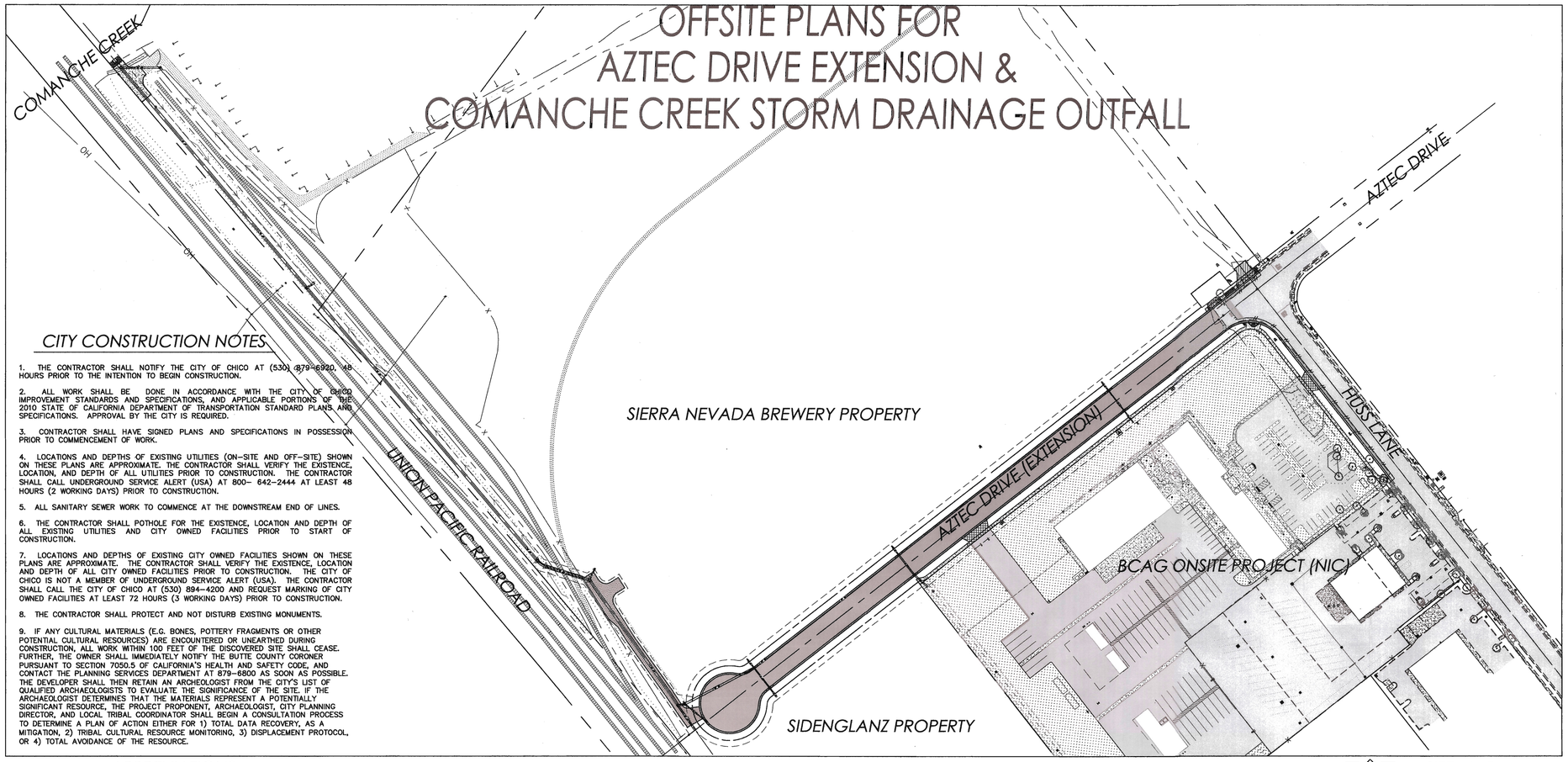
BUTTE COUNTY ASSOCIATION OF GOVERNMENTS

OFFSITE PLANS FOR AZTEC DRIVE EXTENSION & COMANCHE CREEK STORM DRAINAGE OUTFALL



LOCATION MAP NTS

CITY CONSTRUCTION NOTES

1. THE CONTRACTOR SHALL NOTIFY THE CITY OF CHICO AT (530) 879-6920, 48 HOURS PRIOR TO THE INTENTION TO BEGIN CONSTRUCTION.
2. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CITY OF CHICO IMPROVEMENT STANDARDS AND SPECIFICATIONS, AND APPLICABLE PORTIONS OF THE 2010 STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION STANDARD PLANS AND SPECIFICATIONS. APPROVAL BY THE CITY IS REQUIRED.
3. CONTRACTOR SHALL HAVE SIGNED PLANS AND SPECIFICATIONS IN POSSESSION PRIOR TO COMMENCEMENT OF WORK.
4. LOCATIONS AND DEPTHS OF EXISTING UTILITIES (ON-SITE AND OFF-SITE) SHOWN ON THESE PLANS ARE APPROXIMATE. THE CONTRACTOR SHALL VERIFY THE EXISTENCE, LOCATION, AND DEPTH OF ALL UTILITIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL CALL UNDERGROUND SERVICE ALERT (USA) AT 800- 642-2444 AT LEAST 48 HOURS (2 WORKING DAYS) PRIOR TO CONSTRUCTION.
5. ALL SANITARY SEWER WORK TO COMMENCE AT THE DOWNSTREAM END OF LINES.
6. THE CONTRACTOR SHALL POTHOLE FOR THE EXISTENCE, LOCATION AND DEPTH OF ALL EXISTING UTILITIES AND CITY OWNED FACILITIES PRIOR TO START OF CONSTRUCTION.
7. LOCATIONS AND DEPTHS OF EXISTING CITY OWNED FACILITIES SHOWN ON THESE PLANS ARE APPROXIMATE. THE CONTRACTOR SHALL VERIFY THE EXISTENCE, LOCATION AND DEPTH OF ALL CITY OWNED FACILITIES PRIOR TO CONSTRUCTION. THE CITY OF CHICO IS NOT A MEMBER OF UNDERGROUND SERVICE ALERT (USA). THE CONTRACTOR SHALL CALL THE CITY OF CHICO AT (530) 894-4200 AND REQUEST MARKING OF CITY OWNED FACILITIES AT LEAST 72 HOURS (3 WORKING DAYS) PRIOR TO CONSTRUCTION.
8. THE CONTRACTOR SHALL PROTECT AND NOT DISTURB EXISTING MONUMENTS.
9. IF ANY CULTURAL MATERIALS (E.G. BONES, POTTERY FRAGMENTS OR OTHER POTENTIAL CULTURAL RESOURCES) ARE ENCOUNTERED OR UNEARTHED DURING CONSTRUCTION, ALL WORK WITHIN 100 FEET OF THE DISCOVERED SITE SHALL CEASE. FURTHER, THE OWNER SHALL IMMEDIATELY NOTIFY THE BUTTE COUNTY CORONER PURSUANT TO SECTION 7050.5 OF CALIFORNIA'S HEALTH AND SAFETY CODE, AND CONTACT THE PLANNING SERVICES DEPARTMENT AT 879-6800 AS SOON AS POSSIBLE. THE DEVELOPER SHALL THEN RETAIN AN ARCHEOLOGIST FROM THE CITY'S LIST OF QUALIFIED ARCHAEOLOGISTS TO EVALUATE THE SIGNIFICANCE OF THE SITE. IF THE ARCHAEOLOGIST DETERMINES THAT THE MATERIALS REPRESENT A POTENTIALLY SIGNIFICANT RESOURCE, THE PROJECT PROPONENT, ARCHAEOLOGIST, CITY PLANNING DIRECTOR, AND LOCAL TRIBAL COORDINATOR SHALL BEGIN A CONSULTATION PROCESS TO DETERMINE A PLAN OF ACTION EITHER FOR 1) TOTAL DATA RECOVERY, AS A MITIGATION, 2) TRIBAL CULTURAL RESOURCE MONITORING, 3) DISPLACEMENT PROTOCOL, OR 4) TOTAL AVOIDANCE OF THE RESOURCE.

ABBREVIATIONS

AGGREGATE BASE	AB	MINIMUM	MIN
ASPHALT CONCRETE	AC	MID POINT	MP
BEGIN CURVE	BC	MID POINT ON CURVE	MPOC
BACK OF WALK	BOW	NOT TO SCALE	NTS
BUILDING SETBACK LINE	BSL	ORIGINAL GROUND	OG
BACK OF SIDEWALK	BSW	OVERHEAD ELECTRIC	OHE
BEGIN VERTICAL CURVE	BVC	OFFSET	OS
CURVE #	C	PROPERTY CORNER	PC
CABLE TELEVISION	CATV	PORTLAND CEMENT CONCRETE	PCC
COMPOUND CURVE	CC	PHASE NUMBER	PH
CENTERLINE	CL	POINT OF INTERSECTION	PI
CONCRETE MASONRY UNIT	CMU	PROPERTY LINE	PL
CLEAN OUT	CO	POWER POLE	PP
CUBIC YARDS	CY	POINT OF REVERSE CURVATURE	PRC
DRAIN INLET	DI	PUBLIC STORM DRAIN EASEMENT	PSDE
ELECTRIC	E	PUBLIC SANITARY SEWER EASEMENT	PSSE
END CURVE	EC	POINT OF TANGENCY	PT
EXISTING GROUND	EG	PUBLIC UTILITY EASEMENT	PUE
ELEVATION	ELEV	POLYVINALCHLORIDE	PVC
EDGE OF PAVEMENT	EP	POINT OF VERTICAL INTERSECTION	PVI
END VERTICAL CURVE	EVC	RADIUS	R
EXISTING	EX	REINFORCED CONCRETE PIPE	RCP
FUTURE	F	RELATIVE DENSITY	RD
FINISH GRADE	FG	RETURN	RET
FIRE HYDRANT	FH	RIGHT-OF-WAY	ROW
FLOWLINE	FL	RIGHT	RT
FACE OF CURB	FOC	SLOPE	S
FEET	FT	STORM DRAIN	SD
GAS	G	STORM DRAIN MAN HOLE	SDMH
GUAGE	GA	SERVICE	SERV
GRADE BREAK	GB	SUB GRADE	SG
HIGH DENSITY POLYETHYLENE	HDPE	SANITARY SEWER	SS
INVERT ELEVATION	INV	SANITARY SEWER MAN HOLE	SSMH
JOINT TRENCH	JT	STATION	STA
LATERAL	LAT	STANDARD	STD
LINEAR FEET	LF	SIDEWALK	SW
LIP OF GUTTER	LIP	TRANSFORMER	T
MAXIMUM	MAX	TOP BACK OF CURB	TBC
MAXIMUM DRY DENSITY	MDD	TOP OF CURB	TC
		TELEPHONE	TEL
		TOE OF SLOPE	TOE
		TOP OF SLOPE	TOP
		TOP OF WALL	TW
		TYPICAL	TYP
		VALLEY GUTTER	VG
		WATER	W
		WATER METER	WM
		YARDS	YDS

LEGEND

- EXISTING PROPERTY LINE
- EXISTING EASEMENT
- EXISTING CONTOUR MAJOR 5' (190)
- EXISTING CONTOUR MINOR 1' (189)
- EXISTING EDGE OF PAVEMENT
- EXISTING 6" HIGH CURB
- EXISTING CURB, GUTTER & SIDEWALK
- EXISTING FENCE LINE
- EXISTING DRAINAGE PIPE / SIZE (36" SD)
- EXISTING SEWER PIPE / SIZE (8" SS)
- EXISTING WATER MAIN / SIZE (12" W EX-W)
- EXISTING GAS LINE / SIZE (4" GAS EX-GAS)
- EXISTING UNDERGROUND TELEPHONE (EX-T)
- EXISTING UNDERGROUND ELECTRIC (EX-E)
- EXISTING JOINT UTILITY TRENCH (EX-JT)
- EXISTING ABANDONED TRAIN SIGNAL CONDUIT (TS)
- EXISTING BUILDING
- EXISTING SURFACE FLOWLINE
- EXISTING TOP/TOE OR GRADE BREAK
- EXISTING TREE SIZE AND TYPE (7" PECAN)
- EXISTING FIRE HYDRANT
- EXISTING WATER VALVE
- EXISTING GAS VALVE
- EXISTING WATER METER
- EXISTING STREET LIGHT
- EXISTING STREET LIGHT BOX
- EXISTING SIGN
- EXISTING CITY STD. SSMH
- EXISTING CITY STD. SDMH
- EXISTING CITY STD. DRAIN INLET
- EXISTING FLAT GRATE SD INLET
- EXISTING UTILITY EQUIPMENT (ELEC GAS TELE)
- EXISTING UTILITY VAULT
- EXISTING UTILITY RISER
- EXISTING TRUNCATED DOMES
- EXISTING PEDESTRIAN RAMP
- DESIGN ROADWAY CENTERLINE
- PROPOSED SAWCUT LINE
- PROPOSED GRADE BREAK
- PROPOSED STREET LIGHT CONDUIT (SL-1 LED/11)
- PROPOSED JOINT UTILITY TRENCH PER PG&E PLANS (JT)
- PROPOSED WATER MAIN PER CAL WATER PLANS (8" W)
- PROPOSED IRRIGATION SLEEVE (LS-14/10) (4" SLV)
- PROPOSED STORM DRAIN PIPE (12" SD)
- PROPOSED SANITARY SEWER PIPE (PVC) (8" SS)
- PROPOSED CITY STANDARD CURB & GUTTER (S-2/10)
- PROPOSED CITY STANDARD SIDEWALK (S-1/10)
- PROPOSED MODIFIED CITY STANDARD DRIVEWAY (S-5A/10)
- PROPOSED PROJECT PEDESTRIAN RAMP AREA (F/9 & G/9)
- PROPOSED ASPHALT PAVING 5" AC ON 9" AB ON 12" LIME+ TREATED SUBGRADE PER GEOTECH REPORT (J/9)
- PROPOSED ASPHALT PAVING 3" AC ON 12" AB COMPACT 12" SUBGRADE TO 95% R.D.
- PROPOSED ALL WEATHER ACCESS ROAD (D/9) (ASPHALT)
- PROPOSED 1.5" ASPHALT GRIND AND OVERLAY
- PROPOSED ALL WEATHER ACCESS ROAD (D/9) (DITCH & FENCE)
- ¼ TON VEGETATED ROCK SLOPE PROTECTION
- PROPOSED CITY STANDARD LED STREET LIGHT & BOX – BETA LED (SL-1 LED/11) ALSO SEE STREET LIGHT NOTES ON SHEET 9 (SL)
- PROPOSED CITY STANDARD SIGNAGE PER CALLOUT
- PROPOSED CITY STANDARD SSMH (SEWER) (S-10/11) (S)
- PROPOSED CITY STANDARD SDMH (STORM) (S-10/11) (D)
- PROPOSED CITY STANDARD DRAIN INLET (S-7/12)
- PROPOSED COOKS OR EQUAL AREA DRAIN (24"X48" AREA DRAIN/12)
- PROPOSED CITY STANDARD DRAIN INLET (NO GUTTER) (S-10/11)
- PROPOSED COOKS OR EQUAL AREA DRAIN (18"X18" AREA DRAIN/12)
- PROPOSED TRUNCATED DOMES (I/9)
- PROPOSED RAMP SLOPE 8.33% MAXIMUM
- PROPOSED FIRE HYDRANT AND VALVE PER CAL WATER PLANS (W)
- PROPOSED TEMPORARY BLOW-OFF PER CAL WATER PLANS (BO)
- (A/9) TYPICAL PROJECT DETAIL REFERENCE (DETAIL/SHEET)
- (S-27/10) TYPICAL CITY STD. DETAIL REFERENCE (CITY DETAIL#/SHEET)

SITE MAP
SCALE 1"=100'

SHEET INDEX

PROJECT PLANS
- 1 OFFSITE TITLE SHEET
- 2 OVERALL OFFSITE PLAN
- 3 PLAN AND PROFILE - HUSS LANE
- 4 PLAN AND PROFILE - AZTEC DRIVE
- 5 PLAN AND PROFILE - AZTEC DRIVE
- 6 PLAN AND PROFILE - SD OUTFALL-1
- 7 PLAN AND PROFILE - SD OUTFALL-2
- 8 PLAN AND PROFILE - SD OUTFALL-3
- 9 PROJECT DETAILS
- 10 CITY STD. DETAILS -1
- 11 CITY STD. DETAILS-2
- 12 CITY STD. DETAILS-3

SCHEMATIC JOINT TRENCH PLANS
- A JOINT TRENCH SCHEDULING CONCEPT

CAL WATER PLANS
- CH-5444 1 AZTEC ROAD EXTENSION OFFSITE WORK
- CH-5444 2 AZTEC ROAD EXTENSION OFFSITE WORK
- CW-832-R4 SPECIFICATIONS
- CWDWGS 1 CAL WATER STANDARD DRAWINGS
- CWDWGS 2 CAL WATER STANDARD DRAWINGS

SOILS REPORT

CONSTRUCTION SHALL CONFORM TO THE SOILS REPORT PREPARED BY HOLDREGE & KULL DATED MAY 17, 2012. THE CONTRACTOR IS TO NOTIFY THE ENGINEER IMMEDIATELY IF SOILS DIFFERING IN CHARACTER OR STRUCTURE FROM THE REPORT ARE FOUND TO BE PRESENT ON THE SITE.

SURVEY INFORMATION

BENCHMARK: BRASS DISK CENTER LINE MONUMENT STAMPED RCE 28998 LOCATED 25' SOUTH OF THE CENTER LINE INTERSECTION OF HUSS DRIVE AND AZTEC DRIVE. ALSO CONTROL POINT NUMBER 1. ELEVATION = 191.73' (CITY OF CHICO DATUM)

BASIS OF BEARING: THE BASIS OF BEARING FOR THIS SURVEY IS THE CENTERLINE OF HUSS DRIVE (FORMERLY ARROYO GRANDE DRIVE) PER RECORD MAP ENTITLED "OATES BUSINESS PARK" RECORDED IN MAP BOOK 118 PAGE 33 IN BUTTE COUNTY, MEASURED BETWEEN FOUND CENTERLINE MONUMENTS AND TAKEN AS NORTH 38°05'15" WEST.

PLANS PREPARED BY:

or under the supervision of,

ROSS SIMMONS, P.E. 68511
NORTHSTAR ENGINEERING — DATE 6-5-14

APPROVED FOR CONSTRUCTION:

MATT JOHNSON
SENIOR DEVELOPMENT ENGINEER
CITY OF CHICO — DATE 6/9/14

APPROVED FOR CONSTRUCTION:

JON A. CLARK
EXECUTIVE DIRECTOR
BUTTE COUNTY ASSOCIATION OF GOVERNMENTS — DATE 6/9/14

UTILITY & SERVICE CONTACTS

UTILITY	CONTACT NAME	TELEPHONE	EMAIL
CITY ROADWAYS	MATT JOHNSON	530-879-6910	Matt.Johnson@chicoca.gov
CITY SEWER/STORM	MATT THOMPSON	530-879-6959	Matt.Thompson@chicoca.gov
CAL WATER	JASON HAMMOND	530-893-6315	JHammond@Calwater.com
PG&E ELECTRIC	LINDSAY LEWIS	530-894-4731	LMLc@pge.com
PG&E GAS	LARRY JACKSON	530-894-4773	LWJ3@pge.com
AT&T TELEPHONE	CRAIG EDWARDS	530-891-2442	CE2424@att.com
COMCAST CABLE	BRANDON STOKES	530-332-5993	Brandon_Stokes@cable.comcast.com
UNION PACIFIC RR	TERREL ANDERSON	916-789-5134	TAANDERS@UP.COM

REGISTERED PROFESSIONAL ENGINEER — ROSS NORMAN SIMMONS — No. 68511 — Exp. 9/30/16 — CIVIL — STATE OF CALIFORNIA

Designed:	RMS
Drawn By:	RMS
Approved:	
Date:	6-5-14

Revision	Date	By

NorthStar
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Chico, California

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TLCD ARCHITECTURE
HUSS LANE
CHICO, CALIFORNIA

OFFSITE PLANS TITLE SHEET

BCAG TRANSIT FACILITY

APN Number	Job Number	Scale	Sheet
NA	11-260	1"= 100' Horz. NA Vert.	Sheet 1 Of 12

Designed:	RMS	Revision	Date	By
Drawn By:	RMS			
Approved:				
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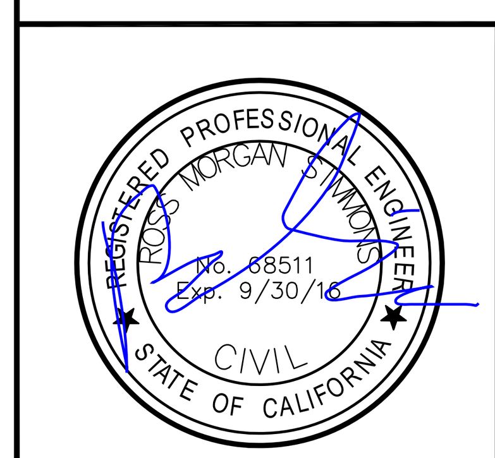
OFFSITE PLAN LAYOUT
BCAG TRANSIT FACILITY

APN Number	Job Number	Scale		Sheet
NA	11-260	1"= 80' Horz.	NA Vert.	Sheet 2 Of 12

WORK NOT IN CONTRACT (NIC). TO BE COMPLETED BY ONSITE CONTRACTOR. SHOWN FOR CITY CONCEPT REVIEW ONLY



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CHICO, CALIFORNIA

PLAN AND PROFILE - HUSS LANE
BCAG TRANSIT FACILITY

APN Number	Job Number	Scale	Sheet
NA	11-260	1"= 20' Horz. 1"=2' Vert.	Sheet 3 Of 12


EX GROUND CL
EX GROUND 20' LEFT
EX GROUND 20' RIGHT
FINISHED GROUND CL
PROPOSED FLOW LINE
STA = 8+85
ELEV = 187.66
STA = 9+45.79
ELEV = 187.66
1.76%
0.00%
0.30%
24"x48" AREA DRAIN#9
STA: 8+25.94
FL=186.50
INV IN=181.04 36" NE
INV IN=183.04 12" SE
HDPE Pipe 36" L=12.08' S=0.0033'/ft
HDPE Pipe 36" L=129.00' S=0.0030'/ft
HDPE Pipe 36" L=304.84' S=0.0020'/ft
HDPE Pipe 24" L=442.37' S=0.0040'/ft
INSTALL SS PVC 8" L=45.00' S=0.0021'/ft
INSTALL SS PVC 8" L=311.21' S=0.0020'/ft
INSTALL SS PVC 8" L=439.37' S=0.0020'/ft
SS LAT=180.07
SS LAT=179.71
S-7 SDDI #4
STA: 12+57.65
FL=188.08
INV IN=183.00 24" SE
INV OUT=183.00 24" NW
S-10 SDMH#1
STA: 8+15.19
RIM=188.40
INV IN=181.00 36" E
INV IN=181.10 36" SE
INV OUT=180.90 48" NW
S-7 SDDI#6
INV OUT=183.69 12" NW
STD. S-10 SSMH#3
STA: 9+34.40
INV IN=179.86 8" NW
INV IN=180.03 6" SE
INV OUT=179.86 8" NE
S-7 MODIFIED SDDI#5
STA: 9+52.79
FL=187.14
INV IN=181.43 36" NE
INV IN=182.84 18" SE
INV IN=183.09 15" NW
INV OUT=181.43 36" SW
STD. S-10 SSMH #2
STA: 12+45.61
RIM=188.56
INV IN=179.23 8" SW
INV IN=179.23 8" SE
INV OUT=179.23 8" NE
S-7 MODIFIED SDDI #3
STA: 12+57.63
FL=188.08
INV IN=183.03 24" NE
INV IN=182.89 24" SE
INV IN=182.25 15" NW
INV OUT=182.04 36" SW
FG CL ELEV
8+00
9+00
10+00
11+00
12+00
13+00
14+00


SEE SHEET 6
SEE SHEET 5
EXISTING PROPERTY LINE
LANDSCAPE BERM TO BE CONSTRUCTED OF CLEAN EARTHWORK & TRENCHING SPOILS ONLY. ALL CLEAN SPOILS TO THE EAST OF THE RAIL SPUR SHALL BE DEPOSITED HERE. APPROXIMATE HEIGHT 3'-4' AND UNIFORM IN SIZE AND SHAPE FOR THE ENTIRE LENGTH SHOWN. SPOILS FROM JACK & BORE OPERATION AND ALL SPOILS FROM WORK BETWEEN THE RAIL SPUR AND MAIN RAILROAD TRACK SHALL NOT BE ALLOWED TO BE DEPOSITED HERE (EVEN TEMPORARILY).
10' SLOPE
CLEAN SPOILS BERM (10' TOP)
S-10 SDMH#1
CAP & MARK
INV=183.09
49.44 L
8+26.18
24"x48" AREA DRAIN#9
CAP & MARK
INV=179.95
45.00 L
9+34.39
CAP & MARK
INV=183.19
40.00 L
9+52.79
CAP & MARK
INV=182.35
40.00 L
12+57.63
A/9
B/9
10+70.00
24.50' L
13+50.00
24.50' L
FUTURE SIDEWALK (NIC)
FUTURE PARKWAY (NIC)
34' ROW
22'
S-7 MODIFIED SDDI#5
S-7 MODIFIED SDDI #3
S-7 SDDI#6
STD. S-10 SSMH#3
STD. S-10 SSMH #2
AZTEC DRIVE EXTENSION
S-7 SDDI#7
S-7 SDDI #4
CAP & MARK
INV=181.25
0.00
0+50.00
9+45.79
24.50' R
R50.00
R30.00
R18.00
R62.00
R72.00
CAP & MARK
INV=180.49
45.00 R
9+34.39
CAP & MARK
INV=183.03
40.00 R
9+52.79
SPOILS FROM JACK & BORE OPERATION AND ALL SPOILS FROM WORK BETWEEN THE RAIL SPUR AND MAIN RAILROAD TRACK SHALL BE DEPOSITED ON THIS PROPERTY IN A 300'X300' AREA. MATERIAL SHALL BE SPREAD EVENLY TO AN APPROXIMATE DEPTH OF 6". NO COMPACTION REQUIRED.
12+33.61
40.00' R
CAP & MARK
INV=179.31
40.00 R
12+45.65
BEGIN SIDEWALK CONSTRUCTION
12+55.64
34.00' R
CAP & MARK
INV=183.15
50.47 R
12+63.30
BCAG ONSITE CONSTRUCTION (NIC)
INSTALL DWY #2 (HEAVY TRUCK) (S-5A/10)
INSTALL TEMPORARY BLOW-OFF PER CAL WATER PLANS
13+69.64
45.08' R

REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA — CIVIL — No. 68511

Designed:	RMS	Revision	Date	By
Drawn By:	RMS			
Approved:				
Date:	6-5-14			

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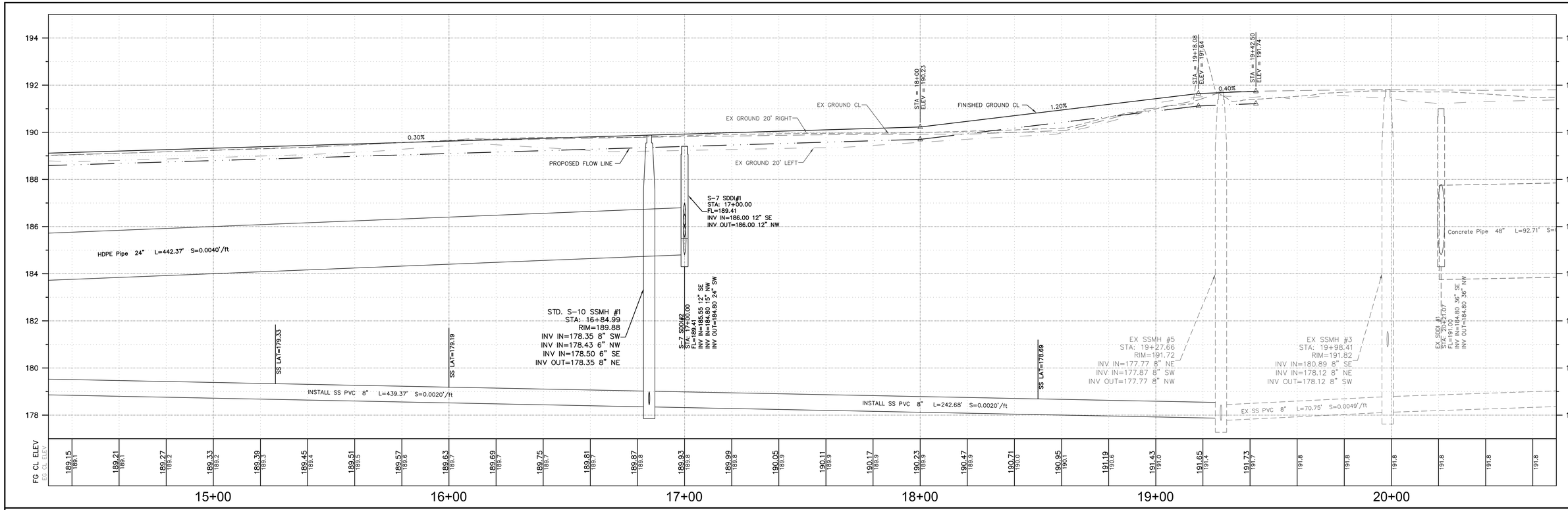
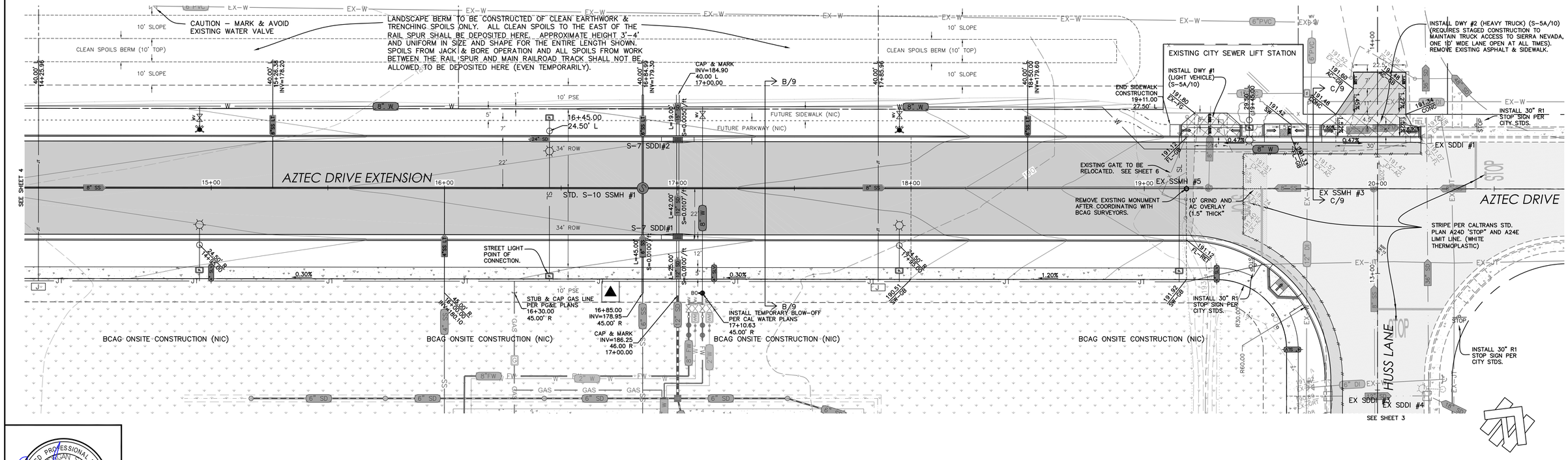
TLCD ARCHITECTURE
HUSS LANE
CHICO, CALIFORNIA

PLAN AND PROFILE - AZTEC DRIVE
BCAG TRANSIT FACILITY

APN Number	Job Number	Scale	Sheet
NA	11-260	1"= 20' Horz. 1"=2' Vert.	Sheet 4 Of 12





REGISTERED PROFESSIONAL ENGINEER
ROSS M. MORGAN-SAMUELS
No. 68511
Exp. 9/30/16
CIVIL
STATE OF CALIFORNIA

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Drawn By:	RMS
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PLAN AND PROFILE - AZTEC DRIVE
BCAG TRANSIT FACILITY

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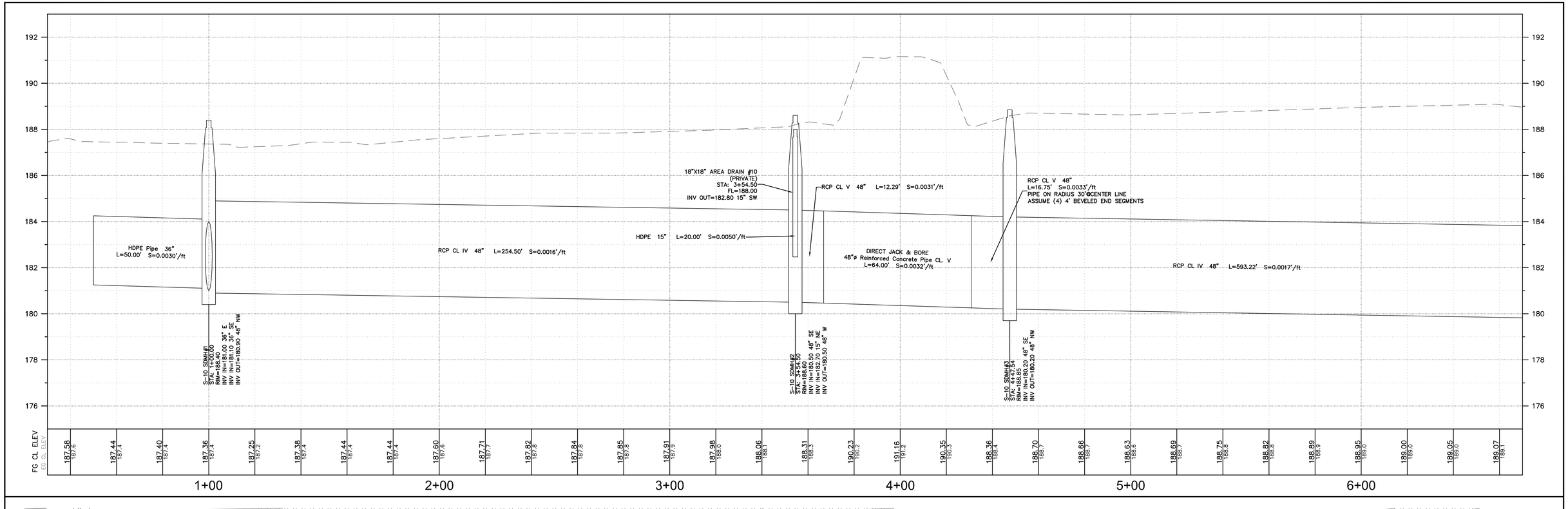

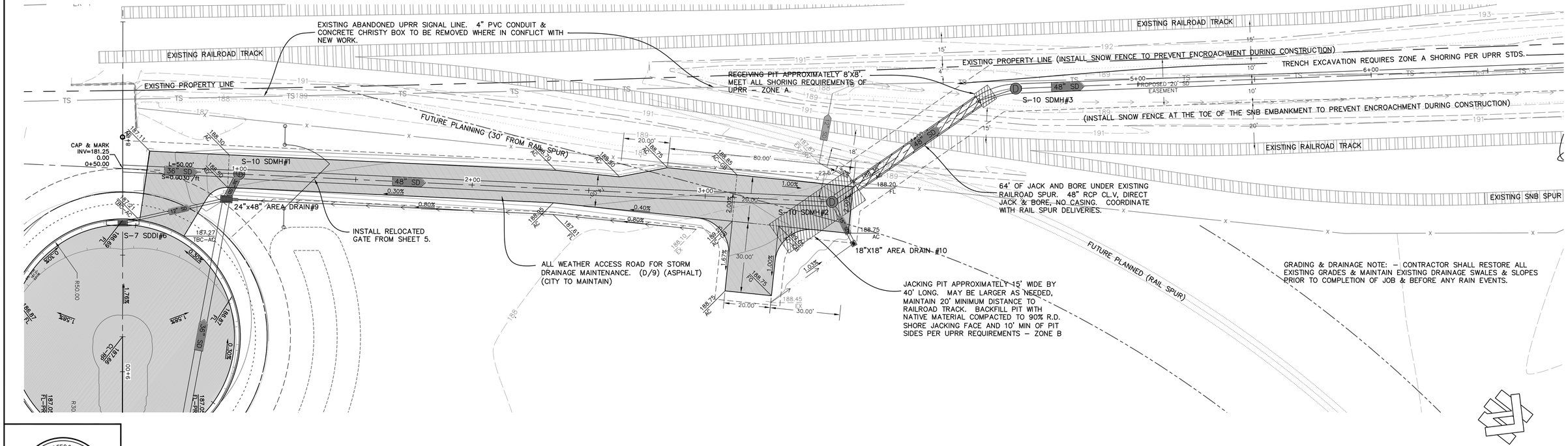

REGISTERED PROFESSIONAL ENGINEER
ROSS MORGAN THOMPSON
No. 68511
Exp. 9/30/16
CIVIL
STATE OF CALIFORNIA

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Drawn By:	RMS
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PLAN AND PROFILE - SD OUTFALL-1

