

LOCATION MAP
SCALE: NTS

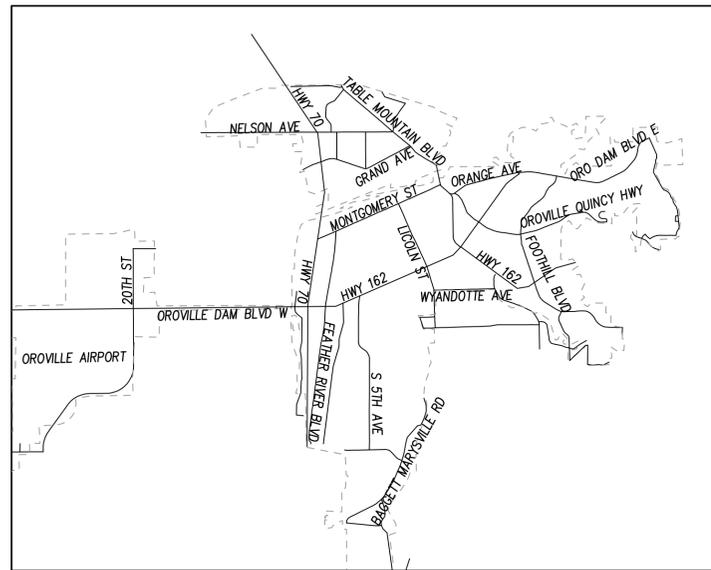
PROJECT LOCATION

OROVILLE SEWER PROJECTS - 1D

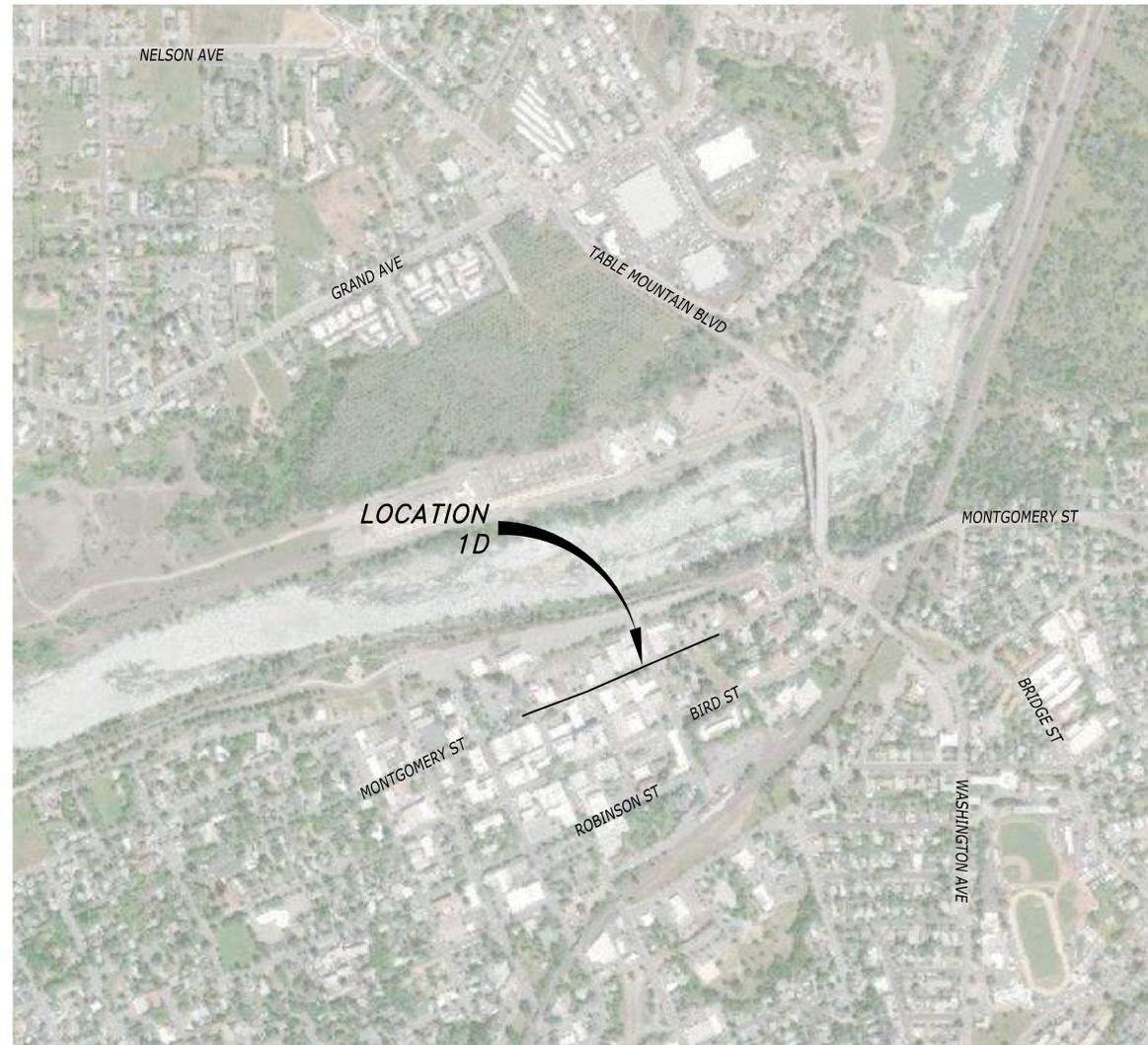
ALONG MONTGOMERY STREET FROM MYERS ST TO OLIVER ST
WITHIN THE CITY OF OROVILLE, COUNTY OF BUTTE

INDEX OF PLAN SHEETS

SHT NO.	DWG NO.	SHEET TITLE
1	G-1	TITLE SHEET
2	G-2	GENERAL NOTES
3	G-3	KEY & SURVEY CONTROL
4	C-1	PLAN & PROFILE STA 0+00 to 5+00
5	C-2	PLAN & PROFILE STA 5+00 to 9+50
6	C-3	PLAN & PROFILE STA 9+50 to 11+75
7	C-12	DETAILS - 1
8	C-13	DETAILS - 2



VICINITY MAP
SCALE: NTS



PROJECT LOCATION
SCALE: 1" = 500'

UTILITY REPRESENTATIVES

CONTACT	UTILITY	COMPANY	PHONE
CORT SCHREIBER	COMMUNICATIONS	AT&T	530-891-2392
BRANDON STOKES	COMMUNICATIONS	COMCAST	530-332-5993
TODD CASH	GAS/ELECTRIC	PG&E	530-894-4781
JASON HAMMOND	WATER	CALIFORNIA WATER SERVICE CO.	530-893-6315
MATT COLWELL	WATER	SOUTH FEATHER WATER AND POWER	530-533-4578
CHRIS HEINDELL	WATER	THERMALITO WATER & SEWER DISTRICT	530-533-0740
SCOTT HOCH	SEWER	SCOR	530-538-7784
MIKE MASSARO	SEWER	CITY OF OROVILLE	916-783-4100
MIKE MASSARO	DRAINAGE	CITY OF OROVILLE	916-783-4100



APPROVED FOR CONSTRUCTION

APPROVAL RECOMMENDED BY:

 MIKE MASSARO
 CITY ENGINEER
 CITY OF OROVILLE
 DATE _____
 APPROVALS ARE GOOD FOR 12 MONTHS FROM DATE OF SIGNATURE

DIGALERT
 DIAL TOLL FREE
 1-800-642-2444
 AT LEAST TWO DAYS BEFORE YOU DIG
 UNDERGROUND SERVICE ALERT OF NORTHERN CALIFORNIA

NO.	REVISIONS	BY	DATE

BENCH MARK ELEV: 238.57 DATUM: NAVD 88
 DESCRIPTION:
 THE HORIZONTAL DATUM IS NAD 83 CALIFORNIA ZONE 2 PER CITY OF OROVILLE HORIZONTAL CONTROL.
 VERTICAL DATUM IS NAVD 88 PER CITY OF OROVILLE BENCHMARKS.

DESIGN BY: K.SETHARES
 DRAWN BY: K.SETHARES
 CHECKED BY: M.MASSARO
 SCALE: AS SHOWN
 DATE: 6/28/19
 PROJ NO.: 17601-200

VERIFY SCALE
 BAR IS ONE INCH ON ORIGINAL DRAWING.
 IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.



BEN EN
 TRUSTED ENGINEERING ADVISORS

Bennett Engineering Services
 1082 Sunrise Avenue, Suite 100
 Roseville, California 95661
 T 916.783.4100
 F 916.783.4110



OROVILLE SEWER PROJECTS - 1D

TITLE SHEET

CALIFORNIA

G-1
 1 OF 8

Login Name: bethares
 Plot Date: June 18, 2019 10:42 am
 Plot Style: ###
 File Name: P:\Proj\17601-200-Oroville-Sewer-Projects-Design\03-PLANS\MASTERS\ASSETS\17601-200_ID\17601-200_ID-G1 - TITLE SHEET.dwg
 Plot Size: Barch\17601-200_ID\17601-200_ID.dwt

GENERAL NOTES:

- ALL CONSTRUCTION AND MATERIALS SHALL CONFORM TO THESE PLANS, ALL CONDITIONS OF APPROVAL RELATED TO THIS PROJECT, AND TO THE LATEST EDITION OF THE CITY OF OROVILLE IMPROVEMENT STANDARDS.
- THE CONTRACTOR AGREES THAT, IN ACCORDANCE WITH THE GENERALLY ACCEPTED CONSTRUCTION PRACTICES, THE CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY. THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS. THE CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD THE CITY OF OROVILLE HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT.
- THE CONTRACTOR SHALL CONTACT THE CITY OF OROVILLE (MIKE MASSARO) 48 HOURS PRIOR TO THE START OF WORK TO ARRANGE A PRECONSTRUCTION FIELD MEETING. NO GRADING OR CONSTRUCTION MAY BE DONE PRIOR TO THE MEETING. CONTRACTOR SHALL OBTAIN AN ENCROACHMENT PERMIT FROM THE CITY OF OROVILLE PRIOR TO PERFORMING ANY WORK WITHIN PUBLIC RIGHT-OF-WAY OR EASEMENT.
- THE CITY OF OROVILLE IS A MEMBER OF THE UNDERGROUND SERVICES ALERT (USA) ONE-CALL PROGRAM. THE CONTRACTOR OR ANY SUBCONTRACTOR FOR THIS CONTRACT SHALL NOTIFY USA TWO (2) WORKING DAYS PRIOR TO PERFORMING ANY EXCAVATION WORK BY CALLING THE TOLL-FREE NUMBER 811 OR 800-642-2444. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ALL EXISTING UNDERGROUND UTILITIES, WHETHER OR NOT THEY ARE SHOWN ON THESE PLANS.
- IF ANY ARCHEOLOGICAL, CULTURAL, OR HISTORICAL RESOURCES, ARTIFACTS OR FEATURES ARE DISCOVERED DURING THE COURSE OF CONSTRUCTION ANYWHERE ON THE PROJECT SITE, WORK SHALL BE SUSPENDED WITHIN 150 FEET OF THAT LOCATION UNTIL A QUALIFIED PROFESSIONAL ARCHEOLOGIST ASSESSES THE SIGNIFICANCE OF THE DISCOVERY AND PROVIDES CONSULTATION WITH THE CITY OF OROVILLE COMMUNITY DEVELOPMENT AND THE BUTTE COUNTY HISTORICAL SOCIETY. THE CITY OF OROVILLE COMMUNITY DEVELOPMENT AND THE BUTTE COUNTY HISTORICAL SOCIETY SHALL BE NOTIFIED AND ANY APPROPRIATE MEASURES AGREED UPON PRIOR TO THE RECOMMENCEMENT OF CONSTRUCTION IN THE AREA IN QUESTION.
- COMPLIANCE WITH NOISE RESTRICTIONS SHALL BE REQUIRED. HOURS OF CONSTRUCTION OPERATION SHALL BE LIMITED TO THE PERIOD FROM 7:00 A.M. TO 6:00 P.M. ON WEEKDAYS. WEEKEND WORK IS NOT PERMITTED WITHOUT APPROVAL FROM CITY. CONSTRUCTION EQUIPMENT SHALL BE MUFFLED AND SHROUDED TO MINIMIZE NOISE LEVELS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- NO REFUELING, LUBRICATION, OR MAINTENANCE OF CONSTRUCTION VEHICLES SHALL BE DONE ANYWHERE ON THE SITE EXCEPT WITHIN APPROVED CONSTRUCTION STAGING AREAS. STAGING AREAS SHALL BE SET UP TO THE SATISFACTION OF THE CONSTRUCTION INSPECTOR AND THE FIRE DEPARTMENT.
- PRIOR TO THE COMMENCEMENT OF GRADING OPERATIONS, TREES TO BE PRESERVED SHALL BE FENCED IN ACCORDANCE WITH SECTION 12.01 OF THE STANDARD CONSTRUCTION SPECIFICATIONS. FIELD PLACEMENT OF FENCING SHALL BE REVIEWED AND APPROVED BY THE CITY ARBORIST PRIOR TO THE COMMENCEMENT OF GRADING OPERATIONS. NO TRENCING, EXCAVATION, AND/OR ENCROACHMENT SHALL OCCUR BENEATH THE DRIP LINE OF ANY OAK TREE TO BE PRESERVED UNLESS APPROVED BY THE CITY ARBORIST.
- MANHOLES LOCATED OUTSIDE OF PAVED AREAS SHOULD BE INSTALLED ABOVE FINISH GRADE, AND SHALL BE LOCATED IN THE CENTER OF A 10-FOOT DIAMETER LEVEL PAD (2% MAX. SLOPE) TO ACCOMMODATE ACCESS BY TRIPPOD.
- THE CONTRACTOR SHALL LEAVE A MINIMUM OF 6 INCHES OF MANHOLE WALL UNDISTURBED BETWEEN CORINGS FOR PIPE TIE-INS. IF THIS CANNOT BE ACCOMPLISHED, A LARGER MANHOLE SHALL BE USED.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING ANY AND ALL BROKEN AND/OR HAZARDOUS PUBLIC SIDEWALK OR CURB & GUTTER WITHIN THE PROJECT SITE AND ALONG THE SITE FRONTAGE, INCLUDING PREEXISTING CONDITIONS, TO THE SATISFACTION OF THE CONSTRUCTION INSPECTOR.
- EROSION AND SEDIMENTATION CONTROL SHALL BE PERFORMED PER SECTION 15.88.060 OF THE OROVILLE MUNICIPAL CODE AND THE SWPPP FILED FOR THIS PROJECT. FIELD APPLICATION OF THE CONTROLS AND TIMING OF IMPLEMENTATION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE SWPPP IS CONSIDERED A DYNAMIC DOCUMENT AND WILL CHANGE AS CONDITIONS WARRANT.
- CONTRACTOR SHALL PROVIDE TRAFFIC CONTROL PLAN TO PUBLIC WORKS FOR EACH STAGE OF CONSTRUCTION PRIOR TO ISSUANCE OF ENCROACHMENT PERMIT. TRAFFIC CONTROL PLANS SHALL BE SUBMITTED A MINIMUM OF TWO WEEKS PRIOR TO COMMENCEMENT OF WORK OR DETOURING OF TRAFFIC PATTERNS. ALL TRAFFIC CONTROL DEVICES SHALL BE INSTALLED AND CONFORM TO STATE OF CALIFORNIA MUTCD 2017.
- THE CONTRACTOR SHALL PRACTICE SAFETY AT ALL TIMES AND SHALL FURNISH, ERECT, AND MAINTAIN SUCH FENCES, BARRICADES, LIGHTS AND SIGNS NECESSARY TO GIVE ADEQUATE PROTECTION TO THE PUBLIC AT ALL TIMES. TEMPORARY TRAFFIC CONTROL SHALL BE APPROVED BY ENGINEER.
- THE CONTRACTOR SHALL COORDINATE THROUGH THE CONSTRUCTION INSPECTOR WITH THE CITY OF OROVILLE LANDSCAPING AND LIGHTING MAINTENANCE ASSESSMENT DISTRICT (LMAD) MANAGER FOR THE REMOVAL, RELOCATION, AND/OR REPLACEMENT OF ALL EXISTING PLANT MATERIAL IMPACTED BY CONSTRUCTION, WHICH IS MAINTAINED BY THE LIGHTING AND LANDSCAPING DISTRICT, AND FOR ANY SHUTDOWNS OF EXISTING IRRIGATION SYSTEMS.
 - UNLESS OTHERWISE AGREED TO IN WRITING, REPLACEMENT PLANTS SHALL BE OF THE SAME TYPE AND OF COMPARABLE SIZE TO THOSE REMOVED.
 - THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE EXISTING IRRIGATION SYSTEM DURING CONSTRUCTION, INCLUDING REPAIRS OF ANY CONSTRUCTION DAMAGE.
 - THE CONTRACTOR SHALL GIVE A MINIMUM OF 48 HOURS NOTICE OF INTENT TO SHUT DOWN THE EXISTING IRRIGATION SYSTEM TO THE CITY.
 - THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY PLANT MATERIAL WHICH IS DAMAGED BY CONSTRUCTION ACTIVITY, WHETHER DIRECTLY OR AS A RESULT OF INSUFFICIENT WATER OR SIMILAR CAUSES.
 - THE CONTRACTOR SHALL EXERCISE GREAT CARE WHEN CUTTING INTO EXISTING IRRIGATION MAINLINES TO PREVENT THE INTRODUCTION OF DIRT OR OTHER FOREIGN MATERIALS INTO THE PIPE WHICH MAY CLOG EXISTING HEADS OR OTHERWISE DAMAGE THE SYSTEM.
 - PRIOR TO FINAL ACCEPTANCE OF THE IMPROVEMENTS SHOWN ON THESE PLANS, THE LANDSCAPING AND IRRIGATION SHALL BE RESTORED TO THE CITY'S SATISFACTION.

GRADING NOTES:

- AN ENCROACHMENT PERMIT IS REQUIRED FOR ALL WORK TO BE DONE WITHIN PUBLIC RIGHTS-OF-WAY OR EASEMENTS, AND FOR CONNECTIONS TO PUBLICLY-OWNED AND MAINTAINED FACILITIES.
- CALL UNDERGROUND SERVICE ALERT (USA) AT 811 OR 800-642-2444, FORTY-EIGHT

(48) HOURS PRIOR TO ANY GRADING/EXCAVATION ACTIVITY.

- THE CONTRACTOR SHALL NOTIFY THE CITY OF OROVILLE (MIKE MASSARO), TWENTY-FOUR (24) HOURS PRIOR TO COMMENCEMENT OF ANY GRADING.
- CONTRACTOR SHALL OBTAIN AN APPROVED WATER METER FROM THE CITY AT THE OWNER'S EXPENSE.
- CLEARING AND GRUBBING SHALL CONFORM TO THE PROVISIONS OF SECTION 16 OF THE STANDARD SPECIFICATIONS.
- ALL EXCAVATION, EMBANKMENT, BACKFILL, ETC., SHALL CONFORM TO THE PROVISIONS IN SECTION 19, "EARTHWORK", OF THE STANDARD SPECIFICATIONS.
- NO WORK SHALL BE DONE UNDER OR WITHIN THE TREE PROTECTION ZONE (TPZ) OF ANY EXISTING TREE WITHOUT A VALID TREE PERMIT.
- THERE SHALL BE NO TRESPASSING OF ANY KIND INTO PUBLIC OR PRIVATE OPEN SPACE AREAS.

ACCEPTANCE TESTS--SANITARY SEWERS:

- REQUIREMENTS - ALL LEAKAGE TESTS SHALL BE COMPLETED AND APPROVED AFTER CITY ACCEPTANCE OF STREET SUBGRADE IN NEW STREETS AND/OR TRENCH BACKFILL IN EXISTING STREETS EXCEPT FOR THE MANHOLE VACUUM TEST. ANY EXCAVATION REQUIRED FOR TESTING OR REPAIRS SHALL BE BACKFILLED WITH AGGREGATE BASE COMPACTED TO 95% RELATIVE COMPACTION. ALL TESTING SHALL BE PERFORMED BY THE CONTRACTOR AT HIS EXPENSE.
 - MANHOLE VACUUM TEST - ALL SEWER MANHOLES SHALL PASS A VACUUM TEST. THE VACUUM TEST SHALL BE PERFORMED BY THE CONTRACTOR AFTER INSTALLATION OF THE MANHOLE BUT PRIOR TO PLACEMENT OF TRENCH BACKFILL. ALL JOINT SURFACES BOTH INSIDE AND OUTSIDE OF THE MANHOLE SHALL BE PLASTERED WITH MORTAR AND ALL LIFT HOLES SHALL BE FILLED WITH MORTAR. ALL PIPES ENTERING THE MANHOLE SHALL BE PLUGGED, TAKING CARE TO SECURELY BRACE THE PLUG TO PREVENT IT FROM BEING DRAWN INTO THE MANHOLE. THE TEST HEAD SHALL BE PLACED INSIDE OR OF THE TOP OF THE CONE SECTION AND THE SEAL INFLATED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATION. A VACUUM OF 10 INCHES OF MERCURY SHALL BE DRAWN AND THE VACUUM PUMP SHUT OFF. WITH THE VALVES CLOSED, THE TIME SHALL BE MEASURED FOR THE VACUUM TO DROP TO 9 INCHES. ACCEPTABLE TIMES ARE:

45+ SECONDS FOR 36 INCH MANHOLE
60+ SECONDS FOR 48 INCH MANHOLE
75+ SECONDS FOR 60 INCH MANHOLE
90+ SECONDS FOR 72 INCH MANHOLE

IF A MANHOLE FAILS THE VACUUM TEST, REPAIRS TO THE OUTSIDE OF THE MANHOLE SHALL BE MADE WITH MORTAR WHILE THE VACUUM IS STILL BEING DRAWN. RETESTING SHALL PROCEED UNTIL A SATISFACTORY TEST IS OBTAINED.

- CLEANING AND FLUSHING - CLEANING AND FLUSHING FOR ACCEPTANCE SHALL OCCUR AFTER ALL MANHOLES AND CLEANOUTS HAVE BEEN RAISED TO GRADE AND FINISHED UNLESS APPROVED OTHERWISE BY THE ENGINEER. CLEANING SHALL BE PERFORMED BY THE CONTRACTOR BY MEANS OF AN INFLATABLE RUBBER BALL. THE BALL SHALL BE OF A SIZE THAT WILL FIT SNUGLY INTO THE PIPE TO BE FLUSHED. THE BALL SHALL BE PLACED IN THE LAST CLEANOUT OR MANHOLE OF THE PIPE TO BE CLEANED, AND WATER INTRODUCED BEHIND IT. THE BALL SHALL PASS THROUGH THE PIPE WITH ONLY THE PRESSURE OF THE WATER IMPELLING IT. ALL DEBRIS FLUSHED OUT AHEAD OF THE BALL SHALL BE REMOVED AT THE FIRST MANHOLE WHERE ITS PRESENCE IS NOTED. IF ANY WEDGED DEBRIS OR DAMAGED PIPE STOP THE BALL, THE CONTRACTOR SHALL REMOVE THE OBSTRUCTION. WHEN A NEW SEWER IS CONNECTED TO AN EXISTING LINE, CLEANING AND FLUSHING SHALL BE CARRIED OUT TO THE FIRST EXISTING MANHOLE DOWNSTREAM FROM THE POINT OF CONNECTION. A SCREEN OF 1/8 INCH GRID MESH SHALL BE USED TO ENSURE THAT NO DEBRIS ENTERS THE EXISTING SYSTEM.

- PVC DEFLECTION TEST - A DEFLECTION TEST SHALL BE MADE BY THE CONTRACTOR AFTER THE PVC SEWER PIPE IS INSTALLED AND CLEANED AND UPON COMPLETION AND ACCEPTANCE OF ALL TRENCH BACKFILL BY THE CITY. THE DEFLECTION TESTING SHALL BE IN THE PRESENCE OF THE ENGINEER AND SHALL BE CONDUCTED BY THE CONTRACTOR. ONE HUNDRED PERCENT (100%) OF ALL MAINLINE PVC SEWER PIPE INSTALLED SHALL BE DEFLECTION TESTED FOR EXCESSIVE VERTICAL DEFLECTION USING A PRE-SIZED, RIGID MANDREL OR "GO-NO-GO" DEVICE APPROVED BY THE ENGINEER. THE MANDREL SIZE SHALL BE CLEARLY LABELED AND SHALL BE SIZED SO AS TO PROVIDE A DIAMETER OF AT LEAST (95%) OF THE BASE INTERNAL DIAMETER AS SPECIFIED IN ASTM D-3034 FOR PVC GRAVITY SEWER PIPE. THE MANDREL SHALL BE DRAWN THROUGH THE PIPE USING ONLY THE FORCE THAT CAN BE EXERTED BY ONE MAN ON THE END OF A ROPE, USING NO MECHANICAL ADVANTAGE. UNDER NO CIRCUMSTANCES SHALL THE MANDREL DEVICE BE ATTACHED TO THE CLEANING BALL. PIPE EXCEEDING FIVE PERCENT (5%) DEFLECTION SHALL BE REPAIRED OR REPLACED AND SHALL BE REMANDRELED IN THE PRESENCE OF THE ENGINEER. RE-ROUNDING OR OTHER ATTEMPTS TO REDUCE DEFLECTION BEYOND THE ALLOWABLE LIMIT WILL NOT BE ACCEPTABLE. ALL RETESTS FOR DEFLECTIONS SHALL BE MADE AT THE COMPLETE EXPENSE OF THE CONTRACTOR.

- LOW-PRESSURE AIR TEST - AFTER CITY ACCEPTANCE OF THE STREET SUBGRADE AND/OR THE TRENCH BACKFILL, THE CONTRACTOR SHALL CONDUCT A LINE ACCEPTANCE TEST USING LOW PRESSURE AIR. THE TEST SHALL BE PERFORMED ACCORDING TO STATED PROCEDURES IN THE PRESENCE OF THE ENGINEER. PROCEDURE: AT LEAST TWO MINUTES SHALL BE ALLOWED FOR THE AIR PRESSURE TO STABILIZE AFTER AIR IS INTRODUCED INTO THE SEALED TEST SECTION.

- AFTER THE STABILIZATION PERIOD (3.5 PSI MINIMUM PRESSURE IN THE PIPE), THE AIR HOSE FROM THE CONTROL PANEL TO THE AIR SUPPLY SHALL BE DISCONNECTED. THE PORTION OF LINE BEING TESTED SHALL BE TERMED "ACCEPTABLE" IF THE TIME REQUIRED IN MINUTES FOR THE PRESSURE TO DECREASE FROM 3.5 TO 2.5 PSIG IS NOT LESS THAN THE TIME SHOWN FOR THE GIVEN DIAMETERS IN THE FOLLOWING TABLE:

PIPE DIAMETER IN INCHES	MINUTES
4	2.0
6	3.0
8	4.0
10	5.0
12	6.0

IF THE INSTALLATION FAILS TO MEET THIS REQUIREMENT, THE CONTRACTOR SHALL DETERMINE THE SOURCE OF LEAKAGE. HE SHALL THEN REPAIR AND/OR REPLACE ALL DEFECTIVE MATERIALS AND/OR WORKMANSHIP AND PERFORM THE AIR TEST AS MANY TIMES AS NECESSARY TO ACHIEVE AN ACCEPTABLE TEST. ALL REPAIRS AND/OR REPLACEMENTS AND RETESTS SHALL BE AT THE CONTRACTOR'S EXPENSE.

THE PRESSURE GAUGE USED SHALL BE SUPPLIED BY THE CONTRACTOR AND SHALL HAVE MINIMUM DIVISION OF 0.10 PSI, AND SHALL HAVE ACCURACY TO 0.04 PSI. ACCURACY AND CALIBRATION OF THE GAUGE SHALL BE CERTIFIED BY A QUALIFIED TESTING FIRM.

SAFETY: THE AIR TEST MAY BE DANGEROUS IF, BECAUSE OF IGNORANCE OR CARELESSNESS, A LINE IS IMPROPERLY PREPARED. IT IS EXTREMELY IMPORTANT

THAT THE VARIOUS PLUGS BE INSTALLED AND BRACED IN SUCH A WAY AS TO PREVENT BLOWOUTS. NO ONE SHALL BE ALLOWED IN THE MANHOLES DURING TESTING. PLUGS SHALL NOT BE REMOVED UNTIL ALL AIR PRESSURE IS COMPLETELY RELIEVED.

- T.V. INSPECTION - PRIOR TO ACCEPTANCE OF ANY SANITARY SEWER LINE BY THE CITY, SAID LINE SHALL BE INSPECTED INTERNALLY BY TELEVISION AS OUTLINED BELOW. DEFECTS SUCH AS HIGH AND LOW SPOTS, JOINT SEPARATIONS, OFFSET JOINTS, CHIPPED ENDS, CRACKED OR DAMAGED PIPE, INFILTRATION POINTS AND DEBRIS IN LINES SHALL BE CORRECTED BY THE CONTRACTOR, AT HIS EXPENSE. FOR JOINT SEPARATIONS, LOW SPOTS AND CHIPPED ENDS, THE FOLLOWING MAXIMUM ACCEPTABLE LIMITS SHALL APPLY.

JOINT SEPARATIONS - 1/2 INCH
 LOW SPOTS - 1/2 INCH MAXIMUM DEPTH FOR PIPES LESS THAN OR EQUAL TO 12 INCHES IN DIAMETER; 1 INCH MAXIMUM DEPTH FOR PIPES GREATER THAN 12 INCHES IN DIAMETER

CHIPPED ENDS - 1/4 INCH

- THE COMPLETE JOB IS READY FOR TELEVISION INSPECTION WHEN THE FOLLOWING WORK HAS BEEN COMPLETED:

-ALL SEWER MAIN CONNECTIONS HAVE BEEN MADE BY THE CONTRACTOR PRESENCE OF A CONSTRUCTION INSPECTOR.

-ALL SEWER PIPELINES ARE INSTALLED AND BACKFILLED.

-ALL STRUCTURES ARE IN PLACE, ALL CHANNELIZING IS COMPLETE AND ARE ACCESSIBLE FROM STRUCTURES.

-ALL OTHER UNDERGROUND FACILITIES, UTILITY PIPING AND CONDUITS ARE INSTALLED.

-FINAL STREET SUBGRADE AND/OR TRENCH BACKFILL IS COMPLETE AND ASPHALTIC CONCRETE PAVING.

-PIPELINES TO BE INSPECTED HAVE BEEN PRELIMINARY BALLED AND CLEANED WITH A HIGH PRESSURE CLEANER.

-FINAL AIR TEST HAS BEEN COMPLETED AND APPROVED.

- WHEN THE ABOVE WORK IS COMPLETE, THE CONTRACTOR SHALL ARRANGE FOR THE TELEVISION INSPECTION.

- THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN WRITING AS TO THE SCHEDULED DATE OF THE TELEVISION INSPECTION.

- AFTER CONDITIONS 1 THROUGH 7 AS OUTLINED ABOVE ARE MET, THE ENTIRE JOB WILL BE INITIALLY TELEVIEWED AND RECORDED. WATER SHALL BE INTRODUCED INTO THE PIPELINE AS APPROVED BY THE ENGINEER.

- THE AUDIO AND VIDEO PORTIONS OF THE DVD WILL BE FREE OF ELECTRICAL INTERFERENCE AND EXCESSIVE BACKGROUND NOISE.

- THE AUDIO REPORT SHALL BE RECORDED BY THE OPERATING TECHNICIAN ON THE VIDEOTAPES AS THEY ARE BEING PRODUCED AND SHALL INCLUDE THE LOCATION OF THE SEWER, THE NAMES AND NUMBERS OF THE MANHOLES INVOLVED, THE DIRECTION OF TRAVEL AND A DESCRIPTION OF ALL LATERAL LOCATIONS AND CONDITIONS IN THE SEWER LINE AS THEY ARE ENCOUNTERED.

- IN ADDITION TO THE AUDIO REPORT, A WRITTEN REPORT SHALL BE REQUIRED LISTING ALL THE INFORMATION REQUIRED IN THE AUDIO REPORT.

- THE CONTRACTOR WILL BE NOTIFIED IN WRITING BY THE ENGINEER OF ANY DEFICIENCIES REVEALED BY THE TELEVISION INSPECTION THAT WILL REQUIRE REPAIR. IF CORRECTIVE WORK IS INDICATED AND THE CONTRACTOR WISHES TO VIEW VIDEOTAPES, HE SHALL CONTACT THE ENGINEER TO SET A TIME FOR VIEWING WITH THE ENGINEER.

- CORRECTIVE WORK SHALL BE BY THE CONTRACTOR AT HIS EXPENSE.

- THOSE PORTIONS OF THE PIPELINE SYSTEM THAT HAVE BEEN CORRECTED SHALL BE RE-TELEVIEWED AND VIDEOTAPED AND THE TAPES AND REPORTS DELIVERED TO THE ENGINEER.

- THE PROCEDURE OUTLINED IN CONDITIONS "A" THROUGH "G" ABOVE WILL BE REPEATED UNTIL ALL DEFICIENCIES OBSERVED BY TELEVISION INSPECTION HAVE BEEN CORRECTED TO THE COMPLETE SATISFACTION OF THE ENGINEER.

- THE TAPES AND REPORTS SHALL BE DELIVERED TO THE CITY OF FOLSOM WASTE WATER DIVISION AFTER COMPLETION OF THE TELEVISION INSPECTION. ALL RECORDINGS AND REPORTS SHALL BECOME THE PROPERTY OF THE CITY.

- A FINAL VISUAL INSPECTION WILL BE MADE BY THE ENGINEER TO ENSURE THAT THERE IS NO GROUND WATER INTRUSION INTO THE SANITARY SEWER SYSTEM. IF GROUND WATER INTRUSION IS DISCOVERED BY THE ENGINEER, CORRECTIVE WORK SHALL BE PERFORMED BY THE CONTRACTOR AT HIS EXPENSE. A SECOND SEWER LATERAL TV INSPECTION SHALL OCCUR WHEN THE PLUMBER CONNECTS THE HOUSE PLUMBING TO THE SEWER LATERAL IN THE PRESENCE OF A BUILDING INSPECTOR.

- INCLUDE CCTV OF SANITARY SEWER LATERALS IN ADDITION TO SANITARY SEWER MAINS.

- CCTV DATA SHALL BE COMPATIBLE WITH CITY'S COMPUTERIZED MAINTENANCE MANAGEMENT SYSTEM (CMMS) AND UPLOADABLE.

- IT IS THE CONTRACTOR'S RESPONSIBILITY TO HIRE AN ISA CERTIFIED ARBORIST FOR TREE TAGGING, ASSESSMENT, TRIMMING, OBSERVATION, ARBORIST REPORT, TREE PERMITTING, ETC. COST IS TO BE INCLUDED IN BID. THE CITY OF FOLSOM GENERAL PROVISIONS CONTAIN INFORMATION REGARDING TREE PERMITTING.

- THE CONTRACTOR SHALL COORDINATE SEWER GARBAGE COLLECTION DAYS AND IS RESPONSIBLE FOR MOVING GARBAGE OUT OF ALLEYSWAYS TO THE STREET.

- THE CONTRACTOR SHALL NOTIFY RESIDENTS OF WORK 7 DAYS PRIOR, 3 DAYS PRIOR, AND THE DAY OF START OF WORK WITHIN AREA OF PROPERTY.

- THE CONTRACTOR IS RESPONSIBLE FOR REMOVAL AND DISPOSAL OF HAZARDOUS MATERIALS INCLUDING ASBESTOS CEMENT PIPING, IF ENCOUNTERED.

ABBREVIATIONS:

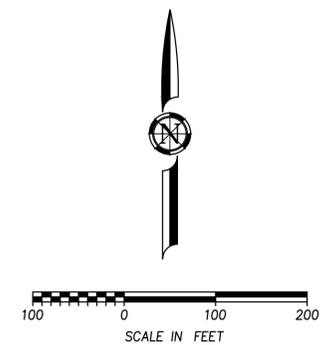
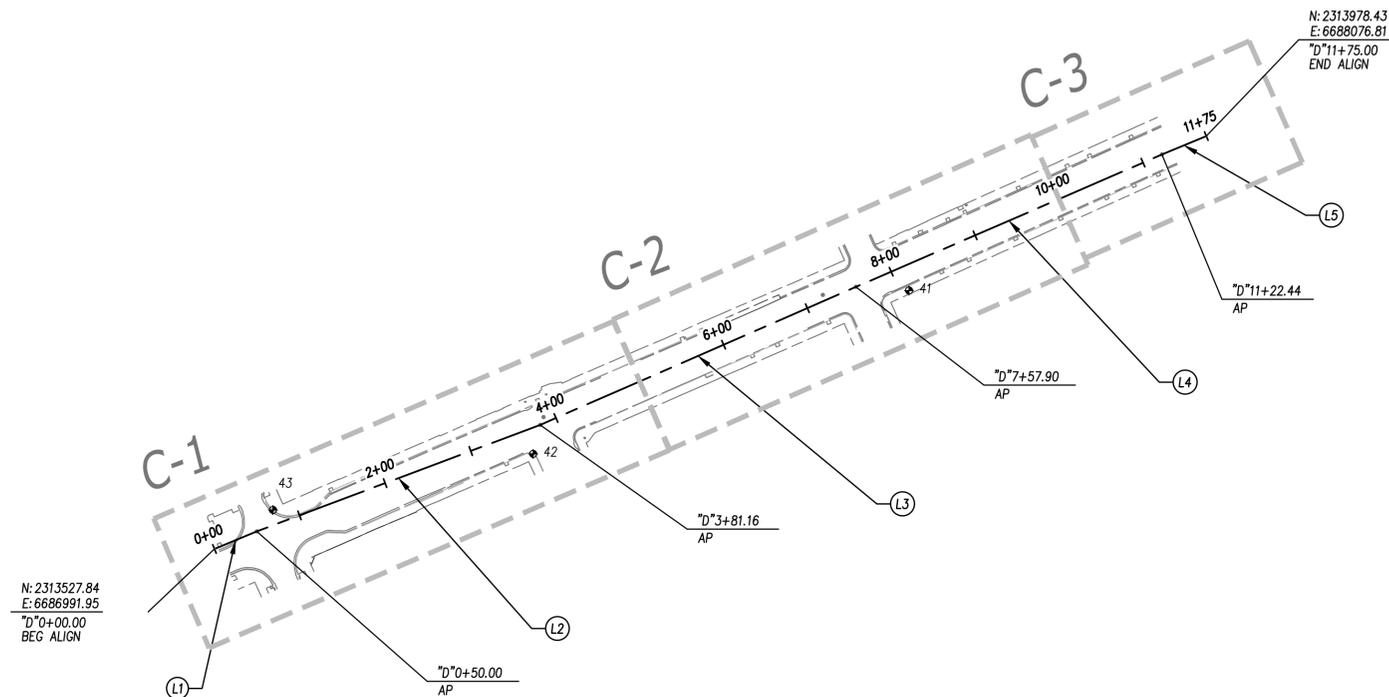
L	ANGLE	LF	LINEAR FOOT/FEET
AB	AGGREGATE BASE	LP	LOW POINT
ABAND	ABANDON	LT	LEFT, LIGHT
AC	ASPHALT CONCRETE	L/S	LANDSCAPING
ALUM	ALUMINUM	MAX	MAXIMUM
AP	ANGLE POINT	MFR	MANUFACTURER
APPROX	APPROXIMATE	MG	MILLION GALLONS
AVE	AVENUE	MH	MANHOLE
BEG	BEGIN	MJ	MECHANICAL JOINT
BF	BLIND FLANGE	MP	MIDPOINT
BFP	BACKFLOW PREVENTER	NPS	NOMINAL PIPE SIZE
BFV	BUTTERFLY VALVE	OC	ON CENTER
BL	BREAK LINE	OD	OUTSIDE DIAMETER
BOV	BLOW-OFF VALVE	OH	OVERHEAD
BV	BALL VALVE	PB	PULL BOX
BW	BUTT WELD	PE	POLYETHYLENE
BWE	BUTT WELD END	PERF	PERFORATED
C&G	CURB AND GUTTER	R	PROPERTY LINE
C&S	CURB, GUTTER, AND SIDEWALK	PP	POWER POLE
CL	CENTER LINE	PRV	PRESSURE REDUCING VALVE
CH	CHORD	PT	POINT
CI	CAST IRON	PUB	PUBLIC
CLR	CLEAR	PUE	PUBLIC UTILITY EASEMENT
CMP	CORRUGATED METAL PIPE	PVMT	PAVEMENT
CO	CLEANOUT, COUNTY	RCP	REINFORCED CONCRETE PIPE
COMM	COMMUNICATIONS	RD	ROAD, RING DRAIN
CONC	CONCRETE	R,R=	RADIUS
CONST	CONSTRUCT	RS	RISING STEM
CORP	CORPORATION	RT	RIGHT
CP	CONTROL POINT	R/W, ROW	RIGHT-OF-WAY
CV	CHECK VALVE	S=	SLOPE
DECLOR	DECLORINATION	SCHED	SCHEDULE
DEPT	DEPARTMENT	SD	STORM DRAIN
DI	DUCTILE IRON	SDCO	STORM DRAIN CLEANOUT
DIA	DIAMETER	SDMH	STORM DRAIN MANHOLE
DIP	DUCTILE IRON PIPE	SDR	STANDARD DIMENSION RATIO
DWG	DRAWING	S/W,SW	SIDEWALK
E,ELEC	ELECTRIC	SECT	SECTION
EA	EACH	SHT	SHEET
EG	EXISTING GRADE	SL	STREET LIGHT
EJ	EXPANSION JOINT	SPCS	SPECIFICATIONS
EL, ELEV	ELEVATION	SS	SANITARY SEWER
ELL	ELBOW	SSMH	SANITARY SEWER MANHOLE
EP	EDGE OF PAVEMENT	SF	SQUARE FEET
ER	EDGE OF ROAD	SSCO	SANITARY SEWER CLEANOUT
EW	EACH WAY	ST	STAINLESS STEEL
EX	EXISTING	ST	STATION
FCA	FLANGED COUPLING ADAPTER	STD	STANDARD
FO	FINISHED GRADE	STL	STEEL
FH	FIRE HYDRANT	T	TELEPHONE
FL	FLOW LINE	TBM	TEMPORARY BENCHMARK
FLG	FLANGE	TC	TOP OF CONCRETE
FM	FORCE MAIN	TP	TELEPHONE POLE
FO	FIBER OPTIC	TS	TRAFFIC SIGNAL
G	GAS	TYP	TYPICAL
GALV	GALVANIZED	UGE	UNDERGROUND ELECTRIC
GB	GRADE BREAK	UNO	UNLESS OTHERWISE NOTED
GM	GAS METER	VAR	VARIES
GR	GRATE, GRATE ELEVATION	W	WATER
HDPE	HIGH DENSITY POLYETHYLENE	W/WTR	WITH WATER
HSS	HOLLOW STRUCTURAL SECTION	W/	WITH
HP	HORSEPOWER, HINGE POINT, HIGH POINT	WM	WATER METER
ICV	IRRIGATION CONTROL VALVE	WV	WATER VALVE
ID	INSIDE DIAMETER	WY	WAY
IN	INCHES		
INV	INVERT		
IP	JOINT POLE		
L=	LENGTH		
LBS	POUNDS		

LEGEND

	EXISTING	PROPOSED
ABANDON PIPE	ABND	ABND
AIR RELEASE VALVE		
AIR VACUUM RELEASE VALVE		
ASSESSOR'S PARCEL NO.	25-025-254	
BLOW-OFF VALVE		
BOLLARD		
BORING HOLE LOCATION		
BUILDING		
BUTTERFLY VALVE		
CENTERLINE	CL	CL
CHECK VALVE		
DRAINAGE INLET		
EASEMENT LINE	---	---
EDGE OF PAVEMENT	---	---
ELECTRIC BOX		
ELECTRICAL MANHOLE		
FENCE LINE	-x-x-	-x-x-x-
FIRE DEPARTMENT CONNECTION		
FIRE HYDRANT		
FLOW METER		
FLOWLINE		
IRRIGATION CONTROL VALVE		
MONITORING WELL		
MANHOLE		
OVERHEAD ELECTRIC	OHE	
PLUG VALVE		
POLE W/ GUY WIRE & ANCHOR		
POST INDICATOR VALVE		
PROJECT COORDINATE		
PROPERTY LINE	---	---
RIGHT OF WAY (R/W)	---	---
RISE OR DROP		
SANITARY SEWER CLEAN OUT		
SEWER MAIN		
SEWER MANHOLE		
SPOT ELEVATION		
STORM DRAIN		
STORM DRAIN MANHOLE		
AREA LIGHT		
STREET SIGN		
SURVEY CONTROL POINT		
SURVEY MONUMENT/BENCH MARK		
TELEPHONE MANHOLE		
TOP OF EMBANKMENT		
TOE OF EMBANKMENT		
UNDERGROUND COMM	---	---
UNDERGROUND ELECTRIC	E	---
UNDERGROUND FIRE WATER	FW	---
UNDERGROUND GAS	G	---
UNDERGROUND WATER	W	---
UTILITY POLE		
WATER MANHOLE		
WATER METER		
WATER PIPE		
WATER VALVE		
YARD LIGHT		

POINT TABLE				
Point #	Elevation	Northing	Easting	Description
41	163.04	2313809.79	6687751.63	MAG
42	163.97	2313631.56	6687340.53	MAG
43	164.82	2313570.35	6687055.84	X

"D" LINE TABLE		
NUMBER	LENGTH	BEARING
L1	50.00'	N67°26'41"E
L2	331.16'	N69°27'02"E
L3	378.74'	N66°26'50"E
L4	364.54'	N66°39'12"E
L5	52.56'	N67°26'41"E



Login Name: kethares
 Plot Date: June 18, 2019 - 10:42 am; Plot Style: ###
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 Plot Size: Barch17601-200_11x17

NO.	REVISIONS	BY	DATE

BENCH MARK ELEV : 238.57 DATUM : NAVD 88
 DESCRIPTION :
 THE HORIZONTAL DATUM IS NAD 83 CALIFORNIA ZONE
 2 PER CITY OF OROVILLE HORIZONTAL CONTROL.
 VERTICAL DATUM IS NAVD 88 PER CITY OF OROVILLE
 BENCHMARKS.

DESIGN BY : K.SETHARES
 DRAWN BY : K.SETHARES
 CHECKED BY : M.MASSARO
 SCALE : 1" = 100'
 DATE : 6/28/19
 PROJ NO. : 17601-200

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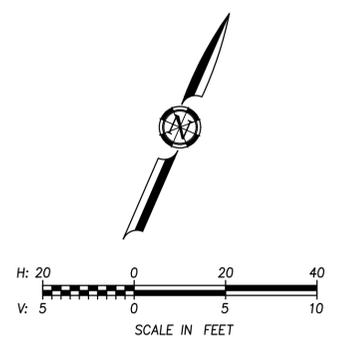
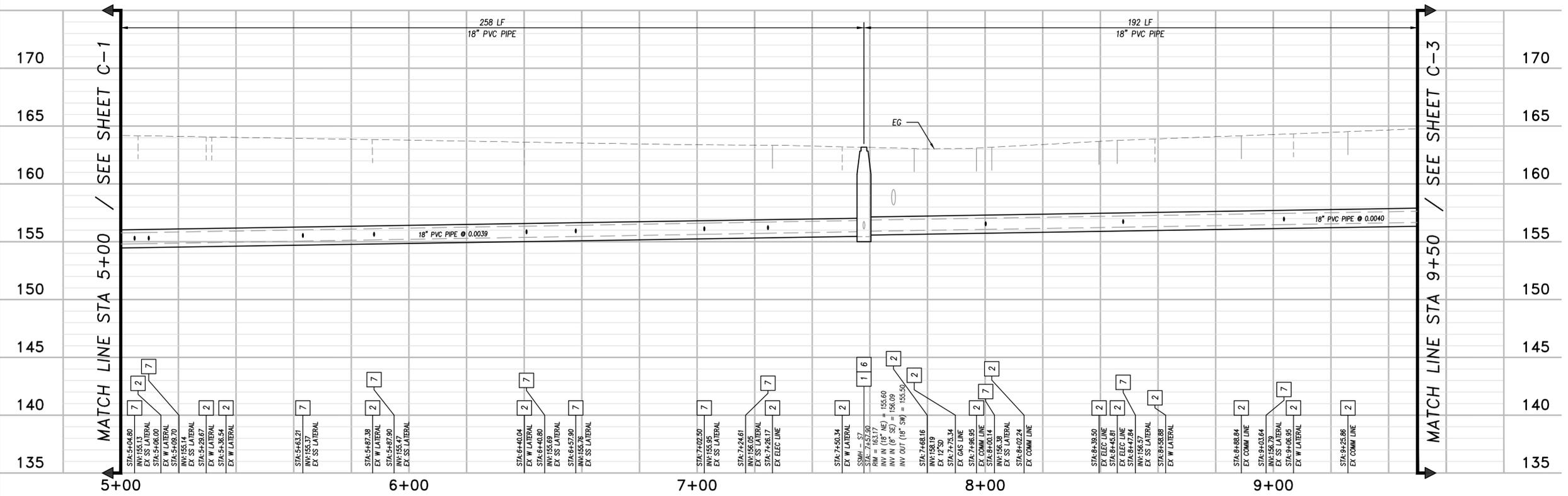
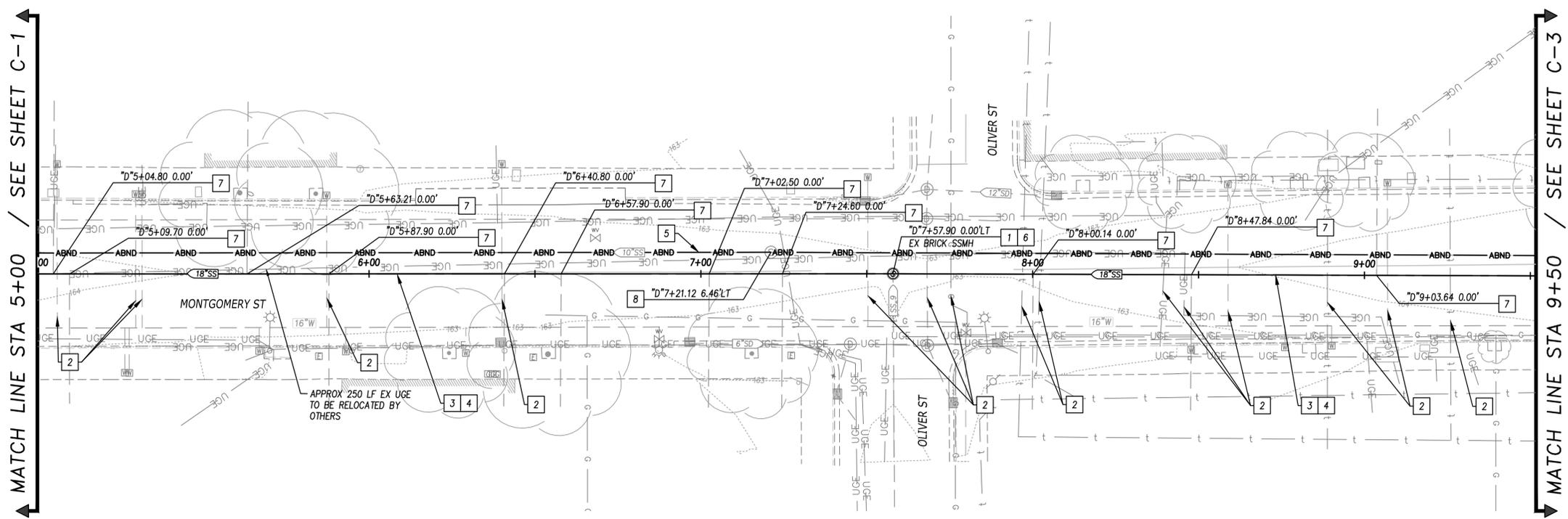
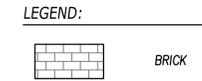
Bennett Engineering Services
 1082 Sunrise Avenue, Suite 100
 Roseville, California 95661
 T 916.783.4100
 F 916.783.4110



OROVILLE SEWER PROJECTS - 1D
KEY & SURVEY CONTROL
 CALIFORNIA

- CONSTRUCTION NOTES:**
- 1 REMOVE AND REPLACE EX 48" SSMH
 - 2 PROTECT EX UTILITY OR STRUCTURE IN PLACE
 - 3 INSTALL 18" PVC SS PIPE PER CITY STD DTL SS-01
 - 4 REMOVE EX SS PIPE
 - 5 ABANDON EX SS PIPE
 - 6 CONNECT TO EX SS PIPE OR SSMH
 - 7 CONNECT EX SEWER LATERAL TO NEW PIPE
 - 8 ABANDON EX 48" SSMH

- NOTES:**
1. ASSUMED DEPTH FOR ALL DRY UTILITIES, WATER SERVICES, AND SEWER LATERALS. CONTRACTOR TO VERIFY LOCATION, SIZE, & DEPTH IN FIELD PRIOR TO COMMENCING ALL WORK.
 2. CONTRACTOR TO NOTIFY RESIDENTS OF SERVICE INTERRUPTION 3 DAYS PRIOR TO INTERRUPTION.
 3. REPAIR STREET SECTIONS PER CITY OF OROVILLE STD DTL ST-01.



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 Plot Date: June 18, 2019 - 10:41 am; Plot Style: ###

NO.	REVISIONS	BY	DATE

BENCH MARK ELEV: 238.57 DATUM: NAVD 88
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 THE HORIZONTAL DATUM IS NAD 83 CALIFORNIA ZONE
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 VERTICAL DATUM IS NAVD 88 PER CITY OF OROVILLE
 BENCHMARKS.

DESIGN BY: K.SETHARES
 DRAWN BY: K.SETHARES
 CHECKED BY: M.MASSARO
 SCALE: 1" = 20'
 DATE: 6/28/19
 PROJ NO.: 17601-200

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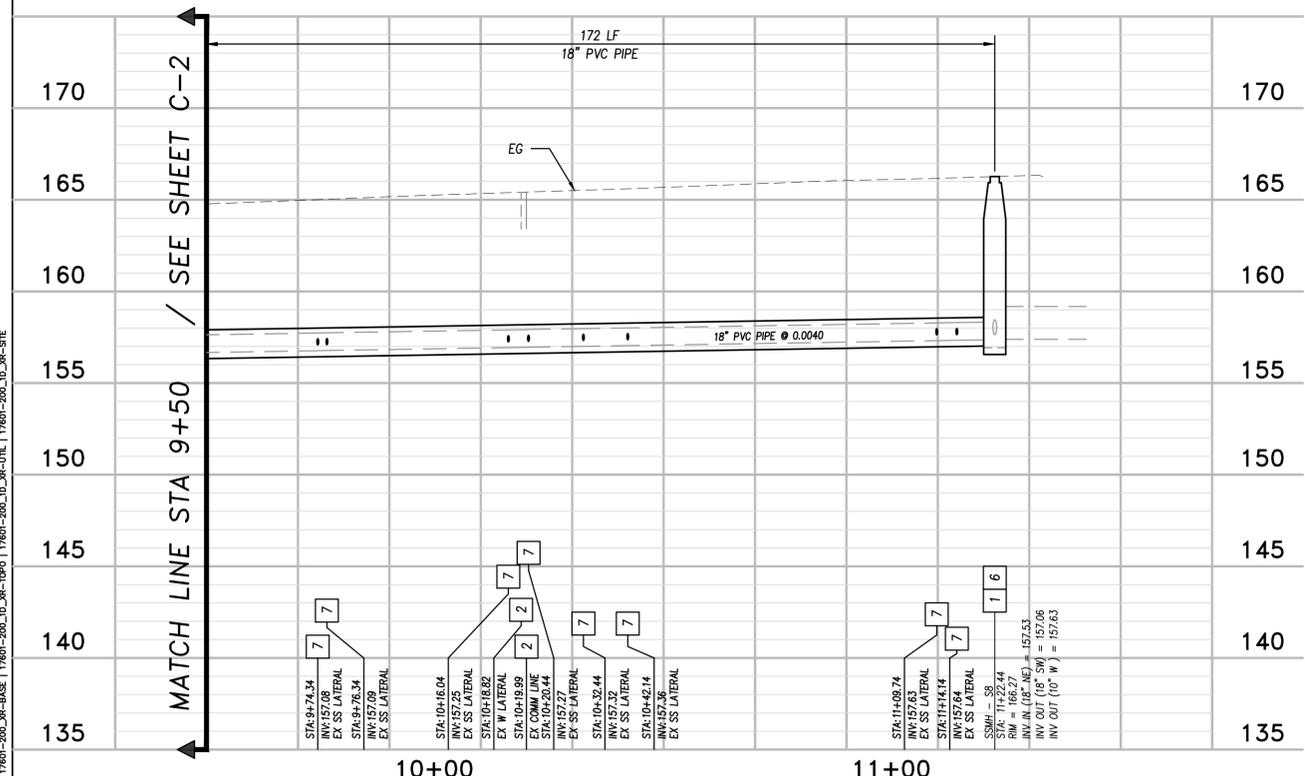
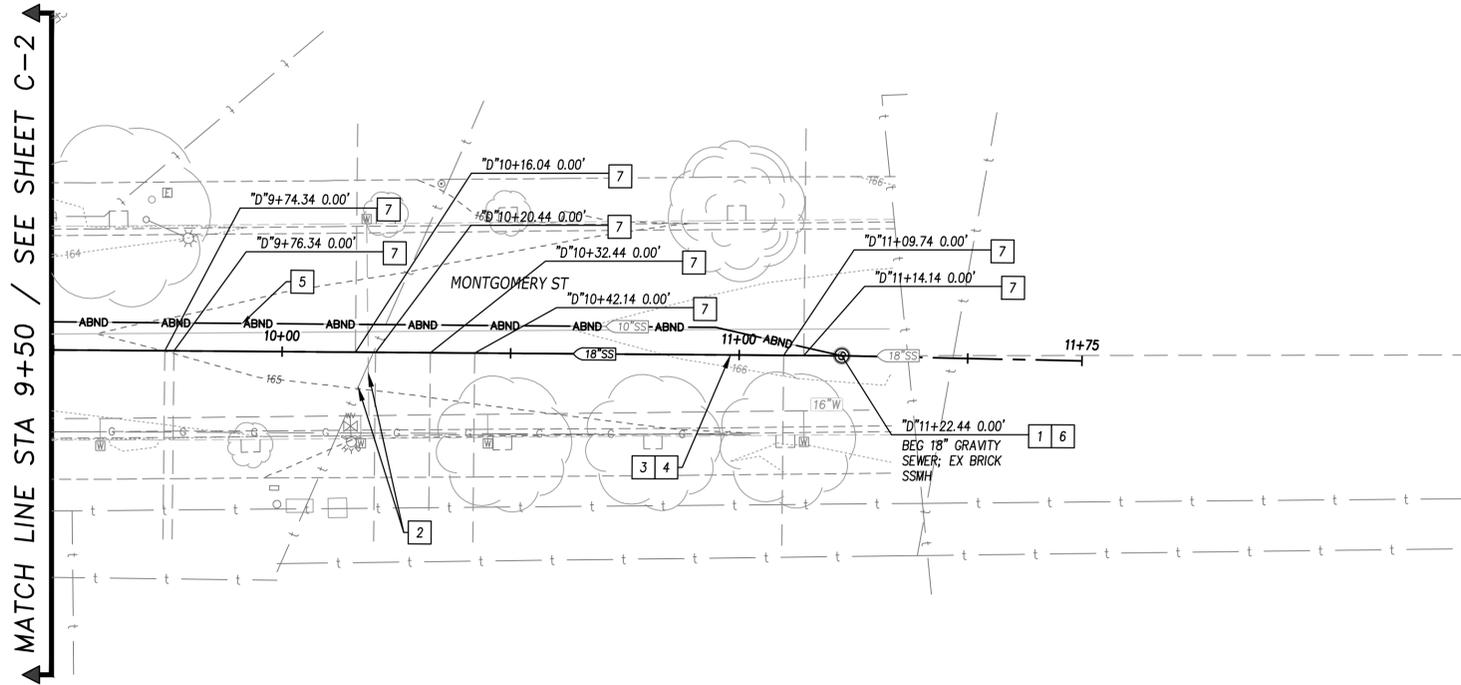
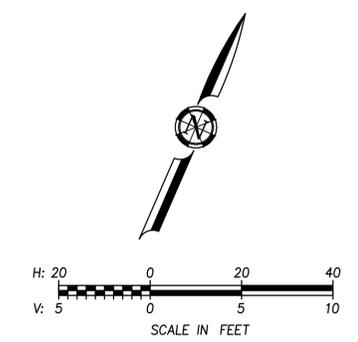
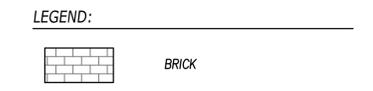
Bennett Engineering Services
 1082 Sunrise Avenue, Suite 100
 Roseville, California 95661
 T 916.783.4100
 F 916.783.4110



OROVILLE SEWER PROJECTS - 1D
PLAN & PROFILE
 STA 5+00 to STA 9+50
 CALIFORNIA

- CONSTRUCTION NOTES:**
- 1 REMOVE AND REPLACE EX 48"Ø SSMH
 - 2 PROTECT EX UTILITY OR STRUCTURE IN PLACE
 - 3 INSTALL 18" PVC SS PIPE PER CITY STD DTL SS-01
 - 4 REMOVE EX SS PIPE
 - 5 ABANDON EX SS PIPE
 - 6 CONNECT TO EX SS PIPE OR SSMH
 - 7 CONNECT EX SEWER LATERAL TO NEW PIPE
 - 8 ABANDON EX 48"Ø SSMH

- NOTES:**
1. ASSUMED DEPTH FOR ALL DRY UTILITIES, WATER SERVICES, AND SEWER LATERALS. CONTRACTOR TO VERIFY LOCATION, SIZE, & DEPTH IN FIELD PRIOR TO COMMENCING ALL WORK.
 2. CONTRACTOR TO NOTIFY RESIDENTS OF SERVICE INTERRUPTION 3 DAYS PRIOR TO INTERRUPTION.
 3. REPAIR STREET SECTIONS PER CITY OF OROVILLE STD DTL ST-01.



Login Name: bethares
 Plot Date: June 18, 2019 10:41 am
 Plot Style: ###
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NO.	REVISIONS	BY	DATE

BENCH MARK ELEV: 238.57 DATUM: NAVD 88
 DESCRIPTION:
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 VERTICAL DATUM IS NAVD 88 PER CITY OF OROVILLE
 BENCHMARKS.

DESIGN BY: K.SETHARES
 DRAWN BY: K.SETHARES
 CHECKED BY: M.MASSARO
 SCALE: 1" = 20'
 DATE: 6/28/19
 PROJ NO.: 17601-200

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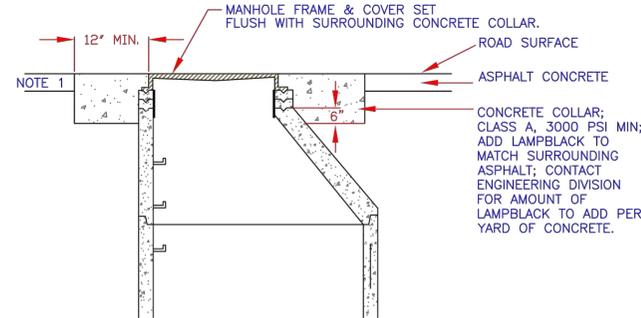
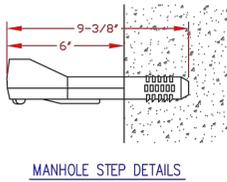
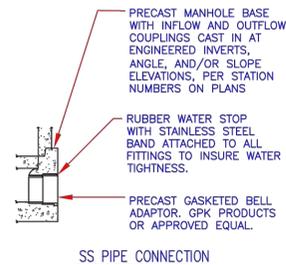
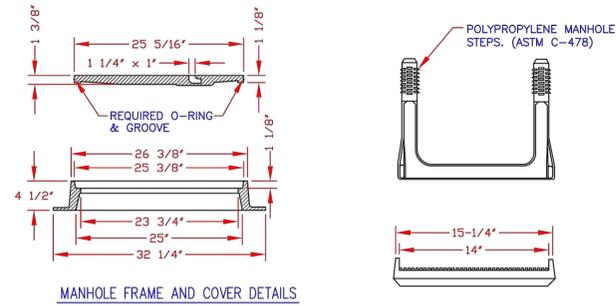
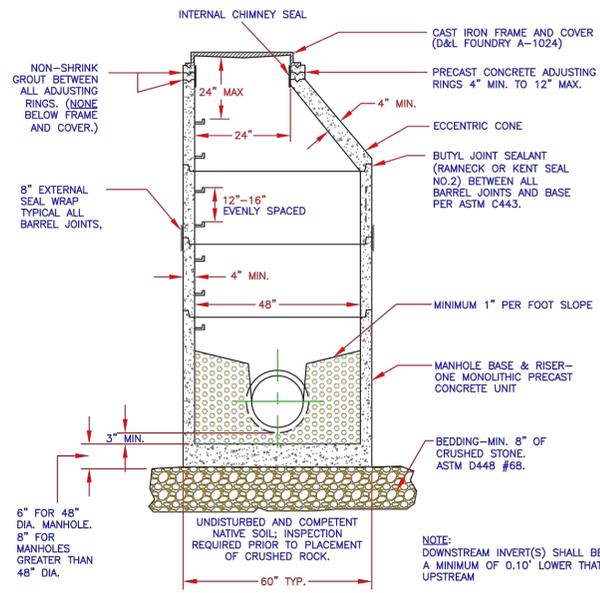
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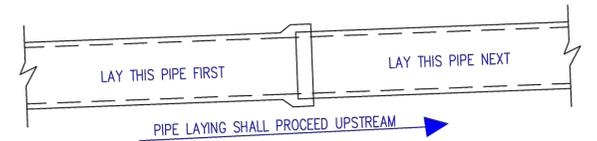
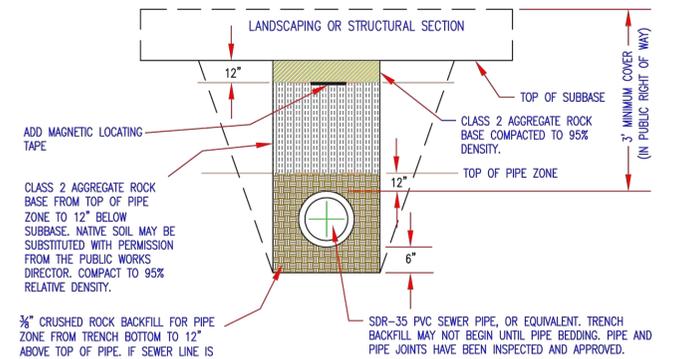


OROVILLE SEWER PROJECTS - 1D
PLAN & PROFILE
 STA 9+50 to STA 11+75
 CALIFORNIA

C-3
 6
 OF
 8

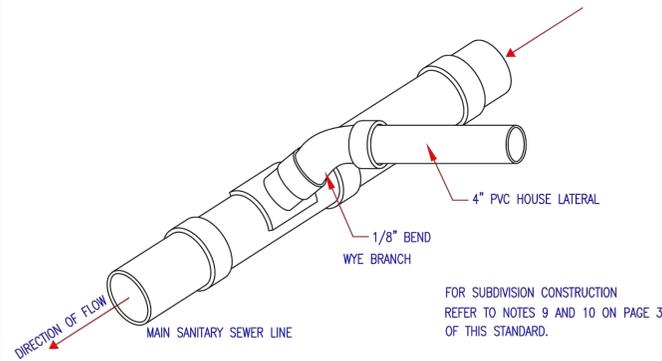


- NOTES:
- 2", 3", 4" OR MATCH EXISTING. REFER TO ENGINEERING DIVISION FOR GUIDANCE.
 - PLACE A MINIMUM OF 24" OF COMPACTED CLASS II AB AROUND MANHOLE PERIMETER, TO BOTTOM OF MANHOLE.
 - USE OF NATIVE MATERIAL BELOW STRUCTURAL ROAD SECTION SHALL BE APPROVED BY THE CITY ENGINEER.



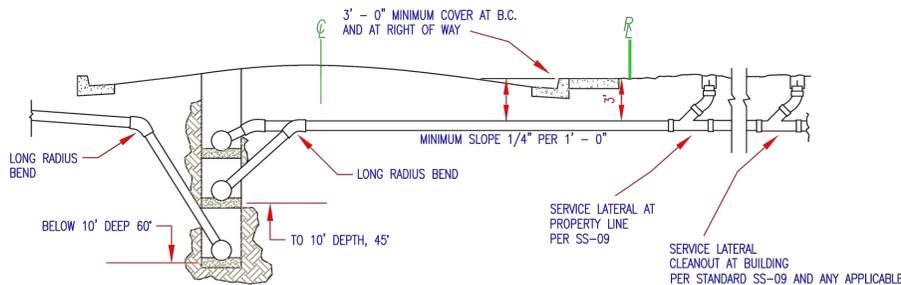
- NOTES:
- SERVICE LATERALS SHALL BE A MINIMUM 4" DIAMETER. SEWER MAINS SHALL BE A MINIMUM 8-INCH DIAMETER.
 - SEWER LATERALS OUTSIDE OF THE RIGHT OF WAY SHALL BE COMPACTED TO A RELATIVE DENSITY OF 90%. NATIVE SOIL MAY BE USED OUTSIDE OF THE RIGHT OF WAY. THE CITY MAY REQUIRE DENSITY TESTING TO CONFIRM ADEQUATE COMPACTION.
 - PIPE MAY BE SHADED BEFORE INSPECTION, HOWEVER, JOINTS SHALL BE LEFT EXPOSED.
 - A 2-SACK SAND AND CEMENT SLURRY MIX MAY BE SUBSTITUTED FOR TRENCH BACKFILL MATERIAL IF APPROVED IN ADVANCE BY THE PUBLIC WORKS DIRECTOR.
 - REPAIRS MADE TO THE PIPE SHALL BE MADE WITH LIKE PIPE ;
 - SDR 35 IN LINE REPAIRS SHALL BE MADE WITH GASKETED SLIP REPAIR COUPLINGS.
 - IT SHALL BE PERMISSIBLE TO USE CAULDER COUPLINGS ON CLAY PIPE.
 - THE CITY MAY FIELD REQUIRE GEOTECHNICAL OVERSIGHT AND FIELD DENSITY TESTING TO CONFIRM COMPLIANCE WITH THIS STANDARD. THE COST FOR FIELD OVERSIGHT SHALL BE PAID BY THE OWNER. COMPACTED BACKFILL MATERIAL NOT MEETING THE DENSITY REQUIREMENTS OF THIS STANDARD SHALL BE REMOVED, REPLACED AND RECOMPACTED TO THE CITY'S SATISFACTION.

1 MANHOLE W/ ECCENTRIC CONE ASSEMBLY
SCALE: NTS

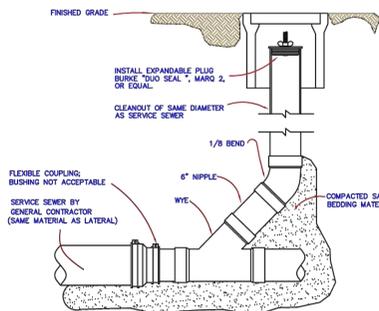


TYPICAL PVC HOUSE LATERAL ASSEMBLY

- NOTES:
- CITY WILL TAP ALL LATERAL CONNECTIONS MADE TO THE MAIN.
 - 4" ABS OR SDR 35 PVC PIPE SHALL BE USED FROM MAIN TO PROPERTY LINE, 3" MAY BE USED FROM THERE TO HOUSE.

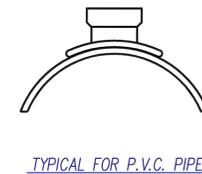


HOUSE SERVICE CONNECTION
(SEE SS - 01 FOR TYPICAL TRENCH SECTION)



- NOTES:
- SERVICE LATERAL CLEANOUT TO BE OF SAME MATERIAL AS LATERAL OR BUILDING SEWER.
 - FOR 4" SERVICES, INSTALL ROUND, NON-TRAFFIC TYPE, CONCRETE OR PVC VALVE BOX AND COVER MARKED "SEWER". BOX INSIDE DIAMETER TO BE A MINIMUM OF 7" AND A MAXIMUM OF 10".
 - FOR SERVICE 6" OR LARGER, INSTALL ROUND, CONCRETE, TRAFFIC TYPE VALVE BOX WITH CAST IRON FACE AND COVER. COVER TO BE MARKED "SEWER".
 - CLEANOUTS TO BE LOCATED ACCORDING TO UNIFORM PLUMBING CODE.

3 SEWER LATERAL TO MAIN CONNECTION
SCALE: NTS



- NOTES:
- ALL TAPS ARE TO BE DONE BY CITY OF OROVILLE PERSONAL.
 - SHORING IS TO BE IN PLACE BEFORE TAPPING BY THE CONTRACTOR IF THE TRENCH IS FIVE FEET OR DEEPER.
 - A FOUR INCH MINIMUM SIZE LATERAL IS TO BE USED, STARTING AT THE MAIN TO PROPERTY LINE.
 - MANHOLES ARE TO BE INSTALLED WHENEVER A LINE LARGER THAN FOUR INCHES IN DIAMETER INTERSECTS THE MAIN LINE.
 - BACKFILL PIPE ZONE SHALL BE BACKFILLED WITH 3/8" CRUSHED ROCK.
 - BACKFILL MATERIAL SHALL BE 100% IMPORTED MATERIAL AND COMPACTED TO 95% RELATIVE DENSITY OR APPROVED BY CITY ENGINEER.
 - TRENCH AND PIPE LAYING SHALL CONFORM TO SS-01 "STANDARDS FOR TRENCH DETAIL AND STANDARD FOR LAYING SANITARY SEWER PIPE".
 - ALL LATERALS TO BE LEAK TESTED ACCORDING TO CITY STANDARDS.
 - FOR LATERALS BEING CONSTRUCTED IN A NEW SUBDIVISION, THE LATERAL SHALL BE EXTENDED A MINIMUM OF 1 FOOT BEYOND THE PUBLIC UTILITY EASEMENT AND SHALL BE STUBBED ABOVE GROUND AND CAPPED.
 - FOR LATERALS BEING CONSTRUCTED IN A NEW SUBDIVISION, AN "S" SHALL BE STAMPED INTO THE CURB FACE CENTERED ON THE SEWER LATERAL.

2 SANITARY SEWER TRENCH DETAIL
SCALE: NTS

NO.	REVISIONS	BY	DATE

BENCH MARK ELEV : 238.57 DATUM : NAVD 88
DESCRIPTION :
THE HORIZONTAL DATUM IS NAD 83 CALIFORNIA ZONE 2 PER CITY OF OROVILLE HORIZONTAL CONTROL. VERTICAL DATUM IS NAVD 88 PER CITY OF OROVILLE BENCHMARKS.

DESIGN BY : K.SETHARES
DRAWN BY : K.SETHARES
CHECKED BY : M.MASSARO
SCALE : N/A
DATE : 6/28/19
PROJ NO. : 17601-200

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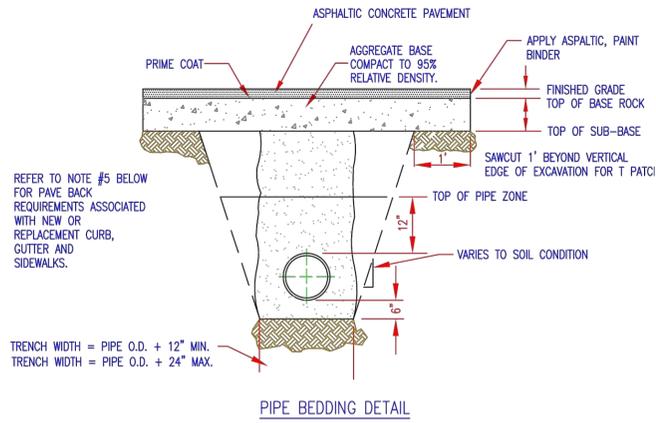
CITY OF OROVILLE
DEPARTMENT OF PUBLIC WORKS
STANDARD FOR
SEWER LATERAL TO MAIN CONNECTION
DRAWN BY: SG
RICK WALLS, P.E.
DIRECTOR OF PUBLIC WORKS DEPARTMENT
SHEET 2 OF 3
SS-13

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1082 Sunrise Avenue, Suite 100
Roseville, California 95661
T 916.783.4100
F 916.783.4110



OROVILLE SEWER PROJECTS - 1D
DETAILS - 1
C-4
7 OF 8
CALIFORNIA

Login Name: bethares June 18, 2019 10:41 am: Plot Style: ###
 File Name: P:\Proj\17601-200-Oroville-Sewer-Problem-Design\03-Plans\Masters\Sheet\17601-200-SS-13-Details.dwg
 Plot Date: 6/28/2019 10:41:24 AM
 Plot Size: 11x17



REFER TO NOTE #5 BELOW FOR PAVE BACK REQUIREMENTS ASSOCIATED WITH NEW OR REPLACEMENT CURB, GUTTER AND SIDEWALKS.

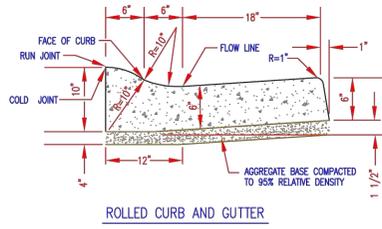
TRENCH WIDTH = PIPE O.D. + 12" MIN.
TRENCH WIDTH = PIPE O.D. + 24" MAX.

PIPE BEDDING DETAIL

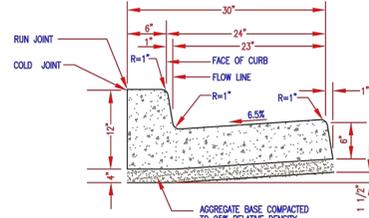
NOTES:

1. AGGREGATE BASE SHALL BE COMPACTED WITH OPTIMUM MOISTURE TO 95% RELATIVE DENSITY. CITY MAY REQUIRE DENSITY TESTING OF SUBGRADE AND/OR TRENCHES AT OWNER'S EXPENSE.
2. DEPTH OF ASPHALT CONCRETE:
RESIDENTIAL STREET: 2 LANE: 3"; 4 LANE: 4"
COMMERCIAL STREET: 2 LANE: 3"; 4 LANE: 4"
INDUSTRIAL STREET: 2 LANE: 3"; 4 LANE: 4"
3. DEPTH OF AGGREGATE BASE:
RESIDENTIAL STREET: 2 LANE: 10"; 4 LANE: 10"
COMMERCIAL STREET: 2 LANE: 10"; 4 LANE: 10"
INDUSTRIAL STREET: 10"
4. DEPTHS OF ASPHALT CONCRETE AND AGGREGATE BASE SPECIFIED IN NOTES 2 AND 3 ARE MINIMUM ALLOWABLE. SPECIFIC STREET LOCATIONS MAY REQUIRE ADDITIONAL DEPTH PURSUANT TO THE REQUIREMENTS OF THE ENGINEER.
5. REPLACEMENT OF STREET ASPHALT NECESSARY DUE TO THE CONSTRUCTION OF EITHER NEW (INFILL) OR REPLACEMENT CURB, GUTTER, OR SIDEWALK SHALL REQUIRE A MINIMUM OF A 12" WIDE PAVE BACK. WIDER PAVE BACKS MAY BE REQUIRED IN SITUATIONS WHERE EXISTING ROAD CONDITIONS WILL PREVENT PROPER DRAINAGE.

1 STREET REPAIR/PAVEMENT REPLACEMENT
SCALE: NTS



ROLLED CURB AND GUTTER



VERTICAL CURB AND GUTTER

NOTES:

1. ROLLED CURB AND GUTTER AS SHOWN, IS USED ONLY IN RESIDENTIAL ZONES, OR WITH EXCEPTIONS BY THE PUBLIC WORKS DIRECTOR. ALL CONCRETE SHALL BE 3,000 P.S.I. AT 28 DAYS.
ROLLED CURB AND GUTTER IS PERMITTED WITHIN INDUSTRIAL UNIT #2. (9/5/00) WITH PRIOR APPROVAL FROM CITY ENGINEER.

2 CURB AND GUTTER
SCALE: NTS

Login Name: ksethares
 Plot Date: June 18, 2019 - 10:41 am
 Plot Style: ###
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 T: 17601-200-11.dwg

NO.	REVISIONS	BY	DATE

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 T 916.783.4100
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OROVILLE SEWER PROJECTS - 11D
 DETAILS - 2
 CALIFORNIA

CITY OF OROVILLE, CALIFORNIA



SPECIFICATIONS AND CONTRACT DOCUMENTS

OROVILLE SEWER PROJECTS - 1D

JANUARY 2020

PREPARED FOR:

**CITY OF OROVILLE PUBLIC WORKS DEPARTMENT
OROVILLE, CALIFORNIA**

PREPARED BY:

**BENNETT ENGINEERING SERVICES
ROSEVILLE, CALIFORNIA**

SPECIFICATIONS AND CONTRACT DOCUMENTS FOR

OROVILLE SEWER PROJECTS - 1D

TABLE OF CONTENTS

<u>SECTION NAME</u>	<u>PAGE/SECTION</u>
BIDDING REQUIREMENTS	
Invitation for Bids.....	BR-1
Information for Bidders.....	BR-4
BIDDING DOCUMENTS	
Bid Form.....	BD-1
Bid Schedule.....	BD-4
List of Subcontractors.....	BD-6
Bidder's Bond	BD-7
Equal Opportunity Certification.....	BD-8
Noncollusion Affidavit.....	BD-9
Public Contract Code Section 10285.1 Statement	BD-10
Public Contact Code Section 10162 Questionnaire.....	BD-11
Public Contact Code Section 10232 Statement.....	BD-12
Debarment and Suspension Certification.....	BD-13
CONTRACT FORMS	
Project Contract.....	CF-1
Form of Performance Bond.....	CF-8
Form of Payment Bond	CF-9
GENERAL CONDITIONS	Section GC
TECHNICAL SPECIFICATIONS	Section TS
Measure and Payment.....	01550
Submittals.....	01300
Testing of Gravity Sewer Lines and Manholes	01666
Demolition, Clearing, Grubbing, and Stripping.....	02100
Dewatering	02140
Earthwork	02200
Abandonment of Pipelines and Manholes.....	02222
Trenching, Backfilling, and Compacting	02223
Structure Excavation and Backfill.....	02225
Stormwater Runoff Control Program.....	02270
Construction Activities Stormwater Best Management Practices.....	02273
Sheeting, Waling, and Shoring.....	02400
Paving and Road Surfacing	02510
Manholes and Cleanouts.....	02601
Concrete.....	03100
Concrete Saw Cutting and Core Drilling.....	03700
Pipe Removal.....	15030
Plastic Pipe and Fittings	15071
Piping Accessories and Appurtenances.....	15080
PROJECT PLAN SHEETS (8 Sheets Total)	

SECTION - BR
BIDDING REQUIREMENTS

INVITATION FOR BIDS
CITY OF OROVILLE
1735 MONTGOMERY STREET
OROVILLE, CALIFORNIA 95965-4897

Sealed proposals for the work described in the specifications and contract documents entitled:

OROVILLE SEWER PROJECTS - 1D

will be received at the City of Oroville, office of the City Clerk, 1735 Montgomery Street, Oroville, California 95965 until:

TUESDAY, JULY 23, 2019 AT 2:00 PM

at which time they will be publicly opened and read aloud in Conference Room 1 at said address.

NON-MANDATORY PRE-BID MEETING

TUESDAY, JULY 9, 2019 AT 2:00 PM

All Contractors interested in bidding on this project can attend a non-mandatory pre-bid meeting to be held at Oroville City Hall, 1735 Montgomery Street, Oroville, California. The pre-bid meeting will be held on **Tuesday, July 9, 2019** at 2:00 PM.

Proposal forms for this work are included in the document entitled:

OROVILLE SEWER PROJECTS - 1D

The proposed work for this project consists of the following generalized scope of work:

- Remove and replace 1,075 linear feet of 18-inch sanitary sewer and 4 manholes on Montgomery Street, reconnect laterals, and all associated pavement repair.
- Abandon 1,075 linear feet of 10-inch sanitary sewer and 2 manholes on Montgomery Street.

Contractor's License Classification. The Contractor shall possess a Class A General Engineering Contractor license issued by the State of California Contractors State License Board at the time of contract award. The Contractor's subcontractor(s) performing work shall possess the appropriate State licenses for the work being performed. The awarded Contractor and subcontractors will also be required to obtain a City Business License.

Obtaining or Inspecting Contract Documents. The plans, specifications and contract documents (Contract Documents) are available for download on the City of Oroville website at:

<http://www.cityoforoville.org/business/rfp-rfq-public-bids/project-documentation>

The City will also be transmitting scanned copies of the Contract Documents to building exchanges throughout the Northern Central Valley and the Bay Area. The City will not be providing Contractors paper copies of the Contract Documents. Further information regarding wage requirements, contract time, bonding requirements, federal requirements and other contract provisions are included in the Instructions for Bidders as part of the Contract Documents. Any questions or clarifications regarding the Contract Documents requested by Contractors shall be emailed to the City of Oroville, Project

Manager, Mike Massaro, P.E., at mmassaro@ben-en.com after the pre-bid meeting on July 9, 2019.

Questions or clarifications to the Contract Documents will be responded to through the issuance of addendum(s) by the City. As required, Contractors that submit written questions or clarifications to the City by email (mmassaro@ben-en.com) will be automatically placed on the bidders list. Addendums will be email to all Contractors who have submitted questions and have been placed on the bidders list. Addendums will also be place on the City's website (website address above).

