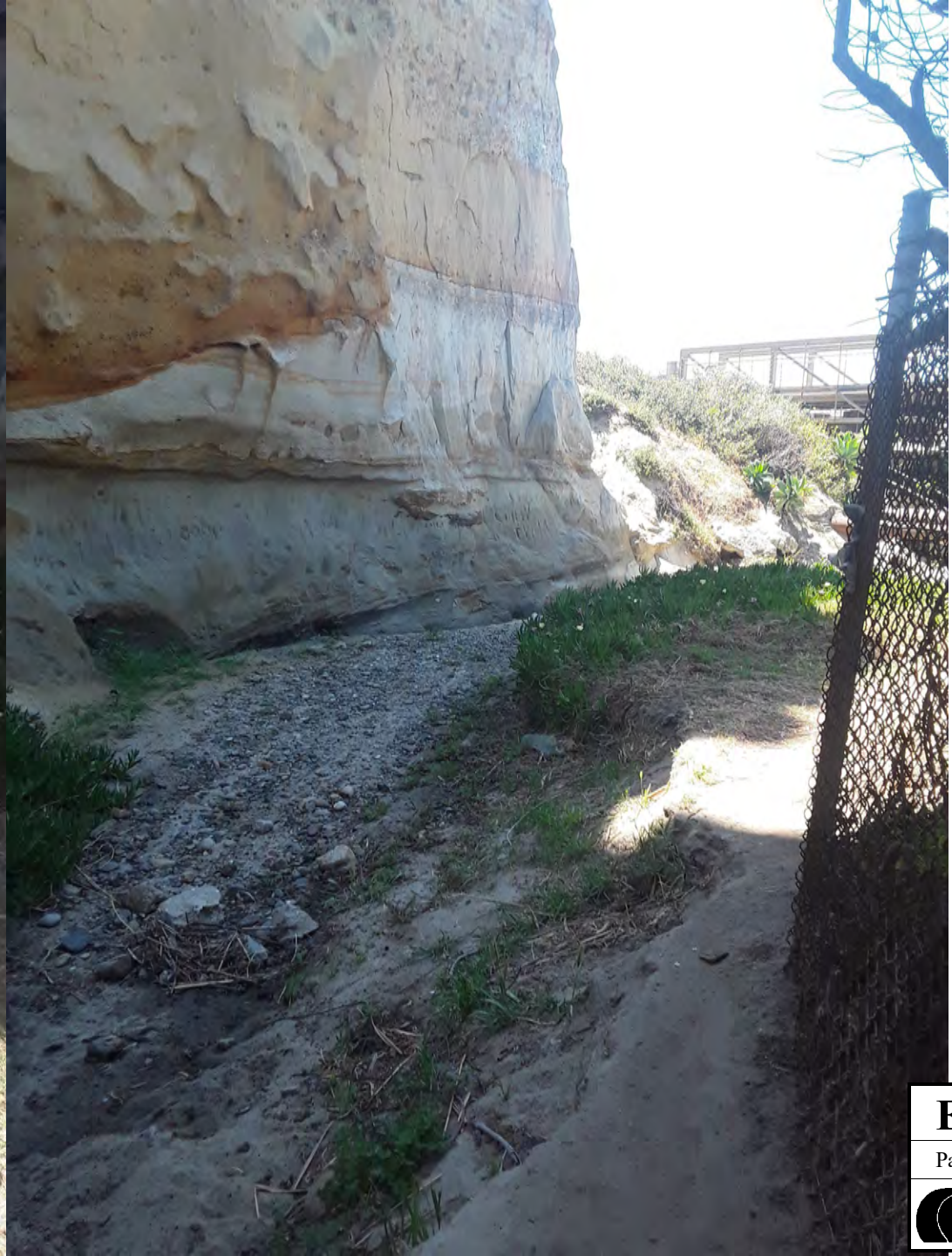


Exhibit 5

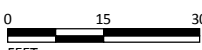


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LEGEND

















 Project Area (0.04 acre)	 Revegetation Area (0.135 ac)	 Developed (0.06 ac)
 Ingress Egress Area	 Low Flow Area	 Drainage (0.05 ac)
 Existing USACE & CDFW Jurisdictional Area (0.02 acre)	 Proposed Trail	 Native (0.29 ac)
 Proposed Realigned Streambed (0.02 acre)	 Easement From Client	 Nonnative Ornamental (0.28 ac)
 Proposed Placement of Gabions (0.01 acre)	Land Cover	 Too Steep to Access (0.02 ac)
	 Bare Ground (0.01 ac)	<i>Montalvo Canyon</i>

FIGURE 2

	Exhibit 7
Page 1 of 1	
California Coastal Commission	

August 19, 2021

Mr. Amir K. Ilkhanipour, P.E.
Senior Civil Engineer
City of San Clemente – PW Engineering
910 Calle Negocio, Suite 100
San Clemente, CA 92673

Subject: Alternatives Analysis for the Montalvo Canyon Erosion Repair Project

Dear Amir,

The proposed Montalvo Canyon Erosion Repair Project (Project) is located in the City of San Clemente (City) downstream of the Montalvo Canyon Storm Drain pipe outlet and just upstream from the Pacific Ocean. Figure 1 shows the location of the Project.

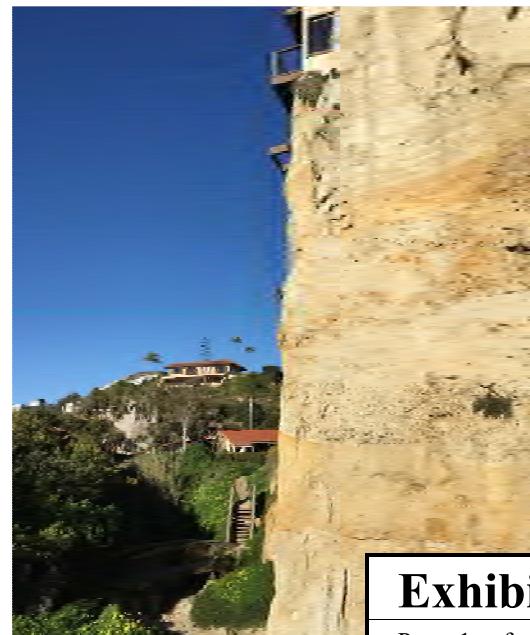
The Project area can be accessed from the public beach by crossing under existing railroad and pedestrian bridges. Access can also be obtained by means of an existing public beach access trail that descends from Avenida Lobeiro along a 70-foot high, near-vertical sandstone bluff. The bluff is among the tallest unprotected bluffs in City and is typical of those situated along the coast of Southern California.

Access to the beach at this location serves an integral part of the City's Federal Railroad Administration's (FRA) Safety Quiet Zone Permit. The permit requires the City to maintain certain beach access points that pass over or below the existing railroad tracks, which improves the safety of pedestrians seeking to access the beach.

Currently, the earthen storm water channel that is located downstream of the storm drain outlet is eroding the face of the adjacent near-vertical bluff. Photograph 1 shows a picture of the bluff erosion and Photograph 2 shows the relative height of the bluff.