BCAG TRANSIT FACILITY

APN Number	Job Number	Scale		Sheet
NA	11-260	1"= 20' Horz.	1"=2' Vert.	Sheet 6 Of 12

REGISTERED PROFESSIONAL ENGINEER
ROSS MORGAN SIMMONS
No. C-[illegible]
Exp. 9/30/16
CIVIL
STATE OF CALIFORNIA

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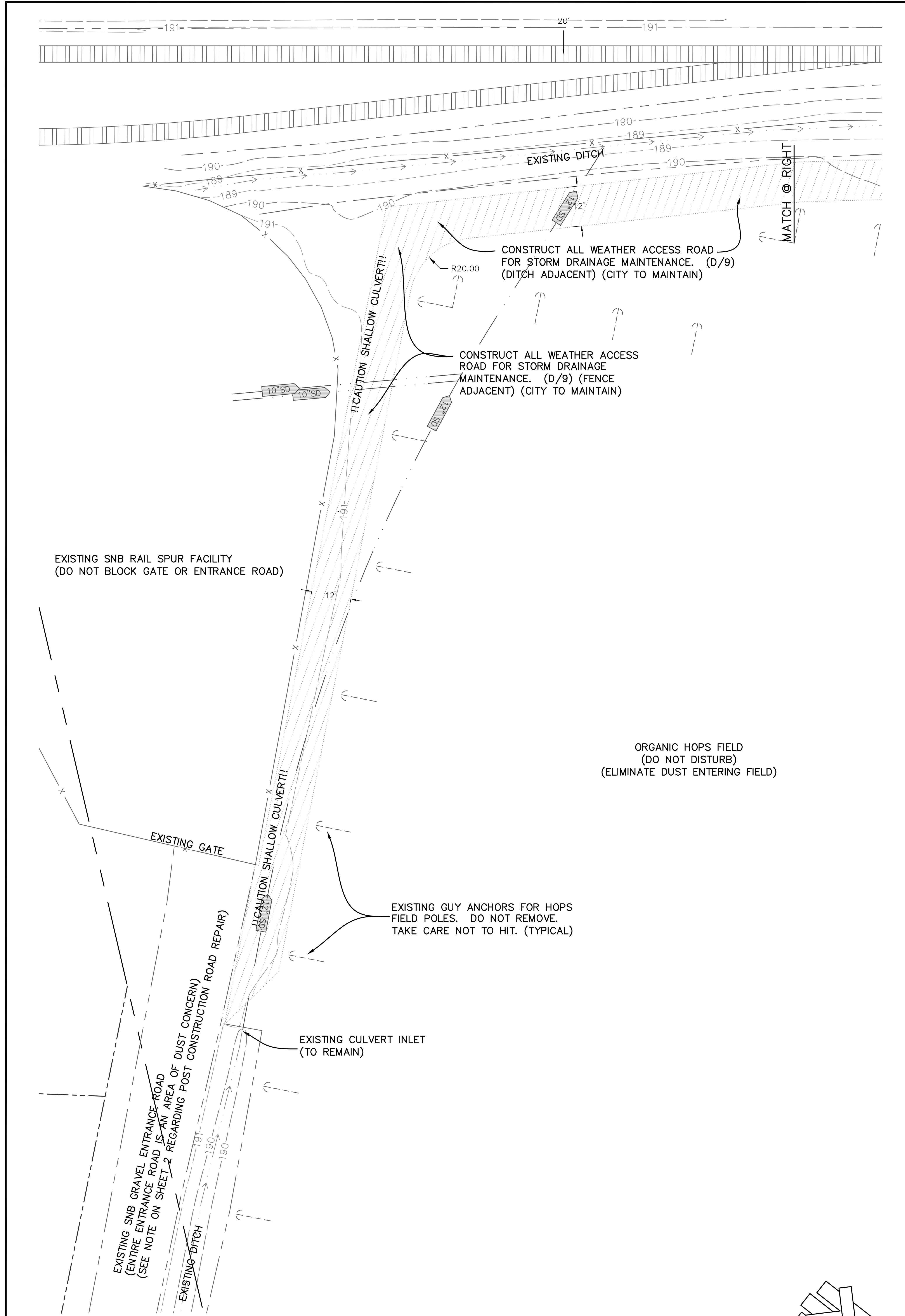
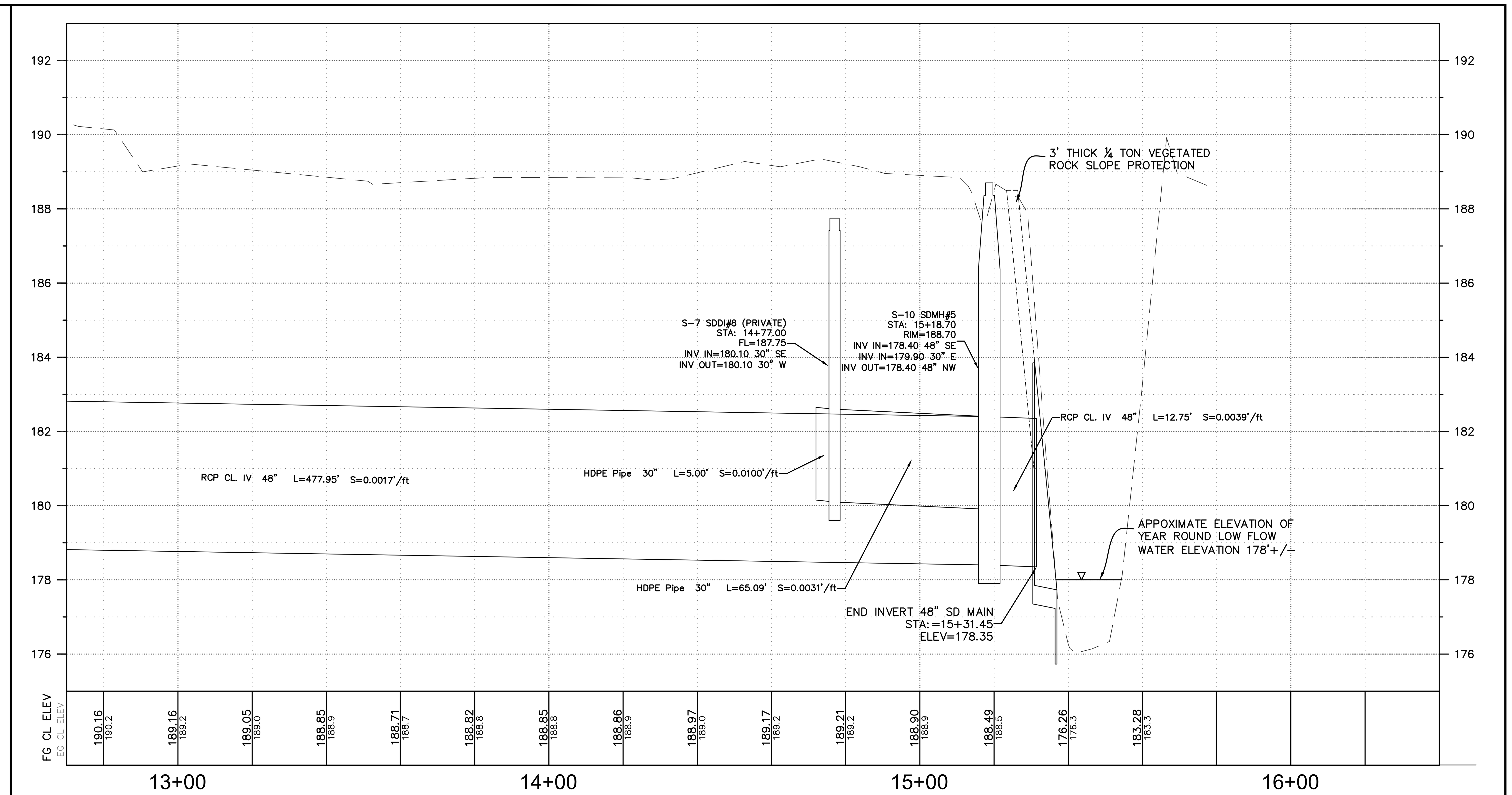
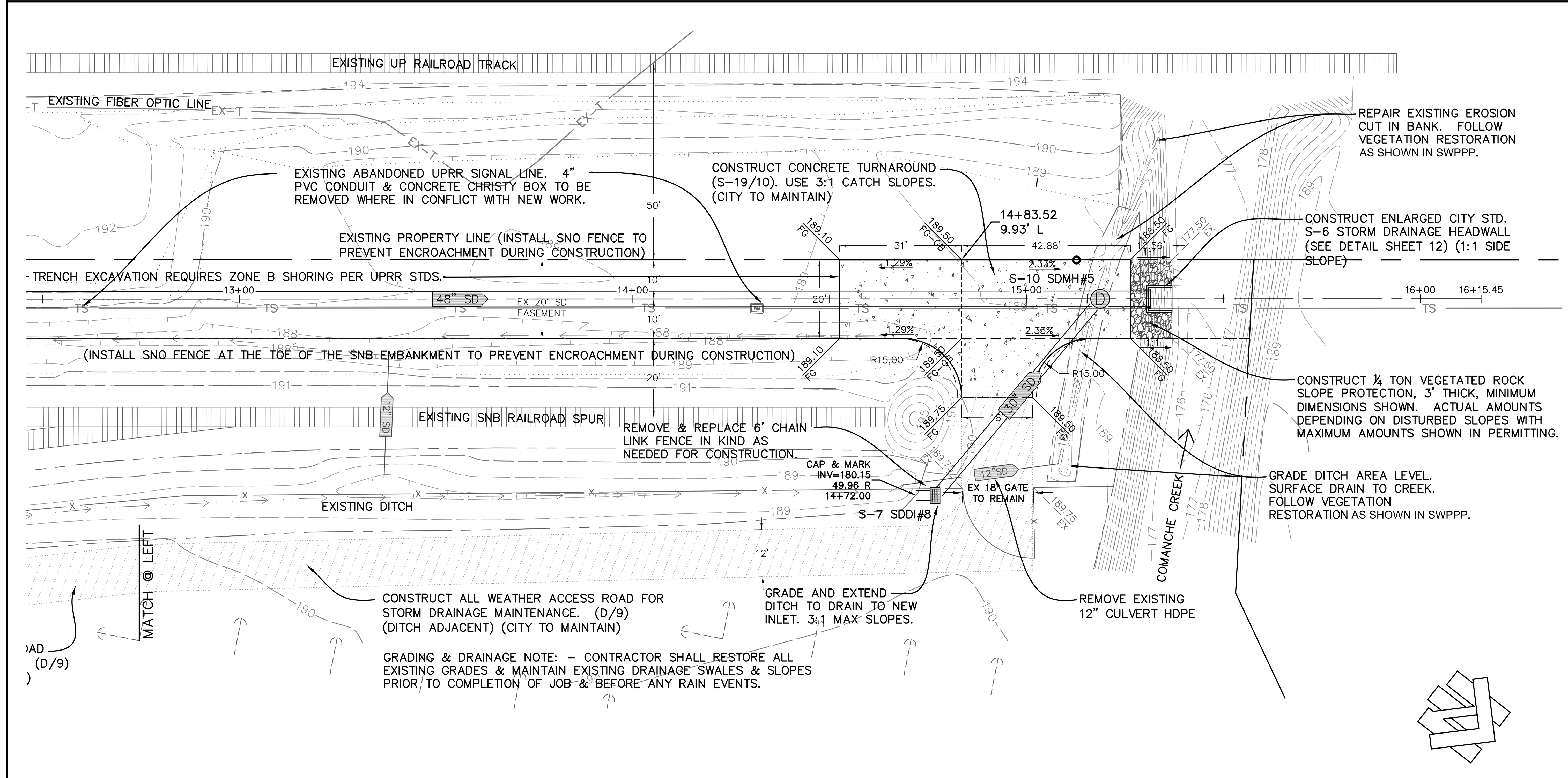
PLAN AND PROFILE - SD OUTFALL-2
BCAG TRANSIT FACILITY

APN Number	Job Number	Scale		Sheet
NA	11-260	1"= 20' Horz.	1"=2' Vert.	Sheet 7 Of 12







REGISTERED PROFESSIONAL ENGINEER
ROSS MORGAN SIMMONS
No. 68511
Exp. 9/30/16
CIVIL
STATE OF CALIFORNIA

		Revision	Date	By
Designed:	RMS			
Drawn By:	RMS			
Approved:				
Date:	6-5-14			

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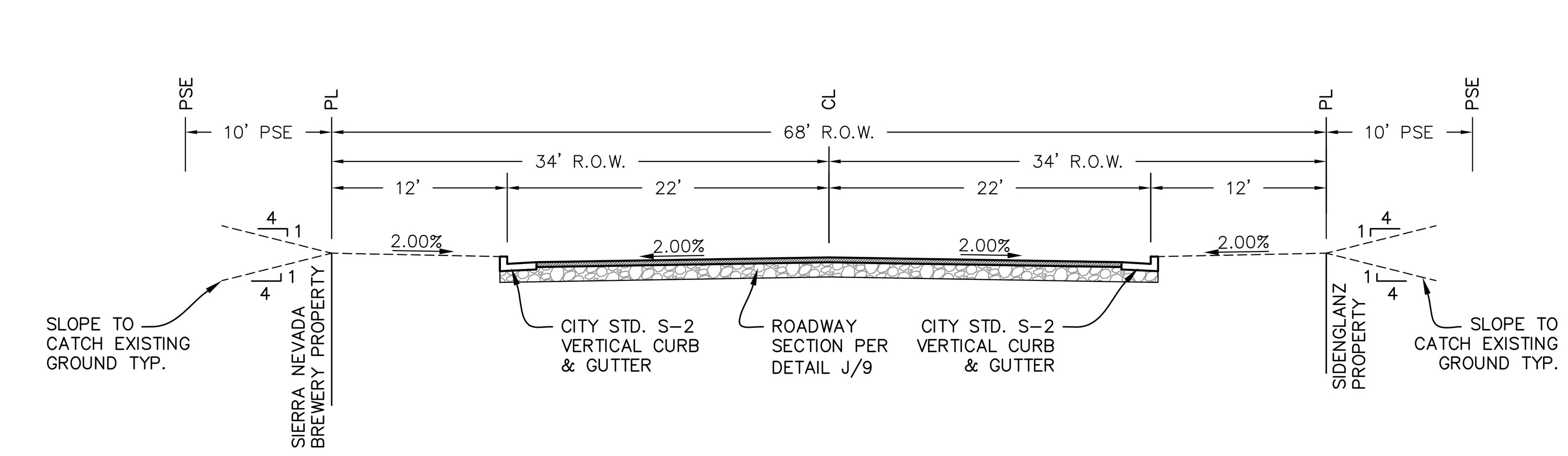
TLCD ARCHITECTURE
HUSS LANE
CHICO, CALIFORNIA

PLAN AND PROFILE - SD OUTFALL-3
BCAG TRANSIT FACILITY

APN Number	Job Number	Scale	Sheet
NA	11-260	1"= 20' Horz. 1"=2' Vert.	Sheet 8 Of 12

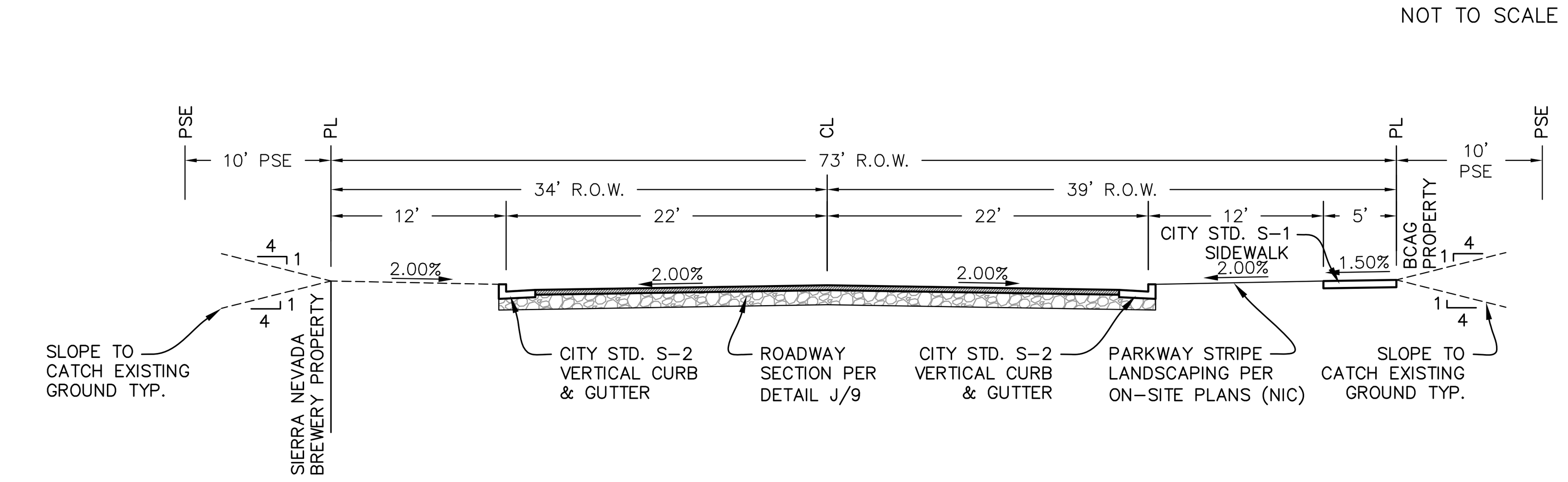
A AZTEC EXTENSION – STA: 9+46.79 TO 12+55.65

NOT TO SCALE



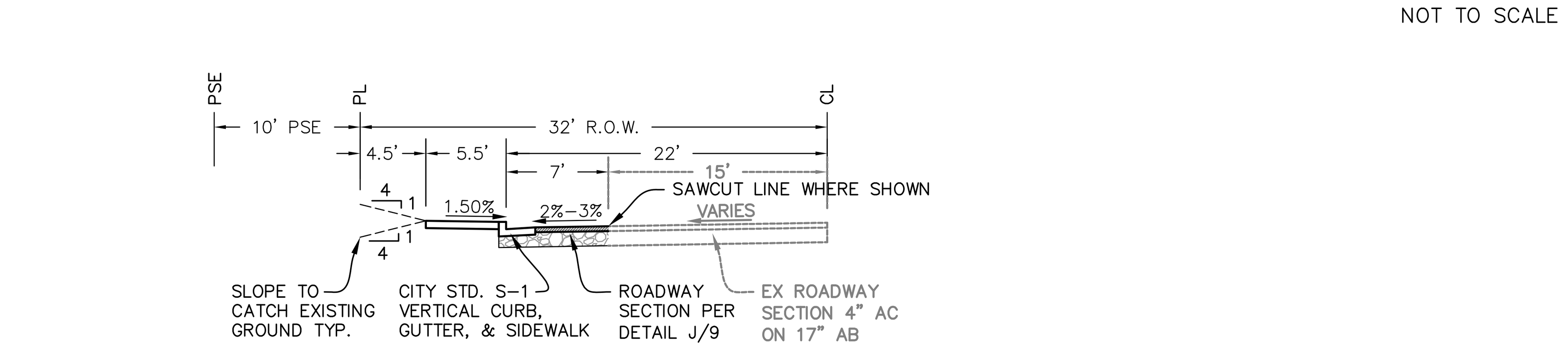
B AZTEC EXTENSION – STA: 12+55.65 TO 19+18.08

NOT TO SCALE


PSE
PL
CL
10' PSE
73' R.O.W.
34' R.O.W.
39' R.O.W.
12'
22'
5'
2.00%
1.50%
CITY STD. S-1 SIDEWALK
BCAG PROPERTY
SLOPE TO CATCH EXISTING GROUND TYP.
CITY STD. S-2 VERTICAL CURB & GUTTER
ROADWAY SECTION PER DETAIL J/9
PARKWAY STRIPE LANDSCAPING PER ON-SITE PLANS (NIC)
SIERRA NEVADA BREWERY PROPERTY

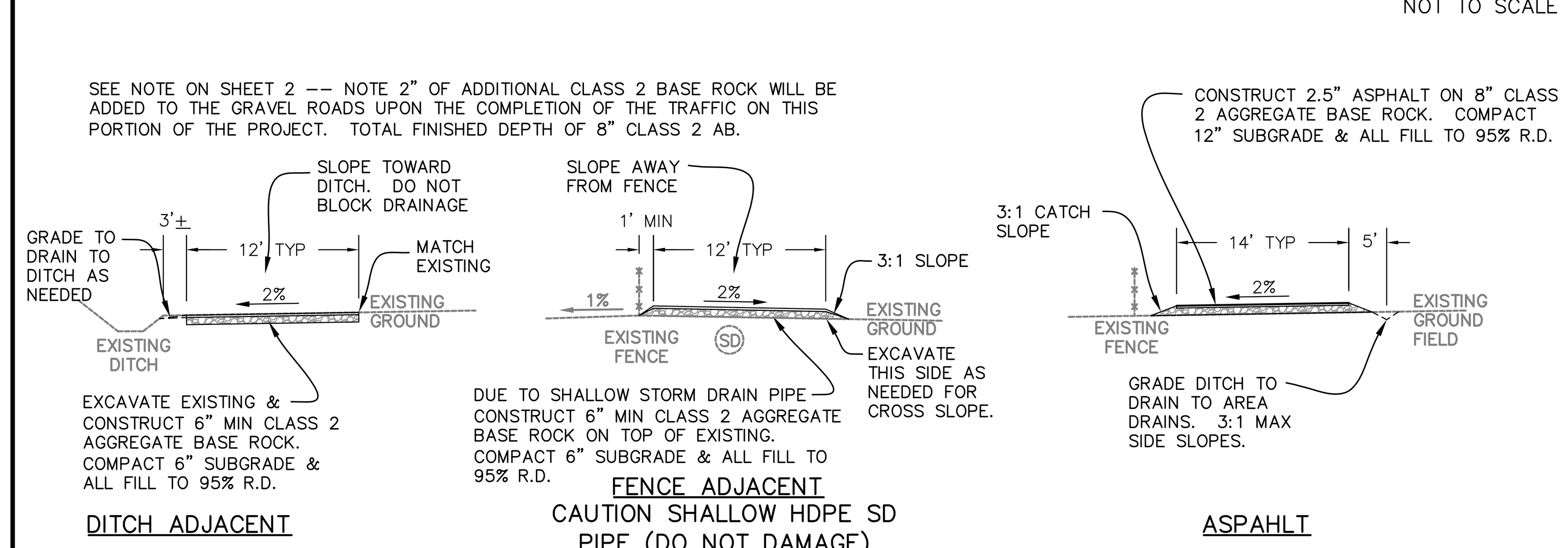
C AZTEC EXTENSION – STA: 19+18.08 TO 20+17.50

NOT TO SCALE



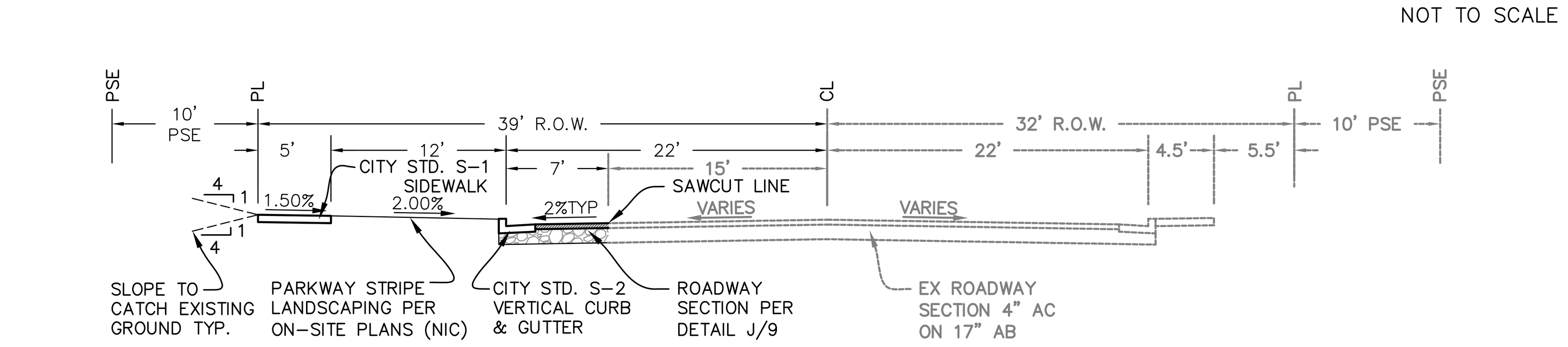
D ALL WEATHER STORM DRAINAGE MAINTENANCE ROAD (TO BE MAINTAINED BY CITY OF CHICO)

NOT TO SCALE


SEE NOTE ON SHEET 2 -- NOTE 2" OF ADDITIONAL CLASS 2 BASE ROCK WILL BE ADDED TO THE GRAVEL ROADS UPON THE COMPLETION OF THE TRAFFIC ON THIS PORTION OF THE PROJECT. TOTAL FINISHED DEPTH OF 8" CLASS 2 AB.
GRADE TO DRAIN TO DITCH AS NEEDED
SLOPE TOWARD DITCH. DO NOT BLOCK DRAINAGE
MATCH EXISTING
EXISTING DITCH
EXISTING GROUND
EXCAVATE EXISTING & CONSTRUCT 6" MIN CLASS 2 AGGREGATE BASE ROCK. COMPACT 6" SUBGRADE & ALL FILL TO 95% R.D.
DITCH ADJACENT
SLOPE AWAY FROM FENCE
1' MIN
12' TYP
3:1 SLOPE
EXISTING FENCE
EXCAVATE THIS SIDE AS NEEDED FOR CROSS SLOPE.
DUE TO SHALLOW STORM DRAIN PIPE CONSTRUCT 6" MIN CLASS 2 AGGREGATE BASE ROCK ON TOP OF EXISTING. COMPACT 6" SUBGRADE & ALL FILL TO 95% R.D.
FENCE ADJACENT
CAUTION SHALLOW HDPE SD PIPE (DO NOT DAMAGE)
CONSTRUCT 2.5" ASPHALT ON 8" CLASS 2 AGGREGATE BASE ROCK. COMPACT 12" SUBGRADE & ALL FILL TO 95% R.D.
3:1 CATCH SLOPE
14' TYP
EXISTING GROUND FIELD
GRADE DITCH TO DRAIN TO AREA DRAINS. 3:1 MAX SIDE SLOPES.
ASPAHLT

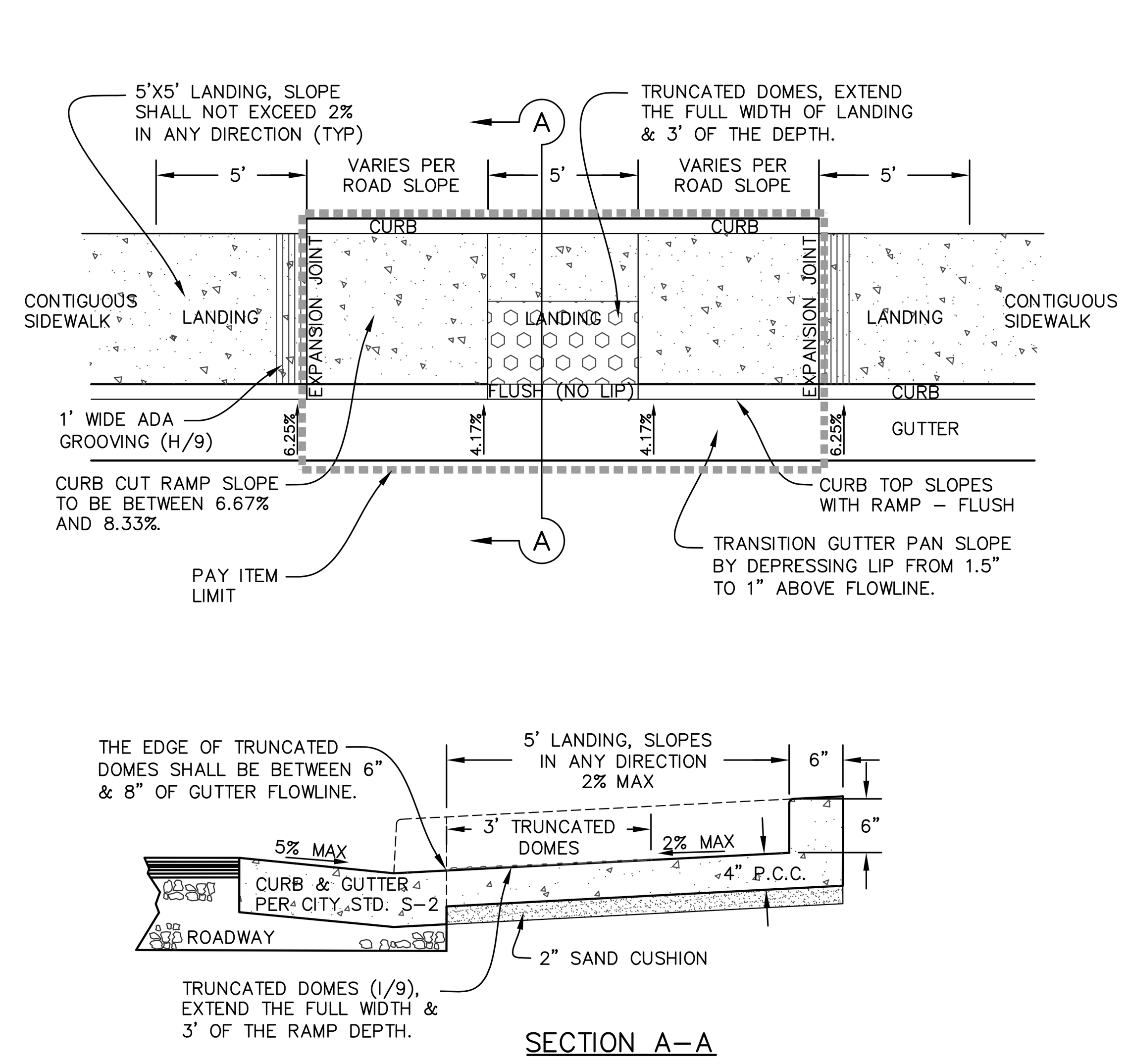
E HUSS LANE – STA: 9+48.85 TO 12+54.40

NOT TO SCALE


PSE
PL
CL
10' PSE
39' R.O.W.
32' R.O.W.
CITY STD. S-1 SIDEWALK
SAWCUT LINE
VARIES
1.50%
2%TYP
SLOPE TO CATCH EXISTING GROUND TYP.
PARKWAY STRIPE LANDSCAPING PER ON-SITE PLANS (NIC)
CITY STD. S-2 VERTICAL CURB & GUTTER
ROADWAY SECTION PER DETAIL J/9
EX ROADWAY SECTION 4" AC ON 17" AB

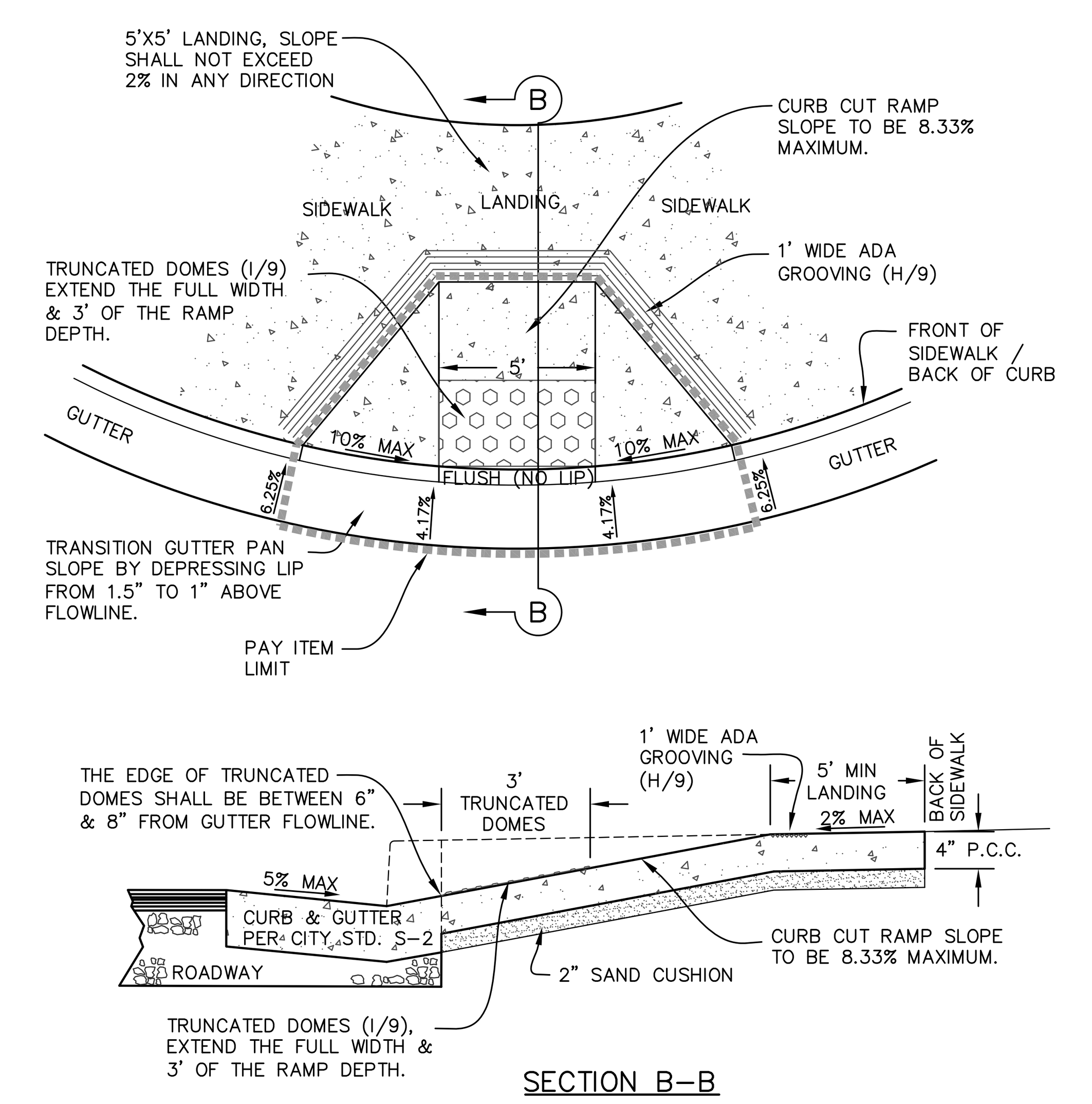
F MODIFIED CITY S-27A PEDESTRIAN RAMP

NOT TO SCALE


5'X5' LANDING, SLOPE SHALL NOT EXCEED 2% IN ANY DIRECTION (TYP)
TRUNCATED DOMES, EXTEND THE FULL WIDTH OF LANDING & 3' OF THE DEPTH.
VARIES PER ROAD SLOPE
CONTIGUOUS SIDEWALK
LANDING
EXPANSION JOINT
CURB
FLUSH (NO LIP)
GUTTER
1' WIDE ADA GROOVING (H/9)
CURB CUT RAMP SLOPE TO BE BETWEEN 6.67% AND 8.33%
CURB TOP SLOPES WITH RAMP - FLUSH
TRANSITION GUTTER PAN SLOPE BY DEPRESSING LIP FROM 1.5" TO 1" ABOVE FLOWLINE.
PAY ITEM LIMIT
THE EDGE OF TRUNCATED DOMES SHALL BE BETWEEN 6" & 8" OF GUTTER FLOWLINE.
5' LANDING, SLOPES IN ANY DIRECTION 2% MAX
3' TRUNCATED DOMES
5% MAX
CURB & GUTTER PER CITY STD. S-2
4" P.C.C.
ROADWAY
2" SAND CUSHION
TRUNCATED DOMES (I/9), EXTEND THE FULL WIDTH & 3' OF THE RAMP DEPTH.
SECTION A–A

G MODIFIED CITY STD. S-27 PEDESTRIAN RAMP

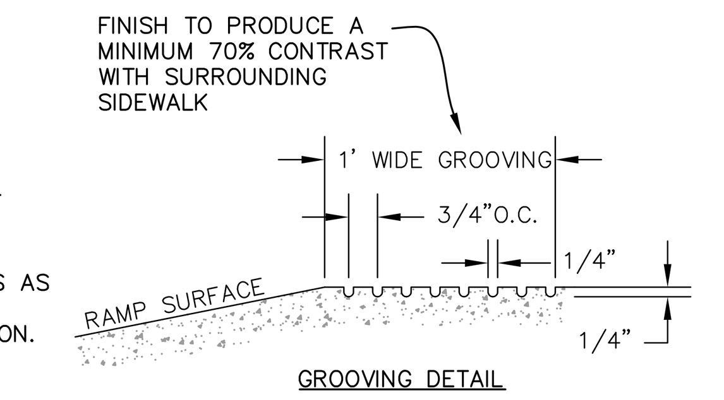
NOT TO SCALE


5'X5' LANDING, SLOPE SHALL NOT EXCEED 2% IN ANY DIRECTION
CURB CUT RAMP SLOPE TO BE 8.33% MAXIMUM.
SIDEWALK
LANDING
TRUNCATED DOMES (I/9) EXTEND THE FULL WIDTH & 3' OF THE RAMP DEPTH.
1' WIDE ADA GROOVING (H/9)
FRONT OF SIDEWALK / BACK OF CURB
GUTTER
10% MAX
FLUSH (NO LIP)
TRANSITION GUTTER PAN SLOPE BY DEPRESSING LIP FROM 1.5" TO 1" ABOVE FLOWLINE.
PAY ITEM LIMIT
THE EDGE OF TRUNCATED DOMES SHALL BE BETWEEN 6" & 8" FROM GUTTER FLOWLINE.
3' TRUNCATED DOMES
1' WIDE ADA GROOVING (H/9)
5' MIN LANDING 2% MAX
BACK OF SIDEWALK
4" P.C.C.
5% MAX
CURB & GUTTER PER CITY STD. S-2
ROADWAY
2" SAND CUSHION
CURB CUT RAMP SLOPE TO BE 8.33% MAXIMUM.
TRUNCATED DOMES (I/9), EXTEND THE FULL WIDTH & 3' OF THE RAMP DEPTH.
SECTION B–B

H TYPICAL TOP OF RAMP ADA GROOVING

NOT TO SCALE

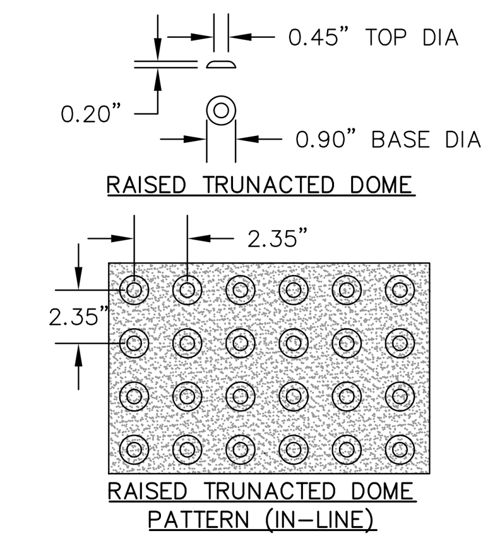
NOTES:
ALONG THE TOP OF THE CONNECTION POINT BETWEEN THE RAMP & SIDEWALK THE CONTRACTOR SHALL CONSTRUCT A 1' WIDE CONTINUOUS STRIPE OF CONTRAST GROOVES AS SHOWN. GROOVES ARE TO BE TOOLED IN CONCRETE NOT SAWCUT AFTER CONSTRUCTION.