Wage Requirements. The Contractor and Subcontractors on this project must comply with Nondiscrimination, Equal Employment Opportunity, Antitrust, Occupational Safety and Health Standards and Regulations as set forth in the Contract Bid Documents. This municipality is an equal opportunity employer and businesses owned by women or minorities are strongly encouraged to bid. The Department of Public Works hereby notifies all bidders that it will affirmatively insure that in any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, gender, color or national origin in consideration for the award.

All labor on the project shall be paid the higher of the minimum wage rates as established by the U.S. Secretary of Labor, or the California Director of Industrial Relations. If a discrepancy exists between these two determinations, then all labor on the project shall be paid the higher of the two minimum wage rates. Refer to the Wage Determinations OnLine.gov (www.wdol.gov) for the latest wage rates established by the U.S. Secretary of Labor as of the date of advertisement. This project is subject to State general prevailing wage rates unless a construction trade as part of the project has no listed in the State general prevailing wage rate. In this case, and only if there is no listed federal wage rate for a specific and necessary trade, the State general prevailing wage rate shall apply. It shall be mandatory upon the Contractor to whom the Contract is awarded, and upon any subcontractors under such contract, to pay not less than said prevailing rates to all workers employed by them in the execution of the Contract.

Contract Time. This work shall be constructed in accordance with details as shown on the plans and described in the specifications for this project. The construction work for the entire project shall be completed within sixty (60) working days.

Bidder's Bond. Bids must be from an appropriately licensed contractor, must be sealed and accompanied by cash, a certified or cashier's check, equivalent to ten percent (10%) of the proposal, payable to the order of the City of Oroville, to guarantee that if a proposal is accepted, a contract will be entered into and its performance secured. A Bidder's Bond to like effect and amount with a corporate surety will be acceptable for this project. Bids must be in writing and signed by or on behalf of the bidder.

Award of Contract. The contract will be awarded on the basis of lowest price for the combination of the base bid and the additive alternative bid from a responsive and responsible bidder and will provide for progressive payments and liquidated damages as fixed in the specifications. Although the additive bid alternative will be use in the determination of the lowest bidder, the additional work for the additive bid alternative will be the sole discretion of the City of Oroville. All proposals must be made on the forms as contained in the specifications for the previously described project and shall in all respects comply with the Instructions to Bidders and Contract Documents. Bids must be in writing and signed by or on behalf of the bidder.

Bonding Requirements. The successful bidder will be required to furnish a Performance Bond for 100 percent of the contract price to secure fulfillment of all the bidder's obligations under such contract. The successful bidder will further be required to furnish a Labor and Material Bond for 100 percent of the

contract price to assure payment as required by law of all persons supplying labor and material in the execution of the work provided for in the contract.

Retainage from Payments. Monthly progress payments shall be made to the Contractor for the value of the work completed during the preceding month, less a five percent (5%) security withhold.

Public Works Contractor Law. Bidders are advised that effective January 1, 2015, SB854 requires that no contractor or subcontractor may be listed on a bid proposal for a public works project (submitted on or after March 1, 2015) unless registered with the Department of Industrial Relations (DIR) pursuant to Labor Code section 1725.5 [with limited exceptions from this requirement for bid purposes only under Labor Code section 1771.1(a)]. Furthermore, no contractor or subcontractor may be awarded a contract for public work on a public works project (awarded on or after April 1, 2015) unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5. After registration, contractors and subcontractors shall submit be required to electronic certified payroll reports to DIR.

The City of Oroville reserves the right to reject any and/or all bids or to utilize any alternate procedures as authorized by California Public Contracts Code Sections 20166 and 20167, and accept such bids as are to the best interest of the City. No bidder may withdraw his/her bid for a period of ninety (90) days after the date set for the opening thereof.

Engineer's Estimate: \$516,700

CITY OF OROVILLE

Mike Massaro, P.E.
City Engineer

Dated:

June 27, 2019

Advertising Date: June 27, 2019

INFORMATION FOR BIDDERS

Bids will be received by the City of Oroville at the office of the City Clerk, City Hall, 1735 Montgomery Street, Oroville, California 95965-4897, until:

TUESDAY, JULY 23, 2019 AT 2:00 PM

at which time they will be publicly opened and read aloud.

Each bid must be submitted in a sealed envelope, addressed to the City of Oroville, 1735 Montgomery Street, Oroville, California 95965-4897. Each sealed envelope containing a bid must be plainly marked on the outside as bid for:

OROVILLE SEWER PROJECTS - 1D

and the envelope should bear on the outside the name of the bidder, his/her address, his/her license number and classification, and the name of the project for which the bid is submitted. If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed to the City of Oroville.

1. SCOPE OF PROJECT

The work to be done under this contract consists of furnishing all materials, plant and equipment, and performing all necessary labor in accordance with the prepared plans, specifications, and special provisions as directed by the City or its authorized representative, as follows:

CONSTRUCTION OF THE OROVILLE SEWER PROJECTS - 1D

2. FORM OF PROPOSAL

All bids must be made on the required bid form, and other forms furnished with the contract documents. All blank spaces for bid prices must be filled in, in ink or typewritten, and the bid form must be fully completed and executed when submitted. Only one copy of the bid form is required. Each bid shall be accompanied by a certified check, cashier's check, or surety bond for not less than ten (10) percent of the amount of the bid, made payable to the order of the City Clerk, City of Oroville. Such check or bond shall be given as a guarantee that the bidder will enter into the contract if awarded to him/her, and will be declared forfeited if the bidder refuses to enter into said contract and give the required contract bonds within five (5) days after being notified to do so by the City. The check or bond accompanying the accepted bid will be retained until the contract documents have been signed by the successful bidder and approved by the City of Oroville.

The following forms shall be completed and signed (where required), and submitted together to constitute a fully responsive bid:

- Bid Form (Pages BD-1 through BD-3)
- Bid Schedule (Page BD-4)
- List of Subcontractors (Page BD-6)
- Bidder's Bond (Page BD-7)

- Equal Opportunity Certification (Page BD-8)
- Noncollusion Affidavit (Page BD-9)
- Public Contract Code Section 10285.1 Statement (Page BD-10)
- Public Contract Code Section 10162 Questionnaire (Page BD-11)

The Contractor shall possess a Class A General Engineering License issued by the State of California Contractors State License Board at the time of contract award. The Contractor's subcontractor performing work elements shall possess the appropriate state licenses for the work being performed. The awarded Contractor and subcontractors will also be required to obtain a City Business License.

The City may waive any informalities or minor defects or reject any and all bids. Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified shall not be considered. No bidder may withdraw a bid within ninety (90) days after the actual date of the opening thereof. The City intends to award the contract at a regularly scheduled City Council Meeting as soon as possible thereafter. Should there be reasons why the contract cannot be awarded within the specified period; the time may be extended by mutual agreement between the City and the bidder.

The proposals may be rejected if they show any alteration of forms, additions not called for, conditional or alternative bids, incomplete bids, erasures or irregularities of any kind. The City of Oroville reserves the right to retain the checks or bonds of the three lowest bidders until an approved contract has been signed. All other bidders' checks will be returned by the City of Oroville.

3. LOCAL CONDITIONS

Bidders must satisfy themselves of the accuracy of the estimated quantities in the bid schedule by examination of the site and a review of the drawings and specifications including addenda. After bids have been submitted, the bidder shall not assert that there was a misunderstanding concerning the quantities of work, the nature of the work to be done or other requirements that are being called for in these specifications.

The City shall provide to bidders, prior to bidding, all information that is pertinent to, and delineates and describes, the land owned and rights-of-way acquired or to be required. The contract documents contain the provisions required for the construction of the project. Information obtained from an officer, agent, or employee of the City or any other person shall not affect the risks or obligations assumed by the Contractor or relieve him/her from fulfilling any of the conditions of the contract.

If any bidder is in doubt as to the true meaning of any part of the drawings, specifications, or other Contract Documents, or finds discrepancies in, or omissions from, the drawings or specifications, he/she may submit to the Design Engineer a written request for a clarification or correction thereof not later than five (5) days before the date bids will be opened. The person submitting the request will be responsible for its prompt delivery. Any clarification or correction will be made by written addendum, which shall be mailed or delivered to each person receiving a set of such documents.

The City will not be responsible for any other explanation or interpretation of the Contract Documents.

Any addenda issued before the time in which to submit bids expires shall form a part of the Contract Documents and shall be covered in the bid. Each bidder shall confirm receipt of any and all addenda in the space provided in the bid form.

4. BASIS OF AWARD

Award will be made to the lowest responsive and responsible bidder. A conditional or qualified bid will not be accepted. All applicable laws, ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the contract throughout. Each bidder is responsible for inspecting the site and for reading and being thoroughly familiar with the Contract Documents. The failure or omission of any bidder to do any of the foregoing shall in no way relieve any bidder from any obligation in respect to his/her bid. The low bidder shall supply the names and addresses of major material suppliers and subcontractors with the bid proposal on the form provided.

In making the award of the contract the City will consider the balanced character of the bids, the experience and ability of the bidders, as well as the extension of the estimate of quantities at the unit prices bid. The Contract will be awarded to the lowest cost for the work subject to the conditions for the basis of award of a contract. The Owner reserves the right to reject any or all bids and to waive irregularities not affecting substantial rights.

In case of conflict in the proposal between unit price bid and the extended total, the unit price bid shall govern. The basis of the award is subject to all conditions as contained in these specifications. The party to whom the contract is awarded will be required to execute the agreement and obtain the performance bond and payment bond within fourteen (14) calendar days from the date when notice of award (either verbal or written) is delivered to the bidder. The notice of award shall be accompanied by the necessary agreement and bond forms. In case of failure of the bidder to execute the agreement, the City may, at its option, consider the bidder in default, in which case the bid bond accompanying the proposal shall become the property of the City.

5. CONTRACT BONDS

Upon receipt of written notice of award of the contract and not more than five (5) days thereafter, the Contractor shall furnish the following bonds with power of attorney issued by a surety licensed to do business in the State of California and approved by the City. Attorneys-in-fact who sign bid bonds or payment bonds and performance bonds must file with each bond a certified and effective dated copy of their power of attorney. The form of the bonds shall be acceptable to the Owner:

- a. Faithful Performance Bond in a sum equal to one hundred percent (100%) of the amount of the contract awarded. This bond shall be made payable to the City of Oroville to guarantee the faithful performance of the contract.
- b. Labor and Material Bond in a sum equal to one hundred percent (100%) of the amount of the contract awarded. This bond shall be made payable to the City of Oroville to guarantee the payment of all labor, materials, rentals, etc. This bond shall have specific provisions to assure payment of all unemployment contributions which become due and payable.

6. PRECONSTRUCTION CONFERENCE

Prior to the issuance of the Notice to Proceed, a pre-construction conference will be held at a location determined by the City Engineer for the purpose of discussing with the Contractor the Scope of Work, contract drawings, specifications, existing conditions, materials to be ordered, equipment to be used, and all essential matters pertaining to the prosecution and the satisfactory completion of the project as required. The Contractor's representative at this conference shall include all major superintendents for the work and may include major sub-contractors.

7. NOTICE TO PROCEED

The Notice to Proceed (NTP) shall be issued for the date agreed by the City and Contractor as long as the agreement has been executed and the City has received the bonds and insurance documentation required per contract.

8. BIDDER'S QUALIFICATIONS

The City may make such investigations as it deems necessary to determine the ability of the bidder to perform the work, and the bidder shall furnish to the City all such information and data of this purpose as the City may request. The City reserves the right to reject any bid if the evidence submitted by, or investigation of, such bidder fails to satisfy the City that such bidder is properly qualified to carry out the obligations of the agreement and to complete the work contemplated therein.

9. WAGE RATES

All labor on the project shall be paid no less than the minimum wage rates as established by the U.S. Secretary of Labor. Further, pursuant to California Labor Code Section 1770, the California Department of Industrial Relations has specified the general prevailing wage rates for all public projects in California. The wages to be paid to all workers on such projects shall not be less than those specified in such wage rate determination.

10. ESTIMATE OF QUANTITIES

The estimate of quantities of work to be done under the specifications is approximate and is given only as a basis of calculation upon which the award of the contract will be made. The Contractor will be paid for the actual work done including materials and equipment actually installed at the contract unit price as shown on the plans, or as directed by the engineer. The Owner reserves the right to increase or decrease the amount of any class of work or material deemed necessary without restrictions. Bidders must submit balanced bids in order that they may not be affected adversely by an increase or decrease of quantities.

11. SUBLETTING OF CONTRACT

The Contractor shall not sublet, sell, transfer, assign or otherwise dispose of the contract or contracts or any portion thereof, or of his/her right, title, or interest therein, without written consent of the Owner. In case such consent is given, the Contractor will be permitted to sublet a portion thereof but shall perform with his/her own organization not less than 50 percent of the total contract cost, except that any items designated by the Contractor and approved by the Owner as "specialty items" may be performed by subcontract and the cost of any such specialty items so performed by

subcontract may be deducted from the total cost before computing the amount of work to be performed by the Contractor with his/her own organization. No subcontracts or transfer of contract shall release the Contractor of his/her liability under contracts and bonds.

12. WORKER'S COMPENSATION INSURANCE

The Contractor shall provide worker's compensation insurance, as required under the laws of the State of California, protecting the employees on the work, and shall pay all premiums due thereunder.

13. PUBLIC LIABILITY INSURANCE

The Contractor shall not commence any work or permit any subcontractor to commence any work until he/she obtains at his/her expense all required insurance. Such insurance must have the approval of the Owner as to limit, form and amount. Any insurance bearing on adequacy of performance shall be maintained after completion of the project for the full guarantee period.

14. CONTRACT TIME

The Contractor shall begin work within ten (10) calendar days after the date set in the written Notice to Proceed by the Owner and shall diligently prosecute same to completion for all of the proposed construction. The Contract time for the completion of the total project shall be **sixty (60)** working days beginning on the date of the written Notice to Proceed.

15. LIQUIDATED DAMAGES

If the Contractor refuses or fails to complete the work within the time specified, including authorized extensions, there shall be deducted from monies due the Contractor, not as a penalty, but as liquidated damages the sum of Two Thousand Seven Hundred Dollars (\$2,700.00) for each working day subsequent to the time specified for each project and the time the work is actually completed and accepted. Delays caused by adverse weather conditions or conditions for which the Owner is clearly responsible will be added to the contract time.

16. PAYMENTS

Progress payments shall be made at least once each month as the work progresses. These progress payments shall be based on work accomplished during the previous working month, based on the various contract bid items and the unit bid prices included in the Bid Schedule submitted by the Contractor with his/her bid. In applying for payments, the Contractor shall submit a statement based on this schedule. Payment will be made only for material and work actually incorporated in the work.

17. WITHHOLDING

Owner shall withhold from each payment due the Contractor five percent (5%) of the amount claimed. This 5% of the payment shall be withheld until final acceptance of the total project is given by the Owner. After final acceptance of the project is given and the Contractor has submitted

acceptable release of all liens and furnished the Engineer acceptable red-lined drawings showing the "as-built" condition of the completed project, then the Owner shall release for payment the 5% retention. Owner will make such final payment of retention within thirty-five (35) days of final acceptance of the project and submittal of release of liens and red-lined as-built drawings.

Pursuant to Government Code Section 4590, at the request and expense of the Contractor, securities equivalent to the amount withheld shall be deposited with the City or with a state or federally chartered bank as the escrow agent, who shall pay such monies to the Contractor upon satisfactory completion of the contract. Securities eligible for investment under this section shall include those listed in Government Code Section 16430 or bank or savings and loan certificates of deposit. The Contractor shall be the beneficial owner of any securities substituted for monies withheld and shall receive any interest thereon.

18. DEFINITIONS

Whenever in the specifications or on the drawings the word directed, required, permitted, designated, ordered, or words of like import are used, it shall be understood that the direction, requirement, permission, designation or order of the City of Oroville is intended; and, similarly, the words approved, satisfactory, suitable, acceptable, or words of like import, shall mean approved by the representative of the City of Oroville authorized to express such approval.

19. TAXES

Bidders shall have included in their bids any and all Federal, State and local taxes of whatever nature in connection with material to be furnished to the City. Absolutely no extras shall be allowed for such by the City.

20. CONTRACT DOCUMENTS

The form of agreement which the successful bidder, as Contractor, will be required to execute and the form of bonds which he/she will be required to furnish are included in the Contract Documents and should be carefully examined by each bidder. The agreement and bonds will be executed in two (2) original counterparts. The complete contract consists of the Contract Documents as defined in the agreement, and are intended to cooperate and be complementary so that any work called for in one and not mentioned in the other, or vice versa, is to be executed the same as if mentioned in all said documents. The intention of the documents is to include all labor, materials, equipment, transportation and services necessary for the proper execution of the work.

21. DECLARATION FOR FINAL PAYMENT

After the completion of the work of this contract, the Contractor shall file with the City his/her declaration under penalty of perjury stating that all workers and persons employed, all firms supplying the materials and all subcontractors upon the project, have been paid in full and that there are no bills outstanding against the project for either labor or materials except certain items, if any, to be set forth in detail in the declaration. The filing of such declaration by the Contractor and the submittals referred to in the General Provisions shall be a condition precedent to Contractor's receipt of the final payment on this contract.

22. ADMONITION

All bidders hereby are advised that the City of Oroville has adopted General Provisions for this work which might differ from the general provisions provided for private projects or projects undertaken by other governmental agencies. Contractors are admonished to carefully read the General Provisions, as well as the technical provisions, and are advised that the General Provisions shall be enforced strictly.

23. QUALITY

a. Conduct of Work. The construction in place, and all operations on the site and in conjunction with the work of construction, shall comply with all laws, ordinances and regulations of legally constituted authorities having jurisdiction.

b. Manufacturer's Directions. Where specifications require work to be performed in accordance with manufacturer's directions, the Contractor shall obtain and distribute copies of said directions to City, Engineer and field office before starting the affected part of the work.

c. Materials. All materials and equipment incorporated in the work shall be new, except where reuse of existing materials or equipment is specified. All similar materials and equipment shall be products of one manufacturer, and shall be the same model, type and style for the same use throughout the project. This requirement shall apply whether item is furnished under one or several sections of the specifications. It shall be the Contractor's responsibility to coordinate and assure compliance of this requirement. The conditions of this paragraph shall be sufficient cause for rejection of the substitutions.

d. Workmanship.

1. All workmanship shall be performed by skilled laborers in accordance with established standards of first-class workmanship in each of the various trades. All items shown or indicated shall be plumb, level, flat or straight, throughout their entire extent, within limits of tolerances specified. In cases where tolerances are not specified, all items shall be installed in accordance with established standards for first-class work in each trade.

2. Contractor shall, prior to installing any item or material, assure himself that surfaces to receive such items or materials are plumb, level, true to line and straight to the degree necessary to achieve tolerances specified or required. All shimming, blocking, stripping, grinding, or patching required shall be performed without extra cost.

3. All joints in finish materials shall be tight, straight, even and smooth.

4. All operable items shall operate smoothly, without sticking or binding, and without excessive "play" or looseness

5. Finished appearance of all items, and of joints or transitions between items, shall be indicative of highest-quality workmanship.

24. SUBMITTALS

The contractor shall prepare and provide all submittals, shop drawings and samples required by other pertinent sections of the specifications for work, and all incidental submittals required for proper performance of the work. The City shall prepare a submittal schedule prior to the issuance of the Notice to Proceed. All submittals shall be submitted in a timely manner allowing the City a 1-week review time. It is the expressed responsibility of the Contractor to ensure that the submittal, review and approval of submittals by the City do not delay the project schedule.

25. GUARANTEE

In addition to requirements for a guarantee specified in "General Conditions," the effective date of the guarantee shall be the date of recording the notice of final completion.

SECTION - BD
BIDDING DOCUMENTS

BID FORM

Bid Opening Date: July 23, 2019

Hour of Bid Opening: 2:00 p.m.

Place of Bid Opening:

City of Oroville
1735 Montgomery Street, Conference Room 1
Oroville, California 95965

TO: The City of Oroville, State of California:

Bid of, _____,
organized and existing under the laws of the State of California, and doing business as:

- a Corporation
- a Partnership
- an Individual

to the City of Oroville, 1735 Montgomery Street, Oroville, California 95965.

The bidder, in compliance with the Invitations for Bids for:

OROVILLE SEWER PROJECTS - 1D

having examined the plans and specifications with related documents of the proposed work, and being familiar with all of the conditions surrounding the construction of the proposed project including the availability of materials and labor, hereby proposes to furnish all labor, materials, and supplies, and to construct the project in accordance with the contract documents, within the time set forth therein, and at the prices stated below. These prices are to cover all expenses incurred in performing the work required under the contract documents, of which this proposal is a part.

The bidder is required to examine carefully the work site, the proposal form, plans, Specifications, Supplemental Specifications, special provisions and contract forms for the work contemplated. It will be assumed that the bidder has investigated and is satisfied as to the conditions to be encountered for performing the work as scheduled, and as to the character, quality and quantities of work to be performed and materials to be furnished, and as to the requirements of the plans, Specifications, Supplemental Specifications, special provisions and contract. The submission of a proposal shall be considered conclusive evidence that the bidder has made such examination and is satisfied as to all the conditions and contingencies.

Bidder hereby agrees to commence work under this contract within 10 working days after issuance of the Notice to Proceed by the City and, will fully complete the project within **60** working days after the issuance of the Notice to Proceed, unless the period of completion is extended thereafter as stipulated in the specifications. Liquidated damages established for this contract are established at \$2,700 per day for each working day that all project work is not

completed after the 60th working day.

Bidder further agrees that should he/she fail to complete any segment of work in the time specified, he/she will pay liquidated damages to the City as prescribed in these specifications. It is understood that the City reserves the right to increase or decrease the quantities of items bid in the contract with no change in the unit prices bid, provided the change in a major item does not exceed 25 percent and of other items, 30 percent.

All items contained in the project bid schedule, including any additive bid alternatives, must be submitted for the entire work. Award of contract will be based on the lowest responsible bidder for the combination of base bid schedule with the additive alternatives, at the City's discretion. The amount of the bid for comparison purposes will be the total bid of all items for each respective Bid Schedule. The unit prices shall include all labor, materials, tools, equipment, overhead, profit, fees and all other items of expense necessary for and incidental to the finished work.

The bidder understands that the City reserves the right to award or reject any or all bids for each respective Bid Schedule. The bidder agrees that their bids shall be good and may not be withdrawn for a period of ninety (90) calendar days after the actual date of opening thereof.

Upon receipt of written notice of the acceptance of this bid, bidder will execute the formal contract attached within ten (10) calendar days and deliver surety bonds as required by the general conditions. The bid security, attached, is to become the property of the City in the event the contract and bonds are not executed within the time set forth as liquidated damages for the delay and additional expense to the City caused thereby.

Accompanying this bid is _____

(Note: Insert the words "cash," "cashier's check," "certified check," or "bidders bond" as the case may be in the amount equal to at least ten (10) percent of the total bid.)

The names of all persons interested in the foregoing proposal as principals are as follows:

IMPORTANT NOTICE: If bidder or other interested person is a corporation, state legal name of corporation, also names of the president, secretary, treasurer and manager thereof; if a co-partnership, state true name of firm, also names of all individual copartners composing firm; if bidder or other interested person is an individual, state first and last names in full.

Licensed in accordance with an act providing for the registration of Contractors,

License No. & Exp. Date: _____ Classification(s) _____

ADDENDA: This proposal is submitted with respect to the changes to the contract included in addendum number(s) _____

(Fill in addendum numbers if addenda have been received and insert, in this Proposal, any Engineer's Estimate sheets that were received as part of the addenda.)

Addendum or addenda issued by the department must be noted above.

By my signature on this proposal I certify, under penalty of perjury under the laws of the State of California, that the foregoing questionnaire and statements of Public Contract Code Sections 10162, 10232 and 10285.1 are true and correct and that the bidder has complied with the requirements of Section 8103 of the Fair Employment and Housing Commission Regulations (Chapter 5, Title 2 of the California Administrative Code). By my signature on this proposal I further certify, under penalty of perjury under the laws of the State of California and the United States of America, that the Noncollusion Affidavit required by Title 23 United States Code are true and correct.

Signature of Bidder _____ Date: _____

Name and Title of Bidder: _____

Name of Business: _____

Business Address: _____

Telephone Number: _____

Attest: _____

Dated: _____

License No. & Exp. Date: _____

Classification: _____

SEAL: (If bid by corporation)

OROVILLE SEWER PROJECTS - 1D BID SCHEDULE

Bidder agrees to perform all of the work described in the contract documents and this bid form for the amounts shown in the "Bid Amount" column.

Contractor's Company Name, Address and Phone Number

Contractor's Title, Signature and Date

We hereby propose to furnish all labor, materials, equipment, tools, transportation, and services, and to discharge all duties and obligations necessary and required to perform and complete the Project in strict accordance with the Contract Documents for the TOTAL BID PRICE:

BASE BID SCHEDULE

BID ITEM	ITEM DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	LINE ITEM COST
1	MOBILIZATION/DEMOBILIZATION	LS	1		
2	TRAFFIC CONTROL	LS	1		
3	DEWATERING	LS	1		
4	SHEETING, SHORING, BRACING	LS	1		
5	BYPASS PUMPING	LS	1		
6	18" PVC PIPE	LF	1,075		
7	ABANDON PIPE	LF	1,075		
8	48" SANITARY SEWER MANHOLE	EA	4		
9	ABANDON MANHOLE	EA	2		
10	LATERAL RECONNECTION	EA	22		
			Total Bid Items 1-10:		

Bidders must provide pricing for every bid item. Base Bid items above reflect in the project plans.

The estimated quantities for unit price items are for purposes of comparing bids only and the City makes no representation that the actual quantities of work performed will not vary from the estimates.

In case of discrepancy between the unit price and the line item cost set forth for a unit price item, the line item cost, calculated at the unit price multiplied by the estimated quantity, shall prevail and shall be utilized as the basis for determining the lowest responsive, responsible bidder. However, if the amount set forth as a unit price is ambiguous, unintelligible or uncertain for any cause, or is omitted, or is the same amount as the entry in the "Line Item Cost" column, then the amount set forth in the "Line Item Cost" column for the item shall prevail and shall be divided by the estimated quantity for the item and the price thus obtained shall be the unit price. If any of the above discrepancies exist, the City may recalculate the bid price on the basis of the unit price and the bidder agrees to be bound by such recalculation. Final payment for unit price items shall be determined by the City from measured quantities of work performed.

The contract shall be awarded to the contractor submitting the lowest responsible Base Bid Price.

BASE BID PRICE:

\$ _____
Base Bid in Numbers

Base Bid in Written Form

BIDDER'S BOND

CITY OF OROVILLE

We, _____

_____ as Principal, and

as Surety are bound unto the City of Oroville, hereafter referred to as "Obligee," in the penal sum of ten percent (10%) of the total amount of the bid of the Principal submitted to the Obligee for the work described below, for the payment of which sum we bind ourselves, jointly and severally.

THE CONDITION OF THIS OBLIGATION IS SUCH, THAT:

WHEREAS, the Principal is submitting a bid to the Obligee, for the **OROVILLE SEWER PROJECTS - 1D** as shown on the Project Plans and Technical Specification, for which bids are to be opened at 1735 Montgomery Street, Oroville, California 95965 on **July 23, 2019 at 2:00 P.M.**

NOW, THEREFORE, if the Principal is awarded the contract and, within the time and manner required under the specifications, after the prescribed forms are presented to him/her for signature, enters into a written contract, in the prescribed form, in accordance with the bid, and files two bonds with the Obligee, one to guarantee faithful performance of the contract and the other to guarantee payment for labor and materials as provided by law, then this obligation shall be null and void; otherwise, it shall remain in full force.

In the event suit is brought upon this bond by the Obligee and judgment is recovered, the Surety shall pay all costs incurred by the Obligee in such suit, including a reasonable attorney's fee to be fixed by the court.

Dated: _____, 20____

*THIS DOCUMENT
MUST BE NOTARIZED*

Principal

Surety

By: _____

Note: Correspondence or claims relating to this bond should be sent to the surety at the following address:

EQUAL OPPORTUNITY CERTIFICATION

The bidder and proposed subcontractor(s) hereby certify the he/she has____, has not____ participated in a previous contract or subcontract subject to the equal opportunity clauses, as required by Executive Orders 10925, 11114, or 11246, and that, where required, he/she has filed with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance, a Federal Government contracting or administering agency, or the former President's Committee on Equal Employment Opportunity, all reports due under the applicable filing requirements.

Notes: The bidder must place a checkmark after "has" or "has not" in one of the blank spaces provided above. The above Certification is part of the Bid. Signing this Bid on the signature portion of the Bid Schedule thereof shall also constitute signature of this certification. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

Proposed prime contractors and subcontractors who have participated in a previous contract or subcontract subject to the Executive Orders and have not filed the required reports should note that 41 CFR 60-1.7(b) (1) prevents the award of contracts and subcontracts unless such contractor submits a report covering the delinquent period or such other period specified by the Federal Highway Administration or by the Director, Office of Federal Contract Compliance, U.S. Department of Labor.

NONCOLLUSION AFFIDAVIT

In conformance with Title 23 United States Code Section 112 and Public Contract Code 7106 the bidder declares that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

Note: The above Statement, Questionnaire, and Non-Collusion Affidavit are a part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute signature of this Affidavit. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

PUBLIC CONTRACT CODE SECTION 10285.1 STATEMENT

In accordance with Public contract Code Section 10285.1 (Chapter 376, Stats. 1985), the bidder hereby declares under penalty of perjury under the laws of the State of California that the bidder has , has not , been convicted within the preceding three years of any offenses referred to in that section, including any charge of fraud, bribery, collusion, conspiracy, or any other act in violation of any state or federal antitrust law in connection with the bidding upon, award of, or performance of, any public works contract, as defined in Public Contract Code Section 1101, with any public entity, as defined in Public Contract Code Section 1100, including the Regents of the University of California or the Trustees of the California State University. The term "bidder" is understood to include any partner, members, officer, director, responsible managing officer, or responsible managing employee thereof, as referred to in Section 10285.1.

Note: The bidder must place a checkmark after "has" or "has not" in one of the blank spaces provided. The above Statement is part of the Bid. Signing this Bid on the signature portion of the bid schedule thereof shall also constitute signature of this Statement. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

PUBLIC CONTRACT CODE SECTION 10162 QUESTIONNAIRE

In accordance with Public Contract Code Section 10162, the Bidder shall complete, under penalty of perjury, the following questionnaire:

Has the bidder, any officer of the bidder, or any employee of the bidder who has a proprietary interest in the bidder, ever been disqualified, removed, or otherwise prevented from bidding on, or completing a federal, state, or local government project because of a violation of law or safety regulation?

YES_____ NO_____

If the answer is yes, explain the circumstances in the following space.

Note: The bidder must place a checkmark after "YES" or "NO" in one of the blank spaces provided. The above Questionnaire is part of the Bid. Signing this Bid on the signature portion of the bid schedule thereof shall also constitute signature of this Questionnaire. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

PUBLIC CONTRACT CODE SECTION 10232 STATEMENT

In conformance with Public Contract Code Section 10232, the Contractor, hereby states under penalty of perjury, that no more than one final un-appealable finding of contempt of court by a federal court has been issued against the Contractor within the immediately preceding two-year period because of the Contractor's failure to comply with an order of a federal court which orders the Contractor to comply with an order of the National Labor Relations Board.

Note: The above Statement is part of the Bid. Signing this Bid on the signature portion thereof shall also constitute signature of this Statement. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

**DEBARMENT AND SUSPENSION
CERTIFICATION**

TITLE 49, CODE OF FEDERAL REGULATIONS, PART
29

The bidder, under penalty of perjury, certifies that, except as noted below, he/she or any other person associated therewith in the capacity of owner, partner, director, officer, manager:

- is not currently under suspension, debarment, voluntary exclusion, or determination of ineligibility by any Federal agency;
- has not been suspended, debarred, voluntarily excluded or determined ineligible by any Federal agency within the past 3 years;
- does not have a proposed debarment pending; and
- has not been indicted, convicted, or had a civil judgment rendered against it by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past 3 years.

If there are any exceptions to this certification, insert the exceptions in the following space.

Exceptions will not necessarily result in denial of award, but will be considered in determining bidder responsibility. For any exception noted above, indicate below to whom it applies, initiating agency, and dates of action.

Notes: Providing false information may result in criminal prosecution or administrative sanctions. The above certification is part of the Bid. Signing this Bid on the signature portion thereof shall also constitute signature of this Certification.

PROJECT CONTRACT

THIS PROJECT CONTRACT (the "contract" or "Contract"), is made and entered into this day of _____, by and between City of Oroville (referred to herein as the "Owner" or the "City") and _____(the "Contractor").

WITNESSETH: That the parties hereto have mutually covenanted and agreed, and by these presents do covenant and agree with each other as follows:

1. THE CONTRACT DOCUMENTS.

The complete contract is comprised of and may or may not include: Invitation for Bids; Information for Bidders; Bid Schedule; Proposal Form; Bidder's Bond; Contract; General Conditions; Special Provisions; Technical Provisions; Payment Bond; Performance Bond; Notice of Award; Notice to Proceed; Change Orders; Supplemental Drawings Issued; Drawings; Specifications and Contract Documents; All addenda or bulletins issued during the time of bidding or forming a part of the documents loaned to the bidder for preparation of the bid; The complete plans and provisions, regulations, ordinances, codes, and laws incorporated therein or herein by reference or otherwise applicable to the Project.

All of the above documents are intended to cooperate so that any work called for in one and not mentioned in the other, or vice versa, is to be executed the same as if mentioned in all said documents. The documents comprising the complete contract are hereinafter referred to collectively as the Contract Documents.

2. THE WORK.

Contractor agrees to furnish all tools, apparatus, facilities, equipment, labor and materials (except that specifically mentioned as being furnished by others) necessary to perform and complete the work in a "good and workmanlike manner" as called for, and in the manner designated in, and in strict conformity with the Plans, Detail Specifications, and other Contract Documents which are identified by the signatures of the parties to this Contract and are, collectively, entitled:

OROVILLE SEWER PROJECTS - 1D

3. CONTRACT PRICE.

The City agrees to pay and the Contractor agrees to accept, in full payment for the work above agreed to be done, the following compensation: \$_____. In no event shall Contractor's compensation exceed the amount of \$_____ without additional written authorization from the City. Payment by City under this Agreement shall not be deemed a waiver of defects in Consultant's services, even if such defects were known to the City at the time of payment

For the purpose of fixing the amount of bonds referred to in the Instructions to Bidders, it is estimated by both Parties that the total contract price shall be based on the Contractor's Base Bid amount.

4. DISPUTES PERTAINING TO PAYMENT FOR WORK.

Should any dispute arise respecting the true value of any work done or any work omitted, or of any extra work which the Contractor may be required to do, or respecting the size of any payment to the Contractor during the performance of this Contract, the dispute shall be informally mediated between the parties. Following such mediation, either party may file an action exclusively in the Butte County Superior Court or in the United States District Court, Eastern District of California. Under no condition shall there be a cessation of work by the Contractor during any such dispute. This article does not exclude recovery of damages by either party for delays.

5. PAYMENT.

Not later than the 20th day of each calendar month, the Contractor shall make a partial payment request to the City on the basis of an estimate approved by the Engineer of the work performed since the last partial payment request during the preceding month by the Contractor with five percent (5%) of the amount of each such estimate retained by the City, until completion of the Project and the recordation of a Notice of Completion of all work covered by this Contract. The City shall make any partial payments provided for in this contract to the Contractor within 30 days of the City's receipt of an undisputed and properly executed partial payment request from the Contractor. The City shall pay the Contractor interest on the amount of any portion of a partial payment, excluding retention amounts, not made to the Contractor within 30 days of the City's receipt of an undisputed and properly executed partial payment request from the Contractor at the legal rate set forth in California Code of Civil Procedure Section 685.010. Upon receipt of a partial payment request from the Contractor, the City shall review the partial payment request for the purpose of determining whether or not the partial payment request is a proper partial payment request. Any partial payment request determined by the City not to be a proper partial payment request suitable for payment shall be returned to the Contractor by the City within 14 days of the City's receipt of such partial payment request. A partial payment request returned to the Contractor by the City under the provisions of this section shall be accompanied by a written document setting forth the reason(s) why the partial payment request is not proper. The number of days for the City to make a certain partial payment provided for in this Contract, without incurring interest pursuant to this section, shall be reduced by the number of days by which the City exceeds the 14 day return period for such partial payment request, if determined to be improper, as set forth in this section. For the purposes of this section, a "partial payment" means all payments due to the Contractor under this contract, exclusive of that portion of the final payment designated as retention earnings. Also, for the purposes of this section, a partial payment request shall be considered properly executed by the City if funds are available to pay the partial payment request and payment is not delayed due to an audit inquiry by the City's financial officer. The City will release Contractor's retention earnings within 45 days after recordation of Notice of Completion, as defined in California Civil Code Section 3093. Recordation of a Notice of Completion for the Project by the City shall constitute the City's acceptance of the Project work.

6. TIME FOR COMPLETION.

All work under this contract shall be completed within a period of 120 working days from the date of the Contractor's receipt of a Notice to Proceed from the City.

7. EXTENSION OF TIME.

If the Contractor is delayed by acts of negligence of the City, or its employees or those under it by contract or otherwise, or by changes ordered in the work, or by strikes, lockouts, fire, unavoidable casualties, or any causes beyond the Contractor's control, or by delay authorized by the City, or by any justifiable cause which the Engineer shall authorize, then the Contractor shall make out a written claim addressed to the City setting forth the reason for the delay and the extension of the time requested and forward a copy of the claim to the Engineer for approval. The Engineer will evaluate the claim and if the claim is justifiable, will request the City's approval. No such extension will be allowed unless written claim therefore has been made within 3 days after the delay became apparent.

If the Contractor fails or refuses to complete the work within the time specified, including authorized extensions, there shall be deducted from monies due the Contractor, not as a penalty, but as liquidated damages the sum of Two Thousand Seven Hundred Dollars (\$2,700.00) for each calendar day subsequent to the time specified for each project and the time the work is actually completed and accepted. Delays caused by adverse weather conditions or conditions for which the Owner is clearly responsible will be added to the contract time.

8. LABOR PROVISIONS.

The project is subject to both federal and state prevailing wages. The Contractor shall pay laborers the higher of either the federal or state prevailing wage rate determination for the trades to be utilized. The contractor and all subcontractors on the project shall complete electronic reporting of prevailing wage rate reports through the Department of Industrial Relations, with copies of such reports to be provided to the City.

9. CONTRACT WORK HOURS AND SAFETY STANDARDS REQUIREMENTS.

As used in the following provision, the term "laborers" and "mechanics" include watchmen and guards.

a. Overtime Requirements. Neither the Contractor nor any subcontractor contracting for any part of the Project which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek, whichever is greater.

b. Violation; Liability for Unpaid Wages; Liquidated Damages. In the event of any violation of the clause set forth in paragraph a. above, the Contractor and any subcontractor responsible therefore shall be liable for the unpaid wages. In addition, the Contractor and subcontractor shall be liable to the City for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph a. above, in the sum of \$2,700 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph a. above.

c. Withholding for Unpaid Wages and Liquidated Damages. The City shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any monies payable on account of work performed by the Contractor or subcontractor under any such contract or any other Federal contract with the same Contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same Contractor, such sums as may be determined to be necessary to satisfy any liabilities of such Contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph b. above.

d. Working conditions. Neither the Contractor nor any subcontractor may require any laborer or mechanic employed in the performance of any contract to work in surroundings or under working conditions that are unsanitary, hazardous or dangerous to his health or safety as determined under construction safety and health standards (29 CFR Part 1926) issued by the Department of Labor.

e. Subcontracts. The Contractor and any subcontractor shall insert in any subcontracts the clauses set forth in paragraphs a. through d. and also a clause requiring the subcontractor to include these clauses in any lower tier subcontracts. The Contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs a. through d.

10. NONDISCRIMINATION.

The Contractor, with regard to the work performed by it during the contract, shall not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The Contractor shall not participate either directly or indirectly in the discrimination prohibited by Section 21.5 of the Regulations, including employment practices when the contract covers a program set forth in Appendix B of the Regulations.

11. DISADVANTAGED BUSINESS ENTERPRISE PROGRAM PROVISIONS.

The Contractor, sub recipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The Contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the Contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as recipient deems appropriate.

The Contractor agrees to pay each subcontractor under this contract for satisfactory performance of its contract no later than 10 days from the receipt of each payment the Contractor receives from City. The Contractor agrees further to return retainage payments to each subcontractor within 30 days after the subcontractor's work is satisfactorily completed. Any delay or postponement of payment from the above referenced time frame may occur only for good cause following written approval of the City. This clause applies to both DBE and non-DBE subcontractors.

12. CIVIL RIGHTS.

The Contractor assures that it will comply with pertinent statutes, Executive Orders and such rules as are promulgated to assure that no person shall, on the grounds of race, creed, color, national origin, sex, age or handicap be excluded from participating in any activity conducted with or benefiting from Federal assistance. This Provision binds the Contractor from the bid solicitation period through the completion of the contract. This provision shall be inserted in all subcontracts, subleases and other agreements at all tiers.

13. SOLICITATIONS FOR SUBCONTRACTS, INCLUDING PROCUREMENTS OF MATERIALS AND EQUIPMENT.

In all solicitations either by competitive bidding or negotiation made by the Contractor for work to be performed under a subcontract, including procurements of materials or leases of equipment, each potential subcontractor or supplier shall be notified by the Contractor of the Contractor's obligations under this contract and the Regulations relative to nondiscrimination on the grounds of race, color or national origin.

14. INFORMATION AND REPORTS.

The Contractor shall provide all information and reports required by the Regulations or directives issued pursuant thereto and shall permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the City to be pertinent to ascertain compliance with such Regulations, orders, and instructions. Where any information required of a Contractor is in the exclusive possession of another who fails or refuses to furnish this information, the Contractor shall so certify to the City and shall set forth what efforts it has made to obtain the information.

15. SANCTIONS FOR NONCOMPLIANCE.

In the event of the Contractor's noncompliance with the nondiscrimination provisions of this contract, the City shall impose such contract sanctions as it may determine to be appropriate, including but not limited to:

- a. Withholding of payments to the Contractor under the contract until the Contractor complies, and/or
- b. Cancellation, termination or suspension of the contract, in whole or in part.

16. INSPECTION OF RECORDS.

The Contractor shall maintain an acceptable cost accounting system. The City, the Federal Aviation Administration, the Comptroller General of the United States or any of their duly authorized representatives shall have access to any books, documents, paper, and records of the Contractor which are directly pertinent to this Contract or the Project for the purposes of making an audit, examination, excerpts, and transcriptions. The Contractor shall maintain all required records for 3 years after the City makes final payment and all other pending matters are closed.

17. RIGHTS IN INVENTIONS.

All rights to inventions and materials, if any, generated under this contract are subject to regulations issued by the City. Information regarding these rights is available from the City.

18. BREACH OF CONTRACT TERMS.

Any violation or breach of terms of this Contract on the part of the Contractor or its subcontractors may result in the suspension or termination of this Contract or such other action that may be necessary to enforce the rights of the City under this Contract. The duties and obligations imposed by the Contract Documents and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by law.

19. TERMINATION OF CONTRACT BY CITY

a. The City may, by written notice, terminate this Contract in whole or in part at any time, either for the City's convenience or because of the Contractor's failure to fulfill its contract obligations. Upon receipt of such notice, services shall be immediately discontinued (unless the notice directs otherwise) and all materials as may have been accumulated in performing this Contract, whether completed or in process, delivered to the City.

b. If the termination is for the convenience of the City, an equitable adjustment in the contract price shall be made, but no amount shall be allowed for anticipated profit on unperformed services.

c. If the termination is due to failure to fulfill the Contractor's obligations, the City may take over the work and prosecute the same to completion by contract or otherwise. In such case, the Contractor shall be liable to the City for any additional cost occasioned to the City thereby.

d. If, after notice of termination for failure to fulfill contract obligations, it is determined that the Contractor had not so failed, the termination shall be deemed to have been affected for the convenience of the City. In such event, adjustment in the contract price shall be made as provided in the second paragraph of this clause.

e. The rights and remedies of the City provided in this clause are in addition to any other rights and remedies provided by law or under this contract.

20. INCORPORATION OF PROVISIONS.

The Contractor shall include the provisions of this contract in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Regulations of directives issued pursuant thereto. The Contractor shall take such action with respect to any subcontract or procurement as the City may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, however, that in the event the Contractor becomes involved in, or is threatened with, litigation with a subcontractor or supplier as a result of such direction, the Contractor may request the City to enter into such litigation to protect the interests of the City and, in addition, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

21. CONTRACTOR CLAIMS OF \$375,000 OR LESS.

Claims by the Contractor relating to the Project for (a) a time extension, (b) money or damages arising from work done by, or on behalf of, the Contractor on the Project for which payment is not expressly provided for or to which the Contractor is not otherwise entitled, or (c) an amount that is disputed by the City, with a value of \$375,000 or less, are subject to the claims procedures set forth in California Public Contract Code Sections 20104, et seq., except as otherwise provided in this Contract and the incorporated documents, conditions and specifications.

22. LOBBYING AND INFLUENCING FEDERAL EMPLOYEES.

a. No Federal appropriated funds shall be paid, by or on behalf of the Contractor or its subcontractors, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the making of any Federal grant or the amendment or modification of any Federal grant.

a. If any funds other than Federal appropriated funds have been paid or will be paid by the Contractor or its subcontractors to any person for influencing or attempting to influence an officer or employee of the City, any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with any Federal grant, the contractor shall complete and submit Standard Form-LLL, "Disclosure of Lobby Activities," in accordance with its instructions.

23. ASSIGNMENT OF CERTAIN RIGHTS TO THE CITY.

In entering into this Contract or a subcontract to supply goods, services, or materials pursuant to this Contract, the Contractor and/or subcontractor offers and agrees to assign to the City all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Sec. 15) or under the Cartwright Act (Chapter 2 (commencing with Section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services, or materials pursuant to this Contract or the subcontract. This assignment shall be made and become effective at the time the City tenders final payment to the Contractor, without further acknowledgement by the parties.

24. ENERGY CONSERVATION REQUIREMENTS

The contractor agrees to comply with mandatory standards and policies relating to energy efficiency that are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (Public Law 94-163)

IN WITNESS WHEREOF, two identical counterparts of this Contract, each of which shall for all purposes be deemed an original thereof, have been duly executed by the parties hereinabove named, on the day and year first herein written.

AGENCY: City of Oroville (First Party)

By: _____
(Chuck Reynolds)

Mayor
(Official Title)

CONTRACTOR: _____(Second Party)

By: _____
(Authorized Representative)

(Official Title)

FORM OF PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS: That WHEREAS, the City of Oroville, California hereinafter called City, on _____, 20_____, awarded

Name and Address of Contractor

hereinafter designated as the "Principal", the contract for:

OROVILLE SEWER PROJECTS - 1D

NOW THEREFORE, we the Principal, and _____
_____ as Surety, are held and firmly
bound unto _____,
_____ hereinafter called the
_____, in the penal sum of _____
_____ Dollars (\$ _____)

lawful money of the United States, for the payment of which sum we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally firmly by these presents.

THE CONDITIONS OF THIS OBLIGATION ARE SUCH that, if the above bounden Principal, his/her or its heirs, executors, administrators, successors or assign, shall in all things stand to and abide by and keep and perform the covenants, conditions and agreements in the said contract and any alteration thereof made as therein provided, on his/her or their part, to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall indemnify and save harmless the City, its officers and agents, as therein stipulated, then this obligation shall become null and void: otherwise, it shall be and remain in full force and virtue, and also in case suit is brought upon such bond, the above bounden principal and the said surety will pay a reasonable attorney's fee which shall be awarded by the court to the prevailing party in said suit, said attorney's fee to be taxed as costs in said suit and to be included in the judgment therein rendered.

And the surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the work to be performed or materials and/or equipment to be furnished thereunder or the Specifications accompanying the same, shall in anywise affect its obligations on this bond; and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the work or to the Specifications.

IN WITNESS WHEREOF three identical counterparts of this instrument, each of which shall for all purposes be deemed an original thereof, have been duly executed by the Principal and Surety above named, on the day of _____, 20 .

By _____

By _____

Surety

Contractor

SECTION - GC

GENERAL CONDITIONS

GENERAL CONDITIONS

SECTION - GC	PAGE
1. Definitions and Terms	GC-1
2. Examination of Contract Documents, Bid Items and Bid Submittal	GC-3
3. Interpretation of Plans and Project Specifications	GC-4
4. Field Instructions and Other Written Directives	GC-4
5. Schedules, Reports and Records	GC-4
6. Drawings and Specifications	GC-4
7. Shop Drawings	GC-5
8. Materials, Services and Facilities.....	GC-5
9. Inspection and Testing	GC-5
10. Substitutions	GC-6
11. Patents	GC-7
12. Permits and Regulations.....	GC-7
13. Protection of Work, Property and Persons	GC-7
14. Supervision by Contractor	GC-8
15. Changes in the Work	GC-8
16. Changes in Contract Price	GC-8
17. Time for Completion and Liquidated Damages	GC-9
18. Correction of Work	GC-9
19. Unusual Conditions	GC-9
20. Suspension of Work, Termination and Delay	GC-10
21. Payments to Contractor	GC-11
22. Acceptance of Final Payment as Release	GC-13
23. Insurance Requirements for Contractors	GC-15
24. Contract Security.....	GC-18
25. Assignments	GC-18
26. Indemnification	GC-18
27. Separate Contracts.....	GC-18
28. Subcontracting.....	GC-19
29. Engineer's Authority.....	GC-19
30. Land and Right-of-Way	GC-19
31. Guarantee	GC-20
32. Contract Disputes and Potential Notice of Claim	GC-20
33. Dispute Resolution	GC-22
34. Taxes	GC-22
35. Applicable Wage Rates	GC-23

1. DEFINITIONS AND TERMS

Wherever used in the Contract Documents, the following terms shall have the meanings indicated which shall be applicable to both the singular and plural thereof:

ADDENDA - Written or graphic instruments issued prior to the execution of the Agreement, which modify or interpret the Contract Documents, drawings and specifications by additions, deletions, clarifications or corrections.

BID - The offer or proposal of the bidder submitted on the prescribed form setting forth the prices for the work to be performed.

BIDDER - Any person, firm or corporation submitting a bid for the work.

BONDS - Bid, performance and payment bonds and other instruments of security, furnished by the Contractor and his/her surety in accordance with the Contract Documents.

CALENDAR DAY - Each and every day, including Saturdays, Sundays and legal holidays.

CHANGE ORDER - A written order to the Contractor authorizing an addition, deletion or revision in the work within the general scope of the Contract Documents, or authorizing an adjustment in the contract price or the contract time.

CITY - City of Oroville, 1735 Montgomery Street, Oroville, California.

CONTRACTOR - The person or persons, firm, partnership, corporation or combination thereof, licensed to perform the type of work involved, who has entered into a contract with the City of Oroville for the construction of the improvements within the City of Oroville described herein.

DEPARTMENT OF PUBLIC WORKS - The Department of Public Works of the City of Oroville.

ENGINEER - The Contract City Engineer of the City of Oroville acting either directly or through properly authorized agents, such agents acting within the scope of the particular duties entrusted to them.

PROJECT - The undertaking to be performed as provided in the contract documents.

RESIDENT PROJECT REPRESENTATIVE - The authorized representative of the City who is assigned to the project site or any part thereof.

SHOP DRAWINGS - All drawing, diagrams, illustration, brochures, schedules and other data which are prepared by the Contractor, a subcontractor, manufacturer, supplier or distributor, which illustrate how specific portions of the work shall be fabricated or installed.

SPECIFICATIONS - The directions, provisions and requirements contained herein.

STANDARD PLANS AND SPECIFICATIONS - Whenever reference is made to the "Standard Plans and Specifications" such reference shall be made to the most current of those

certain plans and specifications entitled “State of California, Department of Transportation, Standard Plans and Standard Specifications”.

As used in the Standard Specifications, unless the content otherwise requires, the following terms have the following meanings:

Department of Transportation: The City of Oroville.

Director of Transportation: The Public Works Director of the City of Oroville.

Division of Highways: Department of Public Works of the City of Oroville.

Engineer: The Contract City Engineer of the City of Oroville, acting either directly or through properly authorized agents, such agents acting within the scope of the particular duties entrusted to them.

Laboratory: The designated laboratory authorized by the City of Oroville to test materials and work involved in the contract.

Office of Administrative Hearings: The City Council of the City of Oroville.

Standard Specifications: The most current or 2018 Edition of those certain specifications entitled "State of California, Department of Transportation, Standard Specifications 2018"

Standard Plans: The most current or 2018 Edition of those certain standard plans entitled "State of California, Department of Transportation, Standard Plans 2018"

State: The City of Oroville.

Reference is made to Section 1 of the Standard Specifications for other pertinent definitions.

SUBCONTRACTOR - An individual, firm or corporation having a direct contract with the Contractor or with any other subcontractor for the performance of a part of the work at the site.

SUBSTANTIAL COMPLETION - That date as certified by the Engineer when the construction of the project or a specified part thereof is sufficiently completed, in accordance with the contract documents, so that the project or specified part can be utilized for the purpose for which it is intended.

SUPPLEMENTAL GENERAL CONDITIONS - Modifications to general conditions required by a federal agency for participation in the project or such requirements that may be imposed by applicable State laws.

SUPPLIER - A person or organization who supplies material or equipment for the work, including that fabricated to a special design, but who does not perform labor on the site.

WORK - All labor necessary to produce the construction required by the contract documents and all materials and equipment incorporated or to be incorporated in the project.

WORKING DAY - Each and every day, except Saturdays, Sundays, legal holidays, days on which the Contractor is specifically required by the special provisions to suspend construction operation and days on which the Contractor is prevented by inclement weather or conditions resulting immediately therefrom adverse to the current controlling operation or operations, as determined by the Engineer, from proceeding with at least 75 percent of the normal labor and equipment force engaged on such operation or operations for at least 60 percent of the total daily time being currently spent on the controlling operation or operations.

WRITTEN NOTICE - Any notice to any party of the Agreement relative to any part of this Agreement in writing and considered delivered and the service thereof completed, when posted by certified or registered mail to the said party at his/her last given address, or delivered in person to said party or his/her authorized representative on the work.

2. EXAMINATION OF CONTRACT DOCUMENTS, BID ITEMS AND BID SUBMITTAL

The Contractor shall do all of the work and furnish all labor, materials, tools, equipment, and appliances, except as otherwise herein expressly stipulated, necessary or proper for performing and completing the work herein required, including any Change Order work or disputed work directed by the Engineer in conformity with the true meaning and intent of the Plans and Specifications for the project. The Engineer attempts to express all or most elements of the work with bid items that allow both the Engineer and the Contractor to view, evaluate and understand the cost of the project. At the Engineer's discretion, certain improvements within the project boundaries may not be specifically identified as a line item in the project bid schedule. At times, the project plans may show required construction elements of the project for which there is no discrete bid item. It is the responsibility of the Contractor to account for construction elements for which there may be no discrete bid item. The Contractor shall be responsible for the construction of any and all improvements or construction elements shown on the Project Plans whether there is a bid item or not in the project bid schedule.

By submission of a Bid, the Bidder acknowledges acceptance of the nature and location of the Work, the general and local conditions, conditions of the site, the character, quality and scope of work to be performed, the availability of labor, electric power, water, the kind of surface and subsurface materials on the site, the materials and equipment to be furnished, and all requirements of the Contract or other matters which may affect the Work or the cost. Any failure of a Bidder to become acquainted with all of the available information concerning conditions will not relieve the Bidder from the responsibility for estimating properly the difficulties or cost of the Work. Bidder agrees to inform the Engineer of any errors or oversight by Engineer it perceives in the Bid documents prior to submission of its bid.

Bid prices shall include everything necessary for the completion of the Work and fulfillment of the Contract, including but not limited to furnishing all materials, equipment, tools, excavation sheeting, bracing and supports, plant, labor and services, except as may be provided otherwise in the Contract. Bid prices shall also include labor and material escalation and all Federal, State, and local taxes.

3. INTERPRETATION OF PLANS AND PROJECT SPECIFICATIONS

The component Contract documents (Project Plans, Project-specific Specifications, City Standard Drawings, etc.) are essential parts of the Contract, and intended to provide explanation

for each other. Any work and/or improvements shown on the Plans and not in the Specifications, or vice versa, are to be executed as if indicated both on the Plans and in the Specifications. In case of conflict in the Contract, the Project plans shall govern over project-specific specifications (materials specifications excluded). Any physical construction-related work necessary to complete the improvements shown on the Project Plans for which there are no provisions in the project specifications or elsewhere in the Contract documents shall be performed and completed in accordance with either State Standards and/or Specifications where such specifications exist, City Engineer Standards where such standards exist, or in conformance with generally accepted practices for public works construction.

4. FIELD INSTRUCTIONS OR OTHER WRITTEN DIRECTIVES

The Engineer may issue Field Instructions or other written directives during the course of the Work, and the Contractor shall comply with the Field Instruction or other written directive. A Field Instruction or other written directive may be used to add, delete, modify, or reject work, to note deficiencies in work, to clarify the Contract or to order work to be performed. Work required by a Field Instruction or other written directive shall be in accordance with the Contract and any previously executed Contract Change Orders, except as delineated otherwise in the Field Instruction or other written directive. Drawings included with Field Instructions or other written directives are part of the Contract and shall be incorporated into the Record Drawings. If the Contractor neglects to comply with or make progress in the execution of any Field Instruction or other written directive, the Engineer may employ any person or persons to perform such work and the Contractor shall not interfere with the person or persons so employed. Field Instructions and other written directives issued by the City that serve to alter (either add to or deduct from) the Contract scope and price will be grouped to form a Contract Change Order.

5. SCHEDULES, REPORTS, AND RECORDS

The Contractor shall submit to the City such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, records and other data where applicable as are required by the contract documents for the work to be performed.

Prior to the first partial payment estimate, the Contractor shall submit construction progress schedules showing the order in which he/she proposes to carry out the work, including dates at which he/she will start the various parts of the work, estimated date of completion of each part and as applicable.

6. DRAWINGS AND SPECIFICATIONS

The intent of the drawings and specifications is that the Contractor shall furnish all labor, materials, tools, equipment and transportation necessary for the proper execution of the work in accordance with the contract documents and all incidental work necessary to complete the project in an acceptable manner; ready for use or operation by the City.

In case of conflict between the drawing and specifications, the specifications shall govern. Figure dimensions on drawings shall govern over scale dimensions and detailed drawings shall govern over general drawings.

Any discrepancies found between the drawings and specifications and site conditions or any inconsistencies or ambiguities in the drawings or specifications shall be immediately reported to

the Engineer, in writing, who shall promptly correct such inconsistencies or ambiguities, in writing. Work done by the Contractor after his/her discovery of such discrepancies, inconsistencies or ambiguities shall be done at the Contractor's risk.

7. SHOP DRAWINGS

The Contractor shall provide shop drawings as may be necessary for the construction of the work required by the contract documents. The Engineer shall promptly review all shop drawings. The Engineer's approval of any shop drawings shall not release the Contractor from responsibility for deviations from the requirements of the contract documents. The approval of any shop drawing, which substantially deviates from the requirements of the contract documents, shall be evidenced by a change order.

When submitted for the Engineer's review, shop drawings shall bear the Contractor's certification that he/she has reviewed, checked and approved the shop drawings and that they are in conformance with the requirement of the contract documents.

Portions of the work requiring a shop drawing or sample submission shall not begin until the shop drawing or submission has been approved by the Engineer. A copy of each approved shop drawing and each approved sample shall be kept in good order by the Contractor at the site and shall be available to the Engineer.

8. MATERIALS, SERVICES AND FACILITIES

It is understood that, except as otherwise specifically stated in the contract documents, the Contractor shall provide and pay for all materials, labor, tools, equipment, water, lights, power, transportation, supervision, temporary construction of any nature, and all other services and facilities of any nature whatsoever necessary to execute, complete and deliver the work within the specified time. Material and equipment shall be so stored as to ensure the preservation of their quality and fitness for the work. Stored materials and equipment to be incorporated in the work shall be located so as to facilitate prompt inspection. Manufactured articles, materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned as directed by the manufacturer.

Materials, supplies and equipment shall be in accordance with samples submitted by the Contractor and approved by the Engineer. Materials, supplies or equipment to be incorporated into the work shall not be purchased by the Contractor or the subcontractor subject to a chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller.

9. INSPECTION AND TESTING

All materials and equipment used in the construction of the project shall be subject to adequate inspection and testing in accordance with general accepted standards, as required and defined in the contract documents. The City will provide the inspection and testing services to be employed pursuant to the City Quality Assurance Plan (QAP) for Federally Funded Highway Projects dated January 2015. The City will provide the Contractor a written QAP schedule that will list the types of materials to be tested, test methods and sample and test quantities. The Contractor shall be responsible for coordinating and scheduling the QAP schedule with the City's material testing consultant.

If the contract documents, laws, ordinances, rules, regulations or order of any public authority having jurisdiction require any work to specifically be inspected, tested or approved by someone other than the Contractor, the Contractor will give the Engineer timely notice of readiness. The Contractor will then furnish the Engineer the required certificates of inspection, testing or approval. Inspections, test or approvals by the Engineer or others shall not relieve the Contractor from his/her obligations to perform the work in accordance with the requirements of the contract documents. The Engineer and his/her representative will at all times have access to the work. In addition, authorized representatives and agents of any participating Federal or State agency shall be permitted to inspect all work, materials, payrolls, records of personnel, invoices of materials and other relevant data and records. The Contractor will provide proper facilities for such access and observation of the work and also for any inspection or testing thereof.

If any work is covered contrary to the written instructions of the Engineer, it must, if requested by the Engineer, be uncovered for his/her observation and replaced at the Contractor's expense. If the Engineer considers it necessary or advisable that covered work be inspected and tested by others, the Contractor, at the Engineer's request, will uncover, expose or otherwise make available for observation, inspection or testing as the Engineer may require of that portion of the work in question, furnishing all necessary labor, materials, tools and equipment. If it is found that such work is defective, the Contractor will bear all the expenses of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction. If, however, such work is not found to be defective, the Contractor will be allowed an increase in the contract price or an extension of the contract time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing reconstruction and an appropriate change order shall be issued.

All required QAP testing of construction materials, including aggregate base compaction testing, will be provided by the City at no cost to the Contractor. Should tests show materials or methods to be unacceptable, however, and retesting of the same material is required, the City's cost of such retesting will be deducted from payment due the Contractor. The Contractor is encouraged (not required) to perform roadway aggregate base compaction testing independently of the City's QAP. All required performance testing shall be done by the Contractor in the presence of the Engineer.

The specific tests to be performed for this particular job, and the party, Contractor or City, responsible for providing equipment and technical personnel shall be enumerated in the section entitled "REQUIRED TESTING" in the Special Provisions. During each field test, an authorized representative of the Contractor and of the City shall be present. The City inspector will maintain the TEST RECORD for the entire job which lists details of each test performed. The inspector will provide a copy of the TEST RECORD to the Contractor upon request.

10. SUBSTITUTIONS

Whenever a material, article or piece of equipment is identified on the drawings or specifications by reference to a brand name or catalog number, it shall be understood that this is referenced for the purpose of defining the performance or other salient requirements and that other products of equal capacities, quality and function shall be considered.

The Contractor may recommend the substitution of a material, article or piece of equipment of equal substance and function for those referred to in the contract documents by reference to brand name or catalog number, and if, in the opinion of the Engineer, such material, article or

piece of equipment is of equal substance and function to that specified, the Engineer may approve its substitution and use by the Contractor.

Any cost differential shall be deductible from the contract price and the contract documents shall be appropriately modified by change order. The Contractor warrants that if substitutes are approved, no major changes in the function or general design of the project will result. Incidental changes or extra work component parts required to accommodate the substitute will be made by the Contractor without a change in the contract price or contract time.

11. PATENTS

The Contractor shall pay all applicable royalties and license fees. He/she shall defend all suits or claims for infringement of any patent rights and save the City harmless from loss on account thereof, except that the City shall be responsible for any such loss when a particular process, design, or the product of a particular manufacturer or manufacturers is specified. However, if the Contractor has reason to believe that the design, process or product specified is an infringement of a patent, he/she shall be responsible for such loss unless he/she promptly gives such information to the Engineer.

12. PERMITS - REGULATIONS

Permits and licenses of a temporary nature necessary for the prosecution of the work shall be secured and paid for by the Contractor unless otherwise stated in the Supplemental General Conditions. Permits, licenses and easements for permanent structures or permanent changes in existing facilities shall be secured and paid for by the City, unless otherwise specified. If the Contractor observes that the contract documents are at variance therewith, he/she shall promptly notify the Engineer, in writing and any necessary changes shall be adjusted as provided in Section 13, Changes in the Work.

13. PROTECTION OF WORK, PROPERTY AND PERSON

The Contractor will be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the work. He/she will take all necessary precautions for the safety of, and will provide the necessary protection to prevent damage, injury or loss to, all employees on the work and other persons who may be affected thereby, and all the work and all materials or equipment to be incorporated therein, whether in storage on or off the site, and shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocations or replacement in the course of construction.

The Contractor will comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction. He/she will erect and maintain, as required by the conditions and progress of the work, all necessary safeguards for safety and protection. He/she will notify owners or adjacent utilities when prosecution of the work may affect them.

The Contractor will remedy all damage, injury or loss to any property caused, directly or indirectly, in whole or in part, by the Contractor, any subcontractor, or anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, except damage or loss attributable to the fault of the contract documents, or to the acts or omission of the City or the Engineer, or anyone employed by either of them, or anyone for whose acts either

of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of the Contractor.

In emergencies affecting the safety of persons or the work or the property at the site or adjacent thereto; the Contractor, without special instruction or authorization from the Engineer or the City, shall act to prevent threatened damage, injury or loss. He/she will give the Engineer prompt written notice of any significant changes in the work or deviations from the contract documents caused thereby and a change order shall thereupon be issued covering the changes and deviations involved.

14. SUPERVISION BY CONTRACTOR

The Contractor will supervise and direct the work. He/she will be solely responsible for the means, methods, techniques, sequences and procedures of construction. The Contractor will employ and maintain on the work site, a qualified supervisor or superintendent who shall have been designated, in writing, by the Contractor as the Contractor's representative at the site. The supervisor shall have full authority to act on behalf of the Contractor and all communications given to the supervisor shall be as binding as if given to the Contractor. The supervisor shall be present on the site at all times as required to perform adequate supervision and coordination of the work.

15. CHANGES IN THE WORK

The City may, at any time as the need arises, order changes within the scope of the work without invalidating the Agreement. If such changes increase or decrease the amount due under the contract documents, or in the time required for performance of the work, an equitable adjustment shall be authorized by change order.

The Engineer also may, at any time by issuing a field order, make changes in the details of the work. The Contractor shall proceed with the performance of any changes in the work so ordered by the Engineer unless the Contractor believes that such field order entitles him/her to a change in contract price or time, or both, in which event he/she shall give the Engineer written notice thereof within seven (7) days after the receipt of the ordered change.

Thereafter, the Contractor shall document the basis for a change in contract price or time within thirty (30) days. The Contractor shall not execute such changes pending the receipt of an executed change order or further instruction from the City.

16. CHANGES IN CONTRACT PRICE

The contract price may be changed only by a change order. The value of any work covered by a change order, or of any claim for increase or decrease in the contract price, shall be determined by one or more of the following methods in order of precedence listed below:

- a. Unit prices previously approved
- b. An agreed upon lump sum
- c. The actual cost for labor, direct overhead, materials, supplies, equipment and other services necessary to complete the work. Said costs shall be computed and documented in accordance with Section 9-1.04, "Force Account", of the Standard Specifications.

17. TIME FOR COMPLETION AND LIQUIDATED DAMAGES

The date of beginning and the time for completion of the work are essential conditions of the contract documents and the work embraced shall be commenced on a date specified in the Notice to Proceed.

The Contractor will proceed with the work at such rate of progress to ensure full completion within the contract time. All contract work shall be completed within 45 working days after issuance of the Notice to Proceed. Liquidated damages established for this contract are \$2,700.00 for each day beyond the 60 working day timeframe. It is expressly understood and agreed, by and between the Contractor and the City, that the contract time for the completion of the work described herein is a reasonable time, taking into consideration the average climatic and economic conditions and other factors prevailing in the locality of the work.

If the contractor shall fail to complete the work within the contract time, or extension of time granted by the City, the Contractor will pay to the City the amount of liquidated damages as specified in the bid for each calendar day that the Contractor shall be in default after time stipulated in the contract documents.

The Contractor shall not be charged with liquidated damages or any excess cost when the delay in completion of the work is due to the following, and the contractor has promptly given written notice of such delay to the City or Engineer:

- To any preference, priority, or allocation order duly issued by the City.
- To unforeseeable causes beyond the control and without fault or negligence of the Contractor; including but not restricted to acts of God, or of the public enemy, acts of the City, acts of another Contractor in the performance of a contract with the City, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes and abnormal and unforeseeable weather.
- To any delays of subcontractors occasioned by any of the causes specified above.

18. CORRECTION OF WORK

The Contractor shall promptly remove from the premises all work rejected by the Engineer for failure to comply with the contract documents, whether incorporated in the construction or not, and the Contractor shall promptly replace and re-execute the work in accordance with the contract documents and without expense to the City and shall bear the expense of making good all work of other Contractors destroyed or damage by such removal or replacement.

All removal and replacement work shall be done at the Contractor's expense. If the Contractor does not take action to remove such rejected work within ten (10) days after receipt of written notice, the City may remove such work and store the materials at the expense of the Contractor.

19. UNUSUAL CONDITIONS

The Contractor shall promptly and before such conditions are disturbed, except in the event of an emergency, notify the City by written notice of:

- Subsurface or latent physical conditions at the site differing materially from those indicated in the contract documents; or
- Unknown physical conditions at the site of any unusual nature differing from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the contract documents.

The City shall promptly investigate the conditions, and if it finds that such conditions do so materially differ and cause an increase or decrease in the cost of, or in the time required for, performance of the work, an equitable adjustment shall be made and the contract documents shall be modified by change order. Any claim of the Contractor for adjustment hereunder shall not be allowed unless he/she has given the required written notice; provided that the City may, if it determines the facts so justify, consider and adjust any such claims asserted before the date of final payment.

20. SUSPENSION OF WORK, TERMINATION AND DELAY

The City may suspend the work or any portion thereof for a period of not more than ninety (90) days or such further time as agreed upon by the Contractor, by written notice to the Contractor and the Engineer, which notice shall fix the date on which work shall be resumed. The Contractor will resume that work on the date so fixed. The Contractor will be allowed an increase in the contract price or an extension in the contract time, or both, directly attributable to any suspension.

If the Contractor is adjudged as bankrupt or insolvent, or if he/she makes a general assignment for the benefit of his/her creditors, or if a trustee or receiver is appointed for the Contractor or for any of his/her property, or if he/she files a petition to take advantage of any debtor's act, or to reorganize under the bankruptcy or applicable laws, or if he/she repeatedly fails to supply sufficient skilled workmen or suitable materials or equipment, or if he/she repeatedly fails to make prompt payments to subcontractors or for labor, materials or equipment, or if he/she disregards laws, ordinances, rules, regulations or orders of any public body having jurisdiction over the work, or if he/she otherwise violates any provision of the contract documents; then the City may, without prejudice to any other right or remedy and after giving the Contractor and his/her surety a minimum of ten (10) days from delivery of written notice, terminate the services of the Contractor and take possession of the project and all materials, equipment, tools, construction equipment and machinery thereon owned by the Contractor, and finish the work by whatever method it may deem expedient.

In such case, the Contractor shall not be entitled to receive any further payment until the work is finished. If the unpaid balance of the contract price exceeds the direct and indirect cost of completing the project, including compensation for additional professional services, such excess shall be paid to the Contractor. If such costs exceed such unpaid balance, the Contractor will pay the difference to the City. Such costs incurred by the City will be determined by the Engineer and incorporated into a change order.

When the Contractor's services have been so terminated by the City, said termination shall not affect any right of the City against the Contractor then existing or which may thereafter accrue. Any retention or payment of monies by the City due to the Contractor will not release the Contractor from compliance with the contract documents. After ten (10) days from delivery of a written notice to the Contractor and the Engineer, the City may, without cause and without

prejudice to any other right or remedy, elect to abandon the project and terminate the contract. In such case, the Contractor shall be paid for all work executed and any expense sustained plus a reasonable profit.

If, through no act or fault of the Contractor, the work is suspended for a period of more than ninety (90) days by the City, or under an order of the court, or other public authority, or the Engineer fails to act on any request for payment within thirty (30) days after it is submitted, or the City fails to pay the Contractor substantially the sum approved by the Engineer or awarded by the arbitrators within thirty (30) days of its approval and presentation, the Contractor may, after ten (10) days from delivery of a written notice to the City and the Engineer, terminate the contract and recover from the City payment for all work executed and all expenses sustained. In addition and in lieu of terminating the contract, if the Engineer fails or has failed to act on a request for payment or if the City has failed to make any payment as aforesaid, the Contractor may upon ten (10) days written notice to the City and the Engineer, stop the work until he/she has been paid all amounts then due, in which event and upon resumption of the work, change orders shall be issued for adjusting the contract price or extending the contract time, or both, to compensate for the costs and delays attributable to the stoppage of work.

If the performance of all or any portion of the work is suspended, delayed or interrupted as a result of a failure of the City or Engineer to act within the time specified in the contract documents, or if no time is specified, within a reasonable time, an adjustment in the contract price or an extension of the contract time, or both, shall be made by change order to compensate the Contractor for the costs and delays necessarily caused by the failure of the City or Engineer.

21. PAYMENTS TO CONTRACTOR

Within ten (10) days after receipt of the Notice to Proceed, the Contractor shall submit to the City a proposed Schedule of Values broken down in sufficient detail to evaluate progress at any point in the work. Labor and material costs for each line item shall be shown separately. Cost of contract closeout shall be shown as an individual line item. The schedule of values, when approved by the City, shall be used as a basis for the Contractor's Application and Certification for Payment. Application and Certification for Payment shall utilize American Institute of Architects (AIA) Document G702 (cover sheet) and Document G703 (continuation sheets). The AIA Document G703 sheets will list the Schedule of Values approved by the City and will track any Change Orders that may be issued during the project.

At least ten (10) days before each progress payment falls due, but not more often than once a month, the Contractor will submit to the Engineer a partial payment estimate filled out and signed by the Contractor covering the work performed during the period covered by the partial payment estimate and supported by such data as the Engineer may reasonably require. If payment is requested on the basis of materials and equipment not incorporated in the work but delivered and suitably stored at or near the site, the partial payment estimated shall also be accompanied by such supporting data, satisfactory to the City, that will establish the City's title to the material and equipment and protect its interest therein, including applicable insurance. The Engineer will, within ten (10) days after receipt of each partial payment estimate, either indicate in writing his/her approval of payment and present the partial payment estimate to the City, or return the partial payment estimate to the Contractor indicating in writing his/her reasons for refusing to approve the payment. In the latter case, the Contractor may make the necessary corrections and resubmit the partial payment estimate.

The City will, within ten (10) days of presentation to it of an approved partial payment estimate, pay the Contractor a progress payment on the basis of the approved partial payment estimate. The City shall retain ten (10) percent of the amount of each payment until final completion and acceptance of all work covered by the contract documents. The City at any time, however, after fifty (50) percent of the work has been completed, if it finds that satisfactory progress is being made, may reduce retention to five (5) percent on the current and remaining estimates. When the work is substantially complete, operational or beneficial occupancy, the retained amount may be further reduced below five (5) percent to only that amount necessary to assure completion. Upon completion and acceptance of a part of the work on which the price is stated separately in the contract documents, payment may be made in full, including retention percentages, less authorized deductions. The request for payment may also include an allowance for the cost of such major materials and equipment, which are suitably stored either at or near the site.

Prior to substantial completion, the City, with the approval of the Engineer and the concurrence of the Contractor, may use any completed or substantially completed portion of the work. Such use shall not constitute an acceptance of such portions of the work.

The City shall have the right to enter the premises for the purpose of doing work not covered by the contract documents. This provision shall not be construed as relieving the Contractor of the sole responsibility for the care and protection of the work, or the restoration of any damaged work except such as may be caused by agents or employees of the City.

Upon completion and acceptance of the work, the Engineer shall issue a certificate attached to the final payment request that the work has been accepted by him/her under the conditions of the contract documents. Within fifteen (15) days after the date of acceptance, the City shall cause to be filed in the office of the County Recorder, a Notice of Completion of the work. The entire balance found to be due to the Contractor, including the retained percentages, but except such sums as may be lawfully retained by the City, shall be paid to the Contractor within forty-five (45) days after the date of filing the Notice of Completion.

The Contractor will indemnify and save the City, or the City's agents, harmless from all claims growing out of the lawful demands of subcontractors, laborers, workmen, mechanics, manufacturers, suppliers and furnishers of machinery and parts thereof, equipment, tools, and all supplies incurred in the furtherance of the performance of the work. The Contractor shall, at the City's request, furnish satisfactory evidence that all obligations of the nature designated above have been paid, discharged or waived.

If the Contractor fails to do so, the City may, after having notified the Contractor, either pay unpaid bills or withhold from the Contractor's unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to the Contractor shall be resumed in accordance with the contract documents, but in no event shall the provisions of this sentence be construed to impose any obligations upon the City to either the Contractor, his/her surety or any third party. In paying any unpaid bills of the Contractor, any payment so made by the City shall be considered as a payment made under the contract documents by the City to the Contractor and the City shall not be liable to the Contractor for any such payments made in good faith.

If the City fails to make payment forty-five (45) days after the filing of the Notice of Completion, in addition to other remedies available to the Contractor, there shall be added to

each such payment interest at the maximum legal rate commencing on the first day after said payment is due and continuing until the payment is received by the Contractor.

22. ACCEPTANCE OF FINAL PAYMENT AS RELEASE

The acceptance by the Contractor of final payment shall be, and shall operate as, a Release to the City of all claims of Contractor. The Release shall include all things done or furnished by Contractor in connection with the work and every act and neglect of the City relating to or arising out of the work. If the Contractor intends to exclude any claim or claims from the Release, the Contractor must provide a written list of such claims to City, stating the exact dollar amount, within forty-five (45) days after the date of filing the Notice of Completion. No payment, whether a final payment or not, shall serve to release the Contractor or the Contractor's sureties from any obligations under the Contract Documents, or the Performance Bond or the Payment Bond.

23. INSURANCE REQUIREMENTS FOR CONTRACTORS

At no additional cost to City, Contractor shall procure and maintain for the duration of the contract insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder by the Contractor, his/her agents, representatives, employees or subcontractors.

A. MINIMUM SCOPE OF INSURANCE:

Coverage shall be at least as broad as:

1. Insurance Services Office Commercial General Liability coverage (occurrence form CG 00 01).
2. Insurance Services Office form number CA 00 01 covering Automobile Liability, code 1 (any auto).
3. Workers' Compensation as required by the State of California and Employer's Liability Insurance.

B. MINIMUM LIMITS OF INSURANCE:

Contractor shall maintain limits no less than:

1. General Liability: \$1,000,000 per occurrence for bodily injury, personal injury and property damage. If Commercial General Liability Insurance or other form with a general aggregate limit is used, either the general aggregate limit shall apply separately to this project/location or the general aggregate limit shall be twice the required occurrence limit.
2. Automobile Liability: \$1,000,000 per accident for bodily injury and property damage.
3. Workers' Compensation and Employers' Liability: \$1,000,000 per accident for bodily injury or disease.

C. DEDUCTIBLES AND SELF-INSURED RETENTIONS:

Any deductibles or self-insured retentions shall be declared to and approved by the City. At the option of the City, either: the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the City, its officers, officials, employees and volunteers; or the Contractor shall provide a financial guarantee satisfactory to the City guaranteeing payment of losses and related investigations, claim administration and defense expenses.

D. OTHER INSURANCE PROVISIONS:

The policies are to contain, or be endorsed to contain, the following provisions:

1. General Liability and Automobile Liability Coverages.

- a. The City, its officers, officials, employees and volunteers are to be covered as additional insureds with respect to liability arising out of automobiles owned, leased, hired or borrowed by or on behalf of the Contractor; and with respect to liability arising out of work or operations performed by or on behalf of the Contractor including materials, parts or equipment furnished in connection with such work or operations. General liability coverage can be provided in the form of an endorsement to the Contractor's insurance, or as a separate owner's policy.
- b. For any claims related to this project, the Contractor's insurance coverage shall be primary insurance as respects the City, its officers, officials, employees, and volunteers. Any insurance or self-insurance maintained by the City, its officers, officials, employees, or volunteers shall be excess of the Contractor's insurance and shall not contribute with it.
- c. Each insurance policy required by this clause shall be endorsed to state that coverage shall not be canceled by either party, except after thirty (30) days' prior written notice has been given to the City.
- d. Coverage shall not extend to any indemnity coverage for the active negligence of the additional insured in any case where an agreement to indemnify the additional insured

E. ACCEPTABILITY OF INSURERS:

Insurance is to be placed with insurers with a current A.M. Best's rating of no less than A:VII.

F. VERIFICATION OF COVERAGE:

Contractor shall furnish the City with original certificates and amendatory endorsements effecting coverage required by this clause. The endorsements should be on forms that conform to the requirements. All certificates and endorsements are to be received and approved by the City before work commences. The City reserves the right to require complete, certified copies of all required insurance policies, including endorsements affecting the coverage required by these specifications at any time. Any confidential or proprietary information may be removed.

G. SUBCONTRACTORS:

Contractor shall include all subcontractors as insureds under its policies or shall furnish separate certificates and endorsements for each subcontractor. All coverages for subcontractors shall be subject to all of the requirements stated herein.

24. CONTRACT SECURITY

The Contractor shall, within ten (10) days after the receipt of the Notice of Award, furnish the City with a Performance Bond in the amount of one hundred (100) percent of the contract price, and a Payment Bond in the amount of one hundred (100) percent of the contract price, conditioned upon the performance of the Contractor of all undertakings, covenants, terms, conditions and agreements of the contract documents, and upon prompt payment by the Contractor to all persons supplying labor and materials in the prosecution of the work provided by the contract documents. Such bonds shall be executed by the Contractor and a corporate bonding company approved by the City and licensed to transact business in the State of California. The expense of these bonds shall be borne by the Contractor. If, at any time, a surety on any such bond is declared bankrupt or loses its right to do business in the State of California the Contractor shall, within ten (10) days after notice from the City to do so, substitute an acceptable bond, or bonds, in such form and sum and signed by such other surety or sureties as may be satisfactory to the City. No further payments shall be deemed due, nor shall be made, until the new surety or sureties shall have furnished an acceptable bond to the City.

25. ASSIGNMENTS

Neither the Contractor nor the City shall sell, transfer, assign or otherwise dispose of the contract or any portion thereof, or of his/her right, title or interest therein or his/her obligations thereunder without written consent of the other party.

26. INDEMNIFICATION

The Contractor will indemnify and hold harmless the City, the Engineer, and their agents and employees from and against all claims, damages, losses and expenses including attorney's fees arising out of or resulting from the performance of the work, provided that any such claims, damage, loss or expense is attributable to bodily injury, sickness, disease or death; or to injury or destruction of tangible property including the loss therefrom; and is caused in whole or in part by any negligent or willful act or omission by the Contractor, subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable.

In any and all claims against the City or the Engineer, or any of their agents or employees, by any employee of the Contractor, any subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any subcontractor under Workmen's Compensation acts, disability acts or other employee benefit acts.

The obligation of the Contractor under this paragraph shall not extend to the liability of the Engineer, his/her agents or employees arising out of the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs or specifications. The City will not be held liable for any accident, loss or damage to work prior to its completion and acceptance.

27. SEPARATE CONTRACTS

The City reserves the right to let other contracts in connection with this project. The Contractor shall afford other Contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work and shall properly connect and coordinate his/her work with theirs. If the proper execution or results of any part of the Contractor's work depends upon the work of any other Contractor, the Contractor shall inspect and promptly report to the Engineer any defects in such work that render it unsuitable for such property execution and results.

The City may perform additional work related to the project by itself, or it may let other contracts containing provisions similar to these. The Contractor will afford the other Contractors who are parties to such contracts, or the City if it is performing the additional work itself, reasonable opportunity for the introduction and storage of materials and equipment and the execution of work, and shall properly connect and coordinate his/her work with theirs.

If the performance of additional work by other Contractors or the City, is not noted in the Contract documents prior to the execution of the contract, written notice thereof shall be given to the Contractor prior to starting such additional work. If the Contractor believes that the performance of such additional work by the City or others involves him/her in additional expense or entitles him/her to any extension of contract time, he/she may make a claim therefore as provided in Sections 14 and 15.

28. SUBCONTRACTING

The Contractor may utilize the services of specialty Contractors on those parts of the work, which, under normal contracting practices, are performed by specialty Contractors. The Contractor shall be fully responsible to the City for the acts and omissions of his/her subcontractors and of persons either directly or indirectly employed by them, as he/she is responsible for the acts and omissions of persons directly employed by him/her.

The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the work to bind subcontractors to the Contractor by the terms of the contract documents insofar as applicable to the work of the subcontractors and to give the Contractor the same power as regards terminating any subcontract that the City may exercise over the Contractor under the provisions of the contract documents. Nothing contained in this contract shall create any contractual relation between any subcontractor and the City.