Photograph 1: Bluff Erosion and Overhang



Photograph 2: Bluff Height

The persistent erosion is cause for great concern by City staff in that it is undermining the stability of the bluff. Given that the public routinely uses the beach access trail as shown in Photograph 3, the possibility exists that a bluff failure will cause injury or loss of life. The existing canyon is shown in plan view on Figure 2 and in section view on Figure 3.

The threat to the public is exemplified by several events that have occurred in the recent past. These examples include the following:

- February 6, 2020: A moderate landslide of the Montalvo Canyon bluff occurred and temporarily blocked the safe passage of pedestrians along the existing beach access trail. Had pedestrians been adjacent to the bluff, the slide was of sufficient volume that it could have caused injury or death. Photograph 4 shows a picture of the landslide.



Photograph 3: Public on Trail



Photograph 4: February 2020 Landslide

- November 19, 2019: A bluff landslide at Mariposa Point in the City of San Clemente damaged a pedestrian bridge that forms a portion of the pedestrian trail that fronts the coastline. The trail was closed while repairs to the bridge were performed.
- August 2, 2019: The collapse of a bluff in Encino, California, down-coast from San Clemente, killed three people while they were on the beach. The bluff was configured similarly to the one in Montalvo Canyon.
- August 22, 2017: The City of Dana Point closed a portion of Coast Highway approximately 1/2 mile north of the City limits to remove debris from a bluff landslide that occurred a day earlier.
- June 8-11, 1999: In approving Coastal Development Permit No. 5-99-109 for a residential improvement, the California Coastal Commission stated, "Coastal bluffs in the City of San Clemente are composed of fractured bedding which is subject to block toppling and unconsolidated surface soils which are subject to sloughing, creep, and landsliding."

In addition to the threat to the public, a landslide of the bluff could damage two bridges that parallel the beach and cross the canyon opening. The first bridge is pedestrian bridge that forms a portion of the coastal beach trail. The second bridge supports the railroad and is part of the coastal commuter corridor that serves approximately 3 million passengers per year.

The City is also concerned that storm water within the channel, if diverted or blocked, could erode the existing beach access trail. Storm water flow routinely scours the non-bluff, northerly embankment of the channel upon which the trail is located.

Given the potential risks to public safety, public access to the beach, and the existing railroad bridge structure, the City has undertaken the development of a project to mitigate these risks. In order to ensure that the project is proper for this specific location, constraints associated with the project site have been identified. Project alternatives were then developed and assessed against the identified constraints.

PROJECT CONSTRAINTS

Multiple constraints characterize the project location. All of these constraints must be respected. As such, they limit the feasibility of otherwise plausible alternatives. The following identifies and describes each constraint.

Constraint No. 1: Public Safety

The first constraint is public safety. Project alternatives need to provide for the passage of the public along the beach access trail without the threat of being injured or killed by the continued erosion of the bluff. The safety of the beach access trail also needs to be addressed in that the erosion of the trail could encourage pedestrians to traverse unsafe trail segments created by channel erosion of the northerly embankment.

Furthermore, if the trail were to become blocked or made unusable, the terms of the City's Federal Railroad Administration's (FRA) Safety Quiet Zone Permit could be violated. The permit requires that a number of overpass or underpass crossings of the railroad be present. The loss of this particular underpass crossing would require detours to other crossing points such as the adjacent at-grade crossing at the San Clemente State Beach, which is inherently less safe.

Constraint No. 2: Confined Canyon Area

The second constraint is the highly confined canyon area. Photographs 5 and 6 shows that both canyon slopes are exceedingly steep and the canyon bottom is relatively narrow. The tops of these slopes are constrained by private properties. As a result of this confined area, the selected project



Photograph 5: Confined Canyon Looking U/S



Photograph 6: Confined Canyon Looking D/S

requires a minimal footprint to allow for the preservation or replacement of the maximum flow conveyance area possible, while also mitigating the erosion of the southerly bluff and preserving the existing coastal access trail.

Constraint No. 3: Improvement Durability

The third constraint considers the nature of the erosion to be addressed by the project. The continued erosion of the bluff represents a significant risk to the stability of the bluff, to the life and safety of the public, and to the railroad transportation corridor. Therefore, the erosion-protection solution must be durable and have an extended design life.

Constraint No. 4: Existing Cliff Stability

The fourth constraint is the questionable stability of the existing cliff face. In February 2020 evidence of instability was exhibited through a localized slide of material from the cliff face into the conveyance area. Alternatives for the project must not jeopardize or lessen the existing stability of the cliff face. In other words, the alternative must be non-invasive with respect to the existing cliff face composition.

Constraint No. 5: Existing Multiunit Residential Structure Foundation

The fifth constraint consist of the foundation of the multiunit residential structure located at the top of the bluff. The foundation consists of multiple concrete piles that extend down into the material that forms the bluff face. In places, the piles are visible where bluff material has sloughed off. Alternatives for the project must not jeopardize the support of these existing pile foundation features or cause undue interactions with the piles that could lead to their instability or failure. The collapse of the residential structure would jeopardize public safety in a manner similar to a landslide of the existing bluff.

Constraint No. 6: Natural Aesthetics

The sixth constraint consists of the natural aesthetics of the location. The site is characterized by the rock face of bluff with vegetation present along the sides of the low-flow area of the earthen channel. The channel area is comprised of a natural sandy/gravel bottom. The proposed improvements should have some natural features associated with them so that impacts to the existing aesthetic conditions can be minimized as much as practicable.

Constraint No. 7: Project Site Construction Access

The seventh constraint recognizes the project's location within a canyon area that presently prohibits vehicular access. As such, project materials need to be comprised of components that can be readily transported in small batches, preferably by human means. While bulky and/or heavy components could possibly be lowered into the canyon by crane, the movement of those components into final position would be significantly problematic, if not impossible, without large construction vehicles.

PROJECT ALTERNATIVES

Given the above-stated constraints, alternatives were considered for possible implementation. Each alternative was evaluated with respect to each of the identified constraints to determine its feasibility for implementation.

Alternative No. 0: No Project

Consideration was given to not addressing the bluff or channel erosion through the implementation of a mitigation project. This approach would preserve the existing look of the canyon area and would eliminate the need for canyon access by construction equipment and materials.

However, past landslides, such as the one that occurred in February 2020 (Photograph 4), give rise significant concern that the continued erosion of the bluff represents an ever-increasing danger to the public. There is a **precedent** for landslides to occur in the future.

Additionally, the loss of trail access by the public by either landslide or storm water erosion could jeopardize the City's Federal Railroad Administration's (FRA) Safety Quiet Zone Permit. This effect would be the result of pedestrian trail users diverting to other less safe at-grade crossings. For Montalvo Canyon, the next adjacent crossing is the at-grade crossing at the San Clemente State Beach to the south, which is inherently less safe than the Montalvo Canyon underpass crossing.

Finally, the continued erosion threatens the integrity of the existing railroad bridge responsible for the transport of nearly 3 million commuters per year.

Alternative No. 1: Natural Erosion Protection

Natural alternatives for erosion protection such as live log crib walls, root wads, and brush mattresses all require sloped surfaces or footprints that would significantly reduce conveyance area. Additionally, their biomass compositions could lead to a rapid destabilization due to reasons associated with biodegradation. Other natural solutions such as loose rock covered with soil for vegetation establishment would have the desired design life but would also require a sloped surface that would significantly reduce conveyance area and impede flow. Lastly, the movement of such materials into the project area and the placement of the materials into their final position could not be achieved without heavy construction equipment.