GROOVING DETAIL

I TYPICAL TRUNCATED DOMES

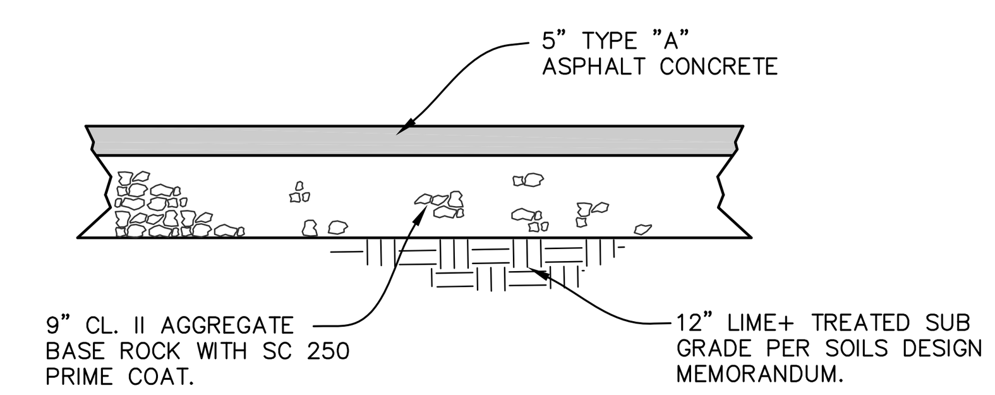
NOT TO SCALE



NOTES:
1. ALL DETECTABLE WARNING SURFACES SHALL BE 3'X5' CAST IN PLACE PREFABRICATED TRUNCATED DOMES. WITH REPLACEABLE SCREW ON TOP SURFACE "HERCULITE SERIES" BY ARMOR-TILE OR APPROVED EQUAL.
2. TRUNCATED DOMES SHALL BE MANUFACTURED OF A HERCULITE POLYMER COMPOSITE.
3. COLOR SHALL BE FEDERAL YELLOW NO. 33538.
4. DOMES TO BE 'IN-LINE', PARALLEL TO CURBING, WITH A HEIGHT OF 0.2", BASE DIAMETER OF 0.9", AND TOP DIAMETER OF 0.45", SPACED AT 2.35" NOMINAL O.C.
5. FIELD SURFACE & TOP OF DOMES TO HAVE A DOTTED TEXTURE FOR SLIP RESISTANCE. DENSITY OF DOTS IN THE FIELD AREA TO BE 30 PER SQUARE INCH MINIMUM.
6. INSTALLATION PER MANUFACTURES SPECIFICATIONS.
7. THE EDGE OF THE DETECTABLE WARNING SURFACE NEAREST THE STREET SHALL BE BETWEEN 6" & 8" FROM THE GUTTER FLOW LINE.

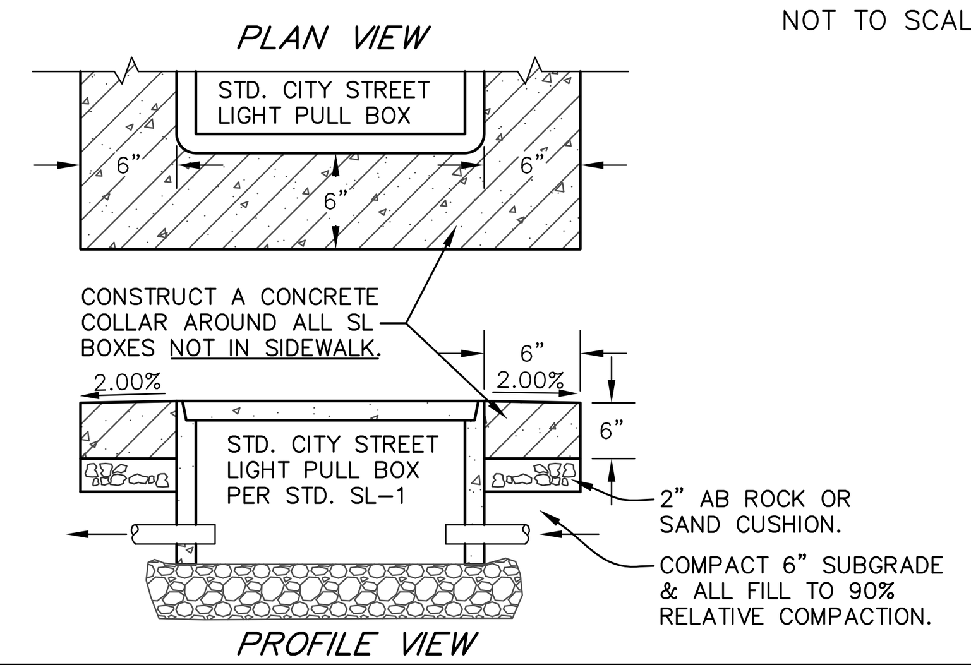
J NEW LIME TREATED PUBLIC ROADWAY SECTION

NOT TO SCALE



K STREET LIGHT PULL BOX (WHEN NO SIDEWALK)

NOT TO SCALE


PLAN VIEW
STD. CITY STREET LIGHT PULL BOX
6"
CONSTRUCT A CONCRETE COLLAR AROUND ALL SL BOXES NOT IN SIDEWALK.
2.00%
STD. CITY STREET LIGHT PULL BOX PER STD. SL-1
2" AB ROCK OR SAND CUSHION.
COMPACT 6" SUBGRADE & ALL FILL TO 90% RELATIVE COMPACTION.
PROFILE VIEW

REQUIRED STREET LIGHT NOTES

1. THE STREETLIGHT CONDUIT RUNS SHALL BE INSTALLED UNDER THE SIDEWALK. STREETLIGHT SERVICE BOXES SHALL BE INSTALLED IN THE SIDEWALK AT THE STREETLIGHT LOCATION.

2. THE CITY OF CHICO ENCOURAGES THE ENGINEER TO HAVE A NOTE PLACED ON THE LANDSCAPE PLANS AS TO THE LOCATION OF THE SL CONDUIT BETWEEN THE SL AND THE SL SERVICE BOX LOCATED IN THE SIDEWALK.

3. A SET OF PG&E JOINT TRENCH PLANS SHOWING SERVICE POINTS, CONDUIT RUNS, AND SL SERVICE BOXES, SHALL BE AVAILABLE TO THE CITY OF CHICO INSPECTOR AT THE TIME OF CONSTRUCTION.

4. WHEN PG&E ENERGIZES THE STREETLIGHTS, THE DEVELOPER SHALL NOTIFY THE CITY'S PROJECT INSPECTOR (879-6999), SO THAT THE MANDATORY 7 DAY BURN-IN PERIOD OF THE SL CAN START.

5. ALL NEW SL SHALL HAVE A PG&E SL NUMBER ASSIGNED. THE SL PG&E NUMBERS ARE TO BE ACQUIRED AND INSTALLED BY THE DEVELOPER AS A PART OF THE SUBDIVISION CONSTRUCTION AND SHOWN ON THE AS-BUILTS. THE MOUNTING LOCATION OF THESE NUMBERS CAN BE FOUND IN THE CITY OF CHICO STD. SL-1 SHT 11. THE INFORMATION FOR THE SIZE, TYPE AND MOUNTING HEIGHT IS SHOWN IN THE PG&E DOCUMENT "IDENTIFICATION OF STREETLIGHT LUMINARIES #01537, DATED 08-29-95.

6. ALL STREET LIGHTS PER CITY STD. SL-1-LED.

POLE: 30' POLE, 6' ARM (ANY POLE OF CALTRANS TYPE 15 OR AMERON N SERIES)
LUMINAIRE: BETA LIGHTING STR-LWY-3M-HT-03-D-UL-SV-525-R-UTL
(TYPE III MEDIUM, HORIZONTAL TENON MOUNTED, 30 LEDs, 120 VOLT, SILVER, 525mA, W/ PHOTO CELL & WATTAGE LABEL) 52 WATT LIGHT.

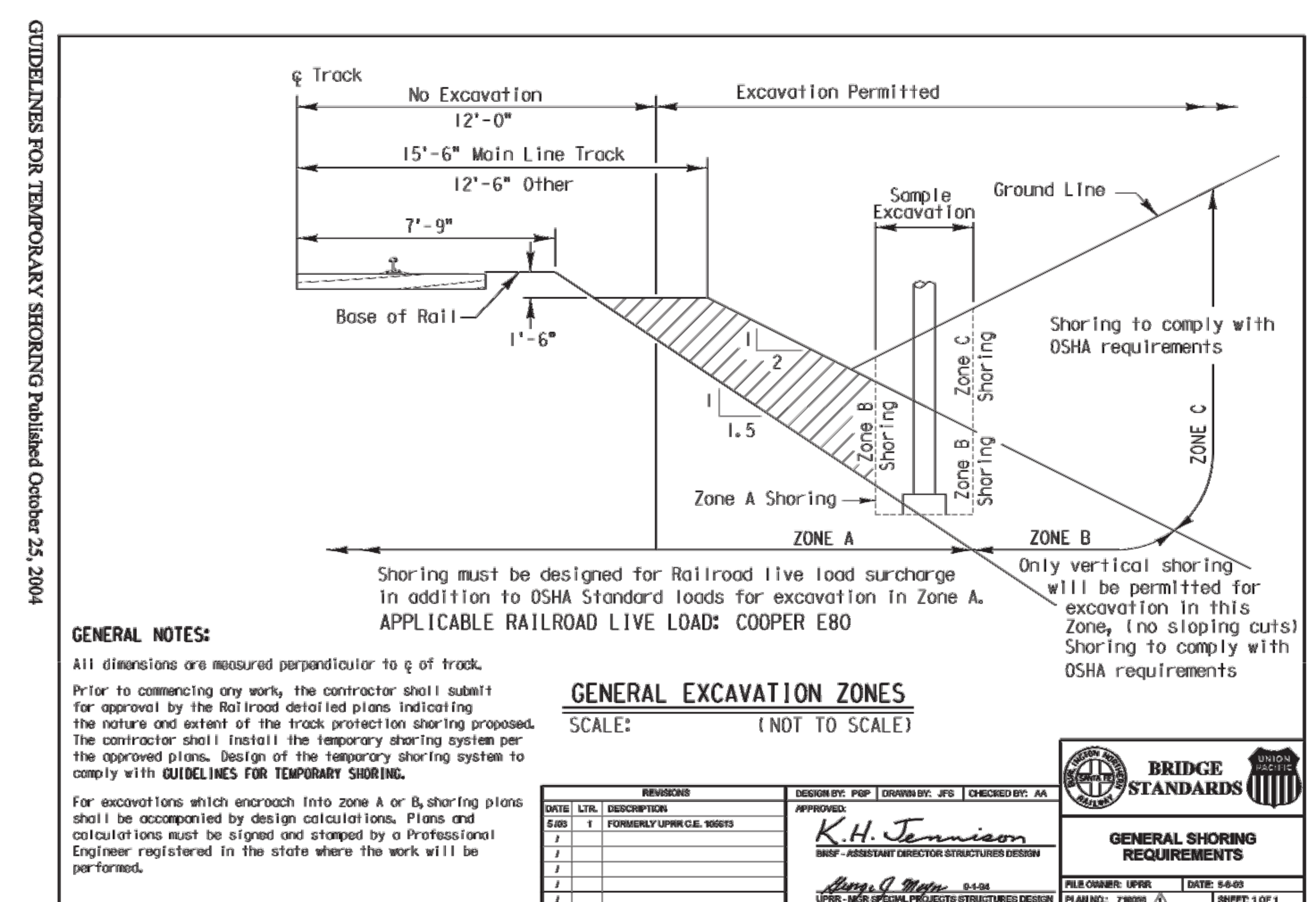

GUIDELINES FOR TEMPORARY SHORING Published October 25, 2004
No Excavation
12'-0"
Excavation Permitted
15'-6" Main Line Track
12'-6" Other
7'-9"
Base of Rail
1'-6"
Sample Excavation
Ground Line
Shoring to comply with OSHA requirements
Zone A Shoring
ZONE A
ZONE B
ZONE C
Shoring must be designed for Railroad live load surcharge in addition to OSHA Standard loads for excavation in Zone A.
APPLICABLE RAILROAD LIVE LOAD: COOPER E80
Only vertical shoring will be permitted for excavation in this Zone, (no sloping cuts) Shoring to comply with OSHA requirements
GENERAL NOTES:
GENERAL EXCAVATION ZONES
SCALE: (NOT TO SCALE)
BRIDGE STANDARDS
GENERAL SHORING REQUIREMENTS
K.H. Jennison

Figure 1

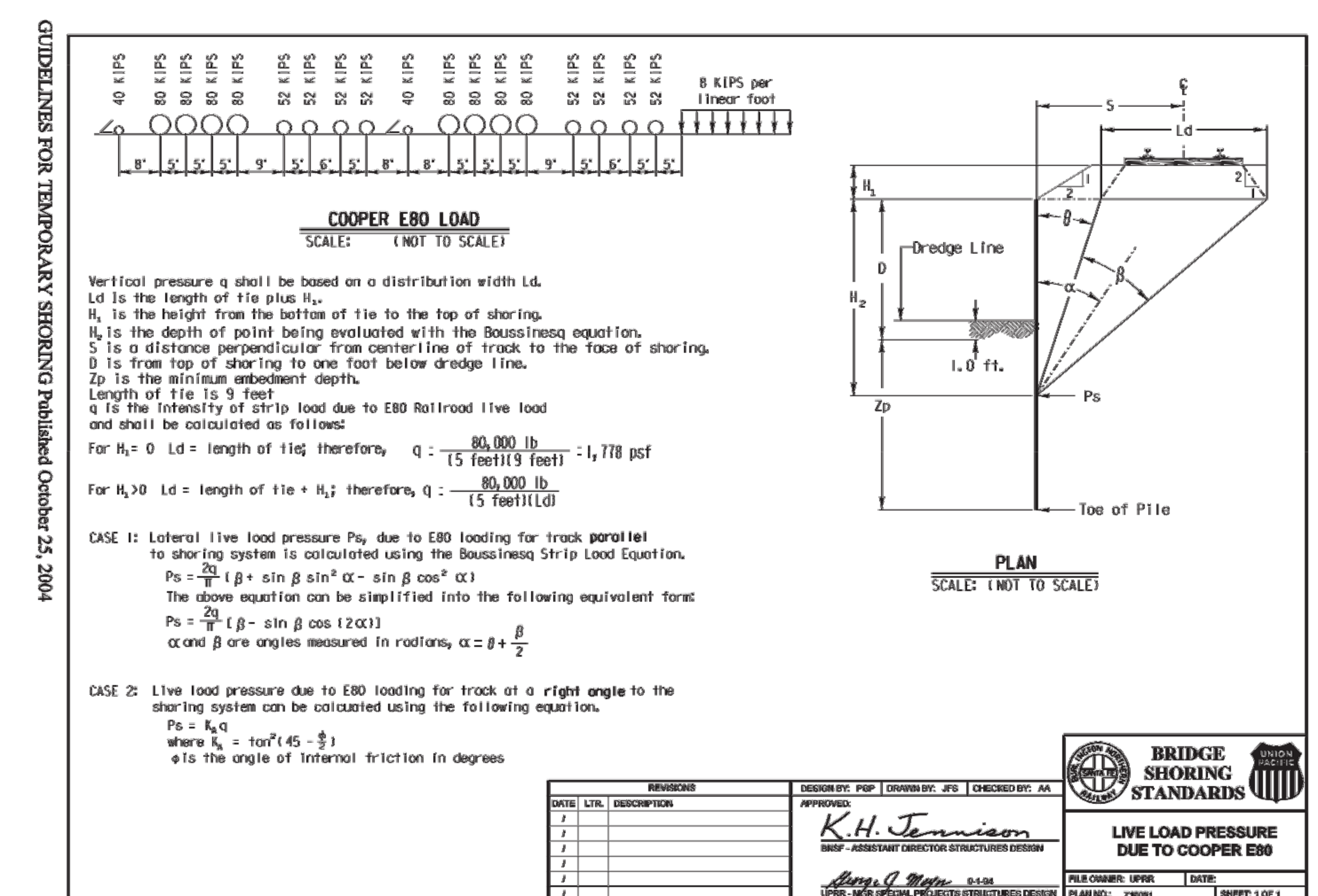
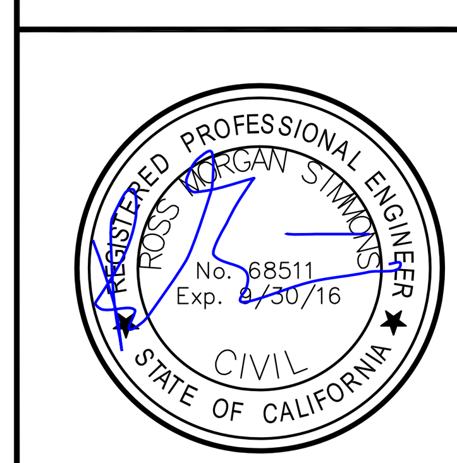


Figure 2



Designed:	RMS	Revision	Date	By
Drawn By:	RMS			
Approved:				
Date:	6-5-14			

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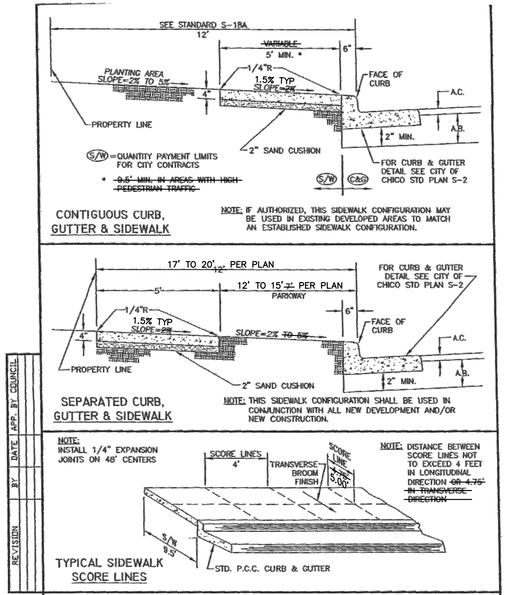
TLCD ARCHITECTURE
HUSS LANE
CHICO, CALIFORNIA

NOTES AND DETAILS
BCAG TRANSIT FACILITY

APN Number	Job Number	Scale	Sheet
NA	11-260	NA Horz. NA Vert.	Sheet 9 Of 10



CONTIGUOUS CURB, GUTTER & SIDEWALK

NOTE: IF AUTHORIZED, THIS SIDEWALK CONFIGURATION MAY BE USED IN EXISTING DEVELOPED AREAS TO MATCH AN ESTABLISHED SIDEWALK CONFIGURATION.

SEPARATED CURB, GUTTER & SIDEWALK

NOTE: THIS SIDEWALK CONFIGURATION SHALL BE USED IN CONJUNCTION WITH ALL NEW DEVELOPMENT AND/OR NEW CONSTRUCTION.

NOTE: INSTALL 1/4" EXPANSION JOINTS ON 48' CENTERS

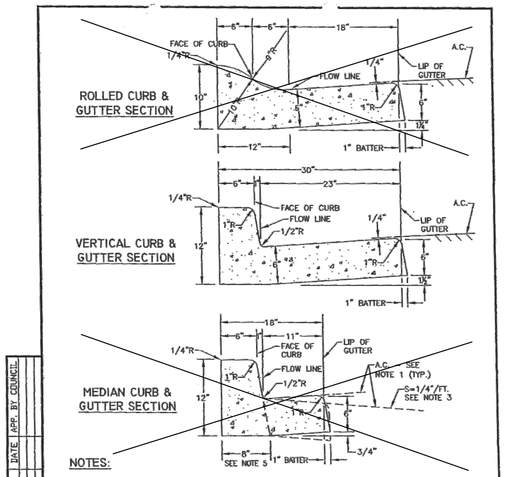
NOTE: DISTANCE BETWEEN SCORE LINES NOT TO EXCEED 4 FEET IN LONGITUDINAL DIRECTION ~~OR 4.75' IN TRANSVERSE DIRECTION~~

TYPICAL SIDEWALK SCORE LINES

REVISION | BY | DATE | APP. BY COUNCIL

CITY OF CHICO		STANDARD PLAN	
DRAWN BY: GL	DATE: 1/05	P.C.C. SIDEWALK DETAILS	NO. S-1
CHECKED BY: MJ	SCALE: NONE		
APPROVED: DIRECTOR OF ENGINEERING			SHEET 1 OF 1

EXHIBIT A



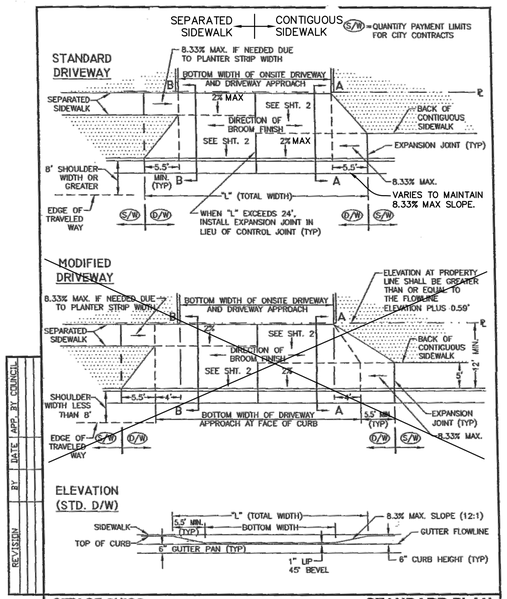
NOTES:

1. A.C. PAVING ADJACENT TO ALL GUTTERS SHALL BE 1/4" ABOVE THE LIP OF GUTTER.
2. INSTALL 1/4" WIDE EXPANSION JOINTS AT 48' MAX. INTERVALS AND 1/8" SCORED CONTROL JOINTS AT 12' MAX. INTERVALS ON ALL CURBS AND GUTTERS.
3. ~~THE DIRECTION OF FALL OF MEDIAN GUTTER CROSS-SLOPES SHALL BE THE SAME AS THE ADJACENT STREET.~~
4. ~~SEE STANDARD S-3 FOR DETAIL OF INSTALLATION OF GUTTER ADJACENT TO EXISTING A.C.~~
5. ~~INSTALL MEDIAN CURB WITHOUT THE GUTTER, UNLESS SPECIFICALLY SHOWN ON IMPROVEMENT PLANS.~~
6. PLACE AGGREGATE BASE UNDER CURB AND GUTTER TO DEPTH OF STRUCTURAL SECTION WITH 2" MINIMUM THICKNESS.

REVISION | BY | DATE | APP. BY COUNCIL

CITY OF CHICO		STANDARD PLAN	
DRAWN BY: GL	DATE: 1/05	P.C.C. CURB AND GUTTER	NO. S-2
CHECKED BY: MJ	SCALE: NONE		
APPROVED: DIRECTOR OF ENGINEERING			SHEET 1 OF 1

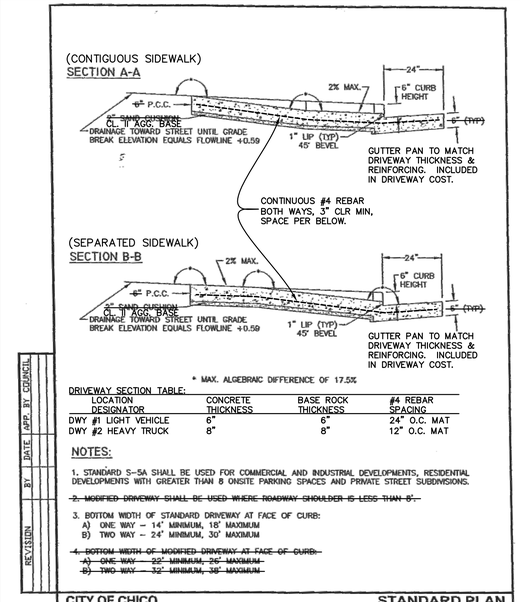
EXHIBIT B



REVISION | BY | DATE | APP. BY COUNCIL

CITY OF CHICO		STANDARD PLAN	
DRAWN BY: GL	DATE: 1/05	COMMERCIAL DRIVEWAY APPROACH	NO. S-5A
CHECKED BY: MJ	SCALE: NONE		
APPROVED: DIRECTOR OF ENGINEERING			SHEET 1 OF 2

EXHIBIT F



* MAX. ALGEBRAIC DIFFERENCE OF 17.5%

DRIVEWAY SECTION TABLE:

LOCATION DESIGNATOR	CONCRETE THICKNESS	BASE ROCK THICKNESS	#4 REBAR SPACING
DWY #1 LIGHT VEHICLE	6"	6"	24" O.C. MAT
DWY #2 HEAVY TRUCK	8"	8"	12" O.C. MAT

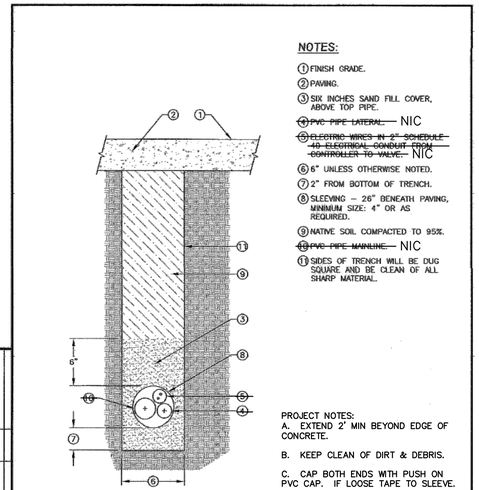
NOTES:

1. STANDARD S-5A SHALL BE USED FOR COMMERCIAL AND INDUSTRIAL DEVELOPMENTS, RESIDENTIAL DEVELOPMENTS WITH GREATER THAN 8 ONSITE PARKING SPACES AND PRIVATE STREET SUBDIVISIONS.
2. ~~MODIFIED DRIVEWAY SHALL BE USED WHERE ROADWAY SHOULDER IS LESS THAN 8'.~~
3. BOTTOM WIDTH OF STANDARD DRIVEWAY AT FACE OF CURB:
   A) ONE WAY – 14' MINIMUM, 18' MAXIMUM
   B) TWO WAY – 24' MINIMUM, 30' MAXIMUM
4. ~~BOTTOM WIDTH OF MODIFIED DRIVEWAY AT FACE OF CURB:~~
   ~~A) ONE WAY – 22' MINIMUM, 26' MAXIMUM~~
   ~~B) TWO WAY – 32' MINIMUM, 38' MAXIMUM~~

REVISION | BY | DATE | APP. BY COUNCIL

CITY OF CHICO		STANDARD PLAN	
DRAWN BY: GL	DATE: 1/05	COMMERCIAL DRIVEWAY APPROACH	NO. S-5A
CHECKED BY: MJ	SCALE: NONE		
APPROVED: DIRECTOR OF ENGINEERING			SHEET 2 OF 2

EXHIBIT F-

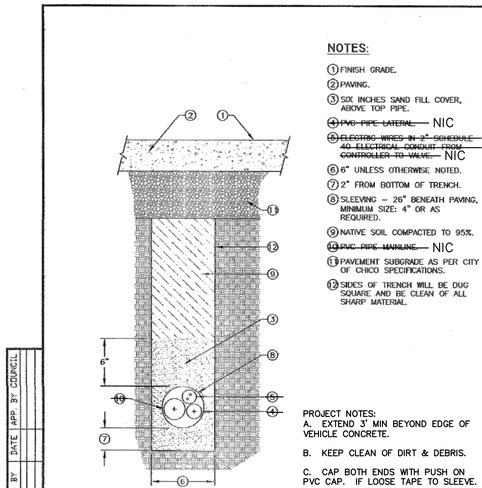


SECTION VIEW

PROJECT NOTES:
A. EXTEND 2' MIN BEYOND EDGE OF CONCRETE.
B. KEEP CLEAN OF DIRT & DEBRIS.
C. CAP BOTH ENDS WITH PUSH ON PVC CAP. IF LOOSE TAPE TO SLEEVE.
D. MARK ENDS BY SETTING ¾" PVC PIPE VERTICALLY AT BOTH ENDS EXTENDING A MINIMUM OF 1' ABOVE FINISHED GRADE.

REVISION | BY | DATE | APP. BY COUNCIL

CITY OF CHICO		STANDARD PLAN	
DRAWN BY: GL	DATE: 10/06	TRENCHING DETAIL BENEATH PAVING (NON-VEHICULAR)	NO. LS-14
CHECKED BY: DB	SCALE: NONE		
APPROVED: DIRECTOR OF ENGINEERING			SHEET 2 OF 3

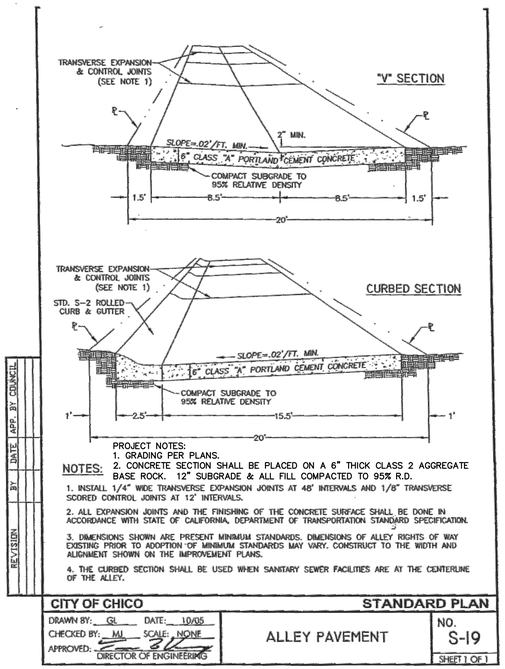


SECTION VIEW

PROJECT NOTES:
A. EXTEND 3' MIN BEYOND EDGE OF VEHICLE CONCRETE.
B. KEEP CLEAN OF DIRT & DEBRIS.
C. CAP BOTH ENDS WITH PUSH ON PVC CAP. IF LOOSE TAPE TO SLEEVE.
D. MARK ENDS BY SETTING ¾" PVC PIPE VERTICALLY AT BOTH ENDS EXTENDING A MINIMUM OF 1' ABOVE FINISHED GRADE.

REVISION | BY | DATE | APP. BY COUNCIL

CITY OF CHICO		STANDARD PLAN	
DRAWN BY: GL	DATE: 10/06	TRENCHING DETAIL BENEATH PAVING (VEHICULAR)	NO. LS-14
CHECKED BY: DB	SCALE: NONE		
APPROVED: DIRECTOR OF ENGINEERING			SHEET 3 OF 3



PROJECT NOTES:
1. GRADING PER PLANS.
2. CONCRETE SECTION SHALL BE PLACED ON A 6" THICK CLASS 2 AGGREGATE BASE ROCK. 12" SUBGRADE & ALL FILL COMPACTED TO 95% R.D.

NOTES:

1. INSTALL 1/4" WIDE TRANSVERSE EXPANSION JOINTS AT 48' INTERVALS AND 1/8" TRANSVERSE SCORED CONTROL JOINTS AT 12' INTERVALS.
2. ALL EXPANSION JOINTS AND THE FINISHING OF THE CONCRETE SURFACE SHALL BE DONE IN ACCORDANCE WITH STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION.
3. DIMENSIONS SHOWN ARE PRESENT MINIMUM STANDARDS. DIMENSIONS OF ALLEY RIGHTS OF WAY EXISTING PRIOR TO ADOPTION OF MINIMUM STANDARDS MAY VARY. CONSTRUCT TO THE WIDTH AND ALIGNMENT SHOWN ON THE IMPROVEMENT PLANS.
4. THE CURBED SECTION SHALL BE USED WHEN SANITARY SEWER FACILITIES ARE AT THE CENTERLINE OF THE ALLEY.