29. ENGINEER'S AUTHORITY

The Engineer shall act as the City's representative during the construction period. He/she shall decide questions, which may arise as to quality and acceptability of materials furnished and work performed. He/she shall interpret the intent of the contract documents in a fair and unbiased manner. The Engineer will make visits to the site and determine if the work is proceeding in accordance with the contract documents.

30. LAND AND RIGHT-OF-WAY

Prior to the issuance of Notice to Proceed, the City shall obtain all land and rights-of-way necessary for carrying out and for the completion of the work to be performed pursuant to the contract documents, unless otherwise mutually agreed.

The City shall provide to the Contractor information, which delineates and describes the lands owned and rights-of-way acquired. The Contractor shall provide, at his/her own expense and without liability to the City, any additional land and access thereto that the Contractor may desire for temporary construction facilities, or for storage of equipment or materials.

31. GUARANTEE

The Contractor shall guarantee all materials and equipment furnished and work performed for a period of one (1) year from the date of substantial completion. The Contractor warrants and guarantees for a period of one (1) year from the date of substantial completion of the system that the completed system is free from all defects due to faulty materials or workmanship and the Contractor shall promptly make such corrections as may be necessary by reason of such defects including the repairs of any damage to other parts of the system resulting from such defects.

The City will give notice of observed defects with reasonable promptness. In the event that the Contractor should fail to make such repairs, adjustments or other work that may be necessary by such defects, the City may do so and charge the Contractor the cost thereby incurred. The Performance Bond shall remain in force and effect through the guarantee period.

32. CONTRACT DISPUTES AND NOTICE OF POTENTIAL CLAIM

If the Contractor and Engineer fail to agree whether or not any work or other matter is within the scope of the Contract, the Contractor shall nevertheless immediately perform such work upon receipt of a written Field Instruction or other written directive. It is the intention of this section that disputes between the parties arising under and by virtue of the contract be brought to the attention of the Engineer at the earliest possible time in order that the matters may be resolved, if possible, or other appropriate action can be undertaken.

For disputes arising under and by virtue of the contract, including an act or failure to act by the Engineer, the Contractor shall provide a signed written initial notice of potential claim to the Engineer within 5 days from the date the dispute first arose. The initial notice of potential claim shall provide the nature and circumstances involved in the dispute which shall remain consistent through the dispute. The initial notice of potential claim shall be submitted on State Form CEM-6201A to be furnished by the Engineer and shall be certified with reference to the California False Claims Act, Government Code Sections 12650-12655. The Contractor shall assign an exclusive identification number for each dispute, determined by chronological sequencing, based on the date of the dispute.

The exclusive identification number for each dispute shall be used on the following corresponding documents:

- Initial notice of potential claim.
- Supplemental notice of potential claim.
- Full and final documentation of potential claim.

- Corresponding claim included in the Contractor's written statement of claims.

The Contractor shall provide the Engineer the opportunity to examine the site of work within 5 days from the date of the initial notice of potential claim. The Contractor shall proceed with the performance of contract work unless otherwise specified or directed by the Engineer.

Throughout the disputed work, the Contractor shall maintain records that provide a clear distinction between the incurred direct costs of disputed work and that of undisputed work. The Contractor shall allow the Engineer access to the Contractor's project records deemed necessary by the Engineer to evaluate the potential claim within 20 days of the date of the Engineer's written request.

Within 15 days of submitting the initial notice of potential claim, the Contractor shall provide a signed supplemental notice of potential claim to the Engineer that provides the following information:

- A narrative describing the complete nature and circumstances of the dispute which caused the potential claim.
- The contract provisions that provide the basis of claim.
- The estimated cost of the potential claim, including an itemized breakdown of individual labor and material costs and how the estimate was determined.
- A time impact analysis of the project schedule that illustrates the effect the effect on the scheduled completion date due to schedule changes or disruptions where a request for adjustment of contract time is made.

The supplemental notice of potential claim shall be submitted on State Form CEM-6201B to be furnished by the Engineer and shall be certified with reference to the California False Claims Act, Government Code Sections 12650-12655. The Engineer will evaluate the information presented in the supplemental notice of potential claim and provide a written response to the Contractor within 20 days of its receipt. If the estimated cost or effect on the scheduled completion date changes, the Contractor shall update this information as soon as the change is recognized and submit this information to the Engineer.

Within 30 days of the completion of work related to the potential claim, the Contractor shall provide the full and final documentation of potential claim to the Engineer that provides the following information:

- A detailed factual narration of events fully describing the nature and circumstances that caused the dispute, including, but not limited to, necessary dates, locations, and items of work affected by the dispute.
- The specific provisions of the contract that support the potential claim and a statement of the reasons these provisions support and provide a basis for entitlement of the potential claim.
- When additional monetary compensation is requested, the exact amount requested shall be segregated into the following cost categories:
 1. Labor – A listing of individuals, classifications, regular hours and overtime hours worked, dates worked, and other pertinent information related to the requested reimbursement of labor costs.

2. Materials – Invoices, purchase orders, location of materials either stored or incorporated into the work, dates materials were transported to the project or incorporated into the work, and other pertinent information related to the requested reimbursement of material costs.

3. Equipment – Listing of detailed description (make, model, and serial number), hours of use, dates of use and equipment rates. Equipment rates shall be at the applicable State rental rate as listed in the Department of Transportation publication entitled "Labor Surcharge and Equipment Rental Rates," in effect when the affected work related to the dispute was performed.

- When an adjustment of contract time is requested the following information shall be provided:

1. The specific dates for which contract time is being requested.

2. The specific reasons for entitlement to a contract time adjustment.

3. The specific provisions of the contract that provide the basis for the requested contract time adjustment.

4. A detailed time impact analysis of the project schedule. The time impact analysis shall show the effect of changes or disruptions on the scheduled completion date to demonstrate entitlement to a contract time adjustment.

The full and final documentation of the potential claim shall be submitted on State Form CEM-6201C to be furnished by the Engineer and shall be certified with reference to the California False Claims Act, Government Code Sections 12650-12655.

Pertinent information, references, arguments, and data to support the potential claim shall be included in the full and final documentation of potential claim. Information submitted subsequent to the full and final documentation submittal will not be considered. Information required in the full and final documentation of potential claim, as listed in items above, that is not applicable to the dispute may be exempted as determined by the Engineer. No full and final documentation of potential claim will be considered that does not have the same nature and circumstances, and basis of claim as those specified on the initial and supplemental notices of potential claim.

The Engineer will evaluate the information presented in the full and final documentation of potential claim and provide a written response to the Contractor within 30 days of its receipt unless otherwise specified. The Engineer's receipt of the full and final documentation of potential claim shall be evidenced by postal receipt or the Engineer's written receipt if delivered by hand. If the full and final documentation of potential claim is submitted by the Contractor after acceptance of the work by the Director, the Engineer need not provide a written response.

Failure of the Contractor to conform to specified dispute procedures shall constitute a failure to pursue diligently and exhaust the administrative procedures in the contract, and is deemed as the Contractor's waiver of the potential claim.

33. DISPUTE RESOLUTION

In the event that disputes cannot be resolved pursuant to the provisions of Section 32, disputes of \$375,000 or less between that parties shall be subject to the provisions set forth in California Public Contract Code sections 20104 et seq.

34. TAXES

The Contractor will pay all sales, consumer, use and other similar taxes required by the law of the place where the work is performed.

35. APPLICABLE WAGE RATES

The Contractor's attention is directed to Section 7-1.02K(2) "Wages" of the Standard Specification and the most recent General Prevailing Wage Determination made by the Director of Industrial Relations, a copy of which is available for examination at the Public Works Office. These prevailing wage rates, and any subsequent amendments thereto made prior to the date of the Invitation for Bids, are the minimum rates to be paid during the life of the contract.

Certified copies of all payroll records shall be submitted to the Engineer each week for the prior week's work. Certified payroll records and submittal thereof shall be in accordance with Section 7-1.02K(3) "Certified Payroll Records" of the Standard Specifications.

In accordance with the California Labor Code, and other applicable labor provisions, the prevailing wages applicable to the project will be determined by the United States Secretary of Labor and/or the State of California Department of Industrial Relations.

The listings of or reference to minimum rates herein is not a representation that labor can be obtained at these rates. It is the responsibility of bidders to inform themselves as to local labor conditions and prospective changes or adjustments of wage rates. No increase in the contract price shall be allowed or authorized on account of payment of wage rates in excess of those listed or referred to herein.

SECTION TS

TECHNICAL SPECIFICATIONS

SECTION 01150

MEASUREMENT AND PAYMENT

PART 1: GENERAL

1.01 DESCRIPTION

Payment shall be made at the bid prices and shall be considered as full compensation for furnishing all labor, materials, tools, supplies, and services as required for proper completion of the work described in the following bid items, complete in place, and to the satisfaction of the Engineer.

Items of work or other services which the Contractor is required to supply, such as final clean-up or other incidental items, and which are not listed as separate bid items shall be included in the related bid items and shall be considered as paid in those items, whether or not specifically identified in the following descriptions. Also considered to be included in such costs are any costs associated with the repair of damage which may occur to existing improvements as a result of the Contractor's operations.

1.02 LUMP SUM BREAKDOWN SUBMITTALS

After award of the Contract and prior to approval of initial progress payment requests, the Contractor shall submit a cost breakdown list to the Engineer for all Lump Sum bid items. The list shall consist of the major elements of work that make up each of the lump sum bid items and shall be used for determining progress pay estimates. The Contractor shall provide amounts for each element, prorating general costs such as mobilization, setup, temporary facilities and controls, and overhead and profit for each element. The distribution breakdown that the contractor indicates for any lump sum bid item may be revised as deemed necessary by the Engineer if it appears such items are unbalanced, unless the Contractor can substantiate these costs. Only elements of work of value to the City shall be included in the list.

PART 2: BID ITEMS

Bid Item 1 – Mobilization/Demobilization

The lump sum bid for Mobilization shall not exceed three percent (3%) of the total bid price. Mobilization shall include: the obtaining of insurance and bonds; moving onto the site of all equipment; submittal and approval of initial project schedule; obtaining and paying for all permits by other agencies as applicable and not delineated in other bid items; furnishing temporary construction utilities (temporary power, toilets, water, fences, etc.); installing construction signs; temporary buildings and field office trailer(s); establishment of temporary site access and staging area; installation of temporary construction fencing; and all other construction as required for the proper performance and completion of work.

The lump sum bid for Demobilization shall not exceed three percent (3%) of the total bid price. Demobilization shall include: site cleaning and restoration of surfaces within the job site; post-construction meeting; removal of all temporary facilities and equipment from the work area; disconnection of the temporary construction utilities; and turnover of a project to the Owner.

Contractor may apply for payment of mobilization on a percent complete basis as the items covered in Mobilization are being completed.

Contractor may apply for payment of Demobilization after the overall project substantial

completion is achieved and the project begins to demobilize.

The lump sum price shall be full compensation for the preparation and installation or submittal of these materials, and for all labor, equipment, tools and incidentals to complete this item.

Bid Item 2 - Traffic Control

The lump sum amount shall include all work and materials necessary to create, obtain approval, and implement a traffic control plan as required by the City of Oroville for this project. Measurement and payment shall be made on a percent complete basis. The price shall be full compensation for updates or changes required by the City.

The lump sum price shall be full compensation for the preparation, submittal, approvals, fees, and implementation of these materials, and for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 3 - Dewatering

The lump sum amount shall include all work and materials necessary for dewatering, including installation of wet well, piping, earthwork, and all other essentials to complete this item as detailed in the Specifications and Plans.

The lump sum price shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 4 – Sheeting, Shoring, Bracing

The lump sum amount shall include all work and materials necessary for sheeting, shoring, and bracing, including installation of shores, wales, braces, posts, piling, sheeting, anchorages, fastenings, and all other essentials required to complete this item as detailed in the Specifications and Plans.

The lump sum price shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 5 – Bypass Pumping

The lump sum amount shall include all work and materials necessary for bypass pumping, including installation of pumps, piping, and all other essentials required to complete this item as detailed in the Specifications and Plans.

The lump sum price shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 6 – 18" PVC Pipe

The price per linear foot for 18" PVC Pipe shall include all work and materials necessary to install new 18" PVC sanitary sewer, including sawcutting, trenching, installation of bedding, temporary plating, utility crossing protection, backfill and compaction, pavement repair, furnishing of pipe, and all other essentials required to complete this item as detailed in the Specifications and Plans.

The price per linear foot shall be full compensation for all labor, equipment, tools, and

incidentals to complete this item.

Bid Item 7 – Abandon Pipe

The price per linear foot for abandon pipe shall include all work and materials necessary to abandon pipe, including flowable fill, grout plugs, repair of holes on existing structures, cutting and disposal of pipe near existing structures, and all other essentials required to complete this item as detailed in the Specifications and Plans.

The price per linear foot shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 8 – 48” Sanitary Sewer Manhole

The price per each for 48” Sanitary Sewer Manhole shall include all work and materials necessary to install new sanitary sewer manholes, including sawcutting, trenching, removal and disposal of existing manhole, furnishing and installation of manhole bases, sections, frames, and covers, backfill and compaction, testing, and all other essentials required to complete this item as detailed in the Specifications and Plans.

The price per each shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 9 – Abandon Manhole

The price per each for Abandon Manhole shall include all work and materials necessary to abandon manholes, including removal and disposal of frames, covers, and castings, flowable fill, grout plugs, backfill and compaction, and all other essentials required to complete this item as detailed in the Specifications and Plans.

The price per each shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 10 – Lateral Reconnection

The price per each for Lateral Reconnection shall include all work and materials necessary for lateral reconnection, including sawcutting, trenching, coring of pipe, saddle tap, backfill and compaction, and all other essentials required to complete this item as detailed in the Specifications and Plans.

The price per each shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1: GENERAL

1.01 SECTION INCLUDES

- A. Submittal procedures.
- B. Proposed Products list.
- C. Product Data.
- D. Shop Drawings.
- E. Samples.
- F. Design data.
- G. Test reports.
- H. Certificates.
- I. Manufacturer's field reports.
- J. CPM Qualifications

1.02 SUBMITTAL PROCEDURES

- A. Transmit each submittal with transmittal form provided by Contractor.
- B. Sequentially number the transmittal form. Resubmittals shall be identified with original number and a sequential resubmittal suffix number. The original submittal shall be numbered X-1. The first resubmittal shall be numbered X-2 and so on.
- C. Identify Project, date of submittal, Contractor, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate.
- D. Apply Contractor's signature certifying that review, approval, verification of Products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents.
- E. Schedule submittals to expedite the Project and deliver to Engineer at the Engineer's office. Coordinate submission of related items.
- F. For each submittal for review, allow 30 days excluding delivery time to and from the Contractor.
- G. Identify variations from Contract Documents and Product or system limitations which may be detrimental to successful performance of the completed Work.
- H. Provide space for Design Engineer's review stamps.

- I. When revised for resubmission, identify all changes made since previous submission.
- J. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.
- K. Submittals not requested either in the Contract Documents or in writing from the Engineer will not be recognized or processed.
- L. Within 15 days after Notice to Proceed submit a complete list of all submittals to be submitted and the dates when they will be submitted.
- M. Wherever called for in the Contract Documents, or where required by the Engineer, the Contractor shall furnish to the Engineer for review, 3 copies, plus one reproducible copy, of each shop drawing submittal. The term "Shop Drawings" as used herein shall be understood to include detail design calculations, shop drawings, fabrication and installation drawings, erection drawings, lists, graphs, catalog sheets, data sheets, and similar items. Whenever the Contractor is required to submit design calculations as part of a submittal, such calculations shall bear the signature and seal of an engineer registered in California, unless otherwise directed.
- N. All Shop Drawing submittals shall be accompanied by the Contractor's standard submittal transmittal form. Any submittal not accompanied by such a form, or where applicable items on the form are not complete, will be returned for resubmittal.
- O. Normally, a separate transmittal form shall be used for each specific item or class of material or equipment for which a submittal is required. Transmittal of a submittal of various items using a single transmittal form will be permitted only when the items taken together constitute a manufacturer's "package" or are so functionally related that expediency indicates review of the group or package as a whole. A multi-page submittal shall be collated into sets, and each set shall be stapled or bound, as appropriate, prior to transmittal to the Engineer.
- P. Except as may otherwise be indicated herein, the Engineer will return prints of each submittal to the Contractor with its comments noted hereon, within 30 calendar days following their receipt by the Engineer. It is considered reasonable that the Contractor shall make complete and acceptable submittal to the Engineer by the second submission of a submittal item. The City reserves the right to withhold monies due to the Contractor to cover additional costs of the Engineer's review beyond the second submittal. The Engineer's maximum review period for each submittal, including all resubmittals, will be 30 days per submittal. In other words, for a submittal that requires two resubmittals before it is complete, the maximum review period for that submittal could be 90 days.
- Q. If a submittal is returned to the Contractor marked "NO EXCEPTIONS NOTED", formal revision and resubmission of said submittal will not be required.
- R. If a submittal is returned to the Contractor marked "MAKE CORRECTIONS NOTED", formal revision and resubmission of said submittal will not be required.
- S. If a submittal is returned to the Contractor marked "AMEND-RESUBMIT", the Contractor shall revise said submittal and shall resubmit the required number of copies of said revised submittal to the Engineer.

- T. If a submittal is returned to the Contractor marked "REJECTED-RESUBMIT", the Contractor shall revise said submittal and shall resubmit the required number of copies of said revised submittal to the Engineer.
- U. Fabrication of an item shall be commenced only after the Engineer has reviewed the pertinent submittals and returned copies to the Contractor marked "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED". Corrections indicated on submittals shall be considered as changes necessary to meet the requirements of the Contract Documents and shall not be taken as the basis for changes to the contract requirements.
- V. The Engineer's review of Contractor Shop Drawing submittals shall not relieve the Contractor of the entire responsibility for the correctness of details and dimensions. The Contractor shall assume all responsibility and risk for any misfits due to errors in Contractor submittals. The Contractor shall be responsible for the dimensions and the design of adequate connections and details for all connections and details.

1.03 PROPOSED PRODUCTS LIST

- A. Within 15 days after date of Notice to Proceed submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
- B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

1.04 PRODUCT DATA AND SHOP DRAWINGS

- A. Product Data for Review:
 - 1. Submitted to Engineer for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.
 - 2. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article above.
- B. Product Data for Information:
 - 1. Submitted for the Engineer's knowledge as contract administrator or for the City of Oroville.
- C. Product Data for Project Close-out:
 - 1. Submitted for the City's benefit during and after project completion.
- D. Submit one electronic copy of each submittal.
- E. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- F. After review distribute in accordance with the Submittal Procedures article above.

1.05 SAMPLES

- A. Samples for Review:

1. Submitted to Engineer for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.
 2. After review, produce duplicates and distribute in accordance with SUBMITTAL PROCEDURES article above.
- B. Samples for Information:
1. Submitted for the Engineer's knowledge as contract administrator or for the City.
- C. Include identification on each sample, with full Project information.
- D. Submit the number of samples specified in individual specification sections; one of which will be retained by Engineer.
- E. Reviewed samples which may be used in the Work are indicated in individual specification sections.
- F. Samples will not be used for testing purposes unless specifically stated in the specification section.

1.06 DESIGN DATA

- A. Submit for the Engineer's knowledge as contract administrator or for the City.
- B. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.07 TEST REPORTS

- A. Submit for the Engineer's knowledge as contract administrator or for the City.
- B. Submit test reports for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.08 CERTIFICATES

- A. When specified in individual specification sections, submit certification by the manufacturer, installation/application Subcontractor, or the Contractor to Engineer, in quantities specified for Product Data.
- B. Indicate material or Product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or Product but must be acceptable to Engineer.

1.09 MANUFACTURER'S FIELD REPORTS

- A. Submit reports for the Engineer's benefit as contract administrator and for the City.
- B. Submit three copies of each report within 30 days of observation to Engineer for information.

- C. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.10 CPM QUALIFICATIONS

- A. Submit a statement for individual who will perform CPM scheduling that identifies who they are and highlights their qualifications.

PART 2: MATERIALS - NOT USED

PART 3: EXECUTION - NOT USED

END OF SECTION

SECTION 01666

TESTING OF GRAVITY SEWER LINES AND MANHOLES

PART 1: GENERAL

1.01 DESCRIPTION

- A. The work of this section consists of testing gravity sewer lines and gravity sewer manholes. Repaired work shall be retested.
- B. Testing Methods: Gravity sewer lines - air test; manholes – vacuum test.

1.02 QUALITY ASSURANCE

- A. Flow meters shall record the actual volume plus or minus 2 percent.
- B. Air test gauges shall be ANSI/ANSI B40.1, Grade 3A (plus or minus 0.25 percent of full-scale accuracy), and 15 psi dial range.
- C. Water test gauges shall be ANSI/ANSI B40.1, Grade 2A (plus or minus 0.5 percent of full-scale accuracy), and dial range approximately twice the required test pressure.

1.03 SUBMITTALS

- A. Accuracy certification by approved independent testing labs for flow meters and test gauges. Certifications shall be dated no more than 90 days prior to actual system testing.
- B. Prior to testing, provide the following information:
 - 1. All Tests: Describe precautions that will be taken to protect system equipment that might be damaged under test pressures, and the proposed method for rerouting sewer flows where the system must remain in service.
 - 2. Air Test: Describe safety devices on air test equipment and personnel safety precautions during air.

1.04 PROJECT CONDITIONS

Testing shall not be performed until each system has been flushed or thoroughly cleaned in accordance with procedures in the section that describes sewer line installation.

PART 2: MATERIALS - NOT USED

PART 3: EXECUTION

3.01 GENERAL

Prepare each section for testing, using adequate bracing; protect system equipment susceptible to damage by test pressures; make provision for installation of Agency's pressure gauge in parallel with Contractor's gauge, if so requested; and maintain services where required.

3.02 GRAVITY SEWER SYSTEMS

- A. Air Test: Test lines less than or equal to 30 inches in diameter between manholes with low pressure air. Safety requires regulator or relief valve on pressurizing equipment, set at 8 psig. No one will be allowed in manholes while there is air pressure against test plugs.

Lines greater than 30-inches in diameter shall include individual joint testing as specified per these specifications or the manufacturer.
- B. Plug all pipe outlets to resist test pressure. Give special attention to laterals. Plug all other pipes in both upstream and downstream manholes.
- C. Supply air into the line until the test pressure of 3.5 psi in excess of the ground water pressure is attained or 8 psi, whichever is greater. Allow at least 5 minutes for air temperature in the test section to stabilize.
- D. Reestablish the test pressure, and start a stop watch. Determine the time required for pressure to drop 1.0 psig.
- E. For 6-inch and smaller pipe only, if the pressure does not drop during the stabilization period, and no additional air has been added, the section undergoing test will have passed without further testing.
- F. The pipe section will also have passed if the time observed for the pressure to drop 1.0 psig is greater than that determined by using Table 1.

Determine the test time from Table 1 (minimum time 60 seconds).

SIZE	Time per 100-foot	SIZE	Time per 100-foot	SIZE	Time per 100-foot
4-inch	0.3-min.	12-inch	1.8-min.	24-inch	3.6-min
6-inch	0.7-min.	15-inch	2.1-min.	27-inch	4.2-min.
8-inch	1.2-min.	18-inch	2.4-min.	30-inch	4.8-min.
10-inch	1.5-min.	21-inch	3.0-min.		

- G. When a combination of more than one pipe size is under test, the calculated time for the larger pipe shall apply.
- H. For larger sewer pipes, refer to the material specification for testing requirements.

3.03 VISUAL TEST FOR PIPELINES

Interior visual inspection shall be conducted by the Contractor. The Contractor's Inspector shall visibly inspect the line and record findings. Copies of video inspection shall be provided to the City Engineer for review and acceptance of work.

The sewer system shall be completely cleaned by an approved method prior to visual inspection. The sewer system shall be rejected if any of these conditions exist:

- A. Standing water or sags greater than ½-inch in depth.

- B. Standing water in services.
- C. Offset joints.
- D. Cracked pipe.
- E. Infiltration.

3.04 DEFLECTION TESTING OF FLEXIBLE PIPE

All flexible PVC pipe shall be tested for over-deflection as specified in Section 15071.

3.05 LEAKAGE TEST FOR MANHOLES

Sewer manholes shall pass a vacuum test consisting of the following criteria and procedures:

- A. The Contractor shall notify the Engineer at least 72-hours in advance to be present during testing without exception.
- B. The test shall be performed after assembly of the manhole, but prior to backfilling. The Contractor shall perform the test and supply all test equipment. A City Inspector shall witness the test results.
- C. Lift holes shall be filled with non-shrinking grout prior to testing.
- D. Pipe entering and existing the manhole shall be plugged. Securely brace the plugs to prevent them from being drawn into the manhole. Unused channels shall be permanently plugged with a plastic or clay stop and filled with grout.
- E. A vacuum of 10-inches of mercury shall be drawn to start the test. The amount of time required for the vacuum to drop to 9-inches shall be measured. The manhole will pass the test if the amount of elapsed time is greater than 60 seconds for a 48-inch manhole, 75 seconds for a 72-inch manhole, and 120 seconds for an 84-inch manhole. A liquid filled with vacuum gauge shall be used for testing.
- F. If the manhole fails the initial test, necessary repairs shall be made with a non-shrink grout while the vacuum is still being drawn. Retesting shall proceed until the elapsed times are satisfactory.
- G. After passing the vacuum test, all joints shall then be mortared, inside and out. Outside mortared joints shall be allowed to dry before backfilling.

END OF SECTION

SECTION 02100
DEMOLITION, CLEARING, GRUBBING, AND STRIPPING

PART 1: GENERAL

1.01 DESCRIPTION

Work Included: Demolition, clearing, grubbing, and stripping required for this work includes, but is not necessarily limited to:

- A. Felling and removal of trees, stumps, roots, and tree debris.
- B. Removal of surface rock and all debris.
- C. Removal of surface organic topsoil layer.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 02200: Earthwork
- B. Section 02223: Trenching, Backfilling, and Compacting
- C. Section 02225: Structure Excavation and Backfill
- D. Section 02270: Stormwater Runoff Control Program

1.03 LIMITS OF WORK

Perform demolition, clearing, grubbing, and stripping operations to the following limits:

- A. Demolition: Perform demolition of existing facilities as designated on the contract drawings.
- B. Clearing: Perform clearing operations throughout the project site, including, but not limited to, areas upon which facilities, ponds, roadways, structures, landscaping or structural fill will be placed, and all borrow sites.
- C. Grubbing: Perform grubbing operations at all locations identified for clearing.
- D. Stripping: Perform stripping operations at the following locations as:
 - 1. The area of the plant site.
 - 2. The new access roadways.
 - 3. The effluent pipeline corridor.
 - 4. The pond sites
 - 5. Irrigation/borrow fields, as required to meet fill requirements
- E. Any and all areas that have been demolished, cleared, grubbed or stripped that has not be covered by any other order of work and is left as bare or native ground ,excluding the irrigation fields, shall have a finishing treatment applied at

the discretion of the engineer and may consist of one of the following: hydroseeded and continuously irrigated until established, covered with 2" Class 2 aggregate base and compacted to 95%, paved, or receive authorization by the engineer to remain in the native state.

1.04 CLEARING

Remove and dispose of trees, snags, stumps, shrubs, brush, limbs, and other vegetative growth to the limits defined in Section 1.03. Remove all evidence of branches greater than 1-inch in diameter of thickness. Remove and dispose of trash piles and rubbish. Protect structures and piping above and below ground, trees, shrubs, and vegetative growth and fencing which are not designated for removal or which exist outside project limits.

1.05 GRUBBING

After clearing, remove and dispose of wood or root matter, including stumps, trunks, roots, or root systems greater than 1-inch in diameter to the limits defined in Section 1.03.

1.06 STRIPPING

After grubbing, strip the organic material to the limits defined in Section 1.03 to a depth of not less than 6-inches or to a depth required to remove all deleterious matter, vegetation, or cementations larger than 1 inch in the maximum dimension. Upon completion of the stripping operation, the remaining material, if utilized for structural fill, shall not exceed a concentration of organics in excess of 3 percent by dry weight. Dilution shall be accomplished by means of disking.

Stripping material shall be stockpiled onsite. All stockpiled material, including existing stockpile in irrigation fields, shall be spread across the borrow site to drain towards the tailwater ditch.

1.07 QUALITY ASSURANCE

- A. Qualifications of Workmen: Provide at least one person who shall be present at all times during tree clearing and grubbing operations and who shall be thoroughly familiar with the types of trees involved and who shall direct the trimming of roots and limbs where required.
- B. Codes and Standards: In addition to complying with all pertinent codes and regulations, comply with the requirements of those insurance carriers providing coverage for this work.

1.08 JOB CONDITIONS

- A. Dust Control: Use all means necessary to prevent the spread of dust during performance of the work; thoroughly moisten all surfaces as required to prevent dust being a nuisance to the public, neighbors, and concurrent performance of other work on the site. Wind in excess of 10 MPH causing dust to leave site will require Contractor to limit dust causing activities.
- B. Burning: On-site burning will not be permitted.

- C. Protection: Use all means necessary to protect existing objects designated to remain and, in the event of damage, immediately notify the Engineer and make all repairs and replacements necessary for approval by the Engineer at no additional cost to the Owner.

PART 2: MATERIALS

2.01 TEMPORARY BARRICADES

Unless otherwise specifically approved by the Engineer, use only new and solid lumber of utility grade or better to construct temporary barricades around the objects designated to remain.

2.02 PRUNING PAINT

Use only a pruning paint specially formulated for horticultural application to cut or damaged plant tissue and approved by the Engineer for use on this work.

2.03 EXPLOSIVES

Do not use explosives on this project.

2.04 OTHER MATERIALS

All other material not specifically described but required for proper completion of the work of this Section, shall be as selected by the Contractor subject to approval of the Engineer.

PART 3: EXECUTION

3.01 PREPARATION

- A. Notification: Notify the Engineer at least two full working days prior to commencing the work of this section.
- B. Site Inspection:
 - 1. Prior to all work of this section, carefully inspect the entire site and all objects designated to be removed and to be preserved.
 - 2. Locate all existing inactive utility lines to be encountered by the new work and determine all requirements for disconnecting and capping. Abandonment of piping requires capping at each end or plugging with concrete to the satisfaction of the Engineer.
 - 3. Locate all existing active utility lines traversing the site and determine the requirements for their protection.
- C. Clarification:
 - 1. The Drawings do not purport to show all objects existing on the site.
 - 2. Before commencing the work of this section, verify with the Engineer all objects to be removed and all objects to be preserved.

- D. Scheduling:
 - 1. Schedule all work in a careful manner with all necessary consideration for neighbors, operation of existing facilities, and the public.
 - 2. Avoid interference with the use of, and passage to and from, adjacent buildings and facilities.
- E. Disconnection of Utilities: Before starting site operations, disconnect or arrange for the disconnection of all utility services designated to be removed, performing all such work in accordance with the requirements of the utility company or Owner involved.
- F. Protection of Utilities: Preserve in operating condition all active utilities traversing the site and designated to remain.

3.02 STRUCTURE DEMOLITION

- A. Facilities so designated on the plans shall be demolished, and all materials there from shall become the property of the Contractor and shall be removed and disposed of away from the site. Any equipment or pipework connected within a structure which is designated to be removed and saved or relocated shall be removed before demolition begins. All other equipment within the structure shall become the property of the Contractor.
- B. All concrete and rock shall be removed to firm undisturbed soil and scarified to a depth of 12 inches, unless otherwise noted, and shall be disposed of off-site. Concrete not removed shall be broken to prevent entrapment of water, as directed by the Engineer. Concrete includes all reinforcement and embedded items. Pipework and conduit within 10 feet of a structure shall also be removed to firm undisturbed soil and scarified to a depth of 12 inches unless otherwise noted.
- C. Safety Requirements: The Contractor's attention is directed to the provisions of Subpart T of the OSHA Safety and Health Standards for Construction and the provisions of Article 31 of the Construction Safety Orders of the California Division of Industrial Safety governing the work of demolition. The Contractor shall perform all the work hereunder in accordance with said provisions, and where in conflict, the more stringent shall apply.
- D. Backfill and Grading: After facilities have been demolished and all material removed, any remaining depression or hole shall be backfilled, and the area finish graded as specified in Section 02200. Rubble and broken concrete will not be allowed to be used as fill material.

3.03 ROADWAY DEMOLITION

- A. Where shown on the contract drawings, the Contractor shall remove entire pavement section including base material. This will also be necessary where deemed by the Engineer that extensive pipe construction has caused a loss of pavement integrity. Base material may be stockpiled and reused where appropriate and only with the approval of the Engineer.
- B. Asphalt concrete, concrete curb, and gutter materials to be demolished shall be removed from the site by the Contractor at no additional cost to the Owner.

3.04 PIPE DEMOLITION

- A. Unless otherwise specified, or in conflict with a proposed pipeline or structure, all pipes shown to be demolished shall be abandoned in place and have each end capped with at least a 24-inch long plug of concrete or grout material within the pipe. Piping subject to internal pressure upon abandonment shall be capped with pressure retaining caps or plugs.
- B. All pipe materials to be removed including pipe, fittings, valves, and thrust blocking shall be removed from the site by the Contractor at no additional cost to the Owner.

3.05 CLEARING AND GRUBBING

- A. Area to be Cleared and Grubbed:
 - 1. The Contractor shall restrict clearing and grubbing to the areas designated for new construction or adjustment of grades on the plans. Surrounding trees shall be protected from damage.
 - 2. Where limbs or roots of trees designated to remain extend into work areas, the limbs or roots shall be trimmed in accordance with the provisions of this section.
- B. Felling of Trees:
 - 1. Use all necessary care to protect the roots and branches of trees designated to remain, and to prevent damage to persons and properties.
 - 2. Immediately after felling a tree, remove the branches, cut trunk and limbs as necessary for removal, and clear the debris. Remove tree roots within a minimum of 3 feet below the existing grade.
- C. Trimming of Trees:
 - 1. In company with the Engineer, ascertain the limbs and roots which are to be trimmed and clearly mark them to designate the approved point of cutting.
 - 2. Cut evenly, using proper tools and skilled workmen to achieve neat severance with the least possible damage to the tree.
 - 3. Promptly coat the cut area with the approved pruning paint in strict accordance with the manufacturer's recommendations.
 - 4. In the case of root cuts, apply wet burlap or other protection approved by the Engineer, as required, to prevent drying out.
- D. Grubbing:
 - 1. Remove all surface rocks and all stumps, roots, and vegetation within the limits of construction. Roots shall be removed to at least 2.5 feet below proposed finish grade.

3.06 PLACEMENT OF STRIPPINGS

Strippings shall be removed from the site. The contractor may coordinate with the Engineer to stockpile strippings and then spread on project site area should a specific site area be available.

3.07 CONSTRUCTION OF BARRICADES

A. Layout:

1. At all trees designated to be preserved, construct a temporary barricade around the tree at the tree's approximate drip line.
2. Construct barricades at least three feet high, consisting of two inch by four inch or larger posts set at least 18 inches into the ground at not more than six feet on centers, joined at the top by one inch by six inch or larger boards firmly nailed to the posts. Metal post with orange safety fencing may also be used if allowed by the local Owner having jurisdiction.

B. Protection:

1. Take special care in setting posts to not damage tree roots.
2. Do not permit stockpiling of materials or debris within the barricaded area nor permit the earth surface to be changed in any way except as specifically approved by the Engineer.

C. Maintenance: All protective fencing shall be inspected and maintained by the contractor at weekly intervals. Any damaged fencing shall be restored within one week.

D. Removal of Barricades: All protective fencing including posts and fabric shall be removed from the site at the completion of the work at the Contractor's expense.

3.08 REMOVAL OF DEBRIS

- A. Remove all debris from the site and leave the site in a neat and orderly condition to the approval of the Engineer. Dispose of debris off site at a location approved by the Engineer.
- B. Removal of demolished materials shall be included in the applicable lump sum base bid item and shall not be paid on a unit cost basis.

END OF SECTION

SECTION 02140

DEWATERING

PART 1: GENERAL

1.01 SCOPE

The work of this section consists of providing all labor, materials, and equipment necessary to dewater trench and structure excavations.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 01300: Submittals
- B. Section 02200: Earthwork
- C. Section 02223: Trenching, Backfilling, and Compacting
- D. Section 02225: Structure Excavation and Backfill

1.03 SUBMITTALS

- A. In accordance with Section 01300.
- B. Two weeks prior to installation of dewatering facilities and commencement of excavation, submit:
 - 1. A dewatering plan prepared and submitted to the Engineer for approval.
 - 2. Drawings and descriptions indicating numbers, locations, arrangements, depths, capacities, and construction details, as applicable, of all dewatering system equipment and components, including standby equipment and components.
 - 3. Methods of disposal of pumped water.
 - 4. Methods of diverting precipitation and surface water away from excavations.
 - 5. Method for collecting and removing precipitation within excavations as necessary.
 - 6. Copies of executed permits necessary to perform work.

1.04 PERMITS

The Contractor shall obtain and comply with all required permits for the dewatering system and operation, disposal of water, and pay all associated fees.

PART 2: MATERIALS

2.01 FACILITIES AND EQUIPMENT

The Contractor shall provide all necessary facilities and equipment for the dewatering operations.

PART 3: EXECUTION

3.01 GENERAL REQUIREMENTS

- A. The Contractor shall have on hand, at all times, sufficient pumping equipment and machinery in good working condition and shall have available, at all times, competent workmen for the operation of the pumping equipment. Adequate standby equipment shall be kept available at all times to insure efficient dewatering and maintenance of dewatering operation during power failure.
- B. Dewatering shall commence at an appropriate time prior to commencing excavation and shall be continuous until facilities and structures are completed, backfilled, and, as appropriate, filled with water to prevent damage from hydrostatic uplift and/or floatation.
- C. Excavations extending below site groundwater levels or encounter perched groundwater within permeable soil layers shall be dewatered. Dewatering of narrow trench excavations that penetrate less than a few feet below the groundwater level and do not encounter loose and/or cohesionless soils may be possible by directing inflow to a sump where water can be removed by a pump. Temporary dewatering of wider, deeper, and/or more extensive excavations may require well points, perimeter trench drains, and/or deep sumps. To help maintain bottom stability of wider, deeper, and/or more extensive excavations, groundwater levels shall be drawn-down a minimum of 3 feet below the lowest portion of the excavation.
- D. Dewatering shall at all times be conducted in such a manner as to preserve the undisturbed bearing capacity of the subgrade soils at proposed bottom of excavation and protect temporary excavation slope stability during construction. If foundation soils are disturbed or loosened by the upward seepage of water or an uncontrolled flow of water, the affected areas shall be excavated and replaced with drain rock on geotextile fabric at no additional cost to the Owner.

3.02 DISPOSAL OF WATER

- A. The Contractor shall be responsible to design and control the dewatering operations such that disposal of water does not cause erosion or other damage and such that water to be disposed of is free from silt and other objectionable materials and in compliance with any applicable permit requirements. Settling basins and/or other means shall be used as necessary.
- B. Contractor shall utilize applicable construction activity Best Management Practices (BMP) for the project. Refer to "Caltrans Storm Quality Handbooks, Construction Site Best Management Procedures Manual", Latest Edition.

3.03 TERMINATION OF DEWATERING

The termination of dewatering operations shall be performed in such a manner as to maintain the undisturbed state of the natural foundation soils, prevent disturbance of compacted backfill and prevent flotation or movement of structures, pipelines and sewers. Dewatering devices/features shall either be removed or abandoned in place in accordance with legal regulatory requirements and as approved by the Engineer.

END OF SECTION

SECTION 02200

EARTHWORK

PART 1: GENERAL

1.1 DESCRIPTION

- A. Contractor furnished labor, materials, equipment, and incidentals necessary to perform all excavation, backfill, grading, and compaction required to complete the work shown on the Plans and specified herein. The work shall include, but not necessarily be limited to, excavation for structures, footings, conduit, pipe, and paving; backfilling and fill; embankment and grading; disposal of surplus and unsuitable materials; hydroseeding; and all incidental related work.

1.2 REFERENCED SECTIONS

- A. The following Sections are referenced in this Section:
1. Section 01300: Submittals
 2. Section 02140: Dewatering

1.3 GEOTECHNICAL REPORT

- A. The geotechnical report included in **Appendix A** is for reference only.

1.4 QUALITY ASSURANCE

- A. Reference Specifications, Codes, and Standards
1. This section references the following documents. They are a part of this section insofar as specified and modified herein. The latest edition of referenced publications in effect at the time of bid opening shall govern. In case of conflict between the requirements of this section and the listed documents, the requirements of this section shall prevail.

Reference	Title
ASTM D1556	Density of Soil in Place by the Sand-Cone Method
ASTM D1557	Moisture Density Relations of Soils and Soil-Aggregate Mixtures Using 10-lb. (4.54-kg) Rammer and 18-in. (457-mm) Drop
ASTM D2922	Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
ASTM D3017	Moisture Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow

B. Tests

1. The City or their Representative shall take samples and perform moisture content, gradation, compaction, and density tests during compaction and placement of backfill materials to check compliance with these specifications.
2. The Contractor shall remove surface material at locations designated by the Engineer and provide such assistance as necessary for sampling and testing.

3. The Engineer may direct the Contractor to construct inspection trenches in compacted or consolidated backfill to determine that the Contractor has complied with these specifications.
4. Tests will be made in accordance with the following:

Test	Standard Procedure
Moisture content	ASTM D3017
Density in-place	ASTM D1556 or ASTM D2922
Moisture-density relationships	ASTM D1557

1.5 SUBMITTALS

- A. Comply with the General Provisions and include test results, certifications, and source for all earthwork materials.

PART 2: PRODUCTS

2.1 MATERIALS

- A. Imported fill
 1. Imported fill shall be imported granular material with a maximum plasticity index 12 and a three-inch maximum particle size. Imported fill shall be approved by the Engineer prior to importation to the site.
- B. Engineered Fill
 1. Engineered fill material shall consist of soil excavated onsite, free of debris, wood, trash, peat, and other objectionable material which may be compressible, or which cannot be compacted properly.
 2. Engineered fill shall be well graded and shall possess sufficient fines such that no nesting or voids result in the compacted mass.
 3. Engineered fill shall contain less than 3% organic matter or other deleterious substances by weight and shall not contain rocks or rubble fragments over three inches in greatest dimension.
 4. Soil removed during excavations will require drying prior to use as engineered fill material. Lime can be mixed with soil to dry it to compactable moisture content. The percentage of lime is dependent on the moisture content of the soils.
- C. Crushed Rock (Drain Rock)
 1. Crushed rock shall be clean and free draining and conform to the following gradation:

Sieve Size	Percent Passing by Weight
3/4"	100
No. 4	0-5

2. Crushed rock material shall be composed of hard, durable, sound pieces having a specific gravity of not less than 2.60.
- D. Pipe Bedding and Pipe Zone Material

1. Pipe bedding and pipe zone material shall be 3/8-inch minus granular material conforming to the following gradation:

Sieve Size	% Passing
3/4"	100
3/8"	100
#4	35 - 55
#30	20-60
#200	0-10
Sand Equivalent	30min
Minimum Dry Density	80 lb/cu ft
Coefficient of Permeability	1.4 in/hr

E. Trench Backfill Material

1. Native material meeting the requirement of Engineered Fill.

F. Gravel Material

1. 1-inch minus aggregate material obtained from a single source of uniformly graded angular rock, shall be clean and free draining with no more than 2% passing a No. 4 sieve, and shall be of such a nature that it can be spread and compacted to produce a stable driving surface.

G. Filter Fabric Material

1. Permeable, nonwoven, shall not act as a wicking agent, and shall conform to the requirements of the Filter Fabric found in Section 88 of the most current Standard Specifications, as issued by the California Department of Transportation.

H. Controlled Low Strength Material (CLSM)

1. Hand-excavatable, free-flowing and self-compacting material that consists of cement, pozzolan fly ash, fine and coarse aggregates, and water that has been mixed in accordance with ASTM C94.
2. The CLSM shall have a minimum 28-day compressive strength of not less than 50 psi and a maximum 28- day compressive strength of no more than 150 psi.
3. Placement of backfill or concrete on top of the CLSM is not allowed until the CLSM passes a ball drop test described in ASTM D6024.

PART 3: EXECUTION

3.1 GENERAL

A. Control of Water

1. Keep excavations free from water during construction. Groundwater shall be maintained either naturally or by dewatering at least three feet below the lowest anticipated excavation depth.

B. Surplus Material

1. Unless otherwise specified, surplus excavated material shall be disposed of at the Contractor's expense.
 2. The Contractor shall satisfy himself that there is sufficient material available for the completion of the work before disposing of any material inside or outside the site. Shortage of material, caused by premature disposal of any material by the Contractor, shall be replaced by the Contractor at his expense.
- C. Hauling
1. When hauling is done over highways or city streets, the loads shall be trimmed and the vehicle shelf areas shall be cleaned after each loading. The loads shall be watered after trimming to eliminate dust.
- D. Maintenance of Roadways
1. All earthwork operations shall be performed in a manner which does not disrupt the continuous flow of traffic on existing roadways. All streets shall be swept clean daily where dirt and debris result from contractor's operations.
- E. Finish Grading
1. Finish grades and existing or natural grades in the area of work are indicated on the plans. If no finished grade is shown on the Plans, Contractor shall grade to existing.
 2. The Contractor shall do all grading, filling or excavating as required to completely grade the site to lines and grades shown, and to provide for the indicated drainage.
 3. Where finished grade corresponds practically with existing grade, the ground shall be worked up and graded off evenly with existing grade.
 4. Filled areas shall be compacted so as to prevent settlements and the Contractor shall be responsible for a period of one year after final acceptance of the project to provide additional fill as necessary to bring to grade any areas which settle below the indicated grades and to replace or repair any planting or work damaged by such settlement.
- F. Tolerances
1. Finished grade shall be to the line and grade shown on the plans to within a tolerance of plus or minus 0.05 ft.
 2. Allowance for topsoil and grass cover, and sub-base and pavement thickness shall be made so that the specified thickness can be applied to attain the finished grade.
- G. Control of Erosion
1. The Contractor shall maintain earthwork surfaces true and smooth and protected from erosion.
 2. Erosion control measures, such as silt fences, filter fabric, sedimentation ponds, placement of straw waddles along the peripheries of construction sites, temporary detention ponds, and terraced slopes, shall be employed as appropriate and shall be in place prior to any clearing or grading activity.

3.2 EXCAVATION AND COMPACTION

A. General

1. Excavation shall be in accordance with the Plans and as required for construction. Excavations shall be kept free from water while construction is in progress. The Engineer shall be notified immediately in writing if it becomes necessary to remove soft, weak, or wet material. Wet excavated materials may need to be dried by aeration prior to being used as engineered fill.
2. Soil disturbed or weakened by the Contractor's operations and soils permitted to soften from exposure to weather shall be excavated to firm foundation and refilled with engineered fill material compacted to 95 percent of ASTM D1557, maximum density. All work of this nature will be at the Contractor's expense.

B. Trench Excavation

1. Trench sides shall be constructed as nearly vertical as practicable. Sides of trenches shall not be sloped between the bottom of the trench and the elevation of the top of the pipe.
2. Bottom of trenches shall be graded accurately to provide uniform bearing and support for each section of pipe or conduits on undisturbed soil, or bedding material as indicated or specified at every point along its entire length except for portions where it is necessary to excavate for bell holes and for making proper joints.
3. Bell holes and depressions for joints shall be dug after trench has been graded. Dimension of bell holes shall be as required for properly making the joint to ensure that the bell does not bear on the bottom of the excavation. Trench dimensions shall be as indicated.

C. Structural Excavation

1. General

- a. The bottom excavation elevation shall be enough to allow the proper placing of forms and concrete construction to undisturbed weathered material to the elevations indicated, or as specified herein.
- b. Unless otherwise specified, excavations shall extend enough distance from walls and footings to allow for placing and removal of forms, installation of services, and for inspection, except where concrete is specified to be placed directly against excavated surfaces.

2. Foundation Inspection

- a. Whenever any structure excavation is substantially completed to grade, the Contractor shall notify the Engineer who will inspect the foundation for uniformity and suitability as a structure foundation.
- b. No gravel, rock, sand, concrete or masonry shall be placed until the foundation has been inspected by the Engineer.
- c. The Contractor shall, if directed by the Engineer, dig test pits and make test borings and foundation bearing tests.

- d. If the material tested complies with the specifications, the cost thereof will be paid for as extra work.
- e. If the material tested does not comply with the specifications, the cost thereof (initial testing, remedial work, re-testing) will be borne by the Contractor.

3.3 SUBGRADE PREPARATION

- A. Ground surfaces receiving fill shall be prepared by clearing and grubbing as specified in these specifications, and by removing soil which is high in organic content and other deleterious material.
- B. Subgrade shall then be scarified to a depth of 8 inches, brought to a uniform moisture content of one (1%) to three percent (3%) above optimum and compacted to at least 90 percent (90%) maximum dry density as determined by ASTM D1557.

3.4 FILLING OPERATIONS

- A. General
 - 1. The Contractor shall be responsible for the maintenance and protection of all embankments and fills made during the contract period and shall bear the expense of replacing any portion which has been displaced due to carelessness, negligent work, erosion or failure to take proper precautions.
 - 2. If the existing slope in an area to be filled is greater than 5:1, the Contractor shall bench the area prior to filling to allow each lift to be keyed 1 foot into the existing slope.
- B. Construction of Engineered Fill and Imported Fill
 - 1. Finish grade shall be established with onsite engineered fill and imported fill placed in lifts not to exceed eight inches in compacted thickness and uniformly compacted at or near the optimum moisture content.
 - 2. Each layer shall be spread evenly and shall be thoroughly mixed during spreading to promote uniformity of the material in each layer.
 - 3. When the moisture content of Engineered Fill with clay materials is less than two percent (2%) over optimum, water shall be added until a moisture content of at least two percent (2%) over optimum is achieved.
 - 4. When the moisture content of Imported Fill is less than optimum, water shall be added until a moisture content of at least optimum is achieved.
 - 5. When the moisture content of the Engineered Fill is too high to permit the specified compaction, the fill shall be aerated by blading or other methods until satisfactory moisture content is achieved.
 - 6. No fill shall be placed during weather conditions, which will alter the moisture content of the fill materials sufficiently to make adequate compaction impossible.
 - 7. After placing operations have been stopped because of adverse weather conditions, no additional fill material shall be placed until the

last layer compacted has been checked and found to be compacted to the specified densities.

C. Pipe Bedding and Trench Backfill

1. Bedding

- a. Provide six-inch minimum bedding material under pipe. Bedding shall be placed in 6-inch maximum loose lifts.
- b. Provide uniform and continuous support for each section of utility except at bell holes or depressions necessary for making proper joints.
- c. Bring up evenly on each side and along the full length of the pipe.
- d. Ensure that no damage is done to piping or their protective coatings.
- e. Compact each loose lift as specified below before placing the next lift.
- f. Do not place bedding in freezing weather or where the material in the trench is already frozen or is muddy, except as authorized.

2. Backfilling

- a. Backfill shall be placed in 6-inch maximum loose lifts, mechanically consolidated and shovel sliced under the haunches of the pipe. See City Improvement Standards for backfill and compaction requirements.
- b. Where settlements greater than the tolerance allowed herein for grading occur in trenches and pits due to improper compaction, excavate to the depth necessary to rectify the problem, then backfill and compact the excavation as specified herein and restore the surface to the required elevation.
- c. Coordinate backfilling with testing of utilities.

3. Unsuitable Material Under Bedding

- a. If soft, spongy, unstable, or similar other material is encountered upon which the bedding material or pipe is to be placed, this unsuitable material shall be removed to a minimum depth of 12-inches below the pipe.
- b. The 12-inch depth shall be backfilled with pervious material or accepted bedding material suitably compacted.
- c. Sufficient pervious material shall be installed to provide a stable base accepted by the Engineer prior to installation of the utility, pipe, or structure.

3.5 COMPACTION

A. General

1. Each layer or lift of material specified shall be compacted so that the in-place density tested is not less than the percentage of maximum density identified herein. Compaction shall be accomplished by mechanical equipment such as tamping rollers, sheepsfoot rollers, pneumatic tire rollers, vibrating rollers, or other mechanized tampers suitable for the work.
2. Compaction of materials by ponding and jetting is prohibited.

3. Compaction equipment and procedures are subject to approval by the Engineer.
4. Compaction shall be in accordance with the following:

Item	Compaction, Percentage of ASTM 1557 Maximum Density
Subgrade:	
Under Fill	90% to a depth of 8 inches
Under Concrete Slabs	95% to a depth of 8 inches
Engineered Fill and Imported Fill:	
Under Pavement to 24 inch depth	95%
Under Pump Station to Subgrade	95%
All Other	90%
Pipe Bedding:	
Below pipe	95%
To 6 inches above top of pipe	90%
Trench Backfill:	
Below 24 inches	90%
Under Pavement to 24 inch depth	95%

- B. Consolidation of Crushed Rock
 1. Crushed rock shall be consolidated by one of three methods, as follows:
 - a. A minimum of three (3) passes with a vibrator plate compactor
 - b. Tamping of the crushed rock as it is placed, using the bucket of the backhoe
 - c. Thoroughly wheel rolling with equipment
 2. Each lift of rock shall not exceed 12 inches of unconsolidated thickness.

3.6 CLEAN UP

- A. After completing all earthwork, the Contractor shall leave the site in a neat and clean condition, doing all such grading as is required by the plans. Any existing features, structures, and other facilities damaged or affected by the work shall be replaced, repaired, or restored to their original condition or better.

END OF SECTION

SECTION 02222

ABANDONMENT OF PIPELINES AND MANHOLES

PART 1: GENERAL

1.01 DESCRIPTION

This section includes abandonment in place of existing pipelines and manholes, when indicated on the Drawings for abandonment.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 01300: Submittals
- B. Section 02223: Trenching, Backfilling, and Compacting
- C. Section 03100: Concrete

1.03 QUALITY ASSURANCE REFERENCES

This section contains references to some or all of the following documents, most recent edition. They are a part of this section as specified and modified. In case of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.

Reference	Title
ASTM C150	Standard Specification for Portland Cement.
ASTM C494	Standard Specification for Chemical Admixture for Concrete.
ASTM C618	Standard Specification for Fly Ash and Raw or Calcinated Natural Pozzolan for use as Mineral Admixture in Portland Cement Concrete.
ASTM C940	Standard Test Method for Expansion and Bleeding of Freshly Mixed Grout for Replaced Aggregate Concrete in the Laboratory.
ASTM C1017	Standard Specification for Chemical Admixture for Use in Producing Flowing Concrete.
ASTM C1107	Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Non-Shrink).

1.04 DEFINITIONS

- A. Abandonment. Pipeline abandonment consists of filling or plugging portions of existing pipelines with flowable fill or grout plugs, as indicated on the Drawings. Manhole abandonment consists of removing cylinders, rings, and lids above the depth indicated on the Drawings, and filling the remainder with flowable fill.
- B. Flowable Fill. Flowable fill shall be controlled low-strength material (CLSM) consisting of fluid mixture of cement, fly ash, aggregate, water, and with admixtures as necessary to provide workable properties. Placement of flowable fill may be by grouting techniques in pipelines or other restricted areas, or as mass placement by chutes or tremie methods in unrestricted locations with open access. Long-term hardened strength shall be within specified range.

- C. Backgrouting. Secondary stage pressure grouting to ensure that voids have been filled within abandoned pipes. Backgrouting will only be required at critical locations indicated on the Drawings or if there is evidence of incomplete flowable fill placements.

1.05 SUBMITTALS

- A. Submit flowable fill mix design report.
1. Flowable fill type and production method. Describe if fill will be mixed to final proportions and consistency in batch plant or if constituents will be added in transit mixer at placement location.
 2. Aggregate gradation of fill. Aggregate gradation of mix shall be used as pilot curve for quality control during production.
 3. Fill mix constituents and proportions including materials by weight and volume, and air content. Give types and amounts of admixtures including air entrainment or air generating compounds.
 4. Fill densities and viscosities, including wet density at point of placement.
 5. Initial time of set.
 6. Bleeding and shrinkage.
 7. Compressive strength.
- B. Submit technical information for equipment and operational procedures including projected injection rate, grout pressure, method for controlling grout pressure, bulkhead and vent design and number of stages for grout application.

PART 2: MATERIALS

2.01 FLOWABLE FILL

- A. Design Mix Criteria. Provide design of one or more mixes to meet design criteria and conditions for placement. Present information required by Part 1, Paragraph 1.05-A in mix design, to include the following:
1. Cement: ASTM C150 Type I or II. Volume and weight per cubic yard of fill. Provide minimum cement content of 50 pounds per cubic yard.
 2. Fly ash: ASTM C618, Class C or F. Volume and weight per cubic yard of fill. Provide minimum fly ash content of 200 pounds per cubic yard.
 3. Potable water: Volume and weight per cubic yard of fill. Amount of water determined by mix design testing.
 4. Aggregate gradation: 100 percent passing 3/8-inch sieve and not more than 10 percent passing No. 200 sieve. Mix design report shall define pilot gradation based on following sieve sizes: 3/8 inch, No. 4, 8, 16, 30, 50, 100, and 200. Do not deviate from pilot gradation by more than plus or minus 10 percentage points for any sieve for production material.

5. Aggregate source material: Screened or crushed aggregate, pit or bank run fine gravels or sand, or crushed concrete. If crushed concrete is used, add at least 30 percent natural aggregate to provide workability.
 6. Admixtures: Use admixtures meeting ASTM C494 and ASTM C1017 as needed to improve pumpability, to control time of set and to reduce bleeding.
 7. Fluidifier: Use fluidifier meeting ASTM C937 as necessary to hold solid constituents in suspension. Add shrinkage compensator if necessary.
 8. Performance additive: Use flowable fill performance additive, if needed, to control fill properties.
- B. Flowable Fill Requirements:
1. Unconfined compressive strength: minimum 75 psi and maximum 150 psi at 56 days as determined based on an average of three tests for same placement. Present at least three acceptable strength tests for proposed mix design in mix design report.
 2. Placement characteristics: self-leveling.
 3. Shrinkage characteristics: non-shrink.
 4. Water bleeding for fill to be placed by grouting method in pipes: not to exceed 2 percent according to ASTM C940.
 5. Minimum wet density: 90 pounds per cubic foot.
- C. Grout Plugs
1. Cement-based dry-pack grout conforming to ASTM C1107, Grade B or C.

PART 3: EXECUTION

3.01 REQUIREMENTS BY PIPE LOCATION, SIZE, AND DEPTH

- A. Pipes indicated on the Drawings to be abandoned in place shall be completely filled with flowable fill.
- B. Sewer laterals indicated on the Drawings to be abandoned in place shall not be filled with any flowable fill. Sewer laterals to be abandoned shall be cut at the ends and plugged or capped.
- C. Pipes under structures, waterways, roads, railroad tracks, rail right-of-ways, or similar surface obstructions, and depth or diameter. Pipes indicated on the Drawings to be abandoned in place shall be completely filled with flowable fill.
- D. No existing pipeline facility shall be abandoned until all new facilities serving the same area are in operation and as authorized by the Construction Manager. In the case of water or sewer pipeline that are to be removed due to conflicts with

new work, the existing pipelines may be removed after the bypass system has been installed and tested.

- E. Where existing pipe is to be abandoned, the Contractor shall cut back the abandoned pipe for a distance of five feet from any connecting structure. All holes at the existing structures shall be repaired. The abandoned pipe shall be filled with CLSM or approved alternate pumpable mix design and capped or plugged with at least a 2 foot depth of concrete at both ends prior to backfill.

3.02 PREPARATION

- A. Notify inspector at least 24-hours in advance of grouting with flowable fill.
- B. Select fill placement equipment and follow procedures with sufficient safety and care to avoid damage to existing underground utilities and structures. Operate equipment at pressure that will not distort or imperil portions of the work, new or existing.
- C. Cut and cap portions of the piping system to remain, as shown on the Drawings. Drain water mains to be abandoned.
- D. Clean sewer lines and video to identify connections and locate obstructions. Locate previously unidentified connections which have not been redirected or reconnected as part of the work and report them to the Project Manager. During placement of fill, compensate for irregularities in sewer pipe, such as obstructions or open joints, to ensure no voids remain unfilled.
- E. Perform demolition work prior to starting fill placement. Clean placement areas for pipes and manholes of debris that may hinder fill placement. Remove excessive amounts of sludge and other substances that may degrade performance of the fill. Do not leave sludge or other debris in place if filling more than 2 percent of placement volume. Dispose of waste material in accordance with applicable codes and regulations.
- F. Remove free water prior to fill placement.

3.03 EQUIPMENT

- A. Mix flowable fill in automated batch plant and deliver it to site in ready-mix trucks. Performance additives may be added at placement site if required by mix design.
- B. Use concrete or grout pumps capable of continuous delivery at planned placement rate.

3.04 DEMOLITION OF SEWER MANHOLES PRIOR TO ABANDONMENT

- A. Remove manhole frames and covers and castings and dispose or recycle as applicable. Obtain City approval before reusing frames and covers within the work.
- B. Demolish and remove precast concrete rings to the depth indicated on the plans. Minimum depth of removal shall be 3-feet below finished grade, or 12-inches below any crossing utility, whichever is greater.

3.05 INSTALLATION OF FLOWABLE FILL

- A. Abandon pipelines, as required in Part 3, Paragraph 3.01, by completely filling with flowable fill. Abandon manholes by filling the portion not removed with flowable fill.
- B. Place flowable fill equal to volume of pipe being filled. Continuously place flowable fill from manhole to manhole with no intermediate pour points, but not exceeding 500 linear feet of pipe per fill segment.
- C. Perform operation with experienced crews with equipment to monitor density of flowable fill and to control pressure.
- D. Temporarily plug or cap pipe segments which are to remain in operation during filling to keep lines free of flowable fill.
- E. Pump flowable fill through bulkheads or use other suitable construction methods to contain flowable fill in lines to be abandoned.
- F. Place flowable fill under pressure flow conditions into properly vented open system until flowable fill emerges from vent pipes. Pump flowable fill with sufficient pressure to overcome friction. Fill sewers from the downstream end to vent at upstream end.
- G. Backfill excavations per Section 02223, Trenching, Backfilling, and Compacting.
- H. Collect and dispose of excess flowable fill material and debris.

3.06 INSTALLATION OF GROUT PLUGS

- A. Abandon pipelines of diameter 8-inches and below, as required in Part 3, Paragraph 3.01, by cutting and placing grout plugs.
- B. Clean inside surface of pipe at least 12-inches from ends, achieving firm bond and seal grout plug to pipe surface. Similarly, clean and prepare exterior surface if manufactured cap is to be used.

- C. Place temporary plug or bulkhead approximately 12-inches inside pipe. Fill pipe end completely with dry-pack grout mixture.
- D. Backfill excavations per Section 02223, Trenching, Backfilling, and Compacting.
- E. Collect and dispose of excess grout material and debris.

3.07 QUALITY CONTROL

- A. Provide batch plant tickets for each truck delivery of flowable fill. Note on tickets addition of admixtures at site.
- B. Check flow characteristics and workability of fill as placement proceeds.
- C. Obtain at least three test cylinders for each placement area for determination of 56-day compressive strength and bleeding. Acceptance of placement will be based on average strength of three tests.
- D. Record volume of flowable fill placement to demonstrate that voids have been filled. If voids exceed 10% of pipeline volume, injection grouting may be required at the direction of the Project Manager.

3.08 PROTECTION OF PERSONS AND PROPERTY

- A. Provide safe working conditions for employees throughout demolition and removal operations. Observe safety requirements for work below grade.
- B. Maintain safe access to adjacent property and buildings. Do not obstruct roadways, sidewalks, or passageways adjacent to the work.

END OF SECTION

SECTION 02223

TRENCHING, BACKFILLING, AND COMPACTING

PART 1: GENERAL

1.01 DESCRIPTION

The work of this section consists of trenching and backfilling for the construction and installation of pipelines, conduits, and cables. All trenching will be open cut, unless otherwise approved in writing. It includes all clearing and grubbing, trenching or tunneling, construction of cribbing and cofferdams, dewatering, incidental work, and providing specified backfill.

Excavated soil at the site will generally be suitable for use as backfill above the pipe zone provided it does not contain deleterious matter, vegetation or cementations larger than 3 inches in maximum dimension. Pipe zone materials (bedding shading, etc.) shall conform to the requirements of the pipe manufacturer or utility authority, as appropriate and will likely consist of imported aggregate or sand.

Temporary excavation, sloping, and shoring shall be per Section 02400.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 01300: Submittals
- B. Section 01666: Testing of Gravity Sewer Lines and Manholes
- C. Section 02100: Demolition, Clearing, Grubbing, and Stripping
- D. Section 02140: Dewatering
- E. Section 02200: Earthwork
- F. Section 02225: Structure Excavation and Backfill
- G. Section 02510: Paving and Road Surfacing
- H. Section 03100: Concrete

1.03 SUBMITTALS

- A. Submit an electronic copy of a report from a testing laboratory verifying that backfill material conforms to the specified gradations of characteristics for granular material, imported sand, rock refill for foundation stabilization, and water.
- B. Submit method of compaction in pipe zone, including removal sequence of shoring where used.
- C. Provide written description of barricading, shoring, cribbing, bracing, and sloping precautions.

1.04 PROJECT CONDITIONS

- A. Obtain all required permits and licenses before installing utilities under existing roads, other than City roads, and follow the rules and requirements of the authority having jurisdiction.
- B. Arrange construction sequences to provide the shortest practical time that the trenches will be open to avoid hazard to City staff, subcontractors, and the public, and to minimize the possibility of trench collapse.

1.05 TESTING FOR COMPACTION

- A. The Contractor shall test for compaction every 100 feet at locations determined by the Engineer.
- B. Relative compaction is defined as the ratio, as a percentage, of the as-compacted dry density to the laboratory maximum dry density. The laboratory maximum dry density is defined in accordance with ASTM D1557, latest edition.
- C. Where compaction tests indicate a failure to meet the specified compaction, the Contractor will take additional tests every 50 feet in each direction until the extent of the failing area is identified. Rework the entire failed area until the specified compaction has been achieved.

1.06 STREET ZONE

The street zone includes the asphalt concrete and aggregate base pavement section placed over the trench backfill.

1.07 TRENCH ZONE

The trench zone includes the portion of the trench from the top of the pipe zone to the bottom of the street zone in paved areas or to the existing surface in unpaved areas.

1.08 PIPE ZONE

The pipe zone shall include the full width of trench from the bottom of the pipe or conduit to a horizontal level above the top of the pipe, as shown on the contract drawings. Where multiple pipes or conduits are placed in the same trench, the pipe zone shall extend from the bottom of the lowest pipes to a horizontal level above the top of the highest or topmost pipe.

1.09 EXCAVATION BOTTOM CONDITIONS

Based on conditions encountered in our exploratory borings, materials exposed at the base of excavations are expected to be variable ranging from lean clay with sand and gravel to silty sand with gravel.

Generally, some form of excavation bottom stabilization will be necessary where wet, unstable soils are exposed. Since we do not know the extent of potential locally soft or unstable areas, our field representative shall provide mitigation recommendations in the field at the time of construction. Typical mitigation alternatives include overexcavation and replacement with a gravel mat wrapping in geosynthetic fabric to provide a stable bottom.

The weight of pipe, contents and compacted backfill above the pipe will not result in significant increased load over present overburden. Assuming soft and/or unsuitable subgrade areas are mitigated, pipeline settlement shall be negligible.

1.10 PIPE BEDDING

All earthwork operations shall be observed, and all fills tested for recommended compaction and moisture content by a geotechnical inspector.

Pipe zone materials (bedding, shading, etc.) shall conform to the requirements of the City and/or pipe manufacturer, as appropriate, and will likely consist of imported aggregate or sand.

The pipe base or bedding shall be defined as a minimum 6-inches thick layer of material immediately below the bottom of the pipe or conduit and extending over the full trench width in which the pipe is bedded.

Trench backfill shall be mechanically compacted. Flooding or jetting will not be allowed. Backfill shall be placed in lifts 12 inches or less in loose thickness, moisture-conditioned above optimum moisture content, and compacted to at least 90% relative compaction. Excavated soils may require drying prior to placement.

PART 2: MATERIALS

2.01 GRANULAR MATERIAL FOR BACKFILL - STREET ZONE

Granular material or granular soil for backfill used above the pipe zone shall be ¾-inch – Class 2 Aggregate Base conforming to the most recent Caltrans Standard Specification 26-1.02.

2.02 IMPORTED SAND - PIPE BASE AND PIPE ZONE

Imported sand used for the pipe base and pipe zone shall be free of clay or organic material and have the following gradation:

Sieve Size	Percent Passing By Weight
3/8-Inch	100
No. 4	90 – 100
No. 30	12 – 50
No. 100	5 – 20
No. 200	0 – 5

Imported sand shall have a sand equivalent not less than 28 per ASTM D2419.

2.03 PIPE ZONE MATERIAL ALTERNATIVE

Pipe zone material shall be ¾-inch Class 2 Aggregate Base conforming to the most recent Caltrans Standard Specifications 26-1.02.

2.04 TRENCH ZONE MATERIAL

Trench zone material shall consist of native material conforming to engineered fill, in accordance with Section 02200.

2.05 CEMENT SLURRY - PIPE BASE AND PIPE ZONE ALTERNATIVE

Cement slurry backfill shall consist of Type I or II Portland cement, imported sand, and sufficient water for workability, per the most recent Caltrans Standard Specification 19-3.062. The mix shall produce a minimum 28-day strength of 50 PSI and 1×10^{-6} cm/sec permeability. Submit a mix design and confirming test results per Section 01300.

2.06 REFILL FOR FOUNDATION STABILIZATION

$\frac{3}{4}$ -inch crushed rock shall be used in areas where pipelines extend into loose medium dense sands below the water table.

2.07 CONCRETE FOR PIPE ENCASEMENT AND THRUST BLOCKS

- A. Concrete for pipe encasement and thrust blocks shall be per Section 03100, unless otherwise shown in the drawings.
- B. Provide thrust blocks at fittings in pipe having rubber gasket bell and spigot or unrestrained mechanical joints as directed by the Engineer. Provide thrust blocks at all tees and elbows 45° and greater, or as noted on contract plans and in the general or specific pipe specifications.
- C. Size thrust block bearing area for 1500 psf. Size thrust blocks based on the test pressures provided in the contract documents.

2.08 WATER FOR COMPACTION

Water for compaction shall be clean and free of oil, acids, salts, and other deleterious substances. Water shall be supplied by the Contractor at no additional expense to the Owner. The Contractor shall coordinate with the Engineer for the use of the water, shall provide all necessary labor and equipment to extract the water, and shall be responsible for the repair of any damage to the existing facilities which can be attributed to this operation.

PART 3: EXECUTION

3.01 COMPACTION REQUIREMENTS

Unless otherwise shown in the drawings or otherwise described in the specifications for the particular type of pipe installed, relative compaction in pipe trenches shall be as follows:

- A. Pipe Base: 95% relative compaction.
- B. Pipe Zone: 95% relative compaction.
- C. Backfill in Trench Zone not Beneath Paving or Aggregate Base Access Roadways: 90% relative compaction.

- D. Backfill in Trench Zone to Street Zone in Paved Areas or Within Limits of Aggregate Base Roadways: 95% relative compaction.
- E. Backfill in Street Zone in Paved Areas or within Limits of Aggregate Base Roadways: 95% of relative compaction.
- F. Refill for Foundation Stabilization: 95% relative compaction.
- G. Refill for Over-excavation: 95% relative compaction.

3.02 MATERIAL REPLACEMENT

Remove and replace any trenching and backfilling material which does not meet the specifications, at the Contractor's expense.

3.03 SLOPING, SHEETING, SHORING, AND BRACING OF TRENCHES

Trenches shall have sloping, sheeting, shoring, and bracing conforming with 29CFR1926, Subpart P – Excavations, CAL/OSHA requirements, and Section 02400.

3.04 SIDEWALK, PAVEMENT, AND CURB REMOVAL

Cut bituminous and concrete pavements regardless of the thickness and curbs and sidewalks prior to excavation of the trenches with a pavement saw or pavement cutter. Width of the pavement cut shall be at least equal to the required width of the trench at ground surface. Haul pavement and concrete materials from the site. Do not use for trench backfill.

3.05 TRENCH WIDTHS

Trench widths in the pipe zone shall be as shown in the drawings. If no details are shown, maximum width shall be 24 inches greater than the pipe outside diameter. Comply with 29CFR Part 1926 Subpart P – Excavations. Trench width at the top of the trench will not be limited except where width of excavation would undercut adjacent structures and footings. In such case, width of trench shall be such that there is at least 2 feet between the top edge of the trench and the structure or footing.

3.06 TRENCH EXCAVATION

Excavate the trench to the lines and grades shown in the drawings with allowance for pipe thickness, sheeting and shoring if used, and for pipe base or special bedding. If the trench is excavated below the required grade, refill any part of the trench excavated below the grade at no additional cost to the Owner with foundation stabilization material. Place the refilling material over the full width of trench in compacted layers not exceeding 6-inches deep to the established grade with allowance for the pipe base or special bedding.

3.07 DEWATERING

- A. Provide and maintain means and devices to remove and dispose of all water entering the trench excavation during the time the trench is being prepared for the pipelaying, during the laying of the pipe, and until the backfill at the pipe zone has been completed. These provisions shall apply during the noon hour as well as overnight. Dispose of the water in a manner to prevent damage to adjacent

property and in accordance with regulatory agency requirements. Do not drain trench water through the pipeline under construction. Do not allow groundwater to rise around the pipe until jointing compound has set hard.

- B. Dewater in accordance with Section 02140.

3.08 LOCATION OF EXCAVATED MATERIAL

During trench excavation, place the excavated material only within the working area. Do not obstruct any roadways or streets. Conform the federal, state, and local codes governing the safe loading of trenches with excavated material. All trenches shall be backfilled at the end of each day's operation. Trench patching with asphalt concrete shall be completed within 24 hours of trench backfill.

3.09 LENGTH OF OPEN TRENCH

Limit the length of open trench to 50 feet in advance of pipe laying or amount of pipe installed in one working day, whichever is less, and not more than 50 feet in the rear of pipe laying, except as modified by encroachment permit requirements. At the end of each working day, the trench shall be backfilled to match existing surface.

3.10 TRENCH EXCAVATION IN BACKFILL AND EMBANKMENT AREAS

- A. Construct trench excavation for pipe, pipes, or conduit in backfill or embankment areas in accordance with the following procedures:
- B. Construct and compact the embankment to an elevation of 1-foot minimum over the top of the layer of the largest pipe or conduit to be installed.
- C. Excavate trench in the compacted backfill or embankment. Place cement slurry in the pipe base and pipe zone. Compact backfill above the pipe zone to the relative compaction required for trench zone backfill.

3.11 FOUNDATION STABILIZATION

- A. After the required excavation has been completed, the Owner and/or Agency will inspect the exposed subgrade to determine the need for any additional excavation. It is the intent that additional excavation is conducted in all areas within the influence of the pipeline where unacceptable materials exist at the exposed subgrade. Over-excavation shall include the removal of all such unacceptable materials that exists directly beneath the pipeline to the required trench width and to the depth required. Backfill the trench to sub-grade of pipe base with fill material adequate for foundation stabilization. Place the foundation stabilization material over the full width of the trench and compact in layers not exceeding 6-inches deep to the required grade. Foundation stabilization work above and beyond the recommended stabilization of bedding and foundation preparation in this section and Section 02225 may be executed in accordance with a change order. Any claims relating to this work without prior written authorization will be at the contractor's expense.
- B. Refill used by the Contractor for his convenience will not receive any additional payment.

3.12 INSTALLING BURIED PIPING

- A. Backfill per the detailed piping specification for the particular type of pipe and per the following.
- B. Handle pipe in such a manner as to avoid damage to the pipe. Do not drop or dump pipe into trenches under any circumstances.
- C. Inspect each pipe or fitting prior to placing into the trench. Inspect the interior and exterior protective coatings. Patch damaged areas in the field with material recommended by the protective coating manufacturer. Clean ends of pipe thoroughly. Remove foreign matter and dirt from inside of pipe and keep clean during and after installation.
- D. Grade the bottom of the trench to the line and grade to which the pipe is to be laid, with allowance for pipe thickness and bedding depth. Remove hard spots that would prevent a uniform thickness of bedding. Place the specified thickness pipe base material over the full width of trench. Grade the top of the pipe base ahead of the pipe laying to provide firm, continuous, uniform support along the full length of pie, and compact to the relative compaction specified herein. After laying each section of the pipe, check the grade and alignment and correct any irregularities prior to laying next joint.
- E. Excavate bell holes at each joint to permit proper assembly and inspection of entire joint. Fill the area excavated for the joints with the bedding material specified or detailed in the drawings.
- F. When installing pipe, do not deviate more than 1-inch from line or 1/4 -inch from grade. Measure elevation at the pipe invert. The Contractor shall verify pipe grade at not more than 80 feet intervals, in the presence of the Owner's Representative.
- G. After pipe has been bedded, place pipe zone material simultaneously on both sides of the pipe, in maximum 6-inch lifts, keeping the level of backfill the same on each side. Carefully place the material around the pipe so that the pipe barrel is completely supported and that no voids or compacted areas are left beneath the pipe. Use particular care in placing material on the underside of pipe to prevent lateral movement during subsequent backfilling.
- H. For pipe sizes greater than 12-inches in diameter, no more backfill material than the lesser of 6-inches or 1/3rd of the pipe diameter shall be placed prior to shovel slicing. Sufficient care shall be taken to prevent movement of the pipe during shovel slicing. Shovel slicing shall be witnessed by the Field Inspector and/or Geotechnical Engineer.
- I. Compact each lift to the relative compaction specified herein.
- J. Push the backfill material carefully onto the backfill previously placed in the pipe zone. Do not permit free fall of the material until at least 2 feet of cover is provided over the top of the pipe. Do not drop sharp, heavy pieces of material directly onto the pipe or the tamped material around the pipe. Do not operate heavy equipment over the pipe until at least 3 feet of backfill has been placed and compacted over the pipe.

- K. When pipe laying is not in progress, including the noon hours, close the open ends of pipe. Do not allow trench water, animals, or foreign material to enter the pipe.
- L. Remove and dispose of all water entering the trench during the process of pipe laying. Keep the trench dry until the pipe laying and jointing are completed.

3.13 BACKFILL COMPACTION

Compact per the detailed piping specification for the particular type of pipe and per the following:

- A. Compact trench backfill to the specified relative compaction. Compact by using mechanical compaction or hand tamping. Do not use high impact hammer-type equipment except where the pipe manufacturer warrants in writing that such use will not damage the pipe. Ponding or jetting is not allowed.
- B. Compact material placed within 12-inches of the outer surface of the pipe by hand tamping only.
- C. Do not use any axle-driven or tractor-drawn compaction equipment within 5 feet of building walls, foundations, or other structures.

3.14 CEMENT SLURRY BACKFILL

When cement slurry backfill is utilized, pipe shall be supported by mounding imported backfill material or sandbags filled with imported backfill material. Pipe shall not be supported on wooden or concrete blocks.

END OF SECTION

SECTION 02225

STRUCTURE EXCAVATION AND BACKFILL

PART 1: GENERAL

1.01 DESCRIPTION

The work of this section consists of all structure excavation and backfill required to complete the work, including rock excavation and furnishing select or imported backfill. It includes disposal of surplus or unsuitable material.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 01300: Submittals
- B. Section 02100: Demolition, Clearing, Grubbing, and Stripping
- C. Section 02140: Dewatering
- D. Section 02200: Earthwork
- E. Section 02223: Trenching, Backfilling, and Compacting

1.03 QUALITY ASSURANCE

Evaluation of all fill materials and testing required to determine compliance for the work of this section will be the responsibility of the Contractor and at the Contractor's expense. Areas where test results indicate noncompliance shall be corrected before placing additional backfill.

1.04 PROJECT CONDITIONS

Excavations should be performed carefully to avoid damaging existing underground utilities and adjacent structures. Adjacent improvements should be monitored by the Contractor so that excavation methods and support systems can be modified in a timely manner, if surface deflections are observed.

Take necessary precautions to prevent the entrance of soils and other materials into streambeds, lakes, or water courses.

1.05 RELATIVE COMPACTION TEST

- A. The Contractor will test for compaction every 100 square feet at locations determined by the Engineer.
- B. Relative compaction is defined as the ratio, in percent, of the as-compacted dry density to the laboratory maximum dry density. The laboratory maximum dry density is defined in accordance with ASTM D1557, latest edition.
- C. Where compaction tests indicate a failure to meet the specified compaction, the Contractor will take additional tests every 50 square feet in each direction until the extent of the failing area is identified. Rework the entire failed area until the specified compaction has been achieved.

PART 2: MATERIALS

2.01 ENGINEERED FILL

See Section 02200 for Material Requirements.

2.02 CRUSHED ROCK

Material shall be crushed rock of one-inch (1") maximum size, with no material passing a Number four (#4) sieve.

2.03 AGGREGATE BASE

Aggregate base shall be Class 2 aggregate base, ¾" maximum as specified in Section 26 of the most recent California Department of Transportation Standard specifications.

2.04 DRAIN ROCK

Drain rock shall be Class 1, Type B permeable material as specified in Section 68 of the most recent California Department of Transportation Standard specifications.

2.05 DRAIN ROCK FABRIC

Drain rock fabric shall be non-woven geotextile fabric.

PART 3: EXECUTION

3.01 CLEARING

Perform clearing operations in accordance with Section 02100.

3.02 STRUCTURAL EXCAVATION

- A. General: All excavation for structures shall be done to the dimensions and levels indicated on the drawings or specified herein.
 - 1. Under all structures, the Contractor shall:
 - a. Excavate to sub-grade, remove and dispose of organic material and unsuitable soils.
 - b. Scarify the surface a minimum depth of 12 inches; bring the moisture content to at least 3 percent above optimum and compact to not less than 90 percent relative compaction.
 - c. Place Engineered Fill in 8-inch maximum lifts to obtain sub-grade elevations. Compact to not less than 95 percent relative compaction and at a moisture content of at least 2 percent above optimum.
 - 2. Under all pavements, the Contractor shall:
 - a. Excavate to below sub-grade, remove and dispose of organic material and unsuitable soils.

- b. Scarify the surface a minimum depth of 12 inches; bring the moisture content to at least 3 percent above optimum and compact to not less than 95 percent relative compaction.
 - c. Place Engineered Fill in 8-inch maximum lifts to obtain sub-grade elevations. Compact to not less than 95 percent relative compaction and at a moisture content of at least 2 percent above optimum.
3. Under all embankments, the Contractor shall:
- a. Excavate to below sub-grade, remove and dispose of organic material and unsuitable soils.
 - b. Scarify the surface a minimum depth of 12 inches; bring the moisture content to at least 3 percent above optimum and compact to not less than 95 percent relative compaction.
 - c. Place Engineered Fill in 8-inch maximum lifts to obtain sub-grade elevations. Compact to not less than 95 percent relative compaction and at a moisture content of at least 2 percent above optimum.

Excavation shall be made to such width outside the lines of the structure to be constructed therein as may be required for proper working methods, the erection of forms and the protection of the work. Care shall be taken to preserve the foundation surfaces shown on the drawings in an undisturbed condition. If the Contractor excavates or disturbs the foundation surfaces shown on the drawings or specified herein without written authorization of the Engineer he shall replace at his expense such foundations with compacted gravel foundation fill or other material approved by the Engineer in a manner which will show by test an equal bearing strength with the undisturbed foundation material.

- B. Bracing, Sheeting, and Shoring: Care shall be exercised in excavating for lower footings not to disturb bearing under higher adjacent footings or structures. Existing structures and pipework shall be adequately braced and cared for so that no damage will result. The Contractor shall submit structural calculations and drawings signed and sealed by a civil engineer registered in the State of California showing members, connections, and anchorage of the proposed bracing, sheeting, and shoring. The Contractor shall provide suitable sheeting and shoring, where necessary, for protection of the excavations. All such sheeting and shoring shall be removed unless otherwise specifically authorized.
- C. Unsuitable Materials: To suit field conditions, excavation below the depths shown may be ordered, but changes may only be made as directed. Soft, spongy, or unsuitable bearing material of any kind shall be entirely removed down to solid bearing soil and replaced with an engineered fill as specified herein. In such event only the excess excavation and fill will be paid for as extra work.
- D. Dewatering: Any water that may be encountered or that may accumulate in excavations shall be removed and kept out by pumping or other approved methods, and all construction shall be carried on in the dry. Water shall be kept down until structures are complete to above water, safe from uplift and horizontal water pressure and the backfill has been placed. Dewatering shall be in accordance with Section 02140.
- E. Approval of Excavation: The Contractor shall notify the Engineer when excavation for a structure is complete and no forms, reinforcing steel or concrete, shall be

placed until the excavation has been deemed acceptable by the Engineer. Once the excavation is deemed acceptable, the Contractor must protect the work from flooding or groundwater uplift.

- F. Disposal of Waste Excavation: Excavated material determined by the Engineer to be unsuitable, or in excess of the amounts required for backfill shall be disposed off-site at no additional cost to the Owner.