Alternative No. 2: Concrete Wall on Pile Foundation

A vertical concrete wall on a pile foundation would address the conveyance area constraint as well as provide for an extended design life, but would introduce issues associated with aesthetics and promote graffiti. Additionally, the limited ability to provide vehicular access to the site inhibits the construction of the pile foundation that would be needed to preserve the soft bottom of the conveyance. For example, pile reinforcement would consist of long steel cages that would could not be placed by hand or small equipment into their final vertical position.

Alternative No. 3: Concrete Wall on Spread Footing Foundation

Similar to a pile foundation, a vertical concrete wall on a spread footing foundation would address the conveyance area constraint as well as provide for an extended design life, but would also introduce issues associated with aesthetics and promote graffiti. The wall reinforcement and forms would be exceedingly heavy and could not be properly placed without heavy construction equipment. Lastly, the spread footing would extend into the conveyance area and effectively change the conveyance bottom to concrete.

Alternative No. 4: Vertical Wall with Soil Nail Tie-Backs

A wall that used soil nail tie-backs to obtain stability would address concerns over conveyance area limitations and long-term durability. Other constraints, however, could not be addressed with this alternative. Specifically, the drilling of the tie-backs into the cliff face could be detrimental to existing stability of the cliff and also adversely affect the pile foundation of the existing multiunit residential structure. Furthermore, the lengths of the tie-backs would preclude their installation in the narrow canyon area of the Project. Graffiti issues would also be a concern.

Alternative No. 5: Erodible Concrete Fill

The use of erodible concrete fill would consist of placing a concrete-slurry mixture into the existing void at the base of the cliff. The surface of the concrete could be aesthetically treated to mimic the existing surface of the cliff face. As such, aesthetics and conveyance area could be preserved. However, this alternative does not preserve the bluff's natural condition.

Additionally, the placement of the concrete-slurry material would require that a clean and suitable surface be prepared in the existing cliff material in order to promote long-term stability. In previous projects where this method has been used, the prepared surface consisted of a level bench carved out of the natural material so that the concrete-slurry could remain stable over its design life. The modification of the existing cliff material may adversely affect its internal stability and may jeopardize the continued functionality of the pile foundation of the multiunit residential structure at the top of the bluff.

Alternative No. 6: Gabion Cage Stabilization

As a means of addressing all of the constraints the presently proposed gabions solution was developed. The gabions offer a relatively long design life. The relatively steep inclination face of the gabions results in a manageable reduction in conveyance area that can be replaced by the relocation of the existing trail. The gabions themselves exhibit a stone face which mimics the gravel/sand conveyance. The tops of the exposed gabions can also be covered with soil material and planted with vegetation. The gabions are constructed with small, manageable components that are compatible with the limited access afforded the site. And with the exception of the small buried concrete cutoff wall, the balance of the gabion footprint allows for the continued infiltration of storm water into the earthen bottom of the existing conveyance. Lastly, the gabions do not interact structurally with the existing cliff face. They are independently stable.

ALTERNATIVE COMPARISON

Table 1 below lists all of the considered alternatives and the identified project constraints. For each alternative, each constraint is identified as being addressed or identified as being a hindrance to implementing the alternative.

Table 1
Summary of Alternative's Compatibility with Constraints
(Yes or No)

	Constraint						
	No. 1 Public Safety	No. 2 Confined Area	No. 3 Imp. Durability	No. 4 Cliff Stability	No. 5 Residential Foundation	No. 6 Natural Aesthetics	No. 7 Const. Access
Alt. No. 0 No Project	No	Yes	No	No	No	Yes	Yes
Alt. No. 1 Nat. Erosion Protection	Yes	No	No	Yes	Yes	Yes	No
Alt. No. 2 Wall w/Pile Foundation	Yes	Yes	Yes	Yes	Yes	No	No
Alt. No. 3 Wall w/Spread Footing	Yes	Yes	Yes	Yes	Yes	No	No
Alt. No. 4 Soil Nail Wall	No	Yes	Yes	No	No	No	No
Alt. No. 5 Erodible Concrete Fill	No	Yes	Yes	No	No	Yes	Yes
Alt. No. 6 Gabion Stabilization	Yes	Yes	Yes	Yes	Yes	Yes	Yes

PREFERRED ALTERNATIVES

A review of Table 1 shows that the only alternative that address all of the project constraints is the stabilization of the erosion by means of the gabion cages (Alternative No. 6). This alternative would rehabilitate the existing earthen channel along the bluff with a gabion armoring system and reconstruct the public trail to minimize the erosive effects of flow in the existing channel. The preferred project is shown in plan view on Figure 3 and in cross section on Figure 4.

The bottom of the excavated channel will be earthen/sand native material similar to the existing conveyance bottom. Additionally, the horizontal surfaces of the gabions can be covered with soil and vegetated to mimic the existing vegetation within the project area.

The Project would also result in biological improvements to some of the areas disturbed by construction. Presently, vegetative cover along the existing trail consists of ice plant that has invaded the canyon from adjacent residential lots. The project would result in the removal of the ice plant and its replacement with native seeding in the areas where earthen surfaces were exposed as a result of construction.

Materials used in the construction of the gabions can be brought to the project site without the need for heavy vehicles and equipment. There will be exported material from the gabion foundation, the riprap subgrade preparation, and the creation of the new soft-bottom channel area, but this material can be transported out of the canyon by human-powered means.

The proposed pedestrian beach path will be constructed of a concrete surface with cutoff walls on either side of the path extending to a depth of approximately 5 feet below grade. This configuration will provide a safe and stable pathway for pedestrians traversing the trail.

Please call me with any questions or comments.

Sincerely,

STANTEC CONSULTING SERVICES INC.