REVISION | BY | DATE | APP. BY COUNCIL

CITY OF CHICO		STANDARD PLAN	
DRAWN BY: GL	DATE: 10/05	ALLEY PAVEMENT	NO. S-19
CHECKED BY: MJ	SCALE: NONE		
APPROVED: DIRECTOR OF ENGINEERING			SHEET 1 OF 1

EXHIBIT BB

REGISTERED PROFESSIONAL ENGINEER — ROBERT MORGAN SIMMONS — No. 68511 — Exp. 6/30/16 — CIVIL — STATE OF CALIFORNIA

Designed:	RMS
Drawn By:	RMS
Approved:	
Date:	6-5-14

Revision	Date	By

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Chico, California

111 MISSION RANCH BLVD., SUITE 100
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PHONE: (530) 893-1600 FAX: (530) 893-2113
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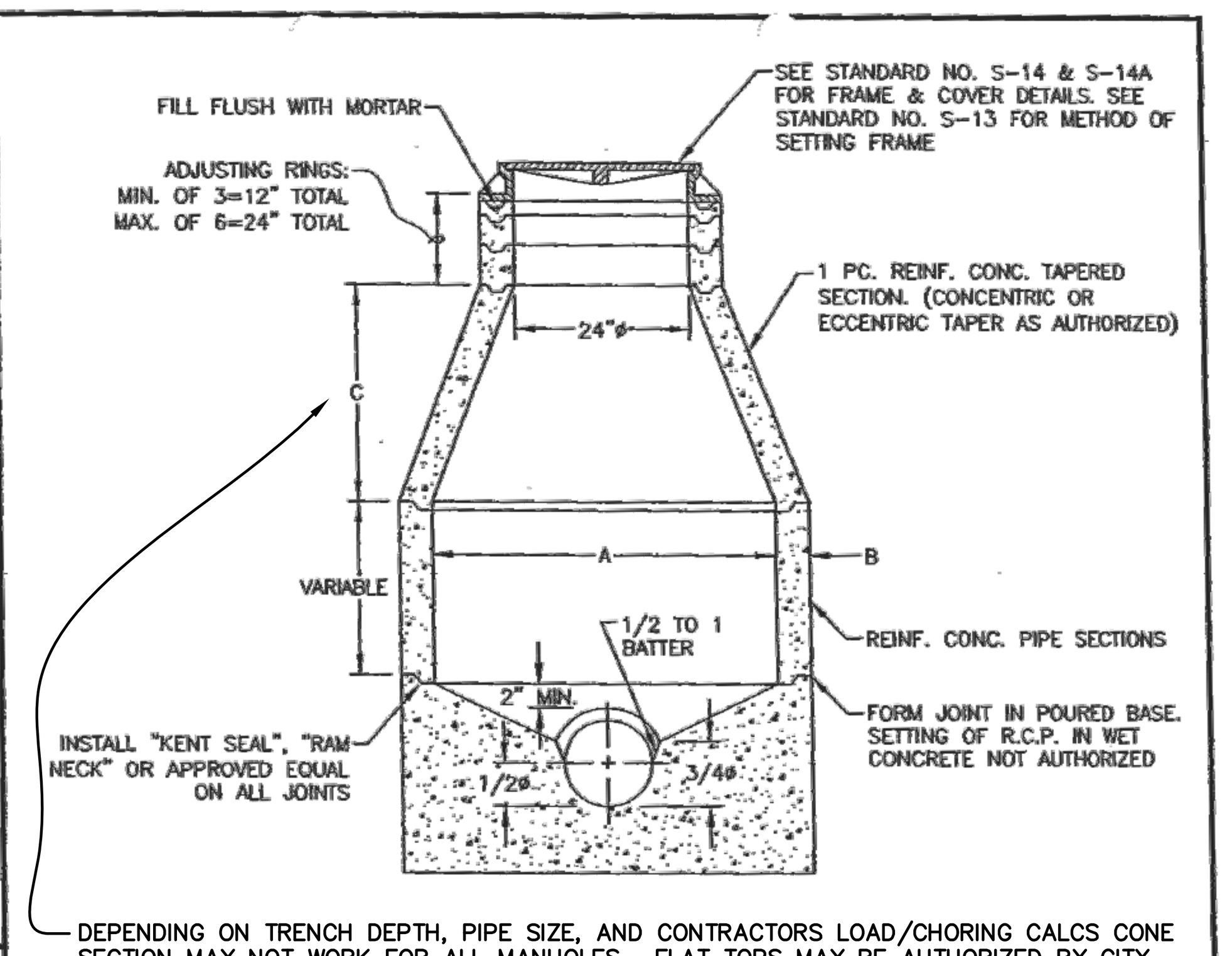
CITY STD. DETAILS-1
BCAG TRANSIT FACILITY

APN Number	Job Number	Scale	Sheet
NA	11-260	NA Horz. NA Vert.	Sheet 10 Of 12



DEPENDING ON TRENCH DEPTH, PIPE SIZE, AND CONTRACTORS LOAD/CHORING CALCS CONE SECTION MAY NOT WORK FOR ALL MANHOLES. FLAT TOPS MAY BE AUTHORIZED BY CITY OF CHICO. NO ADJUSTMENT IN PAYMENT TO THE CONTRACTOR WILL BE ALLOWED.

THE MANHOLE BASE SHALL BE:

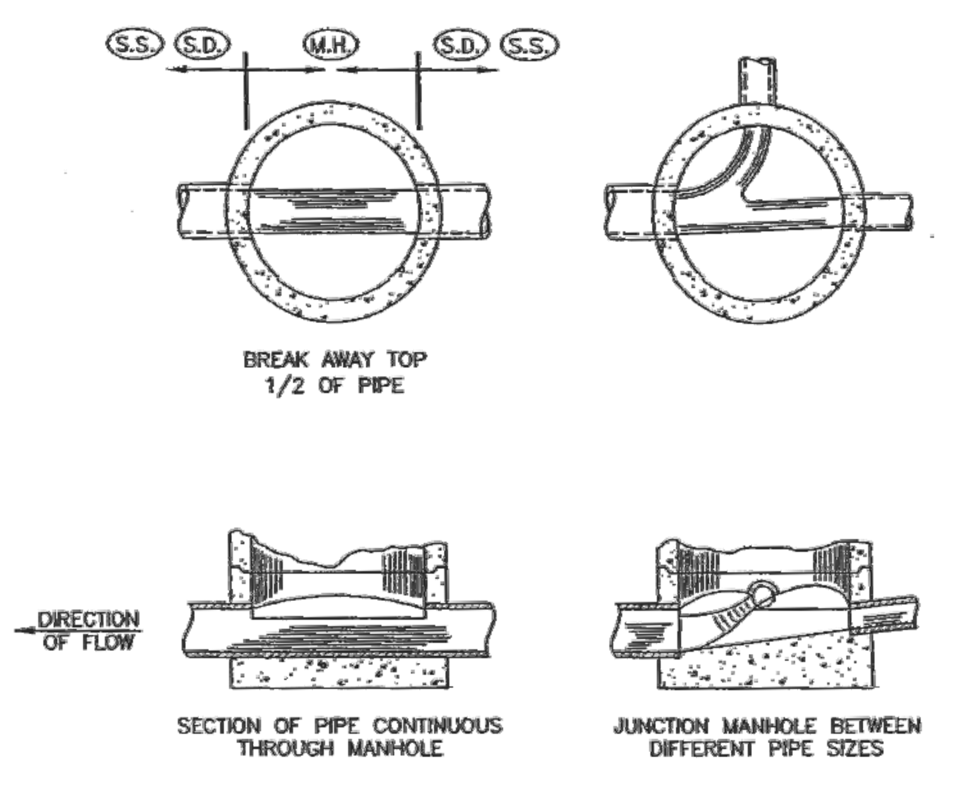
1. CLASS B CONCRETE POURED AGAINST UNDISTURBED EARTH, OR:
2. A PRECAST BASE WITH GASKETED JOINTS, PLACED ON 6" MINIMUM A.B., COMPACTED TO 95% RELATIVE DENSITY.

A	B	C	NOTES
~~M.H. DIA. 36"~~	~~3½"~~	12"	~~MANHOLE FOR CONNECTION OF PRIVATE LINE TO PUBLIC MAIN WHEN SHOWN ON PLANS.~~
M.H. DIA. 48"	4"	30"	MANHOLE SHALL BE USED ~~UNLESS~~ FOR SEWER ~~OTHERWISE SPECIFIED.~~
* M.H. DIA. 60"	–	–	DIMENSIONS IN ACCORDANCE WITH A.S.T.M. C-478-70 AS AMENDED.

*ALL STORM DRAIN MANHOLES SHALL BE 60" DIA OR LAGER AS REQUIRED FOR PIPE SIZES SHOWN. CONTRACTOR TO CONFIRM AND SUPPLY NEEDED SIZES BASED ON PIPING. NO PAYMENT ADJUSTMENT ALLOWED FOR INCREASED SIZE.

CITY OF CHICO — STANDARD PLAN
DRAWN BY: GL DATE: 10/05
CHECKED BY: MJ SCALE: NONE
APPROVED: DIRECTOR OF ENGINEERING
STORM DRAIN AND SANITARY SEWER MANHOLE
NO. S-10 — SHEET 1 OF 2

EXHIBIT L

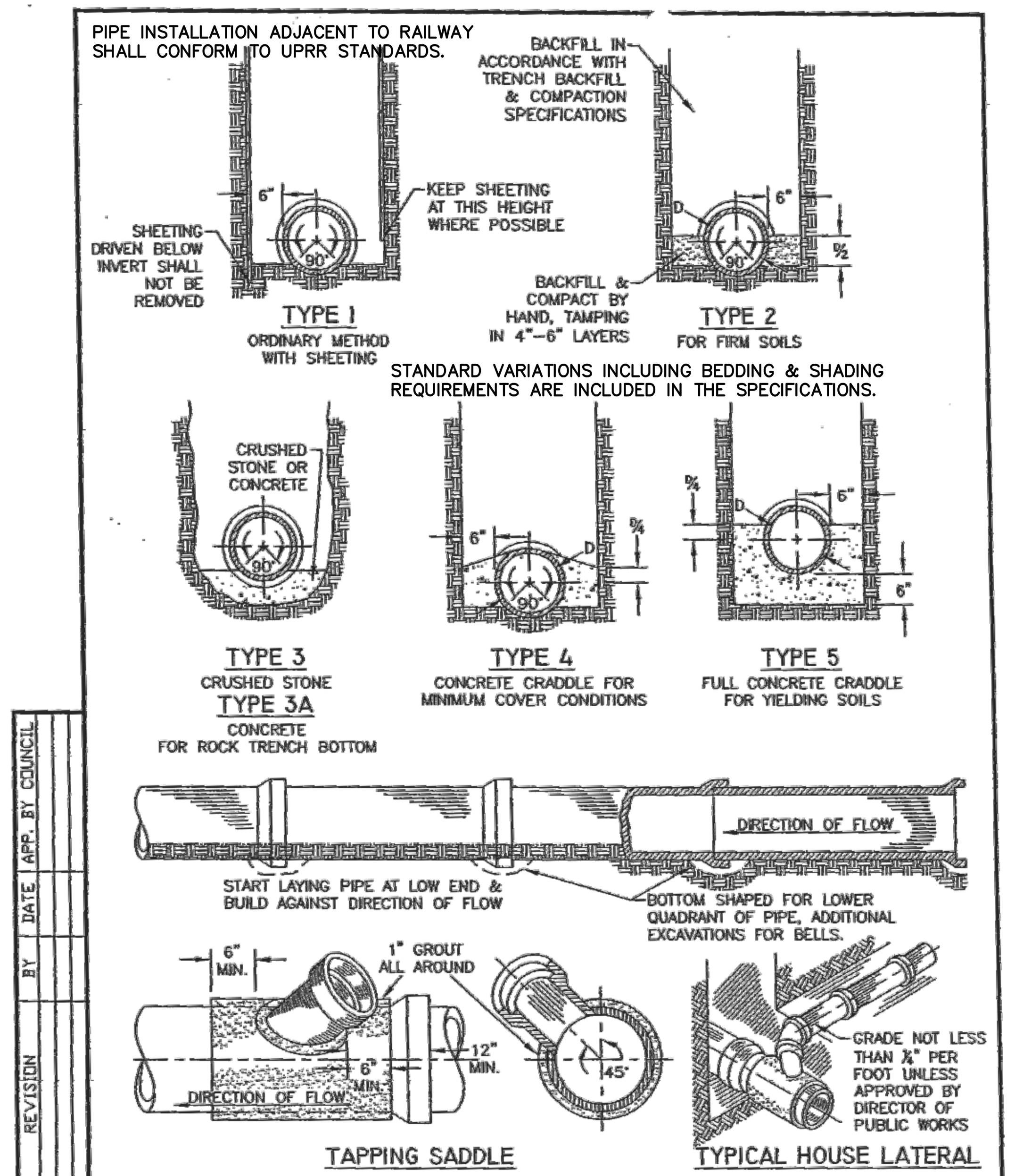


SHAPING BOTTOM OF MANHOLE

(S.D.) = QUANTITY PAYMENT LIMITS FOR CITY CONTRACTS

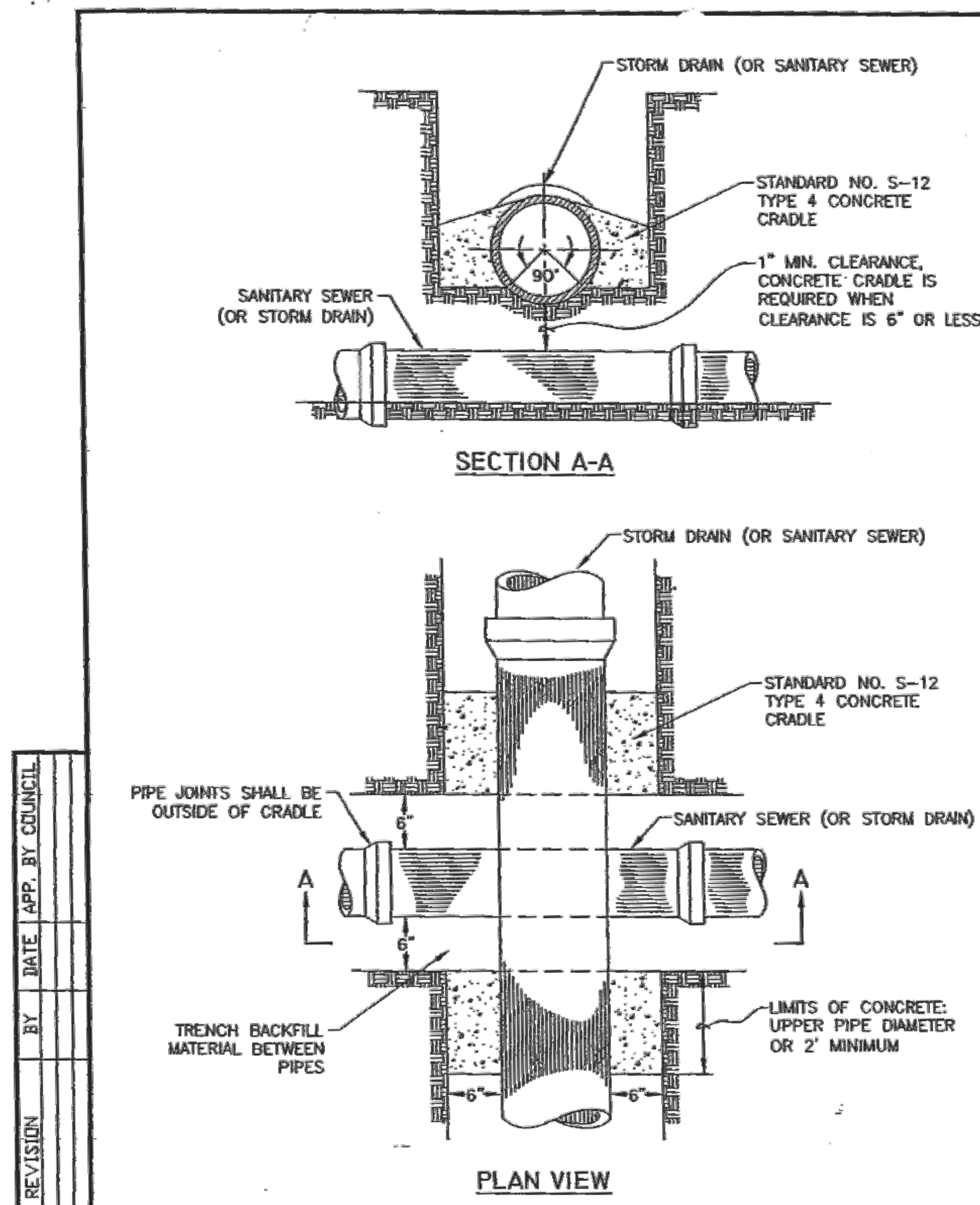
CITY OF CHICO — STANDARD PLAN
DRAWN BY: GL DATE: 1/05
CHECKED BY: MJ SCALE: NONE
APPROVED: DIRECTOR OF ENGINEERING
STORM DRAIN AND SANITARY SEWER MANHOLE
NO. S-10 — SHEET 2 OF 2

EXHIBIT L



CITY OF CHICO — STANDARD PLAN
DRAWN BY: GL DATE: 1/05
CHECKED BY: MJ SCALE: NONE
APPROVED: DIRECTOR OF ENGINEERING
APPROVED METHODS OF LAYING PIPE
NO. S-12 — SHEET 1 OF 1

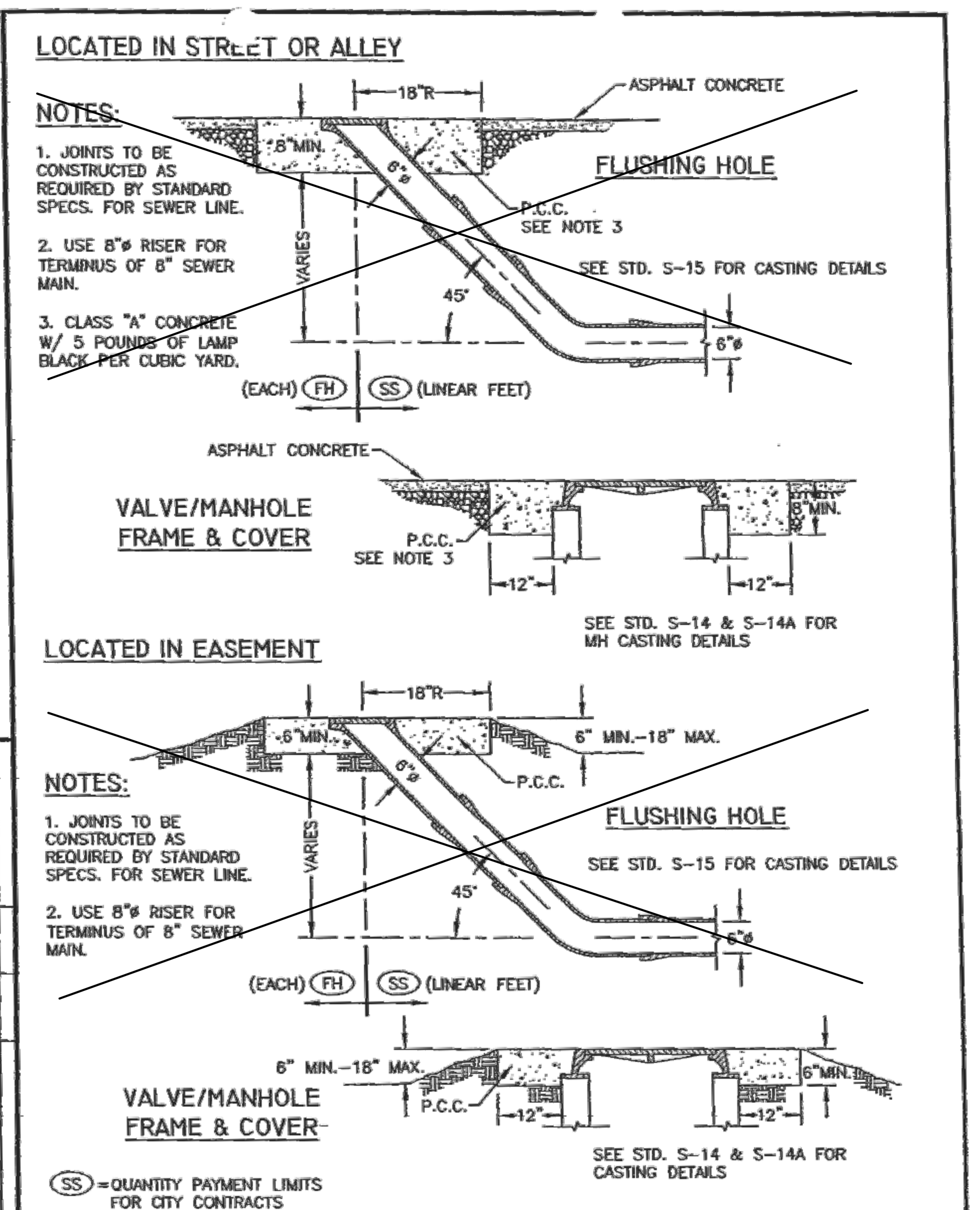
EXHIBIT N



PAYMENT FOR ANY PIPE CROSSING CRADLE TO BE INCLUDED IN PIPE PAY ITEM. NO ADDITIONAL COST ALLOWED.

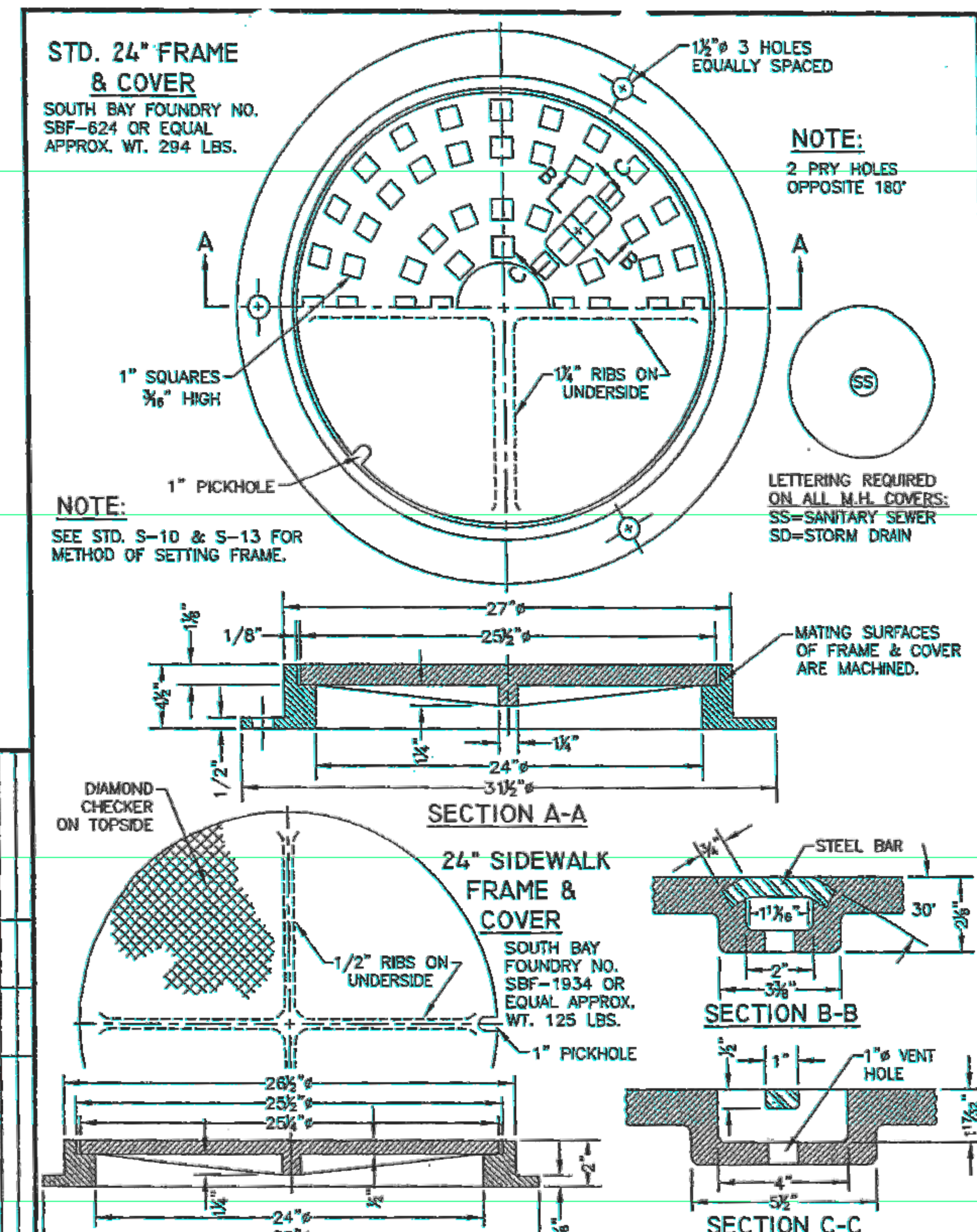
CITY OF CHICO — STANDARD PLAN
DRAWN BY: GL DATE: 1/05
CHECKED BY: MJ SCALE: NONE
APPROVED: DIRECTOR OF ENGINEERING
PIPE CROSSING CRADLE
NO. S-12A — SHEET 1 OF 1

EXHIBIT O



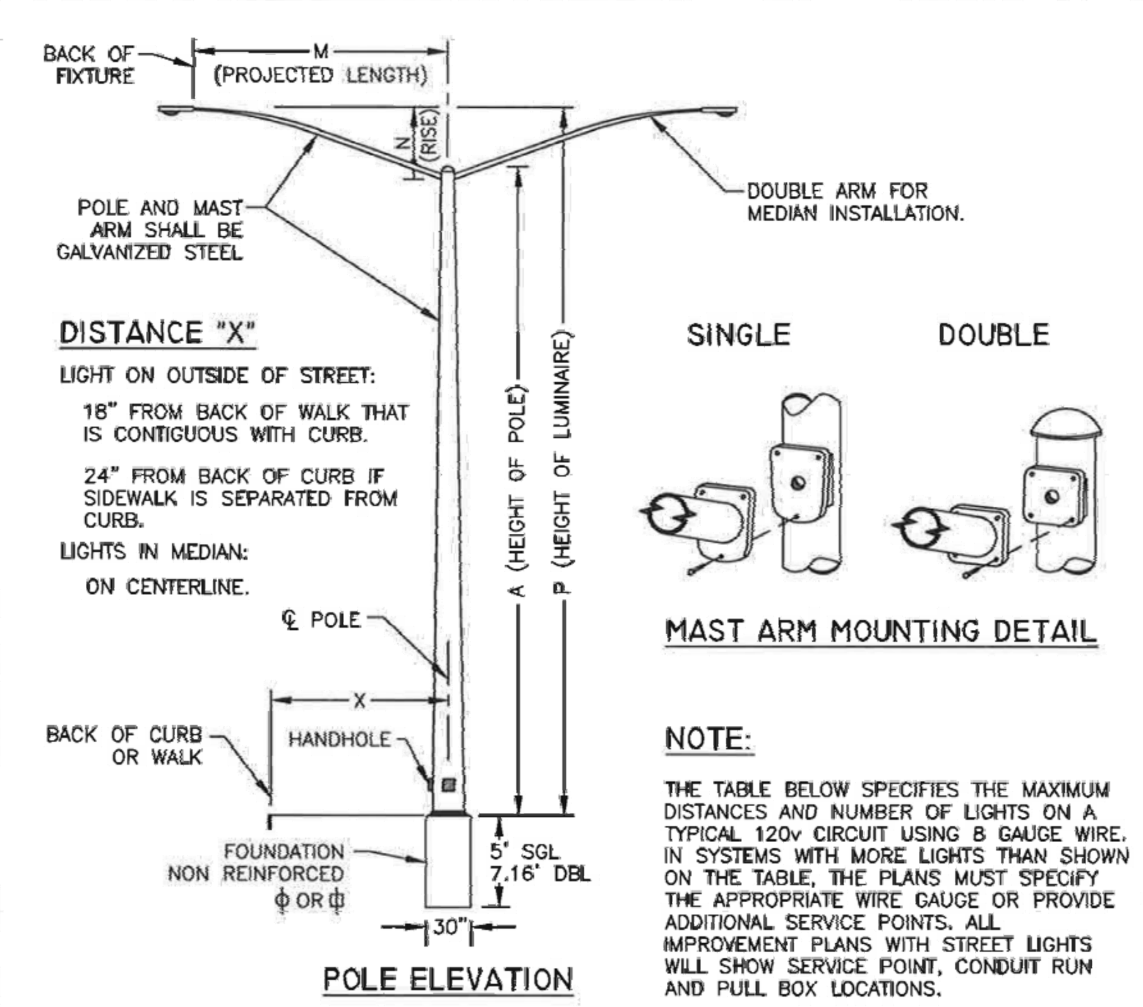
CITY OF CHICO — STANDARD PLAN
DRAWN BY: GL DATE: 1/05
CHECKED BY: MJ SCALE: NONE
APPROVED: DIRECTOR OF ENGINEERING
TYPICAL METHOD FOR SETTING APPURTENANCES
NO. S-13 — SHEET 1 OF 1

EXHIBIT Q



CITY OF CHICO — STANDARD PLAN
DRAWN BY: GL DATE: 1/05
CHECKED BY: MJ SCALE: NONE
APPROVED: DIRECTOR OF ENGINEERING
MANHOLE FRAME & COVER DETAILS
NO. S-14 — SHEET 1 OF 1

EXHIBIT R

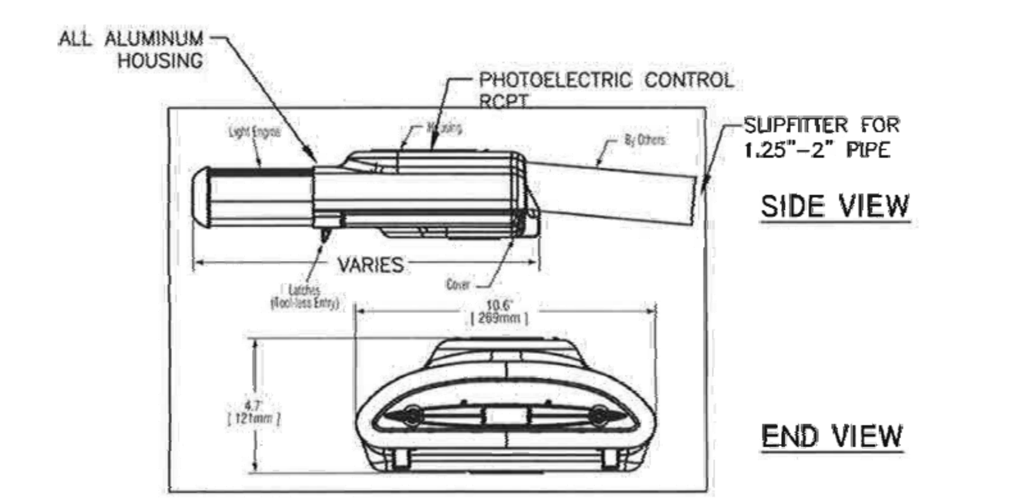


NOTE:

THE TABLE BELOW SPECIFIES THE MAXIMUM DISTANCES AND NUMBER OF LIGHTS ON A TYPICAL 120v CIRCUIT USING 8 GAUGE WIRE. IN SYSTEMS WITH MORE LIGHTS THAN SHOWN ON THE TABLE, THE PLANS MUST SPECIFY THE APPROPRIATE WIRE GAUGE OR PROVIDE ADDITIONAL SERVICE POINTS. ALL IMPROVEMENT PLANS WITH STREET LIGHTS WILL SHOW SERVICE POINT, CONDUIT RUN AND PULL BOX LOCATIONS.

STREET WIDTH	# LEDS	MAXIMUM SPACING (SEE NOTE 11, SL-5)	MAXIMUM DISTANCE FROM SERVICE	MAXIMUM LIGHTS PER SERVICE	P	M	A	N
20' – 44'	30	170'	2100'	14	31.5'	6'	30'	2'
~~60' – 68'~~	~~60~~	~~220'~~	~~900'~~	~~9~~	~~33.75'~~	~~12'~~	~~30'~~	~~4.25'~~
~~74' – 80' LIGHTS IN MEDIAN~~	~~2–80~~	~~160'~~	~~1400'~~	~~9~~	~~33.75'~~	~~12'~~	~~30'~~	~~4.25'~~

CITY OF CHICO — STANDARD PLAN
DRAWN BY: WW DATE: 8/2010
CHECKED BY: TV SCALE: NONE
APPROVED: CPSD DIRECTOR
MAJOR ROADWAY STREET LIGHTS - LED HEAD POLE AND MAST ARM DETAIL
NO. SL-I LED — SHEET 1 OF 3



NOTE:

ALL LUMINAIRES WILL BE LED ROADWAY TYPE. ALL LUMINAIRES WILL BE INSTALLED WITH OPERATIONAL PHOTOCELL. PHOTOCELL WILL BE INSTALLED WITH SENSOR FACING NORTH. LUMINAIRES SHALL OPERATE AT 120 VOLTS UNLESS SPECIFIED OR APPROVED OTHER. LUMINAIRES SHALL BE FULL CUTOFF TYPE. ANY CHANGES MUST BE APPROVED BY CITY ENGINEER. STREET LIGHTING FIXTURES SHALL BE LED TYPE UNLESS SPECIFIED ON PLAN. LED DRIVERS SHALL HAVE A POWER FACTOR OF GREATER THAN 90%, OPERATE AT 6000K COLOR TEMPERATURE, HAVE AN INTEGRAL 9KV SURGE SUPPRESSION PROTECTION CIRCUIT AND A MINIMUM 70 CRI. OPERATE AT 525MA WITH A QUICK DISCONNECT HARNESS SUITABLE FOR MATE AND BREAK UNDER LOAD PROVIDED ON POWER FEED DRIVER FOR EASE OF MAINTENANCE. ALL FIXTURES SHALL CARRY A MINIMUM OF A 5 YEAR MANUFACTURER WARRANTY.

APPROVED MATERIALS FOR POLES AND LUMINAIRES

POLES	LUMINAIRES
AMERON N SERIES	BETA LIGHTING SRT-LWY TYPE III HORIZONTAL TENNON 20-90 LEDS
ANY POLE OF CALTRANS TYPE 15	BETA LIGHTING SLM-LWY (FUTURE) TYPE III HORIZONTAL TENNON 20-90 LEDS

CITY OF CHICO — STANDARD PLAN
DRAWN BY: WW DATE: 8/10
CHECKED BY: TV SCALE: NONE
APPROVED: CPSD DIRECTOR
MAJOR ROADWAY STREET LIGHTS - LED HEAD LUMINAIRE DETAIL
NO. SL-ILED — SHEET 2 OF 3

REVISION | BY | DATE | APP. BY COUNCIL

Designed:	RMS	Revision	Date / By
Drawn By:	RMS		
Approved:			
Date:	6-5-14		

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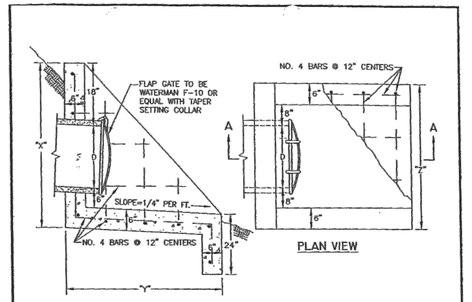
CITY STD. DETAILS-2
BCAG TRANSIT FACILITY

APN Number	Job Number	Scale		Sheet
NA	11-260	NA Horz.	NA Vert.	Sheet 11 Of 12



SECTION A-A

PIPE DIAMETER	HEADWALL WIDTH	VARIABLE DIMENSIONS					
		SLOPE = 1:1		SLOPE = 1.5:1		SLOPE = 2:1	
D	"Z"	"X"	"Y"	"X"	"Y"	"X"	"Y"
	D+2'-4"	D+2'-6"	D+2'-6"	D+2'-6"	1.5(D+2'-6")	D+2'-6"	2(D+2'-6")
8"	3'-0"	3'-2"	3'-2"	3'-2"	4'-9"	3'-2"	5'-4"
10"	3'-2"	3'-4"	3'-4"	3'-4"	5'-0"	3'-4"	6'-8"
12"	3'-4"	3'-6"	3'-6"	3'-6"	5'-3"	3'-6"	7'-0"
15"	3'-7"	3'-9"	3'-9"	3'-9"	5'-7½"	3'-9"	7'-6"
18"	3'-10"	4'-0"	4'-0"	4'-0"	6'-0"	4'-0"	8'-0"
21"	4'-1"	4'-3"	4'-3"	4'-3"	6'-4½"	4'-3"	8'-6"
24"	4'-4"	4'-6"	4'-6"	4'-6"	6'-9"	4'-6"	9'-0"
27"	4'-7"	4'-9"	4'-9"	4'-9"	7'-1½"	4'-9"	9'-6"
30"	4'-10"	5'-0"	5'-0"	5'-0"	7'-6"	5'-0"	10'-0"
36"	5'-4"	5'-6"	5'-6"	5'-6"	8'-3"	5'-6"	11'-0"
42"	5'-10"	6'-0"	6'-0"	6'-0"	9'-0"	6'-0"	12'-0"
48"	6'-4"	6'-6"	6'-6"				

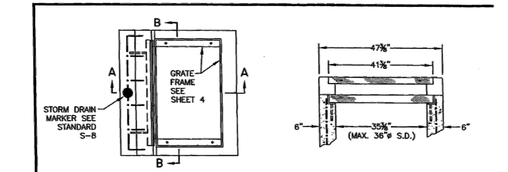
REVISION | BY | DATE | APP. BY COUNCIL

CITY OF CHICO — STANDARD PLAN

DRAWN BY: GL DATE: 10/05
CHECKED BY: MJ SCALE: NONE
APPROVED: DIRECTOR OF ENGINEERING

STORM DRAIN HEADWALL — NO. S-6 — SHEET 1 OF 1

EXHIBIT I



S-7 MODIFIED:
WHERE NOTED "MODIFIED" (D#3 & #5) UPSIZE SD BOX IN THE DIRECTION OF THE SIDEWALK TO ACCOMMODATE LARGER PIPE SIZES. GUTTER PAN & GRATE TO REMAIN UNCHANGED. SUBMIT SHOP DRAWINGS TO CITY OF CHICO FOR APPROVAL.

NOTES:

1. WALL THICKNESS SHALL BE 8" WHEN DEPTH OF D.I. IS GREATER THAN 8'.
2. PIPES CAN BE PLACED IN ANY WALL.
3. SEE SHEET 2 OF 4 FOR D.I. CUT AWAY VIEW.
4. SEE SHEETS 3 & 4 FOR GRATE & FRAME DETAILS.
5. CAST-IN-PLACE OR PRECAST ALTERNATIVE IS OPTIONAL WITH CONTRACTOR; SEE STANDARD SPECS.
6. AT CONTRACTOR'S OPTION, 60" TRANSITIONS & D.I. TOP MAY BE MONOLITHIC POUR.