3.03 ENGINEERED FILL

- A. General: All soil under structures, pavements, embankments, and at other locations where indicated on the drawings shall be made using Engineered Fill sub-base, carefully controlled and compacted on a prepared surface.
- B. Surface Preparation: The surface on which fill is to be placed shall be free of all vegetation, debris, or other objectionable material, and all large roots shall be grubbed out to a depth of at least 2 feet below footing, slab, or pavement elevations and 5 feet beyond the limits of the proposed improvements. The surface shall be scarified to a depth of 12 inches, brought to a moisture content of optimum plus approximately 2 percent. It may be necessary to adjust the moisture content of the sub-grade soil by watering or aeration to bring the moisture content of the soil near optimum in order that the specified densities can be obtained.
- C. Placement of Fill:
 - 1. Fill materials shall be spread in a maximum of 8-inch lifts and shall have uniform moisture content that will provide the specified dry density after compaction. If necessary to obtain uniform distribution of moisture, water shall be added to each layer by sprinkling and the soil disced, harrowed, or otherwise manipulated after the water is added. If the material is too wet, the moisture content shall be reduced as necessary by spreading and aerating.
 - 2. Field density tests shall be used to check the compaction of the fill materials. Sufficient tests shall be made on each layer by the Engineer to assure adequate compaction throughout the entire area. If the dry densities are not satisfactory, the contractor will be required to increase the weight of the roller or the number of passes as required to produce the specified densities.
 - 3. Where trenches must be excavated in Engineered Fill these trenches shall be backfilled with the fill materials excavated. The backfill shall be placed in 6 inch layers and each layer compacted with pneumatic tampers to provide densities as specified above. Backfill placed adjacent to walls shall be placed in a similar manner to that specified for backfill in excavated trenches.
 - 4. No fill shall be placed during weather conditions which will alter the moisture content of the fill materials sufficiently to make adequate compaction impossible. After placing operations have been stopped because of adverse weather conditions, no additional fill material shall be placed until the last layer compacted has been checked and found to be compacted to the specified densities.

3.04 BACKFILL AGAINST STRUCTURES

Material for filling and backfilling around structures shall meet the requirements for Engineered Fill. Should the material available from excavation be insufficient or

unsuitable for the required use, the Contractor shall furnish and place suitable material. Do not place backfill against newly constructed concrete structures for a period of 14 days unless authorized by the Engineer. Hand operated compactors shall be used for backfilling against concrete walls within a horizontal distance of H/2 of the structure, where H is defined as the vertical height of the backfill above the foundation. Backfill shall be placed in even, uniform lifts around the structure.

3.05 TEMPORARY EXCAVATION SLOPES

Based on the conditions encountered in exploratory borings, including shallow groundwater and zones of granular soil type the site may be considered OSHA "Type C". The Contractor shall have an OSHA-approved competent person onsite during excavation and pipe placement to evaluate trench/excavation conditions and to make appropriate recommendations where necessary.

Sloughing and caving should be anticipated, particularly in area with seepage zones of poorly grade, cohesionless sands. Flatter slopes, shoring, or safety shields may be needed in areas where sloughing raveling or running is likely. The Contractor shall have equipment readily available to flatten slopes or install shoring if necessary. Loose or easily erodible soils may be present locally and should be removed from excavation faces before personnel begin work below the slopes. In addition, stockpiled materials, equipment and other surcharge loads should be kept back a minimum distance from the top of the trench equal to the depth of the excavation.

3.06 EXCAVATION BOTTOM CONDITIONS

Based on conditions encountered in our exploratory borings, materials exposed at the base of excavations are expected to be variable ranging from lean clay with sand and gravel to silty sand with gravel.

Generally, some form of excavation bottom stabilization will be necessary where wet, unstable soils are exposed. Since we do not know the extent of potential locally soft or unstable areas, our field representative shall provide mitigation recommendations in the field at the time of construction. Typical mitigation alternatives include overexcavation and replacement with a gravel mat wrapping in geosynthetic fabric to prove a stable bottom.

The weight of pipe, contents and compacted backfill above the pipe will not result in significant increased load over present overburden. Assuming soft and/or unsuitable subgrade areas are mitigated, pipeline settlement should be negligible.

END OF SECTION

SECTION 02270

STORMWATER RUNOFF CONTROL PROGRAM

PART 1: GENERAL

1.01 DESCRIPTION

- A. This section describes work necessary by the Contractor to allow the Owner to comply with the current California State Water Resources Control Board (SWRCB) General Construction Activity Storm Water Permit No. CAS000002 (General Permit) for discharges of stormwater associated with construction activities. Specifically, this includes the implementation of a Stormwater Pollution Prevention Plan (SWPPP) should disturbance exceed 1 acre, an erosion control plan (ECP) for projects less than 1 acre and Monitoring and Reporting Plan. The Contractor will be responsible for compliance with the General Permit and any other applicable stormwater regulations. The Contractor will be required to produce a SWPPP or ECP and M&RP, pursuant to the requirements of the General Permit.
- B. This specification, in addition to specification Sections 02273, detail the minimum essential elements of the SWPPP, ECP and Monitoring Reporting Program. Should the disturbed land area exceed 1 acre, the Contractor will be responsible for composing a complete SWPPP that includes all elements set forth in Section A, "Storm Water Pollution Prevention Plan", of the General Permit. An Erosion Control Plan (ECP) shall be submitted to the City of Oroville based on the Butte County Erosion Control Plan Submittal requirements. The Contractor will also be responsible for composing an M&RP that satisfies the requirements set forth in Section B, "Monitoring Program and Reporting Requirements", of the General Permit.
- C. The Contractor will be responsible for obtaining coverage under the General Permit and finalizing the SWPPP or approval of an ECP and M&RP prior to commencing construction. The SWPPP or ECP and M&RP must be approved by the Engineer before they are considered finalized.
- D. Disposal of construction water from operations such as groundwater dewatering and water used for testing, disinfecting, and flushing pipelines is not part of the work under this section. Refer to Sections 02140 and 02223 for permit requirements for those discharges.

1.02 RELATED WORK DESCRIBED ELSEWHERE

- A. Section 01300: Submittals
- B. Section 02223: Trenching, Backfilling, and Compacting
- C. Section 02273: Construction Activities Stormwater Best Management Practices

1.03 STATE CONSTRUCTION PERMIT COVERAGE

- A. It is the responsibility of the landowner to obtain State CGP coverage for planned construction activities prior to the commencement of work. To apply for coverage, the landowner, or his/her Legal Responsible Person (LRP) must electronically submit through the State's Storm Water Multiple Application and Report Tracking

System (SMARTS), a Notice of Intent (NOI), a SWPPP, and other documents required by the CGP, and mail the appropriate fee to the SWRCB. This request to the State will provide, if approved, coverage under the State's General NPDES permit for construction activities. Coverage under the permit is not complete until a SWPPP and Permit Registration Documents (PRD's) are electronically submitted, the appropriate fee is paid, and a Waste Water Identification Number (WDID) is assigned by the RWQCB.

- B. The General Permit for Construction Activity requires the SWPPP address water pollution control during construction. The SWPPP must outline the Best Management Practices (BMP's) planned for use on the site to prevent pollutants from leaving the project site. The BMP's should include, but are not limited to:
1. Erosion controls
 2. Wind erosion controls
 3. Sediment controls
 4. Non-stormwater runoff controls
 5. Tracking controls
 6. Waste management controls
 7. Materials pollution controls
 8. Advanced treatment methods

1.03A PROJECTS ONE ACRE OR MORE

- A. The City's Public Works Department requires the submission of a SWPPP prior to the issuance of an Improvement Plan, Grading Permit or Encroachment Permit. The following procedures apply to construction sites that disturb one acre or more of land or are part of a larger project that disturbs one acre or more.
1. The landowner or LRP shall submit PRD's to the SWRCB in compliance with the NPDES General Stormwater Construction Permit before construction commences. The following steps are provided as guidance for obtaining State permit coverage:
 - a. Access the SWRCB Stormwater Multi Application Reporting and Tracking (SMARTS) website at:
www.swrcb.ca.gov/stormwtr/construction.html
 - b. Electronically submit all required PRD's which include but are not limited to:
 - 1) Notice of Intent
 - 2) Risk Assessment (Standard or Site-Specific)
 - 3) Site Map
 - 4) SWPPP
 - 5) Signed Certification Statement

- c. Mail the appropriate annual fee, to the State Water Board via certified mail no later than seven days prior to commencement of construction activities.
 - d. Permit coverage shall not commence until the PRD's and the annual fee are received by the State Water Boards, and a WDID number is assigned and sent by SMARTS.
 - e. Complete a hard copy of the site specific SWPPP identical to that uploaded to the SMARTS and submit it to the City of Oroville at the same time Improvement Plans are submitted.
- B. The SWPPP, as described in the CASQA Handbook for Construction requires the use of stormwater BMP's tailored to the circumstances of a particular site or project. The SWPPP has two main objectives: 1) identify pollutant sources, and 2) describe practices to reduce sediment transport of pollutants in stormwater discharges. Specific requirements can be obtained from the RWQCB, and at the following website: <http://www.cabmphandbooks.com>.
- C. The Applicant shall submit a complete SWPPP to the City's Public Works, Engineering, and Economic Development Departments concurrent with the Improvement Plan review and approval process. Submittal of the SWPPP shall be a condition of the Improvement Plan, Grading Permit and Encroachment Permit issuance. The hard copy SWPPP shall be submitted to the City in a three ring binder. Only one set is required.
- D. The City's Development Section Staff will then perform a cursory review of the SWPPP for completeness, general conformance, and adherence for the following objectives:
1. All pollutants and their sources, including sources of sediment associated with construction, construction site erosion and all other activities associated with construction activity are controlled;
 2. Where not otherwise required to be under a RWQCB permit, all non-storm water discharges are identified and either eliminated, controlled, or treated;
 3. Site BMP's are effective and result in the reduction or elimination of pollutants in storm water discharges and authorized non-storm water discharges from construction activity to the BAT/BCT standard;
 4. Calculations and design details as well as BMP controls for site run-on are complete and correct, and
 5. BMP's installed to reduce or eliminate pollutants after construction are completed and maintained. The site specific SWPPP shall also include:
 6. Vicinity Map showing nearby roadways, the construction site perimeter and geographic features and general topography surrounding the site.
 7. A site map showing the construction project in detail including site layout, construction site boundaries, drainage areas, discharges locations, sampling locations, areas of soil disturbance (temporary or permanent), active areas of soil disturbance (cut or fill), locations of all runoff BMP's, a description of the type and location of erosion control and sediment control BMP's, Active Treatment System (ATS) location (if applicable), locations of sensitive habitats, watercourses, or other features which are not to be disturbed,

locations of all post-construction BMP's, and locations of storage areas for waste, vehicles, service, loading/unloading of materials, access (entrance/exits) points to construction site, fueling, water storage, and water transfer for dust control and compaction practices.

8. A detailed, site-specific listing of the potential sources of stormwater pollution.
 9. Identify and provide methods to implement BMP inspection, visual monitoring, Rain Event Action Plan (REAP) and Construction Site Monitoring Program (CSMP) requirements to comply with the Construction General Permit.
 10. The name and telephone number of the Qualified SWPPP Practitioner (QSP) responsible for implementing the SWPPP.
 11. Certification/signature by the landowner/LRP and the Qualified SWPPP Developer (QSD) responsible for developing the SWPPP.
 12. A WDID number assigned by the RWQCB,
- E. Once the Development Section records the SWPPP and determines completeness, an acknowledgment sheet is inserted into the SWPPP binder, as well as a tabbed divider, at the rear of the binder for on-site City staff and contractor reference. This document will then be forwarded to the assigned Stormwater Inspector (SWI) along with the approved improvement plans. A pre-construction meeting date may be scheduled by the Applicant following approval of the SWPPP, Improvement Plans, Grading and Encroachment Permit. A pre-construction meeting agenda may be forwarded to the Applicant upon request.
- F. Both the Stormwater and Construction Inspectors' may be present at the pre-construction meeting to discuss contractor expectations for SWPPP compliance. City inspection staff will return the SWPPP binder to the project's QSP during the meeting. The SWPPP must be kept on-site for the duration of the entire construction phase of the project. The inspectors will explain the City's construction stormwater runoff inspection and enforcement procedures during this meeting. Project compliance procedures required of the QSP, QSD and/or the LRP will include, but are not limited to:
1. Keeping the project SWPPP up to date and at the job site.
 2. Inspect all BMP's before, during and after rain events. Keep written comments on failures and corrections.
 3. SWPPP site plan shall be kept current showing changes and updates.
 4. Properly install and maintain BMP's.
 5. Practice good housekeeping.
 6. Eliminate or minimize tracking from construction entrances and exits by utilizing an all- weather rock entrance (see Detail BMP – 9).
 7. Sweep/vacuum streets and obtain clearance from Construction Inspector before washing.

8. Contain and/or treat wash water from power washing operations and dispose of it appropriately.
 9. Maintain drain inlet protection liners and bags and ensure that the area around storm drains is kept clean.
 10. Develop and implement a REAP 48 hours prior to any likely precipitation event (A likely precipitation event is any weather pattern that is forecast to have a 50% or greater probability of producing precipitation in the project area per the National Weather Service Forecast Office.
 11. Electronically submit all sampling, exceedance, and annual reporting; all change of information (COI), and any revisions or amendments to the project SWPPP to the SWRCB through the SMARTS website.
 12. State Construction General Permit coverage will include additional requirements within the SWPPP. (Refer to Order No 2009-0009-DWQ)
- G. City staff will conduct stormwater inspections once a week during the construction process. Site visits will consist of completing the standard a Stormwater Inspection Form. An electronic copy of the Stormwater Inspection Form will be emailed to the project site's QSP. The QSP can print a copy of the inspection report to be inserted in the tabbed section of the SWPPP binder, or the report can be filed electronically. Whichever method is used is acceptable as long as the report can be reproduced at the request of either any City, or RWQCB inspection staff member. It shall be the QSP's responsibility to confirm the copy of the Stormwater Inspection Report is reviewed and filed appropriately, and to correct reported non-compliance issues weekly or as directed. If reports are missing, the site maybe issued a non-compliance inspection report.
- H. If violations are found by the inspector, the QSP will be notified of the violation. The City of Oroville will provide at the pre-construction meeting the City's enforcement procedures for stormwater quality violations. Also, the RWQCB staff may also intermittently inspect sites for stormwater runoff compliance and consult with City stormwater inspection staff. The QSP is encouraged to participate in the site inspections with the Stormwater or Construction Inspector. It is essential, in a timely manner, to address the control of all potentially polluted runoff from the site together, as a team, the City Inspector and the owner's QSP.
- I. City Inspectors may conduct construction site inspections prior to anticipated storms, after storm events, and every 24 hours during extended storms, as well as other times, to find areas contributing to stormwater discharge and to determine if the requirements of the site SWPPP are adequate and properly implemented. The QSP is required, under the State permit, to perform pre and post storm inspections, as well as weekly inspections throughout the entire year. The discharger must immediately make corrections if it is found after a storm that BMP's are damaged or inadequate for protection of water quality.
- J. City Inspectors will also review SWPPP binders for completeness, BMP adequacy, as well as weekly and pre and post inspections documented by the contractor. On-site SWPPP binders need to be kept current with site conditions and shall include full descriptions that explain any changes made to the original plan. The SWPPP is a dynamic document, which is likely to change throughout the construction process. City Inspectors will perform stormwater quality inspections once a week at a minimum.

- K. The Contractor/QSP is responsible for correcting BMP deficiencies immediately. When appropriate, a written or verbal notice of non-compliance will be given to the QSP via the City's Inspection Report, City Inspector, or Regional Board staff. Continued noncompliance at a site will provide justification for the City to issue a Notice of Violation (NOV) which could result in suspending inspections and/or issuing a Stop Work Notice, including recommendation to the RWQCB to inspect the site for violations.
- L. Upon completion of the construction phase, the Applicant shall terminate the specific coverage under the CGP by submitting via the SMARTS a Notice of Termination (NOT) to the RWQCB that certifies that:
1. Construction activity is completed.
 2. All parts of the SWPPP have been completed.
 3. Construction and equipment maintenance waste have been disposed of properly.
 4. The site complies with all local stormwater management requirements.
 5. All disturbed areas of the construction site are stabilized per the General Permit.

Along with submitting to the State a NOT, the owner must remove all temporary construction BMP's: drop inlet filter bags, fiber rolls (wattles), and gravel bags. Additional required clean-up includes the removal of any sediment that has collected in the storm drain system or around any of the storm drain inlets.

- M. The discharger may reduce or increase the total acreage covered under this General Permit when a portion of the site is complete and/or conditions for termination of coverage has been met; when ownership of a portion of the site is sold to a different entity; or when new acreage, subject to this General Permit, is added to the site. Within 30 days of a reduction or increase in total disturbed acreage, the discharger shall electronically file revisions to the PRD's that include:
1. A revised NOI indicating the new project size;
 2. A revised site map showing the acreage of the site completed, acreage currently under construction, acreage sold/transferred or added, and acreage currently stabilized in accordance with the Conditions for Termination of Coverage.
 3. SWPPP revisions, as appropriate; and
 4. Certification that any new landowners have been notified of applicable requirements to obtain General Permit coverage. The certification shall include the name, address, telephone number, and e-mail address of the new landowner.
 5. If the project acreage has increased, dischargers shall mail payment of revised annual fees within 14 days of receiving the revised annual fee notification.
 6. The discharger shall continue coverage under the General Permit for any parcel that has not achieved "Final Stabilization".

7. When an LRP owns property with active General Permit coverage and the LRP sells the property, or a parcel thereof, to another person, that person shall become an LRP with respect to whatever parcel was sold. The existing LRP shall inform the new LRP of the General Permit's requirements. In order for the new LRP to continue the construction activity on its parcel of property, the new LRP, or the new LRP's approved signatory, must submit PRD's in accordance with this General Permit's requirements.
- N. The Discharger is responsible for maintaining SWPPP records for three years. Quarterly and annual reports are also requirements of the Construction General Permit. More specific information on report requirements can be obtained from accessing Section XVI, Annual Reporting Requirements (Order No 2009-0009-DWQ).

1.04 PROJECTS LESS THAN ONE ACRE

- A. SWPPP's and State NPDES permits are not required for projects under one acre within the City, unless they are part of a larger development encompassing over one acre, in which case, the procedures listed above are required. For projects less than one-acre, an erosion and sediment control plan shall be submitted with the improvement plans to the City for approval. This is generally part of the Grading Plan for the development. The Public Works Department, Development Section, will approve the erosion and sediment control plan upon review of the project. All erosion and sediment control devices shall be identified and implemented in the same fashion as projects with SWPPP's over one acre. Enforcement will be conducted similarly, with exception to SWPPP administrative requirements.

1.05 ENFORCEMENT PROCEDURES

- A. The City of Oroville prohibits polluted stormwater discharges from entering the City storm drainage system, watercourse, natural outlet or channel. The City has the authority to make inspections to enforce water quality, and to issue stop work orders for polluted discharges.

1.06 ABANDONED/INACTIVE CONSTRUCTION SITES ONE ACRE OR MORE

- A. Should a new development project with a valid State Stormwater Permit and WDID number become abandoned or inactive during the course of construction and at the discretion of the City's staff will initiate the following procedure.
 1. Determine the stability of the construction site as it relates to storm water runoff and conformance with the approved SWPPP.
 2. If the site is unstable and has the potential to adversely impact receiving water quality, the City will contact the owner/developer by telephone, written letter, and/or electronic mail within 14 days of determining the project has been abandoned or inactive. Inform the owner of the current status and encourage them to stabilize the site according to the project's SWPPP.
 3. Conduct Stormwater site inspection after 21 days of determining the project has been abandoned or inactive, or as applicable to determine if adequate BMP's were installed to establish stability and monitor through the wet season by communicating with the owner/developer representative via periodic Stormwater inspections.

4. Should the owner/developer be unresponsive, uncooperative, or fails to install adequate BMP's as defined above, a City citation and/or RNOV will be issued. If the site is not properly addressed, then the Stormwater project file will be forwarded to the RWQCB staff for further processing and handling.

1.06A LESS THAN ONE ACRE

- A. Should a new development project with a current encroachment permit or subdivision agreement from the City become abandoned or inactive at the discretion of the City, the City will initiate the following procedure.
 1. Determine if the construction site is unstable and without proper stabilization and has a potential to impact water quality.
 2. Attempt to make contact with the owner/developer by telephone, written letter, and/or electronic mail prior to the wet season, or as necessary.
 3. Inform the owner/developer of the current status and encourage him/her to stabilize the site according to the approved plans and the City Standards before the first rain event.
 4. Conduct Stormwater site inspection to determine if adequate BMP's were installed to establish stability and monitor through the wet season by communicating with the owner/developer representative.
 5. Should the owner/developer be unresponsive, uncooperative, or fails to install adequate BMP's as defined above, a City citation and/or RNOV will be issued. If the site is not properly addressed, then the Stormwater project file will be forwarded to the City Attorney's Office for further processing and handling including bond recovery proceedings.

1.07 CITY REPORTING

- A. By September 15th of each year, the City is required to submit an annual report to the RWQCB describing the City's stormwater management program's effectiveness in accordance with the State's General Permit for MS4's. In part, the report encompasses goal expectations for the construction element of the permit. As such, the Public Works Department, Engineering Division, Construction Management Section, will maintain permanent records of all active SWPPP's including inspection reports, and maintain for three years following each project NOT.

For detailed BMP information including a SWPPP template, see the California Stormwater Quality Association (CASQA) web site at: www.cabmphandbooks.com. For online training courses based on the CASQA handbooks, go to the California State University web site at: www.owp.csus.edu/research/bmpcourses.

1.08 SUBMITTALS

Within ten (10) calendar days after issuance of the Notice of Award, the Contractor shall submit (as per Section 01300, Submittals), at a minimum, the following information for review and, upon approval by the Engineer, incorporation into the SWPPP:

- A. SWPPP Compliance Certification-Contractor;

- B. Contractor's Summary of Responsibilities;
- C. Erosion Prevention Plan, narrative and detailed graphic (figures shall not be at scales greater than 100 feet per inch);
- D. Sediment Control Plan, narrative and detailed graphic (figures shall not be at scales greater than 100 feet per inch);
- E. Stormwater pollution prevention training descriptions for both the Project Engineer and Project BMP Installation Trainer(s);
- F. Project Construction Schedule (refer to Caltrans BMP #SS-1 in Appendix B);
- G. BMP Selection and Implementation Schedule (Appendix B);
- H. Contractor's weather forecast source (i.e., website or Company and report name) for storm event preparation;
- I. Hazardous Materials Inventory List with reference to Contractor's Hazardous Materials Business Plan (Federal and County requirement);
- J. Safety Plan: Cal OSHA. Title 8, Chapter 4, Subchapter 4 - Construction Safety Orders Sections 1500 through 1938 and Subchapter 7 – General Industrial Safety Orders, with emphasis on chemical handling and storage (refer to www.dir.ca.gov/samples/search/query.htm).

The submittal shall detail the Contractor's selected BMPs with brief justification on why that BMP is selected, the intended installation date and location on the site. BMP materials and specifications shall be provided, including, where applicable, reference to BMPs described in Specification Section 02273. If the Contractor believes additional or alternative BMPs are necessary, details shall be provided. The Contractor will be required to revise or supplement submitted information that is inadequate or incomplete in the opinion of the Engineer.

Once the information is compiled, the Contractor will finalize and submit the proposed SWPPP or ECP to the Owner and Engineer for final acceptance. The SWPPP or ECP will be posted on-site for reference in compliance monitoring.

In the event the Contractor desires to implement environmental protection BMPs differently than detailed in the Plans and Specifications, SWPPP or the ECP, the Contractor may provide a submittal with his alterations/amendments to the Engineer. All alterations or amendments must get prior authorization from the Engineer as outlined in the SWPPP or ECP. However, if the Contractor desires to implement alternative BMPs to those detailed exclusively in the SWPPP or ECP for an emergency repair to prevent an offsite discharge, he may do so without prior consent. No schedule delays will be allowed due to BMP revisions proposed by the Contractor, unless authorized by the Owner.

1.09 MEASUREMENT AND PAYMENT

The Contractor shall be responsible for all costs associated with the development of the SWPPP or ECP and M&RP. The Contractor shall be responsible for the implementation of the SWPPP or ECP and M&RP. This includes the installation, maintenance, and removal of erosion and sediment control practices specified in the SWPPP or ECP upon

completion of the project or as requested by the Engineer. These costs shall be included in the lump sum bid amount.

PART 2: MATERIALS

2.01 STORMWATER POLLUTION PREVENTION PLAN

- A. The Contractor shall utilize all materials as approved and as necessary to implement a successful SWPPP in accordance with the requirements specified in the General Permit. Refer to Section 02273 for material used in additional BMPs.
- B. The Contractor is responsible for implementing the Best Management Practices to maintain positive pollution prevention, as described in the SWPPP, in response to the monitoring program reports, or as circumstances require. Materials, and the costs thereof, for stormwater pollution prevention are the responsibility of the Contractor.

2.02 EROSION CONTROL PLAN

- A. The Contractor shall utilize all materials as approved and as necessary to implement a successful ECP in accordance with the requirements specified in the General Permit and the Butte County Erosion Control Plan Requirements. Refer to Section 02273 for material used in additional BMPs.
- B. The Contractor is responsible for implementing the Best Management Practices to maintain positive pollution prevention, as described in the ECP, in response to the monitoring program reports, or as circumstances require. Materials, and the costs thereof, for stormwater pollution prevention are the responsibility of the Contractor.

PART 3: EXECUTION

3.01 GENERAL

- A. The SWPPP, ECP and M&RP shall be developed by the Contractor and submitted to the Owner. The SWPPP, ECP and M&RP must be accepted by the Owner and approved by the Engineer prior to commencement of construction activities in the field.
- B. The Contractor will provide, at a minimum, site specific information as listed in this section, Submittals.
- C. The Contractor shall comply with all conditions identified in the General Permit, which could apply to the work under this contract.
- D. The Contractor shall be responsible for the compliance of his personnel and subcontractors with the SWPPP or ECP and the implementation of the M&RP.
- E. The SWPPP (document) and ECP shall be kept on site during construction activity and made available upon request of a representative of the SWRCB and/or other regulatory agency.
- F. The Contractor shall employ BMPs as detailed in the SWPPP and ECP during construction operations to adequately prevent the discharge of pollutants to surface waters, including the municipal storm sewer system.

3.02 STORMWATER POLLUTION PREVENTION PLAN

The SWPPP shall include all the requirements set forth in Section A, "Storm Water Pollution Prevention Plan", of the General Permit. The SWPPP shall provide a description of potential sources which are likely to add significant quantities of pollutants to stormwater discharges or which may result in non-stormwater discharges from the construction site. The SWPPP, similar to this specification Section and specification Section 02273, also provides guidelines on how to prevent potential pollutants and commingled waters from leaving the site, as well as wind-induced sediment transport.

3.02A EROSION CONTROL PLAN

The ECP shall include all the requirements set forth Butte County Erosion Control Plan Requirements. The ESP shall provide a description of potential sources which are likely to add significant quantities of pollutants to stormwater discharges or which may result in non-stormwater discharges from the construction site. The ECP, similar to this specification Section and specification Section 02273, also provides guidelines on how to prevent potential pollutants and commingled waters from leaving the site, as well as wind-induced sediment transport.

3.03 MONITORING AND REPORTING PROGRAM

- A. The Contractor shall implement the M&RP. The Contractor shall also be responsible for monitoring and inspecting his actions and the activities of those responsible to the Contractor.
- B. Monitoring and Inspection:
 - 1. The Contractor will be responsible for completing a Weekly Activity Log, which includes documentation of the following information:
 - 2. Location (using grid map) of weekly construction activities;
 - 3. Confirmation that the appropriate BMPs have been installed per the respective BMP specifications;
 - 4. Confirmation that each BMP is being properly maintained per the respective BMP specifications;
 - 5. Any corrective action taken by the Contractor to ensure proper BMP installation and maintenance;
 - 6. Confirmation that proper housekeeping is being maintained at the site;
 - 7. Confirmation that trash/debris is being controlled and properly stored in covered containers;
 - 8. Confirmation that identified oil spills/leaks are being cleaned up and the contaminated waste and soils are being properly stored and disposed of; and,
 - 9. Evidence that any leaking equipment or vehicles are being taken out of service and repaired prior to continued use.

The Contractor's Weekly Activity Log input will be reviewed for accuracy and completeness by the Engineer or an assigned representative of the Owner. The

weekly logs become a part of the Stormwater SWPPP or ECP/M&RP as partial evidence of compliance with stormwater management regulations. Any deficiencies identified by the Engineer will be brought to the Contractor's attention and shall be corrected at no additional cost to the Owner.

In addition to the weekly Activity Log, it is the Contractor's responsibility to report to the Owner any discharges immediately after discovery. At the Owner's discretion, the Contractor may be required to notify the appropriate regulatory agency (i.e. Regional Board, DHS). These discharges may include, but are not limited to:

1. Fuels
2. Oils
3. Chemicals
4. Sanitary wastes
5. Process and wash waters
6. Sediment laden waters

The Contractor shall allow representatives of the Owner, the Agency, the SWRCB, and/or other regulatory agencies to enter the construction site, inspect the construction site for compliance, and sample and monitor the construction site discharges.

The M&RP may extend past the completion date for this contract. The Contractor's responsibilities for the M&RP will cease upon closure of three conditions: 1) acceptance by the Owner of all work under the contract; 2) the Contractor submits information to the Engineer verifying the site meets the criteria for the Notice of Termination (a notice of termination is not required for an ECP, but the city reserves the right to hold the contractor accountable to the requirements of the NOT), which the Contractor will submit to the SWRCB for approval (pursuant to SWPPP); and, 3) final acceptance not given by Owner until the SWRCB issues approval of the NOT (pursuant to SWPPP).

3.04 DUTY TO COMPLY

- A. The Contractor shall comply with all conditions identified in the General Permit, SWPPP, ECP and M&RP. Nonadherence with the conditions specified in the General Permit may constitute a violation of the Clean Water Act and the Porter-Cologne Water Quality Control Act and may be grounds for enforcement action by the State, which can carry civil or criminal penalties (some cases under Porter-Cologne exceed CWA penalties of \$25,000 per day).
- B. The Contractor shall take all reasonable steps to minimize or prevent any discharge in violation of the General Permit and degradation of water quality due to construction activities.

3.05 SWPPP COMPLIANCE CERTIFICATION

- A. An officer or other authorized representative of the Contractor shall certify the Contractor's stormwater handling roles and responsibilities by signing the "SWPPP

Compliance Certification” for the SWPPP, as well as annual reports required under the General Permit. The purpose of these forms is to certify that the construction activity is and has been in compliance or has been modified to comply with the requirements of the General Permit and the SWPPP.

- B. During construction, if the Contractor determines that he cannot maintain the site with all of the General Permit and SWPPP requirements, he shall notify the Engineer and Owner immediately. It shall be the responsibility of the Contractor to provide a written Notice of Noncompliance to the RWQCB within 30 days of knowledge of the following noncompliant conditions; which the Contractor may need to provide information for:
1. Failure to certify, by July 1 of each year, that the project’s construction activities are in compliance with the provisions of the SWPPP and the Construction General Permit;
 2. Failure to implement the BMPs listed within the SWPPP, in accordance with the schedule outlined within the SWPPP;
 3. Failure to conduct inspection, monitoring and/or reporting as described within the SWPPP; and/or
 4. Failure to initiate corrective actions to BMP breaches, failures and emergency situations.

END OF SECTION

SECTION 02273
CONSTRUCTION ACTIVITIES
STORMWATER BEST MANAGEMENT PRACTICES

PART 1: GENERAL

1.01 DESCRIPTION

This section describes the types of Construction Activity Best Management Practices (BMP) to be employed by the Contractor at the project site to reduce or eliminate sediment and other pollutants in stormwater and non-stormwater discharges during all phases of construction.

1.02 RELATED WORK DESCRIBED ELSEWHERE

- A. Section 02270: Stormwater Runoff Control Program
- B. Caltrans Storm Water Quality Handbooks, Construction Site Best Management Practices Manual, November 2000

1.03 SUBMITTALS

Prior to any equipment staging and/or earthwork activities, the Contractor shall provide the following:

- A. A list of BMP equipment vendors and suppliers to be used by the Contractor for this project, including the type(s) of BMP equipment to be provided by each vendor/supplier and equipment availability and delivery schedules.
- B. A list of qualified personnel/contractors who will be responsible for the following, as described further in this section:
 - 1. Coordinating BMP selection and implementation
 - 2. BMP Installation
 - 3. BMP Inspection and Reporting and Follow-Up
 - 4. BMP Maintenance and Repair
 - 5. BMP removal, if necessary

1.04 PERMITS

- A. The Contractor shall be responsible for the maintenance and update of the site-specific erosion prevention plan and sediment control plan as it pertains to the Contractor's project schedule and the location of his equipment and materials. These plans shall be included in the Contractor's Adopted Stormwater Pollution Prevention Plan (SWPPP).
- B. The Contractor shall be responsible for obtaining any necessary permits from regulating bodies. Obtaining dewatering permits shall be the responsibility of the Contractor.

1.05 MEASUREMENT AND PAYMENT

The Contractor shall be responsible for all costs associated with the procurement, installation, his inspection, maintenance and repair, and removal of any construction related stormwater BMP employed at the site.

PART 2: MATERIALS

2.01 FACILITIES AND EQUIPMENT

The Contractor shall provide all necessary facilities and equipment for the selection, installation, inspection, maintenance and repair, and removal of any construction related stormwater BMP employed at the site.

PART 3: EXECUTION

3.01 GENERAL REQUIREMENTS

- A. The Contractor, in consultation with the Engineer will select BMPs based on existing and anticipated site conditions.
- B. The Contractor will be responsible for providing the necessary equipment and materials to install, inspect and maintain selected BMPs, as described in this section and related Specifications.
- C. The Contractor will be responsible for ensuring the selected BMP equipment and materials are available and onsite with sufficient time to be installed prior to their required installation dates per the Contractor-developed BMP Selection and Implementation Schedule.
- D. The Contractor shall be responsible for ensuring the installation, inspection, maintenance and repair, and removal of any selected construction related BMP is done by qualified personnel. All temporary BMPs must be removed and immediate surrounds repaired and/or cleaned up at projects completion unless instructed by an Owner's Representative to not do so.
- E. The selection, installation, maintenance and repair of any construction related BMP shall, at the minimum, be in accordance with the following control documents:
 - 1. Erosion and Sediment Control Field Manual, prepared by the San Francisco Bay Water Quality Control Board, and adopted by the Central Valley Regional Water Quality Control Board
 - 2. Caltrans Stormwater Quality Handbook: Construction Site BMPs Manual, November 2000
 - 3. Caltrans Stormwater Quality Handbook: Construction Contractor's Guide and Specifications, April 1997
- F. The Contractor shall ensure that water conservation measures are implemented in accordance with Caltrans BMP# NS-1: Water Conservation Practices and Caltrans BMP# NS-7: Potable Water/Irrigation. At no time shall the use of water during construction create or contribute to an unapproved non-stormwater

discharge from the site. All non-stormwater discharges must be preapproved by the Engineer and must be documented in the site's Construction Stormwater Pollution Prevention Plan (SWPPP) prior to discharge.

- G. The Contractor shall ensure, to the extent practical, that clear water and run-on from offsite sources is directed around the construction site. Where it is not practical to divert run-on and/or concentrated flows around the construction site, the Contractor shall direct run-on and concentrated flows through the construction site in a non-erodible fashion. The diversion of run-on/concentrated flows shall be in accordance with Caltrans BMP# NS-5: Diversion of Clear Water Diversion, and the following concentrated flow conveyance controls:
 - 1. Caltrans BMP#SS-9: Earth Dikes/Drainage Swales and Lined Ditches
 - 2. Caltrans BMP#SS-10: Outlet Protection/Velocity Dissipation Devices
 - 3. Caltrans BMP#SS-11: Slope Drains
- H. The Contractor shall be responsible for obtaining a Dewatering General Permit for any dewatering activity, including removal and discharge of groundwater, accumulated rainwater and removing water from cofferdams or diversions, if necessary. Dewatering activities shall comply with the conditions of the Central Valley Regional Water Control Board's General Permit for Dewatering Activities and shall be in accordance with Caltrans BMP# NS-2 Dewatering Operations.
- I. Contractor is responsible to install and maintain BMPs until Notice of Completion by the Engineer. At least seventy percent (70%) of all disturbed areas must be stabilized prior to project acceptance by Engineer.

3.02 EROSION AND SOIL STABILIZATION CONTROLS

- A. The Contractor shall prepare a Construction Activity Schedule that addresses the conditions described in Caltrans BMP # SS-01: Scheduling. The Schedule shall be provided to the Engineer upon award of Contract and prior to any construction related activity occurring at the site. The Schedule shall, at the minimum, accomplish the following conditions to the extent practical:
 - 1. Minimize the length of time that soils are left exposed.
 - a. The Contractor shall ensure that protective erosion control measures, as described in this section, or equivalent BMPs, be implemented for any disturbed area that will remain exposed for more than 14 days.
 - b. All disturbed areas must be stabilized at least 48 hours prior to storm events utilizing the appropriate BMPs described in this section, or an equivalent BMP.
 - 2. Reduce the total area of exposed soils during the raining season (October 1 through May 30). Soil stabilization improvements shall be performed within 14 days after final grade is achieved or all other construction activity on that feature/region is inactive.
 - 3. At all times protect critical areas, including but not limited to drainage channels, creeks, natural water courses and sensitive natural resources (i.e., wetlands).

- B. The Contractor shall ensure that existing vegetation is preserved, and preservation measures are inspected and maintained, in accordance with Caltrans BMP # SS-2: Preservation of Existing Vegetation. ALL temporary construction fencing shall be removed at contract's end unless otherwise specified by Owner.
- C. Soil stabilization BMPs shall be limited to the following, unless the Contractor can recommend alternative BMPs that are deemed as effective by the Engineer:
 - 1. Hydraulic Mulch in accordance with Caltrans BMP# SS-3: Hydraulic Mulch.
 - 2. Hydroseeding in accordance with Caltrans BMP# SS-4: Hydroseeding.3. Tackifiers/Soil Binders: Caltrans BMP# SS-5: Soil Binders, provides supporting information.
 - 4. Straw Mulch: Caltrans BMP# SS-6: Straw Mulch provides supporting information.
 - 5. Erosion control blankets and mats: Caltrans BMP# SS-7: Geotextiles, Plastic Covers and Erosion Control Blankets and Mats provides supporting information.

3.03 SEDIMENT CONTROL BMPS

- A. Sediment control BMPs shall only be used in conjunction with erosion control BMPs. The use of sediment control BMPs in the absence of erosion control BMPs is not considered Best Conventional Pollutant Control Technologies (BCT) / Best Available Technologies Economically Achievable (BAT) and will not satisfy the compliance requirements of the Clean Water Act (i.e., the General Permit).
- B. Sediment control BMPs shall be limited to the following, unless the Contractor can recommend alternative BMPs that are deemed as effective by Engineer:
 - 1. Silt Fence in accordance with Caltrans BMP# SC-1: Silt Fence.
 - 2. Desilting/Sediment Settling Basin in accordance with Caltrans BMP# SC-2: Desilting Basin.
 - 3. Sediment Trap in accordance with Caltrans BMP# SC-3: Sediment Trap.
 - 4. Check Dams in accordance with Caltrans BMP# SC-4: Check Dams.
 - 5. Fiber Rolls in accordance with Caltrans BMP# SC-5: Fiber Rolls.
- C. The use of sandbags and gravel bags are not approved due to the potential to add pollutants to stormwater discharges. Straw bales are discouraged due to the extensive effort to properly install and maintain straw bales as an effective sediment control BMP.
- D. The Contractor shall provide for control of offsite discharge of sediments from wind and wind erosion. The use of soil binders or water as a wind erosion BMP shall be in accordance with this specification Section 3.01 (F) and/or Section 3.02 (C) (3).
- E. The Contractor shall stabilize construction entrances and exits in accordance with Caltrans BMP# TC-1: Stabilized Construction Entrance/Exit.

- F. The Contractor shall stabilize construction roadways in accordance with Caltrans BMP# TC-2: Stabilized Construction Roadway.

3.04 EQUIPMENT RELATED POLLUTANT BMPS

- A. Should the Contractor elect to conduct the following activities onsite at any time, the Contractor shall comply with the following BMPs:
 - 1. Equipment and vehicle cleaning shall be done in accordance with Caltrans BMP# NS-8: Vehicle and Equipment Cleaning.
 - 2. Fueling activities shall be done in accordance with Caltrans BMP# NS-9: Vehicle and Equipment Fueling. It is recommended that fuel trucks and equipment be equipped with “Cam-Loc” air tight vapor and liquid recovery systems to minimize fuel spills and releases.
 - 3. At no time shall open containers of equipment fluids be left uncovered and unsecured. Secondary containment shall be provided for all chemical and waste containers. Stacking of open or closed equipment fluid containers on top of other fluid containers on secondary containment pallets is prohibited.
- B. Equipment maintenance should be conducted as described below:
 - 1. To prevent or reduce the discharge of pollutants to stormwater from vehicle and equipment maintenance by running a “dry site”. This involves using off-site facilities, performing work in designated areas only, providing cover for materials stored outside, checking for leaks and spills, containing and cleaning up spills immediately, and training employees and subcontractors.
 - a. Keep vehicles and equipment clean; don’t allow excessive build-up of oil and grease.
 - b. Use off-site repair shops as much as possible. Maintaining vehicles and equipment outdoors or in areas where vehicle or equipment fluids may spill or leak onto the ground can pollute stormwater. If you maintain a large number of vehicles or pieces of equipment, consider using an off-site repair shop. These businesses are better equipped to handle vehicle fluids and spills properly.
 - c. If maintenance must occur on-site, use designated service areas located a minimum of 300 feet away from drainage courses. Surface drainage shall be diverted away/around service and staging areas to prevent the run-on of stormwater and the runoff of spills.
 - d. Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
 - e. Place a stockpile of spill cleanup materials where it will be readily accessible.
 - f. Use adsorbent materials on small spills rather than hosing down or burying the spill. Remove the adsorbent materials promptly and dispose of properly.
 - g. Regularly inspect on-site vehicles and equipment for leaks, and repair immediately.

- h. Do not allow leaking vehicles or equipment on-site. If fluid spills or leaking vehicles are detected, take immediate measures to stop the leak and/or properly clean the spill.
- i. Repair and maintenance activity shall not take place during wet weather conditions or within 24 hours of a predicted rain event.
- j. Segregate and recycle wastes, such as greases, used oil or oil filters, antifreeze, cleaning solutions, automotive batteries, hydraulic, and transmission fluids.
- k. Train employees and subcontractors in proper maintenance and spill cleanup procedures. All appropriate training sessions should be logged within the SWPPP.

END OF SECTION

SECTION 02400
SHEETING, WALING, AND SHORING

PART 1: GENERAL

1.01 DESCRIPTION

The work of this section covers protective installations consisting of shores, wales, braces, posts, piling, sheeting, anchorages and fastenings required for the work of this project.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 01300: Submittals
- B. Section 02140: Dewatering
- C. Section 02223: Trenching, Backfilling, and Compaction

1.03 QUALITY ASSURANCE

Design Criteria. Contractor shall design and construct temporary and permanent sheeting, shoring, and cofferdams, which are to be used as an aid in construction and portions shall be left in permanently to prevent sediment scour. Design shall be prepared in conformance with applicable requirements of Article 6, "Excavations, Trenches, Earthwork" of Construction Safety Orders of California State Division of Occupational Health and Safety. In addition, sheet piling design shall be based on the material requirements specified herein. Sloping of excavations shall not be employed below the groundwater or maximum aqueduct water elevation. Designs shall be prepared and signed by a Civil Engineer registered in the State of California and shall be based on the stresses for various materials of construction contained in the Uniform Building Code 1994 Edition and latest supplement. The allowable stresses permitted by the Uniform Building Code may be increased 15 percent for temporary shoring used as an aid to construction.

1.04 SUBMITTALS

- A. In accordance with Section 01300.
- B. Submit to the Engineer for record purposes copies of the drawings and calculations used to determine the strength, size, and stability of the protective installations. All designs submitted under this section shall be signed by a Structural or Civil Engineer duly registered in the State of California.
- C. Prior to the start of any work involving sheeting and bracing, the Contractor shall obtain a valid excavation permit from the Cal OSHA District office as required. A copy of the permit and all accompanying drawings, data, and calculations shall be submitted to the Engineer for record purposes only and not for review or approval.

1.05 ALTERNATIVES

The use or application of alternative methods and materials, and the employment of propriety systems under lease or franchise in lieu of that specified herein, may be allowed. Demonstration of suitability and compliance with these specifications and approval of the Owner shall be required.

PART 2: PRODUCTS

2.01 MATERIALS

A. Sheet Piling

1. Sheeting shall be continuous interlock type. Steel sheeting shall be made in accordance with ASTM A857 from steel meeting the requirements of ASTM A570, Grade 30. Sheeting shall be hot-dipped galvanized per ASTM A123 at a rate of two ounces per square foot total both sides. The sides of each piece of sheeting shall be furnished with an interlock that is continuous for the full length of the sheeting. The interlock shall have an opening of sufficient width to allow free slippage of the adjoining sheet. Sheeting shall be "Metric Sheeting" as manufactured by Contech Construction Products, Inc, or approved equal.
2. Dimensions and Section Properties. Steel sheet piling used for cofferdams or shall be standard rolled metric sections. The sheeting shall be galvanized after fabrication and have the minimum physical and sectional properties; Physical Properties: 5 gauge (0.209 inches), Sectional Properties: Modulus – 6.28 in³, Moment of Inertia – 11.04 in⁴.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. General. Install sheeting and bracing for trench and structure excavation as the work requires. Butt planks to and/or interlock sheets to exclude groundwater and fines, preventing the erosion of voids outside sheeting. In soft, wet ground drive sheeting to a lower level as excavation progresses so that sheeting is embedded in undisturbed earth. Bracing of sheet piling may be permitted to penetrate the structural concrete only as approved by the Engineer. Refer to Section 03100. Install wales and struts at close intervals so as to prevent displacement of the surrounding earth and to maintain safe conditions in the work area. Any damage proven to result from improper installation shall be the responsibility of the Contractor.

Temporary sheeting for trench and structure excavation may be removed and re-used. Withdraw individual planks alternatively as the backfill is raised, maintaining sufficient sheeting and bracing to protect the work and workmen. Remove bracing completely. Where unstable conditions occur in the underlying strata from any cause, and withdrawal of sheeting will endanger the work, a portion of the sheeting, including bracing, may be left in place with approval of the Owner. Remove all wood within a zone extending to four (4) feet below finished grade. Leaving such material in place shall not be cause of an increase in Contract in price.

- B. Sheet Piling. The Contractor has the option of using steel sheet piling for temporary protective installations. All piling installations shall be continuous.
1. Installation of Sheet Piling. Depth of piling shall be sufficient to prevent heave when the trench is dewatered. Piles shall be driven with a hammer with an adequate capacity to complete pile driving without changing hammers. The use of air or water jets to assist in driving the sheet piling will be permitted, providing that the last 5 feet of advance is by driving. Piles shall be driven accurately to the lines and grades shown or required, with each section interlocked with the sheet piles driven previously. To ensure proper alignment of the sheet piles, a driving template or jig shall be used. If any pile is damaged during driving, it shall be removed and replaced. If piles are driven out of interlock or are not properly plumbed or aligned, the piles shall be pulled and re-driven.
 2. Prevention of Damage. In installing, cutting off, or removing sheet piles, every precaution shall be taken to ensure that damage to the structure or pipeline does not occur. If damage does occur, the Contractor shall perform the necessary repairs at his own expense.

3.02 PROTECTION OF EXISTING FACILITIES

It is the Contractor's responsibility to protect existing facilities from the consequences of his work. Where any sloped excavation infringes on or potentially endangers any existing facilities or structures, provide shoring, sheeting, and bracing according to shop drawings and calculations signed and stamped by a structural or civil engineer registered in the State of California.

END OF SECTION

SECTION 02510

PAVING AND ROAD SURFACING

PART 1: GENERAL

1.1 SECTION INCLUDES

- A. Contractor furnished labor, materials, equipment, and incidentals necessary to construct paving shown on the Plans, and/or specified herein. The work shall include, but not necessarily be limited to, scarifying and preparing the subgrade, placing and compacting engineered fill materials, placing and compacting Class 2 aggregate base, applying paint binder, placing and compacting asphalt concrete, and all related works.

1.2 REFERENCED SECTIONS

- A. The following Sections are referenced in this Section
1. Section 01300: Submittals
 2. Section 02200: Earthwork

1.3 SUBMITTALS

- A. Contractor shall submit the following information:
1. Manufacturer's Data or Certificate of Compliance
 - a. Aggregate base
 - b. Prime coat and paint binder
 - c. Asphalt concrete
 - d. Independent test laboratory name
 2. Certificate of compliance
 - a. A certificate of compliance signed by the manufacturer shall be furnished prior to the use of any asphalt materials.
 - b. The certificate shall state that the material complies with the requirements of these Specifications.
 - c. A certificate shall be furnished with each lot of material delivered to the site; the material provided shall be clearly identified in the certificate.
 - d. Certificates of compliance shall be provided for each type of asphalt product used.

1.4 REFERENCE PUBLICATIONS

Reference	Title
ASTM D2922	Density of Soil and Soil Aggregate in Place by Nuclear Methods
ASTM D3017	Moisture Content of Soil and Soil Aggregate Place by Nuclear Methods

PART 2: MATERIALS

2.1 ENGINEERING FILL

- A. Engineered fill shall be per these Specifications.

2.2 CLASS 2 AGGREGATE BASE

- A. Class 2 aggregate base shall meet all requirements of the most recent Caltrans Standard Specification Section 26-1.02 A for ¾-inch maximum grading.

2.3 PAINT BINDER (TACK COAT)

- A. The paint binder (tack coat) shall meet all the requirements of the most recent Caltrans Standard Specification Section 94.

2.4 HOT MIX ASPHALT

- A. Asphalt concrete shall meet the requirements of the most recent Caltrans Standard Specification for Type A Hot Mix Asphalt (1/2-inch maximum aggregate, medium grading).
- B. The asphalt to be mixed with the aggregate shall meet the section of the most recent Caltrans Standard Specification Section 92 for PG 64-10 steam-refined paving asphalt.

2.5 HEADER BOARD

- A. Composite of recycled wood and plastic fibers.

PART 3: EXECUTION

3.1 FINAL GRADING

- A. The final grade of the hot mix asphalt shall vary not more than 0.05 foot from the elevations indicated on the Plans and shall conform to the requirements of the most recent Caltrans Standard Specification Section 39. All areas shall be graded to drain. All personnel pathways and areas shall conform to minimum slopes as required by ADA Standards.

3.2 SCARIFYING AND COMPACTING

- A. All the subgrade material underlying asphalt concrete surfacing shall be overexcavated and filled per these specifications and compacted to a relative compaction of not less than ninety percent (95%).

3.3 IMPORTED FILL

- A. Imported fill material under paved areas shall be placed and compacted to a relative compaction of not less than ninety-five percent (95%) to a depth of 24 inches in accordance with these specifications.

3.4 CLASS 2 AGGREGATE BASE

- A. Class 2 aggregate base shall be placed to depth as shown. Placement, moisturizing, spreading, and compaction of Class 2 aggregate base shall meet all requirements of State Standard Specification Section 26, State Standard Specification Section 17, and the details on the Plans.

3.5 PAINT BINDER (TACK COAT)

- A. After the sub-base and aggregate base are placed, compacted, and tested, to the satisfaction of the Engineer, tack coat shall be applied in accordance with State Standard Specification Section 39.

3.6 HOT MIX ASPHALT

- A. Asphalt concrete shall be placed where indicated on the Plans to a total thickness as shown on the plans. Storing, proportioning, mixing, equipment, spreading, compacting, and miscellaneous asphalt concrete shall conform to the requirements of the most recent Caltrans Standard Specification Section 39, and the most recent Caltrans Standard Specification Section 22.

3.7 HEADER BOARD

- A. A header board shall be placed at all limits of paving not abutting a concrete structure. Attached to 12-inch plastic stakes at three feet on center with metal screws.

3.8 TESTING

- A. The Construction Manager will perform laboratory and the initial field testing for density, moisture, and compaction of the asphalt base. The Contractor shall pay for re-testing of locations failing to meet the specified compaction in the initial test. Test laboratory shall provide written reports on the following test methods:
- B. Moisture, density, and compaction per ASTM D2922 and D3017.

3.9 TRENCH RESTORATION WITHIN PAVED SECTION

- A. Trench restoration within paved sections shall conform to City Standard Detail ST-31.
- B. Roadway features such as brick sidewalks and crosswalks shall be replaced in kind during trench restoration.

END OF SECTION

SECTION 02601
MANHOLES AND CLEANOUTS

PART 1: GENERAL

1.01 DESCRIPTION

The work of this section consists of the furnishing of materials and constructing therewith new manholes and cleanouts as shown on the drawings.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 01300: Submittals
- B. Section 01666: Testing of Gravity Sewer Lines and Manholes
- C. Section 02223: Trenching, Backfilling, and Compacting
- D. Section 02225: Structure Excavation and Backfill
- E. Section 03100: Concrete

1.03 QUALITY ASSURANCE

Standards, American Association of State Highway and Transportation Officials (AASHTO) and American Society for Testing and Materials (ASTM).

1.04 SUBMITTALS

Shop Drawings and catalog cut sheets shall be submitted for manhole, frames and covers, precast manhole bases and sections, joint sealer, cleanout meter box, pressure clean-out covers, and epoxy lining in accordance with Section 01300.

PART 2: MATERIALS

2.01 FRAMES AND COVERS

- A. Manhole frames and covers shall be per City Standard Details, cast iron manhole frame and cover set, or approved equal.
- B. Horizontal surfaces of manhole cover seats and under surface of the seat cover which rests upon the frame shall be machined. After machining, it shall not be possible to rock any cover after it has been seated in any position in its frame. Manhole frames and covers shall be designed for heavy duty, H-20 traffic loading. All manholes shall be provided with a nominal 24-inch diameter cover unless otherwise noted on the drawings. Manhole frames shall be capable of receiving standard non-shifting manhole extension (riser) rings.

2.02 PRECAST CONCRETE MANHOLE SECTIONS

Manholes shall be constructed of precast reinforced manhole sections conforming to ASTM C478 and as shown. Precast concrete rings, cones, and flat slabs shall be manufactured by a process that will produce a dense, homogeneous concrete section of

first quality. The sections shall be steel reinforced and have a minimum wall thickness of four (4) inches. Cement used in manufacturing the sections shall be Type V, Portland cement, as specified in ASTM C150. Precast concrete sections, cones, and grade rings shall be joined using preformed joint sealant only. Use of mortar will not be allowed. All manholes shall have cast-in-place concrete bases and formed channels with inverts to match the adjoining pipes. Precast manhole base-blocks will not be allowed.

2.03 PRECAST MANHOLE BASES

Precast manhole bases as manufactured by Central Pre-Cast; Jensen Precast; Hanson Precast, or approved equal.

2.04 DESIGN LOADS

A. Vertical Loads: Design all precast manhole rings and accessories to support an AASHTO H-20 truck loading, in addition to soil weight above sloping ring sections and the dead load of all material supported above.

B. Lateral Loads: Lateral loads shall be as dictated by the following formula or the geotechnical report requirements, whichever are more stringent.

Operating: $95 \times H$ (psf) triangular equivalent fluid pressure for dead load plus a live load surcharge from an H-20 truck, including impact.

Seismic: $23 \times H^2$ (psf) uniform pressure distribution.

Where H = depth below finished grade.

2.05 CONES

All manhole cones shall be as shown on the plans and conform to ASTM designation C478.

2.06 JOINT SEALER

The joint sealer shall be Ram-Nek by K.T. Snyder Company, Inc.; Kor-N-Seal by NPC, Inc., or approved equal.

2.07 CLEANOUTS

Cleanouts shall be of materials in accordance with City Standard Detail SS-12.

2.08 MORTAR

Mortar will not be allowed.

2.09 INTERIOR AND EXTERIOR COATINGS

A. Coatings as required per Manufacturer's recommendations.

B. Interior: Epoxy lining shall be manufactured by Perma-Liner Industries, Inc. or equal and consist of a prime and finish coat. The prime coat shall be a two component, low viscosity 100% solids, deep penetrating primer. The prime coat shall be designed for use on properly prepared porous substrates, such as concrete. The finish coat shall be a non-polluting, solvent free, two-component,

100% solids epoxy system designed as a chemical coating barrier against potable water, salt water, and raw wastewater. The finish coat shall cure at a low minimum temperature of 40°F, have a potlife of 35 minutes at room temperature, be tack free in 4 hours and cured in 3 days.

1. Prime coat (DFT = 2-3 mils), HydroLock or equal.
 2. Finish coat (DFT = 80 mils), Hydro-Pox Ct. 04-204 UHB
- C. Exterior: Buried exterior concrete shall be coated with an emulsified asphalt coating.

PART 3: EXECUTION

3.01 SETTING BASES

- A. Construct to grades, lines and elevations shown on the drawings or staked in the field. Shape tops of the bases by means of accurate bell-ring forms to receive the barrel section. Wet setting is not permitted. Joint sealer shall be placed on the first joint after the Engineer has approved the manhole base for stacking. The concrete shall cure a minimum of 24 hours before stacking the barrel sections.

Pour foundations on 12-inches of compacted crushed rock wrapped in filter fabric. See plans for manhole details.

- B. Precast bases shall be installed in strict conformance with the manufacturer's written instructions, on a foundation of clean, undisturbed soil or native soil compaction to at least 95% maximum dry density and 6" of $\frac{3}{4}$ " crushed rock.

3.02 SETTING PRECAST SECTIONS

- A. Precast-reinforced concrete sections shall be set so as to be vertical and with sections in true alignment. Joints shall be primed and made with sealer applied in strict accordance with the manufacturer's printed instructions.

3.03 FIELD CONNECTIONS

- A. Openings for field connections shall be made with a motor-driven cutting tool which will provide a smooth round opening no more than 3 inches larger than the outside diameter of the pipe being connected. The new pipe shall be inserted with a waterstop conforming to City Standard Detail SS-03. Jack hammers and chipping hammers will not be allowed. Seal field connections with non-shrink grout.

3.04 INTERIOR DROPS

- A. Install interior drops as detailed on the plans.

3.05 INVERT CHANNELS

- A. Smooth and semi-circular in shape conforming to the inside of the adjacent sections. Make changes in flow direction by a smooth curve of radius as large as permitted by manhole size. Make changes in size and grade gradually and evenly. See plans for details.

3.06 SETTING FRAMES AND COVERS

- A. Frames and covers shall be set as detailed on the plans for various locations.

3.07 CLEANOUTS

- A. Installation of cleanouts shall be as shown on the City Standard Details.

3.08 EPOXY MANHOLES

- A. All drop manholes, precast pump station wet wells, and other locations designated on the contract drawings shall be epoxy lined. Sewer manholes requiring an epoxy lining shall first pass a vacuum test (water testing will not be allowed) and shall then be constructed as follows:
 - B. The exterior of the manhole shall be coated with an asphaltic material and wrapped in 8 mils polyethylene prior to backfilling.
 - C. All voids and imperfections in the interior of the manhole shall be mortared or "sacked" smooth with a cement paste composed of 50% Portland cement and 50% sand. The mortar mixture shall be manually worked into the dampened surface with sufficient pressure to completely fill voids and imperfections. The surface shall then be finished smooth. This process shall be continued until the entire manhole surface (base, barrel, cone, neck, and joints) is smooth and free of imperfections.

Upon receiving the Engineer's approval of the sacking, the outlet channel(s) of the manhole to be epoxied and the first upstream manhole shall be mechanically plugged to prevent water flow. The newly sacked manhole shall cure for a period of 28 days. A visqueen test for the absence of moisture may be required by the Engineer.

- D. The epoxy coating may be applied after the 28 day curing period has ended. An accepted method of epoxy application is as follows:
 - 1. Mask off the metal frame.
 - 2. Sandblast the interior concrete surfaces of the sewer manhole.
 - 3. Apply a sealer/primer and allow to cure per the manufacturer's recommendations. Application may be withheld if, in the opinion of the Engineer, the walls of the manhole exceed the recommended moisture content.
 - 4. Apply an approved epoxy to obtain a minimum thickness of 80 mils and allow to cure per the manufacturer's recommendations.
 - 5. Verify the thickness and adherence of the coating samples, to the satisfaction of the Engineer by submittal and testing of samples by an approved lab and complying with ASTM Standards.
 - 6. Repair the sampled areas and allow the repairs to cure.
 - 7. "Spark test" the entire epoxy surface area. The electrode shall provide a minimum of 10,000 volts. Areas failing the spark test shall be removed, repaired, and retested.

8. After approval from the Engineer, remove the masking from the metal frame and use Sika Flex (or approved equal) sealant to caulk the transition joint between the epoxy coating and the metal frame.
9. Use Sika Flex (or approved equal) sealant at the concrete/pipe interface.
10. Remove the plugs.

3.09 MANHOLE TESTING

A. Vacuum Testing: All Project manholes shall be vacuum tested. Vacuum test procedures and requirements shall be as follows:

1. After completion of the manhole barrels but prior to backfilling and grade ring installation, all openings in the manholes are sealed with plugs and a rubber ring “donut” type plug inserted inside the opening of the cone.
2. A small vacuum pump is attached to a hose connected to the plug and 4 psi of vacuum applied.
3. The vacuum is permitted to stabilize at 3.5 psi for 1 minute; then the test is begun.
4. The manhole must maintain vacuum such that no greater than 0.5 psi of vacuum is lost during the specified test period.
5. The specified test period is as follows:

Manhole depth, ft	Test period, min
0-5	4.5
5-10	5.5
10-15	6.0
Greater than 15	6.5

6. Manholes that fail the test shall be patched as required and retested.
7. A vacuum regulator shall be provided on the vacuum pump such that no greater than 10 psi can be applied to the manhole during the test. All manholes that do not meet the leakage test, or are unsatisfactory from visual inspection, shall be repaired to the satisfaction of the Construction Manager.

END OF SECTION

SECTION 02960

TEMPORARY SEWER BYPASS PUMPING

PART 1: GENERAL

1.01 DESCRIPTION

- A. The Contractor shall provide a complete sewer bypassing system including, but not limited to, the following:
 - 1. Developing a sewer bypassing plan
 - 2. Developing a spill prevention and emergency response plan
 - 3. Submitting and obtaining approval from the City for the sewer bypassing plan and the spill prevention and emergency response plan
 - 4. Implementing the bypassing and spill prevention and emergency response plan
 - 5. Providing bypassing in accordance with the approved plans throughout the duration of the work

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 01300: Submittals
- B. Section 15071: Plastic Pipe and Fittings

1.03 SUBMITTALS

- A. In accordance with Section 01300.
- B. Within 10 days of Notice to Proceed, submit drawings and complete design data for bypass pumping plan. Show all proposed methods, equipment, and discharge locations for bypassing. No construction activities related to bypassing shall begin prior to the approval of the required submittals by the City. Approval of the Contractor's Bypassing and Spill Prevention and Emergency Response Plan in no way relieves the Contractor of his responsibility to maintain sewage service or provide sewer bypassing at all times during construction and to prevent any spills.
- C. Bypassing Plan
 - 1. The Contractor shall design the bypass system to handle the flows of the system. Contractor shall assume the sewer lines are flowing half full at the slopes indicated on the Contract Drawings for the purposes of estimating the flow rate.
 - 2. The Contractor shall develop and submit to the City, for review and approval, a written Bypassing Plan including sequence of work outlining how sewage flows will be maintained and bypassed during construction. The bypassing plan shall include, but not be limited to:

- a. A primary and 100% redundant backup pumping system, each capable of handling the peak flow of the system. Which shall be on site and available 24 hours a day.
 - b. A flow monitoring plan describing the method of monitoring and showing the location of upstream and downstream monitoring units for all of the construction locations.
3. The bypassing plan shall be developed in conjunction with the traffic control plans in order to minimize the impact to the community. See the City Standard Specifications.

C. Spill Prevention and Emergency Response Plan

1. The Contractor shall develop and submit to the City, for review and approval, a written Spill Prevention and Emergency Response Plan. The Spill Prevention and Emergency Response Plan shall be developed to prevent and respond to any construction related sewage spills. The plan shall include, but not be limited to:
 - a. Identification of all nearby waterways, channels, catch basins and entrances to underground storm drains.
 - b. Furnishing of all the necessary materials, supplies, tools equipment, labor and other services to prevent sewage from coming into contact with these areas.
 - c. Arrangements for an emergency response unit comprised of emergency response equipment and trained personnel to be immediately dispatched to the site in the event of sewage spill(s).
 - d. An emergency notification procedure, which includes an emergency response roster with telephone numbers and arrangements for backup personnel and equipment and an emergency notification roster of designated City representatives.
 - e. Direct phone numbers (no voicemail) for 3 Contractor representatives who shall be accessible and available at all times to respond immediately to any construction related emergency.

1.04 RESPONSIBILITIES OF CONTRACTOR

- A. The Contractor shall observe and comply with all Federal, State, and local laws, ordinances, codes, orders, and regulations which in any manner affect the conduct of the work, specifically as it relates to sewage and prevention of sewage spills. The Contractor shall be fully responsible for preventing sewage spills, containing any sewage spills, recovery and legal disposal of any spilled sewage, paying any and all fines, incurring and handling any penalties, claims, or liability arising from negligently causing or allowing a sewage spill, failure to prevent a sewage spill, or any violation of any law, ordinance, code, order, or regulation as a result of the spillage.

PART 2: MATERIALS

2.01 GENERAL

- A. All equipment and tools used for sewer bypassing shall be designed to prevent any and all sewage leaks or spills.
- B. All equipment used as part of the bypassing system shall not cause a significant noise impact to the community in accordance with local noise ordinances. If noise complaints from residents occur due to the Contractor's activities, the Contractor shall immediately replace the noise-generating equipment or reduce the noise generated with mitigating devices to the satisfaction of the City.
- C. Sewage shall be conveyed/pumped in closed conduits and disposed of in a sanitary sewer system. Sewage shall not be permitted to flow in trenches or be covered by backfill.
- D. Suction and discharge manholes shall be sealed to prevent odors.
- E. Access to driveways may not be blocked by the bypass pipe. Flat pipe, a raised platform above bypass pipe, or a shallow trench shall be used to provide access to residents.
- F. If bypass pumping must cross any major arterial streets/roads, piping must be installed in a shallow trench. Flat piping or raised traffic platforms across these streets will not be allowed. Trench shall be backfilled or covered with recessed, secured trench plating.
- G. All shallow trenching shall be backfilled and paved in accordance with the standard specifications following demobilization of sewer bypass. All costs to install, maintain, backfill, and pave temporary shallow trenching shall be included in Contractor's bid item for sewer bypassing and no additional compensation shall be made therefor.
- H. If deemed necessary due to lack of preparedness on the Contractor's part, the City has the option to clean up a sewage spill caused by the Contractor. Clean up costs incurred by the City shall be recoverable in addition to the penalties from the Contractor's progress payments.

2.02 PUMPING EQUIPMENT

- A. All pumps used for sewer bypassing shall be the submersible type and shall only be operated below ground in the sewer manhole or other sewer facility. The use of above ground pumps or pumps not specifically designed for submersible service are not allowed.
- B. The pumps shall be sized to fit in manholes or other confined areas necessary to successfully complete the sewer bypassing. The Contractor shall ensure all equipment used for bypassing will operate under the conditions required and the Contractor will be responsible for all costs associated with changes to the bypassing system due to inappropriate equipment or non-conformance with the Contract Documents.

- C. Electric or fuel/generator driven pumps shall be used. The Contractor shall provide an emergency standby power generator, sized to operate the bypass system at a minimum, to be used to operate the submersible pumps if electrical power is lost during the progress of the work and a sewage spill will occur.
- D. The pumps shall be specifically intended for use with raw sewage and shall be capable of passing a 3-inch diameter solid.
- E. Regardless of power used, the total noise of any equipment used by the Contractor as part of the bypassing system shall be under 68 dba as measured standing thirty (30) feet from the equipment.

PART 3: EXECUTION

3.01 GENERAL

- A. The Contractor shall exercise care not to damage existing public and private improvements, interrupt existing services and/or facility operations which may cause a sewage spill. Any reasonably anticipated utility and/or improvement which is damaged by the Contractor shall be immediately repaired at the Contractor's expense. In the event that the Contractor damages an existing utility or interrupts an existing service which causes a sewage spill, the Contractor shall immediately notify the City representatives. The Contractor shall request and obtain from the City an emergency roster of the designated City representatives with their respective telephone numbers. The Contractor shall take all measures necessary to prevent further damage or service interruption, and to control, contain, and clean up the resultant impacts of the damage, service interruption, and any resulting sewage spill(s).
- B. The Contractor shall continuously monitor the flow levels downstream and upstream of the construction location to detect any possible failure that may cause a sewage backup and spill. The Contractor shall include the means and methods of monitoring the flow in their Sewer Bypassing Plan.

3.02 SEWAGE SPILLS

- A. In case of sewage spill, the Contractor shall act immediately, within fifteen minutes – without instructions from the City – to control the spill and take all appropriate steps to contain it in accordance with their Spill Response Plan.
- B. The Contractor shall immediately notify the City representatives of the sewage spill(s) and all remedial actions taken.
- C. The Contractor shall, within 24 hours from the occurrence of the spill, submit to the City a draft written report describing the following information related to the spill: the location; the nature and volume; the date and time; the duration; the cause; the type of remedial and/or preventive actions taken; and the water body impacted and results of any necessary monitoring. The City will review the draft report, and if revisions are required, the Contractor shall make those revisions and submit the final report to the City within 24 hours of the receipt of comments. Requests for additional compensation for the handling of the spill shall be submitted to the Engineer as a construction claim. The Contractor shall assure the validity, accuracy, and correctness of the claim under penalty of perjury. The Engineer may institute further corrective actions, as deemed necessary, to fully

comply with existing law, ordinance, code, order, or regulation. The Contractor shall be responsible for all costs incurred for the corrective actions.

- D. It shall be the Contractor's responsibility to assure that all field forces, including Subcontractors, know and obey all safety and emergency procedures, including the Spill Response Plan, to be maintained and followed at the site.

3.03 SEWER BYPASSING

- A. The Contractor shall provide temporary means to maintain and handle the sewage flow in the existing system as required to complete the necessary construction.
- B. The Contractor shall size the bypass system to handle the peak flow of the system. The Contractor shall provide a redundant, identically sized, one-hundred percent (100%) backup bypass system. The Contractor shall utilize the backup system to mitigate any additional wet weather flows, perform the necessary maintenance and repairs on the primary bypass system, and exercise and ensure the operability of the backup system. Each pump, including the backup pumps, shall be a complete unit with its own suction and discharge piping. The Contractor shall operate the backup bypass system for a minimum of twenty-five percent (25%) of the time on a weekly basis. The backup bypass system shall be fully installed and operationally ready at all times.
- C. Prior to the full operation of the bypass system, the Contractor shall demonstrate, to the satisfaction of the City, that both the primary and backup bypass systems are fully functional and adequate and shall certify the same, in writing, in a manner acceptable to the City.
- D. The Contractor shall provide all equipment necessary to minimize the noise generated by the bypassing operations. Noise levels from the complete bypassing system shall not exceed the levels allowable under the local jurisdictional codes and requirements.
- E. The Contractor shall continuously (while in use) monitor the operation of the bypass system and all impacted facilities. The Contractor shall submit, as part of their bypass plan, their system monitoring procedure and frequency. The Contractor shall maintain a log of the monitoring in a manner acceptable to the Engineer.
- F. The Contractor shall continuously monitor the flow levels downstream and upstream of the bypass to detect any possible failure that may cause a sewage backup and/or spill. The Contractor shall include the means and methods of monitoring the flow in their Bypassing Plan. The Contractor shall provide flow monitoring data to the City on a weekly basis in a format acceptable to the City.
- G. The Contractor shall routinely inspect and maintain the bypass system, including the backup system. The Contractor shall submit as part of their Bypassing Plan their maintenance procedures and frequency. The Contractor shall maintain a log of all pertinent inspection, maintenance and repair records in a manner acceptable to the Engineer.

- H. At the end of each day's work, the Contractor shall re-establish sewer flows in the gravity sewer system. Work undertaken each day shall only include work that can be completed during that working day.

END OF SECTION

SECTION 03100

CONCRETE

PART 1: GENERAL

1.01 DESCRIPTION

- A. This section describes the submittal, material, installation, and testing requirements for furnishing and placing formwork, reinforcement, waterstops, and concrete. It also describes finishing and curing requirements, placement tolerances, and testing and repair procedures.
- B. Except as otherwise provided herein, the design and erection shall be in accordance with the applicable provisions of the ACI "Manual of Concrete Practice".

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 02200: Earthwork
- B. Section 02225: Structure Excavation and Backfill
- C. Section 03700: Concrete Saw Cutting and Core Drilling

1.03 GOVERNING COSTS AND STANDARDS

Furnish and installing concrete shall conform to the following:

- A. ACI: American Concrete Institute, Manual of Concrete Practice (MCP), latest edition, Applicable Standards
- B. CRSI: Concrete Reinforcing Steel Institute
- C. SS90: State Standard Specification 90
- D. ASTM: Applicable Standards
- E. CCRL: Cement and Concrete Reference Laboratory
- F. SEAOC: Structural Engineers Association of California

1.04 SUBMITTALS

- A. Formwork Shop Drawings:
 - 1. Before starting concrete work, submit shop drawings of formwork showing size and thickness of members, dimensions and locations of openings and blockouts, vertical limits of concrete placements, horizontal lifts, plywood form pattern, proposed construction joints, form tie elevations and details, and any architectural features to be cast into the concrete. Incorporate the work of all trades. This review is for the purpose of assessing the Contractor's interpretation of the Contract Documents and will not include any considerations of the suitability, constructability, or safety of the concrete forming system.

2. Submit drawings and structural calculations for all concrete other than slabs on grade. Formwork drawings shall be signed and sealed by a Civil or Structural Engineer registered in California. Where superplasticizers are used, design formwork to resist full liquid head.
3. The Contractor shall be solely responsible for the design, installation, use, and safe removal of all formwork. The formwork design shall comply with all governing codes, all Federal, State, and local ordinances; and generally accepted engineering principles.
4. Submit drawings showing the installation and removal sequence and procedures to be used. Include weight of formwork, assumed construction load, proposed minimum concrete strength for stripping of formwork, size and type of reshores, reshore spacing pattern, number of levels of reshores, and assumed load per reshore at each level.

B. Concrete:

1. Prepare and submit proposed mix designs along with test results from within the last year signed by a laboratory currently certified by CCRL and actively participating in their sample proficiency program verifying that the components and final products meet the requirements of ACI MCP and these specifications. Mix designs shall include fine, coarse, and combined aggregate gradations.
2. Provide certificates that the cement used complies with ASTM C150 and these specifications.
3. Provide delivery tickets for ready-mix concrete or weighmaster certificates per ASTM C94, including cement weights, aggregate size, the amount of water added at the plant and record of pours. Record the amount of water added on the job on the delivery ticket. Water added at the plant shall account for moisture in both the coarse and fine aggregates.
4. Provide certificate of compliance from the manufacturer of the concrete admixtures with these specifications.
5. Provide epoxy bonding compound manufacturer's specific instructions for use. Provide manufacturer's certifications as to suitability of product to meet job requirements with regard to surface preparation, pot life, set time, vertical or horizontal application, corrosive and/or submerged environments and forming restrictions.
6. Provide drying shrinkage test data.

C. Reinforcing Steel Shop Drawings:

1. Before starting concrete work, submit drawings complying with requirements of ACI MCP (latest edition), detailed in accordance with ACI SP66, and adapted to the proposed placement schedule, showing size, dimension, bending, placing, and construction joint details. Submit drawing showing locations of all construction joints. Submit type, size, and location of all slab and bar supports. Submit all reinforcement for a particular structure as a single complete submittal package. Shop fabrication shall not begin until corrected drawings bearing the Engineer's review stamp are returned.

2. The Contractor shall be wholly and completely responsible for the accuracy of the lists and for furnishing and placing reinforcing steel in accordance with the details shown on the plans and as specified.
 3. Submit certified copies of mill test reports for each lot or heat of all reinforcing steel.
- D. Shoring: If shoring the structure is required, submit drawings and structural calculations signed and sealed by a Civil or Structural Engineer registered in the State of California showing anticipated loads, members, connections, and anchorage of the proposed shoring system.
- E. Concrete Joints and Waterstops:
1. Submit manufacturer's literature, catalog data, and statement of compliance with referenced standard and specifications for materials specified herein.
 2. Submit material samples of PVC waterstops.
 3. Provide technical data sheets for the Contractor's personnel and the Owner covering joint preparation, priming, and sealant materials application.
 4. Submit layouts for construction and expansion joints and proposed pour sequence. Unless otherwise noted, maximum length or width of one pour is 30 feet and a maximum area of 900 sf. Where walls meet at a corner, the maximum length of wall from the corner to a construction or expansion joint is 20 feet.

PART 2: MATERIALS

2.01 CONCRETE

- A. General: Materials shall conform to the most recent Caltrans Standard Specifications Section 90 and these specifications.
- B. Portland Cement: Use domestic Portland cement that conforms to the most recent Caltrans Standard Specifications "Type II Modified". Use only one brand of cement in any individual structure. Do not use cement that is damaged, partially set, lumpy, or caked. Reject the entire contents of the sack or container that contains such cement. Do not use salvaged or reclaimed concrete.
- C. Water: Water for washing aggregates and for mixing and curing concrete shall be clean, free from oil, acid, alkalis, vegetable matter, or other deleterious substances. No salt or sea water or water containing excessive amount of sodium sulphate, magnesium sulphate or magnesium chloride shall be used.
- D. Coarse Aggregate: The coarse aggregate shall consist of clean, hard, dense, tough and durable natural gravel, crushed gravel, or crushed rock, conforming to State Specifications. It shall be free from oil, organic matter or other deleterious substances.
- E. Fine Aggregate: Fine aggregate shall consist of hard, durable, uncoated natural sand or other approved material, conforming to State Specifications. It shall be free from oil or other deleterious substances.

- F. Fly Ash: Fly ash shall conform to ASTM A618, Class F or N, except that the loss on ignition shall be limited to 1 percent.
- G. Admixtures:
 - 1. A water reducing agent such as Pozzolith, WRDA, or approved equal shall be used in all concrete. The admixture shall conform to ASTM C494. Proportioning and mixing shall be as recommended by the manufacturer.
 - 2. Admixtures causing accelerated setting of cement in concrete shall not be used.
 - 3. Air entraining admixtures with demonstrated compatibility with the concrete mix shall be used as required as a moderate addition to the water reducing agent to obtain the specified percent air in the resultant concrete. The Contractor shall submit data verifying that the admixtures are compatible with the mix. Air-entraining admixture shall conform to ASTM C260.

2.02 REINFORCING

- A. Reinforcing Steel Bars: Deformed Bars shall be in accordance with ASTM A615, including Supplementary Requirement S1, Grade 60, and free from rust, scale, oil, or frost. No. 3 bars may be Grade 40.
- B. Welded Wire Fabric: Shall be of gauge and mesh size shown and shall meet the requirements of ASTM A185 or ASTM A497 for smooth wire fabric. Wire fabric shall be free from rust, scale, oil, and frost.
- C. Reinforcement supported from formwork shall rest on Class 1 (plastic protected) bar supports, as specified in "Manual of Standard Practice" by the Concrete Reinforcing Steel Institute (CRSI), Chapter 3.

Reinforcement supported from the ground shall rest on 3-inch high precast concrete blocks not less than 4 inches square and having a compressive strength equal to the specified compressive strength of the concrete being placed. The precast blocks shall have been cured as specified for concrete and shall contain soft steel wires embedded therein for fastening to the reinforcing.

- D. Details of concrete reinforcement not shown on drawings shall be in accordance with CRSI Manual of Standard Practice.

2.03 REINFORCING BAR COUPLERS

Reinforcing bar couplers shall be internally threaded to receive future threaded reinforcing bars or couplers. The couplers shall be cold-forged to the reinforcing bars or shall be internally threaded to receive threaded reinforcing bars. The ends of the reinforcing bars shall be upset before threading. Reinforcing bars not upset before threading may be used provided the bar size is increased one bar size. The entire assembly shall be capable of developing, in tension and compression, at least 125 percent of the specified yield strength of the bar. Provide plastic screw-caps to protect internal coupler threads.

2.04 PATCHING GROUT (DRY PACK)

Patching grout shall consist of neat Portland cement, water, and sand passing a No. 8 sieve. The ratio of cement to sand shall be one part Portland cement to two parts sand. Add sufficient water to form a damp formable consistency.

2.05 FORM RELEASE

Form release shall be non-staining and in accordance with Corps of Engineers Specification CE 204 Section 3.03K. Burke Release #1 V.O.C. manufactured by Edoco, or approved equal.

2.06 NONSHRINK GROUT

Nonshrink grout shall conform to the Corps of Engineers Specification for Nonshrink Grout, CRD-C588, and to these specifications. Use a nongas-liberating type, cement base, premixed product requiring only the addition of water for the required consistency. Grout shall be Masterflow 713, as manufactured by Master Builders Company, Upcon by Upco Co., or approved equal.

2.07 EPOXY GROUT

The epoxy shall consist of a two component bonding compound. Epoxy shall be Gantrex K3, GER Grout, Custom Building Products 100 percent solids epoxy, or approved equal.

2.08 JOINT MORTAR BED

Mortar or grout placed on horizontal construction joints shall be a mixture of cement, sand, and water in the same proportions used in the concrete but with the coarse aggregate omitted.

2.09 JOINT SEALANT

A. Joint sealant shall be a multipart, gray, nonstaining, nonsagging, polyurethane sealant, which cures at ambient temperature to a firm, flexible, resilient, tear-resistant rubber. Sealant shall meet ASTM C920 for horizontal joints and for vertical joints and, in addition, is recommended by the manufacturer for continuous immersion in water. Sealant shall be RC 270 of Products Research and Chemical Corporation, Mamico International Vulkem 227, Multi-Chem MC287, or approved equal.

B. Technical Requirements:

Consistency	Gun grade
Tack free time	24 hours at 75 Degrees F and 50% R. H.
Pot life	1 to 3 hours
Hardness	35 shore A, +/- 5
Elongation	500%
Tensile strength ASTM D412	300 psi
Peel strength on concrete	No loss of bond after 24 hours at 150% elongation
Temperature service	-40 degrees F to 155 degrees F
Immersion in water	Continuous

2.10 BACKING ROD FOR EXPANSION JOINTS

Backing rod shall be an extruded closed-cell polyethylene foam rod, such as Minicel backer rod, manufactured by Industrial Systems Department, Plastic Products Group of Hercules, Inc.; Ethafoam SB, as manufactured by Dow Chemical Company; or approved equal.

The rod shall be ¼-inch larger in diameter than the joint width. Where possible, provide full length sections for the joint and minimize splices. Apply backing rod and bond breaker tape in expansion joints.

2.11 BOND BREAKER TAPE

Bond breaker tape shall be an adhesive-backed glazed butyl or polyethylene tape which will adhere to the premolded joint material or concrete surface. The tape shall be the same width as the joint. The tape shall be compatible with the sealant.

2.12 EXPANSION JOINT FILLERS (WALKWAYS AND SIDEWALKS)

Asphalt impregnated, premolded type, ASTM D1751, ½-inch by depth of slab minus ½-inch.

2.13 PREMOLDED JOINT FILLER

Joint filler shall be preformed, non-extruded type constructed of closed-cell neoprene conforming to ASTM D1752, Type I, as manufactured by W. R. Grace Company; W. R. Meadows, Inc.; or approved equal.

2.14 STEEL EXPANSION JOINT DOWELS

Steel expansion joint dowels shall conform to one of the following:

- A. Epoxy coated steel bar dowels with a 12-mil coating thickness. Steel bar dowels shall conform to ASTM A36 or ASTM A615, plain rounds, Grade 60. Epoxy coating shall be in conformance with ASTM A775; or,
- B. Stainless-steel bar dowels conforming to ASTM A276, Type 302.

2.15 EXPANDED POLYSTYRENE FILLER BLOCK

Expanded polystyrene filler blocks for future construction and expansion joints shall be Styrofoam SM brand as manufactured by Dow Chemical Company, or approved equal.

2.16 PREFORMED CONTROL JOINT

Preformed control joint shall be a one-piece, flexible, PVC joint former, such as Kold-Seal Zip-Per Strip KSF-150-50-50, manufactured by Vinylex, Corp., or a one-piece steel strip with preformed groove, such as Keyed Kold Retained Kap, manufactured by Burke Concrete Accessories, Inc., or approved equal. Provide the preformed control joint material in full length unspliced pieces.

2.17 PVC WATERSTOPS

Waterstops shall be extruded from a PVC compound and shall be lock-rib, center-bulb or flat-strip type as manufactured by Greenstreak, Specon, Inc., JPSpecialties, Inc., or approved equal. Waterstop shall comply with Corps of Engineers Specification CRD-C-572. Waterstops shall be of the dimensions and profile as shown in the drawings.