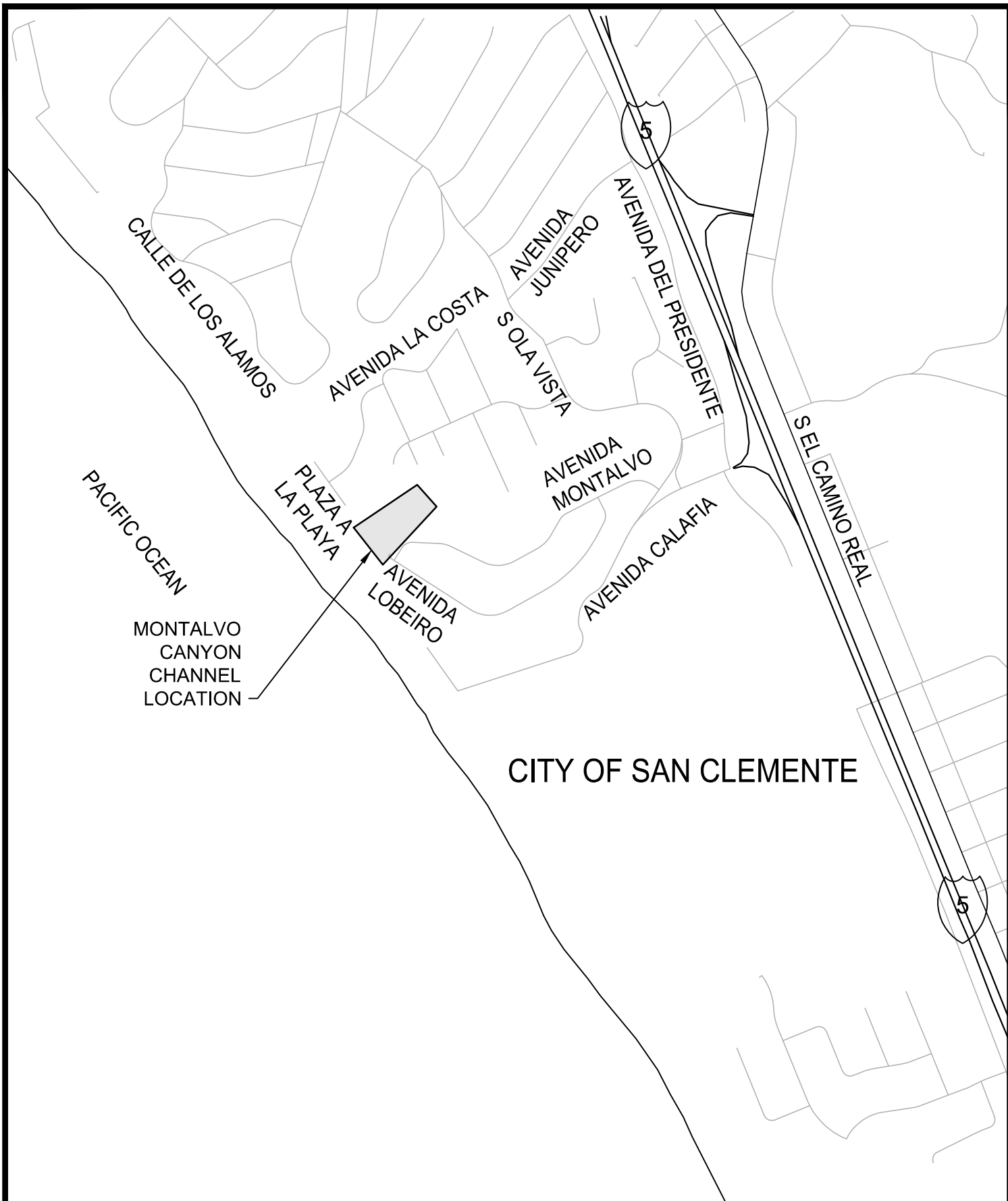


Roger Chung, PE

Phone: 949 923-6089
Roger.Chung@stantec.com

Attachments: Figure 1: Location Map
Figure 2: Existing Canyon Topography Map
Figure 3: Existing Canyon Section Views
Figure 4: Preferred Project Plan View
Figure 5: Preferred Project Section Views
Preferred Project Improvement Plans

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MONTALVO CANYON CHANNEL LOCATION MAP

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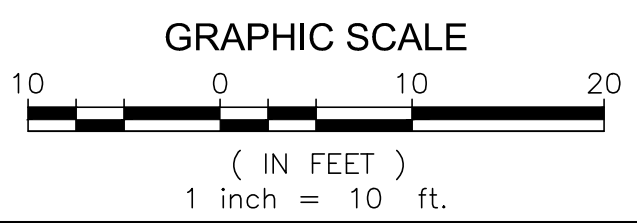
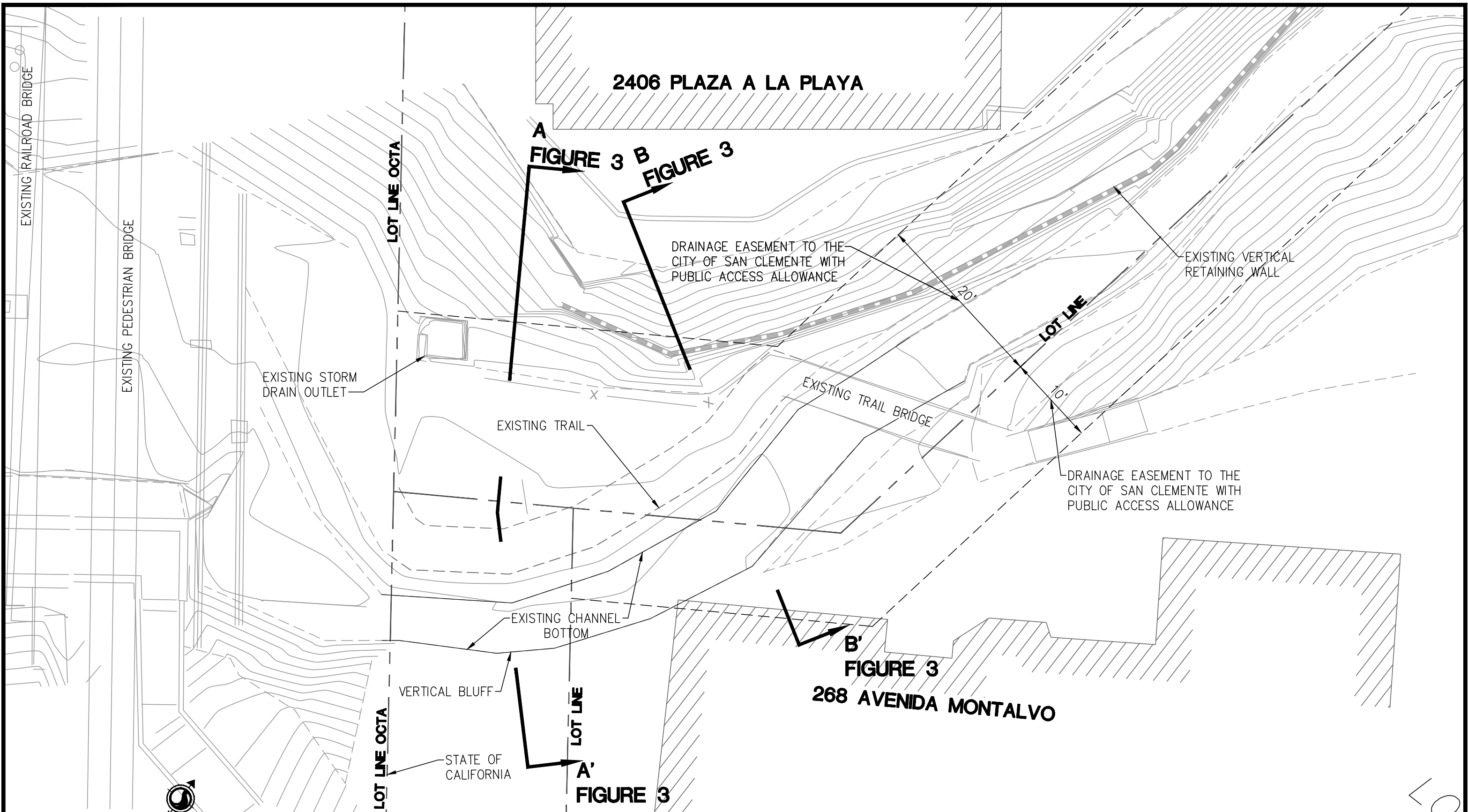
Exhibit 8