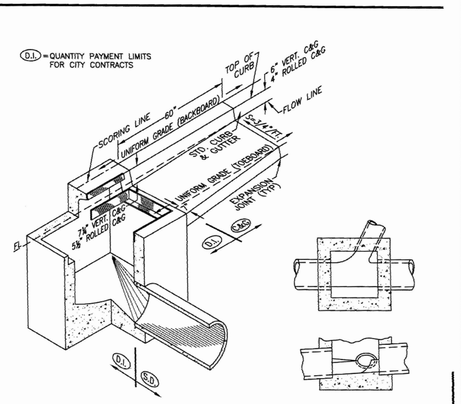
REVISION | BY | DATE | APP. BY COUNCIL

CITY OF CHICO — STANDARD PLAN

DRAWN BY: GL DATE: 8/09
CHECKED BY: MT SCALE: NONE
APPROVED: CPSD DIRECTOR

36" DROP INLET (CAL - TRANS "G-0") — NO. S-7 — SHEET 1 OF 4

EXHIBIT A



NOTES:

1. WALL THICKNESS SHALL BE 8" WHEN DEPTH OF D.I. IS GREATER THAN 8'.
2. PIPES CAN BE PLACED IN ANY WALL.
3. SEE SHEET 2 OF 4 FOR D.I. CUT AWAY VIEW.
4. SEE SHEETS 3 & 4 FOR GRATE & FRAME DETAILS.
5. CAST-IN-PLACE OR PRECAST ALTERNATIVE IS OPTIONAL WITH CONTRACTOR; SEE STANDARD SPECS.
6. AT CONTRACTOR'S OPTION, 60" TRANSITIONS & D.I. TOP MAY BE MONOLITHIC POUR.

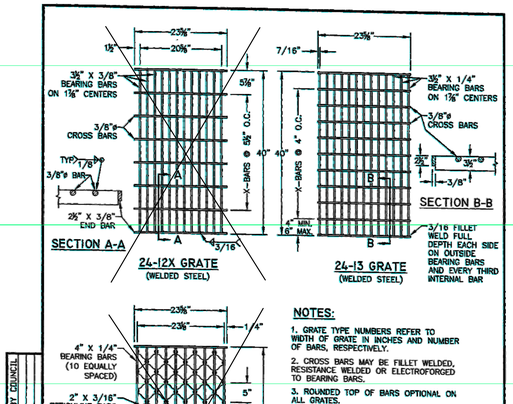
REVISION | BY | DATE | APP. BY COUNCIL

CITY OF CHICO — STANDARD PLAN

DRAWN BY: GL DATE: 8/09
CHECKED BY: MT SCALE: NONE
APPROVED: CPSD DIRECTOR

36" DROP INLET (CAL - TRANS "G-0") — NO. S-7 — SHEET 2 OF 4

EXHIBIT A



NOTES:

1. GRATE TYPE NUMBERS REFER TO WIDTH OF GRATE IN INCHES AND NUMBER OF BARS, RESPECTIVELY.
2. CROSS BARS MAY BE FILLET WELDED, RESISTANCE WELDED OR ELECTROFORGED TO BEARING BARS.
3. ROUNDED TOP OF BARS OPTIONAL ON ALL GRATES.
4. ALL GRATES SHALL BE GALVANIZED IN ACCORDANCE WITH SECTION 75-1.05 OF THE STANDARD SPECIFICATIONS.

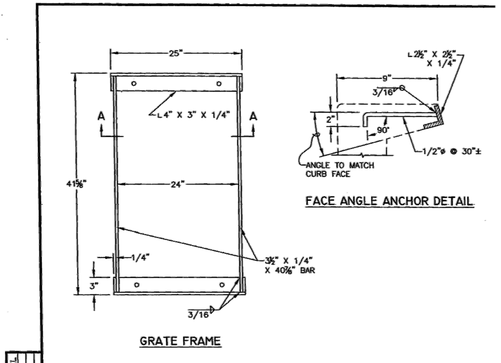
REVISION | BY | DATE | APP. BY COUNCIL

CITY OF CHICO — STANDARD PLAN

DRAWN BY: GL DATE: 8/09
CHECKED BY: MT SCALE: NONE
APPROVED: CPSD DIRECTOR

GRATE DETAILS (CAL TRANS STANDARD D-77-A & D-77-B) — NO. S-7 — SHEET 3 OF 4

EXHIBIT A



NOTES:

1. FULL PENETRATION BUTT WELDS MAY BE SUBSTITUTED FOR FILLET WELDS ON ANCHORS.
2. ALL FRAMES SHALL BE GALVANIZED IN ACCORDANCE WITH SECTION 75-1.05 OF THE STANDARD SPECIFICATIONS.

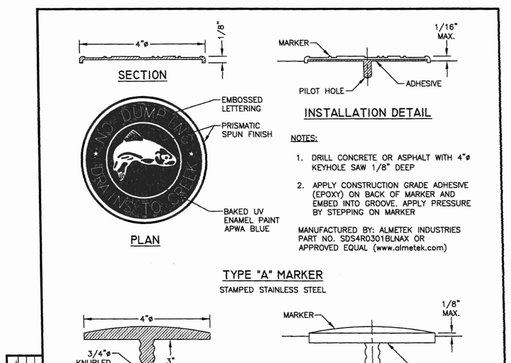
REVISION | BY | DATE | APP. BY COUNCIL

CITY OF CHICO — STANDARD PLAN

DRAWN BY: GL DATE: 8/09
CHECKED BY: MT SCALE: NONE
APPROVED: CPSD DIRECTOR

GRATE FRAME & FACE ANGLE ANCHOR DETAILS (CAL TRANS STANDARD D-77-A & D-77-B) — NO. S-7 — SHEET 4 OF 4

EXHIBIT A



NOTES:

1. DRILL CONCRETE OR ASPHALT WITH 4"ø KEYHOLE SAW 1/8" DEEP
2. APPLY CONSTRUCTION GRADE ADHESIVE (EPOXY) ON BACK OF MARKER AND EMBED INTO GROOVE. APPLY PRESSURE BY STEPPING ON MARKER

MANUFACTURED BY: ALMETEK INDUSTRIES PART NO. SDS4R0301BLNAX OR APPROVED EQUAL (www.almetek.com)

NOTES:

1. IF DROP INLET IS PRE CAST THEN MARKER SHALL BE PLACED AT TIME OF MANUFACTURE
2. IF DROP INLET IS CAST IN PLACE THEN MARKER SHALL BE PLACED AT TIME OF POUR

MANUFACTURED BY: SURV-KAP, INC. PART NO. W/M-ACS-4D WITH LOGO L-27 OR APPROVED EQUAL (www.surv-kap.com)

REVISION | BY | DATE | APP. BY COUNCIL

CITY OF CHICO — STANDARD PLAN

DRAWN BY: GL DATE: 8/09
CHECKED BY: MT SCALE: NONE
APPROVED: CPSD DIRECTOR

STORM DRAIN MARKER DETAIL — NO. S-8 — SHEET 1 OF 1

EXHIBIT B

OR APPROVED EQUAL

COOK CONCRETE PRODUCTS, INC.
—Precast—

MANHOLE PIPE · DRAINAGE INLETS · STORM WATER / OIL SEPARATORS · UTILITY VAULTS & BOXES · CUSTOM PRECAST

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FAX (530) 243-6881
www.cookconcreteproducts.com
e-mail: Info@cookconcreteproducts.com

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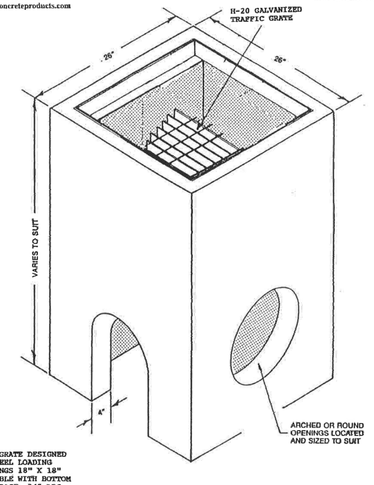
P.O. BOX 720280
REDDING, CA 96099

MEMBER



NOTES:
1. GALVANIZED GRATE DESIGNED FOR H-20 WHEEL LOADING
2. CLEAR OPENINGS 18" X 18"
3. ALSO AVAILABLE WITH BOTTOM
4. WEIGHT W/O BASE, 342 LBS. PER VERTICAL FOOT
5. WATER HOLDING CAPACITY, 16.83 GALLONS PER VERTICAL FOOT

SHAPING OF BOTTOM SHALL CONFORM TO CITY STD. S-7

18" x 18"
AREA DRAIN

CONTRACTOR SHALL PROVIDE SHOP DRAWING FOR APPROVAL BY THE CITY OF CHICO.

OR APPROVED EQUAL

COOK CONCRETE PRODUCTS, INC.
— Precast —
Div. of L. E. Shaw Industries, Inc.

SEPTIC TANKS • MANHOLE PIPE • METER BOXES • PARKING STRIPS • ELECTRICAL VAULTS, CUSTOM PRECAST

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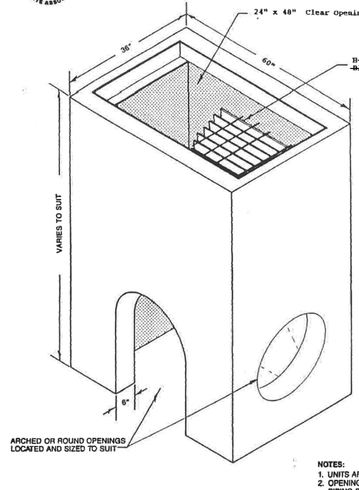
REDDING, CALIFORNIA 96001
(916) 243-2562



SHAPING OF BOTTOM SHALL CONFORM TO CITY STD. S-7

NOTES:
1. UNITS ARE CUSTOM-MADE FOR EACH JOB
2. OPENINGS SHALL BE SIZED FOR PIPING BEING USED
3. AVAILABLE WITH ~~OR WITHOUT~~ BOTTOM
4. WEIGHT W/O BASE, 1050 LBS. PER VERTICAL FOOT

CONTRACTOR SHALL PROVIDE SHOP DRAWING FOR APPROVAL BY THE CITY OF CHICO.

24" x 48"
AREA DRAIN

REGISTERED PROFESSIONAL ENGINEER — ROSS MORGAN SIMMONS — No. ~~68511~~ — Exp. 9/30/16 — CIVIL — STATE OF CALIFORNIA

Designed:	RMS
Drawn By:	RMS
Approved:	
Date:	6-5-14

Revision	Date	By

NorthStar
Civil Engineers • Surveyors
Chico, California

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PHONE: (530) 893-1600 FAX: (530) 893-2113
WEB SITE: www.northstareng.com

TLCD ARCHITECTURE
HUSS LANE
CHICO, CALIFORNIA

CITY STD. DETAILS-3
BCAG TRANSIT FACILITY

APN Number	Job Number	Scale	Sheet
NA	11-260	NA Horz. NA Vert.	Sheet 12 Of 12

APPROXIMATE TRENCH TABLE

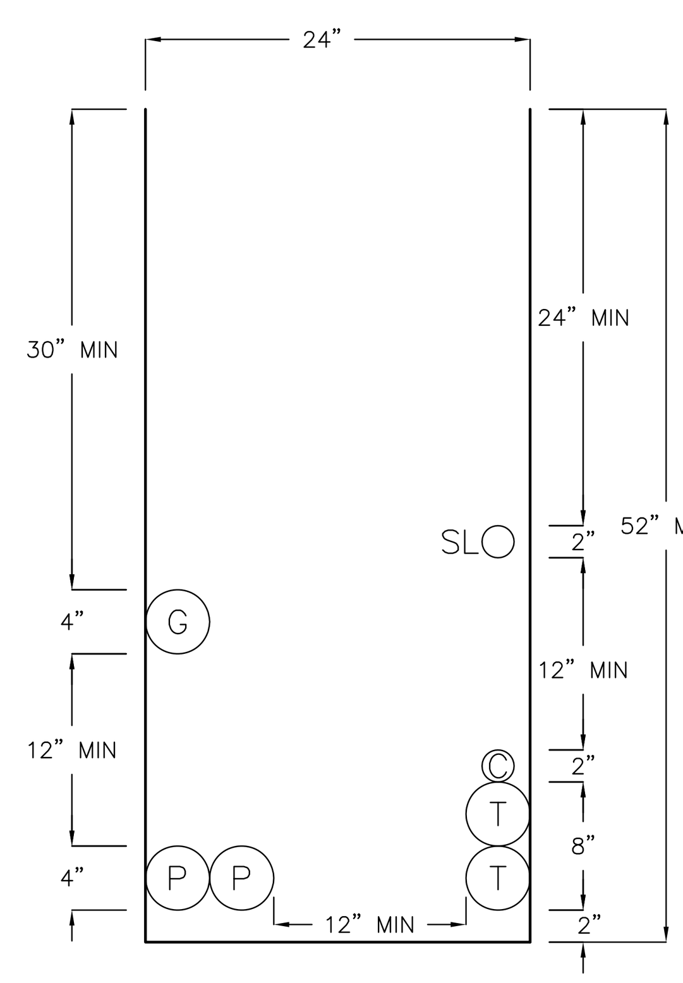
TRENCH SEGMENT	TRENCH LENGTH	TRENCH SECTION	TRENCH OCCUPANTS
E1	EXISTING	(NA)	G,C,T,SL, & P
E2	EXISTING	(NA)	S, & 1–4" CONDUIT
3	70'	(B)	S
4	216'	(B)	SL
5	37'	(A)	G,C,T, & P
6	1045'	(A)	G,C,T,SL, & P
7	150'	(A)	G,C,T, & P

PULL BOXES AND UTILITY EQUIPMENT NOT SHOWN.

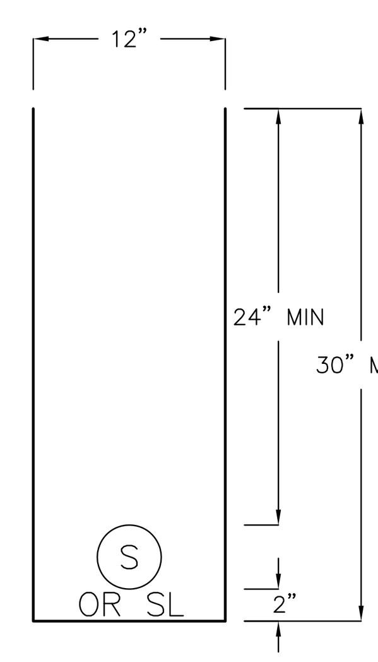
STRUCTURE BIDDING LEGEND

5	PG&E PRIMARY SPLICE BOX (3'X5')
7	PG&E PRIMARY SPLICE BOX (4.5'X8.5')
P9	PG&E PAD MOUNT SWITCH GEAR (PMH9 80.5"X88" PAD)
T1	AT&T TELEPHONE VAULT (3'X5')
T2	AT&T TELEPHONE VAULT (4'X6.5')
C	COMCAST CABLE VAULT (17"X17")

STRUCTURES LOCATED ON PLANS ARE A GUESS ONLY. ACTUAL CONFIGURATION AND COUNT PER PG&E JOINT TRENCH PLANS.



TRENCH "A"



TRENCH "B"

MAXIMUM TRENCH OCCUPANTS SHOWN IN TYPICAL TRENCHES. OMIT ANY OCCUPANTS NOT LISTED FOR THAT TRENCH SEGMENT AS NOTED IN THE TRENCH TABLE ABOVE.

40' 0 40' 80'

ORIGINAL SCALE IN INCHES

NOT FOR CONSTRUCTION - SCHEDULING PURPOSES ONLY

REGISTERED PROFESSIONAL ENGINEER — ROBERT MORGAN STIMSON — No. 68511 — CIVIL — STATE OF CALIFORNIA

NOT FOR CONSTRUCTION

Designed:	RMS	Revision	Date	By
Drawn By:	RMS			
Approved:				
Date:	8-21-13			

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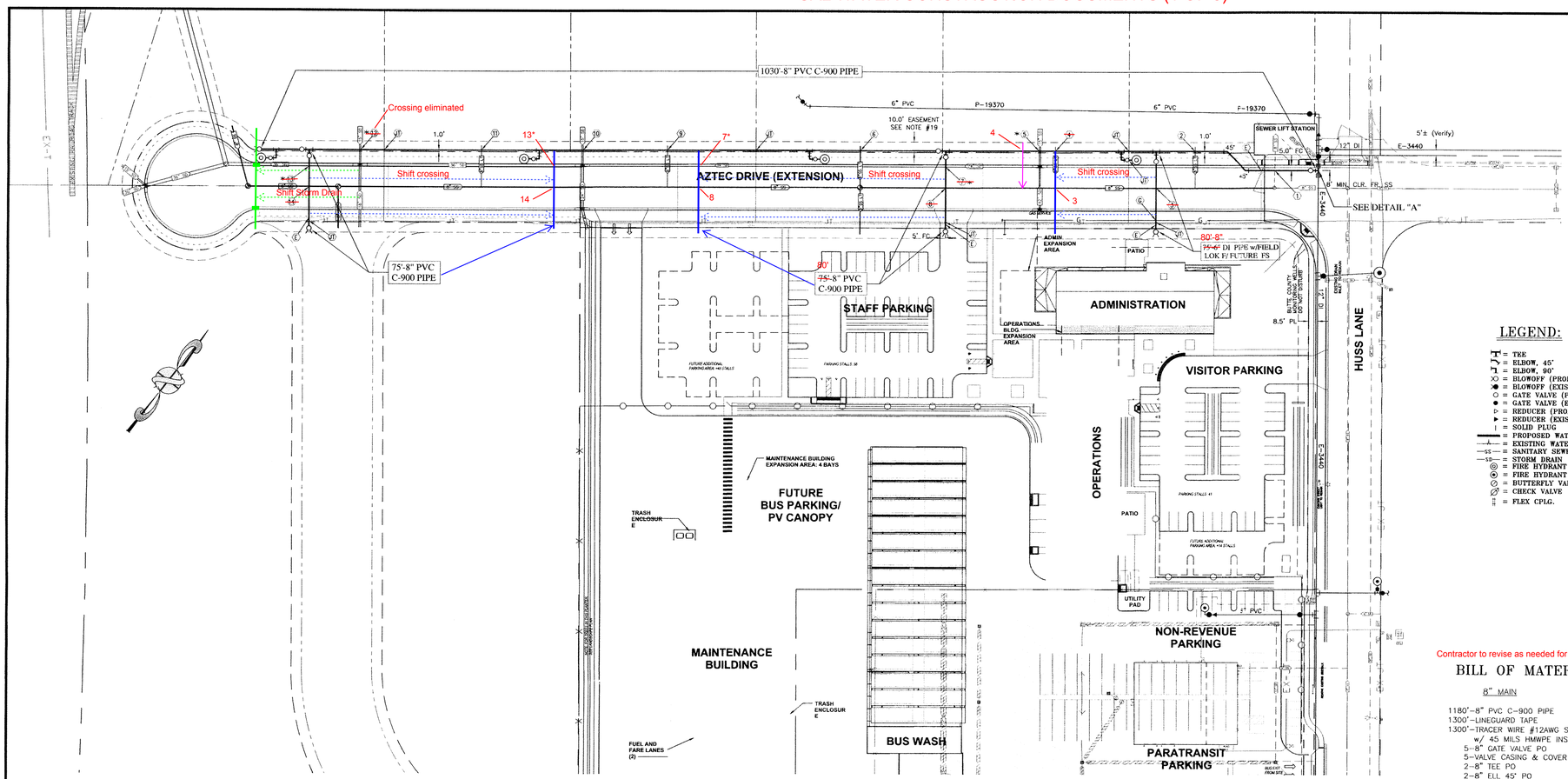
HUSS LANE
CHICO, CALIFORNIA

JOINT TRENCH SCHEDULING CONCEPT
BCAG TRANSIT FACILITY

APN Number	Job Number	Scale		Sheet
NA	11-260	1"= 40' Horz.	NA Vert.	Sheet A Of A

CAL WATER CONSTRUCTION DOCUMENTS (1 OF 5)



NOTES:

1. Inspection of all materials and installation for pipeline, hydrants and services must be made by California Water Service Company. Telephone: (530) 893-8300 at least 48 hours before starting work on water facilities.
2. Any easements and rights-of-way which may be necessary or reasonably appropriate for the extension will be conveyed or caused to be conveyed by the applicant.
3. Contact Underground Service Alert at 800-227-2600 or 811 at least 48 hours prior to the commencement of this project.
4. Place a continuous wire and strip of detector tape over all pipe and extend up into all valve boxes. Tracer wire is required on all pipe.
5. For details of typical thrust block installation, see drawing CW 435-R4.
6. Protect underground flexible couplings, bare steel, MJxMJ sleeves, and all bolts (including stainless steel) as follows:
   1. The entire area of the fitting must be dry and free of dust, dirt, and other foreign matter. Rust or other foreign matter must be removed by scraping or wire brushing. Wiping with a dry clean cloth may be necessary to remove the particles from brush cleaning. Any oil or grease must be removed by using a low residue, volatile petroleum solvent before application of grease and wrapping.
   2. The exposed area should be coated with a heavy coating of Metalguard 301 grease by the glove method to a thickness of at least 1/4".
   3. Firmly wrap the entire grease area with one layer, half lapped of a woven glass filament mesh (Res or Bit Wrap, 4" wide).
   4. Apply a second layer of Metalguard 301 grease on top of the glass filament by the glove method to a thickness of at least 1/4".
   5. Firmly wrap the entire grease area with a second layer, half lapped of the woven glass filament mesh.
   6. Cover the entire mesh wrapped area of the fitting with a third and final coating at least 1/4" thick of Metalguard 301 grease by the glove method.
   7. Firmly apply 2 layers of polywrap, half lapped over all areas of the coated and wrapped fitting. Backfilling may follow immediately after this wrapping.
7. Water main shall be installed at least 10 ft. horizontally from and one foot higher than storm and sanitary sewers located parallel to the main if feasible. Center a 20 foot length at all storm and sanitary sewer crossings. Minimum separation between sewer and water main shall be one foot unless otherwise indicated.
8. No valve covers or meter boxes are to lie in sidewalks, cross gutter, curb or driveways. Each service should also be located to provide protection to the meter box from auto traffic and parking.
9. The exact location of each service to be determined at the time of installation to avoid conflicts with other utilities. Therefore, the number of long, short and split services may vary. Preferred CWS location to be staked and installed by developers's engineer. Any relocations after installation will be at developer's expense.
10. Location of blow-off in new street area will terminate where street improvement ends.
11. Services installed across street area will need import backfill when government agency's compaction requirements cannot be met with native backfill.
12. It is the responsibility of the contractor to verify the exact location and depth of all existing and proposed facilities prior to water main installation.
13. The list of materials for this project is for CWS Co. estimating and reference purposes only and is not intended as a full take-off of material required.
14. The water supply for this development is from local underground aquifers. Additional wells for replacement and pressure will be required in the future.
15. Developer shall obtain all permits necessary for the installation of the facilities.
16. This water plan design is based on incomplete and unapproved improvement plans. Therefore, sewers, storm drains and street grading conflicts may occur.
17. Contractor to ensure air in the pipeline is removed using existing outlets, such as fire hydrants and blowoffs. Contractor is responsible for installing air releases if existing outlets are insufficient.
18. (O) = Indicates fire hydrant (Chico)
    Limits of CWS Co. ownership for each hydrant:
    1 - 6 Inch Outlet Tee POxFLG CI CL
    1 - 6 Inch Flange Tyte Gasket
    8 - 3/4x3-1/2 Inch Machine Bolts W/Hex Nuts, 18-8 Stainless Steel
    1 - 6 Inch Gate Valve FLGxPO NRS NO RS
    1 - Valve Casing and Cover Assembly
    1 - 6 Inch Ell 90° PO DI CL
    +/- 9 Feet of 6 Inch Ductile Iron Pipe
    1 - 6x42 Inch Fire Hydrant Bury FLGxMJ
    1 - 6x12 Inch Fire Hydrant Extension
    2 - Sets Bolts, Nuts and Gaskets F/ Hyd.
    Polywrap Tubing, PVC Tape, Line Guard and misc. coating mat'l.
    After fire hydrant installation, backfill and spoil removal, clean and prepare hydrant surface and fittings above ground for one coat of Sherwin-Williams B66Y300.
    FIRE HYDRANT:
    1 - CLOW 950 2-1/2 & 4-1/2 or
    1 - Hydrant Rich Corona 550 2-1/2 & 4-1/2
    (The fire chief will make the final choice of fire hydrant head with CWS Co. approval.)
19. California Water Service Company will require proof of PUE (recorded tract map) or a 20 ft. water easement for proposed water facilities.

LEGEND:

- T = TEE
- 45 = ELBOW, 45°
- 90 = ELBOW, 90°
- BOWOFF (PROPOSED)
- BOWOFF (EXISTING)
- GATE VALVE (PROPOSED)
- GATE VALVE (EXISTING)
- REDUCER (PROPOSED)
- REDUCER (EXISTING)
- SOLID PLUG
- PROPOSED WATER MAIN
- EXISTING WATER MAIN
- SS — SANITARY SEWER
- SD — STORM DRAIN
- FIRE HYDRANT (PROPOSED)
- FIRE HYDRANT (EXISTING)
- BUTTERFLY VALVE
- CHECK VALVE
- FLEX CPLG.

Contractor to revise as needed for plan modifications

BILL OF MATERIALS

8" MAIN

1180'-8" PVC C-900 PIPE
1300'-LINEGUARD TAPE
1300'-TRACER WIRE #12AWG SOLID COPPER w/ 45 MILS HMWPE INSULATION
5-8" GATE VALVE PO
5-VALVE CASING & COVER ASSY
2-8" TEE PO
2-8" ELL 45° PO
3-8" CAP TAPPED 2" MJ
3-2" BLOWOFF ASSY
20-8" RINGS F/PO FITTINGS
45'-POLYWRAP F/DI FITTINGS

(1) TIE-IN MATERIALS PER DETAIL "A"

6" MAIN

75'-6" DUCTILE IRON PIPE w/FIELD LOK GASKETS
115'-POLYWRAP TUBING F/6" PIPE
1-RL PVC TAPE
85'-LINEGUARD TAPE
85'-TRACER WIRE #12AWG SOLID COPPER w/ 45 MILS HMWPE INSULATION
1-6" GATE VALVE PO
1-VALVE CASING & COVER ASSY
1-8"x6" TEE PO
1-6" CAP TAPPED 2" MJ
1-2" BLOWOFF ASSY
3-6" FIELD LOK GASKETS F/PO FITTINGS
2-8" RINGS F/PO FITTING

FIRE HYDRANTS

4-6" FIRE HYDRANTS
4-8"x6" TEE POxFLG
SEE NOTE #18 F/TYPICAL MATERIALS

CL&C OFFSETS

4-8" CL&C DOUBLE OFFSETS, PCS. MK. "A, B, "C & D" PER DWG. CW-693 ON SHEET 2
8-8" STDxDI FLEX COUPLINGS, 10" SLEEVE

NOTE: WHEN ASSEMBLING A PVC C-900 PIPE TO AN IRON FITTING (PUSH-ON OR MECHANICAL JOINT). REMOVE ALL BUT 1/4 INCH OF THE FACTORY MADE BEVEL FROM THE SPIGOT END OF THE PIPE PRIOR TO INSTALLATION.

SUMMARY

1180'-8" PVC C-900 PIPE
75'-6" DUCTILE IRON PIPE w/FLD LOK
4-6" FIRE HYDRANTS
4-8" CL&C DOUBLE OFFSETS
1-TIE-IN TO EXISTING MAIN

PIPELINE CROSSING INFORMATION

AT WATER MAIN CROSSINGS IN CONFLICT WITH OTHER FACILITIES: When the water main is in conflict with existing facilities or proposed facilities that require more than a 2 foot adjustment from the nominal 4 feet of cover, a fabricated steel cement mortar lined and cement mortar coated offset will be installed at the crossing per CWS Co. standards.

* DENOTES CL&C OFFSET REQUIRED

(1) FINISHED GRADE ELEV. = 191.5
EXISTING 8" SANITARY SEWER INVERT ELEV. = 177.7 @ MH
INSTALL 8" PVC OVER EX. 8" SS w/4' COVER.

(2) FINISHED GRADE ELEV. = 190.0
6" SANITARY SEWER LATERAL INVERT ELEV. = 179.4
INSTALL 8" PVC OVER 6" SS w/4' COVER.

(3) FINISHED GRADE ELEV. = 190.4
8" SANITARY SEWER INVERT ELEV. = 178.1
INSTALL 6" DI OVER 8" SS w/4' COVER.

(4) FINISHED GRADE ELEV. = 189.9±
6" SANITARY SEWER LATERAL INVERT ELEV. = 179.6
INSTALL 8" PVC OVER 6" SS w/4' COVER.

*(5) FINISHED GRADE ELEV. = 189.9± (VERIFY)
15" STORM DRAIN LATERAL INVERT ELEV. = 184.8
INSTALL 8" CL&C DOUBLE OFFSET UNDER 15" SD w/6' COVER, 2' DROP, PC. MK. "A" PER DWG. CW-693 ON SHEET 2.

(6) FINISHED GRADE ELEV. = 189.9±
6" SANITARY SEWER LATERAL INVERT ELEV. = 179.6
INSTALL 8" PVC OVER 6" SS w/4' COVER.

*(7) FINISHED GRADE ELEV. = ~~189.5~~ 188.5
24" STORM DRAIN INVERT ELEV. = ~~184.4~~ 183.5
INSTALL 8" CL&C DOUBLE OFFSET UNDER 24" SD w/6' COVER, 2' DROP, PC. MK. "B" PER DWG. CW-693 ON SHEET 2.

(8) FINISHED GRADE ELEV. = 189.7
8" SANITARY SEWER INVERT ELEV. = ~~178.7~~ 179.0
INSTALL 8" PVC OVER 8" SS w/4' COVER.

(9) FINISHED GRADE ELEV. = 188.8±
6" SANITARY SEWER LATERAL INVERT ELEV. = 180.4
INSTALL 8" PVC OVER 6" SS w/4' COVER.

(10) FINISHED GRADE ELEV. = ~~188.6±~~ (VERIFY) 188.8+/-
15" STORM DRAIN LATERAL INVERT ELEV. = ~~182.9~~ 182.3 (lowered SD to avoid CL&C Offset need)
INSTALL 8" PVC OVER 15" SD w/2.5' COVER. CL&C OFFSET MAY BE REQUIRED DEPENDING ON EXACT FINISHED GRADE ELEVATION.

(11) FINISHED GRADE ELEV. = 188.3±
6" SANITARY SEWER LATERAL INVERT ELEV. = 180.4
INSTALL 8" PVC OVER 6" SS w/4' COVER.

*(12) ~~FINISHED GRADE ELEV. = 187.9± (VERIFY)~~ Crossing Eliminated
~~15" STORM DRAIN LATERAL INVERT ELEV. = 182.6~~ SD shifted west
~~INSTALL 8" CL&C DOUBLE OFFSET UNDER 15" SD w/6.5' COVER, 2.5' DROP, PC. MK. "C" PER DWG. CW-693 ON SHEET 2.~~ past last fire hydrant

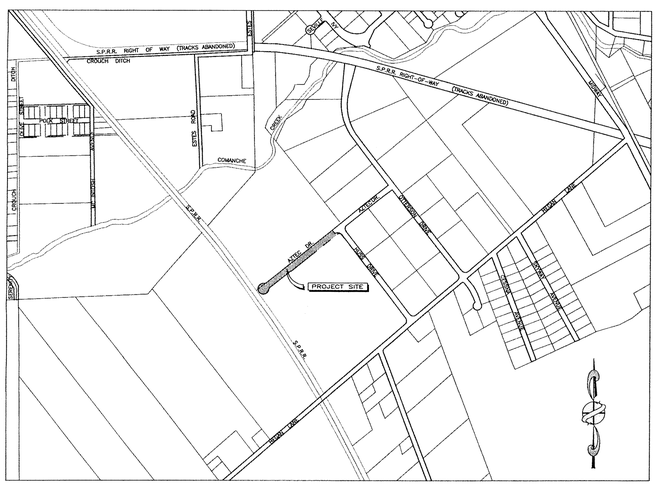
*(13) FINISHED GRADE ELEV. = ~~187.1±~~ 188.7+/-
36" STORM DRAIN INVERT ELEV. = ~~181.5~~ 182.0 (verify CL&C dimensions w/ Cal Water)
INSTALL 8" CL&C DOUBLE OFFSET UNDER 36" SD w/7' COVER, 3' DROP, PC. MK. "D" PER DWG. CW-693 ON SHEET 2.

(14) FINISHED GRADE ELEV. = 187.8
8" SANITARY SEWER INVERT ELEV. = 179.7
INSTALL 8" PVC OVER 8" SS w/4' COVER.

(E) FINISHED GRADE ELEV. = VARIES
STREET LIGHT ELECTRIC INVERT ELEV. = VARIES
ALL WATER MAINS WILL BE INSTALLED PRIOF TO ELEC INSTALLATION.

(G) FINISHED GRADE ELEV. = VARIES
GAS MAIN INVERT ELEV. = VARIES
ALL WATER MAINS WILL BE INSTALLED PRIOF TO GAS INSTALLATION.

(JT) FINISHED GRADE ELEV. = VARIES
JOINT TRENCH INVERT ELEV. = VARIES
ALL WATER MAINS WILL BE INSTALLED PRIOF TO JT INSTALLATION.



VICINITY MAP
N.T.S.

ENGINEERING

CALIFORNIA WATER SERVICE CO.

DEPARTMENT

REVISIONS:

	DATE:	INIT.
DISTRIBUTION MAP	X	
PLAT SHEET	X	
SYSTEM SCHEMATIC		
STATION SCHEMATIC		
ZONE MAP		
VALVE RECORD		

PLAT SHEET NO.:
41-27, 41-28

SCALE:
1"=60'

DRAWN BY:
Peralta

DESIGNED BY:
Prasanna

CHECKED BY: DATE:
D.P 11/26/13

APPROVED BY: DATE:
T.M. 12/2/2013

REGISTERED PROFESSIONAL ENGINEER
TING MEI HU
No. C60340
exp 6/30/14
CIVIL
STATE OF CALIFORNIA

TITLE:
AZTEC ROAD EXTENSION
BCAG TRANSIT FACILITY
OFFSITE WORK

DISTRICT:
CHICO

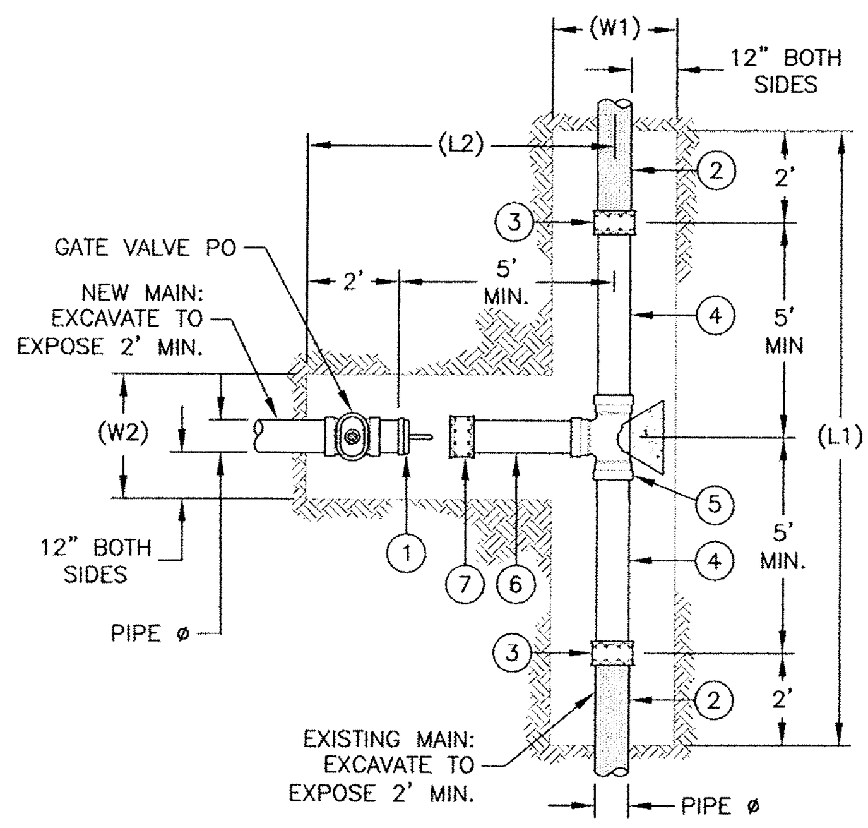
DATE:
10/14/13

PROJECT ID.:
94178

DRAWING NO.:
CH-5444

SHT 1 OF 2

NOTE: IF UNFORESEEN CIRCUMSTANCES OR FIELD CONDITIONS ARISE THAT REQUIRE ALTERNATE OR ADDITIONAL MATERIALS FOR THE TIE-IN TO THE EXISTING SYSTEM, THE DEVELOPER'S CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE THIS MATERIAL TO THE COMPANY TO COMPLETE THE TIE-IN.