Waterstops shall be extruded from virgin elastomeric PVC compound, resistant to chemical action with Portland cement, alkalies, acids, and not affected by mildew or fungi. It shall show no effect when immersed for 10 days in a 10 percent solution of sulfuric or hydrochloric acid, saturated lime solution or salt water. Waterstops shall be such that any cross section will be dense, homogeneous, and free from porosity and other imperfections. Waterstops shall be symmetrical in shape. When tested in accordance

with Federal Standard No. 601, the material shall meet the following minimum requirements:

Minimum Requirement	ASTM Specification
Tensile Strength, 2000 psi	D638
Shore hardness A15, 60-80	D2240
Ultimate elongation, 300%	D638
Water absorption, 0.15	D570
Specific gravity, 1.3	D792
Stiffness in flexure, 1000 psi	D747
Low temperature brittleness, -35 degrees F	D746
Tear Resistance, 300 lb/in	D624

2.18 BENTONITE WATERSTOPS

Where identified on the drawings, or specifically approved by the Engineer, bentonite waterstops shall be bentonite strips, Volclay "Water Stop-RX", or approved equal.

2.19 FLOOR HARDENER

Liqui-Hard by W.R. Meadows; Lapidolith by Sonneborn Building Products, Division of Contech, Inc., or approved equal. Hardener shall be compatible with curing method used.

2.20 ADHESIVE ANCHORS

Anchors called out on Drawings as epoxy anchor, adhesive anchor or chemical anchors shall be stainless steel threaded rods, nuts, and washers or Grade 60 rebar in two component resin adhesive. Adhesive shall be Hilti, Inc. "HIT-HY-150", or approved equal. Adhesive anchors shall be suitable for submerged and corrosive environments.

2.21 STRUCTURAL ANCHORS

- A. Anchors called out on the Drawings as expansion anchors (EA), expansion bolt (EB), or wedge anchor (WA) shall be Type 303 or 304 stainless steel Red Head Multi-set or wedge anchors as manufactured by ITT Phillips Drill Division, U.S.E. Diamond, Inc., or approved equal.
- B. Adhesive anchors may be substituted for structural anchors.

2.22 CURING MATERIALS

- A. Sheet Materials: ASTM C171, 4 mil polyethylene film or waterproof paper.
- B. Spray Applied Membrane Forming Liquids: Meet or exceed requirements of ASTM C309, Type 1-D, Class B, except that the loss of water, when tested, shall be not more than 0.15 kilograms per square meter in 24 hours, nor more than 0.45 kilograms per square meter in 72 hours. Shall be a water-base, resin cure with fugitive dye meeting California Air Regulation Board requirements. Products by Burke, W.R. Meadows, Inc., or approved equal.
- C. Burlap Mats: Burlap mats shall conform to AASHTO M182.

2.23 FORM TIES

- A. Locate form ties on exposed surfaces in a uniform pattern or as indicated on the drawings. Construct form ties so that the ties remain embedded in the concrete except for a removable portion at each end and do not leave an open hole through the concrete. Form ties shall have conical or spherical type inserts with a maximum diameter of 1 inch. Construct form ties so that no metal is within 1 inch of the concrete surface when the forms, inserts, and tie ends are removed. Do not use wire ties. Ties shall withstand all pressures and maintain forms within acceptable deflection limits.
- B. Flat bar ties for panel forms shall have plastic or rubber inserts having a minimum depth of 1 inch and sufficient dimensions to permit patching of the tie hole.
- C. Notify Engineer 48 hours prior to placement of concrete. Concrete shall not be placed until Engineer has reviewed and approved the placement of all reinforcing steel.
- D. Ties for water-holding structures or dry structures with access, such as basements or pipe galleries that are below finish grade shall have an integral steel waterstop that is tightly and continuously welded to the tie. The waterstop shall be at least two times larger in the area than the tie cross-sectional area and shall be oriented perpendicular to the tie and symmetrical about the center of the tie. Construct the ties to provide a positive means of preventing rotation or disturbance of the center portion of the tie during removal of the ends.
- E. Tapered form ties shall be tapered through-bolts at least 1 inch in diameter at the smallest end or through-bolts that utilize a removable tapered sleeve of the same minimum size.

2.24 BONDING AGENT

Concresive Liquid LPL, manufactured by Adhesive Engineering Company, No. 705 Bonding Adhesive, Upco Co., or approved equal.

PART 3: EXECUTION

3.01 CONCRETE MIX COMPOSITION

- A. Concrete Composition: Concrete shall consist of portland cement, fine aggregate, coarse aggregate, an air entraining agent, and water which shall conform to the requirements of Section 90 of the Caltrans 2018 Standard Specifications, and as modified herein.
- B. Submittal of Proposed Mix Design:
 - 1. The proposed mix design, with samples of rock aggregate and any admixtures to be used, shall be submitted in accordance with Section 01300.
 - 2. The grading or proportioning of the fine and coarse aggregates in the mix shall be changed whenever necessary or desirable, in the opinion of the Engineer, to secure the required economy, workability, density, impermeability or strength, and no additional compensation because of such changes shall be allowed.

- C. Concrete Designations: Concrete will be designated as shown in the table below and subsequent sections.

Concrete Summary

Type of Use	Maximum Aggregate Size (inches)	Minimum Compression Strength at 28 Days (psi)	Slump (inches)	Max. Water Cement Ratio (by weight)	Entrained Air Required (%)
Liquid Containing Structures:					
Slabs and Footings on grade	1 ½	4,000	3 max	0.45	4-½ ± 1-½
Vertical Wall Sections and Columns	1	4,000	4 max	0.45	4-½ ± 1-½
Mass Concrete and Unformed Slopes	1	4,000	2 max	0.45	4-½ ± 1-½
Other Structural Concrete:					
Interior and Exterior Slabs, Footings, Caissons, and Pipe Encasements	1 ½	4,000	3 max	0.45	3 ± 1-½
Vertical Wall Sections and Columns	1	4,000	4 max	0.45	3 ± 1-½
Curbs, Gutters, Sidewalks, Mowing Strips, Fence Posts	1	2,500	4 max	0.55	3 ± 1-½
Thrust Blocks, Concrete Fill	1	2,000	4 max	0.60	-----

- D. Concrete Compressive Strength:

1. Whenever the 28-day compressive strength identified is 3,500 pounds per square inch or greater, the concrete shall be considered to be designated by compressive strength.
2. When the concrete is designated by compressive strength the mix proportions shall be determined and concrete shall be furnished which contains not less than 564 pounds and not more than 800 pounds of cement per cubic yard of concrete and which conforms to the strengths shown on the plans or as specified.
3. Batch proportions shall be adjusted as necessary to produce concrete having the specified cement factor.

- E. Fly Ash:

The Contractor may at his option substitute up to 15 percent by weight of fly ash for the Portland cement required herein.

- F. Aggregate Sizing:

1. Coarse aggregate maximum grading shall be as specified in Table 1. Grading shall be as set forth in Section 90 of the most recent Caltrans Standard Specifications.
2. Where the spacing of reinforcing bars is such as to result in minimum clearances, or in other locations where in the opinion of the Engineer difficulties may be experienced in pouring concrete with 1½-inch maximum

size aggregate, concrete with 1-inch maximum size aggregate shall be used. In this event the air content shall be increased by ½ percent.

3.02 MEASURING MATERIALS

Materials shall be measured by weighing except as otherwise specified or where other methods are specifically authorized by the Engineer. Scales shall be approved by the Engineer and have been certified by the local Sealer of Weights and Measures within one year of use. Each size of aggregate and the cement shall be weighed separately. The accuracy of all weighing devices shall be such that successive quantities can be measured to within one percent of the desired amount. Cement in standard packages (sacks) need not be weighed, but bulk cement and fractional packages shall be weighed.

3.03 CONCRETE MIXING & DELIVERY

- A. All concrete shall be machine mixed at the site or delivered to the site by transit mixers under conditions approved by the Engineer.
- B. No concrete shall be placed in the work after it has started to set. No concrete can be placed more than one hour after it has been mixed.
- C. If transit mix is used, the rate of delivery, haul time, mixing time and hopper capacity shall be such that all mixed concrete delivered shall be placed in the forms within one hour from the time of introduction of cement and water to the mixer. All concrete shall be kept continuously agitated until discharged in the hopper at the job site.
- D. Ready-mixed concrete shall be batched, mixed, and transported in accordance with ASTM C94 and Chapter 7 of ACI 301. Plant equipment and facilities shall conform to the "Check List for Certification of Ready Mixed Concrete Production Facilities" of the National Ready Mixed Concrete Association.

3.04 CONCRETE HANDLING & PLACEMENT

- A. Excavations and Formwork:
 - 1. Excavations shall be kept free from water while concrete is being placed, cured and finished therein. Fresh concrete shall be protected at all times from running water.
 - 2. The order of placing concrete in all parts of the work shall be acceptable to the Engineer. In order to minimize the effects of shrinkage, the concrete shall be placed in units as bounded by construction joints shown. The placing of units shall be done by placing alternate units in a manner such that each unit placed shall have cured at least 5 days for hydraulic structures and 2 days for all other structures before the contiguous unit or units are placed, except that the corner sections of vertical walls shall not be placed until the 2 adjacent wall panels have cured at least 10 days for hydraulic structures and 4 days for all other structures.
 - 3. Before placing concrete, all form work shall be cleaned of dirt and construction debris, water-drained, reinforcement securely and properly fastened in its correct position, forms at construction joints re-tightened, all ducts, sleeves, hangers, pipes, conduits, bolts, wires, etc., installed. No concrete shall be placed before the forms and all work that is to be embedded have been set and observed by the Engineer.

B. Concrete Placement:

1. The working schedule and schedule of placement shall be as shown on the plans and worked out in conjunction with the Engineer. The schedule shall be worked out prior to commencement of work and shall be rigidly adhered to.
2. Concrete shall be conveyed from the mixer to the place of final deposit as rapidly as practicable by methods which will prevent the separation or loss of the materials. The concrete shall be deposited in the forms as nearly as practicable in its final position to avoid rehandling.
3. Concrete shall be placed and consolidated by methods that will not cause segregation of the aggregates and will result in a dense homogeneous concrete which is free of voids and rock pockets. All concrete shall be used while fresh and before it has taken an initial set. Retempering any partially hardened concrete with additional water will not be permitted.
4. Surfaces on which concrete is to be placed shall be dampened with water immediately before placing concrete, except where there is a moisture retarder at slabs on grade.
5. Concrete shall not be deposited on frozen or ice-coated ground nor on ice-coated forms, reinforcing steel, embedded items or construction joints.
6. Where pavement or surfacing is to be placed around or adjacent to manholes or drainage inlets which will be located within traffic lanes, such structures shall not be constructed to final grade until after the pavement or surfacing has been placed around these locations.
7. Where a schedule for placing concrete is shown on the plans no deviation will be permitted therefrom unless approved in writing by the Engineer.
8. Mixed concrete, after being deposited, shall be consolidated until all voids are filled and free mortar appears on the surface. The concrete shall be placed as nearly as possible in its final position and the use of vibrators for extensive shifting of the mass of fresh concrete will not be permitted.

Except for concrete used in cast-in-place piles, fresh concrete shall not be permitted to fall from a height greater than 4 feet without the use of adjustable length pipes, tubes or double belting placed to prevent segregation of the concrete. Double belting shall not be used unless the thickness of the member is less than 16 inches.

9. In vertical sections, concrete shall be deposited continuously in horizontal layers of 24 inches maximum depth so as to maintain a horizontal plastic surface until the completion of the unit. No concrete shall be deposited on concrete which has hardened sufficiently to cause the formation of seams and planes of weakness within the section.
10. Concrete for horizontal members or sections shall not be placed until the concrete in the supporting vertical members or sections is no longer plastic and has been in place at least two hours.
11. In all slabs, concrete shall be deposited in a continuous or monolithic operation to the full thickness of the slab. Each batch shall be dumped

against previously placed concrete and not away from it and shall not be dumped in separate piles and then worked together.

12. The concrete in each integral part of the structure shall be placed continuously, and work will not be allowed to commence on any such part unless sufficiently inspected and approved material for the concrete is on hand, and forces and equipment are sufficient to complete the part without interruption in the placing of the concrete.

C. Concrete Vibrating:

1. Consolidate concrete by means of high frequency internal vibrators within 15 minutes after it is deposited in the forms. The vibrators shall not be attached to or held against the forms or the reinforcing steel. The vibrating shall be done with care and in such manner that displacement of reinforcement, ducts, and embedded items is avoided.
2. All concrete shall be consolidated by vibration so that the concrete is thoroughly worked around the reinforcement, around embedded items, and into corners of forms, eliminating all air or stone pockets which may cause honeycombing, pitting, or planes of weakness. Internal vibrators used shall be the largest size and the most powerful that can be properly used in the work, as described in Table 5.1.4 of ACI 309. They shall be operated by competent workmen. Use of vibrators to transport concrete within forms shall not be allowed. The vibrator shall be inserted vertically at uniform spacing over the entire area of the placement. The distance between insertions shall generally be about 1½ times the radius of action, or such that the area visibly affected by the vibrator overlaps the adjacent just-vibrated area by a few inches. In slabs, the vibrator shall be sloped toward the horizontal as necessary to operate in a fully embedded position.
3. The vibrator shall penetrate rapidly to the bottom of the layer, and at least 6 inches into the preceding layer if there is such. At each insertion, the vibrator shall be held stationary for a time sufficient to consolidate the concrete but not cause segregation, generally from 5 to 15 seconds. The vibrator shall then be withdrawn slowly, at the rate of approximately 3 inches per second.
4. A spare vibrator in good working condition shall be kept on the job site during all concrete placing operations. Where the concrete is to have an as-cast finish, a full surface of mortar shall be brought against the form by the vibration process, supplemented if necessary by spading to work the coarse aggregate back from the formed surface.
5. The use of external vibrators for consolidating concrete will be permitted when, in the opinion of the Engineer, the concrete is inaccessible for adequate consolidation provided the forms are constructed sufficiently rigid to resist displacement or damage from external vibration.

D. Cold Weather Requirements:

1. Provide adequate equipment for heating concrete materials and protecting concrete during freezing or near-freezing weather in accordance with ACI 306 and the following paragraphs.

2. When the temperature of the surrounding atmosphere is 40 degrees F or is likely to fall below this temperature, use heated mixing water not to exceed 140 degrees F. Do not allow the heated water to come in contact with the cement before the cement is added to the batch.
3. When placed in the forms during cold weather, maintain concrete temperature at not less than 55 degrees F for the first five days after placing, and above 35 degrees F for the remainder of the curing period. Provide thermometers to indicate the ambient temperature and the temperature 2 inches inside the concrete surface.
4. There will be no additional reimbursement made to the Contractor for costs incurred for placing concrete during cold weather.

E. Hot Weather Requirements:

1. During hot weather, give proper attention to ingredients, production methods, handling, placing, protection, and curing to prevent excessive concrete temperatures or water evaporation in accordance with ACI 305 and the following paragraphs.
2. When the weather is such that the temperature of the concrete as placed would exceed 90 degrees F, use ice or other means of cooling the concrete during mixing and transportation so that the temperature of the concrete as placed will not exceed 90 degrees F.
3. Take precautions when placing concrete during hot, dry weather to eliminate early setting of concrete. This includes protection of reinforcing from direct sunlight to prevent heating of reinforcing, placing concrete during cooler hours of the day, and the proper and timely application of specified curing methods.
4. There will be no additional reimbursement to the Contractor for costs incurred for placing concrete in hot weather.

3.05 BONDING TO EXISTING CONCRETE

Existing concrete is concrete placed prior to this contract or concrete placed during this contract which has cured at least 28 days. Coat the contact surface with epoxy bonding compound. The method of preparation and application of the bonding compound shall conform to the manufacturer's printed instructions and recommendations for specific application of the product.

3.06 FORMWORK

- A. Arrange formwork construction to allow for proper sequencing and removal without damage. Use orderly and symmetrical panel arrangement with minimum number of joints. Before proceeding, secure approval of formwork and procedures.
- B. Lumber, prefabricated wood panels, metal, or plastic-lined panels shall be sound and free from any defects that will mar or detract from the surface of the finished concrete. Construct forms sufficiently tight to prevent loss of mortar. Design forms to withstand vibrator action. Treat forms with a nonstaining material to eliminate absorption of water and to act as a form release agent.

- C. Thoroughly remove all dirt, mortar, and foreign matter before each use. Where the bottom of the form is inaccessible from within, provide access panels to permit thorough removal of extraneous material before placing concrete.
- D. Kerf wood forms inserted for architectural treatment to accommodate swelling without pressure on the concrete.
- E. Chamfer all exposed horizontal and vertical edges or other corners $\frac{3}{4}$ -inch, both interior and exterior of structures.
- F. Earth trench forms for walls and footings below existing and final grades may be used, if approved after inspection of the trenches, provided the sides are clean, even, vertical, true, and provided the bottoms are level, clean, and without fill, and the width is increased two (2) inches.
- G. Where tolerances are not shown elsewhere, permissible deviations from established lines, grades, and dimensions are listed below:
 - 1. Variation from the Plumb:
 - a. In the lines and surfaces of columns, piers, walls and in arises: in 10 feet, $\frac{1}{4}$ -inch; in any story or 20 feet maximum, $\frac{3}{8}$ -inch; in 40 feet or more, $\frac{3}{4}$ -inch.
 - b. For exposed corners and other conspicuous lines: in any bay or 20 feet maximum, $\frac{1}{4}$ -inch; in 40 feet or more, $\frac{1}{2}$ -inch.
 - 2. Variation from the Level or from the Grades Shown:
 - a. In floors, ceilings, and beam soffits: in 10 feet, $\frac{1}{4}$ -inch; in any bay or 20 feet maximum, $\frac{3}{8}$ -inch; in 40 feet or more, $\frac{3}{4}$ -inch; in floors to receive tile, maximum of $\frac{1}{8}$ " in 10 feet.
 - b. For exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines: in any bay or 20 feet maximum, $\frac{1}{4}$ -inch; in 40 feet or more, $\frac{1}{2}$ -inch.
 - 3. Variation of the linear building lines from established position in plan and related position of columns, walls and partitions: In any bay or 20 feet maximum, $\frac{1}{2}$ -inch; in 40 feet or more, 1 inch.
 - 4. Variation in tank, channel or structural lines in 10 feet, $\frac{1}{4}$ -inch; in 20 feet, $\frac{3}{8}$ inch; in 40 feet or more, $\frac{1}{2}$ -inch.
 - 5. Variation in the sizes and locations of sleeves, floor openings and wall openings: $\frac{1}{4}$ -inch.
 - 6. Variation in cross-sectional dimensions of columns, beams and piers, and in the thickness of slabs and walls: minus, $\frac{1}{4}$ -inch; plus, $\frac{3}{8}$ -inch.
 - 7. Footings:
 - a. Variation in Dimensions in Plan: Minus, $\frac{1}{2}$ -inch; plus, 2-inch.
 - b. Misplacement or Eccentricity: 2 percent of the footing width in the direction of misplacement but not more than 2 inches.

- c. Misplacement or Eccentricity of Footings Supporting Masonry Or Concrete: 1/2-inch.
 - d. Reduction in Thickness: Minus 5 percent of specified thickness.
- 8. Variation in Steps:
 - a. In a Flight of Stairs: rise, 1/8-inch; tread, 1/4-inch.
 - b. In Consecutive Steps: rise, 1/16-inch; tread, 1/8-inch.
- 9. Variation from established lines and grades in sidewalks, plazas, outdoor concrete slabs, curb and gutter sections: in 10 feet, 1/4-inch; in 1 foot, 1/8-inch.

Where tolerances are not met, the Owner's Representative may require removal and replacement at no cost to the Owner.

3.07 REINFORCEMENT

- A. Design: The reinforcement design shown on drawings shows only the necessary information for detailing the reinforcement and preparing placing and bending details. Prior to starting concrete work, submitted detailed shop drawings shall be approved.
- B. Bending: In accordance with CRSI Manual of Standard Practice, Chapter 7.
- C. Placement: Place reinforcement accurately as shown. Adequately secure metal reinforcement in position by concrete or metal chairs and spacers, in accordance with CRSI Manual of Standard Practice, Chapter 8. Distance between the steel and the surface, as shown; otherwise, in accordance with Chapter 8. In walls, use bolsters between form and reinforcement to prevent lateral displacement of reinforcement and to insure proper concrete cover.
- D. Splices: Locate splices of reinforcement as shown. For any splices not shown, assume Class B splice. Stagger splice in adjacent horizontal bars. Lap adjacent sheets of wire mesh a minimum of 6 inches and wire securely.
- E. Inspection: After reinforcement has been placed, it shall be inspected and approved before placing concrete.
- F. Conditions of Surfaces: At time concrete is placed, all metal reinforcement shall be free from rust, scale, frost, or other coatings that would destroy or reduce the bond.
- G. Welding Reinforcement: Do not weld reinforcing steel unless specifically approved by the Engineer. Welding to be in accordance with ASTM A706.

3.08 JOINTS AND EMBEDDED ITEMS

- A. Construction Joints:
 - 1. Obtain approval for joints not shown and locate them where they least impair the strength of the structure. Unless otherwise shown on the drawings, joints in walls and columns shall be at the underside of floors, slabs or beams, and at the top of footings or floor slabs. Place beams at the same time as slabs. At least two hours shall elapse after depositing concrete in columns or walls before depositing concrete in supported

beams or slabs. As the new concrete is placed, re-vibration in tops of columns and walls is desirable. Make joints perpendicular to the main reinforcement.

2. All horizontal construction joints in walls shall have a continuous wood screed strip at the outer face of joint to form a true line. Screeds shall be removed and the reglet thoroughly cleaned out before pouring the next portion of wall.
3. Continue all reinforcing steel and mesh across construction joints. Lap splices shall be located outside all construction joints.
4. Construction joints shall be made rough and all laitance removed from the surface by chipping the entire surface, sandblasting with coarse silica sand, or hosing the surface 4 to 6 hours after the pour with a fine spray, exposing solidly embedded clean aggregate.

Forms and reinforcing shall likewise be cleaned of drippings, debris, etc., by means of compressed air. Surfaces of the hardened concrete shall be cleaned to the satisfaction of the Engineer and wet as required before placing of new concrete. Just before starting the new pour, all free water shall be removed and the horizontal surfaces shall be covered with at least a 4-inch thickness of concrete composed of cement and fine aggregate, omitting the coarse aggregate.

B. Expansion Joints:

1. Install expansion joint fillers to ½-inch below slab.
2. Where shown, load transfer dowels shall consist of plain bars with one half coated with an approved antibond coating. The coated half shall be sleeved. No other reinforcement or metal shall extend continuously through the joint.

C. Waterstops:

1. The design and location of waterstops shall be as shown on the drawings and in these specifications. Each piece of premolded waterstop shall be of maximum practicable length to minimize the number of end joints.
2. PVC waterstops shall be properly heat spliced at the ends and intersections to ensure continuity. Construct forms for construction joints in such a manner as to prevent injury to waterstops. Allow at least 10 minutes before pulling or straining the new splice in any way. The finished splices shall provide a cross section that is dense and free of porosity with tensile strength of not less than 80 percent of the unspliced materials.
3. Install waterstops in strict conformance with manufacturer's recommendations.
4. Support waterstops securely against displacement using approved adhesives, or methods specifically recommended by the manufacturer. Hold PVC waterstops securely in position with continuous No. 3 rebar secured to waterstops with hog rings at 12" max on center. Secure continuous rebar to each mat of reinforcing with tie wire at 12" on center.

Install waterstops in construction and expansion joints in hydraulic structures or where shown in the drawings.

5. If joint is not watertight after construction, one or both of the following shall be done to provide a watertight joint:
 - a. Grouting of the joint by drilling grout holes to the center of the structure unit and forcing epoxy grout into the joint under pressure.
 - b. Cutting of a bevel groove on the water side of the joint. The groove shall be $\frac{1}{2}$ to $\frac{3}{4}$ -inch in width and depth and shall be caulked with epoxy joint sealer in accordance with manufacturer's instructions.

D. Other Embedded Items:

1. Prior to concreting, place all required sleeves, inserts, anchor bolts and embedded items.
2. Give all trades whose work is related to the concrete ample notice and opportunity to introduce embedded items before concrete is placed.
3. Position expansion joint material, waterstops, and embedded items accurately and support them against displacement. Fill voids in sleeves, inserts, and anchor slots temporarily with readily removable material to prevent the entry of concrete.

E. Pipes and Wall Spools Cast in Concrete:

1. Install wall spools (i.e. bell ring inserts), wall flanges, and wall anchors before placing concrete. Do not weld, tie, or otherwise connect the wall spools or anchors to the reinforcing steel.
2. Support pipe and fabricated fittings to be encased in concrete on concrete piers or pedestals. Carry concrete supports to firm foundations so that no settlement will occur during construction.
3. Pipes or spools located below operating water level shall have waterstop ring collars and shall be cast in place. Do not block out such piping and grout after the concrete section is cast. Pipes fitted with thrust rings shall be cast in place.

F. Additional Reinforcement Around Openings:

Place additional reinforcement around pipe or openings as indicated in the drawings.

3.09 FORM REMOVAL

Carefully remove forms to insure the complete safety of the structure. Where the structure is supported by shoring, the beam sides, columns, or other vertical forms may be removed after 36 hours, providing the concrete will not be injured. All supporting forms shall remain in place for a minimum of 10 days. Do not remove supporting forms or shoring until members have acquired sufficient strength to support their weight and imposed loads safely.

3.10 CONSTRUCTION LOADS ON STRUCTURAL SLABS

If shoring is removed, no construction materials and equipment shall be allowed on structural slabs until the concrete has reached the 28-day compressive strength. All superimposed construction loads will then be limited to the design load of the slab.

3.11 REPAIRING AND PATCHING

- A. Clean, thoroughly dampen and patch all tie holes and all repairable defects immediately after form removal.
- B. All honeycombed and other defective concrete shall be removed to sound concrete with edges perpendicular to the surface. Surface imperfections greater than 3/8 inch in any dimension shall be removed and the affected areas neatly patched. Dampen the area to be patched and an area at least 6 inches wide surrounding it to prevent absorption of water from the patching mortar. Mix patching grout to the consistency of thick cream and brush it well into the surface.
- C. Make the patching mortar of the same material and approximately the same proportions as used for the concrete, omitting the coarse aggregate. The resultant mortar shall consist of not more than 1 part cement to 2½ parts sand by damp loose volume.
- D. Do not use more mixing water than necessary for handling and placing. Mix the patching mortar in advance and allow to stand with frequent manipulation with a trowel, without adding water, until it has reached the stiffest consistency that will permit placing.
- E. After surface water has evaporated from the area to be patched, brush the patching grout well into the surface. When the patching grout begins to lose the water sheen, apply the premixed patching mortar. The mortar shall be thoroughly consolidated into place and struck off to leave the patch slightly higher than the surrounding surface. To permit initial shrinkage, leave the patch undisturbed for at least 1 hour before finishing it. Keep the patched area damp for 7 days. Do not use metal tools in finishing a patch in a formed wall which will be exposed.
- F. Tie Holes: Clean thoroughly, dampen, then fill solid with patching mortar. Mortar shall match color of concrete. Fill tie holes prior to finishing.

3.12 FINISHES FOR SURFACES

- A. Finish 1: Beams, columns, and exterior walls not exposed to water or view: Repair defective concrete, fill depressions deeper than ½ inch, and fill tie holes.
- B. Finish 2: Exterior and interior walls, beams, and columns exposed to water, unless such items are to be coated: Repair defective concrete, remove fins, fill depressions ¼ inch or deeper, and fill tie holes.
- C. Finish 3: Walls, beams, and columns of structures or buildings exposed to view and to 1 foot below water level or finished grade; underside of formed floors or slabs (Except - surfaces which are to be coated): In addition to Finish 2, fill depressions and airholes with mortar. Dampen surfaces and then spread a slurry consisting of one part cement and one and one-half parts sand by damp loose volume, over the surface with clean burlap pads or sponge rubber floats. Remove any surplus by scraping and then rubbing with clean burlap.

- D. Finish 4: Exterior and interior surfaces to be coated: Repair defective concrete, remove fins, fill depressions 1/16 inch or deeper, fill tie holes, remove mortar spatter, and remove bulges higher than 1/16 inch. Surface shall be trowelled, sacked, and brush blasted.
- E. Finish 5: Slabs and floors to be covered with concrete or grout: Screed to grade without special finish.
- F. Finish 6: Slabs and floors not water bearing: Repair defective concrete, remove fins, fill depressions ¼ inch or deeper, and fill tie holes.
- G. Finish 7: Slabs and floors which are water bearing; Slab surfaces on which mechanical equipment moves; Slab surfaces to receive hardener: Steel trowel finish, free from trowel marks and all irregularities.
- H. Finish 8: Slabs and floors of structures or buildings exposed to view: Steel trowel finish without local depressions or high points and apply a light hair-broom finish. Do not use stiff bristle brooms or brushes. Leave hair-broom lines parallel to the direction of slab drainage.
- I. Finish 9: Slabs and floors at slopes greater than 10 percent and stairs: Steel trowel finish without local depressions or high points. Apply a coarse broom finish. Leave broom lines parallel to the direction of slope drainage.
- J. Finish 10: Exposed stairs and landings and slabs designated for non-slip finish: Areas to have non-slip finish shall incorporate 25 pounds per 100 square feet of aluminum oxide grains into the surface. Immediately before floating begins, sprinkle two-thirds of the abrasive evenly over the surface and float. After embedment, sprinkle the remaining one-third at right angles to the previous application. Apply more heavily in areas not sufficiently covered by the first application, and float again immediately. Complete finishing as specified under Trowelled Finish.
- K. Finish 11: Exposed edges (EXCEPT – edges normally covered with earth): Provide chamfer or beveled edges per this Section.
- L. Finish 12: Top of walls, beams, and similar unformed surfaces: Strike smooth and float in accordance with Finish 8.

3.13 SLAB FINISHING

- A. Screeding: After concrete has been thoroughly consolidated, screed slabs to the desired elevation and contours by means of accurately placed edge forms and intermediate screed strips.
- B. Floated Finish:
 - 1. Place, consolidate, strike off, and level concrete, but do not work it further until ready for floating. Begin floating when water sheen has disappeared and when the surface has stiffened sufficiently.

2. During or after the first floating, check planeness of surface with a 10-foot straightedge applied at not less than two different angles, and then cut down all high spots and fill all low spots to achieve a true plane within ¼-inch in 10 feet.
 3. Refloat slab immediately to a uniform sandy texture.
- C. Troweled Finish: Float finish slab as described above, then steel trowel by machine or by hand. Additional trowellings shall be done by hand after the surface has hardened sufficiently. Final trowelling shall produce a ringing sound from the trowel and the finished surface shall be free of trowel marks, uniform in texture, and appearance shall be planed to the tolerance specified under Floated Finish. Trowelled finish shall occur at tank floors (except where grout topping or fillets will follow), troughs, channels, clear wells, and all building floor slabs.
- D. Coarse Broom Finish: Immediately after floating, give slabs for exterior walkways and exterior stoops a coarse transverse scored texture by drawing a broom across the surface.

3.14 FLOOR HARDENER

- A. All building floors not scheduled for floor covering, Non-slip Floor Finish, or Broom finish shall receive hardener (Finish 7).
- B. Apply hardener after floors have cured, in accordance with the manufacturer's recommendations.
- C. Floors shall receive three applications of hardener, mixed and applied as specified for heavy duty floors.

3.15 CURING AND PROTECTION

- A. General: Beginning immediately after placement, protect concrete from drying, excessively hot and cold temperatures and mechanical injury. Keep moisture loss to a minimum until cement has hydrated and concrete is hard. Keep concrete constantly moist during the curing period. Follow color admixture manufacturer's recommendations for integrally colored concrete.
- B. Curing:
 1. Formed Surfaces: Keep forms wet. Cool metal forms exposed to the sun with water. Forms shall remain in place for 7 days unless material specified for in Section 2.22 Curing Materials is applied. If curing compound is used, apply in accordance with manufacturer's instructions. Curing compound shall not be used on any wall/slab scheduled to be coated.
 2. Slabs: Immediately after finishing, apply one of the materials specified in Section 2.22 entitled Curing Materials, but use membrane forming liquid only with Engineer's approval.
 3. Duration of Curing: 7 days minimum.

C. Protection:

1. In cold weather, maintain the moisture conditions but also, by heating or covering, maintain the temperature of the concrete in accordance with Section 3.04.D.3.
2. In hot weather take immediate steps to protect newly finished concrete from drying effects of wind and sun and maintain temperature of the air surrounding the concrete uniform within 5 degrees F in any one hour or 50 degrees F in any 24 hour period.
3. During curing period, protect concrete from mechanical damage, loading, shock and vibration.

3.16 CONSTRUCTION OF CONCRETE FILLETS, TOPPING, AND EQUIPMENT PADS

- A. Concrete fillets, topping and equipment pads shall be placed as soon as possible after completion of the curing period of the tank walls and structural floors. Contact surfaces shall be thoroughly cleaned to the degree recommended by the bonding agent manufacturer.
- B. Bonding agent shall be accurately and thoroughly mixed and applied at the manufacturer's recommended coverage rate. Mix only the amount which can be used prior to expiration of the pot life. Concrete shall be immediately placed over the fresh surface before setting of the agent. Bonding agent which sets up prior to placing concrete shall be recoated with a fresh coat.
- C. Concrete fillets, topping, and equipment pads shall be accurately screeded to the slopes and elevations shown and steel trowel finished. Cure concrete as specified for slabs above. Set equipment anchor bolts in pad to accommodate equipment furnished.

3.17 BACKFILL AGAINST STRUCTURES

- A. Backfill against concrete structures shall not be allowed until the concrete has reached the specified 28-day compressive strength. Where backfill is to be placed on both sides of the wall, or against more than one wall of a structure, place the backfill uniformly on both sides of the wall or walls.

Do not backfill until structure has passed leakage testing.

- B. Do not backfill the walls of structures that are laterally restrained or supported by suspended slabs or slabs on grade until the slab is poured and the concrete has reached the specified compressive strength.

3.18 NONSHRINK GROUT

Use nonshrink grout to fill sleeves and voids under equipment bases. Grout shall be mixed and used in accordance with manufacturer's recommendations. Exposed edges shall be smooth, straight and even.

3.19 ADHESIVE ANCHORS

Install in strict conformance to manufacturer's printed instructions. Do not cut or damage existing reinforcing bars. Where reinforcing bars are encountered, move anchor location or core hole as approved by the Engineer.

3.20 LEAKAGE TESTING OF HYDRAULIC STRUCTURES

A. General:

1. Prior to backfilling the structure and the application of water-proofing coatings, hydrostatically test reinforced concrete structures which will contain water or fluid to determine that they conform to Section B herein and are free of detectable leaks. Do not start leak testing or cleaning of surfaces until concrete is cured and joint sealants have set and cured a minimum of 14 days. Do not hydrostatically test walls which are to be restrained or laterally supported by slabs until slab concrete has obtained the specified compressive strength.
2. Prior to testing, clean exposed surfaces by thoroughly hosing and removing surface laitance and loose matter from walls and slabs. Remove wash water and debris from the structures by means other than washing through plant piping.

B. Leakage Test Procedure:

1. Fill hydraulic structures to be subjected to leakage tests with potable water to the normal operating liquid level line not less than 2 feet below top of walls. Filling shall be at a uniform rate over a 24-hour period with continuous monitoring. For structures with adjacent bays, fill all bays simultaneously. Empty adjacent bays alternately. Repair any running leaks which appear during filling before continuing.
2. After the structure has been kept full for 48 hours, it will be assumed for the purposes of the test that the absorption of moisture by the concrete in the structure is complete. Then close all valves and gates to the structure and measure the change in water surface each day for a five-day period.
3. During the test period, examine exposed portions of the structure, and mark visible leaks or damp spots. A damp spot is defined as an area which seeps sufficient moisture to dampen a paper towel when pressed against it. Repair visible leaks or damp spots after dewatering. Additionally, if the drop in water surface in the 24-hour period exceeds 1/10 of 1 percent of the normal volume of liquid contained in the structure, the leakage shall be considered excessive.
4. The determination of surface moisture evaporation shall be aided with a 24-inch deep, white colored, watertight container with not less than 10 square feet of surface area exposure. Position container to experience environmental conditions similar to the structure being tested. Subtract the water loss due to evaporation from the measured water loss in the structure to determine the water loss due to leakage.
5. If the leakage is excessive, drain the structure, repair leaks and damp spots, and refill the structure and again test for leakage. Continue this process until the drop in water surface in a 24-hour period meets the test requirements.
6. If an underdrain system is present, inspect the manholes of the underdrain system for evidence of leaks in the floor slabs. If leaking is indicated, locate and repair.

7. Seed the floor slab of each hydraulic structure with one sack of cement per 1,000 square foot surface area. Seeding shall take place after the test filling has reached 18 inches in depth. Detect leaks in construction and expansion joints with the aid of a diver. Stir cementitious deposits flowing toward leaks and repair where the defect is located.
8. Repair flowing leaks whether leakage exceeds the allowable leakage or not.
9. Repairs and additional filling and testing shall be made by the Contractor at no additional cost to the Owner.

C. Repair of Defects:

1. Do not repair defects until concrete has been reviewed by the Owner's Representative.
2. Surface Defects: Repair surface defects that are smaller than 1 foot across in any direction and are less than ½ inch in depth. Repair by removing the honeycombed and other defective concrete down to sound concrete, make the edges perpendicular to the surface and at least 3/8 inch deep, thoroughly dampen the surface, work into the surface a bonding grout, fill the hole with mortar, match the finish on the adjacent concrete, and cure as specified.
3. Severe Defects: Repair severe defects that are larger than surface defects but do not appear to affect the structural integrity of the structure. Repair by removing the honeycombed and other defective concrete down to sound concrete, make the edges perpendicular to the surface, sandblast the surface, coat the sandblasted surface with epoxy bonding compound, place nonshrink grout as specified herein, match the finish on the adjacent concrete, and cure as specified.
4. Major Defects: If the defects are serious or affect the structural integrity of the structure or if patching does not satisfactorily restore the quality and appearance to the surface, the Engineer may require the concrete to be removed and replaced, complete, in accordance with the provisions of this section at no additional cost to the Owner.

D. Repair of Cracks in Concrete:

1. Repair leaking concrete cracks that are 1/10 inch or less in width by epoxy pressure injection.
 - a. Preparation: Insert and anchor a one-way polyethylene valve or pipe nipple in holes drilled into crack. Position them every 6- to 18-inches on center depending on the width of crack. Maintain a slow, steady pressure rather than a rapid buildup of pressure. When grouting material reaches the next tube, stop off the present position and follow the same procedure on the next position.
 - b. Upon completion of the epoxy grouting, remove the epoxy gel used to hold the valve or nipple by applying a direct flame to the epoxy and scraping it off. Fill the holes with the same material as used for patching the surface.

- c. While the valves or nipples are installed first, the grouting operation shall not commence until after the patch work has been completed and has sufficiently cured.
2. Repair cracks in concrete structures that are wider than 1/10 inch in width by cutting out a square edged and uniformly aligned joint 3/8 inch wide by 3/4 inch deep, preparing exposed surfaces of the joint, priming the joint, and applying polyurethane joint sealant in accordance with this section.
3. If the cracks are serious or affect the structural integrity or function of the element, the Engineer may require the concrete to be removed and replaced, complete, in accordance with the provisions of this section at no additional cost to the Owner.
4. After repairing visible leaks, damp spots or leaking concrete cracks, retest the structure.

3.21 CONCRETE TESTING

A certified testing laboratory, at Owner's expense shall perform the following concrete testing:

- A. One set of four concrete test cylinders shall be taken for every 50 cubic yards or fraction thereof of each concrete mix design placed each day. The Engineer has the option to direct the required test specimens to be taken as he deems necessary to insure the concrete meets the specification.
- B. Specimens shall be taken, cured, and tested for compressive strength in accordance with ASTM C31, ASTM C39, and ASTM C172, respectively.
- C. Determine the concrete slump by ASTM C143 with each set of cylinders taken and as required to establish consistency.
- D. Determine air content of the concrete using ASTM C231 to verify the percentage of air in the concrete immediately prior to depositing in the forms with each set of cylinders taken and as required to establish consistency.
- E. Determine drying shrinkage in accordance with ASTM C157, as modified by SEAOC, at 7, 14, 21, and 28 days of drying after the wet cure period. A minimum of three sets of three shrinkage bars shall be cast over the project duration. The Engineer has the option to increase or decrease the testing frequency as he deems necessary to insure the concrete meets the specification. Shrinkage of concrete at 28 days drying age shall not exceed 0.045 percent.
- F. Test reports shall be sent to the Engineer with copies to the Contractor.
- G. Concrete which fails to meet strength, slump, air, or shrinkage requirements may be rejected by the Engineer before, during, or after placement.
- H. Test one cylinder at 7 days for information; test two cylinders at 28 days for acceptance; and hold one cylinder for verification. Strength acceptance will be based on the average of the strengths of the two cylinders tested at 28 days. If one cylinder of a 28-day test manifests evidence of improper sampling, molding, or testing, other than low strength, discard it and use the fourth cylinder for the test result.

- I. The average value of the two cylinders tested at 28 days shall be equal to or greater than the specified 28-day strength. No test shall be less than 90 percent of the specified 28-day strength.
- J. If the average 28-day strength fails to meet the specified minimum compressive strength, the concrete will be assumed to be defective and one set of three cores from areas selected by the Owner may be taken and tested in accordance with ASTM C42. If the average compressive strength of the set of three concrete cores fails to equal 90 percent of the specified minimum compressive strength or if any single core is less than 75 percent of the minimum specified compressive strength, the concrete will be considered defective. The Owner may require additional coring, nondestructive load testing, or repair of defective concrete. Costs of coring, testing of cores, load testing, and required repairing pertaining thereto shall be paid by the Contractor at no extra cost to the Owner.

3.22 DAMAGED OR DEFECTIVE CONCRETE

Remove damaged or defective concrete before completion and acceptance of the work and replace with acceptable concrete, at no additional cost to the Owner.

END OF SECTION

SECTION 03700
CONCRETE SAW-CUTTING AND CORE-DRILLING

PART 1: GENERAL

1.01 DESCRIPTION

The work of this section consists of saw-cutting and/or core-drilling new openings in existing concrete.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 03100: Concrete

1.03 QUALITY ASSURANCE

Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this section.

All measurements and layout of core-drilling and saw-cutting shall be field verified for accuracy. It shall be the responsibility of the contractor to coordinate this work.

1.04 SUBMITTALS

A. Submit sketches and commentary showing and describing the proposed cutting procedures for each type of cut.

PART 2: MATERIALS

2.01 EQUIPMENT

A. Provide equipment in good and safe working order, adequate to perform the work.

B. Provide necessary scaffolding, lighting, access, debris removal equipment and devices, and appropriate safety measures.

PART 3: EXECUTION

3.01 SAFETY REGULATIONS

Comply with all applicable safety regulations including the requirements of "The Construction Safety Orders" of the State of California and the provisions of OSHA.

3.02 CONCRETE CUTTING

A. Perform concrete cutting as shown on the drawings and as specified herein and in accordance with the approved Submittals.s

B. Openings shall be cut to the dimensions shown on the drawings and shall not be overcut. In straight-cut openings, the face opposite the saw shall be chipped to

achieve the opening dimension. Modifications to drawing dimensions may be required and shall be coordinated prior to cutting.

3.03 PATCHING

- A. Where existing reinforcing bars are cut at new opening, burn back the reinforcing bars a minimum of 1-inch below adjacent concrete.
- B. Patch the resulting void at existing reinforcing bars and the surface of chipped opening surfaces with patching grout in accordance with Section 03100 to achieve a smooth, uniform surface.

3.04 DISPOSAL

- A. Remove cut material and dispose of off-site in a safe and orderly manner. Do not allow debris to accumulate on the site exposed to view.
- B. Inside structures, cuttings, chippings and patching grout droppings must be removed completely. No debris shall be washed into the plant's sediment drain system.
- C. Upon completion of the work of this section, the surfaces of all structures shall be clean and free of cuttings, slurry and debris.

END OF SECTION

SECTION 15030

PIPE REMOVAL

PART 1: GENERAL

1.01 SUMMARY

- A. Includes general specifications for removing raw water or sewer pipe.

1.02 SUBMITTALS

- A. Submittals shall be provided in accordance with Section 01300 and shall include the following:
 - 1. A removal plan for review by the Engineer prior to the start of removal after field verification of pipe location, material, and size.
 - 2. Names and descriptions of materials to be used.

PART 2: PRODUCTS

2.01 EQUIPMENT AND MATERIALS

- A. Equipment and materials shall be selected by Contractor as necessary to achieve desired results for removal. Selected equipment and materials are subject to review of Engineer through submittals.
- B. All equipment shall be in good repair and operating order.
- C. Sufficient standby equipment and materials shall be kept available to ensure continuous operation, where required.

PART 3: EXECUTION

3.01 PIPE REMOVAL

- A. Existing sewer pipes shall not be removed until the corresponding new sewer pipes are fully in service or bypass pumping has been established.
- B. Service outage shall be less than 24 hours.
- C. Pipe shall be removed and salvaged if requested by the Owner; otherwise, pipe shall be removed and disposed of in accordance with all applicable laws.
- D. Backfill pipe removal area with Class II aggregate base.

END OF SECTION

SECTION 15071
PLASTIC PIPE AND FITTINGS

PART 1: GENERAL

1.01 DESCRIPTION

The work of this section consists of furnishing and installing polyvinyl chloride pipe and fittings.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 01300: Submittals
- B. Section 02223: Trenching, Backfilling, and Compacting
- C. Section 15080: Piping Accessories and Appurtenances

1.03 QUALITY ASSURANCE REFERENCES

This section contains references to some or all of the following documents, most recent edition. They are a part of this section as specified and modified. In case of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.

Reference	Title
ASTM D1248	Polyethylene Plastics Molding and Extrusion Materials.
ASTM D1784	Rigid Polyvinyl Chloride (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
ASTM D1785	Polyvinyl Chloride (PVC) Plastic Pipe, Schedules 40, 80, and 120
ASTM D2241	Polyvinyl Chloride (PVC) Pressure Rated Pipe (SDR series)
ASTM D2464	Threaded Polyvinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 80
ASTM D2466	Polyvinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 40
ASTM D2467	Socket Type Poly Vinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 80
ASTM D2564	Solvent Cements for Polyvinyl Chloride (PVC) Plastic Pipe and Fittings
ASTM D3034	Type PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings
ASTM D4101	Propylene Plastic Injection and Extrusion Materials
ASTM F402	Practice for Safe Handling of Solvent Cements and Primers Used for Joining Thermoplastic Pipe and Fittings

1.04 SUBMITTALS

- A. In accordance with Section 01300.
- B. Submit materials list and catalog data sheets naming each product to be used identified by manufacturer and type number.
- C. The Contractor shall prepare and submit one copy to the City of Oroville of shop drawings and laying diagrams of all pipe, joints, bends, special fittings, and piping appurtenances.

PART 2: MATERIALS

2.01 PVC PRESSURE PIPE

- A. Not Used.

2.02 PVC SEWER PIPE

- A. General: Pipe and fittings shall be made of PVC plastic having a cell classification of 12454-B as defined in ASTM D1784 and shall be SDR-35 (PVC). Additives and fillers including but not limited to stabilizers, antioxidants, lubricants, colorants, etc. shall not exceed 10 parts by weight per 100 of PVC resin in the compound.
- B. Pipe: All sewer mains shall be eight inch minimum diameter pipe, and shall be continuously and permanently marked with the manufacturer's name, pipe size, dimension ratio and/or pressure rating in psi. PVC pipe shall have a solid cross-section rubber ring gasket. The gasket shall be securely attached to the pipe to prevent displacement of the gasket when installed in the field. All rubber ring gaskets shall be in accordance with ASTM F477. Lubricant used for field assembly of gasketed PVC pipe shall have no detrimental effect on the gasket, joint, fitting, or pipe and shall be as recommended by the manufacturer. Provide rubber waterstops at the entry of all PVC pipe into manhole bases. PVC gravity sewer pipe and fittings shall conform to ASTM D3034 for diameters from 4-inches to 15-inches. Pipe joints shall conform to ASTM D3212. Pipe shall be solid wall only; profile wall pipe is not allowed.
- C. Fittings: Pipe fittings shall be gasketed fittings matching the pipe SDR and conforming to ASTM D3034, Class SDR-35. The ring groove and gasket ring shall be compatible with PVC pipe ends. Flanged fittings shall be compatible with cast-iron or ductile-iron pipe fittings. The strength class of the fittings shall be not less than the strength class of any adjoining pipe.

PART 3: EXECUTION

3.01 GENERAL

- A. All laying, jointing, and testing for defects and for leakage shall be performed in the presence of the Engineer and shall be subject to inspection before acceptance. All material found during the progress of the work to have defects will be rejected, and the Contractor shall promptly remove such defective materials from the site of the work.
- B. Installation shall conform to the requirements of ASTM D2321 and to the supplementary requirements or modifications specified herein. Wherever the provisions of this Section and the requirements of ASTM D2321 are in conflict, the more stringent provision shall apply.

3.02 INSTALLATION OF PIPE AND FITTINGS

- A. General: In accordance with manufacturer's recommendations and ASTM 2321, whichever is more stringent.
- B. Plastic piping exposed to sunlight shall be painted with two coats of latex paint. Color shall be white unless otherwise specified.

- C. Pipe and fittings shall be of the sizes indicated. Clean pipe interior of all foreign matter before installing. Pipe shall be square cut with fine tooth saw or other cutter or knife designed for use with plastic pipe. Remove burrs by smoothing edges with a knife, file, or sandpaper. Replace any section of pipe found to be defective or damaged with new acceptable pipe. Handle pipe carefully to prevent gouging or scratching. Any length of pipe having a gouge, scratch, or other permanent indentation more than 10 percent of the wall thickness in depth shall be rejected.

3.03 INSTALLATION OF SOLVENT WELD JOINT TYPE PIPE

In accordance with the recommendations of the pipe manufacturer and the following supplementary requirements:

- A. Do not solvent weld joints if it is raining, if atmospheric temperature is below 40 degrees F or above 90 degrees F, if the pipe is exposed to direct sunlight.
- B. Test fit dry pipe and fittings before applying cement. Pipe should enter socket without forcing at least one third but not more than two thirds the depth of socket. Fittings that are looser or tighter shall not be used. Thoroughly clean and dry the pipe end and socket of fitting with methyl ethyl ketone, acetone, or similar cleaner. Apply cement evenly to outside surface and end of pipe and inside surface of socket. Avoid excess application of cement but insure complete coverage of all bonding surfaces. Mark depth of socket on pipe to guide application of cement and insure full insertion of pipe. Insert pipe in socket, twisting pipe or fitting approximately ½ turn as pipe is being seated in socket. Make sure pipe is fully seated providing a bond between end of pipe and shoulder of socket. Immediately wipe excess cement from pipe leaving no more than a 1/8-inch fillet at fitting end. Hold assembled joint in place for approximately 15 seconds and allow to set for 30 minutes before moving. Avoid rough handling for 48 hours. Longer periods may be required in cold or wet weather.

3.04 INSTALLATION OF PUSH-ON JOINT TYPE PIPE

Clean gaskets and seats of foreign materials prior to joint assembly. Apply lubricant as recommended by the pipe manufacturer. Carefully insert the spigot end into the bell to prevent entry of dirt and incorrect entry angle. With suitable fork tool, crowbar, or by hand, make the joint to the insertion depth recommended by the manufacturer. When the selected pipe uses joints not designed for full depth insertion, prevent further closure of previously completed joints by restraining movement of the installed line while making succeeding joints.

3.05 INSTALLATION OF TUBING

Not Used.

3.06 TESTING

- A. Pressure Testing: Shall be in accordance with Section 01666.
- B. Field Inspection for Plastic Pipe and Fittings: Installed pipe shall be tested to ensure that vertical deflections for plastic pipe do not exceed the maximum allowable deflection. All SDR 26 and 35 PVC Sewer Pipe shall be mandrel tested by the Contractor as outlined below. All C905 PVC pipe

may be measured by the Engineer for overdeflection above 3%. Maximum allowable deflections for SDR 26 and 35 pipe shall be governed by the mandrel requirements stated herein and shall nominally be the percentage listed of the maximum average ID.

Nominal Pipe Size	Percentage
Up to and including 12-inch	5.0
Over 12-inch to and including 30-inch	4.0
Over 30-inch	3.0

The maximum average ID shall be equal to the average OD per applicable ASTM Standard minus two minimum wall thicknesses per applicable ASTM Standards. Manufacturing and other tolerances shall not be considered for determining maximum allowable deflections.

Deflection tests shall be performed not sooner than 30 days after completion of placement and densification of backfill. The pipe shall be cleaned and inspected for offsets and obstructions prior to testing.

For all pipes less than 24-inch ID, a rigid mandrel shall be pulled through the pipe by hand to ensure that maximum allowable deflections have not been exceeded. Prior to use, the mandrel shall be certified by the Engineer. Use of an uncertified mandrel or mandrel altered or modified after certification will invalidate the test. If the mandrel fails to pass, the pipe will be deemed to be overdeflected.

Unless otherwise permitted by the Engineer any overdeflected pipe shall be uncovered and, if not damaged, reinstalled. Damaged pipe shall not be reinstalled but shall be removed from the Work site. Any pipe subjected to any method or process other than removal, which attempts, even successfully, to reduce or cure any overdeflection, shall be uncovered, removed from the Work site and replaced with new pipe.

The mandrel shall:

1. Be rigid, non-adjustable, odd-numbering-leg (9 legs minimum) mandrel having an effective length not less than its nominal diameter.
2. Have a minimum diameter at any point along the full length as follows:

Pipe Material	Nominal Size (inches)	Minimum Mandrel Diameter * (inches)
PVC-ASTM D 3033 (SDR 35)	6	5.619
	8	7.309
	10	9.137
	12	10.963
	15	13.849
PVC-ASTM F 679 (T-1 Wall)	18	16.924
	21	19.952
	24	22.446
	27	25.297
	30	28.502
	36	35.03

* Mandrel diameters of SDR 26 pipe shall be based on 4% deflection of the average inside diameter.

3. Be fabricated of steel, be fitted with pulling rings at each end, be stamped or engraved on some segment other than a runner indicating the pipe material specification, nominal size and mandrel OD, (e.g., PVC D 3034-8"-7.524"; and be furnished in a suitable carrying case labeled with the same data as stamped or engraved on the mandrel.

All costs incurred by the Contractor attributable to mandrel and deflection testing, including any delays, shall be borne by the Contractor at no cost to the Owner.

END OF SECTION

END OF SECTION

SECTION 15080
PIPING ACCESSORIES AND APPURTENANCES

PART 1: GENERAL

1.01 DESCRIPTION

The work of this section consists of providing piping accessories and appurtenances.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01300: Submittals

1.03 QUALITY ASSURANCE

Reference, American Society for Testing and Materials (ASTM).

1.04 SUBMITTALS

Materials list and catalog data sheets naming each product to be used identified by manufacturer and type number.

PART 2: MATERIALS

2.01 FLEXIBLE COUPLINGS

A. Application

	Baker	Rockwell	Dresser
Iron pipe size O.D. pipe	200	411,521	38,90
Ductile iron	228	411, 431, 441	38, 53, 138, 153
Transition	212, 236	413, 433	162
Reducing	220, 240	415, 435	62
Flanged coupling adapter	601, 602, 603, 604	912, 913, 914, 916	127, 128

Rockwell International, 400 North Lexington, Pittsburg, PA 15208
Dresser Mfg., 41 Fisher Ave., Bradford, PA 16701
R.H. Baker & Co., 2929 Santa Fe Ave., Los Angeles, CA 90058, or equal.

B. Materials

Cast couplings shall be used wherever possible. Steel couplings with a minimum sleeve thickness of the connecting pipe wall or 1/4-inch, whichever is greater, shall be used where cast couplings are not available.

1. Sleeve: Grey iron or steel.
2. Flanges: Malleable or ductile iron or high strength steel.
3. Bolts & Nuts: Low alloy, corrosion resistant high strength.

4. Finish of Coupling: fusion epoxy coating, per Section 09811.
5. Gaskets: Synthetic rubber (Rockwell grade 60, Dresser 42) High-temperature, non-asbestos gasket for service above 212°F.

2.02 FLANGED RUBBER FLEXIBLE CONNECTIONS

- A. The flexible connection shall be manufactured with a chlorosulfonated polyethylene (CSPE) rubber tube with synthetic fabric reinforced rubber body and a neoprene cover. Nylon is unacceptable. A CSPE rubber coating shall be applied to the outside to provide resistance to deterioration. Steel wire reinforcement shall be imbedded in the body for additional strength.
- B. Flanges shall be constructed integrally with the body to resist stresses, drilled to ANSI B 16.5, class 150, and full faced to eliminate the use of gaskets. Retaining rings shall be galvanized and control rods shall be low alloy, corrosion resistant high strength.
- C. The flexible connections shall have a minimum design pressure rating of 50 psi, a minimum burst ratio of 4:1, and a minimum vacuum rating of 10" Hg.
- D. The flexible connections shall be capable of 1 1/8" of lateral movement without damage. Flange to flange length shall not exceed 12".
- E. Flanged rubber flexible connections shall be Redflex TM Type J-IW and Type J-IO (concentric reducing type) as manufactured by the Red Valve Company, Inc. of Carnegie, PA, or approved equal.

2.03 TENSION ASSEMBLIES

- A. Welded
 1. Assemblies per AWWA M11, Section 13.10
 2. Rods shall be galvanized.
 3. Buried assemblies shall receive two coats Koppers, Bitumastic 50, or equal.
- B. Socket Clamps
 1. Carbon steel half bands, bolts and nuts, galvanized.
 2. Socket clamps, Grinnell Fig. 595, B-Line Systems Fig. B3134, or equal.
 3. Socket clamp washers, Grinnell Fig. 594, B-Line Fig. B3134W, or equal.
 4. Yoke, Grinnell Fig. 591.
 5. Tee anchor strap, Grinnell Fig. 593, or equal.
 6. Buried assemblies shall receive two coats Koppers, Bitumastic 50, or equal.
 7. Grinnell Corporation, 155 Westminster Street, Providence, RI 02903; B-Line Systems, 509 West Monroe St., Highland, IL 62249, or equal.

2.04 GROOVED COUPLINGS AND FITTINGS

A. Couplings

1. Housing shall be malleable iron conforming to ASTM A47, grade 32510 or 35018; or ductile iron conforming to ASTM A536, grade 65-45-12.
2. Gasket: ASTM D2000, one of the following, for the appropriate application:
 - a. Ethylene Propylene Diene (EPDM) - Grade "E"
 - b. Nitrile (Buna-N) - Grade "T"
 - c. Halogenated Butyl - Grade "M"
3. Bolts and nuts: heat treated carbon steel, ASTM A183.
4. Coating:
 - a. Exposed: enamel
 - b. Buried: two coats Koppers, Bitumastic 50, or equal, after assembly.
5. Application:
 - a. Grooved Steel Pipe (nonrigid connection): Victaulic 77, Grinnell "GRUVLOK" Fig. 7001, Gustin Bacon 100, or equal.
 - b. Grooved Cast Pipe (nonrigid connection): Victaulic 31, Gustin Bacon 500, or equal.

B. Flanges for Grooved Pipe

1. Class 125 standard drilling.
2. Housing shall be malleable iron conforming to ASTM A47, grade 32510, or 35018; or ductile iron conforming to ASTM A536, grade 65-45-12.
3. Gasket, ASTM D2000, one of the following, for the appropriate application:
 - a. Ethylene Propylene Diene (EPDM) - Grade "E"
 - b. Nitrile (Buna-N) - Grade "S" or "T"
 - c. Halogenated Butyl - Grade "M"
4. Coating:
 - a. Exposed: enamel.
 - b. Buried: Two coats Bitumastic 50, Koppers, or equal, after assembly.
5. Application:
 - a. Grooved Steel Pipe: Victaulic 741, 742; Gustin Bacon 154, or equal.
 - b. Grooved Cast Pipe: Victaulic 341, 342, Gustin Bacon, or equal.

C. Cut and Rolled Grooves

1. Pipe sized $\frac{3}{4}$ through 24-inch may be cut grooved.

2. Roll groove pipe if wall thickness is less than minimum recommended by the manufacturer for cut grooving.
3. Cast pipe shall have rigid radius cut grooves.

D. Collared and Shouldered Pipe

In accordance with manufacturer's recommendations.

Victaulic Co., 3100 Hamilton Blvd., South Plainfield, N.J. 07080
Gustin Bacon, P.O. Box 927, Lawrence, Kansas 66044
Grinnell Co., 260 West Exchange St., Providence, RI 02901, or equal.

2.05 INSULATED (DIELECTRIC) FITTINGS

- A. General: Provide complete insulation between sections of pipe in which installed. All buried pipelines of dissimilar metals shall be insulated from each other.
- B. Couplings and Bushings
 1. Made of Delrin for sizes less than 2 inches, Calpico, Inc., 185 Harbor, South San Francisco, California 94080; Pacific Seal Industries, 3333 N. San Fernando Blvd., Burbank, California 91504, or equal.
- C. Flanges
 1. Assembly consisting of gaskets, insulating bolt sleeves, and appurtenances.
 2. Pacific Seal Industries; Calpico, Inc.; or equal.

2.06 PRESSURE GAUGES (PG)

- A. Liquid filled, glycerine or silicone.
- B. 2½ to 3½ inch dial, scale 20 to 50% greater than normal operating pressure, 270 degree movement.
- C. Stainless steel case, polycarbonate window, stainless steel bourdon tube and movement.
- D. 2½ percent accuracy.
- E. ¼-inch NPT bottom connection.
- F. Ashcroft type 1009; Marsh J7800P Series, or equal.
- G. ¼-inch stainless steel cross handle cock, Ashcroft 7004; Marsh MFG, or equal.
- H. Ashcroft, Dresser Indust., 250 E. Main, Stratford, CT 06497; Marsh Instrument Co., Skokie, IL 60076, or equal.
- I. Mount gauges on diaphragm seals where indicated on the Drawings.

1. Provide diaphragm seals with Type 316 stainless steel top housing, bottom housing, and bolt assemblies.
 - a. Bottom housing shall be fitted with a ¼-inch flushing connection.
 - b. This flushing connection shall be fitted with a Type 316 stainless steel close nipple and a brass shutoff cock.
 - c. Diaphragm Seal: Removable.
 - i. For pressure less than or equal to 15 pounds per square inch, provide a diaphragm seal.
 - ii. For pressures greater than 15 pounds per square inch, provide Type 316 stainless steel diaphragm seal.
 - d. Fit diaphragm seal gauge assembly with a snubber.
 - e. Snubber shall have porous metal disc sized to dampen pressure fluctuations in the filled system.
 - f. Snubber shall be Stainless Steel.
 - g. Snubber filter disc shall be sized to prevent the gauge from pulsating.
 - h. Provide diaphragm seal gauge assemblies filled with silicon.
2. Pressure gauges, except gauges with diaphragm seals, shall have pulsation dampeners installed between the gauge and the shut-off valve.
3. Pulsation Dampeners shall be Stainless Steel.
4. Diaphragm seal:
 - a. For pressure less than or equal to 15 pounds per square inch: Ashcroft, Type 301, Mansfield and Green, Type LG, or equal.
 - b. For pressures greater than 15 pounds per square inch: Ashcroft, Type 101, Mansfield and Green, Type RG, or equal.
5. Snubber: Chemiquip, Ashcroft, or equal.
6. Pulsation Dampener:
 - a. Dresser Industries, Inc., Ashcroft Figure Number 1106S.
 - b. Operation and Maintenance Specialties, Charlotte, NC, Ray Pressure Snubbers.
 - c. ¼-inch stainless steel cross handle cock, Ashcroft 7004; Marsh MFG, or equal.

2.07 FLUSHING CONNECTION

- A. Cast bronze swivel inlet adapter, rocker lugs.
- B. 1 inch NPT inlet, hose thread outlet.
- C. DeSanno Foundry & Machine Co. No. 73, 1933 Peralta, Oakland, CA 94607; Champion No. 10, 1460 No. Naud St., Los Angeles, CA 90012, or equal.

2.08 MECHANICAL RUBBER SEAL

- A. Modular, mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill the annular space between the pipe and the wall opening.
- B. EPDM seal element suitable for service to 250 degrees F, except seal element shall be silicone or viton suitable for 300 degrees F for aeration piping.
- C. Composite pressure plates.
- D. 316 stainless steel nuts and bolts.
- E. Thunderline Link-Seal, or equal.

2.09 TRENCH DRAIN (CAST-IN-PLACE TYPE)

- A. Not Used.

2.10 COATING SYSTEMS

- A. Wedge and Wedge Assemblies, T-bolts, Bolts and Nuts:
 - 1. Process through an iron-phosphate spray, rinse and drying in preparation for coating application.
 - 2. The coating itself shall consist of two coats of liquid Xylan, with heat cure to follow each coat.
- B. Casting shall be surface pre-treated with an iron-phosphate spray, rinse, sealer before drying. The coating shall be electrostatically applied and heat cured. Coating shall be a polyester based powder to provide corrosion, impact and UV resistance.
- C. The coating system shall be EBAA Iron, Inc. Mega-Bond or approved equal.
- D. Where the coating systems of this section are utilized, no additional cathodic protection is required except for polyethylene encasement, which is required.

2.11 POLYETHYLENE ENCASEMENT

All buried metallic piping, specials, and fittings shall be polyethylene encased, double wrapped - 8 mils thickness, sized to pipe diameter, ANSI/AWWA C105/A21.5.

2.12 PIPELINE STRAINERS

- A. 2-inches and smaller
 - 1. Y-pattern.
 - 2. Bronze or cast iron body.
 - 3. 316 Stainless steel or monel screen, .045-inch perforations, 4 to 1 straining ratio.

4. Blowoff connection with bronze ball valve.
5. Muessco Model 11 or 351; Leslie Co., or equal.

2.13 PLASTIC WYE STRAINERS

- A. 2-inches and smaller
 1. Y-pattern.
 2. Clear PVC Body and PVC Screen
 3. EPDM O rings
 4. Tru Union
 5. IPEX RV series or equal.

PART 3: EXECUTION

3.01 FLEXIBLE COUPLINGS

- A. Install where shown on Drawings and where required for ease of installation or removal of pipe, subject to approval of Engineer.
- B. Pipelines 4 inches and larger extending from a concrete structure into earth shall have at least two flexible joints within 3 feet of the structure face.
- C. Provide tension assemblies as specified in subsection 2.05 of this Specification where necessary to prevent separation of pipe due to internal pressures.

3.02 GROOVED COUPLINGS AND FITTINGS

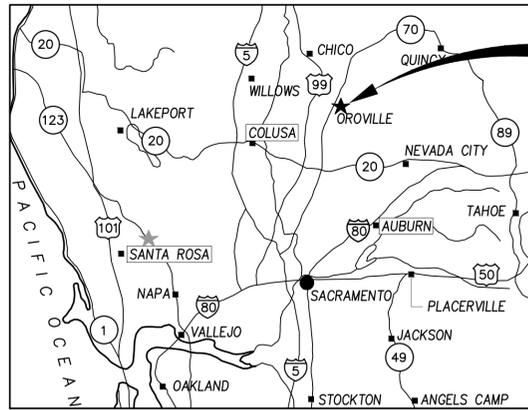
- A. Grooved systems may be used in lieu of flanged, welded or screwed joints for steel or cast pipe (grey or ductile) at Contractor's option, except for chemical service.
- B. Install per manufacturer's directions.

END OF SECTION



OROVILLE SEWER PROJECTS - 1F

ALONG TABLE MOUNTAIN BOULEVARD FROM NELSON AVENUE TO RIVERVIEW TERRACE DRIVE WITHIN THE CITY OF OROVILLE, COUNTY OF BUTTE

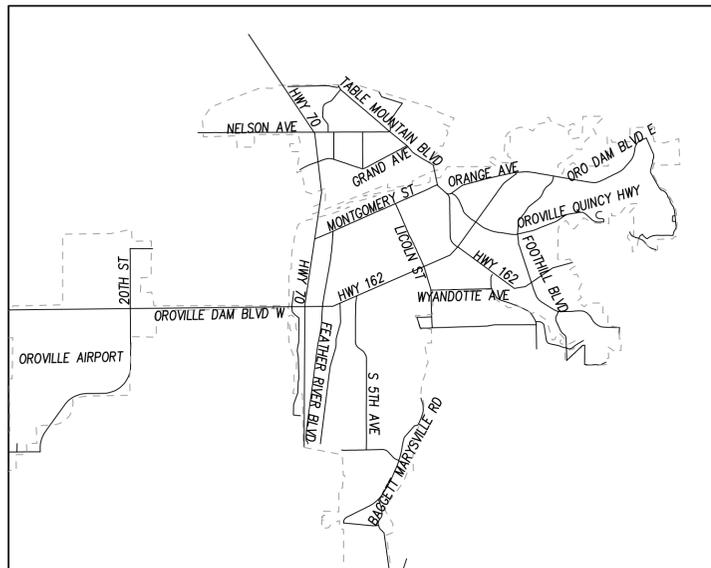


LOCATION MAP
SCALE: NTS

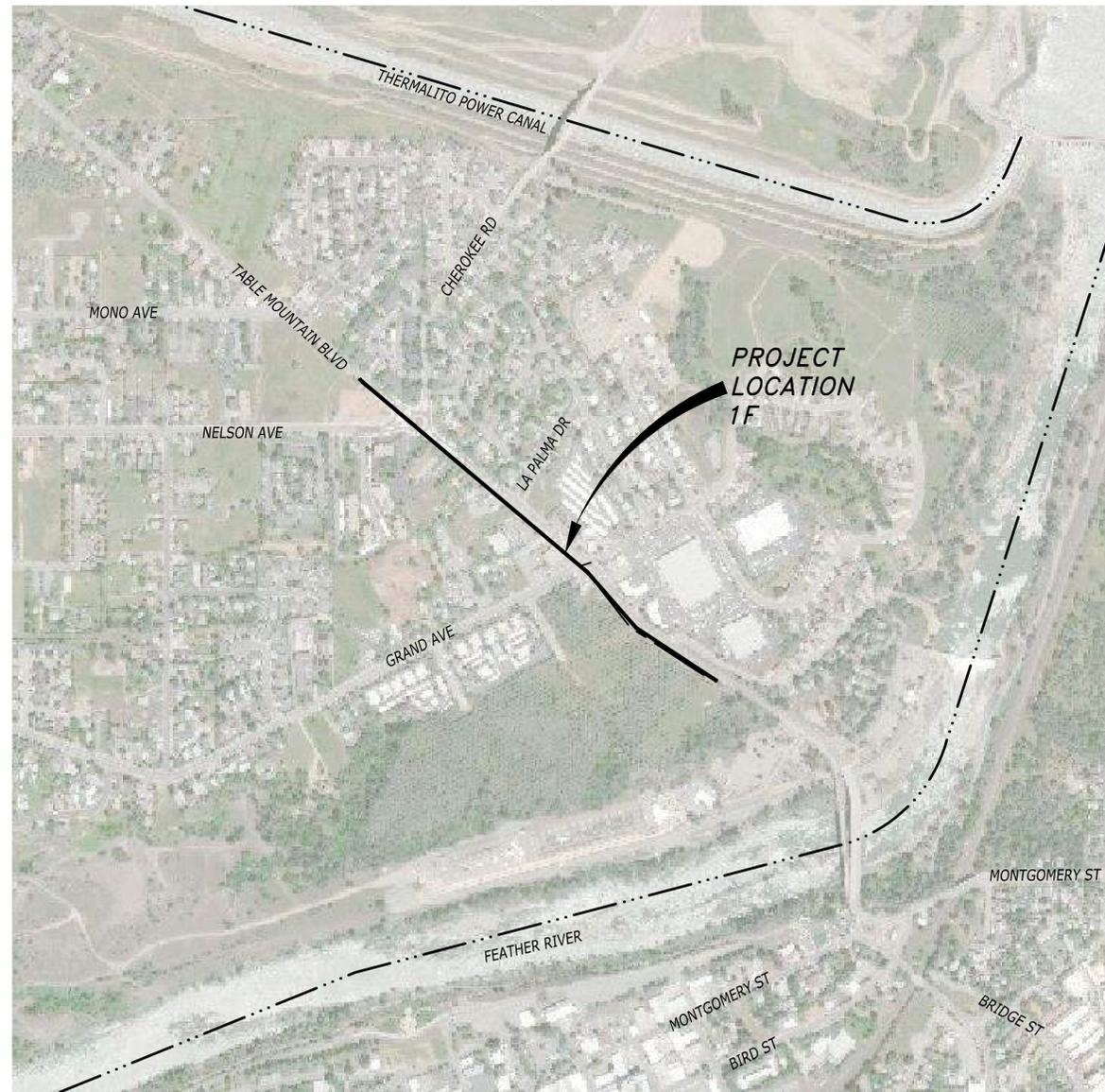
PROJECT LOCATION

INDEX OF PLAN SHEETS

SHT NO.	DWG NO.	SHEET TITLE
1	G-1	TITLE SHEET
2	G-2	GENERAL NOTES
3	G-3	KEY & SURVEY CONTROL
4	C-1	PLAN & PROFILE STA 10+25 TO 15+00
5	C-2	PLAN & PROFILE STA 15+00 TO 19+50
6	C-3	PLAN & PROFILE STA 19+50 TO 24+00
7	C-4	PLAN & PROFILE STA 24+00 TO 28+50
8	C-5	PLAN & PROFILE STA 28+50 TO 33+00
9	C-6	PLAN & PROFILE STA 33+00 TO 37+50
10	C-7	STORM DRAIN PLAN & PROFILE STA 23+50 TO 25+50
11	C-8	8-INCH SS PLAN & PROFILE STA 10+00 TO 11+00
12	C-9	DETAILS - 1
13	C-10	DETAILS - 2



VICINITY MAP
SCALE: NTS



PROJECT LOCATION
SCALE: 1" = 500'

UTILITY REPRESENTATIVES

CONTACT	UTILITY	COMPANY	PHONE
CORT SCHREIBER	COMMUNICATIONS	AT&T	530-891-2392
BRANDON STOKES	COMMUNICATIONS	COMCAST	530-332-5993
TODD CASH	GAS/ELECTRIC	PG&E	530-894-4781
JASON HAMMOND	WATER	CALIFORNIA WATER SERVICE CO.	530-893-6315
MATT COLWELL	WATER	SOUTH FEATHER WATER AND POWER	530-533-4578
CHRIS HEINDELL	WATER	THERMALITO WATER & SEWER DISTRICT	530-533-0740
SCOTT HOCH	SEWER	SCOR	530-538-7784
MIKE MASSARO	SEWER	CITY OF OROVILLE	916-783-4100
MIKE MASSARO	DRAINAGE	CITY OF OROVILLE	916-783-4100

APPROVED FOR CONSTRUCTION

APPROVAL RECOMMENDED BY:

MIKE MASSARO
CITY ENGINEER
CITY OF OROVILLE

DATE _____

APPROVALS ARE GOOD FOR 12 MONTHS FROM DATE OF SIGNATURE



DIGALERT
DIAL TOLL FREE
1-800-642-2444
AT LEAST TWO DAYS BEFORE YOU DIG
UNDERGROUND SERVICE ALERT OF NORTHERN CALIFORNIA

NO.	REVISIONS	BY	DATE

BENCH MARK ELEV: 238.57 DATUM: NAVD 88
DESCRIPTION:
THE HORIZONTAL DATUM IS NAD 83 CALIFORNIA ZONE 2 PER CITY OF OROVILLE HORIZONTAL CONTROL.
VERTICAL DATUM IS NAVD 88 PER CITY OF OROVILLE BENCHMARKS.

DESIGN BY: K.SETHARES
DRAWN BY: K.SETHARES
CHECKED BY: M.MASSARO
SCALE: AS SHOWN
DATE: 7/12/19
PROJ NO.: 17601-200

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.



BEN EN
TRUSTED ENGINEERING ADVISORS
Bennett Engineering Services
1082 Sunrise Avenue, Suite 100
Roseville, California 95661
T 916.783.4100
F 916.783.4110



OROVILLE SEWER PROJECTS - 1F
TITLE SHEET
CALIFORNIA

Login Name: beethares
 Plot Date: July 12, 2019 9:35 am Plot Style: ###
 File Name: P:\Proj\17601-200-Oroville-Sewer-Projects-Design\03-PLANS\MASTERS\ASSETS\17601-200_1F_2019_07_12_09_35.dwg
 Plot Size: 36x48

GENERAL NOTES:

- ALL CONSTRUCTION AND MATERIALS SHALL CONFORM TO THESE PLANS, ALL CONDITIONS OF APPROVAL RELATED TO THIS PROJECT, AND TO THE LATEST EDITION OF THE CITY OF OROVILLE IMPROVEMENT STANDARDS.
- THE CONTRACTOR AGREES THAT, IN ACCORDANCE WITH THE GENERALLY ACCEPTED CONSTRUCTION PRACTICES, THE CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY. THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS. THE CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD THE CITY OF OROVILLE HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT.
- THE CONTRACTOR SHALL CONTACT THE CITY OF OROVILLE (MIKE MASSARO) 48 HOURS PRIOR TO THE START OF WORK TO ARRANGE A PRECONSTRUCTION FIELD MEETING. NO GRADING OR CONSTRUCTION MAY BE DONE PRIOR TO THE MEETING. CONTRACTOR SHALL OBTAIN AN ENCROACHMENT PERMIT FROM THE CITY OF OROVILLE PRIOR TO PERFORMING ANY WORK WITHIN PUBLIC RIGHT-OF-WAY OR EASEMENT.
- THE CITY OF OROVILLE IS A MEMBER OF THE UNDERGROUND SERVICES ALERT (USA) ONE-CALL PROGRAM. THE CONTRACTOR OR ANY SUBCONTRACTOR FOR THIS CONTRACT SHALL NOTIFY USA TWO (2) WORKING DAYS PRIOR TO PERFORMING ANY EXCAVATION WORK BY CALLING THE TOLL-FREE NUMBER 811 OR 800-642-2444. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ALL EXISTING UNDERGROUND UTILITIES, WHETHER OR NOT THEY ARE SHOWN ON THESE PLANS.
- IF ANY ARCHEOLOGICAL, CULTURAL, OR HISTORICAL RESOURCES, ARTIFACTS OR FEATURES ARE DISCOVERED DURING THE COURSE OF CONSTRUCTION ANYWHERE ON THE PROJECT SITE, WORK SHALL BE SUSPENDED WITHIN 150 FEET OF THAT LOCATION UNTIL A QUALIFIED PROFESSIONAL ARCHEOLOGIST ASSESSES THE SIGNIFICANCE OF THE DISCOVERY AND PROVIDES CONSULTATION WITH THE CITY OF OROVILLE COMMUNITY DEVELOPMENT AND THE BUTTE COUNTY HISTORICAL SOCIETY. THE CITY OF OROVILLE COMMUNITY DEVELOPMENT AND THE BUTTE COUNTY HISTORICAL SOCIETY SHALL BE NOTIFIED AND ANY APPROPRIATE MEASURES AGREED UPON PRIOR TO THE RECOMMENCEMENT OF CONSTRUCTION IN THE AREA IN QUESTION.
- COMPLIANCE WITH NOISE RESTRICTIONS SHALL BE REQUIRED. HOURS OF CONSTRUCTION OPERATION SHALL BE LIMITED TO THE PERIOD FROM 7:00 A.M. TO 6:00 P.M. ON WEEKDAYS. WEEKEND WORK IS NOT PERMITTED WITHOUT APPROVAL FROM CITY. CONSTRUCTION EQUIPMENT SHALL BE MUFFLED AND SHROUDED TO MINIMIZE NOISE LEVELS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- NO REFUELING, LUBRICATION, OR MAINTENANCE OF CONSTRUCTION VEHICLES SHALL BE DONE ANYWHERE ON THE SITE EXCEPT WITHIN APPROVED CONSTRUCTION STAGING AREAS. STAGING AREAS SHALL BE SET UP TO THE SATISFACTION OF THE CONSTRUCTION INSPECTOR AND THE FIRE DEPARTMENT. CONTRACTOR SHALL SUBMIT STAGING PLAN PRIOR TO COMMENCEMENT OF ALL CONSTRUCTION.
- THE CONTRACTOR SHALL LEAVE A MINIMUM OF 6 INCHES OF MANHOLE WALL UNDISTURBED BETWEEN CORINGS FOR PIPE TIE-INS. IF THIS CANNOT BE ACCOMPLISHED, A LARGER MANHOLE SHALL BE USED.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING ANY AND ALL BROKEN AND/OR HAZARDOUS PUBLIC SIDEWALK OR CURB & GUTTER IF DAMAGED DURING CONSTRUCTION TO THE SATISFACTION OF THE CONSTRUCTION INSPECTOR.
- EROSION AND SEDIMENTATION CONTROL SHALL BE PERFORMED PER SECTION 15.88.060 OF THE OROVILLE MUNICIPAL CODE. CONTRACTOR SHALL PREPARE AND SUBMIT TO THE CITY FOR REVIEW AN EROSION AND SEDIMENT CONTROL PLAN IN ACCORDANCE WITH THE BUTTE COUNTY EROSION CONTROL PLAN REQUIREMENTS. FIELD APPLICATION OF THE CONTROLS AND TIMING OF IMPLEMENTATION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING THE BEST MANAGEMENT PRACTICES TO MAINTAIN POSITIVE POLLUTION PREVENTION, AS DESCRIBED IN THE ECP. MATERIALS, AND THE COSTS THEREOF, FOR STORMWATER POLLUTION PREVENTION ARE THE RESPONSIBILITY OF THE CONTRACTOR. CHANGES TO THE EROSION PREVENTION AND SEDIMENT CONTROL PLAN MAY BE MADE TO RESPOND TO FIELD CONDITIONS WITH APPROVAL BY THE ENGINEER.
- CONTRACTOR SHALL PROVIDE A TRAFFIC CONTROL PLAN TO PUBLIC WORKS FOR EACH STAGE OF CONSTRUCTION PRIOR TO ISSUANCE OF ENCROACHMENT PERMIT. TRAFFIC CONTROL PLANS SHALL BE SUBMITTED A MINIMUM OF TWO WEEKS PRIOR TO COMMENCEMENT OF WORK OR DETOURING OF TRAFFIC PATTERNS. ALL TRAFFIC CONTROL DEVICES SHALL BE INSTALLED AND CONFORM TO STATE OF CALIFORNIA MUTCD 2017.
- THE CONTRACTOR SHALL PRACTICE SAFETY AT ALL TIMES AND SHALL FURNISH, ERECT, AND MAINTAIN SUCH FENCES, BARRICADES, LIGHTS AND SIGNS NECESSARY TO GIVE ADEQUATE PROTECTION TO THE PUBLIC AT ALL TIMES. TEMPORARY TRAFFIC CONTROL SHALL BE APPROVED BY ENGINEER.
- THE CONTRACTOR SHALL COORDINATE THROUGH THE CONSTRUCTION INSPECTOR WITH THE CITY OF OROVILLE LANDSCAPING AND LIGHTING MAINTENANCE ASSESSMENT DISTRICT (LLMAD) MANAGER FOR THE REMOVAL, RELOCATION, AND/OR REPLACEMENT OF ALL EXISTING PLANT MATERIAL IMPACTED BY CONSTRUCTION, WHICH IS MAINTAINED BY THE LANDSCAPING AND LIGHTING DISTRICT, AND FOR ANY SHUTDOWNS OF EXISTING IRRIGATION SYSTEMS.
 - UNLESS OTHERWISE AGREED TO IN WRITING, REPLACEMENT PLANTS SHALL BE OF THE SAME TYPE AND OF COMPARABLE SIZE TO THOSE REMOVED.
 - THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE EXISTING IRRIGATION SYSTEM DURING CONSTRUCTION, INCLUDING REPAIRS OF ANY CONSTRUCTION DAMAGE.
 - THE CONTRACTOR SHALL GIVE A MINIMUM OF 48 HOURS NOTICE OF INTENT TO SHUT DOWN THE EXISTING IRRIGATION SYSTEM TO THE CITY.
 - THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY PLANT MATERIAL WHICH IS DAMAGED BY CONSTRUCTION ACTIVITY, WHETHER DIRECTLY OR AS A RESULT OF INSUFFICIENT WATER OR SIMILAR CAUSES.
 - THE CONTRACTOR SHALL EXERCISE CARE WHEN CUTTING INTO EXISTING IRRIGATION MAINLINES TO PREVENT THE INTRODUCTION OF DIRT OR OTHER FOREIGN MATERIALS INTO THE PIPE WHICH MAY CLOG EXISTING HEADS OR OTHERWISE DAMAGE THE SYSTEM.
 - PRIOR TO FINAL ACCEPTANCE OF THE IMPROVEMENTS SHOWN ON THESE PLANS, THE LANDSCAPING AND IRRIGATION SHALL BE RESTORED TO THE CITY'S SATISFACTION.
- REQUIREMENTS - ALL LEAKAGE TESTS SHALL BE COMPLETED AND APPROVED AFTER CITY ACCEPTANCE OF STREET SUBGRADE IN NEW STREETS AND/OR TRENCH BACKFILL IN EXISTING STREETS EXCEPT FOR THE MANHOLE VACUUM TEST. ANY EXCAVATION REQUIRED FOR TESTING OR REPAIRS SHALL BE BACKFILLED WITH AGGREGATE BASE COMPACTED TO 95% RELATIVE COMPACTION. ALL TESTING SHALL BE PERFORMED BY THE CONTRACTOR AT HIS EXPENSE.
- THE CONTRACTOR IS RESPONSIBLE FOR REMOVAL AND DISPOSAL OF HAZARDOUS MATERIALS INCLUDING ASBESTOS CEMENT PIPING, IF ENCOUNTERED.
- REMOVE ALL DEBRIS FROM THE SITE AND LEAVE THE SITE IN A NEAT AND ORDERLY CONDITION. DISPOSE OF DEBRIS OFF SITE AT A LOCATION APPROVED BY THE ENGINEER.