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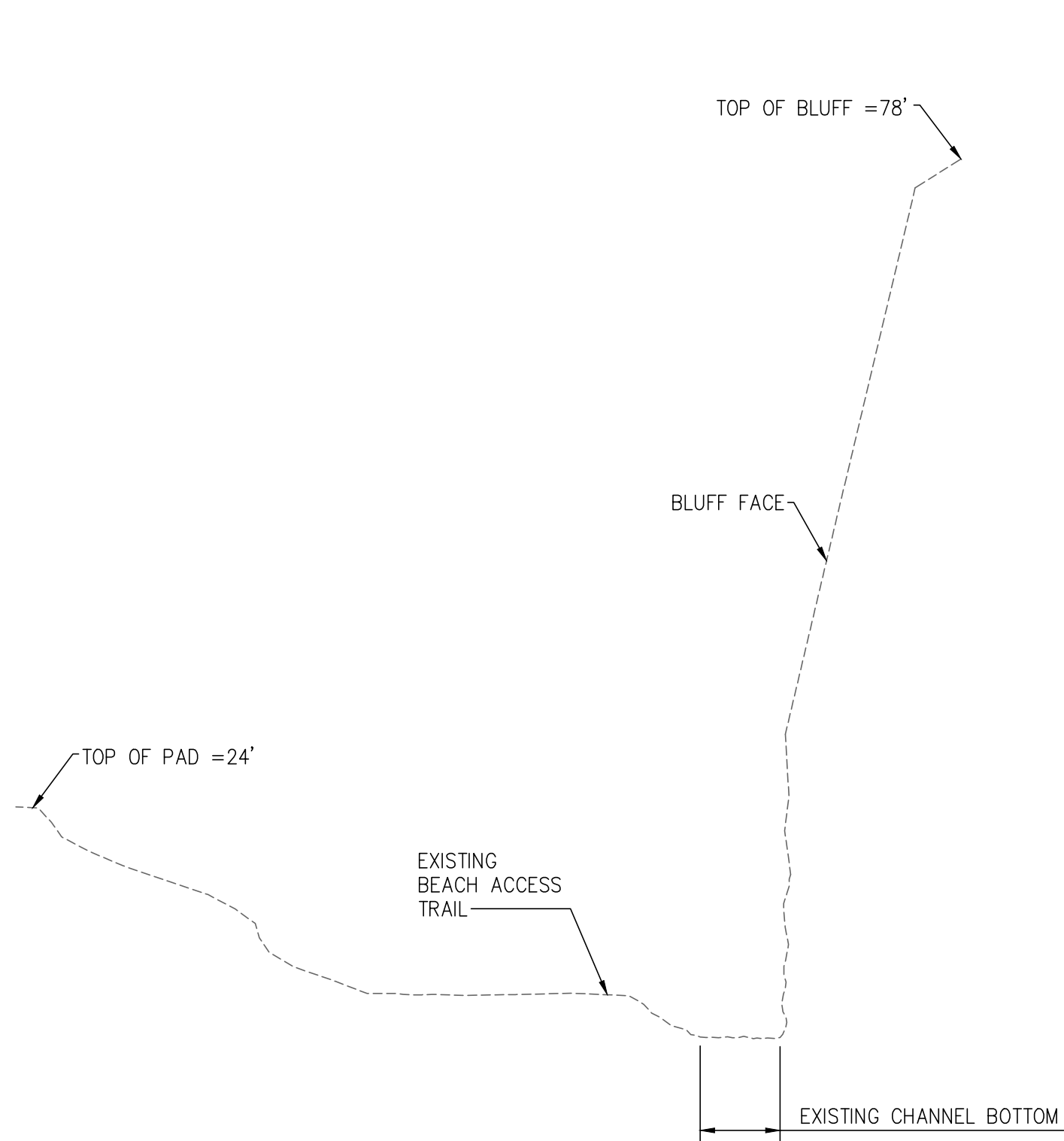
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**MONTALVO CANYON CHANNEL
EXISTING PLAN VIEW**

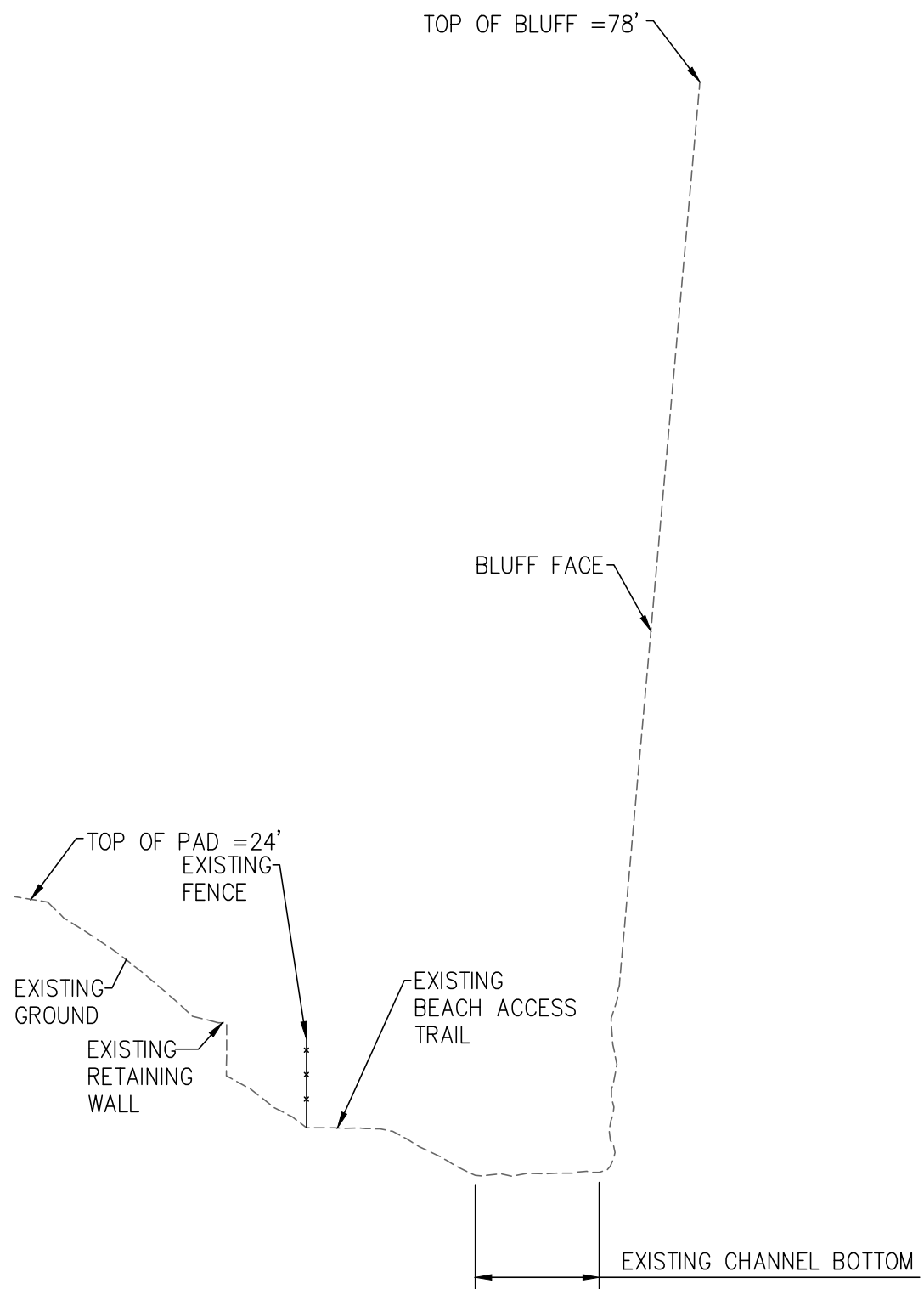
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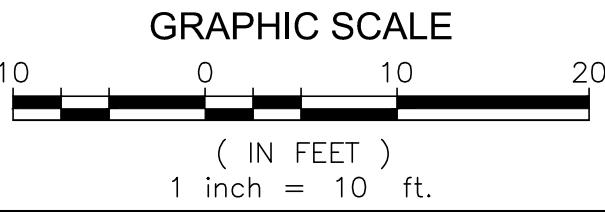
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SECTION A-A'
(FIGURE 2)