TIE-IN DETAIL "A"

N.T.S.

1. DEVELOPER'S CONTRACTOR SHALL INSTALL NEW MAIN AND ADJUST FROM NOMINAL LINE AND GRADE TO MATCH EXISTING FACILITIES AT THIS LOCATION. THE DEVELOPER'S CONTRACTOR SHALL INSTALL A TEMPORARY CAP AND BLOWOFF AT THIS LOCATION.

CALIFORNIA WATER SERVICE CO. WILL TIE THE NEW MAIN FROM THIS LOCATION.

2. EXISTING MAIN, 12" DUCTILE IRON PIPE

THE DEVELOPER'S CONTRACTOR SHALL PROVIDE CALIFORNIA WATER SERVICE COMPANY WITH THE FOLLOWING MATERIALS FOR THE TIE-IN IT WILL MAKE AT THE INTERSECTION OF AZTEC DR. & HUSS DR.

3. 1 – 12" SOLID SLEEVE MJ (2 TOTAL)

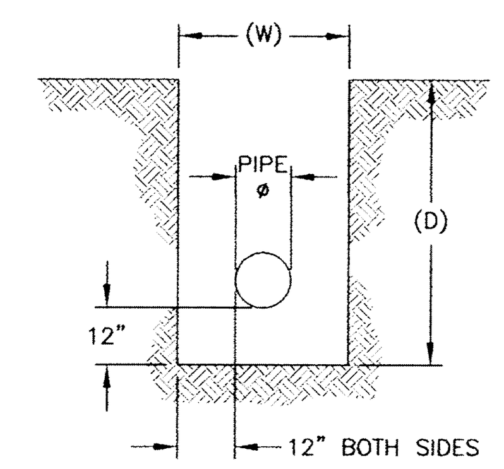
4. 5' – 12" DUCTILE IRON PIPE (10' TOTAL)

5. 1 – 12" x 8" TEE PO w/ 2-12" RINGS & 1-8" RING

6. 5' – 8" PVC C-900 PIPE

7. 1 – 8" SOLID SLEEVE MJ

NOTE: IN ADDITION, THE DEVELOPER'S CONTRACTOR SHALL PROVIDE: MISC. MATERIAL REQUIRED TO COMPLETE THE TIE-IN SUCH AS, BUT NOT LIMITED TO: PROTECTION COATING MATERIAL FOR PIPE & FITTINGS, LINEGUARD TAPE, CONCRETE FOR THRUST BLOCKS, EMBEDMENT BACKFILL AROUND AND OVER THE PIPE, FINAL BACKFILL TO MEET COMPACTION REQUIREMENTS, AND PAVEMENT REPLACEMENT.



TRENCH NOTES FOR TIE-IN:

TRENCH WIDTH (W1) & (W2) SHALL BE ONE PIPE DIAMETER PLUS 12" ON EACH SIDE OF THE PIPE. (E.G. A 6" OR 8" MAIN REQUIRES A 30" TRENCH).

TRENCH LENGTH (L1) SHALL BE 14' (MIN). (10' FOR TIE-IN PLUS 2' EXPOSURE OF EXISTING AND NEW MAIN).

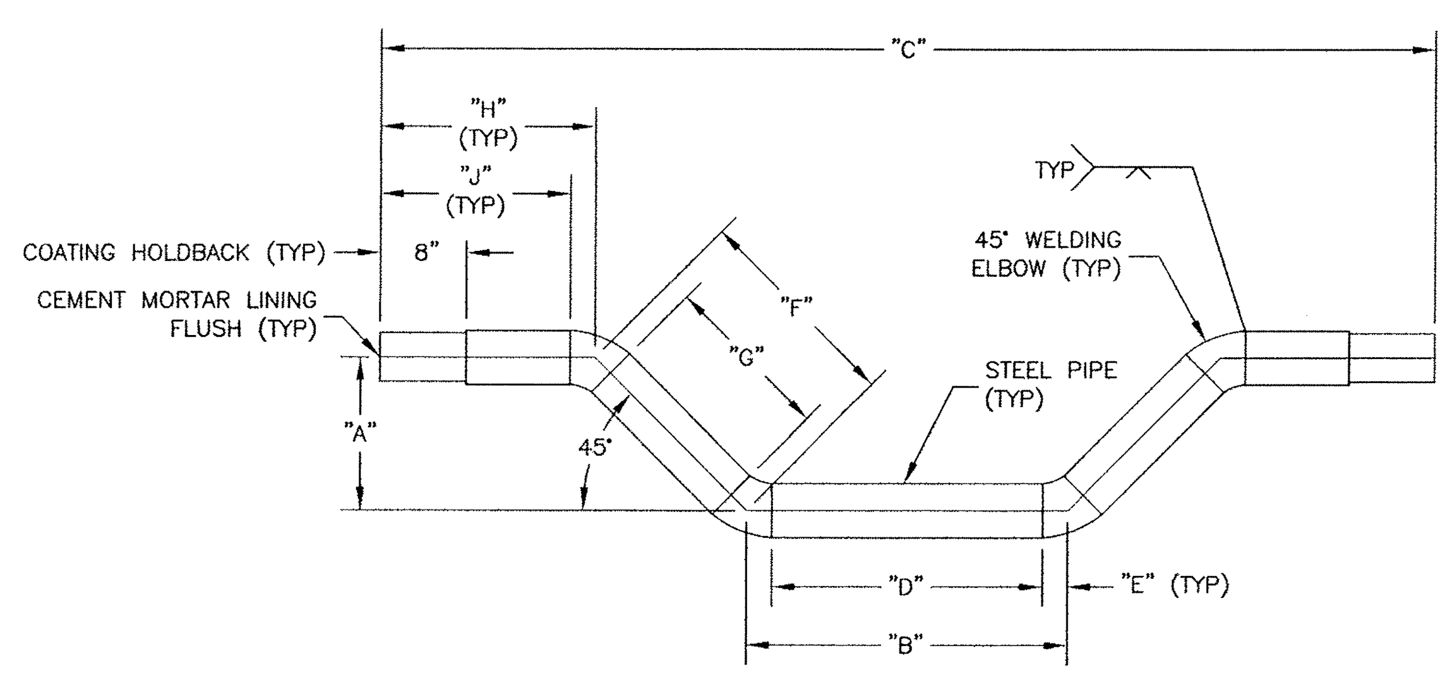
TRENCH LENGTH (L2) SHALL BE 7' (MIN). (5' FOR TIE-IN PLUS 2' EXPOSURE OF NEW MAIN).

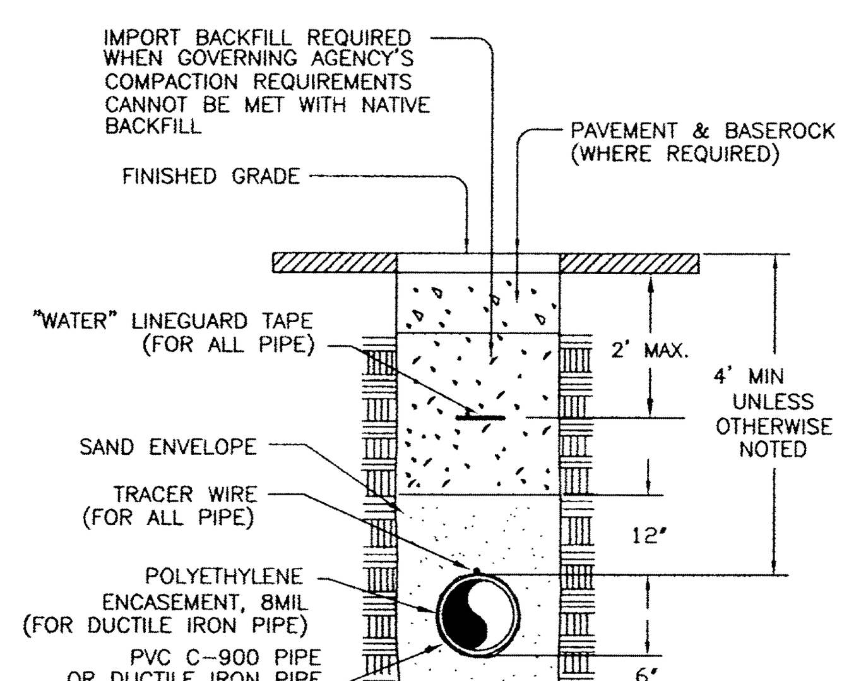
TRENCH DEPTH (D) SHALL BE 12" (MIN) BELOW BOTTOM OF MAIN.

DEVELOPER'S CONTRACTOR SHALL PROVIDE TRENCH SHORING PER OSHA STANDARDS.

DEVELOPER'S CONTRACTOR SHALL BE RESPONSIBLE FOR EMBEDMENT BACKFILL, TRENCH BACKFILL, COMPACTION TO REQUIREMENTS, AND FINAL PAVEMENT RESTORATION.

PIECE MARKED	QTY	"A"	"B"	"C" 2H+2A+B	"D" B-2E	"F" A/.707	"G" F-2E	"H"	"J" H-E
A	1	2.0'	3.5'	17.5'	2.7'	2.8'	2.0'	5.0'	4.6'
B	1	2.0'	4.0'	18.0'	3.2'	2.8'	2.0'	5.0'	4.6'
C	1	2.5'	3.5'	17.5'	2.7'	3.5'	2.7'	4.5'	4.1'
D	1	3.0'	5.0'	19.0'	4.2'	4.2'	3.4'	4.0'	3.6'





NOTE:

1. ALL EXCESS SPOIL IN TRACT IS TO REMAIN TRENCHSIDE AND ALL EXCESS SPOIL OFF TRACT IS TO BE REMOVED.
2. ALL VALVE CASINGS AND COVERS SHALL BE RAISED TO FINISHED GRADE AFTER PERMANENT PAVEMENT HAS BEEN PLACED.

TRENCH CROSS SECTION

NTS

NOTES:

1. STEEL CYLINDER SHALL BE PER A.S.A. WITH ASTM A53 TEST PRESSURE AND ASTM A36 PHYSICAL PROPERTIES.
2. COATING SHALL BE REINFORCED WITH 14 GAUGE WIRE MESH OR 14 GUAGE WIRE SPIRALLY WOUND IN CENTER OF COATING PER LATEST REVISION OF AWWA STANDARD C205.
3. WELDING FITTINGS SHALL BE ASTM A234 GRADE B.

CML= CEMENT MORTAR LINING
CMC= CEMENT MORTAR COATING

		PIPE				ELBOW	
PIECE "MARKED"	QTY	STEEL CYL. (OD)	SCHED.	CML	CMC	SCHED.	"E"
		6.63"	40	3/8"	3/4"	40	3.75"
A, B, C, D	4	8.63"	20	3/8"	3/4"	40	5.00"
		10.75"	20	1/2"	3/4"	40	6.25"
		12.75"	20	1/2"	3/4"	.375"	7.50"
		14.0"	10	1/2"	3/4"	30	8.75"
		16.0"	10	1/2"	3/4"	30	10.00"
		18.0"	10	1/2"	3/4"	.375"	11.25"
		20.0"	10	1/2"	3/4"	20	12.50"
		25.75"	10	1/2"	3/4"	20	*

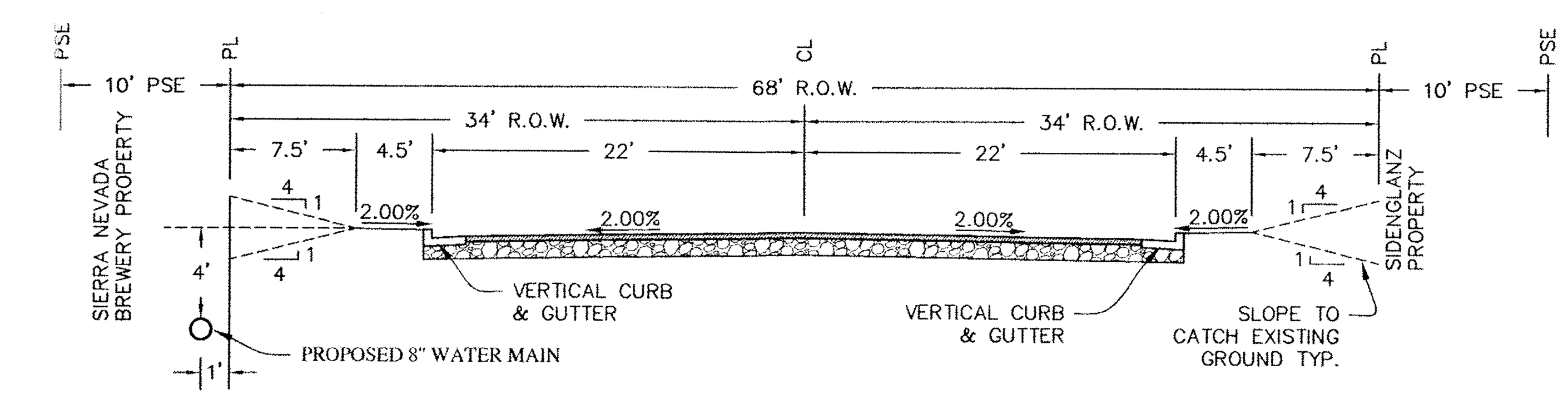
* FABRICATE 5-PIECE MITER WELDED ELBOW PER AWWA C-208

CW 693R7 — **CEMENT MORTAR LINED & COATED STEEL DOUBLE OFFSET WITH 45° ELBOWS**

TYPICAL STREET CROSS SECTIONS

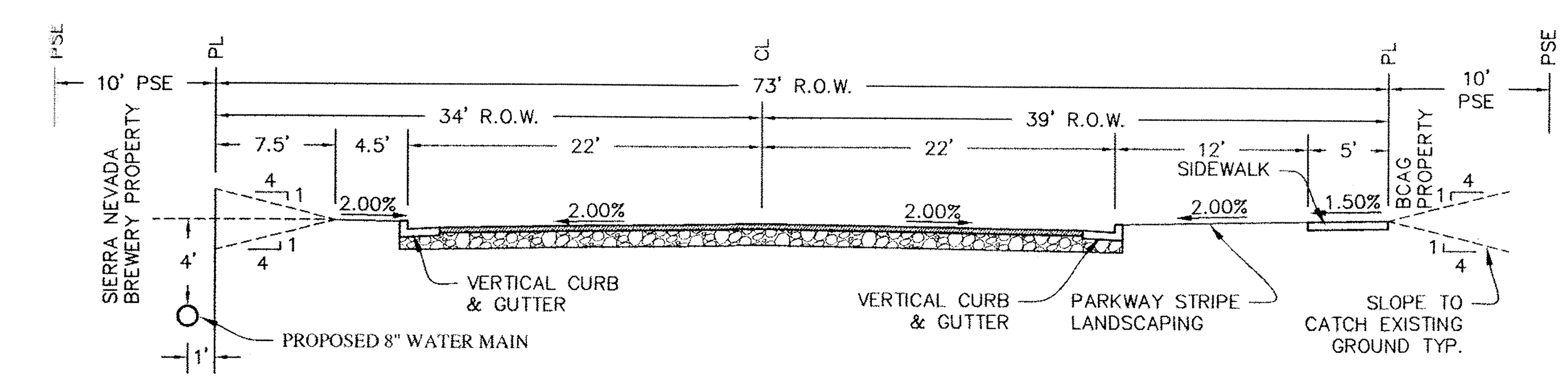
AZTEC EXTENSION

NOT TO SCALE



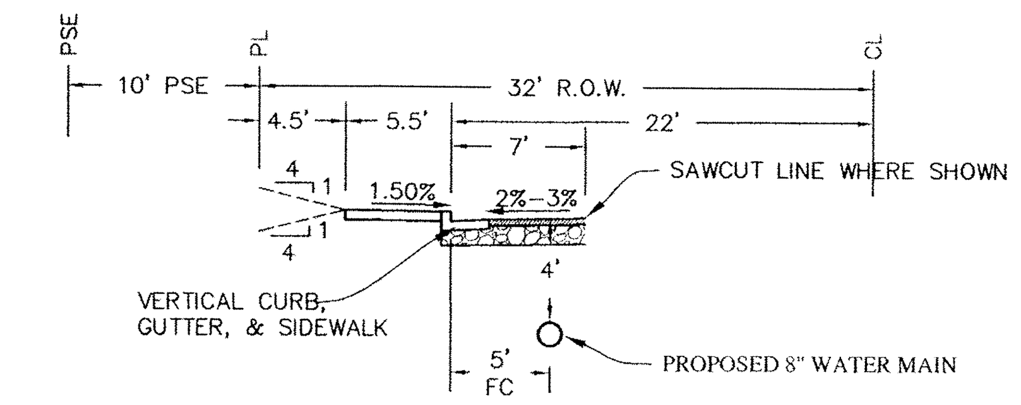
AZTEC EXTENSION

NOT TO SCALE



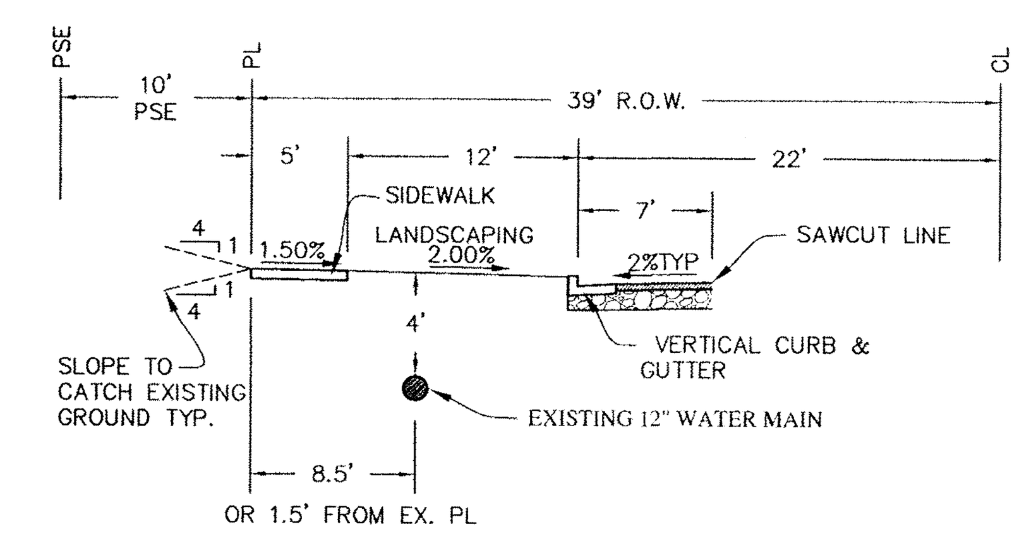
AZTEC EXTENSION

NOT TO SCALE



HUSS LANE

NOT TO SCALE



ENGINEERING

CALIFORNIA WATER SERVICE CO.

DEPARTMENT

REVISIONS:

		DATE:	INIT.
DISTRIBUTION MAP	☒		
PLAT SHEET	☒		
SYSTEM SCHEMATIC	☐		
STATION SCHEMATIC	☐		
ZONE MAP	☐		
VALVE RECORD	☐		

PLAT SHEET NO.: 41-27, 41-28

SCALE: AS NOTED

DRAWN BY: Peralta

DESIGNED BY: Prasanna

CHECKED BY: D. P DATE: 11/26/13

APPROVED BY: T. H. DATE: 12/2/2013

REGISTERED PROFESSIONAL ENGINEER TING MEI HE No. C60340 EXP. 6/30/14 CIVIL STATE OF CALIFORNIA

TITLE: AZTEC ROAD EXTENSION BCAG TRANSIT FACILITY OFFSITE WORK

DISTRICT: CHICO

DATE: 10/14/13

PROJECT ID.: 94178

DRAWING NO.: CH-5444

SHT 2 OF 2

SPECIFICATIONS FOR MATERIAL

Ductile Iron (DI) Pipe: All Ductile Iron pipe shall comply with the latest revision of AWWA Standard C151 and shall be cement mortar lined in conformance with the latest revision of AWWA Standard C104. All pipe shall have Push-on Joint ends complete with gasket unless specified otherwise and shall be Pressure Class 350 in all sizes from 6" to 12" unless specified otherwise. Pipe shall be furnished with polyethylene encasement complying with the latest revision of AWWA Standard C105. All pipe shall be manufactured by Pacific States, Clow/McWane, U.S. Pipe, or Griffin Pipe.

Polyvinyl Chloride (PVC) Pipe: All pipe shall be Class 150, D.R. 18, unless otherwise specified and shall comply with the latest revision of AWWA Standard C-900. The pipe shall have ductile-iron pipe equivalent outside diameter dimensions and shall have Push-on Joint ends complete with gaskets. All pipe shall be manufactured by PW pipe, J-M Pipe, CertainTeed, Diamond Plastic Corp., Vinyl Tech, Uponor or Royal Pipe.

Cement Mortar Lined and Cement Mortar Coated Steel Pipe (CL&C)
All cement mortar lined and coated steel pipe shall be fabricated from steel cylinder ASA schedule as indicated on the drawing, with ASTM A53 test pressure and ASTM A36 physical properties. Cement mortar protective coating shall be 3/4" for all pipe sizes. The lining shall be 1/2" for 12" and larger pipe and 3/8" for 6" and 8" pipe, and conform to the latest revision of AWWA C205 Standard. Cement Mortar Coating shall be reinforced with 14 gauge wire mesh or spirally wound wire in center of coating. All CL&C steel pipe required for the water main installation shall be as specified on the drawing.

PVC "Certa-Lok" VIP Restrained Joint Pipe: All PVC "Certa-Lok" VIP Restrained Joint pipe shall be manufactured by CertainTeed.
Certa-lok shall comply with the latest revision of AWWA Standard C-900. Pipe is made to ductile-iron-outside-diameter (DI-OD), DR 18, Class 150, in 20' laying lengths, with twin gasket Certa-Lok couplings, nylon splines, and rubber rings.

Steel (Stl) Pipe: All Steel pipe shall be as specified on the drawings.

Polyethylene (PE) Pipe: This section is for PE pipe for mains or services sizes 4" and larger and shall only be used when specified on the drawings. All PE pipe shall be high density polyethylene (HDPE) complying with the latest revision of AWWA Standard C906 and PPI PE 3408. PE pipe shall conform to the outside diameter for the ductile-iron sizing system (DI OD) in Table 7 of AWWA C906. For water mains where pressure will be less than 100 PSI, SDR 17 shall be used. For working pressure between 100 and 160 PSI, SDR 11 shall be used. All pipe shall conform to NSF Standard #14 and #61. All pipe shall either be blue or have blue printing on it to designate its use as a potable water pipeline. HDPE pipe shall be manufactured by CP Chem (Performance Pipe-Driscoplex).

Pipe Fittings: All fittings shall be as specified on the drawings and shall be Ductile Iron complying with the latest revision of AWWA Standard C153 for push-on and mechanical joints fittings and C110 for flanged fittings. All fittings shall either be cement mortar lined in conformance with the latest revision of AWWA Standard C104 or coated with fusion-bonded epoxy inside and outside in conformance with the latest revision of AWWA Standard C116. All fittings shall be manufactured by U.S. Pipe, Union/Tyler, Sigma Corp., or Star Pipe.

Gate Valves: All gate valves shall meet or exceed the latest revision of AWWA Standard C515 for reduced wall, resilient-seated gate valves (or C509 for resilient-seated gate valves) and shall be provided with left hand to open, ductile iron (or cast iron) body with epoxy coating inside and outside complying with the latest revision of AWWA Standard C550, nut operated non-rising stem with 2" square operating nut, two O-ring stem seals above the thrust collar and one below, O-ring gaskets and 304 stainless steel bolts and nuts on bonnet and stuffing box and EPDM rubber encapsulated wedge (when available at no extra cost). All gate valves shall be manufactured by Mueller Company, M & H Valve and Fitting Company, Kennedy Valve Co., Clow Valve Co., American Flow Control, American AVK Co. or U.S. Pipe. Two inch and smaller gate valves shall be Class 125 with standard thread, bronze with wheel, and be manufactured by Milwaukee (No. 105) or Nibco.

Butterfly Valves: All valves greater than 12" nominal size shall be butterfly valves. All butterfly valves shall comply with the latest revision of AWWA Standard C504, and shall be provided with "O-ring" packing, left hand to open, nut operated with 2" square operating nuts, ductile iron body, stainless steel shaft, resilient seat and heavy duty actuator. The butterfly valves shall be manufactured by Mueller Company, M & H Valve & Fitting Company, Pratt Company or Kennedy Valve Co.

Pressure Reducing Valves: All pressure reducing valves shall be manufactured by Cla-Val Company. The Model number, body construction, and flange drilling shall be as specified on the drawings. The drawing may indicate that the pressure reducing valve will be supplied by California Water Service Company. All valves shall have factory set controls or pilots as specified on the drawings. All control or pilot piping shall be copper tubing or brass pipe. PRV vaults shall be as specified on the drawings.

Check Valves: Unless specified otherwise, all check valves shall be swing type with spring and lever and shall comply with the latest revision of AWWA Standard C508. The Valves shall have class 125 flanged ends unless shown otherwise on the drawing. Check valves shall be manufactured by Mueller, Clow, M&H, or Kennedy.

Valves for Tapping: All gate valves for tapping purposes shall be Resilient Seat Type valves. The valve for tapping shall be manufactured by Mueller Co., Kennedy Valve Co. or Clow Valve Co.

Tapping Sleeves: All tapping sleeves shall be all stainless steel including flange and shall only be used when specified on the drawings by CWS. Tapping sleeves shall be JCM Model 432, Mueller Model H304, Smith Blair 662-663 or Ford style FTSS.

Valve Casings and Covers: All valve casings and covers shall be fabricated as shown on the latest revision of drawing CW-14 as applicable.

Fire Hydrants: All fire hydrants shall be as specified on the district specific drawing or as approved by CWS Co. district personnel. For typical Fire Hydrant details see the latest revision of drawing CW-380.

Fire Hydrant Burys: All fire hydrant burys shall be manufactured from Ductile Iron to ASTM A536 and have a minimum working pressure rating of 200 PSI. Burys shall be manufactured by Clow, SBF, Sigma, or Star Pipe.

Service Materials: All 1" and 2" service material specifications except copper tubing and plastic PE pipe shall be as shown on the latest revision of drawings CW-555 or CW-436 which includes alternate manufacturers. All service material specifications for services larger than 2" shall be as specified on the plan and/or as specified on the latest revision of the CW drawing for that size service.

Saddles: All saddles shall be as specified on the latest revision of the applicable size service standard drawing: 1" = CW-555 and 2" = CW-436.

Solder: All solder shall be lead free.

Copper Tubing: All copper tubing shall conform to the latest revision of ASTM Specification B88 and be Type K soft.

Polyethylene (PE) Service Pipe: All PE plastic pipe for services shall comply with the latest revision of ASTM D2239 with a Standard Code Designation of PE 3408. Dimensions and tolerance of pipe shall be as specified in Table 3 of the latest revision of AWWA Standard C901 for PC 200-IDR7. This is a high density polyethylene plastic pipe conforming to the inside-diameter dimensions of iron pipe sizes and having a 200 p.s.i. pressure rating. The pipe shall be approved by N.S.F. as suitable for potable water products.

Meter Boxes: All meter boxes for 1" services and 2" services shall be as specified on the latest revision of drawings CW-555 or CW-436. All meter boxes for services larger than 2" shall be as specified on the plans and/or as specified on the latest revision of the CW drawing for that size service. All meter boxes for 1" services and 2" services shall be supported by placing bricks or 2"X4" pressure treated lumber under two sides of the base of the meter box.

Vaults: Vaults for appurtenances other than meters (such as Check Valves or PRV's) shall be as specified on the drawings.

Machine Bolts: All steel bolts and nuts used for flanged fittings, flexible couplings, or other bolted appurtenances shall be 304 stainless steel. Ductile iron bolts are acceptable when the appurtenance is made of ductile iron and comes with option of ductile iron bolts, such as mechanical joint fittings. Anti-gaul lubricant shall be used with stainless steel bolts & nuts.

2" Blow Off Assemblies: All materials for 2" blow off assemblies shall be as shown on the latest revision of drawing CW-122.

Flexible Couplings: The Company may require flexible couplings to be epoxy coated if soil conditions are determined to be corrosive. If the flexible coupling is steel the sleeve must be a minimum of 10 inches long. If the flexible coupling is ductile iron then a standard sleeve length may be used unless the drawing specifies otherwise. Flexible Couplings shall be manufactured by Smith Blair, Ford Meter Box Company, or Romac Industries.

Solid Sleeves: All solid sleeves shall be made of ductile iron and shall be manufactured by Tyler Pipe or Union/Tyler Foundry.

PVC High Deflection Couplings: All PVC high deflection couplings shall conform to the latest revision of AWWA C-900 and shall be manufactured by CertainTeed.

PVC Closure Couplings: All PVC closure couplings shall conform to the latest revision of AWWA C-900 and shall be manufactured by CertainTeed.

2" Ball Valves: Two inch ball valves shall be as shown on the drawing and shall be manufactured by Mueller, James Jones, Ford Meter Box Company or AY McDonald.

Tracer Wire: Tracer wire shall be minimum #12 AWG solid copper wire with 45 mils of high molecular weight polyethylene (HMWPE) insulation, UL Listed, rated for direct burial, color blue and installed with all pipe including PVC, polyethylene, and ductile iron pipe. For installation details see the latest revision of drawing CW-850.

SPECIFICATIONS FOR INSTALLATION OF DUCTILE IRON AND POLYVINYL CHLORIDE PRESSURE PIPE AND APPURTENANCES

Permits: All specification sheets, city/county or other environmental permits necessary for the installation of facilities must be obtained by the Developer or Developer's Contractor and be on the job site prior to and during construction.

Compliance with all the Rules and Regulations of the California Occupational Safety and Health Act (CAL OSHA), Public Law 91-596, the "Williams' Steiger Occupational Safety and Health Act of 1970", is required on this project. The work practices for all pipe shall be in accordance with the latest revision of the American Water Works Association Publication C-600 Standard for Installation of Ductile Iron Water Mains and their Appurtenances, C-605 Standard for underground installation of Polyvinyl Chloride (PVC) Pressure Pipe and fittings for water, and M23 Manual of Water Supply Practices for PVC Pipe-Design and Installation.

Please note direct discharge of highly chlorinated water to the environment is expressly prohibited. Refer to "Specifications for Dechlorination of Flushed Water" for more information. The Developer's Contractor shall comply with environmental laws and regulations as set forth by all federal, state and local agencies.

Materials: All materials installed for the facilities to be constructed by the Developer's Contractor must comply with the drawings and "Specifications for Material". No materials are to be supplied or furnished by California Water Service Company unless specifically indicated on the plans for special installations. All materials must be on the job site and inspected prior to start of construction. Any pipe, valve, or appurtenance whether installed or not, which in the opinion of the Company, does not meet the requirements of these specifications or otherwise found unfit, shall be rejected as being unfit, and shall be immediately removed from the job site.

Line and Grade: The horizontal and vertical alignment for installation of the pipe shall be established in the field by the Developer's Contractor in accordance with the plans and specifications. Location of water facilities including finished grades and elevations shall be staked with offsets on site by the Developer's project engineer prior to start of construction. Final elevations of installed facilities, meter boxes, valve covers, hydrants, etc. shall be signed off by the Developer's project engineer prior to acceptance of facilities.

Cover: Under normal conditions all mains shall be covered to a depth of four feet below the finished grade over the pipeline, unless specified otherwise on the plans. Prior approval must be obtained from California Water Service Company to install mains with greater or less than four feet of cover.

Separation Between Water Mains and Sanitary Sewers or other Facilities: Water mains shall be installed at least ten feet horizontally from and one foot higher than sanitary sewers located parallel to the main, unless specified otherwise on the plans. Install water mains a minimum of one foot higher than sanitary sewers crossing the mains. At all storm and sanitary sewer crossings, a full pipe length shall be centered over the sewer pipe to keep an adequate distance between the sewer and the water pipe joints. A 20 feet length of PVC or 18 feet length of DI pipe is considered to be a full pipe length. The State of California Department of Health Services "Criteria for the Separation of Water Mains and Non-potable Pipelines" shall be followed when installations can not meet the "Basic Separation Standards". A minimum vertical clearance of twelve (12) inches shall be maintained between the water main and all foreign structures, and a minimum horizontal clearance of five (5) feet shall be maintained between utilities unless otherwise indicated on the plans or approved by the Company. Refer to "Pipeline Crossing Information" shown on the plans for information of water main installations crossing other proposed or existing facilities. Company approval must be obtained prior to making any changes from the plans. This includes changing grade or alignment to avoid structures, other pipes, manholes, or any other fixed objects which may be encountered during installation. As per company standards, changes in cover over the pipeline may require the installation of a fabricated steel, cement mortar lined and coated offset.

Workmanship: The pipe shall be installed to a true line and grade except on curves where ductile iron pipe may be installed with joint deflections between adjacent lengths of pipe not to exceed 3 degrees for ductile iron pipe sizes 6", 8", and 12". PVC pipe shall not be deflected at joints for horizontal or vertical deflection. No joint deflection shall be allowed in joints between fittings and pipe. "CertainTeed" PVC Deflection Couplings shall be used with PVC C-900 between adjacent lengths of pipe to attain up to 5 degrees deflection at the joint when required.

When assembling a PVC pipe to an iron fitting, valve, or appurtenance (push-on), remove all but 1/4 inch of the factory made bevel from the spigot end of the pipe. Bottom the pipe in the bell of the iron fitting.

Field-cut lengths of PVC and DI pipe may be used for making connections to valves, fittings, appurtenances, and closures where necessary. The cutting and beveling of the pipe for inserting into the bell shall be done by the use of a square cutting tool approved by the Company and manufactured for this purpose, without damage to the pipe. The bevel of the pipe shall be the same as required for the fitting.

Trench Bottom: The bottom of the trench shall be smooth and free from pieces of rock or other material that would tend to scratch, puncture or break the pipe or damage the polyethylene encasement used on ductile iron pipe. If rocks or stones are encountered, they shall be removed to a depth of six inches below bottom of trench and the void filled with material tamped to grade. A six inch layer of sand shall be placed in the trench bottom to provide a firm, stable, and uniform support for the full length of the pipe, except at the joints where bell holes shall be dug two inches below the surface so that the pipe will not be supported by the joint. Under no circumstances shall the bell hole undermine the support for the fittings or valves.

Valves and other various fittings may be required to be supported by a concrete cradle if it is determined by the Company that the bedding in the trench bottom can not be properly compacted to provide adequate support.

When an unstable subgrade condition is encountered that could provide inadequate pipe support, the Company shall require additional trench depth to be excavated, refilled and compacted with suitable foundation material.

PVC or DI pipe or appurtenance shall not be laid in water, or when, in the opinion of the Company, the trench conditions or the weather are unsuitable for construction. Any water main which has been submerged shall be removed from the trench and be relaid. The trench shall be dewatered whenever running or standing water occurs in the trench bottom and the removal shall continue until the pipe has been installed and the backfill has been placed to a sufficient height to prevent the pipe from being submerged in water.

IMPORTANT: All trench excavations shall be in accordance with the Rules and Regulations of the California Occupational Safety and Health Act (CAL OSHA). This includes all necessary shoring determined by either the depth of trench and/or soil conditions.

Pipe and Appurtenances Handling: All water main and appurtenances shall be carefully lowered into the trench by means of padded slings, hooks, pipe tongs, or other suitable equipment consistent with safety, in such a manner to prevent damage to the exterior and interior pipe or appurtenance surfaces. Under no circumstances shall any material be dropped or dumped into the trench. Any foreign material inside the pipe shall be removed and the interior of the pipe kept clean during installation. PVC pipe, ductile iron pipe, or appurtenance with damaged exterior or interior surfaces shall not be installed.

During installation the open ends of the pipe shall be covered at night or when no work is in progress at that point to prevent entrance of trench water, animals, or other foreign matter.

On all pipe, a continuous strip of tracer wire (per material specification) shall be taped to the top exterior surface of the pipe per the latest revision of drawing CW-850. Tracer wire splices using appropriate connectors are required at all locations where the wire is cut.

A polyethylene encasement shall be installed over ductile iron pipe, fittings, and appurtenances per latest revision of AWWA Standard C105 Polyethylene Encasement for Ductile Iron Piping and per the plans and specifications, or as requested and directed by the authorized Company representatives.

Note: Ductile iron fittings and appurtenances installed on PVC C-900 main shall require polyethylene encasement with a 2 feet overlap onto the PVC main. This overlap to be secured to main per the latest revision of AWWA Standard C105.

Rubber Ring Joints for PVC C-900 and Ductile Iron Pipe:
Push-on type rubber ring joints with rubber rings for integral bell ends shall be joined as follows: The ring groove, bell socket and plain end should be wiped clean. Insert the gasket making sure that it faces the proper direction and that it is correctly seated. The plain end shall be beveled and free of any sharp or ragged edges which may damage or dislodge the gasket. Lubricate the entire outside end of the pipe including the pipe bevel, also lubricate the exposed portion of the rubber ring gasket in the bell (See "pipe joint lubricant" below). Push the plain end into the bell by hand or with the use of a bar and block until it is completely seated, keeping the joint straight while pushing. Construction machinery shall not be used to push the pipe into a pipe bell end or a fitting bell end. After assembly, the resulting position of the rubber ring shall be checked with a feeler gauge.