GRADING NOTES:

- AN ENCROACHMENT PERMIT IS REQUIRED FOR ALL WORK TO BE DONE WITHIN PUBLIC RIGHTS-OF-WAY OR EASEMENTS, AND FOR CONNECTIONS TO PUBLICLY-OWNED AND MAINTAINED FACILITIES.
- CALL UNDERGROUND SERVICE ALERT (USA) AT 811 OR 800-642-2444, FORTY-EIGHT (48) HOURS PRIOR TO ANY GRADING/EXCAVATION ACTIVITY.
- THE CONTRACTOR SHALL NOTIFY THE CITY OF OROVILLE (MIKE MASSARO), TWENTYFOUR (24) HOURS PRIOR TO COMMENCEMENT OF ANY GRADING.
- CONTRACTOR SHALL OBTAIN AN APPROVED WATER METER FROM THE CITY AT THE OWNER'S EXPENSE.
- CLEARING AND GRUBBING SHALL CONFORM TO THE PROVISIONS OF SECTION 16 OF THE STANDARD SPECIFICATIONS.
- ALL EXCAVATION, EMBANKMENT, BACKFILL, ETC., SHALL CONFORM TO THE PROVISIONS IN SECTION 19, "EARTHWORK," OF THE STANDARD SPECIFICATIONS.
- NO WORK SHALL BE DONE UNDER OR WITHIN THE TREE PROTECTION ZONE (TPZ) OF ANY EXISTING TREE WITHOUT A VALID TREE PERMIT.
- THERE SHALL BE NO TRESPASSING OF ANY KIND INTO PUBLIC OR PRIVATE OPEN SPACE AREAS.
- PRIOR TO THE COMMENCEMENT OF GRADING OPERATIONS, TREES TO BE PRESERVED SHALL BE FENCED IN ACCORDANCE WITH SECTION 12.01 OF THE STANDARD CONSTRUCTION SPECIFICATIONS. FIELD PLACEMENT OF FENCING SHALL BE REVIEWED AND APPROVED BY THE CITY ARBORIST PRIOR TO THE COMMENCEMENT OF GRADING OPERATIONS. NO TRENCHING, EXCAVATION, AND/OR ENCROACHMENT SHALL OCCUR BENEATH THE DRIP LINE OF ANY OAK TREE TO BE PRESERVED UNLESS APPROVED BY THE CITY ARBORIST.

ABBREVIATIONS:

L	ANGLE	LBS	POUNDS
AB	AGGREGATE BASE	LF	LINEAR FOOT/FEET
ABND	ABANDON	LP	LOW POINT
AC	ASPHALT CONCRETE	LT	LEFT, LIGHT
ALUM	ALUMINUM	L/S	LANDSCAPING
AP	ANGLE POINT	MAX	MAXIMUM
APPROX	APPROXIMATE	MFR	MANUFACTURER
AVE	AVENUE	MG	MILLION GALLONS
BEG	BEGIN	MH	MANHOLE
BF	BLIND FLANGE	MJ	MECHANICAL JOINT
BFP	BACKFLOW PREVENTER	MP	MIDPOINT
BFV	BUTTERFLY VALVE	NPS	NOMINAL PIPE SIZE
BL	BREAK LINE	OC	ON CENTER
BOV	BLOW-OFF VALVE	OD	OUTSIDE DIAMETER
BV	BALL VALVE	OH	OVERHEAD
BW	BUTT WELD	PB	PULL BOX
BWE	BUTT WELD END	PE	POLYETHYLENE
C&G	CURB AND GUTTER	PERF	PERFORATED
C&S	CURB, GUTTER, AND SIDEWALK	R	PROPERTY LINE
CL	CENTER LINE	PP	POWER POLE
CH	CHORD	PRV	PRESSURE REDUCING VALVE
CI	CAST IRON	PT	POINT
CLR	CLEAR	PUB	PUBLIC
CMP	CORRUGATED METAL PIPE	PUE	PUBLIC UTILITY EASEMENT
CO	CLEANOUT, COUNTY	PWMT	PAVEMENT
COMM	COMMUNICATIONS	RCP	REINFORCED CONCRETE PIPE
CONC	CONCRETE	RD	ROAD, RING DRAIN
CONST	CONSTRUCT	R,R=	RADIUS
CORP	CORPORATION	RS	RISING STEM
CP	CONTROL POINT	RT	RIGHT
CV	CHECK VALVE	R/W, ROW	RIGHT-OF-WAY
DECHLOR	DECHLORINATION	S=	SLOPE
DEPT	DEPARTMENT	SCHED	SCHEDULE
DI	DUCTILE IRON	SD	STORM DRAIN
DIA	DIAMETER	SDCO	STORM DRAIN CLEANOUT
DIP	DUCTILE IRON PIPE	SDMH	STORM DRAIN MANHOLE
DTL	DETAIL	SDR	STANDARD DIMENSION RATIO
DWG	DRAWING	S/W,SW	SIDEWALK
E,ELEC	ELECTRIC	SECT	SECTION
EA	EACH	SHT	SHEET
ECP	EROSION CONTROL PLAN	SL	STREET LIGHT
EG	EXISTING GRADE	SPECS	SPECIFICATIONS
EJ	EXPANSION JOINT	SS	SANITARY SEWER
EL, ELEV	ELEVATION	SSMH	SANITARY SEWER MANHOLE
ELL	ELBOW	SF	SQUARE FEET
EP	EDGE OF PAVEMENT	SSCO	SANITARY SEWER CLEANOUT
ER	EDGE OF ROAD	SST	STAINLESS STEEL
EW	EACH WAY	ST	STREET
EX	EXISTING	STA	STATION
FCA	FLANGED COUPLING ADAPTER	STD	STANDARD
FG	FINISHED GRADE	STL	STEEL
FH	FIRE HYDRANT	T	TELEPHONE
FL	FLOW LINE	TBM	TEMPORARY BENCHMARK
FLG	FLANGE	TC	TOP OF CONCRETE
FM	FORCE MAIN	TP	TELEPHONE POLE
FO	FIBER OPTIC	TS	TRAFFIC SIGNAL
G	GAS	TYP	TYPICAL
GALV	GALVANIZED	UGE	UNDERGROUND ELECTRIC
GB	GRADE BREAK	UNO	UNLESS OTHERWISE NOTED
GM	GAS METER	VAR	VARIABLE
GR	GRATE, GRATE ELEVATION	W	WEST
HDPE	HIGH DENSITY POLYETHYLENE	W, WTR	WITH WATER
HSS	HOLLOW STRUCTURAL SECTION	W/W	WITH WATER METER
HP	HORSEPOWER, HINGE POINT, HIGH POINT	WM	WATER MANHOLE
ICV	IRRIGATION CONTROL VALVE	WV	WATER VALVE
ID	INSIDE DIAMETER	WY	WAY
IN	INCHES		
INV	INVERT		
JP	JOINT POLE		
L=	LENGTH		

LEGEND

	EXISTING	PROPOSED
ABANDON PIPE	ABND	ABND
AIR RELEASE VALVE		
AIR VACUUM RELEASE VALVE		
ASSESSOR'S PARCEL NO.	25-025-254	
BLOW-OFF VALVE		
BOLLARD		
BORING HOLE LOCATION		
BUILDING		
BUTTERFLY VALVE		
CENTERLINE		
CHECK VALVE		
DRAINAGE INLET		
EASEMENT LINE		
EDGE OF PAVEMENT		
ELECTRIC BOX		
ELECTRICAL MANHOLE		
FENCE LINE		
FIRE DEPARTMENT CONNECTION		
FIRE HYDRANT		
FLOW METER		
FLOWLINE		
IRRIGATION CONTROL VALVE		
MONITORING WELL		
MANHOLE		
OVERHEAD ELECTRIC	OHE	
PLUG VALVE		
POLE W/ GUY WIRE & ANCHOR		
POST INDICATOR VALVE		
PROJECT COORDINATE		
PROPERTY LINE		
RIGHT OF WAY (R/W)		
RISE OR DROP		
SANITARY SEWER CLEAN OUT		
SEWER MAIN		
SEWER MANHOLE		
SPOT ELEVATION		
STORM DRAIN		
STORM DRAIN MANHOLE		
AREA LIGHT		
STREET SIGN		
SURVEY CONTROL POINT		
SURVEY MONUMENT/BENCH MARK		
TELEPHONE MANHOLE		
TOP OF EMBANKMENT		
TOE OF EMBANKMENT		
UNDERGROUND COMM		
UNDERGROUND ELECTRIC		
UNDERGROUND FIRE WATER		
UNDERGROUND GAS		
UNDERGROUND WATER		
UTILITY POLE		
WATER MANHOLE		
WATER METER		
WATER PIPE		
WATER VALVE		
YARD LIGHT		

Login Name: bethhans
 Print Date: July 12, 2019 10:01 am: Plot Style: ###
 File Name: P:\Proj\17601-200-Oroville-Sewer Project-Design\03-Plans\Masters\Sheet\17601-200-IF\17601-200-02-02 - GENERAL NOTES.dwg
 Plot Date: July 12, 2019 10:01 am: Plot Style: ###
 File Name: P:\Proj\17601-200-Oroville-Sewer Project-Design\03-Plans\Masters\Sheet\17601-200-IF\17601-200-02-02 - GENERAL NOTES.dwg

NO.	REVISIONS	BY	DATE

BENCH MARK ELEV : 238.57 DATUM : NAVD 88
 DESCRIPTION :
 THE HORIZONTAL DATUM IS NAD 83 CALIFORNIA ZONE 2 PER CITY OF OROVILLE HORIZONTAL CONTROL BENCHMARKS.
 VERTICAL DATUM IS NAVD 88 PER CITY OF OROVILLE BENCHMARKS.

DESIGN BY : K.SETHARES
 DRAWN BY : K.SETHARES
 CHECKED BY : M.MASSARO
 SCALE : N/A
 DATE : 7/12/19
 PROJ NO. : 17601-200

VERIFY SCALE
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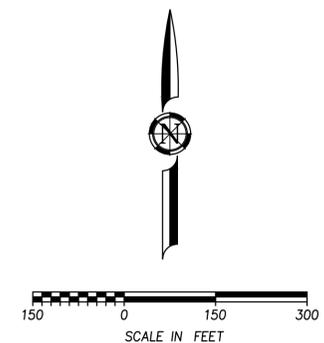
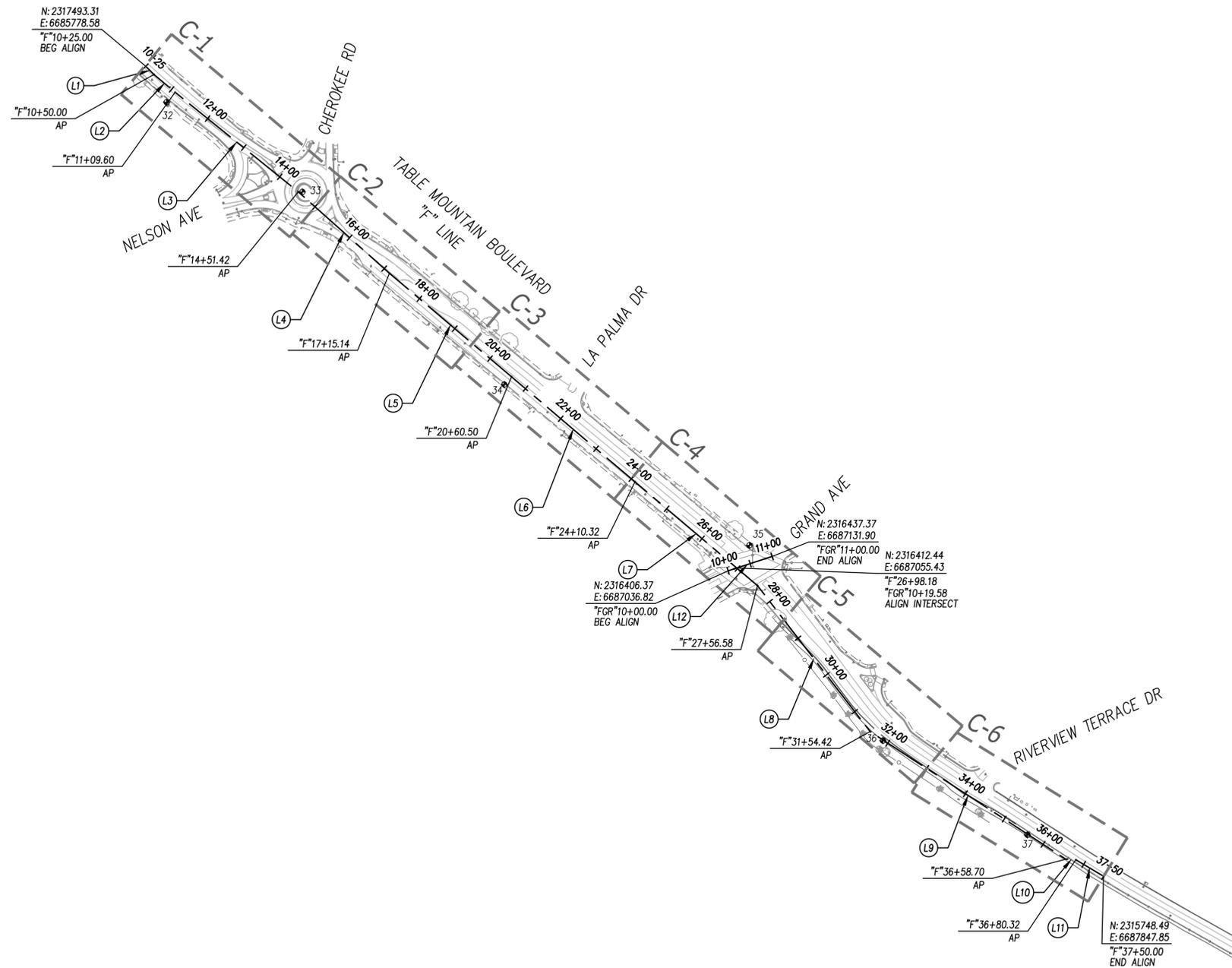
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 1082 Sunrise Avenue, Suite 100
 Roseville, California 95661
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 F 916.783.4110



OROVILLE SEWER PROJECTS - 1F
GENERAL NOTES
 CALIFORNIA

POINT TABLE				
Point #	Elevation	Northing	Easting	Description
32	268.55	2317416.00	6685823.55	MAG
33	276.45	2317222.56	6686116.75	60D
34	274.87	2316807.56	6686552.94	60D
35	273.54	2316461.47	6687082.67	MAG
36	274.97	2316040.75	6687370.92	MAG
37	264.62	2315837.73	6687683.01	MAG

"F" & "FGR" LINE TABLE		
NUMBER	LENGTH	BEARING
L1	25.00'	S45°00'00"E
L2	59.60'	S50°09'36"E
L3	341.82'	S51°07'54"E
L4	263.72'	S48°17'48"E
L5	345.36'	S49°47'18"E
L6	349.81'	S49°39'47"E
L7	346.26'	S49°50'16"E
L8	397.84'	S37°43'33"E
L9	504.28'	S56°58'12"E
L10	21.61'	S86°34'02"E
L11	69.68'	S59°25'20"E
L12	100.00'	N71°56'04"E



Login Name: bethares
 Plot Date: July 12, 2019 9:35 am Plot Style: ###
 File Name: P:\Proj\17601-200-Oroville-Sewer-Projects-Design\03-PLANS\MASTERS\SHETS\17601-200_F\17601-200_03-03 - KEY & SURVEY CONTROL.dwg
 Plot Size: Barch-17601-200_03-03.dwg | 17601-200_03-03.dwg | 17601-200_03-03.dwg

NO.	REVISIONS	BY	DATE

BENCH MARK ELEV : 238.57 DATUM : NAVD 88
 DESCRIPTION :
 THE HORIZONTAL DATUM IS NAD 83 CALIFORNIA ZONE
 2 PER CITY OF OROVILLE HORIZONTAL CONTROL.
 VERTICAL DATUM IS NAVD 88 PER CITY OF OROVILLE
 BENCHMARKS.

DESIGN BY : K.SETHARES
 DRAWN BY : K.SETHARES
 CHECKED BY : M.MASSARO
 SCALE : 1" = 150'
 DATE : 7/12/19
 PROJ NO. : 17601-200

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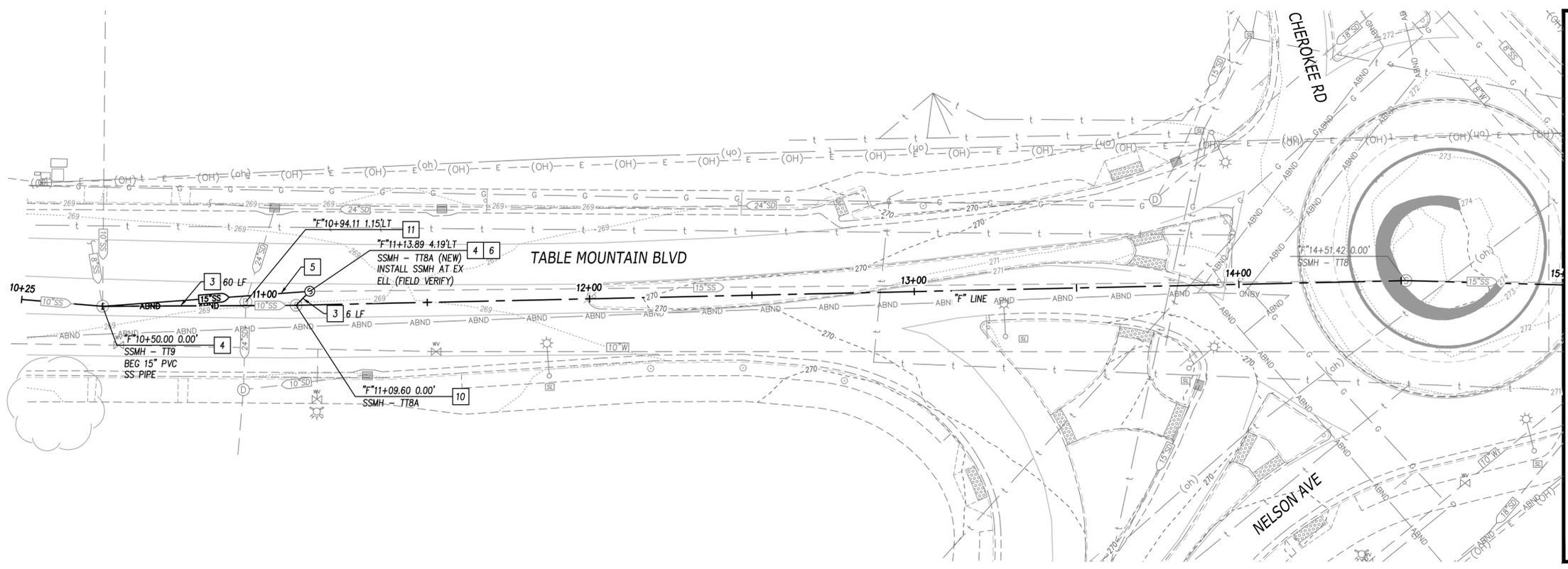


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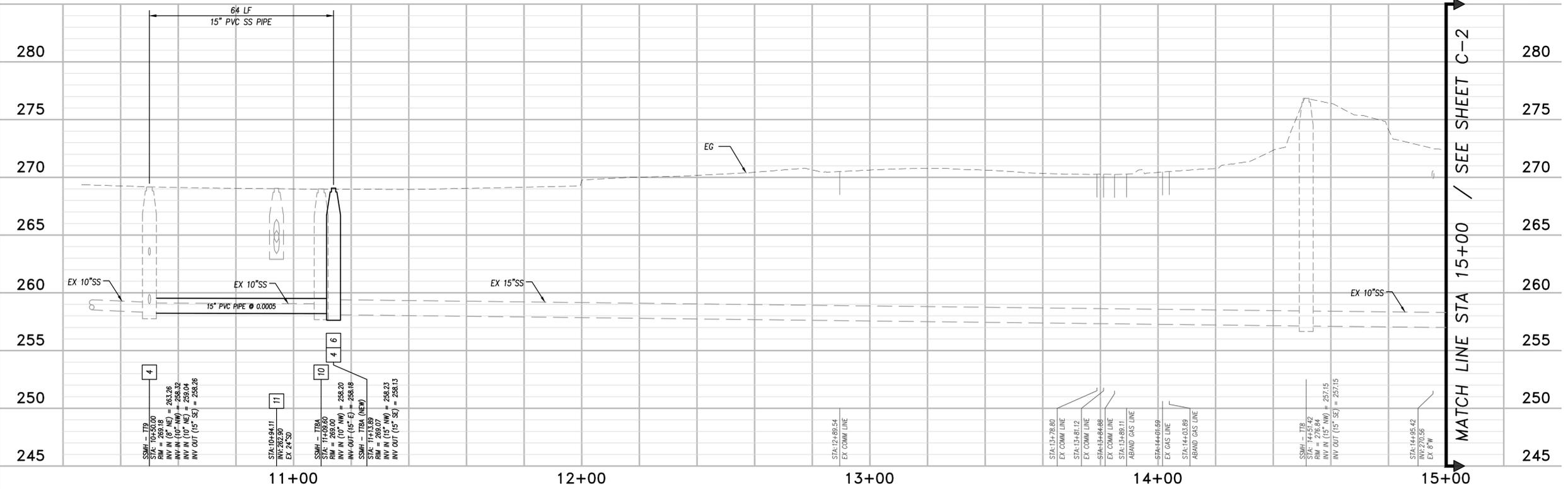
OROVILLE SEWER PROJECTS - 1F
KEY & SURVEY CONTROL
 CALIFORNIA



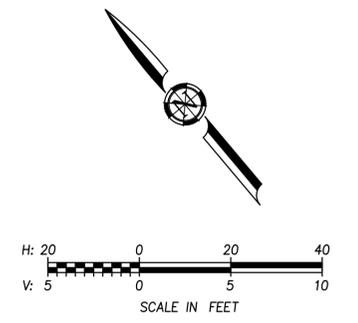
MATCH LINE STA 15+00 / SEE SHEET C-2

- CONSTRUCTION NOTES:**
- 1 PROTECT EX UTILITY OR STRUCTURE IN PLACE
 - 2 REMOVE EX SS PIPE
 - 3 ABANDON EX SS PIPE
 - 4 CONNECT TO EX SS PIPE OR SSMH
 - 5 INSTALL 15" PVC PIPE PER DTL 2 SHT C-9
 - 6 INSTALL 48" SSMH PER DTL 1 SHT C-9
 - 7 REMOVE EX SDMH AND EX 12" PIPE
 - 8 INSTALL 48" SDMH PER DTL 1 SHT C-10
 - 9 CONNECT TO EX SD PIPE OR SDMH
 - 10 ABANDON EX 48" SSMH PER DTL 3 SHT C-10
 - 11 POT HOLE EX BURIED SDMH; REMOVE AND REPLACE W/ 24" PVC SD
 - 12 INSTALL 8" PVC PIPE PER DTL 2 SHT C-9
 - 13 INSTALL 12" PVC PIPE PER DTL 2 SHT C-10

- NOTES:**
1. ASSUMED DEPTH FOR ALL DRY UTILITIES, WATER SERVICES, AND SEWER LATERALS. CONTRACTOR TO VERIFY LOCATION, SIZE, & DEPTH IN FIELD PRIOR TO COMMENCING ALL WORK.
 2. CONTRACTOR TO NOTIFY RESIDENTS OF SERVICE INTERRUPTION 3 DAYS PRIOR TO INTERRUPTION.
 3. REPAIR STREET SECTIONS PER DTL 3 SHT C-9.
 4. CONTRACTOR SHALL MAINTAIN 12" VERTICAL SEPARATION BETWEEN PROPOSED PIPE AND CROSSING UTILITIES.



MATCH LINE STA 15+00 / SEE SHEET C-2



Login Name: ksethares
 Plot Date: July 12, 2019 9:35 am
 Plot Style: ###
 File Name: P:\Proj\17601-200-Oroville-Sewer-Projects-Design\03-PLANS\Masters\Drawings\17601-200-F\17601-200-06-C3 - F PLAN PROFILE.dwg
 Plot Size: 17601-200-06-C3 - F PLAN PROFILE.dwg

NO.	REVISIONS	BY	DATE

BENCH MARK ELEV: 238.57 DATUM: NAVD 88
 DESCRIPTION:
 THE HORIZONTAL DATUM IS NAD 83 CALIFORNIA ZONE
 2 PER CITY OF OROVILLE HORIZONTAL CONTROL
 VERTICAL DATUM IS NAVD 88 PER CITY OF OROVILLE
 BENCHMARKS.

DESIGN BY: K.SETHARES
 DRAWN BY: K.SETHARES
 CHECKED BY: M.MASSARO
 SCALE: H: 1"=20'; V: 1"=5'
 DATE: 7/12/19
 PROJ NO.: 17601-200

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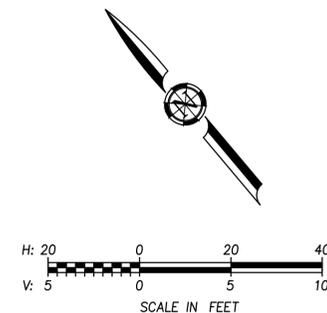
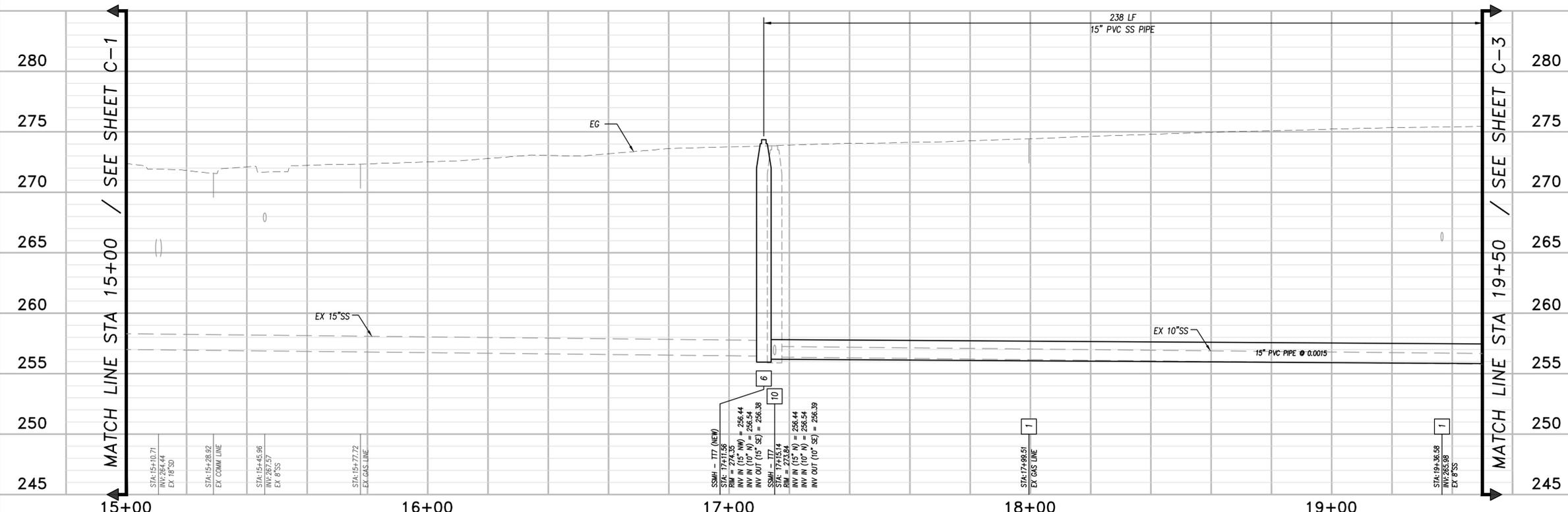
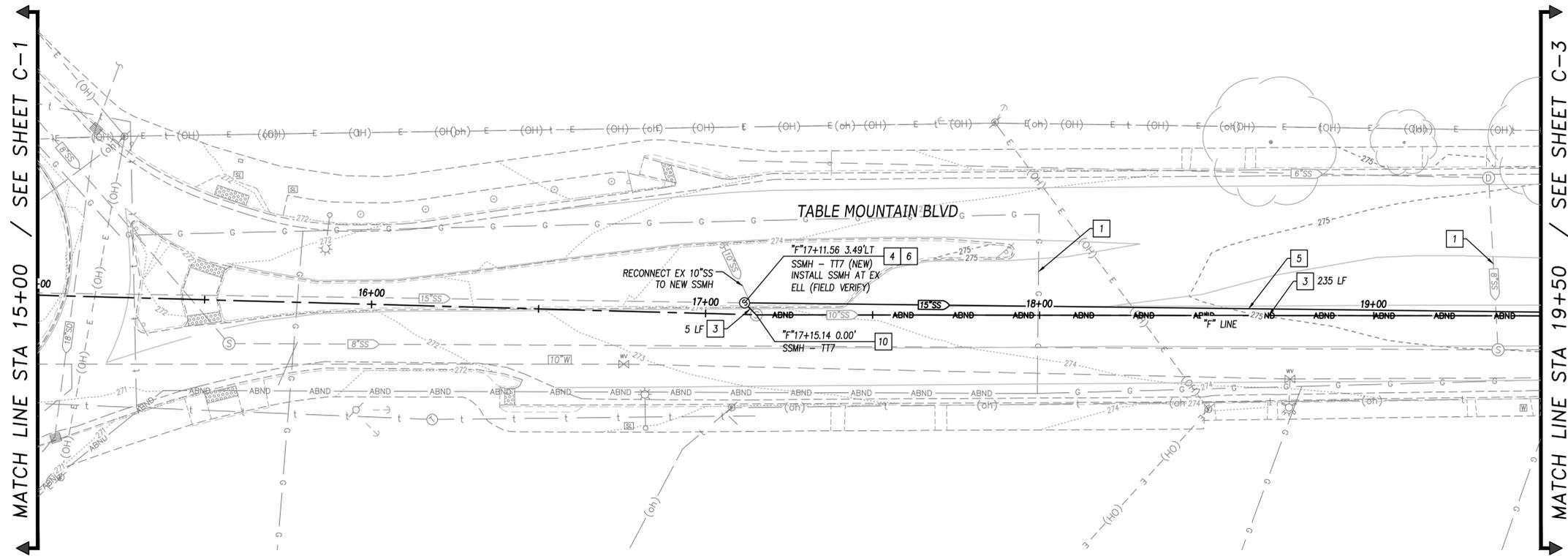
OROVILLE SEWER PROJECTS - 1F
 PLAN & PROFILE
 STA 10+25 to STA 15+00
 CALIFORNIA

CONSTRUCTION NOTES:

- 1 PROTECT EX UTILITY OR STRUCTURE IN PLACE
- 2 REMOVE EX SS PIPE
- 3 ABANDON EX SS PIPE
- 4 CONNECT TO EX SS PIPE OR SSMH
- 5 INSTALL 15" PVC PIPE PER DTL 2 SHT C-9
- 6 INSTALL 48" SSMH PER DTL 1 SHT C-9
- 7 REMOVE EX SDMH AND EX 12" PIPE
- 8 INSTALL 48" SDMH PER DTL 1 SHT C-10
- 9 CONNECT TO EX SD PIPE OR SDMH
- 10 ABANDON EX 48" SSMH PER DTL 3 SHT C-10
- 11 POTHOLE EX BURIED SDMH; REMOVE AND REPLACE W/ 24" PVC SD
- 12 INSTALL 8" PVC PIPE PER DTL 2 SHT C-9
- 13 INSTALL 12" PVC PIPE PER DTL 2 SHT C-10

NOTES:

1. ASSUMED DEPTH FOR ALL DRY UTILITIES, WATER SERVICES, AND SEWER LATERALS. CONTRACTOR TO VERIFY LOCATION, SIZE, & DEPTH IN FIELD PRIOR TO COMMENCING ALL WORK.
2. CONTRACTOR TO NOTIFY RESIDENTS OF SERVICE INTERRUPTION 3 DAYS PRIOR TO INTERRUPTION.
3. REPAIR STREET SECTIONS PER DTL 3 SHT C-9.
4. CONTRACTOR SHALL MAINTAIN 12" VERTICAL SEPARATION BETWEEN PROPOSED PIPE AND CROSSING UTILITIES.



Login Name: ksethares
 Plot Date: July 12, 2019 9:36 am Plot Style: ###
 File Name: P:\Proj\17601-200-Oroville-Sewer-Projects-Design\05-PLANS\Masters\Drawings\17601-200_OF\17601-200_06-C3 - F PLAN PROFILE.dwg
 Plot Size: B3 (17601-200_06-C3)

NO.	REVISIONS	BY	DATE

BENCH MARK ELEV: 238.57 DATUM: NAVD 88
 DESCRIPTION:
 THE HORIZONTAL DATUM IS NAD 83 CALIFORNIA ZONE
 2 PER CITY OF OROVILLE HORIZONTAL CONTROL
 VERTICAL DATUM IS NAVD 88 PER CITY OF OROVILLE
 BENCHMARKS.

DESIGN BY: K.SETHARES
 DRAWN BY: K.SETHARES
 CHECKED BY: M.MASSARO
 SCALE: H: 1"=20'; V: 1"=5'
 DATE: 7/12/19
 PROJ NO.: 17601-200

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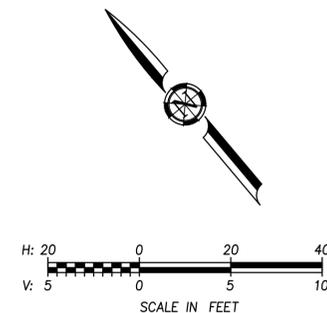
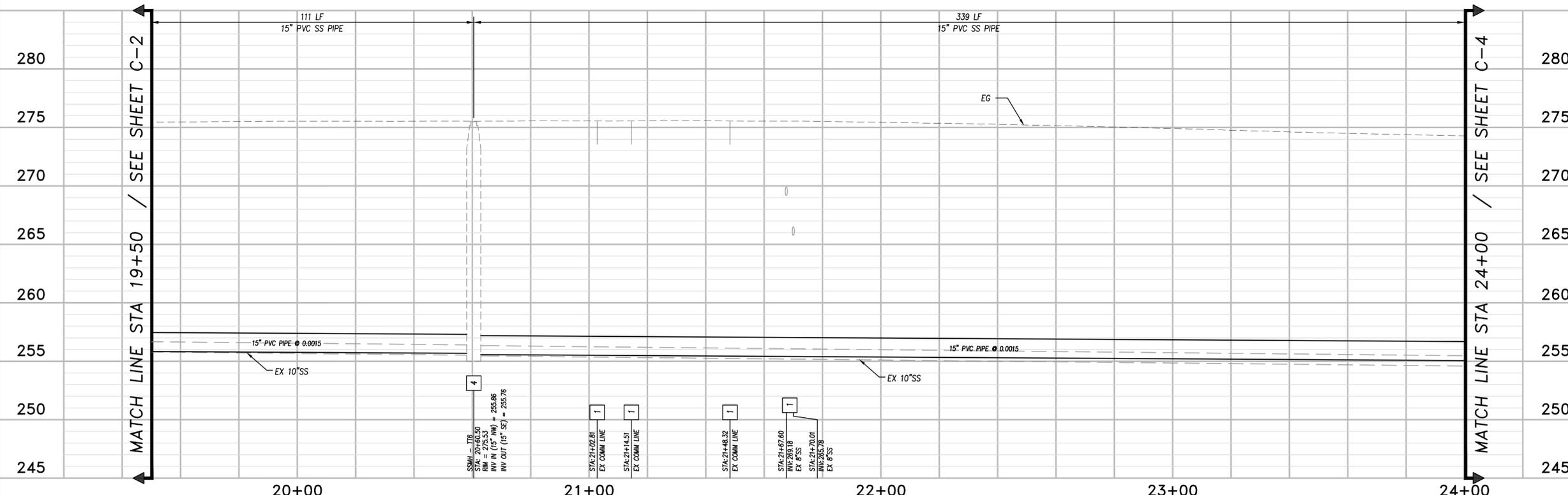
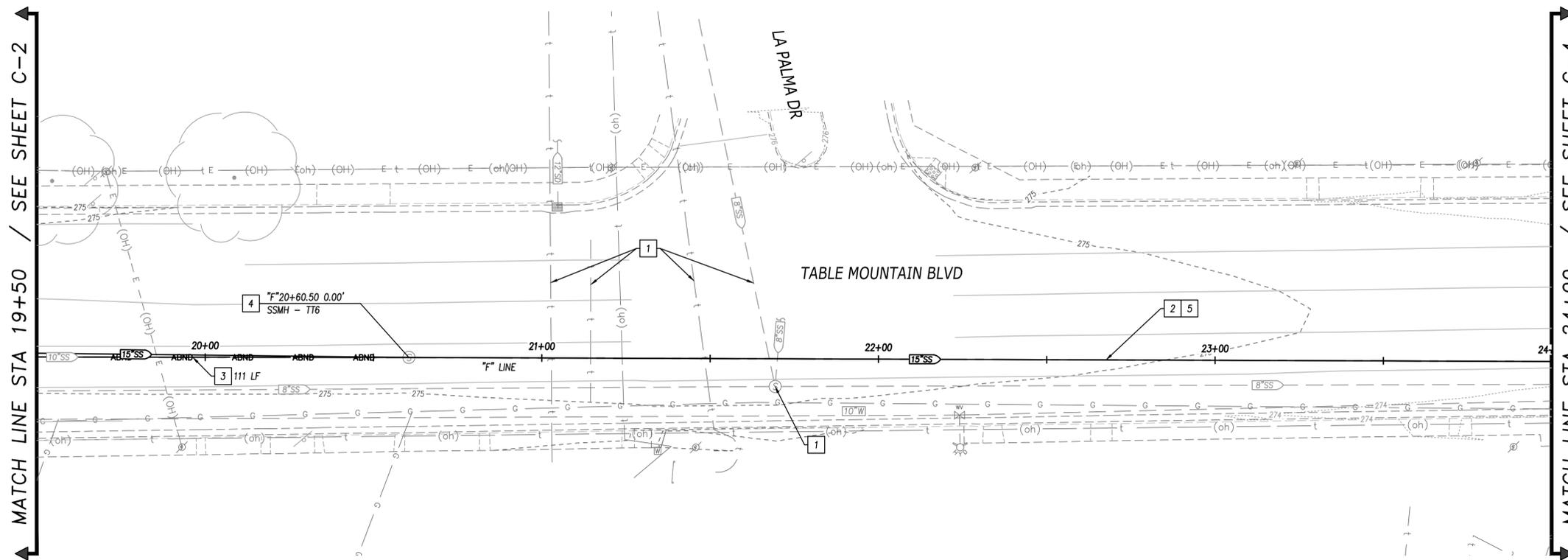
OROVILLE SEWER PROJECTS - 1F
 PLAN & PROFILE
 STA 15+00 to STA 19+50
 CALIFORNIA

CONSTRUCTION NOTES:

- 1 PROTECT EX UTILITY OR STRUCTURE IN PLACE
- 2 REMOVE EX SS PIPE
- 3 ABANDON EX SS PIPE
- 4 CONNECT TO EX SS PIPE OR SSMH
- 5 INSTALL 15" PVC PIPE PER DTL 2 SHT C-9
- 6 INSTALL 48" SSMH PER DTL 1 SHT C-9
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- 13 INSTALL 12" PVC PIPE PER DTL 2 SHT C-10

NOTES:

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2. CONTRACTOR TO NOTIFY RESIDENTS OF SERVICE INTERRUPTION 3 DAYS PRIOR TO INTERRUPTION.
3. REPAIR STREET SECTIONS PER DTL 3 SHT C-9.
4. CONTRACTOR SHALL MAINTAIN 12" VERTICAL SEPARATION BETWEEN PROPOSED PIPE AND CROSSING UTILITIES.



Login Name: ksethares
 Plot Date: July 12, 2019 9:36 am Plot Style: ###
 File Name: P:\Proj\17601-200-Oroville-Sewer-Design\03-PLANS\MASTER SHEETS\17601-200_1F\17601-200_06-C3 - F PLAN PROFILE.dwg
 Plot Size: Barch100-200x1100

NO.	REVISIONS	BY	DATE

BENCH MARK ELEV: 238.57 DATUM: NAVD 88
 DESCRIPTION:
 THE HORIZONTAL DATUM IS NAD 83 CALIFORNIA ZONE
 2 PER CITY OF OROVILLE HORIZONTAL CONTROL
 BENCHMARKS.

DESIGN BY: K.SETHARES
 DRAWN BY: K.SETHARES
 CHECKED BY: M.MASSARO
 SCALE: H: 1"=20'; V: 1"=5'
 DATE: 7/12/19
 PROJ NO.: 17601-200

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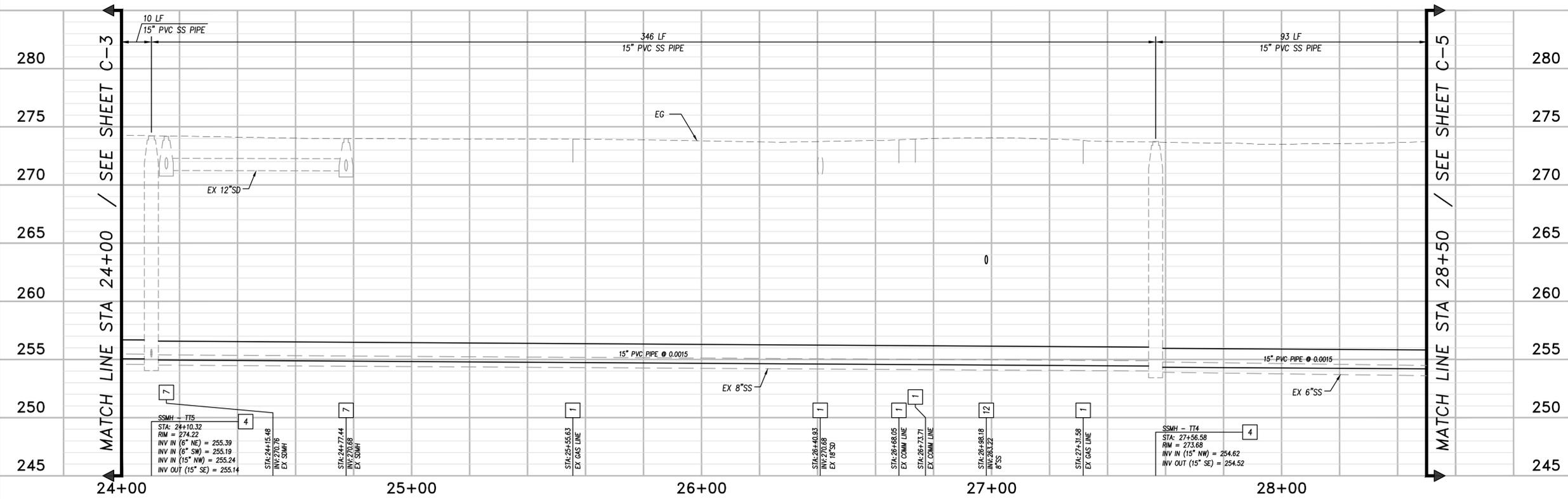
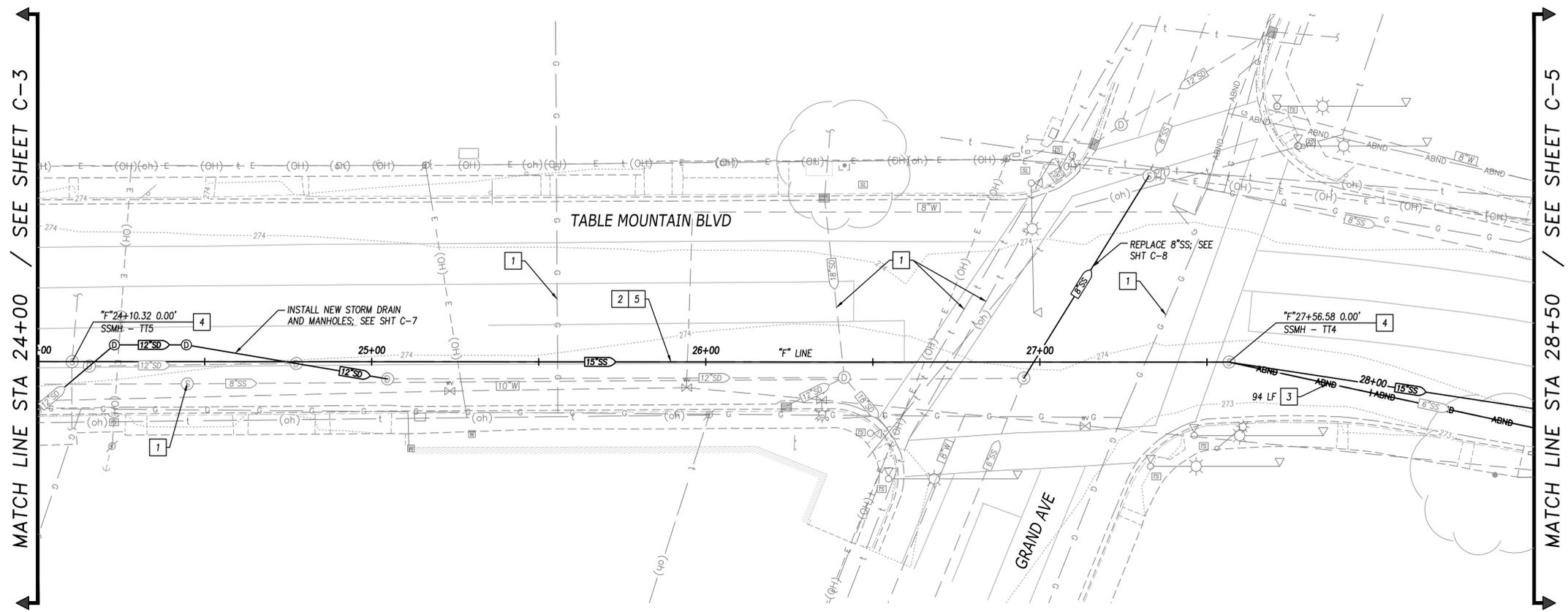
OROVILLE SEWER PROJECTS - 1F
 PLAN & PROFILE
 STA 19+50 to STA 24+00
 CALIFORNIA

CONSTRUCTION NOTES:

- 1 PROTECT EX UTILITY OR STRUCTURE IN PLACE
- 2 REMOVE EX SS PIPE
- 3 ABANDON EX SS PIPE
- 4 CONNECT TO EX SS PIPE OR SSMH
- 5 INSTALL 15" PVC PIPE PER DTL 2 SHT C-9
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- 13 INSTALL 12" PVC PIPE PER DTL 2 SHT C-10

NOTES:

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4. CONTRACTOR SHALL MAINTAIN 12" VERTICAL SEPARATION BETWEEN PROPOSED PIPE AND CROSSING UTILITIES.



Log# Name: ksethars
 Plot Date: July 12, 2019 9:36 am; Plot Style: ##
 File Name: P:\Proj\17601-200-Oroville-Sewer-Projects\Drawings\17601-200_UF\17601-200_06-C3 - F PLAN PROFILE.dwg
 Plot Size: 11x17 (ANSI)

NO.	REVISIONS	BY	DATE

BENCH MARK ELEV: 238.57 DATUM: NAVD 88
 DESCRIPTION:
 THE HORIZONTAL DATUM IS NAD 83 CALIFORNIA ZONE
 2 PER CITY OF OROVILLE HORIZONTAL CONTROL
 VERTICAL DATUM IS NAVD 88 PER CITY OF OROVILLE
 BENCHMARKS.

DESIGN BY: K.SETHARES
 DRAWN BY: K.SETHARES
 CHECKED BY: M.MASSARO
 SCALE: H: 1"=20'; V: 1"=5'
 DATE: 7/12/19
 PROJ NO.: 17601-200

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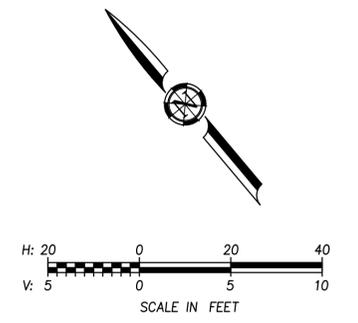
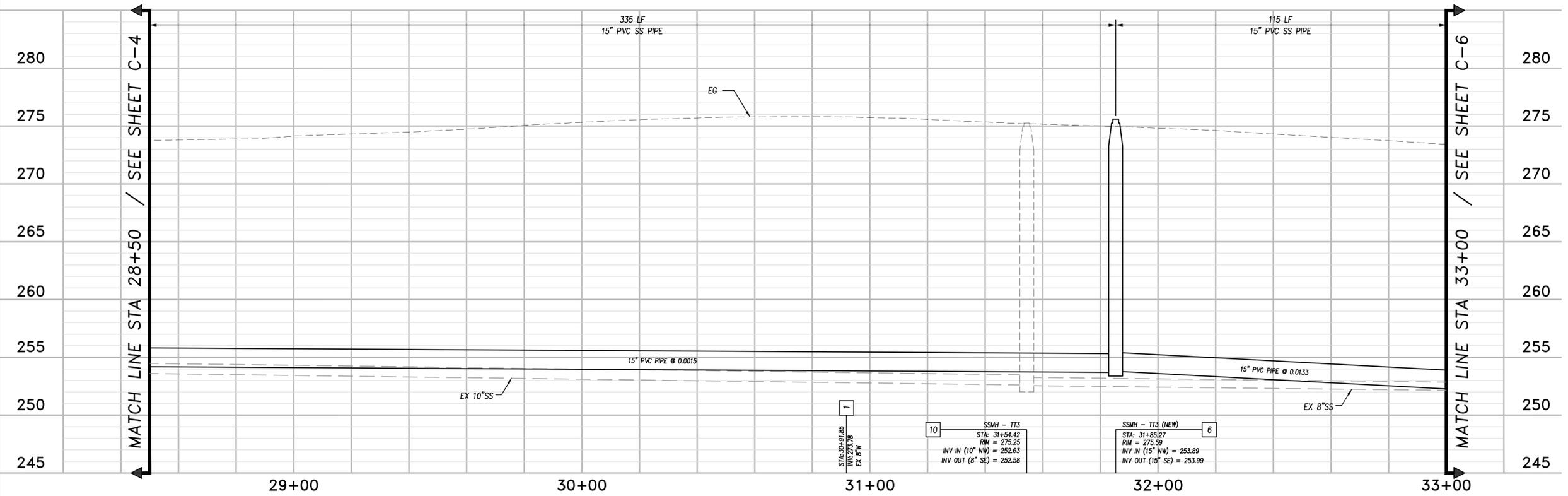
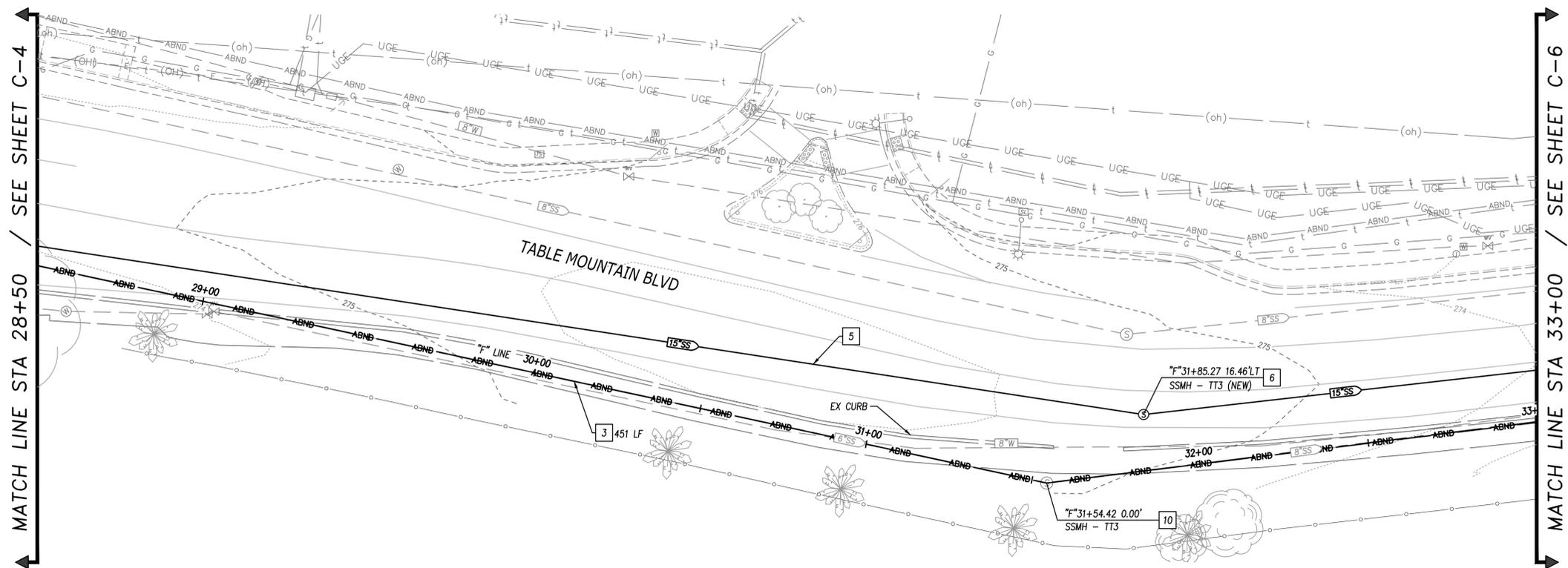


OROVILLE SEWER PROJECTS - 1F
 PLAN & PROFILE
 STA 24+00 to STA 28+50
 CALIFORNIA

CONSTRUCTION NOTES:

- 1 PROTECT EX UTILITY OR STRUCTURE IN PLACE
- 2 REMOVE EX SS PIPE
- 3 ABANDON EX SS PIPE
- 4 CONNECT TO EX SS PIPE OR SSMH
- 5 INSTALL 15" PVC PIPE PER DTL 2 SHT C-9
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- 11 POT HOLE EX BURIED SDMH; REMOVE AND REPLACE W/ 24" PVC SD
- 12 INSTALL 8" PVC PIPE PER DTL 2 SHT C-9
- 13 INSTALL 12" PVC PIPE PER DTL 2 SHT C-10

- NOTES:
1. ASSUMED DEPTH FOR ALL DRY UTILITIES, WATER SERVICES, AND SEWER LATERALS. CONTRACTOR TO VERIFY LOCATION, SIZE, & DEPTH IN FIELD PRIOR TO COMMENCING ALL WORK.
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 3. REPAIR STREET SECTIONS PER DTL 3 SHT C-9.
 4. CONTRACTOR SHALL MAINTAIN 12" VERTICAL SEPARATION BETWEEN PROPOSED PIPE AND CROSSING UTILITIES.



LogIn Name: bethares
 Plot Date: July 12, 2019 3:33 pm Plot Style: ###
 File Name: P:\Proj\17601-200-Oroville-Sewer-Design\Drawings\17601-200_UF\17601-200_06-C3 - F PLAN PROFILE.dwg
 Plot Date: July 12, 2019 3:33 pm Plot Style: ###

NO.	REVISIONS	BY	DATE

BENCH MARK ELEV: 238.57 DATUM: NAVD 88
 DESCRIPTION:
 THE HORIZONTAL DATUM IS NAD 83 CALIFORNIA ZONE
 2 PER CITY OF OROVILLE HORIZONTAL CONTROL
 VERTICAL DATUM IS NAVD 88 PER CITY OF OROVILLE
 BENCHMARKS.

DESIGN BY: K.SETHARES
 DRAWN BY: K.SETHARES
 CHECKED BY: M.MASSARO
 SCALE: H: 1"=20'; V: 1"=5'
 DATE: 7/12/19
 PROJ NO.: 17601-200

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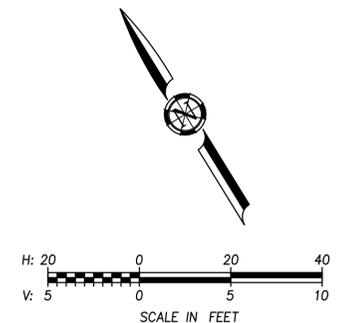
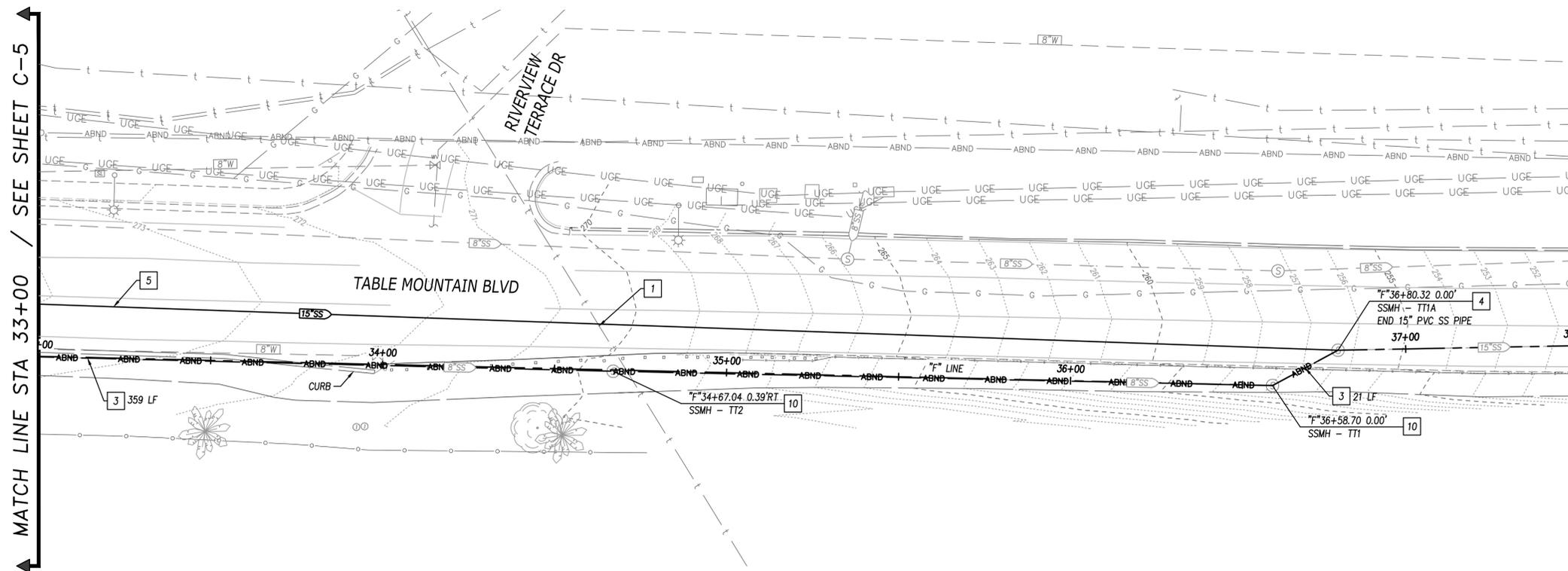
OROVILLE SEWER PROJECTS - 1F
 PLAN & PROFILE
 STA 28+50 to STA 33+00
 CALIFORNIA

CONSTRUCTION NOTES:

- 1 PROTECT EX UTILITY OR STRUCTURE IN PLACE
- 2 REMOVE EX SS PIPE
- 3 ABANDON EX SS PIPE
- 4 CONNECT TO EX SS PIPE OR SSMH
- 5 INSTALL 15" PVC PIPE PER DTL 2 SHT C-9
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NOTES:

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3. REPAIR STREET SECTIONS PER DTL 3 SHT C-9.
4. CONTRACTOR SHALL MAINTAIN 12" VERTICAL SEPARATION BETWEEN PROPOSED PIPE AND CROSSING UTILITIES.



Login Name: bethares
 Plot Date: July 12, 2019 9:36 am Plot Style: ###
 File Name: P:\Proj\17601-200-Oroville-Sewer-Design\Drawings\Sheet\17601-200-F\17601-200-06-C3 - F PLAN PROFILE.dwg
 Plot Size: 36x48

NO.	REVISIONS	BY	DATE

BENCH MARK ELEV: 238.57 DATUM: NAVD 88
 DESCRIPTION:
 THE HORIZONTAL DATUM IS NAD 83 CALIFORNIA ZONE
 2 PER CITY OF OROVILLE HORIZONTAL CONTROL
 VERTICAL DATUM IS NAVD 88 PER CITY OF OROVILLE
 BENCHMARKS.

DESIGN BY: K.SETHARES
 DRAWN BY: K.SETHARES
 CHECKED BY: M.MASSARO
 SCALE: H: 1"=20'; V: 1"=5'
 DATE: 7/12/19
 PROJ NO.: 17601-200

VERIFY SCALE
 BAR IS ONE INCH ON
 ORIGINAL DRAWING.
 IF NOT ONE INCH ON
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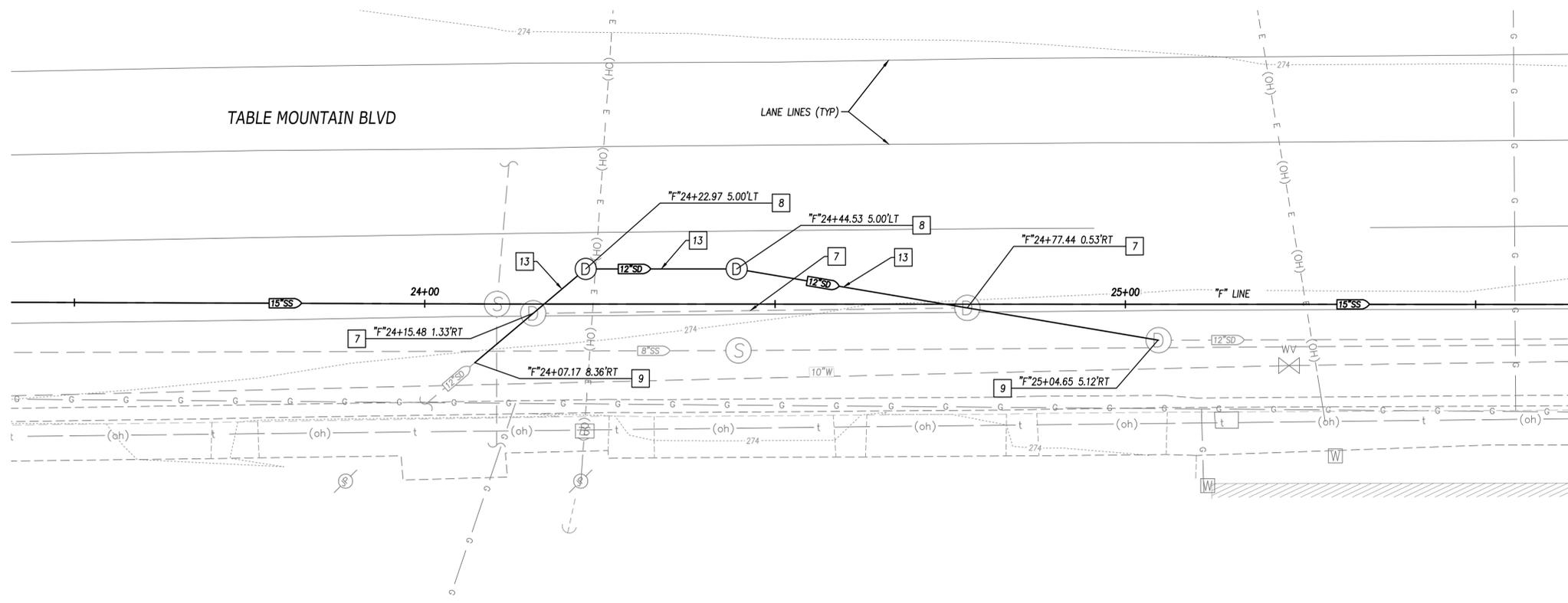
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 T 916.783.4100
 F 916.783.4110



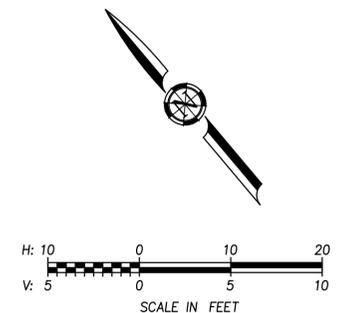
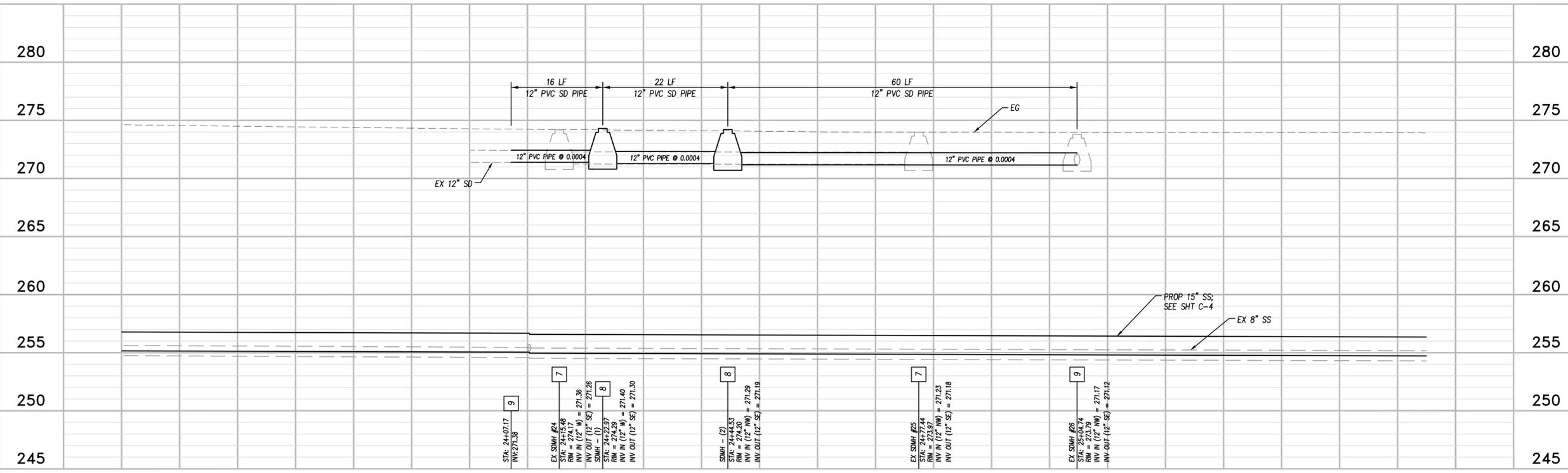
OROVILLE SEWER PROJECTS - 1F
 PLAN & PROFILE
 STA 33+00 to STA 37+50
 CALIFORNIA

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 File Name: P:\Proj\17601-200-Oroville-Sewer-Design\Drawings\17601-200-1F-17601-200-06-C4 - SD PLAN PROFILE.dwg



- CONSTRUCTION NOTES:**
- 1 PROTECT EX UTILITY OR STRUCTURE IN PLACE
 - 2 REMOVE EX SS PIPE
 - 3 ABANDON EX SS PIPE
 - 4 CONNECT TO EX SS PIPE OR SSMH
 - 5 INSTALL 15" PVC PIPE PER DTL 2 SHT C-9
 - 6 INSTALL 48" SSMH PER DTL 1 SHT C-9
 - 7 REMOVE EX SDMH AND EX 12" PIPE
 - 8 INSTALL 48" SDMH PER DTL 1 SHT C-10
 - 9 CONNECT TO EX SD PIPE OR SDMH
 - 10 ABANDON EX 48" SSMH PER DTL 3 SHT C-10
 - 11 POTHOLE EX BURIED SDMH; REMOVE AND REPLACE W/ 24" PVC SD
 - 12 INSTALL 8" PVC PIPE PER DTL 2 SHT C-9
 - 13 INSTALL 12" PVC PIPE PER DTL 2 SHT C-10

- NOTES:**
1. ASSUMED DEPTH FOR ALL DRY UTILITIES, WATER SERVICES, AND SEWER LATERALS. CONTRACTOR TO VERIFY LOCATION, SIZE, & DEPTH IN FIELD PRIOR TO COMMENCING ALL WORK.
 2. CONTRACTOR TO NOTIFY RESIDENTS OF SERVICE INTERRUPTION 3 DAYS PRIOR TO INTERRUPTION.
 3. REPAIR STREET SECTIONS PER DTL 3 SHT C-9.
 4. CONTRACTOR SHALL MAINTAIN 12" VERTICAL SEPARATION BETWEEN PROPOSED PIPE AND CROSSING UTILITIES.



NO.	REVISIONS	BY	DATE

BENCH MARK ELEV: 238.57 DATUM: NAVD 88
 DESCRIPTION:
 THE HORIZONTAL DATUM IS NAD 83 CALIFORNIA ZONE
 2 PER CITY OF OROVILLE HORIZONTAL CONTROL
 VERTICAL DATUM IS NAVD 88 PER CITY OF OROVILLE
 BENCHMARKS.

DESIGN BY: K.SETHARES
 DRAWN BY: K.SETHARES
 CHECKED BY: M.MASSARO
 SCALE: H: 1"=10'; V: 1"=5'
 DATE: 7/12/19
 PROJ NO.: 17601-200

VERIFY SCALE
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 IF NOT ONE INCH ON
 THIS SHEET, ADJUST
 SCALES ACCORDINGLY.

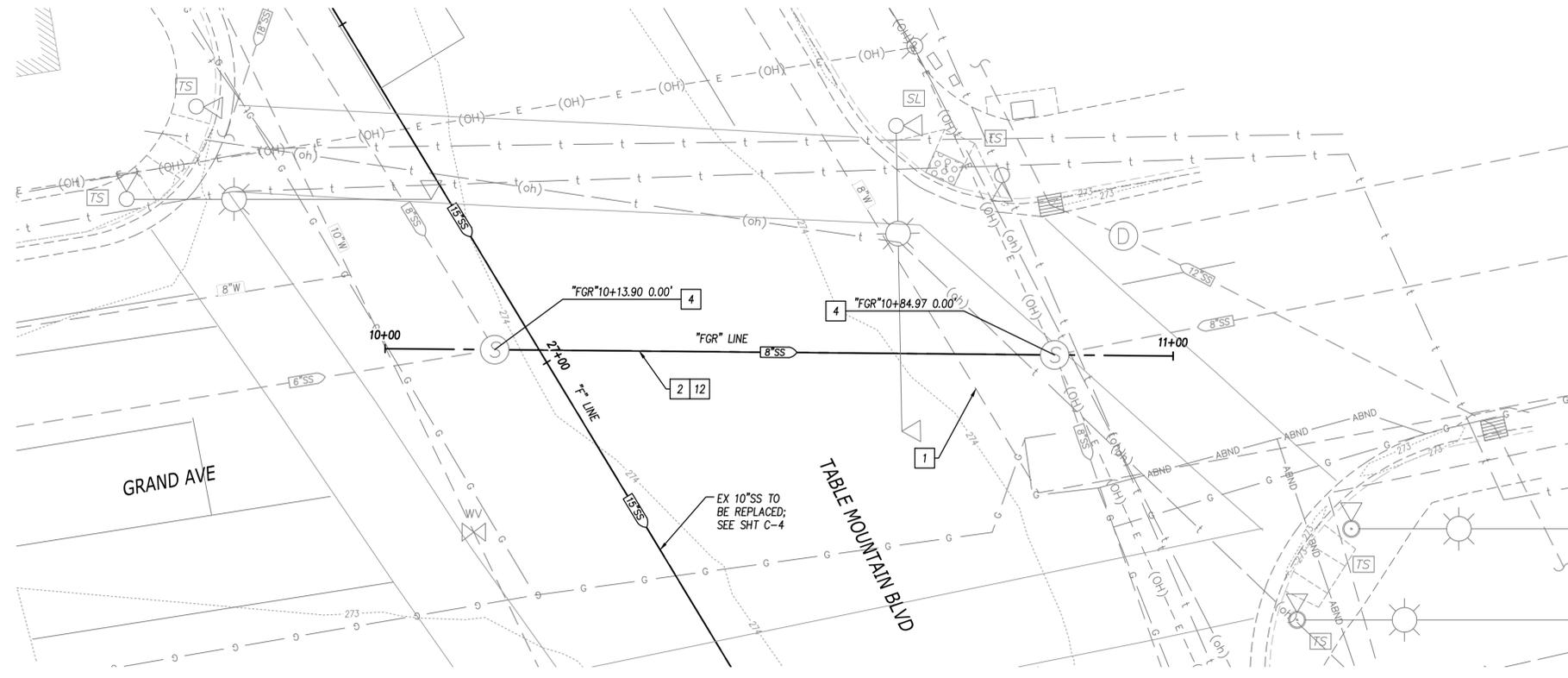


BEN EN
 TRUSTED ENGINEERING ADVISORS

Bennett Engineering Services
 1082 Sunrise Avenue, Suite 100
 Roseville, California 95661
 T 916.783.4100
 F 916.783.4110

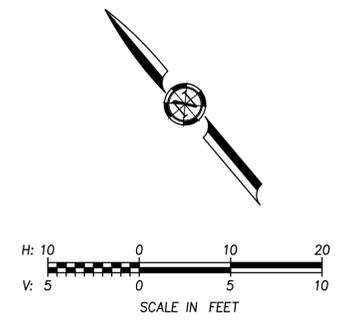
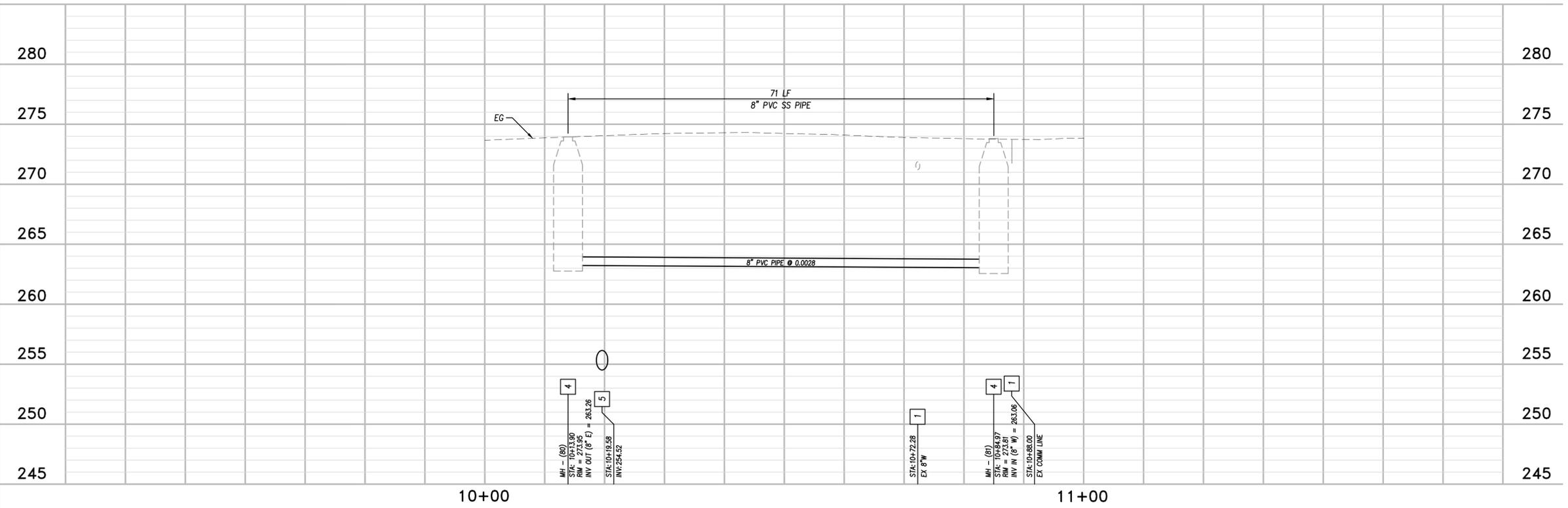


OROVILLE SEWER PROJECTS - 1F
STORM DRAIN PLAN & PROFILE
 STA 23+50 to STA 25+50
 CALIFORNIA



- CONSTRUCTION NOTES:**
- 1 PROTECT EX UTILITY OR STRUCTURE IN PLACE
 - 2 REMOVE EX SS PIPE
 - 3 ABANDON EX SS PIPE
 - 4 CONNECT TO EX SS PIPE OR SSMH
 - 5 INSTALL 15" PVC PIPE PER DTL 2 SHT C-9
 - 6 INSTALL 48" SSMH PER DTL 1 SHT C-9
 - 7 REMOVE EX SDMH AND EX 12" PIPE
 - 8 INSTALL 48" SDMH PER DTL 1 SHT C-10
 - 9 CONNECT TO EX SD PIPE OR SDMH
 - 10 ABANDON EX 48" SSMH PER DTL 3 SHT C-10
 - 11 POTHOLE EX BURIED SDMH; REMOVE AND REPLACE W/ 24" PVC SD
 - 12 INSTALL 8" PVC PIPE PER DTL 2 SHT C-9
 - 13 INSTALL 12" PVC PIPE PER DTL 2 SHT C-10

- NOTES:**
1. ASSUMED DEPTH FOR ALL DRY UTILITIES, WATER SERVICES, AND SEWER LATERALS. CONTRACTOR TO VERIFY LOCATION, SIZE, & DEPTH IN FIELD PRIOR TO COMMENCING ALL WORK.
 2. CONTRACTOR TO NOTIFY RESIDENTS OF SERVICE INTERRUPTION 3 DAYS PRIOR TO INTERRUPTION.
 3. REPAIR STREET SECTIONS PER DTL 3 SHT C-9.
 4. CONTRACTOR SHALL MAINTAIN 12" VERTICAL SEPARATION BETWEEN PROPOSED PIPE AND CROSSING UTILITIES.



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NO.	REVISIONS	BY	DATE

BENCH MARK ELEV: 238.57 DATUM: NAVD 88
 DESCRIPTION:
 THE HORIZONTAL DATUM IS NAD 83 CALIFORNIA ZONE
 2 PER CITY OF OROVILLE HORIZONTAL CONTROL
 VERTICAL DATUM IS NAVD 88 PER CITY OF OROVILLE
 BENCHMARKS.

DESIGN BY: K.SETHARES
 DRAWN BY: K.SETHARES
 CHECKED BY: M.MASSARO
 SCALE: H: 1"=10'; V: 1"=5'
 DATE: 7/12/19
 PROJ NO.: 17601-200

VERIFY SCALE
 BAR IS ONE INCH ON ORIGINAL DRAWING.
 IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

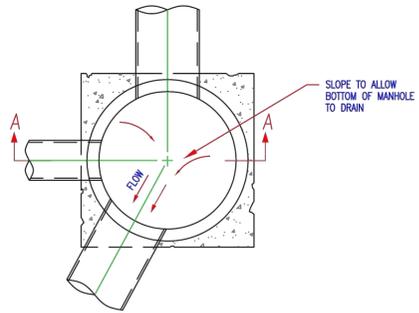


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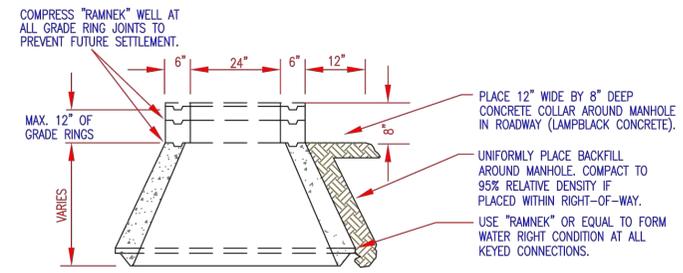
Bennett Engineering Services
 1082 Sunrise Avenue, Suite 100
 Roseville, California 95661
 T 916.783.4100
 F 916.783.4110



OROVILLE SEWER PROJECTS - 1F
8-INCH SS PLAN & PROFILE
 STA 10+00 to STA 11+00
 CALIFORNIA



STORM DRAIN MANHOLE DETAIL



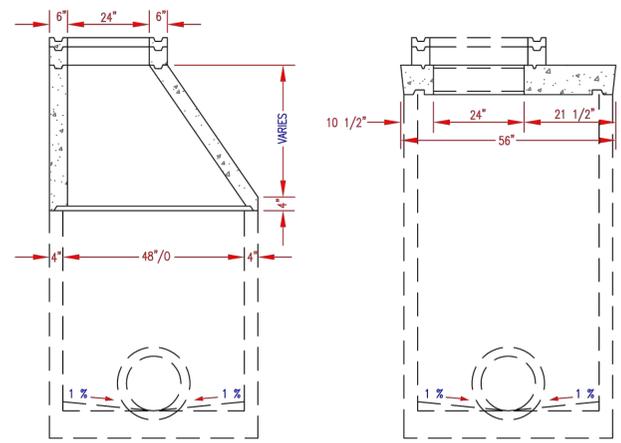
COMPRESS "RAMNEK" WELL AT ALL GRADE RING JOINTS TO PREVENT FUTURE SETTLEMENT.

MAX. 12" OF GRADE RINGS

PLACE 12" WIDE BY 8" DEEP CONCRETE COLLAR AROUND MANHOLE IN ROADWAY (LAMPBLACK CONCRETE).

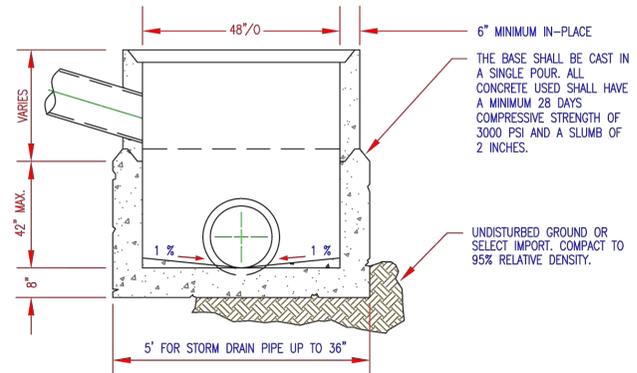
UNIFORMLY PLACE BACKFILL AROUND MANHOLE. COMPACT TO 95% RELATIVE DENSITY IF PLACED WITHIN RIGHT-OF-WAY.

USE "RAMNEK" OR EQUAL TO FORM WATER RIGHT CONDITION AT ALL KEYED CONNECTIONS.



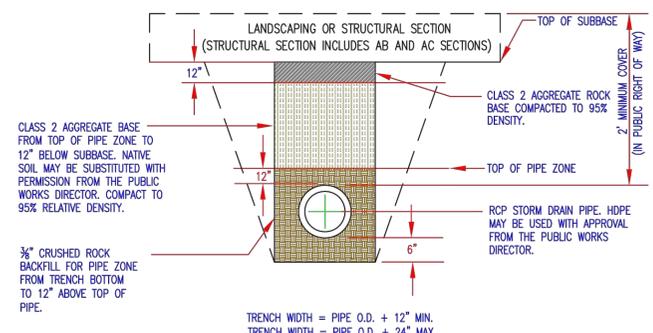
OPTION ECCENTRIC CONE SECTION OPTION FLAT LID SECTION

- NOTES:
- MANHOLE RIM ELEVATION TO BE DETERMINED IN THE FIELD.
 - TOP OF MANHOLE TO BE FITTED WITH STANDARD SD-04 OR SD-05 ASSEMBLY.
 - CHANNEL BASE TO BE SMOOTH TROWELLED WITH STREAMLINED JUNCTIONS.
 - USE 5'-0" MANHOLE FOR STORM DRAINS 48" TO 60" IN DIAMETER.
 - OUTSIDE OF BASE TO BE A MINIMUM OF 5'-0" SQUARE, BUT MAY ASSUME A SHAPE OTHER THAN A SQUARE PROVIDED THE STANDARD BARREL RESTS AT ALL POINTS UPON THE SURFACE OF THE CONCRETE BASE.
 - MANHOLE BASES ONLY MAY BE CAST IN PLACE. ALL BASES SHALL BE PRECAST.
 - USE BARREL OR RING FORM TEMPLATE TO MAKE AN INDENTATION IN THE POURED-IN-PLACE BASE OR AT THE OPTION OF THE CONTRACTOR, THE FIRST BARREL MAY BE PLACED DIRECTLY IN THE WET BASE AND THE CONCRETE MOUNDED 4 INCHES ABOVE THE JOINT AND PACKED TIGHTLY BOTH INSIDE AND OUTSIDE OF THE BARREL.
 - WHEN MANHOLE IS LOCATED OUTSIDE OF PAVED AREAS, CEMENT GROUT SHALL BE PLACED AROUND CIRCUMFERENCE OF CASTING AND UPPERMOST GRADE RING AS DIRECTED BY THE ENGINEER.
 - FOR STORM DRAIN PIPE GREATER THAN 36" I.D., AN ENGINEERED SUBMITTAL SHALL BE SUBMITTED FOR APPROVAL BY THE ENGINEERING DEPARTMENT. THIS SUBMITTAL SHALL BE ADDED TO THE IMPROVEMENT PLANS.