SECTION B-B'
(FIGURE 2)



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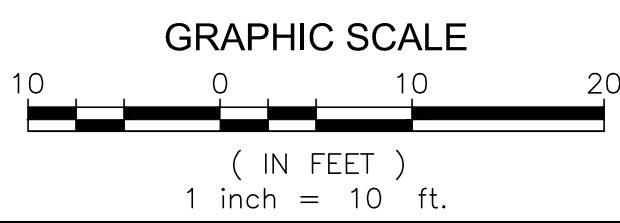
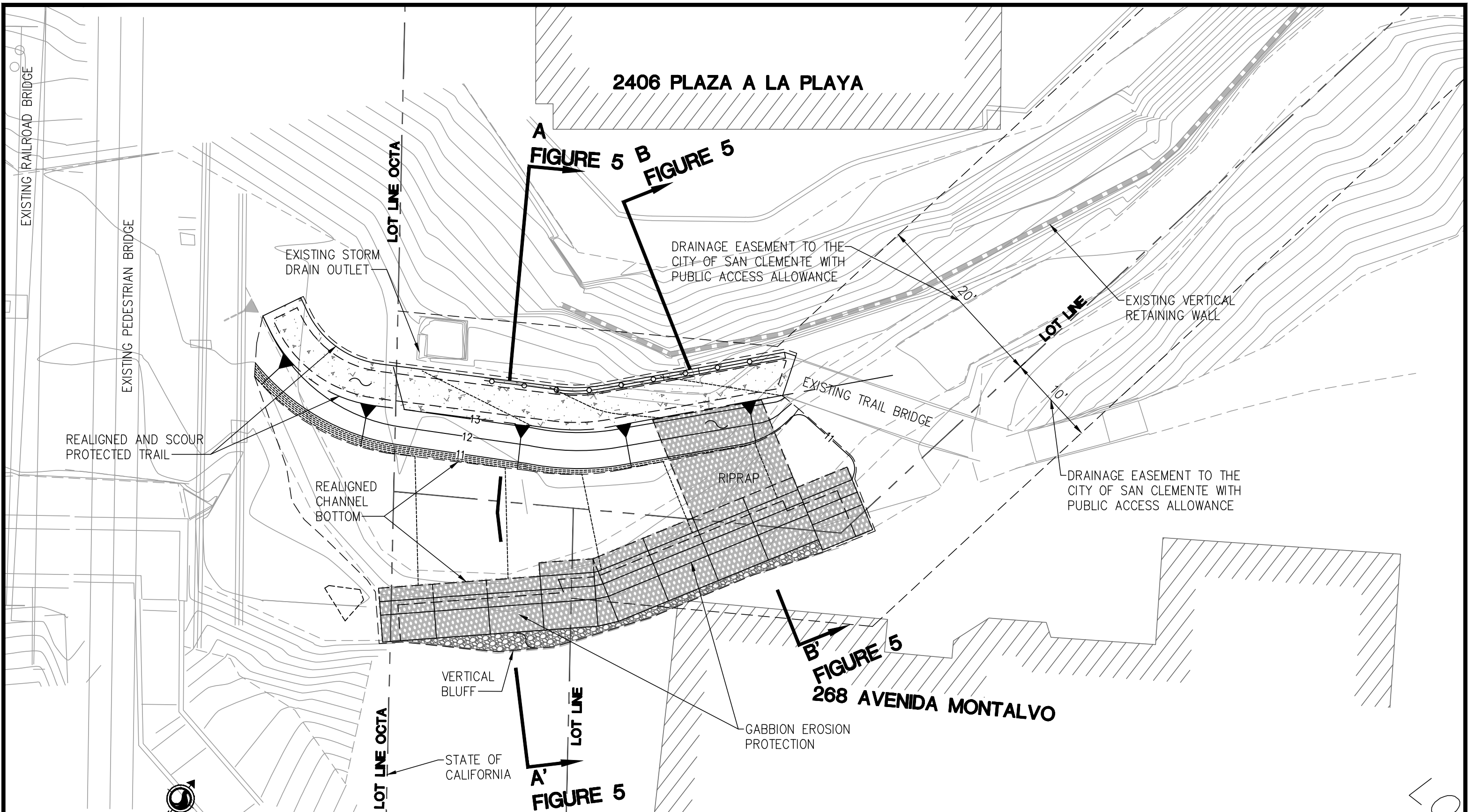
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MONTALVO CANYON CHANNEL
EXISTING CONDITION
CROSS SECTIONS