If "Field Lok" gaskets are specified on the plans, the gasket shall be installed in accordance with the manufacturer's recommendations.

If "TR FLEX" restrained joint system is specified on the plans, the joint assembly shall be installed in accordance with the manufacturer's recommendations.

Pipe Joint Lubricant: Pipe joint lubricant shall be as specified by the pipe manufacturer and shall be NSF approved for use in potable water systems. When specified by the Company, or at the option of the Developer's Contractor, Slikstyx spray-on gasket lubricant may be used as an alternative to the traditional lubricant supplied by the pipe manufacturer. This spray-on lubricant may be helpful in reducing taste and odor complaints from excessive traditional lubrication, particularly on dead end mains.

When using Slikstyx, follow these instructions: After cleaning the bell and spigot of all grease, dirt, or foreign material, apply a thin film of Slikstyx gasket lubricant to the gasket and pipe spigot. Use care on rolled fittings and PVC high deflection couplings, as the product will set up and cause difficulty in manipulating fittings. If the pipe will be installed for a long period before attempting to roll a fitting, the traditional pipe lubricant should be considered. One 16 fluid oz. can of Slikstyx will cover approximately 40 - 6" joints, 30 - 8" joints or 20 - 12" joints. Slikstyx gasket lubricant is currently distributed by Future Tools, Inc., Wellston, OH 45692, 1-800-576-9707.

Mechanical Joints: Mechanical joints shall be joined as follows:
The socket and plain end should be wiped clean and any excess coating in the bell should be removed. The plain end, bell socket, and gasket should be washed with a soap solution or lubricant furnished with the gaskets to improve the seating of the gasket in the socket and to help the various parts slide together along the pipe. Place the gland on the plain end with the lip extension toward the plain end of the pipe, followed by the gasket with the narrow edge of the gasket toward the end of the pipe. Insert the pipe into the socket and press the gasket firmly and evenly into the gasket recess. Keep the joint straight during the assembly. Push the gland toward the socket and center it around the pipe with the gland lip against the gasket. Insert bolts and hand tighten nuts. Partially tighten the bottom bolt first; then the top bolt; next the bolts at either side; and finally the remaining bolts. Repeat this process until all bolts are torqued to a value between 75 and 90 ft-lbs.

If "Mega Lug" mechanical joint retainer glands are specified on the plans, the gland assembly shall be installed in accordance with the manufacturer's recommendations.

Thrust Blocks: Concrete thrust blocks shall be provided for all fittings to prevent movement when the main is under pressure. This includes tees, ells, reducers, caps and plugs. Forms are required and are to be provided by the contractor. These forms shall be smooth, mortar tight and of sufficient strength to maintain shape during the placing of the concrete. All concrete thrust blocks shall be constructed per the latest revision of drawing CW-435.

Embedment Backfill: The embedment backfill is 6 inches of sand bedding below the pipe and 12 inches of sand backfill above the pipe (see sand definition below). Care must be taken to compact the sand backfill material solidly around and under the pipe. Small tampers and vibrators are allowed for compacting near the pipe and over the pipe after a minimum of 6 inches of sand backfill has been placed over the pipe. Flooding, jetting or puddling may be employed for compaction in the first lift although great care must be taken to prevent drainage or flotation of the pipeline. Apply only enough water to give complete saturation. Erosion of support at the pipe sides and bottom by water jetting must be prevented. Rocks or hard lumps are not permitted in the embedment backfill or final backfill.

Sand is defined as material free from organic matter and clay with a sieve gradation by weight as follows:

Sieve Size	% Passing Sieve
No. 4	100
No. 200	0 - 5

Final Backfill: In areas where required, the permanent pavement and temporary pavement replacement must comply with specifications of the local governing authorities. All backfill above the sand embedment backfill must meet compaction requirements of the local governing agency. All pavement broken shall be replaced in strict accordance with the requirements of the local authorities, or lacking local requirements, in accordance with the latest revision of drawing CW-236.

Other Facilities: All existing facilities, such as but not limited to sewers, gas mains, water mains, telephone conduits, and power or telephone poles which may be located close to trench operations must be protected by the Developer's Contractor. If any of these facilities are damaged by the Developer's Contractor, repairs shall be made to the satisfaction of the interested parties at the Developer's expense.

Valve Casings and Covers: A valve casing with cover shall be installed for each gate valve, butterfly valve, 2" blow off assembly or when specified on the plans per the latest revision of drawing CW-439. The valve cover and frame for valves in paved and unpaved areas shall be per the latest revision of drawing CW-14. The valve cover frame shall be set in a ring of concrete a minimum of 24" in diameter and three inches thick or per local governing agency's standards whichever is greater. All valve casing covers must be placed flush with the finished grade of the surrounding area.

2" Blow Off Assemblies: A blow off assembly as shown on the latest revision of drawing CW-122 shall be installed for each dead end capped main. The assembly is to include a valve casing and cover.

Services and Meter Boxes: Services and meter boxes shall be installed as shown on the latest revision of drawings CW-555 for 1" services, CW-436 for 2" services, and for larger than 2" services as designated on the plans and/or the latest revision of the CW drawing for that size service. The 1" and 2" service pipe shall be installed at a depth of 30" or more from finished grade over the service pipe and in no event shall the depth be less than 18". The Developer's Contractor must get prior approval from the Company to install service pipe with less than 30" of cover.

The meter box location must be staked by the Developer's project engineer and the boxes must be installed flush with finished grade of the surrounding area at the meter box cover. The meter boxes for 1" and 2" services shall be supported by placing 2"x4" treated lumber or bricks on two sides of the meter box's base. Avoid postal and street pedestals, driveways, trees/bushes, fencing, sewer lines, and other utilities.

Saddles and saddle tapping are required for all service connections made on PVC pipe. When making this type of connection, proper equipment must be used which attaches to the corporation stop permitting the cutting tool to be fed through the corporation stop to cut a hole in the pipe. It is important that the cutting tool be a sharp shell type (hole) cutter which will retain the coupon and be designed to accommodate walls as heavy as DR 18 pressure class 150. The shell cutter shall be lubricated on the outside only and not on the inside of the cutter with a recommended lubricant. Do not drill a hole in the PVC pipe with a twist drill or auger bit.

Direct tapping machines for service connections on ductile iron pipe must be approved by California Water Service prior to direct tapping ductile iron mains. Plastic PE pipe is to be cold flared to match recessed fittings or is to have outside end bevels for Instatite fittings. Forming tool for bevels shall be Mueller's beveling tool number H10817 or approved equal.

Connection to Existing System: Only the Company is allowed to make the connection to the existing system. The Developer's Contractor shall furnish to the Company the necessary fittings, valves, pipe, and joint material required to connect the new mains to the existing system. The Developer's Contractor must adjust from the nominal line and grade to match the existing facilities. The Developer's Contractor to complete piping and maintain the specified clearance from existing main as shown on the drawings. The Developer's Contractor shall make the excavation for the tie-in. The trench shall be left in a safe condition for the company to complete the connections. If the trench is considered unsafe for workers, the Company may require the Developer's Contractor to return and adequately excavate for the tie-ins at the Contractor's expense. After the Company has completed the connection, the Developer's Contractor shall install concrete thrust blocks, install valve casings and covers, and backfill the excavation. The Developer's Contractor shall then replace any pavement that was cut for the excavation.

Pressure Test: Prior to any testing, at least seven days should elapse after the last concrete thrust block was poured if Type I portland cement was used and three days if high-early-strength Type III portland cement was used. A preliminary pressure test shall be made by filling the mains with water and allowing them to stand under regular system pressure for a period of at least twenty-four hours. After completion of the preliminary test, the Developer's Contractor shall make a hydrostatic test by raising the pressure in the main to 50 pounds per square inch above the normal static pressure at the point of observation with a minimum test pressure of 150 pounds per square inch. A calibrated pressure chart recorder and a water meter shall be provided by California Water Service Company. The hydrostatic test shall not be conducted without a Company representative present. The pressure that the test is started at shall be maintained for a minimum of four hours. The test shall start and finish at the same pressure. If there is a pressure drop, the Developer's Contractor shall pump more water into the main through the water meter to bring the main back to its starting pressure. The leakage is the calculated volume of water pumped into the main through the meter. The leakage shall be measured accurately during the test period to determine that the leakage rate does not exceed the values shown in Table IA for ductile iron pipe and Table IB for PVC C-900 pipe. There shall be no leakage, zero gallons per four hours test period at 150 p.s.i. for the portion of pipeline that is steel pipe CL&C with welded joints. An air test may be used as an alternate method on the steel pipe CL&C welded sections. Test pressure to be 150 p.s.i.g. held for a four hour duration, with no volumetric loss during test period. A calibrated pressure chart recorder will be provided by California Water Service Company. The necessary taps, connecting pipe, and valve fittings shall be provided by the Developer's Contractor. Any leaks or failures that develop during the test shall be repaired by the Developer's Contractor immediately.

If the mains fail to meet requirements of the hydrostatic test, the Developer's Contractor shall, at his expense, make repairs to reduce the leakage. The repair work shall be continued until a satisfactory test is made.

Disinfection of Mains: All mains that are installed by the Developer's Contractor shall be disinfected by the Developer's Contractor in accordance with the "Specifications for Disinfection of New Mains."

Inspection: The Company reserves the right of access to the work at all times for the purpose of inspecting and the Developer's Contractor shall permit the Company's representative to make an inspection at any time. The Developer's Contractor shall notify the Company's local manager at least 48 hours prior to any work being started at the project site. The Company will normally provide no more than 2 inspections per day during normal working hours. The trench must be left open until the Company has inspected the new installation and approved that portion of trench to be covered. If the trench is covered prior to the Company's inspection, the Developer's Contractor will be required to uncover the trench at the Contractor's expense.

Protection: The Developer's Contractor shall at all times provide suitable and adequate danger signals and barricades. If necessary, the Developer's Contractor shall also provide temporary bridges across the trench to permit free ingress and egress to and from private driveways or traveled roads or streets. No street shall be closed unless a permit has been obtained from the appropriate authority.

Specifications and Drawings: Specifications and drawings shall be taken together and anything shown on the drawings and not covered by the specifications or covered by the specifications and not shown on the drawings shall be considered as though it were covered by both specifications and drawings. Any points of disagreement should be referred to the Company's representative as soon as possible to resolve any possible misunderstandings.

Clean Up: Upon completion of the work, the Developer's Contractor shall remove all rubbish and waste materials resulting from the Contractor's operations and leave the ground along the route of the pipeline in a neat and clean condition. The Developer's Contractor shall be responsible for removal of all excess spoil from the trench excavations, the Company shall not accept any responsibility.

Guarantee of Workmanship: Notwithstanding Owner's acceptance of the new facilities, the Developer's Contractor shall guarantee all of his workmanship for a period of one calendar year from and after acceptance of the work by the Owner. The Developer shall be responsible for having his Contractor repair and make good any defects or imperfections in the work at his sole cost and expense. If deficiencies develop during the Guarantee calendar year, such as but not limited to: leaks in the pipeline or appurtenances, settlement of trenches, or deteriorating pavement due to faulty or imperfect workmanship, the owner retains the right of making repairs and the Developer is responsible for the cost of said repairs.

TABLE IA

ALLOWABLE LEAKAGE PER 1000 FT. OF DUCTILE IRON PIPELINE

Average Test Pressure	Nominal Pipe Diameter - inches							
	6	8	10	12	14	16	18	24
(PSI)	GALLONS		PER	HOUR		(GPH) *		
200	0.64	0.85	1.06	1.28	1.48	1.70	1.91	2.55
175	0.59	0.80	0.99	1.19	1.39	1.59	1.79	2.38
150	0.55	0.74	0.92	1.10	1.29	1.47	1.66	2.20

* If the pipeline under test contains sections for various diameters, the allowable leakage will be the sum of the computed leakage for each size.

TABLE IB

ALLOWABLE LEAKAGE PER 1000 FT. OF PVC C-900 PIPELINE

Average Test Pressure	Nominal Pipe Diameter - inches		
	6	8	12
(PSI)	GALLONS PER HOUR (GPH) *		
200	.57	0.76	1.15
150	.50	0.66	.99

* If the pipeline under test contains sections for various diameters, the allowable leakage will be the sum of the computed leakage for each size.

SPECIFICATIONS FOR DISINFECTION OF NEW MAINS BASED ON THE PROCEDURES OUTLINED IN THE LATEST REVISION OF ANSI/AWWA C651

General Instructions

1. Precautions shall be taken to prevent soiling of pipe, fittings and other materials. Pipe and fittings shall be stored so as not to accumulate mud or water, and other material shall be stored in a clean, dry location. Particular care shall be taken to keep rubber gaskets and pipe ends clean.

2. All pipe shall be clean before lowering the pipe into the trench.

3. When the main is left unattended, even for a short time, the ends shall be plugged to prevent the entrance of foreign material or small animals.

4. Loading of new mains: A reduced pressure principle (RPP) backflow assembly is required on all new main installations to prevent any chlorine used for disinfection from entering into domestic water supply. The backflow assembly must be tested by a certified backflow assembly tester within the last twelve months. This test will be verified by the California Water Service Company Inspector. The backflow assembly can be placed on a blow off or fire hydrant. Backflow assemblies and annual testing will be supplied by, and be the responsibility of the installing contractor.

5. Apply the chlorine, using one of the methods described under "Chlorine Application Methods." A California Water Service Company Inspector is to measure the chlorine concentration to insure that a 50 ppm concentration has been applied (not to exceed 200 ppm). Samples with a high chlorine concentration must be analyzed with a high range total chlorine test kit. Hach Catalog Number 2444400, or equivalent may be used to the initial dosage test.

6. Allow heavily chlorinated water to stand therein for a contact period of at least twenty-four hours. If the water temperature is less than 41°F, the water shall remain in the pipe for at least 48 hours. A California Water Service Company Inspector is to measure the chlorine after this contact period. When using the tablet method, there must be a detectable free chlorine residual at the end of the required hold time. When using liquid chlorine, the free chlorine residual must be at least 10 ppm at the end of the required hold time. If the concentration has dropped to less than 10 ppm, then the mains must be superchlorinated by the continuous feed method, and the required contact period shall be repeated due to the high chlorine demand. Equipment used to superchlorinate by the continuous feed method will be provided by the installing contractor.

7. At the end of the contact period, flush the main thoroughly (See Specifications for Dechlorination of Flushed Water). The California Water Service Company Inspector is to test for chlorine to demonstrate that the water leaving the main has no more chlorine than in the water entering the main.

8. The Company's representative will collect two sample sets at least 24 hours apart and work with the Water Quality (WQ) Department in having them analyzed for coliforms and heterotrophic bacteria. The samples should be taken from a combination blow off and sampling device illustrated in drawing CW638 or a service located near the end of the chlorinated section. In accordance with the latest revision of AWWA standard C651 one sample set (two samples 24 hours apart) shall be collected every 1,200 ft., and one set from the end of the line and one set from each branch or dead-end.

9. A WQPM will review the bacteriological results and determine if the main can be put into service. Further flushing and analytical work will be necessary if the bacteriological tests are positive. If any follow-up sample tests positive, the main must be superchlorinated by the continuous feed method. Equipment used to superchlorinate by the continuous feed method will be provided by the installing contractor. The main will only be put into service with two consecutive sets of negative bacteriological results and a free chlorine residual between 0.3 ppm and 1.0 ppm.

10. Before a tie-in is performed, the inside surface of all materials such as the tee, pipe nipples, couplings, and tapping sleeve must be swabbed with NSF-grade 12.5% sodium hypochlorite or heavily dusted with H.T.H. granules.

Chlorine Application Methods:

Safety Notes: Chlorine tablets and solutions should be handled with care, as they are dangerous to the eyes, irritating to the skin, and will damage shoes and clothing. Minimize your exposure by reading and having the M.S.D.S. available should an emergency occur. Follow the guidelines for protecting yourself, asking your supervisor when in doubt and by erring on the safe side by using respirators, protective clothing and other protective equipment.

Method No. 1 - H.T.H. Tablet Method

This method works well for short jobs and for small diameter pipe of any kind. It cannot be used where trench water has entered the main. The main cannot be flushed prior to disinfection, so the method requires that the pipe be kept clean during laying.

Use Permatex (Loctite) Form-A-Gasket No. 1 Sealant (Permatex (Loctite) Catalog No. 80001), to fasten the required number of H.T.H. tablets (See Tables IIA and IIB) to the top of each length of pipe. H.T.H. tablets may be oval or round, must be NSF approved, and have 65% free chlorine.

Permatex (Loctite) No. 1 is a fast drying, hard-setting gasket sealant designed for sealing rigid materials and flanges, or patching holes and joints where permanent assembly is desired. Please refer to its M.S.D.S. for health and safety precautions in its use. Do not use Permatex No. 2 (Loctite), which is a slow-drying, non-hardening sealant used where sealing is more important than adhesion. Tubes of Permatex (Loctite) No. 1 may be purchased locally at any auto parts store. The tablets may be fastened to the pipe before it is placed in the trench provided the top of pipe is marked to avoid the possibility that the pipe may be rotated.

H.T.H. tablets should be removed at the end of the day, when pipe is not installed in the ground the same day tablets are applied. Reuse those tablets in the following days if still intact. This is to prevent moisture from reducing the amount of chlorine available for disinfection.

In addition to the tablets, place 10 ounces of H.T.H. granules at the upstream end of the first length of pipe into which water will flow. This will insure that heavily chlorinated water flows into crevasses caused by couplings and valves. For long runs, this should be repeated about 500 feet.

When using flexible couplings, apply NSF-grade sodium hypochlorite with a spray bottle method, or place additional H.T.H. granules in the annular space between the coupling and the pipe.

When installing CL&C pipe, one cap full of H.T.H. granules shall be placed in the pipe after the pressure test and before tie-ins. NSF-grade sodium hypochlorite can be used when main needs to be placed in service as soon as possible, and can be flushed to the system chlorine reading.

Fill the pipe very sowly and proceed as outlined under the "General Instructions".

TABLE IIA

H.T.H. Oval Tablet Method No. 1 of Main Chlorination
Number of Tablets Specified for Disinfection of at least 50 ppm

Length of Section	DIAMETERS 4" # of Tabs	4" ppm	6" # of Tabs	6" ppm	8" # of Tabs	8" ppm	10" # of Tabs	10" ppm	12" # of Tabs	12" ppm	14" # of Tabs	14" ppm	16" # of Tabs	16" ppm	18" # of Tabs	18" ppm
18'	1	95	2	84	3	71	4	61	5	52	7	54	9	53	11	51
20'	1	85	2	75	3	64	4	54	6	56	8	55	10	53	12	50
30'	1	56	2	50	4	57	6	54	8	50	11	51	15	53	18	50
40'	2	85	3	56	5	53	8	54	11	52	15	52	19	50	24	50

TABLE IIB

H.T.H. Round Tablet Method No. 1 of Main Chlorination
Number of Tablets Specified for Disinfection of at least 50 ppm

Length of Section	DIAMETERS 4" # of Tabs	4" ppm	6" # of Tabs	6" ppm	8" # of Tabs	8" ppm	10" # of Tabs	10" ppm	12" # of Tabs	12" ppm	14" # of Tabs	14" ppm	16" # of Tabs	16" ppm	18" # of Tabs	18" ppm
18'	1	215	1	95	1	55	2	70	2	50	3	55	3	54	5	55
20'	1	200	1	85	1	50	2	60	3	65	4	65	5	60	6	60
30'	1	130	1	60	2	65	3	60	4	60	5	55	7	55	8	50
40'	1	100	2	85	3	75	4	60	5	55	7	55	9	55	11	55

Method No. 2 - 12.5% Liquid Chlorine (Sodium hypochlorite)

This method is general in scope and must be used when it is necessary to re-chlorinate an existing main. It may also be used on new mains, in which case place 10 ounces of H.T.H. granules at the upstream end of the first length of pipe into which water will flow, and every 500 feet thereafter.

This method consists of introducing a 12.5% chlorine solution into water which is being used to fill water main. The 12.5% chlorine solution must be NSF approved and can be purchased through several vendors.

Procedure:

1. Calculate the total volume (ounces or gallons) of 12.5% hypochlorite solution needed, based on the pipe diameter and section length (See Table III and the example below Table III.)

2. Choose a suitable filling rate and determine the time required to fill the water main from Table IV.

3. Calculate the 12.5% hypochlorite dose rate using the results from 1 and 2 above. Using the examples below Table III & Table IV, the dose rate would be: 1.2 gal/52.0 min.=0.02 gal/min. or 150 ounces/52.0 min.=3 ounces/min.

4. It is recommended to use a metering pump, a controlled vacuum device, or an equivalent device to introduce the 12.5% hypochlorite solution into the main at a constant rate. The feed device and method must be approved by the Company prior to loading the main. Adjust the feed device to the dose rate. Introduce the solution through a corporation cock, blow off, or service connection at or ahead of the inlet end of the water main to be disinfected.

5. After flushing the main thoroughly, adjust the filling rate by measuring the time required to fill a five-gallon or other suitable container.

6. Begin introducing the 12.5% hypochlorite solution into the main, and continue until a chlorine residual test on a sample taken from the discharge end of the main shows at least 50 ppm chlorine.

7. Close the filling valve or blow off, and stop introducing hypochlorite solution. Disconnect and flush the feed device and equipment thoroughly with fresh water.

8. Proceed as outlined under the "General Instructions."

TABLE III

12.5% Liquid Hypochlorite Method of Main Chlorination
Amount of 12.5% Liquid Hypochlorite (ounces)
Specified For Disinfection of at Least 50 ppm

Length of Section	DIAMETERS 4" Amount in oz	4" ppm	6" Amount in oz	6" ppm	8" Amount in oz	8" ppm	10" Amount in oz	10" ppm	12" Amount in oz	12" ppm	14" Amount in oz	14" ppm	16" Amount in oz	16" ppm	18" Amount in oz	18" ppm
18'	1	85	2	75	3	60	4	55	6	55	8	55	10	50	13	55
20'	1	75	2	65	3	55	5	60	6	50	9	55	11	50	14	50
30'	1	50	3	65	4	50	7	55	9	50	13	55	16	50	21	50
40'	2	75	3	50	6	55	9	55	12	50	17	50	22	50	27	50

Table III is used to calculate the total ounces of 12.5% hypochlorite required to produce water with a free chlorine concentration of at least 50 ppm in the main.
For example: A 20 ft. section of 8 inch pipe needs 3 ounces, so for 1000 ft. (50-20 foot sections) 50 x 3 = 150 ounces. 150/128 ounces/gal = 1.2 gal.

TABLE IV

(GPM)	DIAMETER OF PIPE BEING DISINFECTED (INCHES) 4	6	8	10	12	14	16	18	20
	TIME REQUIRED TO FILL 100 FEET OF PIPE (MINUTES)								
10	6.5	14.7	26.1	40.8	58.8	---	---	---	---
20	3.3	7.3	13.0	20.4	29.4	---	---	---	---
35	1.9	4.2	7.5	11.7	16.8	---	---	---	---
50	---	2.9	5.2	8.2	11.8	15.0	20.9	---	---
75	---	2.0	3.5	5.5	7.9	10.7	14.0	---	---
100	---	---	2.6	4.1	5.9	8.0	10.4	13.2	16.3

Table IV is used to estimate the time required to fill the pipe with chlorinated water. For example: A flow rate of 50 gpm will fill 1000 feet of 8 inch pipe in, 10 x 5.2 = 52.0 minutes.

SPECIFICATIONS FOR DECHLORINATION OF FLUSHED WATER

Safety Notes: While it is unlikely that these procedures will produce a hazardous reaction, employees should proceed with caution when working with calcium thiosulfate. Minimize your exposure by reading and having the M.S.D.S. available should an emergency occur. Follow the guidelines for protecting yourself, asking your supervisor when in doubt and by erring on the safe side by using respirators, protective clothing and other personal protective equipment.

1. The discharge/disposal of all chlorinated water generated from the procedures in the "Specifications for Disinfection of New Mains" shall be the Developer's Contractor's responsibility. The Developer's Contractor shall comply with all federal, state and local discharge/disposal requirements for chlorinated water.

2. If dechlorination of the water is required, then the chlorinated water that is discharged to a storm drain shall be dechlorinated by water industry accepted methods. The dechlorinated water will be tested for chlorine residual to verify that no detectable amount of free chlorine is present. This testing will take place from the onset of discharging the water and at frequent intervals throughout the dewatering of the pipe. No discharge to an open stream (waters of the State or waters of the U.S.) will be allowed without an NPDES permit.

3. Determine the chlorine concentration of the water to be flushed. If the water to be flushed contains a detectable level of chlorine, then that water must be dechlorinated as follows:

Please note: The use of the dechlorinating agent Captor (30% calcium thiosulfate) is recommended by the Company. Calcium thiosulfate is less hazardous than other ch emicals, and will not deoxygenate the water when marginally over-applied. Gross over-application of any dechlorinating agent is unacceptable because of its potential to deoxygenate a receiving water body. THE USE OF ANOTHER DECHLORINATING AGENT MUST BE APPROVED BY THE COMPANY.

A. Prepare a Captor solution for water containing the following chlorine residuals:
   1. Less than 1 mg/L: add 2 cups of Captor to 25 gallons of water. This will dechlorinate 25,000 gallons of water with a chlorine residual of 1mg/L or less.
   2. 1 to 50+ mg/L: Use straight 30% Captor solution.

B. Calculate the volume of the new main in gallons as follows:
(Length of pipe)(Diameter of pipe)(Diameter of pipe)(0.785)(7.48 gal./ft.^{3})
ft. ft. ft.

C. Calculate the volume of the 30% Captor needed to dechlorinate 1 to 50 mg/L chlorine residuals for the volume calculated in B:

$$\frac{(\text{Vol. of pipe})(\text{Chlorine concentration})(1.45)}{(300{,}000\ \text{mg/L Captor})}$$
gal. mg/L

D. Application of dechlorinating solution:
   1. Elevate the dechlorinating solution container by placing it on a truck. Run a length of clear 1/4" O.D. polyethylene tubing from the container on the truck to a petcock (True Value Hardware part #776674) mounted on a blow off or hydrant pipe (See Figures 1 through 4 in the Company's NPDES Best Management Practices binder). When the water flow starts, a venturi will be created to siphon the calcium thiosulfate from the container and into the main flowstream. The feed rate of the diluted solution can be adjusted by opening or closing the 1/4" in-line valve (True Value Hardware part #467639) on the 1/4" tubing.

4. Check the chlorine residual at the storm drain inlet. If there is a chlorine residual, slowly increase the feed rate of the Captor solution until you can no longer detect chlorine. If there is no chlorine residual at the storm drain inlet, make sure that the Captor solution is not being grossly over applied by slowly decreasing the feed rate until chlorine is detected. Then slowly increase the feed rate again until no chlorine is detected.

5. Best Management Practices must be used when discharging water into a storm drain. This discharge uses the City's/County's NPDES permits. No sediments shall be allowed to be disharged into a storm drain.

6. The installing contractor shall follow the water quality objectives stated below.
pH = 6.5 to 8.5 Chlorine = none detect
Concentration of total suspended solids <25 mg/L

If you find that the water naturally dechlorinates itself by the time it reaches the storm drain inlet, there is no need to add the Captor solution.

ENGINEERING
DEPARTMENT

REVISIONS:
R1. Revised specs. 1/18/96 AIG.
R2. Revised specs. 2/28/02 LP
R3. Minor corrections. 9/2/02 LP
R4. Update specs. 9/9/06 LP

DATE: INIT.
DISTRIBUTION MAP
PLAT SHEET
SYSTEM SCHEMATIC
STATION SCHEMATIC
ZONE MAP
VALVE RECORD

PLAT SHEET NO.:

SCALE: NONE

DRAWN BY: L. PERALTA

DESIGNED BY:

CHECKED BY: DATE:

APPROVED BY: DATE: 9/06

TITLE: CALIFORNIA WATER SERVICE COMPANY
SPECIFICATIONS FOR INSTALLATION OF DUCTILE IRON AND POLYVINYL CHLORIDE (PVC) PRESSURE PIPE AND APPURTENANCES
SPECIFICATIONS FOR MATERIALS, DISINFECTION AND DECHLORINATION OF NEW MAINS

DISTRICT: ALL

DATE: 9/06

PROJECT ID.:

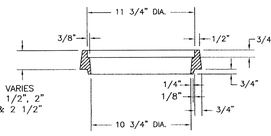
CW832.DWG

DRAWING NO.: CW-832-R4

SHT 1 OF 1

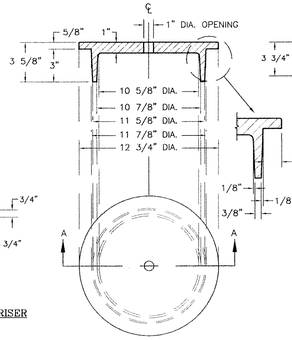
NOTE:

1. FRAME, COVER AND CASING EXTENSIONS TO BE OF GOOD QUALITY DOMESTIC CAST IRON, FREE FROM FLAWS AND BLOW HOLES, AND OF SUFFICIENT STRENGTH TO RESIST BREAKAGE BY STREET TRAFFIC.
2. CASTINGS TO BE TRUE, AND IF NECESSARY TO BE TRIMMED ON EMERY WHEEL TO PREVENT ROCKING OF COVER IN ANY POSITION IN THE FRAME.
3. SEE DRAWING CW 439 FOR VALVE COVER, CASING, AND FRAME INSTALLATION DETAILS.
4. COVER "A" DOES NOT HAVE A MATCHING CAST FRAME.



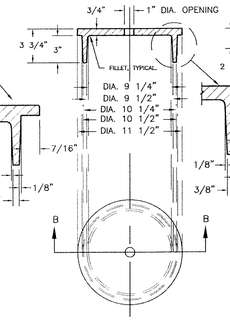
TYPICAL CENTER SECTION OF FRAME RISER FOR PAVED AREAS

SECTION A–A



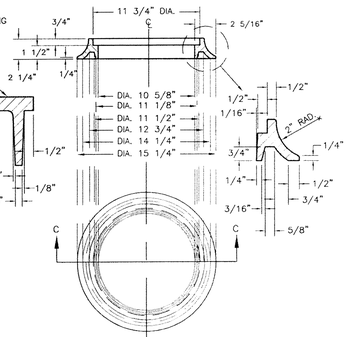
COVER "A" FOR UNPAVED AREAS

SECTION B–B

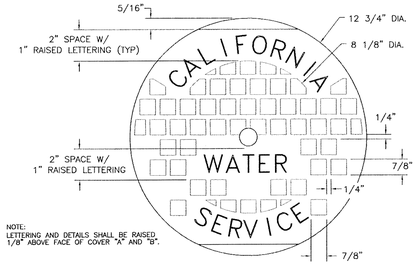


COVER "B" FOR PAVED AREAS

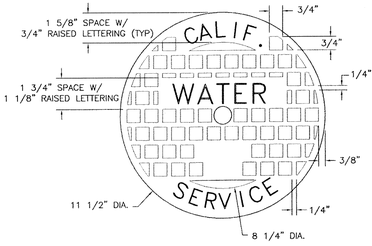
SECTION C–C



FRAME DETAIL FOR COVER "B" IN PAVED AREAS.

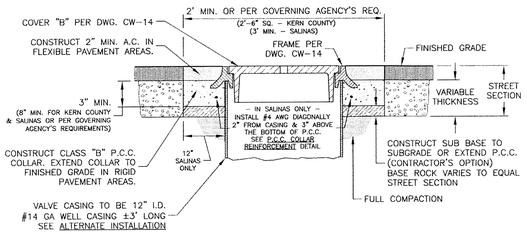


TOP VIEW OF COVER "A"



TOP VIEW OF COVER "B"

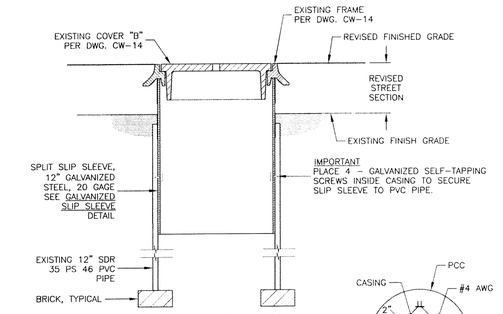
CW 14R5 VALVE COVER AND FRAME FABRICATION DETAILS FOR PAVED AND UNPAVED AREAS



STANDARD PAVED AREA INSTALLATION

N.T.S.

NOTE:
TO EXTEND AN EXISTING STANDARD PAVED INSTALLATION: REMOVE FRAME, ADD STANDARD CAST FRAME RISER PER CW-14, OR TACK WELD ADDITIONAL STEEL CASING AS REQUIRED, REPLACE FRAME.

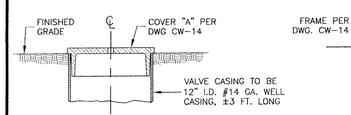


EXISTING PAVED AREA PVC CASING AND SLIP SLEEVE EXTENSION

N.T.S.

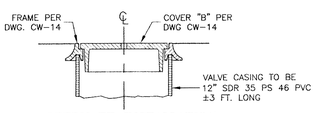
P.C.C. COLLAR REINFORCEMENT (SALINAS ONLY)

N.T.S.



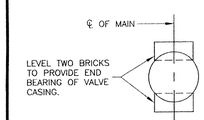
STANDARD INSTALLATION (IN UNPAVED AREAS)

NOTE:
TO EXTEND AN EXISTING STANDARD UNPAVED INSTALLATION: REMOVE COVER, TACK WELD ADDITIONAL STEEL CASING AS REQUIRED, AND REPLACE COVER.



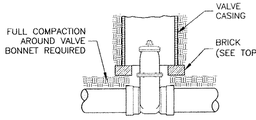
ALTERNATE INSTALLATION (IN PAVED AREAS)

NOTE:
TO EXTEND PVC CASING IN PAVED AREA: SEE EXISTING PAVED AREA PVC CASING AND SLIP SLEEVE EXTENSION DETAIL.



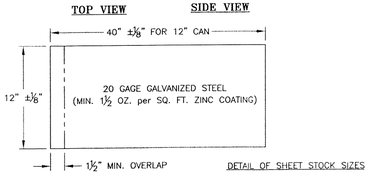
VALVE CASING FOOTING TOP VIEW

N.T.S.



VALVE CASING FOOTING SIDE VIEW

N.T.S.



GALVANIZED SLIP SLEEVE

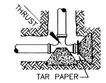
N.T.S.

CW 439R5 VALVE CASING, COVER, AND FRAME INSTALLATION DETAILS

THRUST BLOCK SCHEDULE

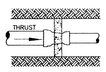
PIPE SIZE	FITTING	TYPE OF SOIL: SOFT CLAY (1000 P.S.F.) MIN. BEARING AREA (SQ. FT.)	SOFT CLAY DIMENSION (FEET) A	SOFT CLAY DIMENSION (FEET) B	SAND (2000 P.S.F.) MIN. BEARING AREA (SQ. FT.)	SAND DIMENSION (FEET) A	SAND DIMENSION (FEET) B	ROCK (3000 P.S.F.) MIN. BEARING AREA (SQ. FT.)	ROCK DIMENSION (FEET) A	ROCK DIMENSION (FEET) B
6"	PLUG, CAP	6	3	2	3	2	1.5	2	2	1
	90° ELL	8	3.2	2.5	4.1	2.7	1.5	3	2	1.5
	45° ELL	4.4	2.2	2	2.3	1.5	1.5	1.5	1.5	1
	22 1/2° ELL	2.3	1.5	1.5	1	1	1	1	1	1
	TEE W/ 6"OUTLET	6	3	2	3	2	1.5	2	2	1
8"	PLUG, CAP	10	4	2.5	5	2.5	2	3.2	2.2	1.5
	90° ELL	14	4	3.5	7	2.8	2.5	5	2.5	2
	45° ELL	7.5	3	2.5	3.8	2	1.9	2.6	1.7	1.5
	22 1/2° ELL	4	2	2	2	2	1	1.3	1.5	1
	TEE W/8"OUTLET	10	4	2.5	5	2.5	2	3.3	2.2	1.5
12"	PLUG, CAP	24	6	4	12	4	3	7.5	3	2.5
	90° ELL	32.5	6.5	5	16.1	4.6	3.5	10.5	3.6	3
	45° ELL	17.5	5	3.5	8.8	3.5	2.5	6	3	2
	22 1/2° ELL	9	3.5	2.5	4.6	2.3	2	3	2	1.5
	TEE W/12"OUTLET	24	6	4	12	4	3	7.5	3	2.5
14"	PLUG, CAP	31.5	6.3	5	15.8	4.5	3.5	10.3	3.5	3
	90° ELL	44.4	7.4	6	22	5.5	4	14.7	4.2	3.5
	45° ELL	24	6	4	12	4	3	8.1	3	2.7
	22 1/2° ELL	12	4	3	6	3	2	4	2	2
	TEE W/ 14"OUTLET	31.5	6.3	5	15.8	4.5	3.5	10.3	3.5	3
16"	PLUG, CAP	40.7	7.4	5.5	20	5	4	13.3	4.5	3
	90° ELL	56	8	7	28.8	6.4	4.5	20	5	4
	45° ELL	31	6.2	5	15.8	4.5	3.5	10.3	3.5	3
	22 1/2° ELL	15.8	4.5	3.5	7.8	3	2.6	5.2	2.6	2
	TEE W/ 16"OUTLET	40.7	7.4	5.5	20	5	4	13.3	4.5	3
18"	PLUG, CAP	52	8	6.5	26.4	6.6	4	17.3	5	3.5
	90° ELL	75	10	7.5	37	7.4	5	24.5	6.2	4
	45° ELL	40.7	7.4	5.5	20	5	4	14	4	3.5
	22 1/2° ELL	20	5	4	10.5	3.5	3	6.9	3	2.3
	TEE W/ 18"OUTLET	52	8	6.5	26.4	6.6	4	17.3	5	3.5

NOTE:
1. THRUST BLOCKS DESIGNED FOR A MAXIMUM OF 150 PSI WATER PRESSURE
2. ALL CONCRETE SHALL CONTAIN 6 SACKS OF CEMENT PER CUBIC YARD.
3. THRUST BLOCKS SHALL BE POURED AGAINST UNDISTURBED SOIL.
4. KEEP ALL CONCRETE CLEAR OF THE JOINTS ON ALL FITTINGS.
5. FORMS ARE REQUIRED ON ALL THRUST BLOCKS AND TO BE SUPPLIED BY CONTRACTOR. ALL FITTINGS TO BE WRAPPED WITH POLYETHELENE PRIOR TO POURING THRUST BLOCKS.