STROM DRAIN MANHOLE DETAIL SECTION AA

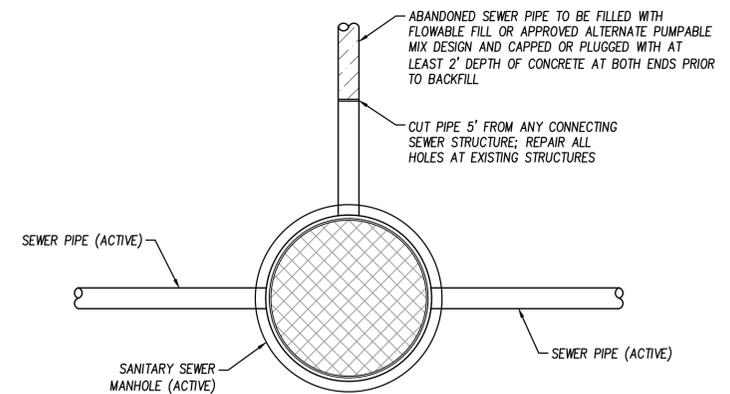
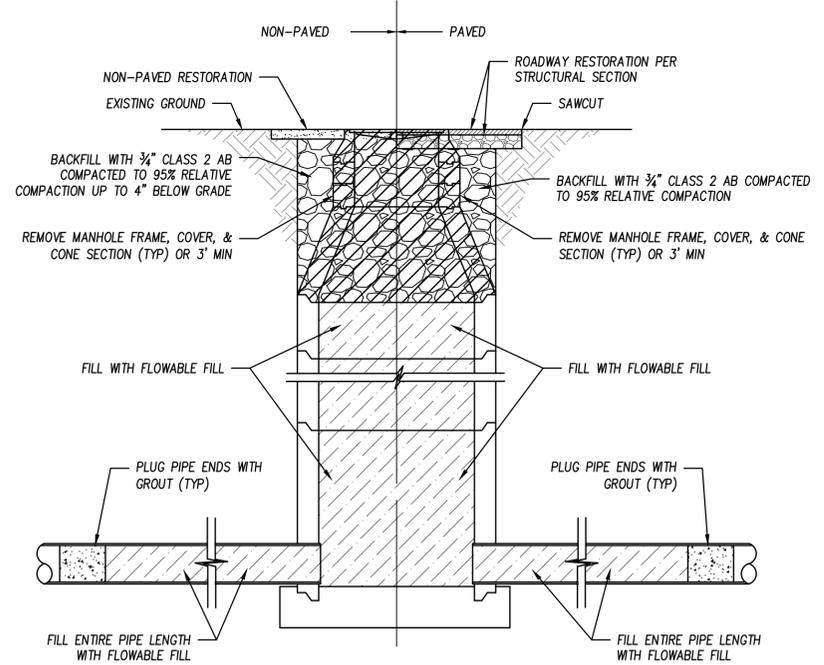
1 STORM DRAIN MANHOLE
SCALE: NTS



TYPICAL TRENCH DETAIL

- NOTES:
- THESE NOTES SHALL APPLY TO ALL STORM DRAIN PIPE
 - STORM DRAIN PIPE MUST BE AT LEAST 12" IN DIAMETER. SITE DRAINS LESS THAN 12" IN DIAMETER MUST BE APPROVED BY THE CITY ENGINEER.
 - THE LENGTH OF STORM DRAIN PIPE WHICH EXTENDS BEYOND THE PUBLIC RIGHT OF WAY SHALL BE COMPACTED TO 95% RELATIVE DENSITY IF THE CITY WILL OWN THE IMPROVEMENT. THE USE OF NATIVE SOIL MAY BE ALLOWED WITH APPROVAL FROM THE CITY ENGINEER.
 - PIPE BEDDING MUST BE LAID BEFORE THE PIPE.
 - CORRUGATED METAL PIPE (CMP) SHALL NOT BE USED.
 - REFER TO STANDARD ST-29 FOR PAVEMENT REPLACEMENT.
 - ANY PIPE WITH A FILL DEPTH OF LESS THAN 12" FROM TOP OF PIPE TO SUBGRADE SHALL BE RCP.

2 STORM DRAIN TRENCH
SCALE: NTS



3 ABANDON MANHOLE
SCALE: NTS

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 Plot Date: July 12, 2019 9:35 am Plot Style: ###
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NO.	REVISIONS	BY	DATE

BENCH MARK ELEV.: 238.57 DATUM: NAVD 88
 DESCRIPTION:
 THE HORIZONTAL DATUM IS NAD 83 CALIFORNIA ZONE 2 PER CITY OF OROVILLE HORIZONTAL CONTROL VERTICAL DATUM IS NAVD 88 PER CITY OF OROVILLE BENCHMARKS.

DESIGN BY: K.SETHARES
 DRAWN BY: K.SETHARES
 CHECKED BY: M.MASSARO
 SCALE: N/A
 DATE: 7/12/19
 PROJ NO.: 17601-200

VERIFY SCALE
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 T 916.783.4100
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OROVILLE SEWER PROJECTS - 1F
 DETAILS - 2
 CALIFORNIA

CITY OF OROVILLE, CALIFORNIA



SPECIFICATIONS AND CONTRACT DOCUMENTS

OROVILLE SEWER PROJECTS - 1F

JULY 2019

PREPARED FOR:

**CITY OF OROVILLE PUBLIC WORKS DEPARTMENT
OROVILLE, CALIFORNIA**

PREPARED BY:

**BENNETT ENGINEERING SERVICES
ROSEVILLE, CALIFORNIA**

SPECIFICATIONS AND CONTRACT DOCUMENTS FOR

OROVILLE SEWER PROJECTS - 1F

TABLE OF CONTENTS

<u>SECTION NAME</u>	<u>PAGE/SECTION</u>
BIDDING REQUIREMENTS	
Invitation for Bids.....	BR-1
Information for Bidders.....	BR-4
BIDDING DOCUMENTS	
Bid Form.....	BD-1
Bid Schedule.....	BD-4
List of Subcontractors.....	BD-6
Bidder's Bond	BD-7
Equal Opportunity Certification.....	BD-8
Noncollusion Affidavit.....	BD-9
Public Contract Code Section 10285.1 Statement	BD-10
Public Contact Code Section 10162 Questionnaire.....	BD-11
Public Contact Code Section 10232 Statement.....	BD-12
Debarment and Suspension Certification.....	BD-13
CONTRACT FORMS	
Project Contract.....	CF-1
Form of Performance Bond.....	CF-8
Form of Payment Bond	CF-9
GENERAL CONDITIONS	Section GC
TECHNICAL SPECIFICATIONS	Section TS
Measure and Payment.....	01550
Submittals.....	01300
Testing of Gravity Sewer Lines and Manholes	01666
Earthwork	02200
Abandonment of Pipelines and Manholes.....	02222
Trenching, Backfilling, and Compacting	02223
Structure Excavation and Backfill.....	02225
Sheeting, Waling, and Shoring.....	02400
Paving and Road Surfacing	02510
Manholes and Cleanouts.....	02601
Temporary Sewer Bypass Pumping	02960
Pipe Removal.....	15030
Plastic Pipe and Fittings	15071
PROJECT PLAN SHEETS (13 Sheets Total)	

SECTION - BR
BIDDING REQUIREMENTS

INVITATION FOR BIDS
CITY OF OROVILLE
1735 MONTGOMERY STREET
OROVILLE, CALIFORNIA 95965-4897

Sealed proposals for the work described in the specifications and contract documents entitled:

OROVILLE SEWER PROJECTS - 1F

will be received at the City of Oroville, office of the City Clerk, 1735 Montgomery Street, Oroville, California 95965 until:

TUESDAY, AUGUST 20, 2019 AT 2:00 PM

at which time they will be publicly opened and read aloud in Conference Room 1 at said address.

NON-MANDATORY PRE-BID MEETING

TUESDAY, JULY 30, 2019 AT 10:00 AM

All Contractors interested in bidding on this project can attend a non-mandatory pre-bid meeting to be held at Oroville City Hall, 1735 Montgomery Street, Oroville, California. The pre-bid meeting will be held on **Tuesday, July 30, 2019** at 10:00 AM.

Proposal forms for this work are included in the document entitled:

OROVILLE SEWER PROJECTS - 1F

The proposed work for this project consists of the following generalized scope of work:

- Install 2,025 linear feet of 15-inch sanitary sewer and 3 sanitary sewer manholes on Table Mountain Boulevard, tie in to existing sewer, and all associated pavement repair.
- Remove 1,110 linear feet of existing sanitary sewer and abandon 1,340 linear feet of existing sewer and 4 manholes.
- Remove and replace 70 linear feet of 8-inch sanitary sewer and connect to existing manholes on Table Mountain Boulevard.
- Relocate 105 linear feet of 12-inch storm drain and 2 storm drain manholes on Table Mountain Boulevard.

Contractor's License Classification. The Contractor shall possess a Class A General Engineering Contractor license issued by the State of California Contractors State License Board at the time of contract award. The Contractor's subcontractor(s) performing work shall possess the appropriate State licenses for the work being performed. The awarded Contractor and subcontractors will also be required to obtain a City Business License.

Obtaining or Inspecting Contract Documents. The plans, specifications and contract documents (Contract Documents) are available for download on the City of Oroville website at:

<http://www.cityoforoville.org/business/rfp-rfq-public-bids/project-documentation>

The City will also be transmitting scanned copies of the Contract Documents to building exchanges

throughout the Northern Central Valley and the Bay Area. The City will not be providing Contractors paper copies of the Contract Documents. Further information regarding wage requirements, contract time, bonding requirements, federal requirements and other contract provisions are included in the Instructions for Bidders as part of the Contract Documents. Any questions or clarifications regarding the Contract Documents requested by Contractors shall be emailed to the City of Oroville, Project Manager, Mike Massaro, P.E., at mmassaro@ben-en.com after the pre-bid meeting on **July 9, 2019**.

Questions or clarifications to the Contract Documents will be responded to through the issuance of addendum(s) by the City. As required, Contractors that submit written questions or clarifications to the City by email (mmassaro@ben-en.com) will be automatically placed on the bidders list. Addendums will be email to all Contractors who have submitted questions and have been placed on the bidders list. Addendums will also be place on the City's website (website address above).

Wage Requirements. The Contractor and Subcontractors on this project must comply with Nondiscrimination, Equal Employment Opportunity, Antitrust, Occupational Safety and Health Standards and Regulations as set forth in the Contract Bid Documents. This municipality is an equal opportunity employer and businesses owned by women or minorities are strongly encouraged to bid. The Department of Public Works hereby notifies all bidders that it will affirmatively insure that in any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, gender, color or national origin in consideration for the award.

All labor on the project shall be paid the higher of the minimum wage rates as established by the U.S. Secretary of Labor, or the California Director of Industrial Relations. If a discrepancy exists between these two determinations, then all labor on the project shall be paid the higher of the two minimum wage rates. Refer to the Wage Determinations OnLine.gov (www.wdol.gov) for the latest wage rates established by the U.S. Secretary of Labor as of the date of advertisement. This project is subject to State general prevailing wage rates unless a construction trade as part of the project has no listed in the State general prevailing wage rate. In this case, and only if there is no listed federal wage rate for a specific and necessary trade, the State general prevailing wage rate shall apply. It shall be mandatory upon the Contractor to whom the Contract is awarded, and upon any subcontractors under such contract, to pay not less than said prevailing rates to all workers employed by them in the execution of the Contract.

Contract Time. This work shall be constructed in accordance with details as shown on the plans and described in the specifications for this project. The construction work for the entire project shall be completed within **one hundred and twenty (120)** working days.

Bidder's Bond. Bids must be from an appropriately licensed contractor, must be sealed and accompanied by cash, a certified or cashier's check, equivalent to ten percent (10%) of the proposal, payable to the order of the City of Oroville, to guarantee that if a proposal is accepted, a contract will be entered into and its performance secured. A Bidder's Bond to like effect and amount with a corporate surety will be acceptable for this project. Bids must be in writing and signed by or on behalf of the bidder.

Award of Contract. The contract will be awarded on the basis of lowest price for the combination of the base bid and the additive alternative bid from a responsive and responsible bidder and will provide for progressive payments and liquidated damages as fixed in the specifications. Although the additive bid alternative will be use in the determination of the lowest bidder, the additional work for the additive bid alternative will be the sole discretion of the City of Oroville. All proposals must be made on the forms as contained in the specifications for the previously described project and shall in all respects comply with the Instructions to Bidders and Contract Documents. Bids must be in writing and signed

by or on behalf of the bidder.

Bonding Requirements. The successful bidder will be required to furnish a Performance Bond for 100 percent of the contract price to secure fulfillment of all the bidder's obligations under such contract. The successful bidder will further be required to furnish a Labor and Material Bond for 100 percent of the contract price to assure payment as required by law of all persons supplying labor and material in the execution of the work provided for in the contract.

Retainage from Payments. Monthly progress payments shall be made to the Contractor for the value of the work completed during the preceding month, less a five percent (5%) security withhold.

Public Works Contractor Law. Bidders are advised that effective January 1, 2015, SB854 requires that no contractor or subcontractor may be listed on a bid proposal for a public works project (submitted on or after March 1, 2015) unless registered with the Department of Industrial Relations (DIR) pursuant to Labor Code section 1725.5 [with limited exceptions from this requirement for bid purposes only under Labor Code section 1771.1(a)]. Furthermore, no contractor or subcontractor may be awarded a contract for public work on a public works project (awarded on or after April 1, 2015) unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5. After registration, contractors and subcontractors shall submit be required to electronic certified payroll reports to DIR.

The City of Oroville reserves the right to reject any and/or all bids or to utilize any alternate procedures as authorized by California Public Contracts Code Sections 20166 and 20167, and accept such bids as are to the best interest of the City. No bidder may withdraw his/her bid for a period of ninety (90) days after the date set for the opening thereof.

Engineer's Estimate: \$942,200

CITY OF OROVILLE

Dated:

Mike Massaro, P.E.
City Engineer

July 19, 2019

Advertising Date: July 19, 2019

INFORMATION FOR BIDDERS

Bids will be received by the City of Oroville at the office of the City Clerk, City Hall, 1735 Montgomery Street, Oroville, California 95965-4897, until:

TUESDAY, AUGUST 20, 2019 AT 2:00 PM

at which time they will be publicly opened and read aloud.

Each bid must be submitted in a sealed envelope, addressed to the City of Oroville, 1735 Montgomery Street, Oroville, California 95965-4897. Each sealed envelope containing a bid must be plainly marked on the outside as bid for:

OROVILLE SEWER PROJECTS - 1F

and the envelope should bear on the outside the name of the bidder, his/her address, his/her license number and classification, and the name of the project for which the bid is submitted. If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed to the City of Oroville.

1. SCOPE OF PROJECT

The work to be done under this contract consists of furnishing all materials, plant and equipment, and performing all necessary labor in accordance with the prepared plans, specifications, and special provisions as directed by the City or its authorized representative, as follows:

CONSTRUCTION OF THE OROVILLE SEWER PROJECTS - 1F

2. FORM OF PROPOSAL

All bids must be made on the required bid form, and other forms furnished with the contract documents. All blank spaces for bid prices must be filled in, in ink or typewritten, and the bid form must be fully completed and executed when submitted. Only one copy of the bid form is required. Each bid shall be accompanied by a certified check, cashier's check, or surety bond for not less than ten (10) percent of the amount of the bid, made payable to the order of the City Clerk, City of Oroville. Such check or bond shall be given as a guarantee that the bidder will enter into the contract if awarded to him/her, and will be declared forfeited if the bidder refuses to enter into said contract and give the required contract bonds within five (5) days after being notified to do so by the City. The check or bond accompanying the accepted bid will be retained until the contract documents have been signed by the successful bidder and approved by the City of Oroville.

The following forms shall be completed and signed (where required), and submitted together to constitute a fully responsive bid:

- Bid Form (Pages BD-1 through BD-3)
- Bid Schedule (Page BD-4)
- List of Subcontractors (Page BD-6)
- Bidder's Bond (Page BD-7)

- Equal Opportunity Certification (Page BD-8)
- Noncollusion Affidavit (Page BD-9)
- Public Contract Code Section 10285.1 Statement (Page BD-10)
- Public Contract Code Section 10162 Questionnaire (Page BD-11)

The Contractor shall possess a Class A General Engineering License issued by the State of California Contractors State License Board at the time of contract award. The Contractor's subcontractor performing work elements shall possess the appropriate state licenses for the work being performed. The awarded Contractor and subcontractors will also be required to obtain a City Business License.

The City may waive any informalities or minor defects or reject any and all bids. Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified shall not be considered. No bidder may withdraw a bid within ninety (90) days after the actual date of the opening thereof. The City intends to award the contract at a regularly scheduled City Council Meeting as soon as possible thereafter. Should there be reasons why the contract cannot be awarded within the specified period; the time may be extended by mutual agreement between the City and the bidder.

The proposals may be rejected if they show any alteration of forms, additions not called for, conditional or alternative bids, incomplete bids, erasures or irregularities of any kind. The City of Oroville reserves the right to retain the checks or bonds of the three lowest bidders until an approved contract has been signed. All other bidders' checks will be returned by the City of Oroville.

3. LOCAL CONDITIONS

Bidders must satisfy themselves of the accuracy of the estimated quantities in the bid schedule by examination of the site and a review of the drawings and specifications including addenda. After bids have been submitted, the bidder shall not assert that there was a misunderstanding concerning the quantities of work, the nature of the work to be done or other requirements that are being called for in these specifications.

The City shall provide to bidders, prior to bidding, all information that is pertinent to, and delineates and describes, the land owned and rights-of-way acquired or to be required. The contract documents contain the provisions required for the construction of the project. Information obtained from an officer, agent, or employee of the City or any other person shall not affect the risks or obligations assumed by the Contractor or relieve him/her from fulfilling any of the conditions of the contract.

If any bidder is in doubt as to the true meaning of any part of the drawings, specifications, or other Contract Documents, or finds discrepancies in, or omissions from, the drawings or specifications, he/she may submit to the Design Engineer a written request for a clarification or correction thereof not later than five (5) days before the date bids will be opened. The person submitting the request will be responsible for its prompt delivery. Any clarification or correction will be made by written addendum, which shall be mailed or delivered to each person receiving a set of such documents.

The City will not be responsible for any other explanation or interpretation of the Contract Documents.

Any addenda issued before the time in which to submit bids expires shall form a part of the Contract Documents and shall be covered in the bid. Each bidder shall confirm receipt of any and all addenda in the space provided in the bid form.

4. BASIS OF AWARD

Award will be made to the lowest responsive and responsible bidder. A conditional or qualified bid will not be accepted. All applicable laws, ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the contract throughout. Each bidder is responsible for inspecting the site and for reading and being thoroughly familiar with the Contract Documents. The failure or omission of any bidder to do any of the foregoing shall in no way relieve any bidder from any obligation in respect to his/her bid. The low bidder shall supply the names and addresses of major material suppliers and subcontractors with the bid proposal on the form provided.

In making the award of the contract the City will consider the balanced character of the bids, the experience and ability of the bidders, as well as the extension of the estimate of quantities at the unit prices bid. The Contract will be awarded to the lowest cost for the work subject to the conditions for the basis of award of a contract. The Owner reserves the right to reject any or all bids and to waive irregularities not affecting substantial rights.

In case of conflict in the proposal between unit price bid and the extended total, the unit price bid shall govern. The basis of the award is subject to all conditions as contained in these specifications. The party to whom the contract is awarded will be required to execute the agreement and obtain the performance bond and payment bond within fourteen (14) calendar days from the date when notice of award (either verbal or written) is delivered to the bidder. The notice of award shall be accompanied by the necessary agreement and bond forms. In case of failure of the bidder to execute the agreement, the City may, at its option, consider the bidder in default, in which case the bid bond accompanying the proposal shall become the property of the City.

5. CONTRACT BONDS

Upon receipt of written notice of award of the contract and not more than five (5) days thereafter, the Contractor shall furnish the following bonds with power of attorney issued by a surety licensed to do business in the State of California and approved by the City. Attorneys-in-fact who sign bid bonds or payment bonds and performance bonds must file with each bond a certified and effective dated copy of their power of attorney. The form of the bonds shall be acceptable to the Owner:

- a. Faithful Performance Bond in a sum equal to one hundred percent (100%) of the amount of the contract awarded. This bond shall be made payable to the City of Oroville to guarantee the faithful performance of the contract.
- b. Labor and Material Bond in a sum equal to one hundred percent (100%) of the amount of the contract awarded. This bond shall be made payable to the City of Oroville to guarantee the payment of all labor, materials, rentals, etc. This bond shall have specific provisions to assure payment of all unemployment contributions which become due and payable.

6. PRECONSTRUCTION CONFERENCE

Prior to the issuance of the Notice to Proceed, a pre-construction conference will be held at a location determined by the City Engineer for the purpose of discussing with the Contractor the Scope of Work, contract drawings, specifications, existing conditions, materials to be ordered, equipment to be used, and all essential matters pertaining to the prosecution and the satisfactory completion of the project as required. The Contractor's representative at this conference shall include all major superintendents for the work and may include major sub-contractors.

7. NOTICE TO PROCEED

The Notice to Proceed (NTP) shall be issued for the date agreed by the City and Contractor as long as the agreement has been executed and the City has received the bonds and insurance documentation required per contract.

8. BIDDER'S QUALIFICATIONS

The City may make such investigations as it deems necessary to determine the ability of the bidder to perform the work, and the bidder shall furnish to the City all such information and data of this purpose as the City may request. The City reserves the right to reject any bid if the evidence submitted by, or investigation of, such bidder fails to satisfy the City that such bidder is properly qualified to carry out the obligations of the agreement and to complete the work contemplated therein.

9. WAGE RATES

All labor on the project shall be paid no less than the minimum wage rates as established by the U.S. Secretary of Labor. Further, pursuant to California Labor Code Section 1770, the California Department of Industrial Relations has specified the general prevailing wage rates for all public projects in California. The wages to be paid to all workers on such projects shall not be less than those specified in such wage rate determination.

10. ESTIMATE OF QUANTITIES

The estimate of quantities of work to be done under the specifications is approximate and is given only as a basis of calculation upon which the award of the contract will be made. The Contractor will be paid for the actual work done including materials and equipment actually installed at the contract unit price as shown on the plans, or as directed by the engineer. The Owner reserves the right to increase or decrease the amount of any class of work or material deemed necessary without restrictions. Bidders must submit balanced bids in order that they may not be affected adversely by an increase or decrease of quantities.

11. SUBLETTING OF CONTRACT

The Contractor shall not sublet, sell, transfer, assign or otherwise dispose of the contract or contracts or any portion thereof, or of his/her right, title, or interest therein, without written consent of the Owner. In case such consent is given, the Contractor will be permitted to sublet a portion thereof but shall perform with his/her own organization not less than 50 percent of the total contract cost, except that any items designated by the Contractor and approved by the Owner as "specialty items" may be performed by subcontract and the cost of any such specialty items so performed by

subcontract may be deducted from the total cost before computing the amount of work to be performed by the Contractor with his/her own organization. No subcontracts or transfer of contract shall release the Contractor of his/her liability under contracts and bonds.

12. WORKER'S COMPENSATION INSURANCE

The Contractor shall provide worker's compensation insurance, as required under the laws of the State of California, protecting the employees on the work, and shall pay all premiums due thereunder.

13. PUBLIC LIABILITY INSURANCE

The Contractor shall not commence any work or permit any subcontractor to commence any work until he/she obtains at his/her expense all required insurance. Such insurance must have the approval of the Owner as to limit, form and amount. Any insurance bearing on adequacy of performance shall be maintained after completion of the project for the full guarantee period.

14. CONTRACT TIME

The Contractor shall begin work within ten (10) calendar days after the date set in the written Notice to Proceed by the Owner and shall diligently prosecute same to completion for all of the proposed construction. The Contract time for the completion of the total project shall be **one hundred and twenty (120)** working days beginning on the date of the written Notice to Proceed.

15. LIQUIDATED DAMAGES

If the Contractor refuses or fails to complete the work within the time specified, including authorized extensions, there shall be deducted from monies due the Contractor, not as a penalty, but as liquidated damages the sum of Two Thousand Seven Hundred Dollars (\$2,700.00) for each working day subsequent to the time specified for each project and the time the work is actually completed and accepted. Delays caused by adverse weather conditions or conditions for which the Owner is clearly responsible will be added to the contract time.

16. PAYMENTS

Progress payments shall be made at least once each month as the work progresses. These progress payments shall be based on work accomplished during the previous working month, based on the various contract bid items and the unit bid prices included in the Bid Schedule submitted by the Contractor with his/her bid. In applying for payments, the Contractor shall submit a statement based on this schedule. Payment will be made only for material and work actually incorporated in the work.

17. WITHHOLDING

Owner shall withhold from each payment due the Contractor five percent (5%) of the amount claimed. This 5% of the payment shall be withheld until final acceptance of the total project is given by the Owner. After final acceptance of the project is given and the Contractor has submitted

acceptable release of all liens and furnished the Engineer acceptable red-lined drawings showing the "as-built" condition of the completed project, then the Owner shall release for payment the 5% retention. Owner will make such final payment of retention within thirty-five (35) days of final acceptance of the project and submittal of release of liens and red-lined as-built drawings.

Pursuant to Government Code Section 4590, at the request and expense of the Contractor, securities equivalent to the amount withheld shall be deposited with the City or with a state or federally chartered bank as the escrow agent, who shall pay such monies to the Contractor upon satisfactory completion of the contract. Securities eligible for investment under this section shall include those listed in Government Code Section 16430 or bank or savings and loan certificates of deposit. The Contractor shall be the beneficial owner of any securities substituted for monies withheld and shall receive any interest thereon.

18. DEFINITIONS

Whenever in the specifications or on the drawings the word directed, required, permitted, designated, ordered, or words of like import are used, it shall be understood that the direction, requirement, permission, designation or order of the City of Oroville is intended; and, similarly, the words approved, satisfactory, suitable, acceptable, or words of like import, shall mean approved by the representative of the City of Oroville authorized to express such approval.

19. TAXES

Bidders shall have included in their bids any and all Federal, State and local taxes of whatever nature in connection with material to be furnished to the City. Absolutely no extras shall be allowed for such by the City.

20. CONTRACT DOCUMENTS

The form of agreement which the successful bidder, as Contractor, will be required to execute and the form of bonds which he/she will be required to furnish are included in the Contract Documents and should be carefully examined by each bidder. The agreement and bonds will be executed in two (2) original counterparts. The complete contract consists of the Contract Documents as defined in the agreement, and are intended to cooperate and be complementary so that any work called for in one and not mentioned in the other, or vice versa, is to be executed the same as if mentioned in all said documents. The intention of the documents is to include all labor, materials, equipment, transportation and services necessary for the proper execution of the work.

21. DECLARATION FOR FINAL PAYMENT

After the completion of the work of this contract, the Contractor shall file with the City his/her declaration under penalty of perjury stating that all workers and persons employed, all firms supplying the materials and all subcontractors upon the project, have been paid in full and that there are no bills outstanding against the project for either labor or materials except certain items, if any, to be set forth in detail in the declaration. The filing of such declaration by the Contractor and the submittals referred to in the General Provisions shall be a condition precedent to Contractor's receipt of the final payment on this contract.

22. ADMONITION

All bidders hereby are advised that the City of Oroville has adopted General Provisions for this work which might differ from the general provisions provided for private projects or projects undertaken by other governmental agencies. Contractors are admonished to carefully read the General Provisions, as well as the technical provisions, and are advised that the General Provisions shall be enforced strictly.

23. QUALITY

a. Conduct of Work. The construction in place, and all operations on the site and in conjunction with the work of construction, shall comply with all laws, ordinances and regulations of legally constituted authorities having jurisdiction.

b. Manufacturer's Directions. Where specifications require work to be performed in accordance with manufacturer's directions, the Contractor shall obtain and distribute copies of said directions to City, Engineer and field office before starting the affected part of the work.

c. Materials. All materials and equipment incorporated in the work shall be new, except where reuse of existing materials or equipment is specified. All similar materials and equipment shall be products of one manufacturer, and shall be the same model, type and style for the same use throughout the project. This requirement shall apply whether item is furnished under one or several sections of the specifications. It shall be the Contractor's responsibility to coordinate and assure compliance of this requirement. The conditions of this paragraph shall be sufficient cause for rejection of the substitutions.

d. Workmanship.

1. All workmanship shall be performed by skilled laborers in accordance with established standards of first-class workmanship in each of the various trades. All items shown or indicated shall be plumb, level, flat or straight, throughout their entire extent, within limits of tolerances specified. In cases where tolerances are not specified, all items shall be installed in accordance with established standards for first-class work in each trade.

2. Contractor shall, prior to installing any item or material, assure himself that surfaces to receive such items or materials are plumb, level, true to line and straight to the degree necessary to achieve tolerances specified or required. All shimming, blocking, stripping, grinding, or patching required shall be performed without extra cost.

3. All joints in finish materials shall be tight, straight, even and smooth.

4. All operable items shall operate smoothly, without sticking or binding, and without excessive "play" or looseness

5. Finished appearance of all items, and of joints or transitions between items, shall be indicative of highest-quality workmanship.

24. SUBMITTALS

The contractor shall prepare and provide all submittals, shop drawings and samples required by other pertinent sections of the specifications for work, and all incidental submittals required for proper performance of the work. The City shall prepare a submittal schedule prior to the issuance of the Notice to Proceed. All submittals shall be submitted in a timely manner allowing the City a 1-week review time. It is the expressed responsibility of the Contractor to ensure that the submittal, review and approval of submittals by the City do not delay the project schedule.

25. GUARANTEE

In addition to requirements for a guarantee specified in "General Conditions," the effective date of the guarantee shall be the date of recording the notice of final completion.

SECTION - BD

BIDDING DOCUMENTS

BID FORM

Bid Opening Date: August 20, 2019

Hour of Bid Opening: 2:00 p.m.

Place of Bid Opening:

City of Oroville
1735 Montgomery Street, Conference Room 1
Oroville, California 95965

TO: The City of Oroville, State of California:

Bid of, _____,
organized and existing under the laws of the State of California, and doing business as:

- a Corporation
- a Partnership
- an Individual

to the City of Oroville, 1735 Montgomery Street, Oroville, California 95965.

The bidder, in compliance with the Invitations for Bids for:

OROVILLE SEWER PROJECTS - 1F

having examined the plans and specifications with related documents of the proposed work, and being familiar with all of the conditions surrounding the construction of the proposed project including the availability of materials and labor, hereby proposes to furnish all labor, materials, and supplies, and to construct the project in accordance with the contract documents, within the time set forth therein, and at the prices stated below. These prices are to cover all expenses incurred in performing the work required under the contract documents, of which this proposal is a part.

The bidder is required to examine carefully the work site, the proposal form, plans, Specifications, Supplemental Specifications, special provisions and contract forms for the work contemplated. It will be assumed that the bidder has investigated and is satisfied as to the conditions to be encountered for performing the work as scheduled, and as to the character, quality and quantities of work to be performed and materials to be furnished, and as to the requirements of the plans, Specifications, Supplemental Specifications, special provisions and contract. The submission of a proposal shall be considered conclusive evidence that the bidder has made such examination and is satisfied as to all the conditions and contingencies.

Bidder hereby agrees to commence work under this contract within 10 working days after issuance of the Notice to Proceed by the City and, will fully complete the project within **120** working days after the issuance of the Notice to Proceed, unless the period of completion is extended thereafter as stipulated in the specifications. Liquidated damages established for this contract are established at \$2,700 per day for each working day that all project work is not

completed after the 120th working day.

Bidder further agrees that should he/she fail to complete any segment of work in the time specified, he/she will pay liquidated damages to the City as prescribed in these specifications. It is understood that the City reserves the right to increase or decrease the quantities of items bid in the contract with no change in the unit prices bid, provided the change in a major item does not exceed 25 percent and of other items, 30 percent.

All items contained in the project bid schedule, including any additive bid alternatives, must be submitted for the entire work. Award of contract will be based on the lowest responsible bidder for the combination of base bid schedule with the additive alternatives, at the City's discretion. The amount of the bid for comparison purposes will be the total bid of all items for each respective Bid Schedule. The unit prices shall include all labor, materials, tools, equipment, overhead, profit, fees and all other items of expense necessary for and incidental to the finished work.

The bidder understands that the City reserves the right to award or reject any or all bids for each respective Bid Schedule. The bidder agrees that their bids shall be good and may not be withdrawn for a period of ninety (90) calendar days after the actual date of opening thereof.

Upon receipt of written notice of the acceptance of this bid, bidder will execute the formal contract attached within ten (10) calendar days and deliver surety bonds as required by the general conditions. The bid security, attached, is to become the property of the City in the event the contract and bonds are not executed within the time set forth as liquidated damages for the delay and additional expense to the City caused thereby.

Accompanying this bid is _____

(Note: Insert the words "cash," "cashier's check," "certified check," or "bidders bond" as the case may be in the amount equal to at least ten (10) percent of the total bid.)

The names of all persons interested in the foregoing proposal as principals are as follows:

IMPORTANT NOTICE: If bidder or other interested person is a corporation, state legal name of corporation, also names of the president, secretary, treasurer and manager thereof; if a co-partnership, state true name of firm, also names of all individual copartners composing firm; if bidder or other interested person is an individual, state first and last names in full.

Licensed in accordance with an act providing for the registration of Contractors,
License No. & Exp. Date: _____ Classification(s) _____

ADDENDA: This proposal is submitted with respect to the changes to the contract included in
addendum number(s) _____

(Fill in addendum numbers if addenda have been received and insert, in this Proposal,
any Engineer's Estimate sheets that were received as part of the addenda.)

Addendum or addenda issued by the department must be noted above.

By my signature on this proposal I certify, under penalty of perjury under the laws of the State of California, that the foregoing questionnaire and statements of Public Contract Code Sections 10162, 10232 and 10285.1 are true and correct and that the bidder has complied with the requirements of Section 8103 of the Fair Employment and Housing Commission Regulations (Chapter 5, Title 2 of the California Administrative Code). By my signature on this proposal I further certify, under penalty of perjury under the laws of the State of California and the United States of America, that the Noncollusion Affidavit required by Title 23 United States Code are true and correct.

Signature of Bidder _____ Date: _____

Name and Title of Bidder: _____

Name of Business: _____

Business Address: _____

Telephone Number: _____

Attest: _____

Dated: _____

License No. & Exp. Date: _____

Classification: _____

SEAL: (If bid by corporation)

OROVILLE SEWER PROJECTS - 1F BID SCHEDULE

Bidder agrees to perform all of the work described in the contract documents and this bid form for the amounts shown in the "Bid Amount" column.

Contractor's Company Name, Address and Phone Number

Contractor's Title, Signature and Date

We hereby propose to furnish all labor, materials, equipment, tools, transportation, and services, and to discharge all duties and obligations necessary and required to perform and complete the Project in strict accordance with the Contract Documents for the TOTAL BID PRICE:

BASE BID SCHEDULE

BID ITEM	ITEM DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	LINE ITEM COST
1	MOBILIZATION/DEMOBILIZATION	LS	1		
2	TRAFFIC CONTROL	LS	1		
3	SHEETING, SHORING, BRACING	LS	1		
4	BYPASS PUMPING	LS	1		
5	8" PVC PIPE	LF	72		
6	12" PVC PIPE	LF	105		
7	15" PVC PIPE	LF	2,025		
8	24" PVC PIPE	LF	20		
9	ABANDON PIPE	LF	1,340		
10	48" SANITARY SEWER MANHOLE	EA	3		
11	48" STORM DRAIN MANHOLE	EA	2		
12	ABANDON MANHOLE	EA	5		
13	CONNECTION TO EXISTING MANHOLE	EA	8		
			Total Bid Items 1-13:		

Bidders must provide pricing for every bid item. Base Bid items above reflect in the project plans.

The estimated quantities for unit price items are for purposes of comparing bids only and the City makes no representation that the actual quantities of work performed will not vary from the estimates.

In case of discrepancy between the unit price and the line item cost set forth for a unit price item, the line item cost, calculated at the unit price multiplied by the estimated quantity, shall prevail and shall be utilized as the basis for determining the lowest responsive, responsible bidder. However, if the amount set forth as a unit price is ambiguous, unintelligible or uncertain for any cause, or is omitted, or is the same amount as the entry in the "Line Item Cost" column, then the amount set forth in the "Line Item Cost" column for the item shall prevail and shall be divided by the estimated quantity for the item and the price thus obtained shall be the unit price. If any of the above discrepancies exist, the City may recalculate the bid price on the basis of the unit price and the bidder agrees to be bound by such recalculation. Final payment for unit price items shall be determined by the City from measured quantities of work performed.

The contract shall be awarded to the contractor submitting the lowest responsible Base Bid Price.

BASE BID PRICE:

\$ _____
Base Bid in Numbers

Base Bid in Written Form

BIDDER'S BOND

CITY OF OROVILLE

We, _____

_____ as Principal, and

as Surety are bound unto the City of Oroville, hereafter referred to as "Obligee," in the penal sum of ten percent (10%) of the total amount of the bid of the Principal submitted to the Obligee for the work described below, for the payment of which sum we bind ourselves, jointly and severally.

THE CONDITION OF THIS OBLIGATION IS SUCH, THAT:

WHEREAS, the Principal is submitting a bid to the Obligee, for the **OROVILLE SEWER PROJECTS - 1F** as shown on the Project Plans and Technical Specification, for which bids are to be opened at 1735 Montgomery Street, Oroville, California 95965 on **August 20, 2019 at 2:00 P.M.**

NOW, THEREFORE, if the Principal is awarded the contract and, within the time and manner required under the specifications, after the prescribed forms are presented to him/her for signature, enters into a written contract, in the prescribed form, in accordance with the bid, and files two bonds with the Obligee, one to guarantee faithful performance of the contract and the other to guarantee payment for labor and materials as provided by law, then this obligation shall be null and void; otherwise, it shall remain in full force.

In the event suit is brought upon this bond by the Obligee and judgment is recovered, the Surety shall pay all costs incurred by the Obligee in such suit, including a reasonable attorney's fee to be fixed by the court.

Dated: _____, 20____

*THIS DOCUMENT
MUST BE NOTARIZED*

Principal

Surety

By: _____

Note: Correspondence or claims relating to this bond should be sent to the surety at the following address:

EQUAL OPPORTUNITY CERTIFICATION

The bidder and proposed subcontractor(s) hereby certify the he/she has____, has not____ participated in a previous contract or subcontract subject to the equal opportunity clauses, as required by Executive Orders 10925, 11114, or 11246, and that, where required, he/she has filed with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance, a Federal Government contracting or administering agency, or the former President's Committee on Equal Employment Opportunity, all reports due under the applicable filing requirements.

Notes: The bidder must place a checkmark after "has" or "has not" in one of the blank spaces provided above. The above Certification is part of the Bid. Signing this Bid on the signature portion of the Bid Schedule thereof shall also constitute signature of this certification. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

Proposed prime contractors and subcontractors who have participated in a previous contract or subcontract subject to the Executive Orders and have not filed the required reports should note that 41 CFR 60-1.7(b) (1) prevents the award of contracts and subcontracts unless such contractor submits a report covering the delinquent period or such other period specified by the Federal Highway Administration or by the Director, Office of Federal Contract Compliance, U.S. Department of Labor.

NONCOLLUSION AFFIDAVIT

In conformance with Title 23 United States Code Section 112 and Public Contract Code 7106 the bidder declares that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

Note: The above Statement, Questionnaire, and Non-Collusion Affidavit are a part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute signature of this Affidavit. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

PUBLIC CONTRACT CODE SECTION 10285.1 STATEMENT

In accordance with Public contract Code Section 10285.1 (Chapter 376, Stats. 1985), the bidder hereby declares under penalty of perjury under the laws of the State of California that the bidder has , has not , been convicted within the preceding three years of any offenses referred to in that section, including any charge of fraud, bribery, collusion, conspiracy, or any other act in violation of any state or federal antitrust law in connection with the bidding upon, award of, or performance of, any public works contract, as defined in Public Contract Code Section 1101, with any public entity, as defined in Public Contract Code Section 1100, including the Regents of the University of California or the Trustees of the California State University. The term "bidder" is understood to include any partner, members, officer, director, responsible managing officer, or responsible managing employee thereof, as referred to in Section 10285.1.

Note: The bidder must place a checkmark after "has" or "has not" in one of the blank spaces provided. The above Statement is part of the Bid. Signing this Bid on the signature portion of the bid schedule thereof shall also constitute signature of this Statement. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

PUBLIC CONTRACT CODE SECTION 10162 QUESTIONNAIRE

In accordance with Public Contract Code Section 10162, the Bidder shall complete, under penalty of perjury, the following questionnaire:

Has the bidder, any officer of the bidder, or any employee of the bidder who has a proprietary interest in the bidder, ever been disqualified, removed, or otherwise prevented from bidding on, or completing a federal, state, or local government project because of a violation of law or safety regulation?

YES_____ NO_____

If the answer is yes, explain the circumstances in the following space.

Note: The bidder must place a checkmark after "YES" or "NO" in one of the blank spaces provided. The above Questionnaire is part of the Bid. Signing this Bid on the signature portion of the bid schedule thereof shall also constitute signature of this Questionnaire. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

PUBLIC CONTRACT CODE SECTION 10232 STATEMENT

In conformance with Public Contract Code Section 10232, the Contractor, hereby states under penalty of perjury, that no more than one final un-appealable finding of contempt of court by a federal court has been issued against the Contractor within the immediately preceding two-year period because of the Contractor's failure to comply with an order of a federal court which orders the Contractor to comply with an order of the National Labor Relations Board.

Note: The above Statement is part of the Bid. Signing this Bid on the signature portion thereof shall also constitute signature of this Statement. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

**DEBARMENT AND SUSPENSION
CERTIFICATION**

TITLE 49, CODE OF FEDERAL REGULATIONS, PART
29

The bidder, under penalty of perjury, certifies that, except as noted below, he/she or any other person associated therewith in the capacity of owner, partner, director, officer, manager:

- is not currently under suspension, debarment, voluntary exclusion, or determination of ineligibility by any Federal agency;
- has not been suspended, debarred, voluntarily excluded or determined ineligible by any Federal agency within the past 3 years;
- does not have a proposed debarment pending; and
- has not been indicted, convicted, or had a civil judgment rendered against it by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past 3 years.

If there are any exceptions to this certification, insert the exceptions in the following space.

Exceptions will not necessarily result in denial of award, but will be considered in determining bidder responsibility. For any exception noted above, indicate below to whom it applies, initiating agency, and dates of action.

Notes: Providing false information may result in criminal prosecution or administrative sanctions. The above certification is part of the Bid. Signing this Bid on the signature portion thereof shall also constitute signature of this Certification.

PROJECT CONTRACT

THIS PROJECT CONTRACT (the "contract" or "Contract"), is made and entered into this day of _____, by and between City of Oroville (referred to herein as the "Owner" or the "City") and _____(the "Contractor").

WITNESSETH: That the parties hereto have mutually covenanted and agreed, and by these presents do covenant and agree with each other as follows:

1. THE CONTRACT DOCUMENTS.

The complete contract is comprised of and may or may not include: Invitation for Bids; Information for Bidders; Bid Schedule; Proposal Form; Bidder's Bond; Contract; General Conditions; Special Provisions; Technical Provisions; Payment Bond; Performance Bond; Notice of Award; Notice to Proceed; Change Orders; Supplemental Drawings Issued; Drawings; Specifications and Contract Documents; All addenda or bulletins issued during the time of bidding or forming a part of the documents loaned to the bidder for preparation of the bid; The complete plans and provisions, regulations, ordinances, codes, and laws incorporated therein or herein by reference or otherwise applicable to the Project.

All of the above documents are intended to cooperate so that any work called for in one and not mentioned in the other, or vice versa, is to be executed the same as if mentioned in all said documents. The documents comprising the complete contract are hereinafter referred to collectively as the Contract Documents.

2. THE WORK.

Contractor agrees to furnish all tools, apparatus, facilities, equipment, labor and materials (except that specifically mentioned as being furnished by others) necessary to perform and complete the work in a "good and workmanlike manner" as called for, and in the manner designated in, and in strict conformity with the Plans, Detail Specifications, and other Contract Documents which are identified by the signatures of the parties to this Contract and are, collectively, entitled:

OROVILLE SEWER PROJECTS - 1F

3. CONTRACT PRICE.

The City agrees to pay and the Contractor agrees to accept, in full payment for the work above agreed to be done, the following compensation: \$_____. In no event shall Contractor's compensation exceed the amount of \$_____ without additional written authorization from the City. Payment by City under this Agreement shall not be deemed a waiver of defects in Consultant's services, even if such defects were known to the City at the time of payment

For the purpose of fixing the amount of bonds referred to in the Instructions to Bidders, it is estimated by both Parties that the total contract price shall be based on the Contractor's Base Bid amount.

4. DISPUTES PERTAINING TO PAYMENT FOR WORK.

Should any dispute arise respecting the true value of any work done or any work omitted, or of any extra work which the Contractor may be required to do, or respecting the size of any payment to the Contractor during the performance of this Contract, the dispute shall be informally mediated between the parties. Following such mediation, either party may file an action exclusively in the Butte County Superior Court or in the United States District Court, Eastern District of California. Under no condition shall there be a cessation of work by the Contractor during any such dispute. This article does not exclude recovery of damages by either party for delays.

5. PAYMENT.

Not later than the 20th day of each calendar month, the Contractor shall make a partial payment request to the City on the basis of an estimate approved by the Engineer of the work performed since the last partial payment request during the preceding month by the Contractor with five percent (5%) of the amount of each such estimate retained by the City, until completion of the Project and the recordation of a Notice of Completion of all work covered by this Contract. The City shall make any partial payments provided for in this contract to the Contractor within 30 days of the City's receipt of an undisputed and properly executed partial payment request from the Contractor. The City shall pay the Contractor interest on the amount of any portion of a partial payment, excluding retention amounts, not made to the Contractor within 30 days of the City's receipt of an undisputed and properly executed partial payment request from the Contractor at the legal rate set forth in California Code of Civil Procedure Section 685.010. Upon receipt of a partial payment request from the Contractor, the City shall review the partial payment request for the purpose of determining whether or not the partial payment request is a proper partial payment request. Any partial payment request determined by the City not to be a proper partial payment request suitable for payment shall be returned to the Contractor by the City within 14 days of the City's receipt of such partial payment request. A partial payment request returned to the Contractor by the City under the provisions of this section shall be accompanied by a written document setting forth the reason(s) why the partial payment request is not proper. The number of days for the City to make a certain partial payment provided for in this Contract, without incurring interest pursuant to this section, shall be reduced by the number of days by which the City exceeds the 14 day return period for such partial payment request, if determined to be improper, as set forth in this section. For the purposes of this section, a "partial payment" means all payments due to the Contractor under this contract, exclusive of that portion of the final payment designated as retention earnings. Also, for the purposes of this section, a partial payment request shall be considered properly executed by the City if funds are available to pay the partial payment request and payment is not delayed due to an audit inquiry by the City's financial officer. The City will release Contractor's retention earnings within 45 days after recordation of Notice of Completion, as defined in California Civil Code Section 3093. Recordation of a Notice of Completion for the Project by the City shall constitute the City's acceptance of the Project work.

6. TIME FOR COMPLETION.

All work under this contract shall be completed within a period of 120 working days from the date of the Contractor's receipt of a Notice to Proceed from the City.

7. EXTENSION OF TIME.

If the Contractor is delayed by acts of negligence of the City, or its employees or those under it by contract or otherwise, or by changes ordered in the work, or by strikes, lockouts, fire, unavoidable casualties, or any causes beyond the Contractor's control, or by delay authorized by the City, or by any justifiable cause which the Engineer shall authorize, then the Contractor shall make out a written claim addressed to the City setting forth the reason for the delay and the extension of the time requested and forward a copy of the claim to the Engineer for approval. The Engineer will evaluate the claim and if the claim is justifiable, will request the City's approval. No such extension will be allowed unless written claim therefore has been made within 3 days after the delay became apparent.

If the Contractor fails or refuses to complete the work within the time specified, including authorized extensions, there shall be deducted from monies due the Contractor, not as a penalty, but as liquidated damages the sum of Two Thousand Seven Hundred Dollars (\$2,700.00) for each calendar day subsequent to the time specified for each project and the time the work is actually completed and accepted. Delays caused by adverse weather conditions or conditions for which the Owner is clearly responsible will be added to the contract time.

8. LABOR PROVISIONS.

The project is subject to both federal and state prevailing wages. The Contractor shall pay laborers the higher of either the federal or state prevailing wage rate determination for the trades to be utilized. The contractor and all subcontractors on the project shall complete electronic reporting of prevailing wage rate reports through the Department of Industrial Relations, with copies of such reports to be provided to the City.

9. CONTRACT WORK HOURS AND SAFETY STANDARDS REQUIREMENTS.

As used in the following provision, the term “laborers” and “mechanics” include watchmen and guards.

a. Overtime Requirements. Neither the Contractor nor any subcontractor contracting for any part of the Project which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek, whichever is greater.

b. Violation; Liability for Unpaid Wages; Liquidated Damages. In the event of any violation of the clause set forth in paragraph a. above, the Contractor and any subcontractor responsible therefore shall be liable for the unpaid wages. In addition, the Contractor and subcontractor shall be liable to the City for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph a. above, in the sum of \$2,700 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph a. above.

c. Withholding for Unpaid Wages and Liquidated Damages. The City shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any monies payable on account of work performed by the Contractor or subcontractor under any such contract or any other Federal contract with the same Contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same Contractor, such sums as may be determined to be necessary to satisfy any liabilities of such Contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph b. above.

d. Working conditions. Neither the Contractor nor any subcontractor may require any laborer or mechanic employed in the performance of any contract to work in surroundings or under working conditions that are unsanitary, hazardous or dangerous to his health or safety as determined under construction safety and health standards (29 CFR Part 1926) issued by the Department of Labor.

e. Subcontracts. The Contractor and any subcontractor shall insert in any subcontracts the clauses set forth in paragraphs a. through d. and also a clause requiring the subcontractor to include these clauses in any lower tier subcontracts. The Contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs a. through d.

10. NONDISCRIMINATION.

The Contractor, with regard to the work performed by it during the contract, shall not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The Contractor shall not participate either directly or indirectly in the discrimination prohibited by Section 21.5 of the Regulations, including employment practices when the contract covers a program set forth in Appendix B of the Regulations.

11. DISADVANTAGED BUSINESS ENTERPRISE PROGRAM PROVISIONS.

The Contractor, sub recipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The Contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the Contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as recipient deems appropriate.

The Contractor agrees to pay each subcontractor under this contract for satisfactory performance of its contract no later than 10 days from the receipt of each payment the Contractor receives from City. The Contractor agrees further to return retainage payments to each subcontractor within 30 days after the subcontractor's work is satisfactorily completed. Any delay or postponement of payment from the above referenced time frame may occur only for good cause following written approval of the City. This clause applies to both DBE and non-DBE subcontractors.

12. CIVIL RIGHTS.

The Contractor assures that it will comply with pertinent statutes, Executive Orders and such rules as are promulgated to assure that no person shall, on the grounds of race, creed, color, national origin, sex, age or handicap be excluded from participating in any activity conducted with or benefiting from Federal assistance. This Provision binds the Contractor from the bid solicitation period through the completion of the contract. This provision shall be inserted in all subcontracts, subleases and other agreements at all tiers.

13. SOLICITATIONS FOR SUBCONTRACTS, INCLUDING PROCUREMENTS OF MATERIALS AND EQUIPMENT.

In all solicitations either by competitive bidding or negotiation made by the Contractor for work to be performed under a subcontract, including procurements of materials or leases of equipment, each potential subcontractor or supplier shall be notified by the Contractor of the Contractor's obligations under this contract and the Regulations relative to nondiscrimination on the grounds of race, color or national origin.

14. INFORMATION AND REPORTS.

The Contractor shall provide all information and reports required by the Regulations or directives issued pursuant thereto and shall permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the City to be pertinent to ascertain compliance with such Regulations, orders, and instructions. Where any information required of a Contractor is in the exclusive possession of another who fails or refuses to furnish this information, the Contractor shall so certify to the City and shall set forth what efforts it has made to obtain the information.

15. SANCTIONS FOR NONCOMPLIANCE.

In the event of the Contractor's noncompliance with the nondiscrimination provisions of this contract, the City shall impose such contract sanctions as it may determine to be appropriate, including but not limited to:

- a. Withholding of payments to the Contractor under the contract until the Contractor complies, and/or
- b. Cancellation, termination or suspension of the contract, in whole or in part.

16. INSPECTION OF RECORDS.

The Contractor shall maintain an acceptable cost accounting system. The City, the Federal Aviation Administration, the Comptroller General of the United States or any of their duly authorized representatives shall have access to any books, documents, paper, and records of the Contractor which are directly pertinent to this Contract or the Project for the purposes of making an audit, examination, excerpts, and transcriptions. The Contractor shall maintain all required records for 3 years after the City makes final payment and all other pending matters are closed.

17. RIGHTS IN INVENTIONS.

All rights to inventions and materials, if any, generated under this contract are subject to regulations issued by the City. Information regarding these rights is available from the City.

18. BREACH OF CONTRACT TERMS.

Any violation or breach of terms of this Contract on the part of the Contractor or its subcontractors may result in the suspension or termination of this Contract or such other action that may be necessary to enforce the rights of the City under this Contract. The duties and obligations imposed by the Contract Documents and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by law.

19. TERMINATION OF CONTRACT BY CITY

a. The City may, by written notice, terminate this Contract in whole or in part at any time, either for the City's convenience or because of the Contractor's failure to fulfill its contract obligations. Upon receipt of such notice, services shall be immediately discontinued (unless the notice directs otherwise) and all materials as may have been accumulated in performing this Contract, whether completed or in process, delivered to the City.

b. If the termination is for the convenience of the City, an equitable adjustment in the contract price shall be made, but no amount shall be allowed for anticipated profit on unperformed services.

c. If the termination is due to failure to fulfill the Contractor's obligations, the City may take over the work and prosecute the same to completion by contract or otherwise. In such case, the Contractor shall be liable to the City for any additional cost occasioned to the City thereby.

d. If, after notice of termination for failure to fulfill contract obligations, it is determined that the Contractor had not so failed, the termination shall be deemed to have been affected for the convenience of the City. In such event, adjustment in the contract price shall be made as provided in the second paragraph of this clause.

e. The rights and remedies of the City provided in this clause are in addition to any other rights and remedies provided by law or under this contract.

20. INCORPORATION OF PROVISIONS.

The Contractor shall include the provisions of this contract in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Regulations of directives issued pursuant thereto. The Contractor shall take such action with respect to any subcontract or procurement as the City may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, however, that in the event the Contractor becomes involved in, or is threatened with, litigation with a subcontractor or supplier as a result of such direction, the Contractor may request the City to enter into such litigation to protect the interests of the City and, in addition, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

21. CONTRACTOR CLAIMS OF \$375,000 OR LESS.

Claims by the Contractor relating to the Project for (a) a time extension, (b) money or damages arising from work done by, or on behalf of, the Contractor on the Project for which payment is not expressly provided for or to which the Contractor is not otherwise entitled, or (c) an amount that is disputed by the City, with a value of \$375,000 or less, are subject to the claims procedures set forth in California Public Contract Code Sections 20104, et seq., except as otherwise provided in this Contract and the incorporated documents, conditions and specifications.

22. LOBBYING AND INFLUENCING FEDERAL EMPLOYEES.

a. No Federal appropriated funds shall be paid, by or on behalf of the Contractor or its subcontractors, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the making of any Federal grant or the amendment or modification of any Federal grant.

a. If any funds other than Federal appropriated funds have been paid or will be paid by the Contractor or its subcontractors to any person for influencing or attempting to influence an officer or employee of the City, any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with any Federal grant, the contractor shall complete and submit Standard Form-LLL, "Disclosure of Lobby Activities," in accordance with its instructions.

23. ASSIGNMENT OF CERTAIN RIGHTS TO THE CITY.

In entering into this Contract or a subcontract to supply goods, services, or materials pursuant to this Contract, the Contractor and/or subcontractor offers and agrees to assign to the City all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Sec. 15) or under the Cartwright Act (Chapter 2 (commencing with Section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services, or materials pursuant to this Contract or the subcontract. This assignment shall be made and become effective at the time the City tenders final payment to the Contractor, without further acknowledgement by the parties.

24. ENERGY CONSERVATION REQUIREMENTS

The contractor agrees to comply with mandatory standards and policies relating to energy efficiency that are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (Public Law 94-163)

IN WITNESS WHEREOF, two identical counterparts of this Contract, each of which shall for all purposes be deemed an original thereof, have been duly executed by the parties hereinabove named, on the day and year first herein written.

AGENCY: City of Oroville (First Party)

By: _____
(Chuck Reynolds)

Mayor
(Official Title)

CONTRACTOR: _____(Second Party)

By: _____
(Authorized Representative)

(Official Title)

FORM OF PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS: That WHEREAS, the City of Oroville, California hereinafter called City, on _____, 20_____, awarded

Name and Address of Contractor

hereinafter designated as the "Principal", the contract for:

OROVILLE SEWER PROJECTS - 1F

NOW THEREFORE, we the Principal, and _____
_____ as Surety, are held and firmly
bound unto _____,
_____ hereinafter called the
_____, in the penal sum of _____
_____ Dollars (\$ _____)

lawful money of the United States, for the payment of which sum we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally firmly by these presents.

THE CONDITIONS OF THIS OBLIGATION ARE SUCH that, if the above bounden Principal, his/her or its heirs, executors, administrators, successors or assign, shall in all things stand to and abide by and keep and perform the covenants, conditions and agreements in the said contract and any alteration thereof made as therein provided, on his/her or their part, to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall indemnify and save harmless the City, its officers and agents, as therein stipulated, then this obligation shall become null and void: otherwise, it shall be and remain in full force and virtue, and also in case suit is brought upon such bond, the above bounden principal and the said surety will pay a reasonable attorney's fee which shall be awarded by the court to the prevailing party in said suit, said attorney's fee to be taxed as costs in said suit and to be included in the judgment therein rendered.

And the surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the work to be performed or materials and/or equipment to be furnished thereunder or the Specifications accompanying the same, shall in anywise affect its obligations on this bond; and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the work or to the Specifications.

IN WITNESS WHEREOF three identical counterparts of this instrument, each of which shall for all purposes be deemed an original thereof, have been duly executed by the Principal and Surety above named, on the day of _____, 20 .

By _____

By _____

Surety

Contractor

FORM OF LABOR AND MATERIAL BOND

KNOW ALL PERSONS BY THESE PRESENTS: That we _____ as Surety, and _____, as Principal, are held and firmly bound unto City of Oroville, in the sum of _____ Dollars (\$ _____), said sum being (100% of the estimated amount of the foregoing and annexed contract,

OROVILLE SEWER PROJECTS - 1F

to be paid to said _____, for which payment, well and truly to be made, we bind ourselves, our heirs, executors and administrators, successors or assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH: That if the above bounden principal, as Contractor in the annexed contract or his/her subcontractors, shall fail to pay for any materials, provisions, provender, or other supplies or teams used in, upon, for or about the performance of the work contracted to be done, or shall fail to pay any person, company or corporation renting or hiring teams or implements or machinery for or contributing to said work to be done, or any person who supplies both work and materials therefore, or the amount due under the Employment Insurance Act with respect to such work or labor, the surety will pay for the same, in an amount not exceeding the above obligation, and also, in case suit is brought upon such bond, the above bounden principal and the said surety will pay a reasonable attorney's fee which shall be awarded by the court to the prevailing party in said suit, said attorney's fee to be taxed as costs in said suit and to be included in the judgment therein rendered. This obligation and bond shall insure to the benefit of any and all persons entitled to file claims under Section 1184C of the Code of Civil Procedure and said persons or any of them or their assigns shall have a right to action thereunder.

IN WITNESS WHEREOF, we have hereunto set our hands and seals on this _____ day of _____, A.D., 20 .

Principal _____

Surety _____

(Seal)

By _____

(Attorney in Fact)

STATE OF CALIFORNIA)
) ss.
COUNTY OF BUTTE)

On this _____ day of _____, 20 , before me _____ a Notary Public in and for the County of _____, _____ known

to me to be the person whose name is subscribed to the within instrument as the Attorney in Fact of _____ and acknowledged to me that he has subscribed the name of _____ thereto as surety, and **his/her** own name as Attorney in Fact.

In witness whereof I have hereunto set my hand and affixed my official seal the day and year in this certificate first above written.

Notary Public in and for said County and State

SECTION - GC

GENERAL CONDITIONS

GENERAL CONDITIONS

SECTION - GC	PAGE
1. Definitions and Terms	GC-1
2. Examination of Contract Documents, Bid Items and Bid Submittal	GC-3
3. Interpretation of Plans and Project Specifications	GC-4
4. Field Instructions and Other Written Directives	GC-4
5. Schedules, Reports and Records	GC-4
6. Drawings and Specifications	GC-4
7. Shop Drawings	GC-5
8. Materials, Services and Facilities.....	GC-5
9. Inspection and Testing	GC-5
10. Substitutions	GC-6
11. Patents	GC-7
12. Permits and Regulations.....	GC-7
13. Protection of Work, Property and Persons	GC-7
14. Supervision by Contractor	GC-8
15. Changes in the Work	GC-8
16. Changes in Contract Price	GC-8
17. Time for Completion and Liquidated Damages	GC-9
18. Correction of Work	GC-9
19. Unusual Conditions	GC-9
20. Suspension of Work, Termination and Delay	GC-10
21. Payments to Contractor	GC-11
22. Acceptance of Final Payment as Release	GC-13
23. Insurance Requirements for Contractors	GC-15
24. Contract Security.....	GC-18
25. Assignments	GC-18
26. Indemnification	GC-18
27. Separate Contracts.....	GC-18
28. Subcontracting.....	GC-19
29. Engineer's Authority.....	GC-19
30. Land and Right-of-Way	GC-19
31. Guarantee	GC-20
32. Contract Disputes and Potential Notice of Claim	GC-20
33. Dispute Resolution	GC-22
34. Taxes	GC-22
35. Applicable Wage Rates	GC-23

1. DEFINITIONS AND TERMS

Wherever used in the Contract Documents, the following terms shall have the meanings indicated which shall be applicable to both the singular and plural thereof:

ADDENDA - Written or graphic instruments issued prior to the execution of the Agreement, which modify or interpret the Contract Documents, drawings and specifications by additions, deletions, clarifications or corrections.

BID - The offer or proposal of the bidder submitted on the prescribed form setting forth the prices for the work to be performed.

BIDDER - Any person, firm or corporation submitting a bid for the work.

BONDS - Bid, performance and payment bonds and other instruments of security, furnished by the Contractor and his/her surety in accordance with the Contract Documents.

CALENDAR DAY - Each and every day, including Saturdays, Sundays and legal holidays.

CHANGE ORDER - A written order to the Contractor authorizing an addition, deletion or revision in the work within the general scope of the Contract Documents, or authorizing an adjustment in the contract price or the contract time.

CITY - City of Oroville, 1735 Montgomery Street, Oroville, California.

CONTRACTOR - The person or persons, firm, partnership, corporation or combination thereof, licensed to perform the type of work involved, who has entered into a contract with the City of Oroville for the construction of the improvements within the City of Oroville described herein.

DEPARTMENT OF PUBLIC WORKS - The Department of Public Works of the City of Oroville.

ENGINEER - The Contract City Engineer of the City of Oroville acting either directly or through properly authorized agents, such agents acting within the scope of the particular duties entrusted to them.

PROJECT - The undertaking to be performed as provided in the contract documents.

RESIDENT PROJECT REPRESENTATIVE - The authorized representative of the City who is assigned to the project site or any part thereof.

SHOP DRAWINGS - All drawing, diagrams, illustration, brochures, schedules and other data which are prepared by the Contractor, a subcontractor, manufacturer, supplier or distributor, which illustrate how specific portions of the work shall be fabricated or installed.

SPECIFICATIONS - The directions, provisions and requirements contained herein.

STANDARD PLANS AND SPECIFICATIONS - Whenever reference is made to the "Standard Plans and Specifications" such reference shall be made to the most current of those

certain plans and specifications entitled “State of California, Department of Transportation, Standard Plans and Standard Specifications”.

As used in the Standard Specifications, unless the content otherwise requires, the following terms have the following meanings:

Department of Transportation: The City of Oroville.

Director of Transportation: The Public Works Director of the City of Oroville.

Division of Highways: Department of Public Works of the City of Oroville.

Engineer: The Contract City Engineer of the City of Oroville, acting either directly or through properly authorized agents, such agents acting within the scope of the particular duties entrusted to them.

Laboratory: The designated laboratory authorized by the City of Oroville to test materials and work involved in the contract.

Office of Administrative Hearings: The City Council of the City of Oroville.

Standard Specifications: The most current or 2018 Edition of those certain specifications entitled "State of California, Department of Transportation, Standard Specifications 2018"

Standard Plans: The most current or 2018 Edition of those certain standard plans entitled "State of California, Department of Transportation, Standard Plans 2018"

State: The City of Oroville.

Reference is made to Section 1 of the Standard Specifications for other pertinent definitions.

SUBCONTRACTOR - An individual, firm or corporation having a direct contract with the Contractor or with any other subcontractor for the performance of a part of the work at the site.

SUBSTANTIAL COMPLETION - That date as certified by the Engineer when the construction of the project or a specified part thereof is sufficiently completed, in accordance with the contract documents, so that the project or specified part can be utilized for the purpose for which it is intended.

SUPPLEMENTAL GENERAL CONDITIONS - Modifications to general conditions required by a federal agency for participation in the project or such requirements that may be imposed by applicable State laws.

SUPPLIER - A person or organization who supplies material or equipment for the work, including that fabricated to a special design, but who does not perform labor on the site.

WORK - All labor necessary to produce the construction required by the contract documents and all materials and equipment incorporated or to be incorporated in the project.

WORKING DAY - Each and every day, except Saturdays, Sundays, legal holidays, days on which the Contractor is specifically required by the special provisions to suspend construction operation and days on which the Contractor is prevented by inclement weather or conditions resulting immediately therefrom adverse to the current controlling operation or operations, as determined by the Engineer, from proceeding with at least 75 percent of the normal labor and equipment force engaged on such operation or operations for at least 60 percent of the total daily time being currently spent on the controlling operation or operations.

WRITTEN NOTICE - Any notice to any party of the Agreement relative to any part of this Agreement in writing and considered delivered and the service thereof completed, when posted by certified or registered mail to the said party at his/her last given address, or delivered in person to said party or his/her authorized representative on the work.

2. EXAMINATION OF CONTRACT DOCUMENTS, BID ITEMS AND BID SUBMITTAL

The Contractor shall do all of the work and furnish all labor, materials, tools, equipment, and appliances, except as otherwise herein expressly stipulated, necessary or proper for performing and completing the work herein required, including any Change Order work or disputed work directed by the Engineer in conformity with the true meaning and intent of the Plans and Specifications for the project. The Engineer attempts to express all or most elements of the work with bid items that allow both the Engineer and the Contractor to view, evaluate and understand the cost of the project. At the Engineer's discretion, certain improvements within the project boundaries may not be specifically identified as a line item in the project bid schedule. At times, the project plans may show required construction elements of the project for which there is no discrete bid item. It is the responsibility of the Contractor to account for construction elements for which there may be no discrete bid item. The Contractor shall be responsible for the construction of any and all improvements or construction elements shown on the Project Plans whether there is a bid item or not in the project bid schedule.

By submission of a Bid, the Bidder acknowledges acceptance of the nature and location of the Work, the general and local conditions, conditions of the site, the character, quality and scope of work to be performed, the availability of labor, electric power, water, the kind of surface and subsurface materials on the site, the materials and equipment to be furnished, and all requirements of the Contract or other matters which may affect the Work or the cost. Any failure of a Bidder to become acquainted with all of the available information concerning conditions will not relieve the Bidder from the responsibility for estimating properly the difficulties or cost of the Work. Bidder agrees to inform the Engineer of any errors or oversight by Engineer it perceives in the Bid documents prior to submission of its bid.

Bid prices shall include everything necessary for the completion of the Work and fulfillment of the Contract, including but not limited to furnishing all materials, equipment, tools, excavation sheeting, bracing and supports, plant, labor and services, except as may be provided otherwise in the Contract. Bid prices shall also include labor and material escalation and all Federal, State, and local taxes.

3. INTERPRETATION OF PLANS AND PROJECT SPECIFICATIONS

The component Contract documents (Project Plans, Project-specific Specifications, City Standard Drawings, etc.) are essential parts of the Contract, and intended to provide explanation

for each other. Any work and/or improvements shown on the Plans and not in the Specifications, or vice versa, are to be executed as if indicated both on the Plans and in the Specifications. In case of conflict in the Contract, the Project plans shall govern over project-specific specifications (materials specifications excluded). Any physical construction-related work necessary to complete the improvements shown on the Project Plans for which there are no provisions in the project specifications or elsewhere in the Contract documents shall be performed and completed in accordance with either State Standards and/or Specifications where such specifications exist, City Engineer Standards where such standards exist, or in conformance with generally accepted practices for public works construction.

4. FIELD INSTRUCTIONS OR OTHER WRITTEN DIRECTIVES

The Engineer may issue Field Instructions or other written directives during the course of the Work, and the Contractor shall comply with the Field Instruction or other written directive. A Field Instruction or other written directive may be used to add, delete, modify, or reject work, to note deficiencies in work, to clarify the Contract or to order work to be performed. Work required by a Field Instruction or other written directive shall be in accordance with the Contract and any previously executed Contract Change Orders, except as delineated otherwise in the Field Instruction or other written directive. Drawings included with Field Instructions or other written directives are part of the Contract and shall be incorporated into the Record Drawings. If the Contractor neglects to comply with or make progress in the execution of any Field Instruction or other written directive, the Engineer may employ any person or persons to perform such work and the Contractor shall not interfere with the person or persons so employed. Field Instructions and other written directives issued by the City that serve to alter (either add to or deduct from) the Contract scope and price will be grouped to form a Contract Change Order.

5. SCHEDULES, REPORTS, AND RECORDS

The Contractor shall submit to the City such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, records and other data where applicable as are required by the contract documents for the work to be performed.

Prior to the first partial payment estimate, the Contractor shall submit construction progress schedules showing the order in which he/she proposes to carry out the work, including dates at which he/she will start the various parts of the work, estimated date of completion of each part and as applicable.

6. DRAWINGS AND SPECIFICATIONS

The intent of the drawings and specifications is that the Contractor shall furnish all labor, materials, tools, equipment and transportation necessary for the proper execution of the work in accordance with the contract documents and all incidental work necessary to complete the project in an acceptable manner; ready for use or operation by the City.

In case of conflict between the drawing and specifications, the specifications shall govern. Figure dimensions on drawings shall govern over scale dimensions and detailed drawings shall govern over general drawings.

Any discrepancies found between the drawings and specifications and site conditions or any inconsistencies or ambiguities in the drawings or specifications shall be immediately reported to

the Engineer, in writing, who shall promptly correct such inconsistencies or ambiguities, in writing. Work done by the Contractor after his/her discovery of such discrepancies, inconsistencies or ambiguities shall be done at the Contractor's risk.

7. SHOP DRAWINGS

The Contractor shall provide shop drawings as may be necessary for the construction of the work required by the contract documents. The Engineer shall promptly review all shop drawings. The Engineer's approval of any shop drawings shall not release the Contractor from responsibility for deviations from the requirements of the contract documents. The approval of any shop drawing, which substantially deviates from the requirements of the contract documents, shall be evidenced by a change order.

When submitted for the Engineer's review, shop drawings shall bear the Contractor's certification that he/she has reviewed, checked and approved the shop drawings and that they are in conformance with the requirement of the contract documents.

Portions of the work requiring a shop drawing or sample submission shall not begin until the shop drawing or submission has been approved by the Engineer. A copy of each approved shop drawing and each approved sample shall be kept in good order by the Contractor at the site and shall be available to the Engineer.

8. MATERIALS, SERVICES AND FACILITIES

It is understood that, except as otherwise specifically stated in the contract documents, the Contractor shall provide and pay for all materials, labor, tools, equipment, water, lights, power, transportation, supervision, temporary construction of any nature, and all other services and facilities of any nature whatsoever necessary to execute, complete and deliver the work within the specified time. Material and equipment shall be so stored as to ensure the preservation of their quality and fitness for the work. Stored materials and equipment to be incorporated in the work shall be located so as to facilitate prompt inspection. Manufactured articles, materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned as directed by the manufacturer.

Materials, supplies and equipment shall be in accordance with samples submitted by the Contractor and approved by the Engineer. Materials, supplies or equipment to be incorporated into the work shall not be purchased by the Contractor or the subcontractor subject to a chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller.

9. INSPECTION AND TESTING

All materials and equipment used in the construction of the project shall be subject to adequate inspection and testing in accordance with general accepted standards, as required and defined in the contract documents. The City will provide the inspection and testing services to be employed pursuant to the City Quality Assurance Plan (QAP) for Federally Funded Highway Projects dated January 2015. The City will provide the Contractor a written QAP schedule that will list the types of materials to be tested, test methods and sample and test quantities. The Contractor shall be responsible for coordinating and scheduling the QAP schedule with the City's material testing consultant.

If the contract documents, laws, ordinances, rules, regulations or order of any public authority having jurisdiction require any work to specifically be inspected, tested or approved by someone other than the Contractor, the Contractor will give the Engineer timely notice of readiness. The Contractor will then furnish the Engineer the required certificates of inspection, testing or approval. Inspections, test or approvals by the Engineer or others shall not relieve the Contractor from his/her obligations to perform the work in accordance with the requirements of the contract documents. The Engineer and his/her representative will at all times have access to the work. In addition, authorized representatives and agents of any participating Federal or State agency shall be permitted to inspect all work, materials, payrolls, records of personnel, invoices of materials and other relevant data and records. The Contractor will provide proper facilities for such access and observation of the work and also for any inspection or testing thereof.

If any work is covered contrary to the written instructions of the Engineer, it must, if requested by the Engineer, be uncovered for his/her observation and replaced at the Contractor's expense. If the Engineer considers it necessary or advisable that covered work be inspected and tested by others, the Contractor, at the Engineer's request, will uncover, expose or otherwise make available for observation, inspection or testing as the Engineer may require of that portion of the work in question, furnishing all necessary labor, materials, tools and equipment. If it is found that such work is defective, the Contractor will bear all the expenses of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction. If, however, such work is not found to be defective, the Contractor will be allowed an increase in the contract price or an extension of the contract time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing reconstruction and an appropriate change order shall be issued.

All required QAP testing of construction materials, including aggregate base compaction testing, will be provided by the City at no cost to the Contractor. Should tests show materials or methods to be unacceptable, however, and retesting of the same material is required, the City's cost of such retesting will be deducted from payment due the Contractor. The Contractor is encouraged (not required) to perform roadway aggregate base compaction testing independently of the City's QAP. All required performance testing shall be done by the Contractor in the presence of the Engineer.

The specific tests to be performed for this particular job, and the party, Contractor or City, responsible for providing equipment and technical personnel shall be enumerated in the section entitled "REQUIRED TESTING" in the Special Provisions. During each field test, an authorized representative of the Contractor and of the City shall be present. The City inspector will maintain the TEST RECORD for the entire job which lists details of each test performed. The inspector will provide a copy of the TEST RECORD to the Contractor upon request.

10. SUBSTITUTIONS

Whenever a material, article or piece of equipment is identified on the drawings or specifications by reference to a brand name or catalog number, it shall be understood that this is referenced for the purpose of defining the performance or other salient requirements and that other products of equal capacities, quality and function shall be considered.

The Contractor may recommend the substitution of a material, article or piece of equipment of equal substance and function for those referred to in the contract documents by reference to brand name or catalog number, and if, in the opinion of the Engineer, such material, article or

piece of equipment is of equal substance and function to that specified, the Engineer may approve its substitution and use by the Contractor.

Any cost differential shall be deductible from the contract price and the contract documents shall be appropriately modified by change order. The Contractor warrants that if substitutes are approved, no major changes in the function or general design of the project will result. Incidental changes or extra work component parts required to accommodate the substitute will be made by the Contractor without a change in the contract price or contract time.

11. PATENTS

The Contractor shall pay all applicable royalties and license fees. He/she shall defend all suits or claims for infringement of any patent rights and save the City harmless from loss on account thereof, except that the City shall be responsible for any such loss when a particular process, design, or the product of a particular manufacturer or manufacturers is specified. However, if the Contractor has reason to believe that the design, process or product specified is an infringement of a patent, he/she shall be responsible for such loss unless he/she promptly gives such information to the Engineer.

12. PERMITS - REGULATIONS

Permits and licenses of a temporary nature necessary for the prosecution of the work shall be secured and paid for by the Contractor unless otherwise stated in the Supplemental General Conditions. Permits, licenses and easements for permanent structures or permanent changes in existing facilities shall be secured and paid for by the City, unless otherwise specified. If the Contractor observes that the contract documents are at variance therewith, he/she shall promptly notify the Engineer, in writing and any necessary changes shall be adjusted as provided in Section 13, Changes in the Work.

13. PROTECTION OF WORK, PROPERTY AND PERSON

The Contractor will be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the work. He/she will take all necessary precautions for the safety of, and will provide the necessary protection to prevent damage, injury or loss to, all employees on the work and other persons who may be affected thereby, and all the work and all materials or equipment to be incorporated therein, whether in storage on or off the site, and shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocations or replacement in the course of construction.

The Contractor will comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction. He/she will erect and maintain, as required by the conditions and progress of the work, all necessary safeguards for safety and protection. He/she will notify owners or adjacent utilities when prosecution of the work may affect them.

The Contractor will remedy all damage, injury or loss to any property caused, directly or indirectly, in whole or in part, by the Contractor, any subcontractor, or anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, except damage or loss attributable to the fault of the contract documents, or to the acts or omission of the City or the Engineer, or anyone employed by either of them, or anyone for whose acts either

of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of the Contractor.

In emergencies affecting the safety of persons or the work or the property at the site or adjacent thereto; the Contractor, without special instruction or authorization from the Engineer or the City, shall act to prevent threatened damage, injury or loss. He/she will give the Engineer prompt written notice of any significant changes in the work or deviations from the contract documents caused thereby and a change order shall thereupon be issued covering the changes and deviations involved.

14. SUPERVISION BY CONTRACTOR

The Contractor will supervise and direct the work. He/she will be solely responsible for the means, methods, techniques, sequences and procedures of construction. The Contractor will employ and maintain on the work site, a qualified supervisor or superintendent who shall have been designated, in writing, by the Contractor as the Contractor's representative at the site. The supervisor shall have full authority to act on behalf of the Contractor and all communications given to the supervisor shall be as binding as if given to the Contractor. The supervisor shall be present on the site at all times as required to perform adequate supervision and coordination of the work.

15. CHANGES IN THE WORK

The City may, at any time as the need arises, order changes within the scope of the work without invalidating the Agreement. If such changes increase or decrease the amount due under the contract documents, or in the time required for performance of the work, an equitable adjustment shall be authorized by change order.

The Engineer also may, at any time by issuing a field order, make changes in the details of the work. The Contractor shall proceed with the performance of any changes in the work so ordered by the Engineer unless the Contractor believes that such field order entitles him/her to a change in contract price or time, or both, in which event he/she shall give the Engineer written notice thereof within seven (7) days after the receipt of the ordered change.

Thereafter, the Contractor shall document the basis for a change in contract price or time within thirty (30) days. The Contractor shall not execute such changes pending the receipt of an executed change order or further instruction from the City.

16. CHANGES IN CONTRACT PRICE

The contract price may be changed only by a change order. The value of any work covered by a change order, or of any claim for increase or decrease in the contract price, shall be determined by one or more of the following methods in order of precedence listed below:

- a. Unit prices previously approved
- b. An agreed upon lump sum
- c. The actual cost for labor, direct overhead, materials, supplies, equipment and other services necessary to complete the work. Said costs shall be computed and documented in accordance with Section 9-1.04, "Force Account", of the Standard Specifications.

17. TIME FOR COMPLETION AND LIQUIDATED DAMAGES

The date of beginning and the time for completion of the work are essential conditions of the contract documents and the work embraced shall be commenced on a date specified in the Notice to Proceed.

The Contractor will proceed with the work at such rate of progress to ensure full completion within the contract time. All contract work shall be completed within 45 working days after issuance of the Notice to Proceed. Liquidated damages established for this contract are \$2,700.00 for each day beyond the 120 working day timeframe. It is expressly understood and agreed, by and between the Contractor and the City, that the contract time for the completion of the work described herein is a reasonable time, taking into consideration the average climatic and economic conditions and other factors prevailing in the locality of the work.

If the contractor shall fail to complete the work within the contract time, or extension of time granted by the City, the Contractor will pay to the City the amount of liquidated damages as specified in the bid for each calendar day that the Contractor shall be in default after time stipulated in the contract documents.

The Contractor shall not be charged with liquidated damages or any excess cost when the delay in completion of the work is due to the following, and the contractor has promptly given written notice of such delay to the City or Engineer:

- To any preference, priority, or allocation order duly issued by the City.
- To unforeseeable causes beyond the control and without fault or negligence of the Contractor; including but not restricted to acts of God, or of the public enemy, acts of the City, acts of another Contractor in the performance of a contract with the City, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes and abnormal and unforeseeable weather.
- To any delays of subcontractors occasioned by any of the causes specified above.

18. CORRECTION OF WORK

The Contractor shall promptly remove from the premises all work rejected by the Engineer for failure to comply with the contract documents, whether incorporated in the construction or not, and the Contractor shall promptly replace and re-execute the work in accordance with the contract documents and without expense to the City and shall bear the expense of making good all work of other Contractors destroyed or damage by such removal or replacement.

All removal and replacement work shall be done at the Contractor's expense. If the Contractor does not take action to remove such rejected work within ten (10) days after receipt of written notice, the City may remove such work and store the materials at the expense of the Contractor.

19. UNUSUAL CONDITIONS

The Contractor shall promptly and before such conditions are disturbed, except in the event of an emergency, notify the City by written notice of:

- Subsurface or latent physical conditions at the site differing materially from those indicated in the contract documents; or
- Unknown physical conditions at the site of any unusual nature differing from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the contract documents.

The City shall promptly investigate the conditions, and if it finds that such conditions do so materially differ and cause an increase or decrease in the cost of, or in the time required for, performance of the work, an equitable adjustment shall be made and the contract documents shall be modified by change order. Any claim of the Contractor for adjustment hereunder shall not be allowed unless he/she has given the required written notice; provided that the City may, if it determines the facts so justify, consider and adjust any such claims asserted before the date of final payment.

20. SUSPENSION OF WORK, TERMINATION AND DELAY

The City may suspend the work or any portion thereof for a period of not more than ninety (90) days or such further time as agreed upon by the Contractor, by written notice to the Contractor and the Engineer, which notice shall fix the date on which work shall be resumed. The Contractor will resume that work on the date so fixed. The Contractor will be allowed an increase in the contract price or an extension in the contract time, or both, directly attributable to any suspension.

If the Contractor is adjudged as bankrupt or insolvent, or if he/she makes a general assignment for the benefit of his/her creditors, or if a trustee or receiver is appointed for the Contractor or for any of his/her property, or if he/she files a petition to take advantage of any debtor's act, or to reorganize under the bankruptcy or applicable laws, or if he/she repeatedly fails to supply sufficient skilled workmen or suitable materials or equipment, or if he/she repeatedly fails to make prompt payments to subcontractors or for labor, materials or equipment, or if he/she disregards laws, ordinances, rules, regulations or orders of any public body having jurisdiction over the work, or if he/she otherwise violates any provision of the contract documents; then the City may, without prejudice to any other right or remedy and after giving the Contractor and his/her surety a minimum of ten (10) days from delivery of written notice, terminate the services of the Contractor and take possession of the project and all materials, equipment, tools, construction equipment and machinery thereon owned by the Contractor, and finish the work by whatever method it may deem expedient.

In such case, the Contractor shall not be entitled to receive any further payment until the work is finished. If the unpaid balance of the contract price exceeds the direct and indirect cost of completing the project, including compensation for additional professional services, such excess shall be paid to the Contractor. If such costs exceed such unpaid balance, the Contractor will pay the difference to the City. Such costs incurred by the City will be determined by the Engineer and incorporated into a change order.

When the Contractor's services have been so terminated by the City, said termination shall not affect any right of the City against the Contractor then existing or which may thereafter accrue. Any retention or payment of monies by the City due to the Contractor will not release the Contractor from compliance with the contract documents. After ten (10) days from delivery of a written notice to the Contractor and the Engineer, the City may, without cause and without

prejudice to any other right or remedy, elect to abandon the project and terminate the contract. In such case, the Contractor shall be paid for all work executed and any expense sustained plus a reasonable profit.

If, through no act or fault of the Contractor, the work is suspended for a period of more than ninety (90) days by the City, or under an order of the court, or other public authority, or the Engineer fails to act on any request for payment within thirty (30) days after it is submitted, or the City fails to pay the Contractor substantially the sum approved by the Engineer or awarded by the arbitrators within thirty (30) days of its approval and presentation, the Contractor may, after ten (10) days from delivery of a written notice to the City and the Engineer, terminate the contract and recover from the City payment for all work executed and all expenses sustained. In addition and in lieu of terminating the contract, if the Engineer fails or has failed to act on a request for payment or if the City has failed to make any payment as aforesaid, the Contractor may upon ten (10) days written notice to the City and the Engineer, stop the work until he/she has been paid all amounts then due, in which event and upon resumption of the work, change orders shall be issued for adjusting the contract price or extending the contract time, or both, to compensate for the costs and delays attributable to the stoppage of work.

If the performance of all or any portion of the work is suspended, delayed or interrupted as a result of a failure of the City or Engineer to act within the time specified in the contract documents, or if no time is specified, within a reasonable time, an adjustment in the contract price or an extension of the contract time, or both, shall be made by change order to compensate the Contractor for the costs and delays necessarily caused by the failure of the City or Engineer.