Exhibit 8
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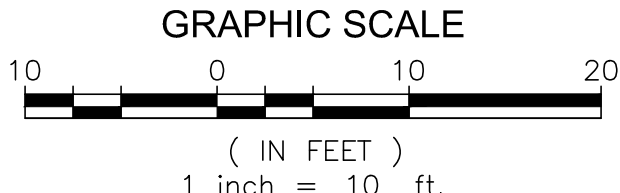
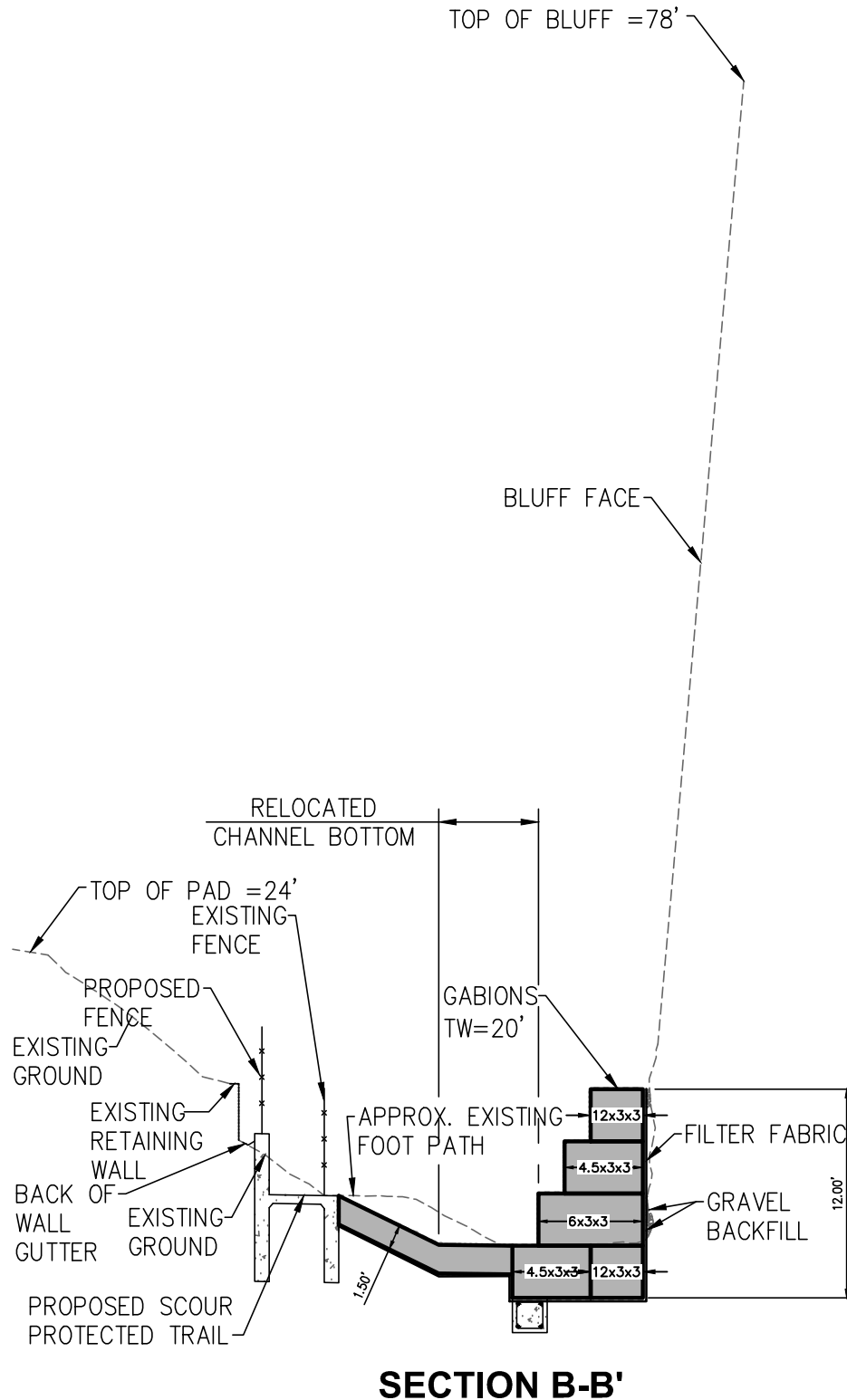
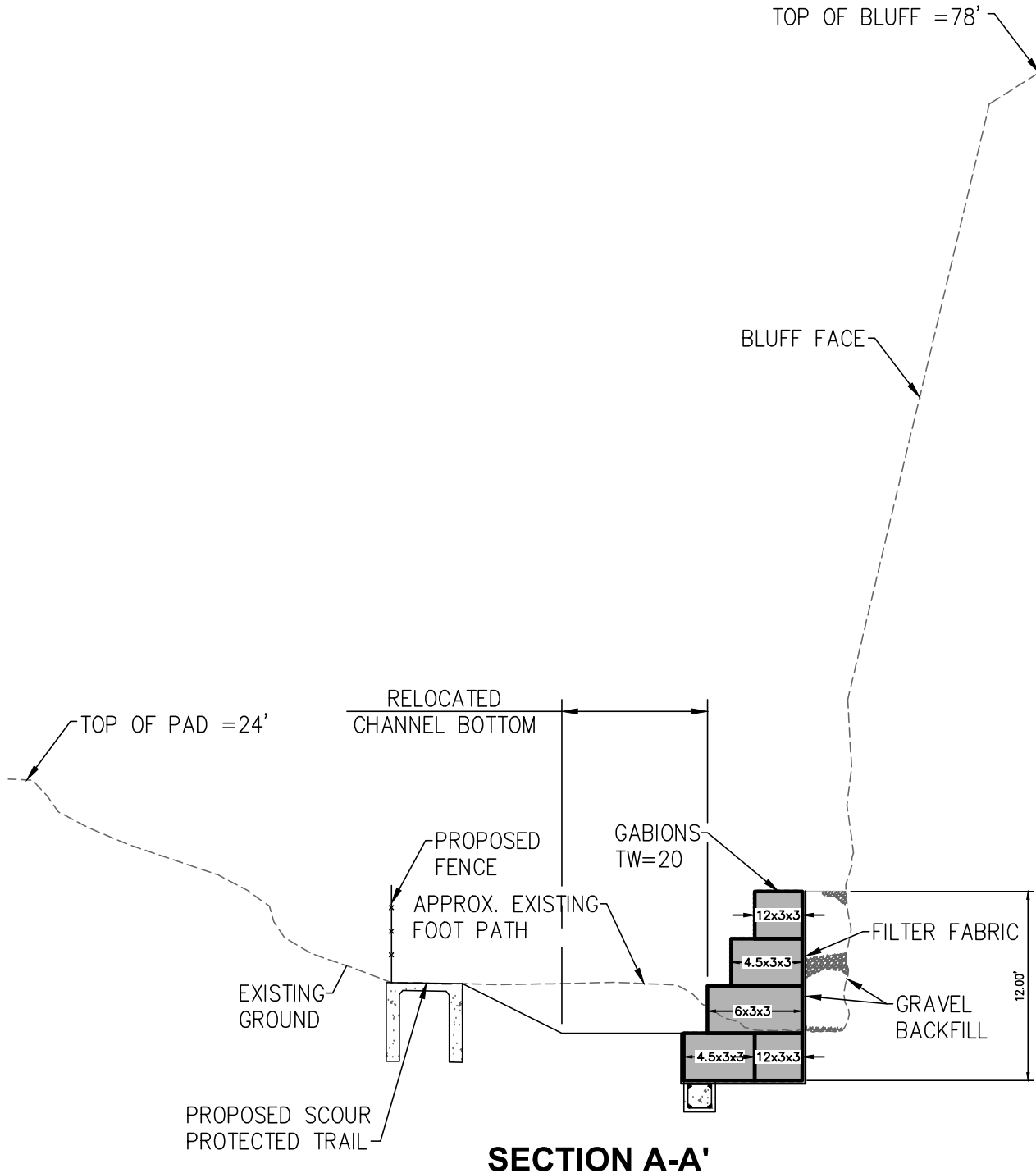
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**MONTALVO CANYON CHANNEL
PROPOSED PLAN VIEW**