TEE & SOLID PLUG

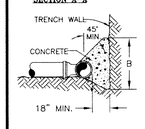
NOTE:
SEE PLANS FOR SIZE & DETAIL OF CONCRETE BLOCK WHEN REQUIRED FOR REDUCER.



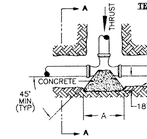
REDUCER

90° ELL

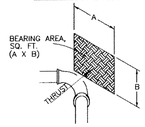
SECTION A–A



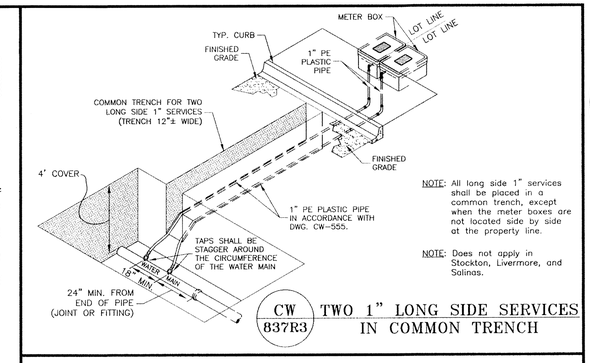
TEE



BEARING AREA DETAIL



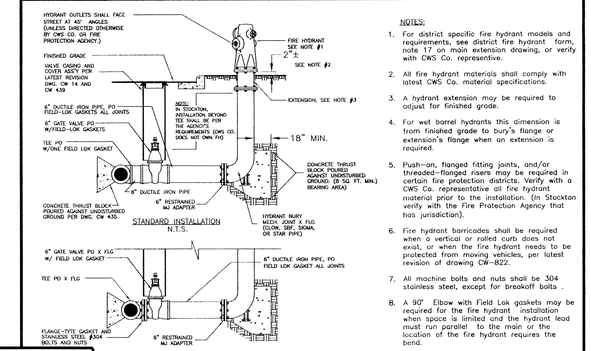
CW 435R4 TYPICAL THRUST BLOCK INSTALLATION



NOTE: All long side 1" services shall be placed in a common trench, except when the meter boxes are not located side by side at the property line.

NOTE: Does not apply in Stockton, Livermore, and Salinas.

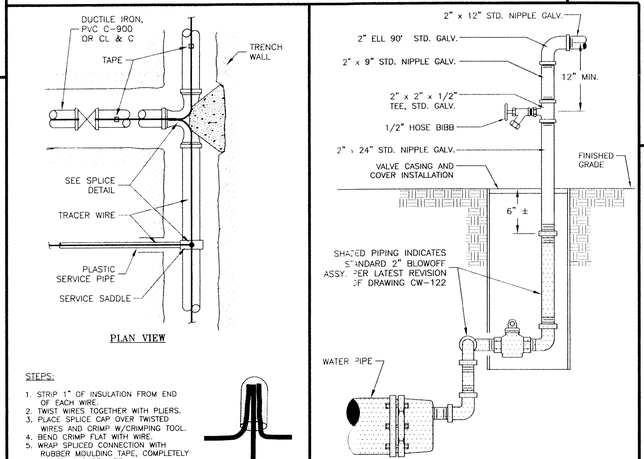
CW 837R3 TWO 1" LONG SIDE SERVICES IN COMMON TRENCH



NOTES:

1. For district specific fire hydrant models and requirements, see district fire hydrant form, note 17 on main extension drawing, or verify with CWS Co. representive.
2. All fire hydrant materials shall comply with latest CWS Co. material specifications.
3. A hydrant extension may be required to adjust for finished grade.
4. For wet barrel hydrants this dimension is from finished grade to bury's flange or extension's flange when an extension is required.
5. Push-on, flanged fitting joints, and/or threaded-flanged risers may be required in certain fire protection districts. Verify with a CWS Co. representative all fire hydrant material prior to the installation. (In Stockton verify with the Fire Protection Agency that has jurisdiction).
6. Fire hydrant barricades shall be required when a vertical or raised curb does not exist, or when the fire hydrant needs to be protected from moving vehicles, per latest revision of drawing CW-822.
7. All machine bolts and nuts shall be 304 stainless steel, except for breakoff bolts .
8. A 90° Elbow with Field Lok gaskets may be required for the fire hydrant installation when space is limited and the hydrant lead must run parallel to the main or the location of the fire hydrant requires the bend.
9. Protect all underground bolts and nuts per CWS Co. Standard Coating Specification.
10. A break-off check valve may be required in sloped terrain as specified by district personnel. Use Clow Model LB400 or approved equal.

CW 380R14 TYPICAL FIRE HYDRANT INSTALLATION



STEPS:

1. STRIP 1" OF INSULATION FROM END OF EACH WIRE.
2. TWIST WIRES TOGETHER WITH PLIERS.
3. PLACE SPLICE CAP OVER TWISTED WIRES AND CRIMP W/CRIMPING TOOL.
4. BEND CRIMP FLAT WITH WIRE.
5. WRAP SPLICED CONNECTION WITH RUBBER MOULDING TAPE, COMPLETELY COVERING BARE WIRE.

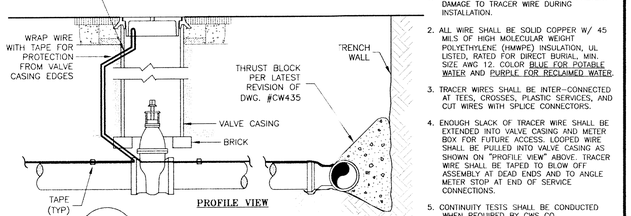
–OR–

USE WATERTIGHT DIRECT BURY TWIST-ON ENCLOSURES OR APPROVED EQUAL MAY BE USED, AND INSTALL PER MANUFACTURER'S INSTRUCTIONS.

SPLICE DETAIL FOR CUT WIRES

CW 638R1 SAMPLING DEVICE FOR 2" BLOW-OFF

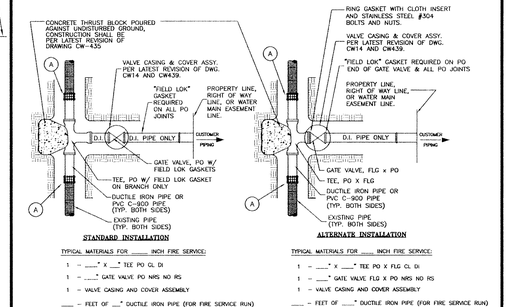
1. CUT HOLE IN VALVE CASING APPROX. 12" FROM TOP OF COVER
2. PULL LOOPED WIRE THROUGH AS SHOWN



NOTES:

1. CONTRACTOR SHALL USE CARE TO PREVENT DAMAGE TO TRACER WIRE DURING INSTALLATION.
2. ALL WIRE SHALL BE SOLID COPPER W/ 45 MILS OF HIGH MOLECULAR WEIGHT POLYETHYLENE (HMWPE) INSULATION, UL LISTED, RATED FOR DIRECT BURIAL, MIN. SIZE AWG 12. COLOR BLUE FOR POTABLE WATER AND PURPLE FOR RECLAIMED WATER
3. TRACER WIRES SHALL BE INTER-CONNECTED AT TEES, CROSSES, PLASTIC SERVICES, AND CUT WIRES WITH SPLICE CONNECTORS.
4. ENOUGH SLACK OF TRACER WIRE SHALL BE EXTENDED INTO VALVE CASING AND METER BOX FOR FUTURE ACCESS. LOOPED WIRE SHALL BE PULLED INTO VALVE CASING AS SHOWN ON "PROFILE VIEW" ABOVE. TRACER WIRE SHALL BE TAPED TO BLOW OFF ASSEMBLY AT DEAD ENDS AND TO ANGLE METER STOP AT END OF SERVICE CONNECTIONS.
5. CONTINUITY TESTS SHALL BE CONDUCTED WHEN REQUIRED BY CWS CO. REPRESENTATIVE.
6. TRACER WIRE SHALL BE REQUIRED ON ALL MAINS.

CW 850R3 STANDARD INSTALLATION DETAILS FOR TRACER WIRES



STANDARD INSTALLATION

TYPICAL MATERIALS FOR ____ INCH FIRE SERVICE:

1 – ____" X ____" TEE PO CL DI
1 – ____" GATE VALVE PO NRS NO RS
1 – VALVE CASING AND COVER ASSEMBLY
____ – FEET OF ____" DUCTILE IRON PIPE (FOR FIRE SERVICE RUN)
1 – GAL. METAL GUARD #301
1 – ROLL BIT OR RES WRAP
____ – 20" POLYWRAP TUBING 8 MIL W/PVC TAPE
____ – ____" "FIELD LOK" GASKET F/PO
____ – FEET OF ____" DUCTILE IRON PIPE OR PVC C-900 PIPE (FOR TEE RUN)

NOTES:

1. A DOUBLE CHECK VALVE OR REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY IS REQUIRED.
2. POLYETHYLENE ENCASEMENT WITH PVC TAPE IS REQUIRED FOR ALL DUCTILE IRON PIPE AND ALL FITTINGS.
3. PROTECT ALL UNDERGROUND BOLTS, NUTS, FLEX. COUPLINGS, AND BARE STEEL PER C.W.S. CO. PROTECTION COATING SPECIFICATIONS.
4. BLOCK AND POUR CONCRETE THRUST BLOCKS ON ALL ELLS, TEES, AND CAPS, PER LATEST REVISION OF DRAWING CW-435.
5. THE USE OF "FIELD LOK" GASKETS DOES NOT ELIMINATE THE NEED FOR CONCRETE THRUST BLOCKS.

ALTERNATE INSTALLATION

TYPICAL MATERIALS FOR ____ INCH FIRE SERVICE:

1 – ____" X ____" TEE PO X FLG CL DI
1 – ____" GATE VALVE FLG X PO NRS NO RS
1 – VALVE CASING AND COVER ASSEMBLY
____ – FEET OF ____" DUCTILE IRON PIPE (FOR FIRE SERVICE RUN)
1 – GAL. METAL GUARD #301
1 – ROLL BIT OR RES WRAP
____ – 20" POLYWRAP TUBING 8 MIL W/PVC TAPE
____ – ____" "FIELD LOK" GASKET F/PO
____ – FEET OF PVC C-900 PIPE OR DUCTILE IRON PIPE (FOR TEE RUN)

FLANGE MATERIAL – CHECK ONE BOX

☐ 1 – 4" FLANGE TYTE GASKET
8 – 5/8" ø x 3" #304 SS MACHINE BOLTS W/ HN

☐ 1 – 6" FLANGE TYTE GASKET
8 – 3/4" ø x 3-1/2" #304 SS MACHINE BOLTS W/ HN

☐ 1 – 8" FLANGE TYTE GASKET
8 – 3/4" ø x 3-1/2" #304 SS MACHINE BOLTS W/ HN

☐ 1 – 10" FLANGE TYTE GASKET
12 – 7/8" ø x 4" #304 SS MACHINE BOLTS W/ HN

MATERIAL FOR ITEM (A)	(EITHER INSTALLATION)
TIE-INS FROM D.I. TO D.I. OR PVC C-900 OR ACME(C-1070A.) USE SOLID SLEEVE MJ TIE-INS FROM D.I. TO CI USE SOLID SLEEVE MJ DUAL PURPOSE	TIE-INS FROM D.I. TO STD STEEL USE OD STEEL X DI FLEX. COUPLING (10" SLV IF STL OR STD SLV IF D.I.)
TIE-INS FROM D.I. TO ACRB (ASBESTOS CEMENT ROUGH BARREL) USE ACRB X DI FLEX. COUPLING (10" SLEEVE IF STEEL OR STANDARD SLEEVE IF DUCTILE IRON).	TIE-INS FROM D.I. TO STD STEEL USE STD X DI FLEX. COUPLING (10" SLV IF STL OR STD SLV IF D.I.) TIE-INS FROM PVC C-900 TO PVC C-900 USE "CENTANTEED" PVC CLOSURE COUPLING

CW 840R4 STANDARD PRIVATE FIRE SERVICE CONNECTION

ENGINEERING

CALIFORNIA WATER SERVICE CO.

DEPARTMENT

REVISIONS:

DISTRIBUTION MAP	DATE:	INIT.
PLAT SHEET		
SYSTEM SCHEMATIC		
STATION SCHEMATIC		
ZONE MAP		
VALVE RECORD		

PLAT SHEET NO.:

SCALE: N.T.S.

DRAWN BY: M. FONG

DESIGNED BY:

CHECKED BY: DATE:

APPROVED BY: DATE: 8/14/13

TITLE: CALIFORNIA WATER SERVICE COMPANY STANDARD DRAWINGS

DISTRICT: ALL

DATE: 8-14-13

PROJECT ID.:

DRAWING NO.: CWDWGS

SHT 1 OF 2

CAL WATER CONSTRUCTION DOCUMENTS (5 OF 5)

NOTES:
1. ALL PE PLASTIC PIPE REQUIRES TRACER WIRE TAPED TO PE PIPE AND EXTENDED INTO METER BOX PER LATEST REVISION OF DWG. CW-850 AND AS SPECIFIED IN CWS CO. MATERIAL SPECIFICATIONS DWG. CW-832.

2. SADDLES ARE REQUIRED ON ALL PVC C-900, AC, STEEL, OR WROUGHT IRON PIPE.

3. INSERT STIFFNERS SHALL BE USED ON ALL PE PIPE WITH COMPRESSION CONNECTIONS.

4. WHEN USING MUELLER INSTA-TITE, BEVEL THE PE PIPE WITH MUELLER'S BEVELING TOOL PER MANUFACTURER'S SPECIFICATIONS.

5. RESPONSIBILITY FOR SERVICE MAINTENANCE BY CWS CO. ENDS AT DOWNSTREAM METER COUPLING (OR LEFT TO DISTRICT'S DISCRETION).

6. ALL PIPE FITTINGS IN CONTACT WITH WATER SHALL BE LEAD FREE (< 0.25% LEAD) AND COMPLIANT TO NSF-61/SECTION 8.

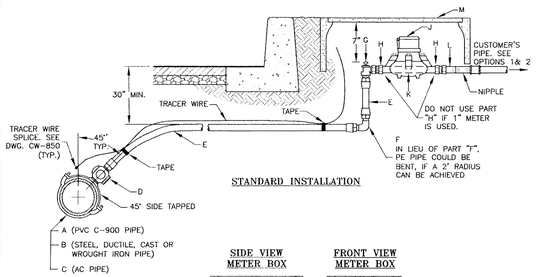
OPTIONS: THESE OPTIONS MAY BE REQUIRED BY CWS CO.

1. EXTEND CUSTOMER'S PIPING ±12" BEYOND METER BOX WITH TWO 12" NIPPLES & TWO 90° ELLS, BRASS (OR GALVANIZED IF PREFERRED BY CWS). SEE NOTE 5.

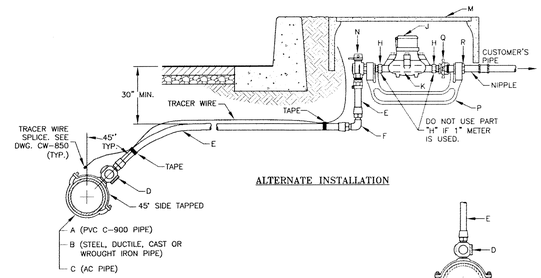
2. INSTALL BALL VALVE DOWNSTREAM FROM METER WHEN CUSTOMER'S PIPING IS UPHILL FROM METER OR CUSTOMER'S VALVE IS A GREAT DISTANCE FROM METER.

3. INSTALL 1" COPPER TUBING, TYPE K SOFT, INSTEAD OF PE WHEN CWS REPRESENTATIVE DETERMINES THAT CONDITIONS ARE UNFAVORABLE TO PE.

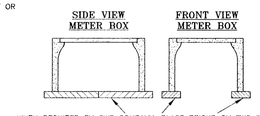
PART LETTER	PART NAME	PART SIZE	MUELLER INSTA-TITE/ MUELLER PACK-JOINT	FORD ULTRA-TITE/ FORD PACK JOINT	A.Y. McDONALD	CAMBRIDGE BRASS	SMITH-BLAIR	APAC
A	SERVICE SADDLE ALL BRONZE	NOMINAL MAIN SIZE x 1" CC	H-13400 SERIES	S90 SERIES	3805 SERIES	800 SERIES	393 SERIES	------
B	SERVICE SADDLE DUCTILE IRON	NOMINAL MAIN SIZE x 1" CC	DR 2A SERIES	F202 SERIES	------	------	313 SERIES	102 SERIES
C	SERVICE SADDLE ALL BRONZE	NOMINAL MAIN SIZE x 1" CC	BR 2B SERIES	202B SERIES	3825 SERIES	810 SERIES	323 SERIES	------
D	CORPORATION STOP (BALL)	1" CC x 1" MFG. F/PE IPS	B-2996N + H15456N	FB1001-4-U-ANWT-NL /FB1001-4-NL	74701B-33 1"	301NL-A4PE4	------	------
E	1" PE PLASTIC PIPE	1" PE PLASTIC PIPE IPS	HIGH DENSITY POLYETHYLENE PIPE, IRON PIPE SIZE, AWWA STANDARD C901, PE 4710, PC 200, SIDR7					------
F	1" 90° ELBOW	1" MFG F/PE IPS	H-15464N	L66-44-U-NL/ L66-44-NL	74761-3Q 1"	105NL-PE4PE4	------	------
G	ANGLE METER STOP (BALL)	1" F/PE IPS x 1" METER SWIVEL NUT	B-24266N/E-24259N	BA63-444W-U-ANT-NL /BA63-444W-NL	74602B-33 1"	210NL-PE4T4	------	------
H	METER ADAPTER	1" METER TO 5/8" x 3/4" METER	H-10879N	A24-NL	710J24	440NL-N4R2	------	------
J	METER	BY CWS COMPANY: 5/8" x 3/4" METER (USE FOR LOT SIZE < 10,000 SQ. FT.) LENGTH 7 1/2". 1" METER (USE FOR LOT SIZE 10,000 SQ. FT. OR LARGER OF IF REQ'D TO MEET CITY'S FIRE SPRINKLER ORDINANCE) LENGTH 10"						
K	METER SPACER	DEVELOPER'S CONTRACTOR SHALL INSTALL SCH. 80 PVC NIPPLE IN PLACE OF METER: 1-1/4" DIAMETER, 11" LONG WITH PIT					------	------
L	METER COUPLING	1" METER SWIVEL NUT x M.I.P.	H-10890N	C38-44-2-625-NL	74624	417NL-T4M4	------	------
M	METER BOX - BROOKS #37 BOX W/ CAST IRON COVER OR CHRISTY #B12 BOX W/ CAST IRON COVER. IF OUTSIDE FULL TRAFFIC AREAS, USE CHRISTY FL12 BOX W/ SVN12S LID. CWS OPTION: 1-PIECE COVER FL12D OR ARMORCAST P6000485-ROTOCAST BOX W/ A6000484DQ COVER & DROP-IN LID A6000487. CWS OPTION: 1-PIECE COVER A6000484	12" x 20" x 12"	------	------	------	------	------	------
N	ANGLE BALL VALVE	1" PEP x 1" LOCKNUT	H-15426N+B-24378N/ E-15429N+B-24278N	BA96-444W-U-AWT-NL /BA96-444W-NL	------	------	------	------
P	IRON YOKE PIECE	------	H-5040	Y504P	------	------	------	------
Q	EXPANSION CONNECTION	------	H-14234N	EC-4-NL	------	------	------	------
R	YOKE COUPLING	LOCKNUT x FIP	H-14219N	C91-44-NL	------	------	------	------



STANDARD INSTALLATION



ALTERNATE INSTALLATION



SIDE VIEW METER BOX

FRONT VIEW METER BOX

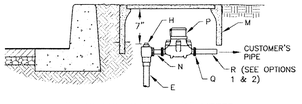
WHEN REQUIRED BY CWS COMPANY, PLACE BRICKS ON TWO SIDES OF METER BOX FOR SUPPORT (OR 2" x 4" PRESSURE TREATED LUMBER)

TAPPED AT TOP OF MAIN
USE THIS INSTALLATION ONLY WHEN METER BOX IS LOCATED DIRECTLY ABOVE THE MAIN

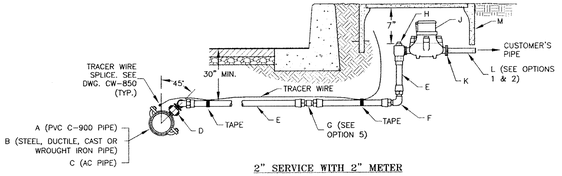
CW 555R15 — STANDARD 1" SERVICE CONNECTION FOR 5/8" X 3/4" METER AND 1" METER

PART LETTER	PART NAME	MUELLER	FORD	A.Y. McDONALD	CAMBRIDGE BRASS	SMITH-BLAIR	APAC
A	SERVICE SADDLE	H-13400	S90 SERIES	3805 SERIES	800 SERIES	393 SERIES	------
B	SERVICE SADDLE	DR2A	F202 SERIES	4825A	------	313 SERIES	102 SERIES
C	SERVICE SADDLE	BR2B	202B SERIES	3825 SERIES	810 SERIES	323 SERIES	------
D	2" CORPORATION STOP - AWWA TAPER THREAD INLET X MIP	B-2996N	FB800-7-NL	73128B	301NL-A7M7	------	------
E	2" COPPER	TYPE K SOFT PER LATEST REVISION OF ASTM SPECIFICATION B88					
F	2" 90° ELL COUPLING - CTS X CTS	P15526-N(P)/H15526-N(Q)	L44-77-NL(P)/L44-77-Q-NL(Q)	74761-22(P)/74761Q-2(Q)	105NL-B7B7(P)/105NL-H7H7(Q)	------	------
G	2" STRAIGHT COUPLING - CTS X CTS (SEE OPTION 5)	P15403-N(P)/H15403-N(Q)	C44-77-NL(P)/C44-77-Q-NL(Q)	74758-22(P)/74758Q-2(Q)	118NL-B7B7(P)/118NL-H7H7(Q)	------	------
H	2" BALL ANGLE METER VALVE - CTS X METER FLANGE - FULL PORT	P24276-N(P)/B24276-N(Q)	BFA13-777W-NL(P)/BFA43-777W-Q-NL(Q)	74602B-22(P)/74602BQ-2(Q)	210NL-B7M7(P)/210NL-H7M7(Q)	------	------
J	2" METER	------	------	------	------	------	------
K	2" METER FLANGE - FLG. X F.I.P; BRONZE WITH FULL FACE GASKET AND #304 STAINLESS STEEL BOLTS & NUTS	------	CF31-77-NL	7610F	421NL-7S/S	------	------
L	2" NIPPLE	------	------	------	------	------	------
M	METER BOX - BROOKS CONCRETE #65 BOX W/ #65S CONCRETE COVER & LID OR CHRISTY CONCRETE B65 BOX W/ B65E CONCRETE COVER & LID NOTE: CAST IRON COVERS REQUIRED IN TRAFFIC AREAS	------	------	------	------	------	------
N	ADAPTER - 2" METER FLG. X 1-1/2" MET FLG.	------	A67-NL	710J67	------	------	------
P	1-1/2" METER	------	------	------	------	------	------
Q	1-1/2" METER FLANGE - FLG. X F.I.P; BRONZE WITH FULL FACE GASKET AND #304 STAINLESS STEEL BOLTS & NUTS	------	CF31-66-NL	7610F	421NL-6S/S	------	------
R	1-1/2" NIPPLE STD. LEAD-FREE BRASS	------	------	------	------	------	------
S	2" 90° ELL, FIP X FIP	------	------	------	------	------	------
T	2" 90° ELL - MIP X CTS	P15531-N(P)/H15531-N(Q)	L84-77-NL(P)/L84-77-Q-NL(Q)	74779M-22 2(P)/74779MQ-2(Q)	105NL-B7M7(P)/105NL-H7M7(Q)	------	------

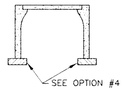
NOTE: P- PACK JOINT; Q- QUICK JOINT



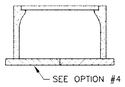
2" SERVICE WITH 1-1/2" METER



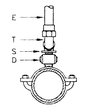
2" SERVICE WITH 2" METER



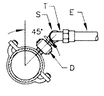
FRONT VIEW METER BOX



SIDE VIEW METER BOX



TAPPED AT TOP OF MAIN
USE THIS INSTALLATION ONLY FOR SERVICES LOCATED DIRECTLY ABOVE THE MAIN



45° SIDE TAPPED CONNECTION

CW 1020 — STANDARD 2" SERVICE CONNECTION FOR 2" OR 1- 1/2" METER [COPPER INSTALLATION]

NOTES:
1. 2" SERVICE SHALL BE INSTALLED FOR ALL 1-1/2" METERS.

2. A SADDLE SHALL BE USED FOR ALL 2" SERVICES.

3. ALL PE PLASTIC PIPE REQUIRES TRACER WIRE TAPED TO PE PIPE AND EXTENDED INTO METER BOX PER LATEST REVISION OF DWG. CW-850 AND AS SPECIFIED IN CWS CO. MATERIAL SPECIFICATIONS DWG. CW-832.

4. INSERT STIFFNERS SHALL BE USED ON ALL PE PIPE WITH COMPRESSION CONNECTIONS.

5. RESPONSIBILITY FOR SERVICE MAINTENANCE BY CWS CO. ENDS AT DOWNSTREAM METER COUPLING (OR LEFT TO DISTRICT'S DISCRETION).

6. ALL PIPE FITTINGS IN CONTACT WITH DRINKING WATER SHALL BE LEAD FREE (< 0.25% LEAD) AND COMPLIANT TO NSF-61/SECTION 8.

OPTIONS: THESE OPTIONS MAY BE REQUIRED BY CWS CO.

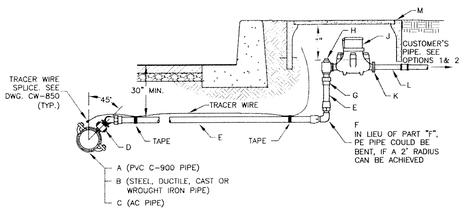
1. EXTEND CUSTOMER'S PIPING ±12" BEYOND METER BOX WITH TWO 12" NIPPLES & TWO 90° ELLS, BRASS (OR GALVANIZED IF PREFERRED BY CWS). SEE NOTE 5.

2. INSTALL BALL VALVE DOWNSTREAM FROM METER WHEN CUSTOMER'S PIPING IS UPHILL FROM METER OR CUSTOMER'S VALVE IS A GREAT DISTANCE FROM METER.

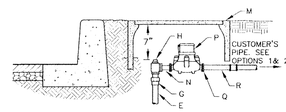
3. INSTALL 2" COPPER TUBING, TYPE K SOFT, INSTEAD OF PE WHEN CWS REPRESENTATIVE DETERMINES THAT CONDITIONS ARE UNFAVORABLE TO PE. REFER TO LATEST REVISION OF DWG# CW1020.

4. WHEN REQUIRED BY CWS COMPANY, PLACE BRICKS ON TWO SIDES OF METER BOX FOR SUPPORT (OR 2" x 4" PRESSURE TREATED LUMBER).

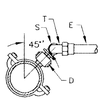
PART LETTER	PART NAME	MUELLER	FORD	A.Y. McDONALD	CAMBRIDGE BRASS	SMITH-BLAIR	APAC
A	SERVICE SADDLE, ALL BRASS WITH 2" AWWA CC THREAD	H-13400	S90 SERIES	3805 SERIES	800 SERIES	393 SERIES	------
B	SERVICE SADDLE, DUCTILE IRON BODY, DOUBLE STEEL STRAP WITH 2" AWWA CC THREAD	DR2A	F202 SERIES	4825A	------	313 SERIES	102 SERIES
C	SERVICE SADDLE, BRASS BODY, DOUBLE BRONZE STRAP WITH 2" AWWA CC THREAD	BR2B	202B SERIES	3825 SERIES	810 SERIES	323 SERIES	------
D	2" CORPORATION STOP - AWWA CC THREAD X MIP	B-2996N	FB400-7-NL	73128B	301NL-A7M7	------	------
E	2" HDPE PIPE	HIGH DENSITY POLYETHYLENE PIPE, IRON PIPE SIZE, AWWA STANDARD C901, PE 4710, PC 200, SIDR7					
F	2" 90° ELL COUPLING - PEP X PEP	------	L66-77-IDR7-NL	74761-33	105NL-PE7PE7	------	------
G	2" STRAIGHT COUPLING - PEP X MIP	E-15429N	CB6-77-IDR7-NL	74753-33	117NL-PE7M7	------	------
H	2" BALL ANGLE METER VALVE - F.I.P. X METER FLANGE	B-24286N-3	BFA13-777WR-NL	74604B	210NL-F7MF7	------	------
J	2" METER, (BY CWS COMPANY) LENGTH 17" NOTE: DEVELOPER'S CONTRACTOR SHALL INSTALL SPACER IN PLACE OF METER PER CWS CO'S DIRECTION	------	------	------	------	------	------
K	2" METER FLANGE - FLG. X F.I.P; BRONZE WITH FULL FACE GASKET AND #304 STAINLESS STEEL BOLTS & NUTS	------	CF31-77-NL	7610F	421NL-7S/S	------	------
L	2" NIPPLE - LEAD FREE BRASS	------	------	------	------	------	------
M	17" X 28" METER BOX-BROOKS CONCRETE #65 BOX W/ #65S CONCRETE COVER & LID OR CHRISTY CONCRETE B65 BOX W/ B65E CONCRETE COVER & LID NOTE: CAST IRON COVERS REQUIRED IN TRAFFIC AREAS	------	------	------	------	------	------
N	ADAPTER - 2" METER FLG. X 1-1/2" MET FLG.	------	A67-NL	710J67	------	------	------
P	1-1/2" METER, (BY CWS COMPANY) LENGTH 13" NOTE: DEVELOPER'S CONTRACTOR SHALL INSTALL SPACER IN PLACE OF METER PER CWS CO'S DIRECTION	------	------	------	------	------	------
Q	1-1/2" METER FLANGE - FLG. X F.I.P; BRONZE WITH FULL FACE GASKET AND #304 STAINLESS STEEL BOLTS & NUTS	------	CF31-66-NL	7610F	421NL-6S/S	------	------
R	1-1/2" NIPPLE - LEAD FREE BRASS	------	------	------	------	------	------
S	2" 90° ELL, LEAD FREE BRASS - FIP X FIP	------	------	------	------	------	------
T	2" 90° ELL COUPLING - MIP X PEP	------	L86-77-IDR7-NL	74779M-33	105NL-B7M7	------	------



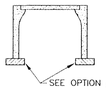
2" SERVICE WITH 1" METER



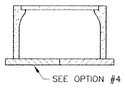
2" SERVICE WITH 1-1/2" METER



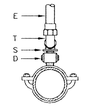
45° SIDE TAPPED CONNECTION



FRONT VIEW METER BOX



SIDE VIEW METER BOX



TAPPED AT TOP OF MAIN
USE THIS INSTALLATION ONLY FOR SERVICES LOCATED DIRECTLY ABOVE THE MAIN

CW 436R9 — STANDARD 2" SERVICE CONNECTION FOR 2" METER OR 1-1/2" METER [POLYETHYLENE INSTALLATION]

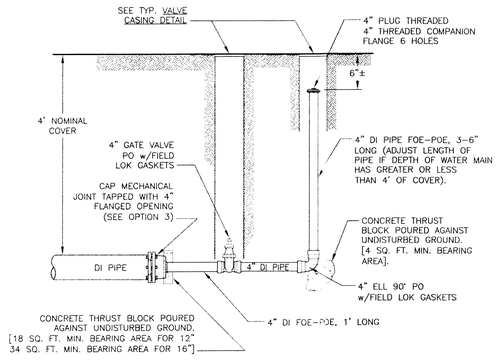
NOTE:
1. ALL PIPE FITTINGS IN CONTACT WITH WATER SHALL BE LEAD FREE (<0.25% LEAD) AND COMPLIANT TO NSF-61/SECTION 8.

OPTIONS: THESE OPTIONS MAY BE REQUIRED BY CWS CO. AT THEIR DISCRETION.

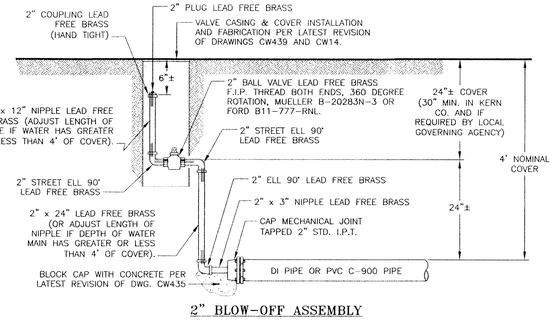
1. FOR 2" BLOW OFFS LOCATED OUTSIDE TRAVELED WAYS OR WHERE STREET RECONSTRUCTION IS NOT A CONCERN, THE BALL VALVE MAY BE PLACED CLOSER TO FINISHED GRADE (+/-12") WITH SHORTER OR NO PERMANENT RISER. SWING JOINT (ONE STREET ELL) MAY BE ADDED AS AN OFFSET TO PROPERLY LOCATE THE BALL VALVE.

2. IN LIEU OF NOTCHING VALVE CASING FOR 2" PIPE, CASING MAY BE SET ON BRICKS OR PRESSURE TREATED LUMBER SO CASING IS JUST ABOVE 2" PIPE.

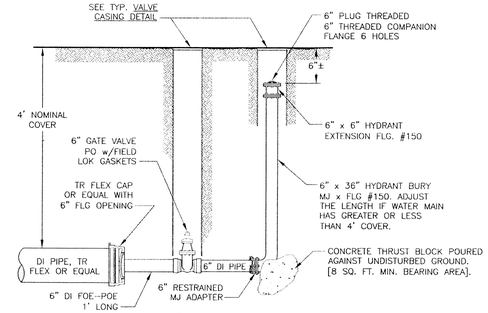
3. IN LIEU OF CAP WITH FLANGED OPENING FOR 12" PIPE, 12" x 4" REDUCER PO WITH FIELD LOK GASKETS MAY BE USED.



4" BLOW-OFF ASSEMBLY FOR 12" TO 16" PIPE
N.T.S.



2" BLOW-OFF ASSEMBLY FOR 8" AND SMALLER PIPE
N.T.S.



6" BLOW-OFF ASSEMBLY FOR 18" AND LARGER PIPE
N.T.S.

CW 122R5 — STANDARD BLOW OFF ASSEMBLY

ENGINEERING

CALIFORNIA WATER SERVICE CO.

DEPARTMENT

REVISIONS:

	DATE:	INT.
DISTRIBUTION MAP		
PLAT SHEET		
SYSTEM SCHEMATIC		
STATION SCHEMATIC		
ZONE MAP		
VALVE RECORD		

PLAT SHEET NO.:

SCALE: N.T.S.

DRAWN BY: M. FONG

DESIGNED BY:

CHECKED BY: DATE:

APPROVED BY: DATE: 8/14/13

TITLE: CALIFORNIA WATER SERVICE COMPANY STANDARD DRAWINGS

DISTRICT: ALL

DATE: 8-14-13

PROJECT ID.:

DRAWING NO.: CWDWGS

SHT 2 OF 2