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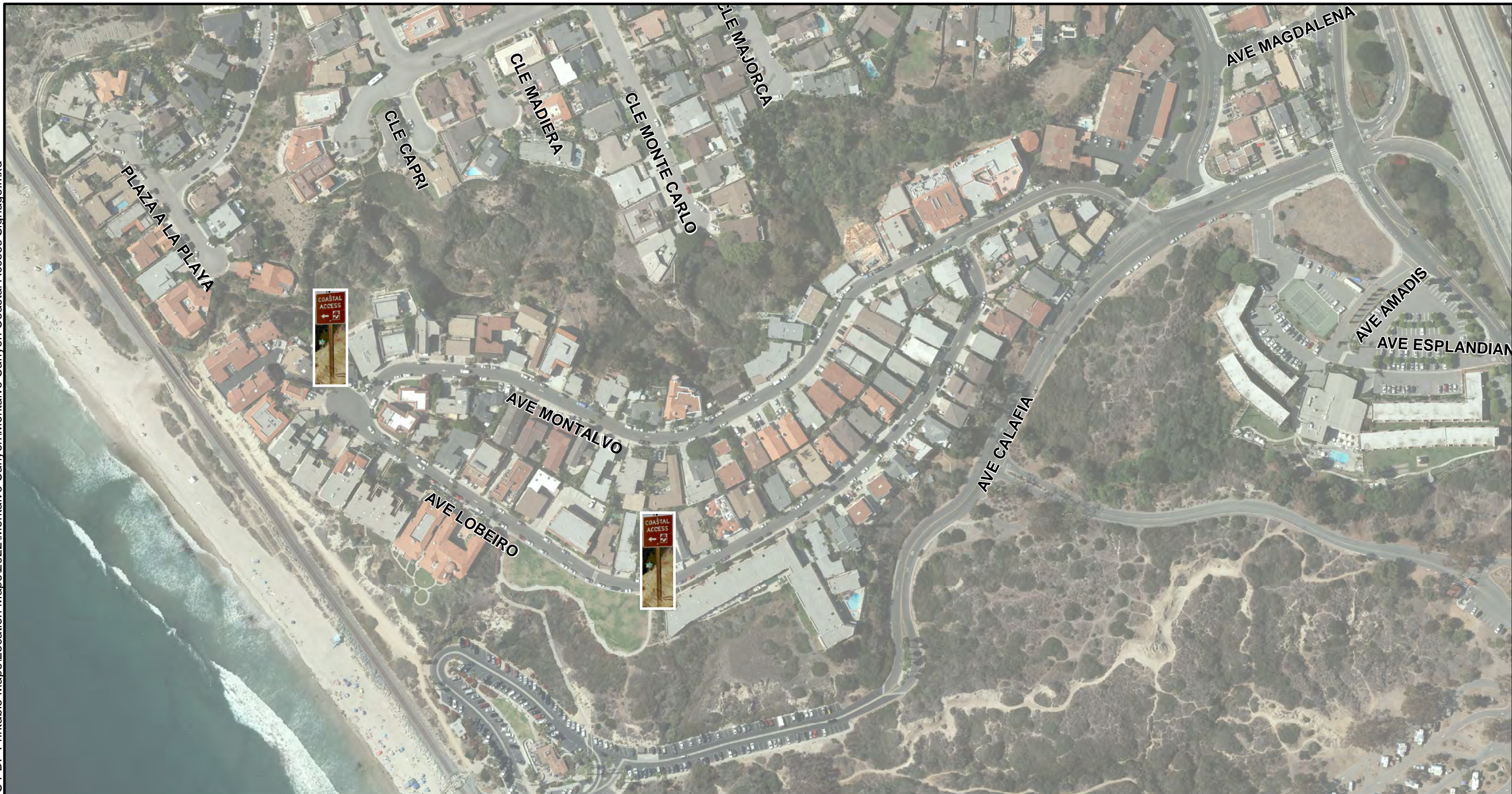
MONTALVO CANYON CHANNEL PROPOSED CONDITION CROSS SECTIONS

Exhibit 8

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Fax: (949) 361-8316

LOCATION MAP

MONTALVO CANYON ACCESS SIGNAGE

COASTAL
ACCESS



0 224



Exhibit 9

Page 1 of 1



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Exhibit 10

Page 1 of 2



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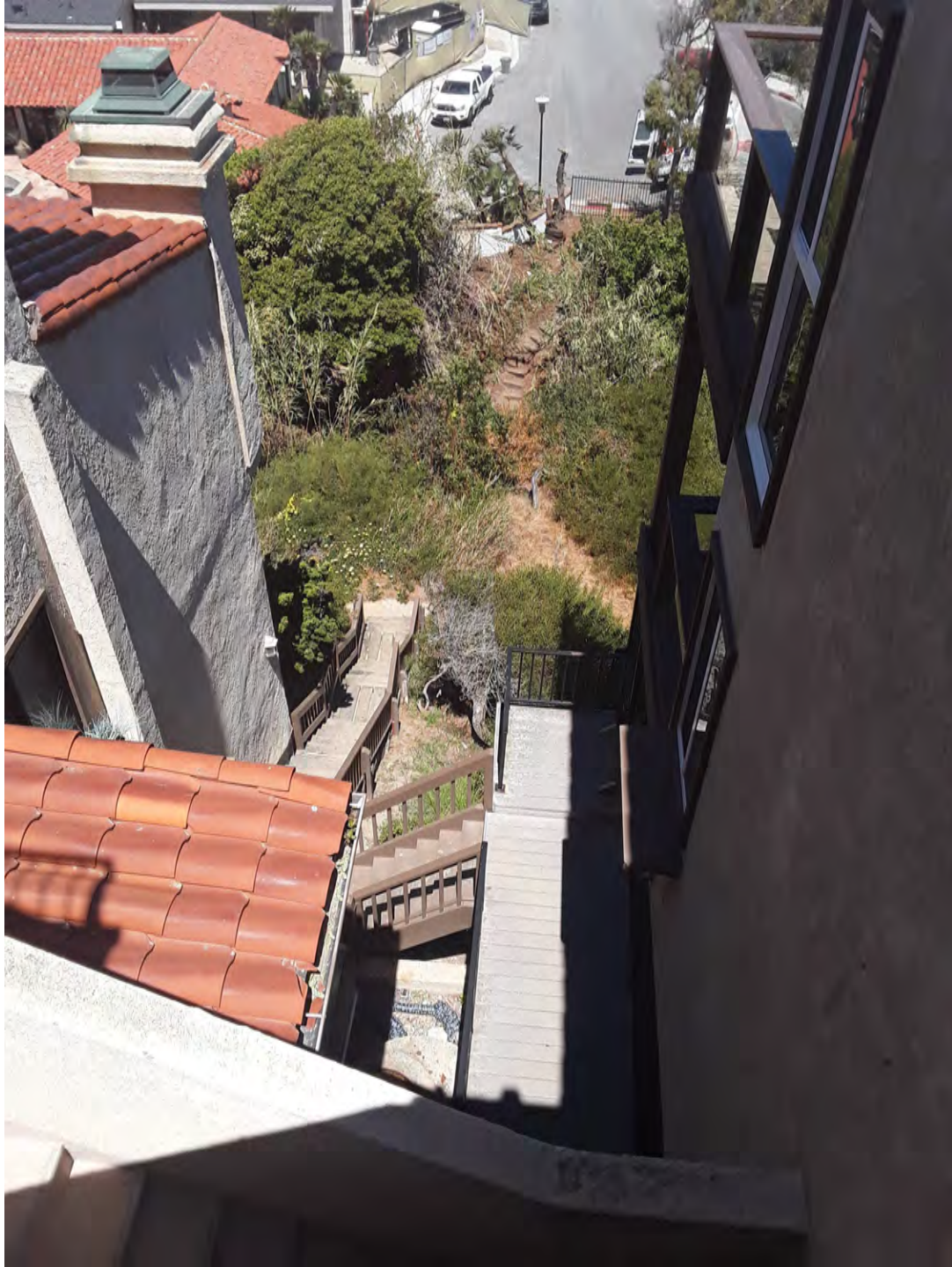


Exhibit 10

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