21. PAYMENTS TO CONTRACTOR

Within ten (10) days after receipt of the Notice to Proceed, the Contractor shall submit to the City a proposed Schedule of Values broken down in sufficient detail to evaluate progress at any point in the work. Labor and material costs for each line item shall be shown separately. Cost of contract closeout shall be shown as an individual line item. The schedule of values, when approved by the City, shall be used as a basis for the Contractor's Application and Certification for Payment. Application and Certification for Payment shall utilize American Institute of Architects (AIA) Document G702 (cover sheet) and Document G703 (continuation sheets). The AIA Document G703 sheets will list the Schedule of Values approved by the City and will track any Change Orders that may be issued during the project.

At least ten (10) days before each progress payment falls due, but not more often than once a month, the Contractor will submit to the Engineer a partial payment estimate filled out and signed by the Contractor covering the work performed during the period covered by the partial payment estimate and supported by such data as the Engineer may reasonably require. If payment is requested on the basis of materials and equipment not incorporated in the work but delivered and suitably stored at or near the site, the partial payment estimated shall also be accompanied by such supporting data, satisfactory to the City, that will establish the City's title to the material and equipment and protect its interest therein, including applicable insurance. The Engineer will, within ten (10) days after receipt of each partial payment estimate, either indicate in writing his/her approval of payment and present the partial payment estimate to the City, or return the partial payment estimate to the Contractor indicating in writing his/her reasons for refusing to approve the payment. In the latter case, the Contractor may make the necessary corrections and resubmit the partial payment estimate.

The City will, within ten (10) days of presentation to it of an approved partial payment estimate, pay the Contractor a progress payment on the basis of the approved partial payment estimate. The City shall retain ten (10) percent of the amount of each payment until final completion and acceptance of all work covered by the contract documents. The City at any time, however, after fifty (50) percent of the work has been completed, if it finds that satisfactory progress is being made, may reduce retention to five (5) percent on the current and remaining estimates. When the work is substantially complete, operational or beneficial occupancy, the retained amount may be further reduced below five (5) percent to only that amount necessary to assure completion. Upon completion and acceptance of a part of the work on which the price is stated separately in the contract documents, payment may be made in full, including retention percentages, less authorized deductions. The request for payment may also include an allowance for the cost of such major materials and equipment, which are suitably stored either at or near the site.

Prior to substantial completion, the City, with the approval of the Engineer and the concurrence of the Contractor, may use any completed or substantially completed portion of the work. Such use shall not constitute an acceptance of such portions of the work.

The City shall have the right to enter the premises for the purpose of doing work not covered by the contract documents. This provision shall not be construed as relieving the Contractor of the sole responsibility for the care and protection of the work, or the restoration of any damaged work except such as may be caused by agents or employees of the City.

Upon completion and acceptance of the work, the Engineer shall issue a certificate attached to the final payment request that the work has been accepted by him/her under the conditions of the contract documents. Within fifteen (15) days after the date of acceptance, the City shall cause to be filed in the office of the County Recorder, a Notice of Completion of the work. The entire balance found to be due to the Contractor, including the retained percentages, but except such sums as may be lawfully retained by the City, shall be paid to the Contractor within forty-five (45) days after the date of filing the Notice of Completion.

The Contractor will indemnify and save the City, or the City's agents, harmless from all claims growing out of the lawful demands of subcontractors, laborers, workmen, mechanics, manufacturers, suppliers and furnishers of machinery and parts thereof, equipment, tools, and all supplies incurred in the furtherance of the performance of the work. The Contractor shall, at the City's request, furnish satisfactory evidence that all obligations of the nature designated above have been paid, discharged or waived.

If the Contractor fails to do so, the City may, after having notified the Contractor, either pay unpaid bills or withhold from the Contractor's unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to the Contractor shall be resumed in accordance with the contract documents, but in no event shall the provisions of this sentence be construed to impose any obligations upon the City to either the Contractor, his/her surety or any third party. In paying any unpaid bills of the Contractor, any payment so made by the City shall be considered as a payment made under the contract documents by the City to the Contractor and the City shall not be liable to the Contractor for any such payments made in good faith.

If the City fails to make payment forty-five (45) days after the filing of the Notice of Completion, in addition to other remedies available to the Contractor, there shall be added to

each such payment interest at the maximum legal rate commencing on the first day after said payment is due and continuing until the payment is received by the Contractor.

22. ACCEPTANCE OF FINAL PAYMENT AS RELEASE

The acceptance by the Contractor of final payment shall be, and shall operate as, a Release to the City of all claims of Contractor. The Release shall include all things done or furnished by Contractor in connection with the work and every act and neglect of the City relating to or arising out of the work. If the Contractor intends to exclude any claim or claims from the Release, the Contractor must provide a written list of such claims to City, stating the exact dollar amount, within forty-five (45) days after the date of filing the Notice of Completion. No payment, whether a final payment or not, shall serve to release the Contractor or the Contractor's sureties from any obligations under the Contract Documents, or the Performance Bond or the Payment Bond.

23. INSURANCE REQUIREMENTS FOR CONTRACTORS

At no additional cost to City, Contractor shall procure and maintain for the duration of the contract insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder by the Contractor, his/her agents, representatives, employees or subcontractors.

A. MINIMUM SCOPE OF INSURANCE:

Coverage shall be at least as broad as:

1. Insurance Services Office Commercial General Liability coverage (occurrence form CG 00 01).
2. Insurance Services Office form number CA 00 01 covering Automobile Liability, code 1 (any auto).
3. Workers' Compensation as required by the State of California and Employer's Liability Insurance.

B. MINIMUM LIMITS OF INSURANCE:

Contractor shall maintain limits no less than:

1. General Liability: \$1,000,000 per occurrence for bodily injury, personal injury and property damage. If Commercial General Liability Insurance or other form with a general aggregate limit is used, either the general aggregate limit shall apply separately to this project/location or the general aggregate limit shall be twice the required occurrence limit.
2. Automobile Liability: \$1,000,000 per accident for bodily injury and property damage.
3. Workers' Compensation and Employers' Liability: \$1,000,000 per accident for bodily injury or disease.

C. DEDUCTIBLES AND SELF-INSURED RETENTIONS:

Any deductibles or self-insured retentions shall be declared to and approved by the City. At the option of the City, either: the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the City, its officers, officials, employees and volunteers; or the Contractor shall provide a financial guarantee satisfactory to the City guaranteeing payment of losses and related investigations, claim administration and defense expenses.

D. OTHER INSURANCE PROVISIONS:

The policies are to contain, or be endorsed to contain, the following provisions:

1. General Liability and Automobile Liability Coverages.

- a. The City, its officers, officials, employees and volunteers are to be covered as additional insureds with respect to liability arising out of automobiles owned, leased, hired or borrowed by or on behalf of the Contractor; and with respect to liability arising out of work or operations performed by or on behalf of the Contractor including materials, parts or equipment furnished in connection with such work or operations. General liability coverage can be provided in the form of an endorsement to the Contractor's insurance, or as a separate owner's policy.
- b. For any claims related to this project, the Contractor's insurance coverage shall be primary insurance as respects the City, its officers, officials, employees, and volunteers. Any insurance or self-insurance maintained by the City, its officers, officials, employees, or volunteers shall be excess of the Contractor's insurance and shall not contribute with it.
- c. Each insurance policy required by this clause shall be endorsed to state that coverage shall not be canceled by either party, except after thirty (30) days' prior written notice has been given to the City.
- d. Coverage shall not extend to any indemnity coverage for the active negligence of the additional insured in any case where an agreement to indemnify the additional insured

E. ACCEPTABILITY OF INSURERS:

Insurance is to be placed with insurers with a current A.M. Best's rating of no less than A:VII.

F. VERIFICATION OF COVERAGE:

Contractor shall furnish the City with original certificates and amendatory endorsements effecting coverage required by this clause. The endorsements should be on forms that conform to the requirements. All certificates and endorsements are to be received and approved by the City before work commences. The City reserves the right to require complete, certified copies of all required insurance policies, including endorsements affecting the coverage required by these specifications at any time. Any confidential or proprietary information may be removed.

G. SUBCONTRACTORS:

Contractor shall include all subcontractors as insureds under its policies or shall furnish separate certificates and endorsements for each subcontractor. All coverages for subcontractors shall be subject to all of the requirements stated herein.

24. CONTRACT SECURITY

The Contractor shall, within ten (10) days after the receipt of the Notice of Award, furnish the City with a Performance Bond in the amount of one hundred (100) percent of the contract price, and a Payment Bond in the amount of one hundred (100) percent of the contract price, conditioned upon the performance of the Contractor of all undertakings, covenants, terms, conditions and agreements of the contract documents, and upon prompt payment by the Contractor to all persons supplying labor and materials in the prosecution of the work provided by the contract documents. Such bonds shall be executed by the Contractor and a corporate bonding company approved by the City and licensed to transact business in the State of California. The expense of these bonds shall be borne by the Contractor. If, at any time, a surety on any such bond is declared bankrupt or loses its right to do business in the State of California the Contractor shall, within ten (10) days after notice from the City to do so, substitute an acceptable bond, or bonds, in such form and sum and signed by such other surety or sureties as may be satisfactory to the City. No further payments shall be deemed due, nor shall be made, until the new surety or sureties shall have furnished an acceptable bond to the City.

25. ASSIGNMENTS

Neither the Contractor nor the City shall sell, transfer, assign or otherwise dispose of the contract or any portion thereof, or of his/her right, title or interest therein or his/her obligations thereunder without written consent of the other party.

26. INDEMNIFICATION

The Contractor will indemnify and hold harmless the City, the Engineer, and their agents and employees from and against all claims, damages, losses and expenses including attorney's fees arising out of or resulting from the performance of the work, provided that any such claims, damage, loss or expense is attributable to bodily injury, sickness, disease or death; or to injury or destruction of tangible property including the loss therefrom; and is caused in whole or in part by any negligent or willful act or omission by the Contractor, subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable.

In any and all claims against the City or the Engineer, or any of their agents or employees, by any employee of the Contractor, any subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any subcontractor under Workmen's Compensation acts, disability acts or other employee benefit acts.

The obligation of the Contractor under this paragraph shall not extend to the liability of the Engineer, his/her agents or employees arising out of the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs or specifications. The City will not be held liable for any accident, loss or damage to work prior to its completion and acceptance.

27. SEPARATE CONTRACTS

The City reserves the right to let other contracts in connection with this project. The Contractor shall afford other Contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work and shall properly connect and coordinate his/her work with theirs. If the proper execution or results of any part of the Contractor's work depends upon the work of any other Contractor, the Contractor shall inspect and promptly report to the Engineer any defects in such work that render it unsuitable for such property execution and results.

The City may perform additional work related to the project by itself, or it may let other contracts containing provisions similar to these. The Contractor will afford the other Contractors who are parties to such contracts, or the City if it is performing the additional work itself, reasonable opportunity for the introduction and storage of materials and equipment and the execution of work, and shall properly connect and coordinate his/her work with theirs.

If the performance of additional work by other Contractors or the City, is not noted in the Contract documents prior to the execution of the contract, written notice thereof shall be given to the Contractor prior to starting such additional work. If the Contractor believes that the performance of such additional work by the City or others involves him/her in additional expense or entitles him/her to any extension of contract time, he/she may make a claim therefore as provided in Sections 14 and 15.

28. SUBCONTRACTING

The Contractor may utilize the services of specialty Contractors on those parts of the work, which, under normal contracting practices, are performed by specialty Contractors. The Contractor shall be fully responsible to the City for the acts and omissions of his/her subcontractors and of persons either directly or indirectly employed by them, as he/she is responsible for the acts and omissions of persons directly employed by him/her.

The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the work to bind subcontractors to the Contractor by the terms of the contract documents insofar as applicable to the work of the subcontractors and to give the Contractor the same power as regards terminating any subcontract that the City may exercise over the Contractor under the provisions of the contract documents. Nothing contained in this contract shall create any contractual relation between any subcontractor and the City.

29. ENGINEER'S AUTHORITY

The Engineer shall act as the City's representative during the construction period. He/she shall decide questions, which may arise as to quality and acceptability of materials furnished and work performed. He/she shall interpret the intent of the contract documents in a fair and unbiased manner. The Engineer will make visits to the site and determine if the work is proceeding in accordance with the contract documents.

30. LAND AND RIGHT-OF-WAY

Prior to the issuance of Notice to Proceed, the City shall obtain all land and rights-of-way necessary for carrying out and for the completion of the work to be performed pursuant to the contract documents, unless otherwise mutually agreed.

The City shall provide to the Contractor information, which delineates and describes the lands owned and rights-of-way acquired. The Contractor shall provide, at his/her own expense and without liability to the City, any additional land and access thereto that the Contractor may desire for temporary construction facilities, or for storage of equipment or materials.

31. GUARANTEE

The Contractor shall guarantee all materials and equipment furnished and work performed for a period of one (1) year from the date of substantial completion. The Contractor warrants and guarantees for a period of one (1) year from the date of substantial completion of the system that the completed system is free from all defects due to faulty materials or workmanship and the Contractor shall promptly make such corrections as may be necessary by reason of such defects including the repairs of any damage to other parts of the system resulting from such defects.

The City will give notice of observed defects with reasonable promptness. In the event that the Contractor should fail to make such repairs, adjustments or other work that may be necessary by such defects, the City may do so and charge the Contractor the cost thereby incurred. The Performance Bond shall remain in force and effect through the guarantee period.

32. CONTRACT DISPUTES AND NOTICE OF POTENTIAL CLAIM

If the Contractor and Engineer fail to agree whether or not any work or other matter is within the scope of the Contract, the Contractor shall nevertheless immediately perform such work upon receipt of a written Field Instruction or other written directive. It is the intention of this section that disputes between the parties arising under and by virtue of the contract be brought to the attention of the Engineer at the earliest possible time in order that the matters may be resolved, if possible, or other appropriate action can be undertaken.

For disputes arising under and by virtue of the contract, including an act or failure to act by the Engineer, the Contractor shall provide a signed written initial notice of potential claim to the Engineer within 5 days from the date the dispute first arose. The initial notice of potential claim shall provide the nature and circumstances involved in the dispute which shall remain consistent through the dispute. The initial notice of potential claim shall be submitted on State Form CEM-6201A to be furnished by the Engineer and shall be certified with reference to the California False Claims Act, Government Code Sections 12650-12655. The Contractor shall assign an exclusive identification number for each dispute, determined by chronological sequencing, based on the date of the dispute.

The exclusive identification number for each dispute shall be used on the following corresponding documents:

- Initial notice of potential claim.
- Supplemental notice of potential claim.
- Full and final documentation of potential claim.

- Corresponding claim included in the Contractor's written statement of claims.

The Contractor shall provide the Engineer the opportunity to examine the site of work within 5 days from the date of the initial notice of potential claim. The Contractor shall proceed with the performance of contract work unless otherwise specified or directed by the Engineer.

Throughout the disputed work, the Contractor shall maintain records that provide a clear distinction between the incurred direct costs of disputed work and that of undisputed work. The Contractor shall allow the Engineer access to the Contractor's project records deemed necessary by the Engineer to evaluate the potential claim within 20 days of the date of the Engineer's written request.

Within 15 days of submitting the initial notice of potential claim, the Contractor shall provide a signed supplemental notice of potential claim to the Engineer that provides the following information:

- A narrative describing the complete nature and circumstances of the dispute which caused the potential claim.
- The contract provisions that provide the basis of claim.
- The estimated cost of the potential claim, including an itemized breakdown of individual labor and material costs and how the estimate was determined.
- A time impact analysis of the project schedule that illustrates the effect the effect on the scheduled completion date due to schedule changes or disruptions where a request for adjustment of contract time is made.

The supplemental notice of potential claim shall be submitted on State Form CEM-6201B to be furnished by the Engineer and shall be certified with reference to the California False Claims Act, Government Code Sections 12650-12655. The Engineer will evaluate the information presented in the supplemental notice of potential claim and provide a written response to the Contractor within 20 days of its receipt. If the estimated cost or effect on the scheduled completion date changes, the Contractor shall update this information as soon as the change is recognized and submit this information to the Engineer.

Within 30 days of the completion of work related to the potential claim, the Contractor shall provide the full and final documentation of potential claim to the Engineer that provides the following information:

- A detailed factual narration of events fully describing the nature and circumstances that caused the dispute, including, but not limited to, necessary dates, locations, and items of work affected by the dispute.
- The specific provisions of the contract that support the potential claim and a statement of the reasons these provisions support and provide a basis for entitlement of the potential claim.
- When additional monetary compensation is requested, the exact amount requested shall be segregated into the following cost categories:
 1. Labor – A listing of individuals, classifications, regular hours and overtime hours worked, dates worked, and other pertinent information related to the requested reimbursement of labor costs.

2. Materials – Invoices, purchase orders, location of materials either stored or incorporated into the work, dates materials were transported to the project or incorporated into the work, and other pertinent information related to the requested reimbursement of material costs.

3. Equipment – Listing of detailed description (make, model, and serial number), hours of use, dates of use and equipment rates. Equipment rates shall be at the applicable State rental rate as listed in the Department of Transportation publication entitled "Labor Surcharge and Equipment Rental Rates," in effect when the affected work related to the dispute was performed.

- When an adjustment of contract time is requested the following information shall be provided:

1. The specific dates for which contract time is being requested.

2. The specific reasons for entitlement to a contract time adjustment.

3. The specific provisions of the contract that provide the basis for the requested contract time adjustment.

4. A detailed time impact analysis of the project schedule. The time impact analysis shall show the effect of changes or disruptions on the scheduled completion date to demonstrate entitlement to a contract time adjustment.

The full and final documentation of the potential claim shall be submitted on State Form CEM-6201C to be furnished by the Engineer and shall be certified with reference to the California False Claims Act, Government Code Sections 12650-12655.

Pertinent information, references, arguments, and data to support the potential claim shall be included in the full and final documentation of potential claim. Information submitted subsequent to the full and final documentation submittal will not be considered. Information required in the full and final documentation of potential claim, as listed in items above, that is not applicable to the dispute may be exempted as determined by the Engineer. No full and final documentation of potential claim will be considered that does not have the same nature and circumstances, and basis of claim as those specified on the initial and supplemental notices of potential claim.

The Engineer will evaluate the information presented in the full and final documentation of potential claim and provide a written response to the Contractor within 30 days of its receipt unless otherwise specified. The Engineer's receipt of the full and final documentation of potential claim shall be evidenced by postal receipt or the Engineer's written receipt if delivered by hand. If the full and final documentation of potential claim is submitted by the Contractor after acceptance of the work by the Director, the Engineer need not provide a written response.

Failure of the Contractor to conform to specified dispute procedures shall constitute a failure to pursue diligently and exhaust the administrative procedures in the contract, and is deemed as the Contractor's waiver of the potential claim.

33. DISPUTE RESOLUTION

In the event that disputes cannot be resolved pursuant to the provisions of Section 32, disputes of \$375,000 or less between that parties shall be subject to the provisions set forth in California Public Contract Code sections 20104 et seq.

34. TAXES

The Contractor will pay all sales, consumer, use and other similar taxes required by the law of the place where the work is performed.

35. APPLICABLE WAGE RATES

The Contractor's attention is directed to Section 7-1.02K(2) "Wages" of the Standard Specification and the most recent General Prevailing Wage Determination made by the Director of Industrial Relations, a copy of which is available for examination at the Public Works Office. These prevailing wage rates, and any subsequent amendments thereto made prior to the date of the Invitation for Bids, are the minimum rates to be paid during the life of the contract.

Certified copies of all payroll records shall be submitted to the Engineer each week for the prior week's work. Certified payroll records and submittal thereof shall be in accordance with Section 7-1.02K(3) "Certified Payroll Records" of the Standard Specifications.

In accordance with the California Labor Code, and other applicable labor provisions, the prevailing wages applicable to the project will be determined by the United States Secretary of Labor and/or the State of California Department of Industrial Relations.

The listings of or reference to minimum rates herein is not a representation that labor can be obtained at these rates. It is the responsibility of bidders to inform themselves as to local labor conditions and prospective changes or adjustments of wage rates. No increase in the contract price shall be allowed or authorized on account of payment of wage rates in excess of those listed or referred to herein.

SECTION TS

TECHNICAL SPECIFICATIONS

SECTION 01150

MEASUREMENT AND PAYMENT

PART 1: GENERAL

1.01 DESCRIPTION

Payment shall be made at the bid prices and shall be considered as full compensation for furnishing all labor, materials, tools, supplies, and services as required for proper completion of the work described in the following bid items, complete in place, and to the satisfaction of the Engineer.

Items of work or other services which the Contractor is required to supply, such as final clean-up or other incidental items, and which are not listed as separate bid items shall be included in the related bid items and shall be considered as paid in those items, whether or not specifically identified in the following descriptions. Also considered to be included in such costs are any costs associated with the repair of damage which may occur to existing improvements as a result of the Contractor's operations.

1.02 LUMP SUM BREAKDOWN SUBMITTALS

After award of the Contract and prior to approval of initial progress payment requests, the Contractor shall submit a cost breakdown list to the Engineer for all Lump Sum bid items. The list shall consist of the major elements of work that make up each of the lump sum bid items and shall be used for determining progress pay estimates. The Contractor shall provide amounts for each element, prorating general costs such as mobilization, setup, temporary facilities and controls, and overhead and profit for each element. The distribution breakdown that the contractor indicates for any lump sum bid item may be revised as deemed necessary by the Engineer if it appears such items are unbalanced, unless the Contractor can substantiate these costs. Only elements of work of value to the City shall be included in the list.

PART 2: BID ITEMS

Bid Item 1 – Mobilization/Demobilization

The lump sum bid for Mobilization shall not exceed four percent (4%) of the total bid price. Mobilization shall include: the obtaining of insurance and bonds; moving onto the site of all equipment; submittal and approval of initial project schedule; obtaining and paying for all permits by other agencies as applicable and not delineated in other bid items; furnishing temporary construction utilities (temporary power, toilets, water, fences, etc.); installing construction signs; temporary buildings and field office trailer(s); establishment of temporary site access and staging area; installation of temporary construction fencing; and all other construction as required for the proper performance and completion of work.

The lump sum bid for Demobilization shall not exceed four percent (4%) of the total bid price. Demobilization shall include: site cleaning and restoration of surfaces within the job site; post-construction meeting; removal of all temporary facilities and equipment from the work area; disconnection of the temporary construction utilities; and turnover of a project to the Owner.

Dewatering is not expected for this project, but should dewatering be required, the pay item for dewatering and all other incidentals required to complete the item is included in Mobilization/Demobilization.

Contractor may apply for payment of mobilization on a percent complete basis as the items

covered in Mobilization are being completed.

Contractor may apply for payment of Demobilization after the overall project substantial completion is achieved and the project begins to demobilize.

The lump sum price shall be full compensation for the preparation and installation or submittal of these materials, and for all labor, equipment, tools and incidentals to complete this item.

Bid Item 2 - Traffic Control

The lump sum amount shall include all work and materials necessary to create, obtain approval, and implement a traffic control plan as required by the City of Oroville for this project. Measurement and payment shall be made on a percent complete basis. The price shall be full compensation for updates or changes required by the City.

The lump sum price shall be full compensation for the preparation, submittal, approvals, fees, and implementation of these materials, and for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 3 – Sheeting, Shoring, Bracing

The lump sum amount shall include all work and materials necessary for sheeting, shoring, and bracing, including installation of shores, wales, braces, posts, piling, sheeting, anchorages, fastenings, and all other essentials required to complete this item as detailed in the Specifications and Plans.

The lump sum price shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 4 – Bypass Pumping

The lump sum amount shall include all work and materials necessary for bypass pumping, including installation of pumps, piping, and all other essentials required to complete this item as detailed in the Specifications and Plans.

The lump sum price shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 5 – 8” PVC Pipe

The price per linear foot for 8” PVC Pipe shall include all work and materials necessary to install new 8” PVC sanitary sewer, including sawcutting, trenching, installation of bedding, temporary plating, utility crossing protection, backfill and compaction, pavement repair, removal and disposal of existing pipe, furnishing of pipe, and all other essentials required to complete this item as detailed in the Specifications and Plans.

The price per linear foot shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 6 – 12” PVC Pipe

The price per linear foot for 12” PVC Pipe shall include all work and materials necessary to install new 12” PVC storm drain, including sawcutting, trenching, installation of bedding, temporary plating, utility crossing protection, backfill and compaction, pavement repair,

removal and disposal of existing pipe, furnishing of pipe, and all other essentials required to complete this item as detailed in the Specifications and Plans.

The price per linear foot shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 7 – 15” PVC Pipe

The price per linear foot for 15” PVC Pipe shall include all work and materials necessary to install new 15” PVC sanitary sewer, including sawcutting, trenching, installation of bedding, temporary plating, utility crossing protection, backfill and compaction, pavement repair, removal and disposal of existing pipe, furnishing of pipe, and all other essentials required to complete this item as detailed in the Specifications and Plans.

The price per linear foot shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 8 – 24” PVC Pipe

The price per linear foot for 24” PVC Pipe shall include all work and materials necessary to install new 24” PVC storm drain, including sawcutting, trenching, installation of bedding, temporary plating, utility crossing protection, backfill and compaction, pavement repair, removal of existing storm drain manhole, furnishing of pipe, and all other essentials required to complete this item as detailed in the Specifications and Plans.

The price per linear foot shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 9 – Abandon Pipe

The price per linear foot for abandon pipe shall include all work and materials necessary to abandon pipe, including flowable fill, caps, grout plugs, repair of holes on existing structures, cutting and disposal of pipe near existing structures, and all other essentials required to complete this item as detailed in the Specifications and Plans.

The price per linear foot shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 10 – 48” Sanitary Sewer Manhole

The price per each for 48” Sanitary Sewer Manhole shall include all work and materials necessary to install new sanitary sewer manholes, including sawcutting, trenching, removal and disposal of existing manhole, furnishing and installation of manhole bases, sections, frames, and covers, backfill and compaction, testing, and all other essentials required to complete this item as detailed in the Specifications and Plans.

The price per each shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 11 – 48” Storm Drain Manhole

The price per each for 48” Storm Drain Manhole shall include all work and materials necessary to install new storm drain manholes, including sawcutting, trenching, removal and disposal of existing manhole, furnishing and installation of manhole bases, sections, frames, and covers, backfill and compaction, testing, and all other essentials required to complete

this item as detailed in the Specifications and Plans.

The price per each shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 12 – Abandon Manhole

The price per each for Abandon Manhole shall include all work and materials necessary to abandon manholes, including removal and disposal of frames, covers, and castings, flowable fill, grout plugs, backfill and compaction, and all other essentials required to complete this item as detailed in the Specifications and Plans.

The price per each shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

Bid Item 13 – Connection to Existing Manhole

The price per each for Connection to Existing Manhole shall include all work and materials necessary for manhole connection, including sawcutting, excavation, coring of existing manhole, pipe boot, grout, and all other essentials required to complete this item as detailed in the Specifications and Plans.

The price per each shall be full compensation for all labor, equipment, tools, and incidentals to complete this item.

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1: GENERAL

1.01 SECTION INCLUDES

- A. Submittal procedures.
- B. Proposed Products list.
- C. Product Data.
- D. Shop Drawings.
- E. Samples.
- F. Design data.
- G. Test reports.
- H. Certificates.
- I. Manufacturer's field reports.
- J. CPM Qualifications

1.02 SUBMITTAL PROCEDURES

- A. Transmit each submittal with transmittal form provided by Contractor.
- B. Sequentially number the transmittal form. Resubmittals shall be identified with original number and a sequential resubmittal suffix number. The original submittal shall be numbered X-1. The first resubmittal shall be numbered X-2 and so on.
- C. Identify Project, date of submittal, Contractor, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate.
- D. Apply Contractor's signature certifying that review, approval, verification of Products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents.
- E. Schedule submittals to expedite the Project and deliver to Engineer at the Engineer's office. Coordinate submission of related items.
- F. For each submittal for review, allow 30 days excluding delivery time to and from the Contractor.
- G. Identify variations from Contract Documents and Product or system limitations which may be detrimental to successful performance of the completed Work.

- H. Provide space for Design Engineer's review stamps.
- I. When revised for resubmission, identify all changes made since previous submission.
- J. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.
- K. Submittals not requested either in the Contract Documents or in writing from the Engineer will not be recognized or processed.
- L. Within 15 days after Notice to Proceed submit a complete list of all submittals to be submitted and the dates when they will be submitted.
- M. Wherever called for in the Contract Documents, or where required by the Engineer, the Contractor shall furnish to the Engineer for review one electronic copy of each shop drawing submittal. The term "Shop Drawings" as used herein shall be understood to include detail design calculations, shop drawings, fabrication and installation drawings, erection drawings, lists, graphs, catalog sheets, data sheets, and similar items. Whenever the Contractor is required to submit design calculations as part of a submittal, such calculations shall bear the signature and seal of an engineer registered in California, unless otherwise directed.
- N. All Shop Drawing submittals shall be accompanied by the Contractor's standard submittal transmittal form. Any submittal not accompanied by such a form, or where applicable items on the form are not complete, will be returned for resubmittal.
- O. Normally, a separate transmittal form shall be used for each specific item or class of material or equipment for which a submittal is required. Transmittal of a submittal of various items using a single transmittal form will be permitted only when the items taken together constitute a manufacturer's "package" or are so functionally related that expediency indicates review of the group or package as a whole. A multi-page submittal shall be collated into sets, and each set shall be stapled or bound, as appropriate, prior to transmittal to the Engineer.
- P. Except as may otherwise be indicated herein, the Engineer will return prints of each submittal to the Contractor with its comments noted hereon, within 30 calendar days following their receipt by the Engineer. It is considered reasonable that the Contractor shall make complete and acceptable submittal to the Engineer by the second submission of a submittal item. The City reserves the right to withhold monies due to the Contractor to cover additional costs of the Engineer's review beyond the second submittal. The Engineer's maximum review period for each submittal, including all resubmittals, will be 30 days per submittal. In other words, for a submittal that requires two resubmittals before it is complete, the maximum review period for that submittal could be 90 days.
- Q. If a submittal is returned to the Contractor marked "NO EXCEPTIONS NOTED", formal revision and resubmission of said submittal will not be required.
- R. If a submittal is returned to the Contractor marked "MAKE CORRECTIONS NOTED", formal revision and resubmission of said submittal will not be required.

- S. If a submittal is returned to the Contractor marked "AMEND-RESUBMIT", the Contractor shall revise said submittal and shall resubmit the required number of copies of said revised submittal to the Engineer.
- T. If a submittal is returned to the Contractor marked "REJECTED-RESUBMIT", the Contractor shall revise said submittal and shall resubmit the required number of copies of said revised submittal to the Engineer.
- U. Fabrication of an item shall be commenced only after the Engineer has reviewed the pertinent submittals and returned copies to the Contractor marked "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED". Corrections indicated on submittals shall be considered as changes necessary to meet the requirements of the Contract Documents and shall not be taken as the basis for changes to the contract requirements.
- V. The Engineer's review of Contractor Shop Drawing submittals shall not relieve the Contractor of the entire responsibility for the correctness of details and dimensions. The Contractor shall assume all responsibility and risk for any misfits due to errors in Contractor submittals. The Contractor shall be responsible for the dimensions and the design of adequate connections and details for all connections and details.

1.03 PROPOSED PRODUCTS LIST

- A. Within 15 days after date of Notice to Proceed submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
- B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

1.04 PRODUCT DATA AND SHOP DRAWINGS

- A. Product Data for Review:
 - 1. Submitted to Engineer for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.
 - 2. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article above.
- B. Product Data for Information:
 - 1. Submitted for the Engineer's knowledge as contract administrator or for the City of Oroville.
- C. Product Data for Project Close-out:
 - 1. Submitted for the City's benefit during and after project completion.
- D. Submit one electronic copy of each drawing included in the submittal.
- E. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

- F. After review distribute in accordance with the Submittal Procedures article above.

1.05 SAMPLES

- A. Samples for Review:
 - 1. Submitted to Engineer for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.
 - 2. After review, produce duplicates and distribute in accordance with SUBMITTAL PROCEDURES article above.
- B. Samples for Information:
 - 1. Submitted for the Engineer's knowledge as contract administrator or for the City.
- C. Include identification on each sample, with full Project information.
- D. Submit the number of samples specified in individual specification sections; one of which will be retained by Engineer.
- E. Reviewed samples which may be used in the Work are indicated in individual specification sections.
- F. Samples will not be used for testing purposes unless specifically stated in the specification section.

1.06 DESIGN DATA

- A. Submit for the Engineer's knowledge as contract administrator or for the City.
- B. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.07 TEST REPORTS

- A. Submit for the Engineer's knowledge as contract administrator or for the City.
- B. Submit test reports for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.08 CERTIFICATES

- A. When specified in individual specification sections, submit certification by the manufacturer, installation/application Subcontractor, or the Contractor to Engineer, in quantities specified for Product Data.
- B. Indicate material or Product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or Product but must be acceptable to Engineer.

1.09 MANUFACTURER'S FIELD REPORTS

- A. Submit reports for the Engineer's benefit as contract administrator and for the City.
- B. Submit one electronic copy of each report within 30 days of observation to Engineer for information.
- C. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.10 CPM QUALIFICATIONS

- A. Submit a statement for individual who will perform CPM scheduling that identifies who they are and highlights their qualifications.

PART 2: MATERIALS - NOT USED

PART 3: EXECUTION - NOT USED

END OF SECTION

SECTION 01666

TESTING OF GRAVITY SEWER LINES AND MANHOLES

PART 1: GENERAL

1.01 DESCRIPTION

- A. The work of this section consists of testing gravity sewer lines and gravity sewer manholes. Repaired work shall be retested.
- B. Testing Methods: Gravity sewer lines - air test; manholes – vacuum test.

1.02 QUALITY ASSURANCE

- A. Flow meters shall record the actual volume plus or minus 2 percent.
- B. Air test gauges shall be ANSI/ANSI B40.1, Grade 3A (plus or minus 0.25 percent of full-scale accuracy), and 15 psi dial range.

1.03 SUBMITTALS

- A. Accuracy certification by approved independent testing labs for flow meters and test gauges. Certifications shall be dated no more than 90 days prior to actual system testing.
- B. Prior to testing, provide the following information:
 - 1. All Tests: Describe precautions that will be taken to protect system equipment that might be damaged under test pressures, and the proposed method for rerouting sewer flows where the system must remain in service.
 - 2. Air Test: Describe safety devices on air test equipment and personnel safety precautions during air.

1.04 PROJECT CONDITIONS

- A. Testing shall not be performed until each system has been flushed or thoroughly cleaned in accordance with procedures in the section that describes sewer line installation.

PART 2: MATERIALS - NOT USED

PART 3: EXECUTION

3.01 GENERAL

- A. Prepare each section for testing, using adequate bracing; protect system equipment susceptible to damage by test pressures; make provision for installation of Agency's pressure gauge in parallel with Contractor's gauge, if so requested; and maintain services where required.

3.02 GRAVITY SEWER SYSTEMS

- A. Air Test: Test lines less than or equal to 30 inches in diameter between manholes with low pressure air. Safety requires regulator or relief valve on pressurizing

equipment, set at 8 psig. No one will be allowed in manholes while there is air pressure against test plugs.

Lines greater than 30-inches in diameter shall include individual joint testing as specified per these specifications or the manufacturer.

- B. Plug all pipe outlets to resist test pressure. Give special attention to laterals. Plug all other pipes in both upstream and downstream manholes.
- C. Supply air into the line until the test pressure of 3.5 psi in excess of the ground water pressure is attained or 8 psi, whichever is greater. Allow at least 5 minutes for air temperature in the test section to stabilize.
- D. Reestablish the test pressure, and start a stop watch. Determine the time required for pressure to drop 1.0 psig.
- E. For 6-inch and smaller pipe only, if the pressure does not drop during the stabilization period, and no additional air has been added, the section undergoing test will have passed without further testing.
- F. The pipe section will also have passed if the time observed for the pressure to drop 1.0 psig is greater than that determined by using Table 1.

Determine the test time from Table 1 (minimum time 60 seconds).

SIZE	Time per 100-foot	SIZE	Time per 100-foot	SIZE	Time per 100-foot
4-inch	0.3-min.	12-inch	1.8-min.	24-inch	3.6-min
6-inch	0.7-min.	15-inch	2.1-min.	27-inch	4.2-min.
8-inch	1.2-min.	18-inch	2.4-min.	30-inch	4.8-min.
10-inch	1.5-min.	21-inch	3.0-min.		

- G. When a combination of more than one pipe size is under test, the calculated time for the larger pipe shall apply.
- H. For larger sewer pipes, refer to the material specification for testing requirements.

3.03 VISUAL TEST FOR PIPELINES

Interior visual inspection shall be conducted by the Contractor. The Contractor's Inspector shall visibly inspect the line and record findings. Copies of video inspection shall be provided to the City Engineer for review and acceptance of work.

The sewer system shall be completely cleaned by an approved method prior to visual inspection. The sewer system shall be rejected if any of these conditions exist:

- A. Standing water or sags greater than ½-inch in depth.
- B. Standing water in services.
- C. Offset joints.
- D. Cracked pipe.

E. Infiltration.

3.04 DEFLECTION TESTING OF FLEXIBLE PIPE

All flexible PVC pipe shall be tested for over-deflection as specified in Section 15071.

3.05 LEAKAGE TEST FOR MANHOLES

Sewer manholes shall pass a vacuum test consisting of the following criteria and procedures:

- A. The Contractor shall notify the Engineer at least 72-hours in advance to be present during testing without exception.
- B. The test shall be performed after assembly of the manhole, but prior to backfilling. The Contractor shall perform the test and supply all test equipment. A City Inspector shall witness the test results.
- C. Lift holes shall be filled with non-shrinking grout prior to testing.
- D. Pipe entering and existing the manhole shall be plugged. Securely brace the plugs to prevent them from being drawn into the manhole. Unused channels shall be permanently plugged with a plastic or clay stop and filled with grout.
- E. A vacuum of 10-inches of mercury shall be drawn to start the test. The amount of time required for the vacuum to drop to 9-inches shall be measured. The manhole will pass the test if the amount of elapsed time is greater than 60 seconds for a 48-inch manhole, 75 seconds for a 72-inch manhole, and 120 seconds for an 84-inch manhole. A liquid filled with vacuum gauge shall be used for testing.
- F. If the manhole fails the initial test, necessary repairs shall be made with a non-shrink grout while the vacuum is still being drawn. Retesting shall proceed until the elapsed times are satisfactory.
- G. After passing the vacuum test, all joints shall then be mortared, inside and out. Outside mortared joints shall be allowed to dry before backfilling.

END OF SECTION

SECTION 02200

EARTHWORK

PART 1: GENERAL

1.1 DESCRIPTION

- A. Contractor furnished labor, materials, equipment, and incidentals necessary to perform all excavation, backfill, grading, and compaction required to complete the work shown on the Plans and specified herein. The work shall include, but not necessarily be limited to, excavation for structures, footings, conduit, pipe, and paving; backfilling and fill; embankment and grading; disposal of surplus and unsuitable materials; hydroseeding; and all incidental related work.

1.2 REFERENCED SECTIONS

- A. The following Sections are referenced in this Section:
1. Section 01300: Submittals

1.3 GEOTECHNICAL REPORT

- A. Not Used.

1.4 QUALITY ASSURANCE

- A. Reference Specifications, Codes, and Standards
1. This section references the following documents. They are a part of this section insofar as specified and modified herein. The latest edition of referenced publications in effect at the time of bid opening shall govern. In case of conflict between the requirements of this section and the listed documents, the requirements of this section shall prevail.

Reference	Title
ASTM D1556	Density of Soil in Place by the Sand-Cone Method
ASTM D1557	Moisture Density Relations of Soils and Soil-Aggregate Mixtures Using 10-lb. (4.54-kg) Rammer and 18-in. (457-mm) Drop
ASTM D2922	Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
ASTM D3017	Moisture Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow

B. Tests

1. The City or their Representative shall take samples and perform moisture content, gradation, compaction, and density tests during compaction and placement of backfill materials to check compliance with these specifications.
2. The Contractor shall remove surface material at locations designated by the Engineer and provide such assistance as necessary for sampling and testing.

3. The Engineer may direct the Contractor to construct inspection trenches in compacted or consolidated backfill to determine that the Contractor has complied with these specifications.
4. Tests will be made in accordance with the following:

Test	Standard Procedure
Moisture content	ASTM D3017
Density in-place	ASTM D1556 or ASTM D2922
Moisture-density relationships	ASTM D1557

1.5 SUBMITTALS

- A. Comply with the General Provisions and include test results, certifications, and source for all earthwork materials.

PART 2: PRODUCTS

2.1 MATERIALS

- A. Imported fill
 1. Imported fill shall be imported granular material with a maximum plasticity index 12 and a three-inch maximum particle size. Imported fill shall be approved by the Engineer prior to importation to the site.
- B. Engineered Fill
 1. Engineered fill material shall consist of soil excavated onsite, free of debris, wood, trash, peat, and other objectionable material which may be compressible, or which cannot be compacted properly.
 2. Engineered fill shall be well graded and shall possess sufficient fines such that no nesting or voids result in the compacted mass.
 3. Engineered fill shall contain less than 3% organic matter or other deleterious substances by weight and shall not contain rocks or rubble fragments over three inches in greatest dimension.
 4. Soil removed during excavations will require drying prior to use as engineered fill material. Lime can be mixed with soil to dry it to compactable moisture content. The percentage of lime is dependent on the moisture content of the soils.
- C. Crushed Rock (Drain Rock)
 1. Crushed rock shall be clean and free draining and conform to the following gradation:

Sieve Size	Percent Passing by Weight
3/4"	100
No. 4	0-5

2. Crushed rock material shall be composed of hard, durable, sound pieces having a specific gravity of not less than 2.60.

D. Pipe Bedding and Pipe Zone Material

1. Pipe bedding and pipe zone material shall be 3/8-inch minus granular material conforming to the following gradation:

Sieve Size	% Passing
3/4"	100
3/8"	100
#4	35 - 55
#30	20-60
#200	0-10
Sand Equivalent	30min
Minimum Dry Density	80 lb/cu ft
Coefficient of Permeability	1.4 in/hr

E. Trench Backfill Material

1. Native material meeting the requirement of Engineered Fill.

F. Gravel Material

1. 1-inch minus aggregate material obtained from a single source of uniformly graded angular rock, shall be clean and free draining with no more than 2% passing a No. 4 sieve, and shall be of such a nature that it can be spread and compacted to produce a stable driving surface.

G. Filter Fabric Material

1. Permeable, nonwoven, shall not act as a wicking agent, and shall conform to the requirements of the Filter Fabric found in Section 88 of the most current Standard Specifications, as issued by the California Department of Transportation.

H. Controlled Low Strength Material (CLSM)

1. Hand-excavatable, free-flowing and self-compacting material that consists of cement, pozzolan fly ash, fine and coarse aggregates, and water that has been mixed in accordance with ASTM C94.
2. The CLSM shall have a minimum 28-day compressive strength of not less than 50 psi and a maximum 28- day compressive strength of no more than 150 psi.
3. Placement of backfill or concrete on top of the CLSM is not allowed until the CLSM passes a ball drop test described in ASTM D6024.

PART 3: EXECUTION

3.1 GENERAL

A. Control of Water

1. Keep excavations free from water during construction. Groundwater shall be maintained either naturally or by dewatering at least three feet below the lowest anticipated excavation depth.

B. Surplus Material

1. Unless otherwise specified, surplus excavated material shall be disposed of at the Contractor's expense.
 2. The Contractor shall satisfy himself that there is sufficient material available for the completion of the work before disposing of any material inside or outside the site. Shortage of material, caused by premature disposal of any material by the Contractor, shall be replaced by the Contractor at his expense.
- C. Hauling
1. When hauling is done over highways or city streets, the loads shall be trimmed and the vehicle shelf areas shall be cleaned after each loading. The loads shall be watered after trimming to eliminate dust.
- D. Maintenance of Roadways
1. All earthwork operations shall be performed in a manner which does not disrupt the continuous flow of traffic on existing roadways. All streets shall be swept clean daily where dirt and debris result from contractor's operations.
- E. Finish Grading
1. Finish grades and existing or natural grades in the area of work are indicated on the plans. If no finished grade is shown on the Plans, Contractor shall grade to existing.
 2. The Contractor shall do all grading, filling or excavating as required to completely grade the site to lines and grades shown, and to provide for the indicated drainage.
 3. Where finished grade corresponds practically with existing grade, the ground shall be worked up and graded off evenly with existing grade.
 4. Filled areas shall be compacted so as to prevent settlements and the Contractor shall be responsible for a period of one year after final acceptance of the project to provide additional fill as necessary to bring to grade any areas which settle below the indicated grades and to replace or repair any planting or work damaged by such settlement.
- F. Tolerances
1. Finished grade shall be to the line and grade shown on the plans to within a tolerance of plus or minus 0.05 ft.
 2. Allowance for topsoil and grass cover, and sub-base and pavement thickness shall be made so that the specified thickness can be applied to attain the finished grade.
- G. Control of Erosion
1. The Contractor shall maintain earthwork surfaces true and smooth and protected from erosion.
 2. Erosion control measures, such as silt fences, filter fabric, sedimentation ponds, placement of straw waddles along the peripheries of construction sites, temporary detention ponds, and terraced slopes, shall be employed as appropriate and shall be in place prior to any clearing or grading activity.

3.2 EXCAVATION AND COMPACTION

A. General

1. Excavation shall be in accordance with the Plans and as required for construction. Excavations shall be kept free from water while construction is in progress. The Engineer shall be notified immediately in writing if it becomes necessary to remove soft, weak, or wet material. Wet excavated materials may need to be dried by aeration prior to being used as engineered fill.
2. Soil disturbed or weakened by the Contractor's operations and soils permitted to soften from exposure to weather shall be excavated to firm foundation and refilled with engineered fill material compacted to 95 percent of ASTM D1557, maximum density. All work of this nature will be at the Contractor's expense.

B. Trench Excavation

1. Trench sides shall be constructed as nearly vertical as practicable. Sides of trenches shall not be sloped between the bottom of the trench and the elevation of the top of the pipe.
2. Bottom of trenches shall be graded accurately to provide uniform bearing and support for each section of pipe or conduits on undisturbed soil, or bedding material as indicated or specified at every point along its entire length except for portions where it is necessary to excavate for bell holes and for making proper joints.
3. Bell holes and depressions for joints shall be dug after trench has been graded. Dimension of bell holes shall be as required for properly making the joint to ensure that the bell does not bear on the bottom of the excavation. Trench dimensions shall be as indicated.

C. Structural Excavation

1. General

- a. The bottom excavation elevation shall be enough to allow the proper placing of forms and concrete construction to undisturbed weathered material to the elevations indicated, or as specified herein.
- b. Unless otherwise specified, excavations shall extend enough distance from walls and footings to allow for placing and removal of forms, installation of services, and for inspection, except where concrete is specified to be placed directly against excavated surfaces.

2. Foundation Inspection

- a. Whenever any structure excavation is substantially completed to grade, the Contractor shall notify the Engineer who will inspect the foundation for uniformity and suitability as a structure foundation.
- b. No gravel, rock, sand, concrete or masonry shall be placed until the foundation has been inspected by the Engineer.
- c. The Contractor shall, if directed by the Engineer, dig test pits and make test borings and foundation bearing tests.

- d. If the material tested complies with the specifications, the cost thereof will be paid for as extra work.
- e. If the material tested does not comply with the specifications, the cost thereof (initial testing, remedial work, re-testing) will be borne by the Contractor.

3.3 SUBGRADE PREPARATION

- A. Ground surfaces receiving fill shall be prepared by clearing and grubbing as specified in these specifications, and by removing soil which is high in organic content and other deleterious material.
- B. Subgrade shall then be scarified to a depth of 8 inches, brought to a uniform moisture content of one (1%) to three percent (3%) above optimum and compacted to at least 90 percent (90%) maximum dry density as determined by ASTM D1557.

3.4 FILLING OPERATIONS

- A. General
 - 1. The Contractor shall be responsible for the maintenance and protection of all embankments and fills made during the contract period and shall bear the expense of replacing any portion which has been displaced due to carelessness, negligent work, erosion or failure to take proper precautions.
 - 2. If the existing slope in an area to be filled is greater than 5:1, the Contractor shall bench the area prior to filling to allow each lift to be keyed 1 foot into the existing slope.
- B. Construction of Engineered Fill and Imported Fill
 - 1. Finish grade shall be established with onsite engineered fill and imported fill placed in lifts not to exceed eight inches in compacted thickness and uniformly compacted at or near the optimum moisture content.
 - 2. Each layer shall be spread evenly and shall be thoroughly mixed during spreading to promote uniformity of the material in each layer.
 - 3. When the moisture content of Engineered Fill with clay materials is less than two percent (2%) over optimum, water shall be added until a moisture content of at least two percent (2%) over optimum is achieved.
 - 4. When the moisture content of Imported Fill is less than optimum, water shall be added until a moisture content of at least optimum is achieved.
 - 5. When the moisture content of the Engineered Fill is too high to permit the specified compaction, the fill shall be aerated by blading or other methods until satisfactory moisture content is achieved.
 - 6. No fill shall be placed during weather conditions, which will alter the moisture content of the fill materials sufficiently to make adequate compaction impossible.
 - 7. After placing operations have been stopped because of adverse weather conditions, no additional fill material shall be placed until the last layer compacted has been checked and found to be compacted to the specified densities.

- C. Pipe Bedding and Trench Backfill
 - 1. Bedding
 - a. Provide six-inch minimum bedding material under pipe. Bedding shall be placed in 6-inch maximum loose lifts.
 - b. Provide uniform and continuous support for each section of utility except at bell holes or depressions necessary for making proper joints.
 - c. Bring up evenly on each side and along the full length of the pipe.
 - d. Ensure that no damage is done to piping or their protective coatings.
 - e. Compact each loose lift as specified below before placing the next lift.
 - f. Do not place bedding in freezing weather or where the material in the trench is already frozen or is muddy, except as authorized.
 - 2. Backfilling
 - a. Backfill shall be placed in 6-inch maximum loose lifts, mechanically consolidated and shovel sliced under the haunches of the pipe. See City Improvement Standards for backfill and compaction requirements.
 - b. Where settlements greater than the tolerance allowed herein for grading occur in trenches and pits due to improper compaction, excavate to the depth necessary to rectify the problem, then backfill and compact the excavation as specified herein and restore the surface to the required elevation.
 - c. Coordinate backfilling with testing of utilities.
 - 3. Unsuitable Material Under Bedding
 - a. If soft, spongy, unstable, or similar other material is encountered upon which the bedding material or pipe is to be placed, this unsuitable material shall be removed to a minimum depth of 12-inches below the pipe.
 - b. The 12-inch depth shall be backfilled with pervious material or accepted bedding material suitably compacted.
 - c. Sufficient pervious material shall be installed to provide a stable base accepted by the Engineer prior to installation of the utility, pipe, or structure.

3.5 COMPACTION

- A. General
 - 1. Each layer or lift of material specified shall be compacted so that the in-place density tested is not less than the percentage of maximum density identified herein. Compaction shall be accomplished by mechanical equipment such as tamping rollers, sheepfoot rollers, pneumatic tire rollers, vibrating rollers, or other mechanized tampers suitable for the work.
 - 2. Compaction of materials by ponding and jetting is prohibited.
 - 3. Compaction equipment and procedures are subject to approval by the Engineer.

4. Compaction shall be in accordance with Section 02223.
- B. Consolidation of Crushed Rock
1. Crushed rock shall be consolidated by one of three methods, as follows:
 - a. A minimum of three (3) passes with a vibrator plate compactor
 - b. Tamping of the crushed rock as it is placed, using the bucket of the backhoe
 - c. Thoroughly wheel rolling with equipment
 2. Each lift of rock shall not exceed 12 inches of unconsolidated thickness.

3.6 CLEAN UP

- A. After completing all earthwork, the Contractor shall leave the site in a neat and clean condition, doing all such grading as is required by the plans. Any existing features, structures, and other facilities damaged or affected by the work shall be replaced, repaired, or restored to their original condition or better.

END OF SECTION

SECTION 02222

ABANDONMENT OF PIPELINES AND MANHOLES

PART 1: GENERAL

1.01 DESCRIPTION

This section includes abandonment in place of existing pipelines and manholes, when indicated on the Drawings for abandonment.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 01300: Submittals
- B. Section 02223: Trenching, Backfilling, and Compacting
- C. Section 03100: Concrete

1.03 QUALITY ASSURANCE REFERENCES

This section contains references to some or all of the following documents, most recent edition. They are a part of this section as specified and modified. In case of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.

Reference	Title
ASTM C150	Standard Specification for Portland Cement.
ASTM C494	Standard Specification for Chemical Admixture for Concrete.
ASTM C618	Standard Specification for Fly Ash and Raw or Calcinated Natural Pozzolan for use as Mineral Admixture in Portland Cement Concrete.
ASTM C940	Standard Test Method for Expansion and Bleeding of Freshly Mixed Grout for Replaced Aggregate Concrete in the Laboratory.
ASTM C1017	Standard Specification for Chemical Admixture for Use in Producing Flowing Concrete.
ASTM C1107	Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Non-Shrink).

1.04 DEFINITIONS

- A. Abandonment. Pipeline abandonment consists of filling or plugging portions of existing pipelines with flowable fill or grout plugs, as indicated on the Drawings. Manhole abandonment consists of removing cylinders, rings, and lids above the depth indicated on the Drawings, and filling the remainder with flowable fill.
- B. Flowable Fill. Flowable fill shall be controlled low-strength material (CLSM) consisting of fluid mixture of cement, fly ash, aggregate, water, and with admixtures as necessary to provide workable properties. Placement of flowable fill may be by grouting techniques in pipelines or other restricted areas, or as mass placement by chutes or tremie methods in unrestricted locations with open access. Long-term hardened strength shall be within specified range.

- C. Backgrouting. Secondary stage pressure grouting to ensure that voids have been filled within abandoned pipes. Backgrouting will only be required if there is evidence of incomplete flowable fill placements.

1.05 SUBMITTALS

- A. Submit flowable fill mix design report.
 - 1. Flowable fill type and production method. Describe if fill will be mixed to final proportions and consistency in batch plant or if constituents will be added in transit mixer at placement location.
 - 2. Aggregate gradation of fill. Aggregate gradation of mix shall be used as pilot curve for quality control during production.
 - 3. Fill mix constituents and proportions including materials by weight and volume, and air content. Give types and amounts of admixtures including air entrainment or air generating compounds.
 - 4. Fill densities and viscosities, including wet density at point of placement.
 - 5. Initial time of set.
 - 6. Bleeding and shrinkage.
 - 7. Compressive strength.
- B. Submit technical information for equipment and operational procedures including projected injection rate, grout pressure, method for controlling grout pressure, bulkhead and vent design and number of stages for grout application.

PART 2: MATERIALS

2.01 FLOWABLE FILL

- A. Design Mix Criteria. Provide design of one or more mixes to meet design criteria and conditions for placement. Present information required by Part 1, Paragraph 1.05-A in mix design, to include the following:
 - 1. Cement: ASTM C150 Type I or II. Volume and weight per cubic yard of fill. Provide minimum cement content of 50 pounds per cubic yard.
 - 2. Fly ash: ASTM C618, Class C or F. Volume and weight per cubic yard of fill. Provide minimum fly ash content of 200 pounds per cubic yard.
 - 3. Potable water: Volume and weight per cubic yard of fill. Amount of water determined by mix design testing.
 - 4. Aggregate gradation: 100 percent passing 3/8-inch sieve and not more than 10 percent passing No. 200 sieve. Mix design report shall define pilot gradation based on following sieve sizes: 3/8 inch, No. 4, 8, 16, 30, 50, 100, and 200. Do not deviate from pilot gradation by more than plus or minus 10 percentage points for any sieve for production material.

5. Aggregate source material: Screened or crushed aggregate, pit or bank run fine gravels or sand, or crushed concrete. If crushed concrete is used, add at least 30 percent natural aggregate to provide workability.
 6. Admixtures: Use admixtures meeting ASTM C494 and ASTM C1017 as needed to improve pumpability, to control time of set and to reduce bleeding.
 7. Fluidifier: Use fluidifier meeting ASTM C937 as necessary to hold solid constituents in suspension. Add shrinkage compensator if necessary.
 8. Performance additive: Use flowable fill performance additive, if needed, to control fill properties.
- B. Flowable Fill Requirements:
1. Unconfined compressive strength: minimum 75 psi and maximum 150 psi at 56 days as determined based on an average of three tests for same placement. Present at least three acceptable strength tests for proposed mix design in mix design report.
 2. Placement characteristics: self-leveling.
 3. Shrinkage characteristics: non-shrink.
 4. Water bleeding for fill to be placed by grouting method in pipes: not to exceed 2 percent according to ASTM C940.
 5. Minimum wet density: 90 pounds per cubic foot.
- C. Grout Plugs
1. Cement-based dry-pack grout conforming to ASTM C1107, Grade B or C.

PART 3: EXECUTION

3.01 REQUIREMENTS BY PIPE LOCATION, SIZE, AND DEPTH

- A. Pipes indicated on the Drawings to be abandoned in place shall be completely filled with flowable fill.
- B. Sewer laterals indicated on the Drawings to be abandoned in place shall not be filled with any flowable fill. Sewer laterals to be abandoned shall be cut at the ends and plugged or capped.
- C. Pipes under structures, waterways, roads, railroad tracks, rail right-of-ways, or similar surface obstructions, and depth or diameter. Pipes indicated on the Drawings to be abandoned in place shall be completely filled with flowable fill.
- D. No existing pipeline facility shall be abandoned until all new facilities serving the same area are in operation and as authorized by the Construction Manager. In the case of water or sewer pipeline that are to be removed due to conflicts with new

work, the existing pipelines may be removed after the bypass system has been installed and tested.

- E. Where existing pipe is to be abandoned, the Contractor shall cut back the abandoned pipe for a distance of five feet from any connecting structure. All holes at the existing structures shall be repaired. The abandoned pipe shall be filled with CLSM or approved alternate pumpable mix design and capped or plugged with at least a 2 foot depth of concrete at both ends prior to backfill.

3.02 PREPARATION

- A. Notify inspector at least 24-hours in advance of grouting with flowable fill.
- B. Select fill placement equipment and follow procedures with sufficient safety and care to avoid damage to existing underground utilities and structures. Operate equipment at pressure that will not distort or imperil portions of the work, new or existing.
- C. Cut and cap portions of the piping system to remain, as shown on the Drawings. Drain water mains to be abandoned.
- D. Clean sewer lines and video to identify connections and locate obstructions. Locate previously unidentified connections which have not been redirected or reconnected as part of the work and report them to the Project Manager. During placement of fill, compensate for irregularities in sewer pipe, such as obstructions or open joints, to ensure no voids remain unfilled.
- E. Perform demolition work prior to starting fill placement. Clean placement areas for pipes and manholes of debris that may hinder fill placement. Remove excessive amounts of sludge and other substances that may degrade performance of the fill. Do not leave sludge or other debris in place if filling more than 2 percent of placement volume. Dispose of waste material in accordance with applicable codes and regulations.
- F. Remove free water prior to fill placement.

3.03 EQUIPMENT

- A. Mix flowable fill in automated batch plant and deliver it to site in ready-mix trucks. Performance additives may be added at placement site if required by mix design.
- B. Use concrete or grout pumps capable of continuous delivery at planned placement rate.

3.04 DEMOLITION OF SEWER MANHOLES PRIOR TO ABANDONMENT

- A. Remove manhole frames and covers and castings and dispose or recycle as applicable. Obtain City approval before reusing frames and covers within the work.
- B. Demolish and remove precast concrete rings to the depth indicated on the plans. Minimum depth of removal shall be 3-feet below finished grade, or 12-inches below any crossing utility, whichever is greater.

3.05 INSTALLATION OF FLOWABLE FILL

- A. Abandon pipelines, as required in Part 3, Paragraph 3.01, by completely filling with flowable fill. Abandon manholes by filling the portion not removed with flowable fill.
- B. Place flowable fill equal to volume of pipe being filled. Continuously place flowable fill from manhole to manhole with no intermediate pour points, but not exceeding 500 linear feet of pipe per fill segment.
- C. Perform operation with experienced crews with equipment to monitor density of flowable fill and to control pressure.
- D. Temporarily plug or cap pipe segments which are to remain in operation during filling to keep lines free of flowable fill.
- E. Pump flowable fill through bulkheads or use other suitable construction methods to contain flowable fill in lines to be abandoned.
- F. Place flowable fill under pressure flow conditions into properly vented open system until flowable fill emerges from vent pipes. Pump flowable fill with sufficient pressure to overcome friction. Fill sewers from the downstream end to vent at upstream end.
- G. Backfill excavations per Section 02223, Trenching, Backfilling, and Compacting.
- H. Collect and dispose of excess flowable fill material and debris.

3.06 INSTALLATION OF GROUT PLUGS

- A. Abandon pipelines of diameter 8-inches and below, as required in Part 3, Paragraph 3.01, by cutting and placing grout plugs.
- B. Clean inside surface of pipe at least 12-inches from ends, achieving firm bond and seal grout plug to pipe surface. Similarly, clean and prepare exterior surface if manufactured cap is to be used.
- C. Place temporary plug or bulkhead approximately 12-inches inside pipe. Fill pipe end completely with dry-pack grout mixture.
- D. Backfill excavations per Section 02223, Trenching, Backfilling, and Compacting.
- E. Collect and dispose of excess grout material and debris.

3.07 QUALITY CONTROL

- A. Provide batch plant tickets for each truck delivery of flowable fill. Note on tickets addition of admixtures at site.
- B. Check flow characteristics and workability of fill as placement proceeds.
- C. Obtain at least three test cylinders for each placement area for determination of 56-day compressive strength and bleeding. Acceptance of placement will be based on average strength of three tests.
- D. Record volume of flowable fill placement to demonstrate that voids have been filled. If voids exceed 10% of pipeline volume, injection grouting may be required at the direction of the Project Manager.

3.08 PROTECTION OF PERSONS AND PROPERTY

- A. Provide safe working conditions for employees throughout demolition and removal operations. Observe safety requirements for work below grade.
- B. Maintain safe access to adjacent property and buildings. Do not obstruct roadways, sidewalks, or passageways adjacent to the work.

END OF SECTION

SECTION 02223

TRENCHING, BACKFILLING, AND COMPACTING

PART 1: GENERAL

1.01 DESCRIPTION

The work of this section consists of trenching and backfilling for the construction and installation of pipelines, conduits, and cables. All trenching will be open cut, unless otherwise approved in writing. It includes all clearing and grubbing, trenching or tunneling, construction of cribbing and cofferdams, dewatering, incidental work, and providing specified backfill.

Excavated soil at the site will generally be suitable for use as backfill above the pipe zone provided it does not contain deleterious matter, vegetation or cementations larger than 3 inches in maximum dimension. Pipe zone materials (bedding shading, etc.) shall conform to the requirements of the pipe manufacturer or utility authority, as appropriate and will likely consist of imported aggregate or sand.

Temporary excavation, sloping, and shoring shall be per Section 02400.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 01300: Submittals
- B. Section 01666: Testing of Gravity Sewer Lines and Manholes
- C. Section 02200: Earthwork
- D. Section 02225: Structure Excavation and Backfill
- E. Section 02510: Paving and Road Surfacing
- F. Section 03100: Concrete

1.03 SUBMITTALS

- A. Submit an electronic copy of a report from a testing laboratory verifying that backfill material conforms to the specified gradations of characteristics for granular material, imported sand, rock refill for foundation stabilization, and water.
- B. Submit method of compaction in pipe zone, including removal sequence of shoring where used.
- C. Provide written description of barricading, shoring, cribbing, bracing, and sloping precautions.

1.04 PROJECT CONDITIONS

- A. Obtain all required permits and licenses before installing utilities under existing roads, other than City roads, and follow the rules and requirements of the authority having jurisdiction.

- B. Arrange construction sequences to provide the shortest practical time that the trenches will be open to avoid hazard to City staff, subcontractors, and the public, and to minimize the possibility of trench collapse.

1.05 TESTING FOR COMPACTION

- A. The Contractor shall test for compaction every 100 feet at locations determined by the Engineer.
- B. Relative compaction is defined as the ratio, as a percentage, of the as-compacted dry density to the laboratory maximum dry density. The laboratory maximum dry density is defined in accordance with ASTM D1557, latest edition.
- C. Where compaction tests indicate a failure to meet the specified compaction, the Contractor will take additional tests every 50 feet in each direction until the extent of the failing area is identified. Rework the entire failed area until the specified compaction has been achieved.

1.06 STREET ZONE

The street zone includes the asphalt concrete and aggregate base pavement section placed over the trench backfill.

1.07 TRENCH ZONE

The trench zone includes the portion of the trench from the top of the pipe zone to the bottom of the street zone in paved areas or to the existing surface in unpaved areas.

1.08 PIPE ZONE

The pipe zone shall include the full width of trench from the bottom of the pipe or conduit to a horizontal level above the top of the pipe, as shown on the contract drawings. Where multiple pipes or conduits are placed in the same trench, the pipe zone shall extend from the bottom of the lowest pipes to a horizontal level above the top of the highest or topmost pipe.

1.09 EXCAVATION BOTTOM CONDITIONS

Based on conditions encountered in our exploratory borings, materials exposed at the base of excavations are expected to be variable ranging from lean clay with sand and gravel to silty sand with gravel.

Generally, some form of excavation bottom stabilization will be necessary where wet, unstable soils are exposed. Since we do not know the extent of potential locally soft or unstable areas, our field representative shall provide mitigation recommendations in the field at the time of construction. Typical mitigation alternatives include overexcavation and replacement with a gravel mat wrapping in geosynthetic fabric to provide a stable bottom.

The weight of pipe, contents and compacted backfill above the pipe will not result in significant increased load over present overburden. Assuming soft and/or unsuitable subgrade areas are mitigated, pipeline settlement shall be negligible.

1.10 PIPE BEDDING

All earthwork operations shall be observed, and all fills tested for recommended compaction and moisture content by a geotechnical inspector.

Pipe zone materials (bedding, shading, etc.) shall conform to the requirements of the City and/or pipe manufacturer, as appropriate, and will likely consist of imported aggregate or sand.

The pipe base or bedding shall be defined as a minimum 6-inches thick layer of material immediately below the bottom of the pipe or conduit and extending over the full trench width in which the pipe is bedded.

Trench backfill shall be mechanically compacted. Flooding or jetting will not be allowed. Backfill shall be placed in lifts 12 inches or less in loose thickness, moisture-conditioned above optimum moisture content, and compacted to at least 90% relative compaction. Excavated soils may require drying prior to placement.

PART 2: MATERIALS

2.01 GRANULAR MATERIAL FOR BACKFILL - STREET ZONE

Granular material or granular soil for backfill used above the pipe zone shall be Class 2 Aggregate Base conforming to City Improvement Standards.

2.02 PIPE BASE AND PIPE ZONE

Granular material or granular soil for backfill used in the pipe base and pipe zone shall be 3/8-inch crushed rock.

2.03 PIPE ZONE MATERIAL ALTERNATIVE - NOT USED

2.04 TRENCH ZONE MATERIAL

Trench zone material shall consist of native material conforming to engineered fill, in accordance with Section 02200.

2.05 CEMENT SLURRY - PIPE BASE AND PIPE ZONE ALTERNATIVE

Cement slurry backfill shall consist of Type I or II Portland cement, imported sand, and sufficient water for workability, per the most recent Caltrans Standard Specification 19-3.062. The mix shall produce a minimum 28-day strength of 50 PSI and 1×10^{-6} cm/sec permeability. Submit a mix design and confirming test results per Section 01300.

2.06 CONCRETE FOR PIPE ENCASEMENT AND THRUST BLOCKS

- A. Concrete for pipe encasement and thrust blocks shall be per Section 03100, unless otherwise shown in the drawings.
- B. Provide thrust blocks at fittings in pipe having rubber gasket bell and spigot or unrestrained mechanical joints as directed by the Engineer. Provide thrust blocks at all tees and elbows 45° and greater, or as noted on contract plans and in the general or specific pipe specifications.

- C. Size thrust block bearing area for 1500 psf. Size thrust blocks based on the test pressures provided in the contract documents.

2.07 WATER FOR COMPACTION

Water for compaction shall be clean and free of oil, acids, salts, and other deleterious substances. Water shall be supplied by the Contractor at no additional expense to the Owner. The Contractor shall coordinate with the Engineer for the use of the water, shall provide all necessary labor and equipment to extract the water, and shall be responsible for the repair of any damage to the existing facilities which can be attributed to this operation.

PART 3: EXECUTION

3.01 COMPACTION REQUIREMENTS

Unless otherwise shown in the drawings or otherwise described in the specifications for the particular type of pipe installed, relative compaction in pipe trenches shall be as follows:

- A. Pipe Base: 95% relative compaction.
- B. Pipe Zone: 95% relative compaction.
- C. Backfill in Trench Zone not Beneath Paving or Aggregate Base Access Roadways: 90% relative compaction.
- D. Backfill in Trench Zone to Street Zone in Paved Areas or Within Limits of Aggregate Base Roadways: 95% relative compaction.
- E. Backfill in Street Zone in Paved Areas or within Limits of Aggregate Base Roadways: 95% of relative compaction.
- F. Refill for Foundation Stabilization: 95% relative compaction.
- G. Refill for Over-excavation: 95% relative compaction.

3.02 MATERIAL REPLACEMENT

Remove and replace any trenching and backfilling material which does not meet the specifications, at the Contractor's expense.

3.03 SLOPING, SHEETING, SHORING, AND BRACING OF TRENCHES

Trenches shall have sloping, sheeting, shoring, and bracing conforming with 29CFR1926, Subpart P – Excavations, CAL/OSHA requirements, and Section 02400.

3.04 SIDEWALK, PAVEMENT, AND CURB REMOVAL

Cut bituminous and concrete pavements regardless of the thickness and curbs and sidewalks prior to excavation of the trenches with a pavement saw or pavement cutter. Width of the pavement cut shall be at least equal to the required width of the trench at ground surface. Haul pavement and concrete materials from the site. Do not use for trench backfill.

3.05 TRENCH WIDTHS

Trench widths in the pipe zone shall be as shown in the drawings. If no details are shown, maximum width shall be 24 inches greater than the pipe outside diameter. Comply with 29CFR Part 1926 Subpart P – Excavations. Trench width at the top of the trench will not be limited except where width of excavation would undercut adjacent structures and footings. In such case, width of trench shall be such that there is at least 2 feet between the top edge of the trench and the structure or footing.

3.06 TRENCH EXCAVATION

Excavate the trench to the lines and grades shown in the drawings with allowance for pipe thickness, sheeting and shoring if used, and for pipe base or special bedding. If the trench is excavated below the required grade, refill any part of the trench excavated below the grade at no additional cost to the Owner with foundation stabilization material. Place the refilling material over the full width of trench in compacted layers not exceeding 6-inches deep to the established grade with allowance for the pipe base or special bedding.

3.07 DEWATERING

- A. Provide and maintain means and devices to remove and dispose of all water entering the trench excavation during the time the trench is being prepared for the pipelaying, during the laying of the pipe, and until the backfill at the pipe zone has been completed. These provisions shall apply during the noon hour as well as overnight. Dispose of the water in a manner to prevent damage to adjacent property and in accordance with regulatory agency requirements. Do not drain trench water through the pipeline under construction. Do not allow groundwater to rise around the pipe until jointing compound has set hard.

3.08 LOCATION OF EXCAVATED MATERIAL

During trench excavation, place the excavated material only within the working area. Do not obstruct any roadways or streets. Conform the federal, state, and local codes governing the safe loading of trenches with excavated material. All trenches shall be backfilled at the end of each day's operation. Trench patching with asphalt concrete shall be completed within 24 hours of trench backfill.

3.09 LENGTH OF OPEN TRENCH

Limit the length of open trench to 50 feet in advance of pipe laying or amount of pipe installed in one working day, whichever is less, and not more than 50 feet in the rear of pipe laying, except as modified by encroachment permit requirements. At the end of each working day, the trench shall be backfilled to match existing surface.

3.10 TRENCH EXCAVATION IN BACKFILL AND EMBANKMENT AREAS

- A. Construct trench excavation for pipe, pipes, or conduit in backfill or embankment areas in accordance with the following procedures:
- B. Construct and compact the embankment to an elevation of 1-foot minimum over the top of the layer of the largest pipe or conduit to be installed.

- C. Excavate trench in the compacted backfill or embankment. Place cement slurry in the pipe base and pipe zone. Compact backfill above the pipe zone to the relative compaction required for trench zone backfill.

3.11 FOUNDATION STABILIZATION

- A. After the required excavation has been completed, the Owner and/or Agency will inspect the exposed subgrade to determine the need for any additional excavation. It is the intent that additional excavation is conducted in all areas within the influence of the pipeline where unacceptable materials exist at the exposed subgrade. Over-excavation shall include the removal of all such unacceptable materials that exists directly beneath the pipeline to the required trench width and to the depth required. Backfill the trench to sub-grade of pipe base with fill material adequate for foundation stabilization. Place the foundation stabilization material over the full width of the trench and compact in layers not exceeding 6-inches deep to the required grade. Foundation stabilization work above and beyond the recommended stabilization of bedding and foundation preparation in this section and Section 02225 may be executed in accordance with a change order. Any claims relating to this work without prior written authorization will be at the contractor's expense.
- B. Refill used by the Contractor for his convenience will not receive any additional payment.

3.12 INSTALLING BURIED PIPING

- A. Backfill per the detailed piping specification for the particular type of pipe and per the following.
- B. Handle pipe in such a manner as to avoid damage to the pipe. Do not drop or dump pipe into trenches under any circumstances.
- C. Inspect each pipe or fitting prior to placing into the trench. Inspect the interior and exterior protective coatings. Patch damaged areas in the field with material recommended by the protective coating manufacturer. Clean ends of pipe thoroughly. Remove foreign matter and dirt from inside of pipe and keep clean during and after installation.
- D. Grade the bottom of the trench to the line and grade to which the pipe is to be laid, with allowance for pipe thickness and bedding depth. Remove hard spots that would prevent a uniform thickness of bedding. Place the specified thickness pipe base material over the full width of trench. Grade the top of the pipe base ahead of the pipe laying to provide firm, continuous, uniform support along the full length of pie, and compact to the relative compaction specified herein. After laying each section of the pipe, check the grade and alignment and correct any irregularities prior to laying next joint.
- E. Excavate bell holes at each joint to permit proper assembly and inspection of entire joint. Fill the area excavated for the joints with the bedding material specified or detailed in the drawings.
- F. When installing pipe, do not deviate more than 1-inch from line or 1/4 -inch from grade. Measure elevation at the pipe invert. The Contractor shall verify pipe grade at not more than 80 feet intervals, in the presence of the Owner's Representative.

- G. After pipe has been bedded, place pipe zone material simultaneously on both sides of the pipe, in maximum 6-inch lifts, keeping the level of backfill the same on each side. Carefully place the material around the pipe so that the pipe barrel is completely supported and that no voids or compacted areas are left beneath the pipe. Use particular care in placing material on the underside of pipe to prevent lateral movement during subsequent backfilling.
- H. For pipe sizes greater than 12-inches in diameter, no more backfill material than the lesser of 6-inches or 1/3rd of the pipe diameter shall be placed prior to shovel slicing. Sufficient care shall be taken to prevent movement of the pipe during shovel slicing. Shovel slicing shall be witnessed by the Field Inspector and/or Geotechnical Engineer.
- I. Compact each lift to the relative compaction specified herein.
- J. Push the backfill material carefully onto the backfill previously placed in the pipe zone. Do not permit free fall of the material until at least 2 feet of cover is provided over the top of the pipe. Do not drop sharp, heavy pieces of material directly onto the pipe or the tamped material around the pipe. Do not operate heavy equipment over the pipe until at least 3 feet of backfill has been placed and compacted over the pipe.
- K. When pipe laying is not in progress, including the noon hours, close the open ends of pipe. Do not allow trench water, animals, or foreign material to enter the pipe.
- L. Remove and dispose of all water entering the trench during the process of pipe laying. Keep the trench dry until the pipe laying and jointing are completed.

3.13 BACKFILL COMPACTION

Compact per the detailed piping specification for the particular type of pipe and per the following:

- A. Compact trench backfill to the specified relative compaction. Compact by using mechanical compaction or hand tamping. Do not use high impact hammer-type equipment except where the pipe manufacturer warrants in writing that such use will not damage the pipe. Ponding or jetting is not allowed.
- B. Compact material placed within 12-inches of the outer surface of the pipe by hand tamping only.
- C. Do not use any axle-driven or tractor-drawn compaction equipment within 5 feet of building walls, foundations, or other structures.

3.14 CEMENT SLURRY BACKFILL

When cement slurry backfill is utilized, pipe shall be supported by mounding imported backfill material or sandbags filled with imported backfill material. Pipe shall not be supported on wooden or concrete blocks.

END OF SECTION

SECTION 02225

STRUCTURE EXCAVATION AND BACKFILL

PART 1: GENERAL

1.01 DESCRIPTION

The work of this section consists of all structure excavation and backfill required to complete the work, including rock excavation and furnishing select or imported backfill. It includes disposal of surplus or unsuitable material.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 01300: Submittals
- B. Section 02200: Earthwork
- C. Section 02223: Trenching, Backfilling, and Compacting

1.03 QUALITY ASSURANCE

Evaluation of all fill materials and testing required to determine compliance for the work of this section will be the responsibility of the Contractor and at the Contractor's expense. Areas where test results indicate noncompliance shall be corrected before placing additional backfill.

1.04 PROJECT CONDITIONS

Excavations should be performed carefully to avoid damaging existing underground utilities and adjacent structures. Adjacent improvements should be monitored by the Contractor so that excavation methods and support systems can be modified in a timely manner, if surface deflections are observed.

Take necessary precautions to prevent the entrance of soils and other materials into streambeds, lakes, or water courses.

1.05 RELATIVE COMPACTION TEST

- A. The Contractor will test for compaction every 100 square feet at locations determined by the Engineer.
- B. Relative compaction is defined as the ratio, in percent, of the as-compacted dry density to the laboratory maximum dry density. The laboratory maximum dry density is defined in accordance with ASTM D1557, latest edition.
- C. Where compaction tests indicate a failure to meet the specified compaction, the Contractor will take additional tests every 50 square feet in each direction until the extent of the failing area is identified. Rework the entire failed area until the specified compaction has been achieved.

PART 2: MATERIALS

2.01 ENGINEERED FILL

See Section 02200 for Material Requirements.

2.02 CRUSHED ROCK

Material shall be crushed rock of one-inch (1") maximum size, with no material passing a Number four (#4) sieve.

2.03 AGGREGATE BASE

Aggregate base shall be Class 2 aggregate base, ¾" maximum as specified in Section 26 of the most recent California Department of Transportation Standard specifications.

2.04 DRAIN ROCK

Drain rock shall be Class 1, Type B permeable material as specified in Section 68 of the most recent California Department of Transportation Standard specifications.

2.05 DRAIN ROCK FABRIC

Drain rock fabric shall be non-woven geotextile fabric.

PART 3: EXECUTION

3.01 CLEARING

Perform clearing operations in accordance with Section 02100.

3.02 STRUCTURAL EXCAVATION

A. General: All excavation for structures shall be done to the dimensions and levels indicated on the drawings or specified herein.

1. Under all structures, the Contractor shall:

- a. Excavate to sub-grade, remove and dispose of organic material and unsuitable soils.
- b. Scarify the surface a minimum depth of 8 inches; bring the moisture content to at least 3 percent above optimum and compact to not less than 90 percent relative compaction.
- c. Place Engineered Fill in 8-inch maximum lifts to obtain sub-grade elevations. Compact to not less than 95 percent relative compaction and at a moisture content of at least 2 percent above optimum.

2. Under all pavements, the Contractor shall:

- a. Excavate to below sub-grade, remove and dispose of organic material and unsuitable soils.
- b. Scarify the surface a minimum depth of 12 inches; bring the moisture content to at least 3 percent above optimum and compact to not less than 95 percent relative compaction.
- c. Place Engineered Fill in 8-inch maximum lifts to obtain sub-grade elevations. Compact to not less than 95 percent relative compaction and at a moisture content of at least 2 percent above optimum.

Excavation shall be made to such width outside the lines of the structure to be constructed therein as may be required for proper working methods, the erection of forms and the protection of the work. Care shall be taken to

preserve the foundation surfaces shown on the drawings in an undisturbed condition. If the Contractor excavates or disturbs the foundation surfaces shown on the drawings or specified herein without written authorization of the Engineer he shall replace at his expense such foundations with compacted gravel foundation fill or other material approved by the Engineer in a manner which will show by test an equal bearing strength with the undisturbed foundation material.

- B. Bracing, Sheeting, and Shoring: Care shall be exercised in excavating for lower footings not to disturb bearing under higher adjacent footings or structures. Existing structures and pipework shall be adequately braced and cared for so that no damage will result. The Contractor shall submit structural calculations and drawings signed and sealed by a civil engineer registered in the State of California showing members, connections, and anchorage of the proposed bracing, sheeting, and shoring. The Contractor shall provide suitable sheeting and shoring, where necessary, for protection of the excavations. All such sheeting and shoring shall be removed unless otherwise specifically authorized.
- C. Unsuitable Materials: To suit field conditions, excavation below the depths shown may be ordered, but changes may only be made as directed. Soft, spongy, or unsuitable bearing material of any kind shall be entirely removed down to solid bearing soil and replaced with an engineered fill as specified herein. In such event only the excess excavation and fill will be paid for as extra work.
- D. Dewatering: Any water that may be encountered or that may accumulate in excavations shall be removed and kept out by pumping or other approved methods, and all construction shall be carried on in the dry. Water shall be kept down until structures are complete to above water, safe from uplift and horizontal water pressure and the backfill has been placed.
- E. Approval of Excavation: The Contractor shall notify the Engineer when excavation for a structure is complete and no forms, reinforcing steel or concrete, shall be placed until the excavation has been deemed acceptable by the Engineer. Once the excavation is deemed acceptable, the Contractor must protect the work from flooding or groundwater uplift.
- F. Disposal of Waste Excavation: Excavated material determined by the Engineer to be unsuitable, or in excess of the amounts required for backfill shall be disposed off-site at no additional cost to the Owner.

3.03 ENGINEERED FILL

- A. General: All soil under structures, pavements, and at other locations where indicated on the drawings shall be made using Engineered Fill sub-base, carefully controlled and compacted on a prepared surface.
- B. Surface Preparation: The surface on which fill is to be placed shall be free of all vegetation, debris, or other objectionable material, and all large roots shall be grubbed out to a depth of at least 2 feet below footing, slab, or pavement elevations and 5 feet beyond the limits of the proposed improvements. The surface shall be scarified to a depth of 12 inches, brought to a moisture content of optimum plus approximately 2 percent. It may be necessary to adjust the moisture content of the sub-grade soil by watering or aeration to bring the moisture content of the soil near optimum in order that the specified densities can be obtained.
- C. Placement of Fill:

1. Fill materials shall be spread in a maximum of 8-inch lifts and shall have uniform moisture content that will provide the specified dry density after compaction. If necessary to obtain uniform distribution of moisture, water shall be added to each layer by sprinkling and the soil disced, harrowed, or otherwise manipulated after the water is added. If the material is too wet, the moisture content shall be reduced as necessary by spreading and aerating.
2. Field density tests shall be used to check the compaction of the fill materials. Sufficient tests shall be made on each layer by the Engineer to assure adequate compaction throughout the entire area. If the dry densities are not satisfactory, the contractor will be required to increase the weight of the roller or the number of passes as required to produce the specified densities.
3. Where trenches must be excavated in Engineered Fill these trenches shall be backfilled with the fill materials excavated. The backfill shall be placed in 6 inch layers and each layer compacted with pneumatic tampers to provide densities as specified above. Backfill placed adjacent to walls shall be placed in a similar manner to that specified for backfill in excavated trenches.
4. No fill shall be placed during weather conditions which will alter the moisture content of the fill materials sufficiently to make adequate compaction impossible. After placing operations have been stopped because of adverse weather conditions, no additional fill material shall be placed until the last layer compacted has been checked and found to be compacted to the specified densities.

3.04 BACKFILL AGAINST STRUCTURES

Material for filling and backfilling around structures shall meet the requirements for Engineered Fill. Should the material available from excavation be insufficient or unsuitable for the required use, the Contractor shall furnish and place suitable material. Do not place backfill against newly constructed concrete structures for a period of 14 days unless authorized by the Engineer. Hand operated compactors shall be used for backfilling against concrete walls within a horizontal distance of H/2 of the structure, where H is defined as the vertical height of the backfill above the foundation. Backfill shall be placed in even, uniform lifts around the structure.

3.05 TEMPORARY EXCAVATION SLOPES

Based on the conditions encountered in exploratory borings, including shallow groundwater and zones of granular soil type the site may be considered OSHA "Type C". The Contractor shall have an OSHA-approved competent person onsite during excavation and pipe placement to evaluate trench/excavation conditions and to make appropriate recommendations where necessary.

Sloughing and caving should be anticipated, particularly in area with seepage zones of poorly grade, cohesionless sands. Flatter slopes, shoring, or safety shields may be needed in areas where sloughing raveling or running is likely. The Contractor shall have equipment readily available to flatten slopes or install shoring if necessary. Loose or easily erodible soils may be present locally and should be removed from excavation faces before personnel begin work below the slopes. In addition, stockpiled materials, equipment and other surcharge loads should be kept back a minimum distance from the top of the trench equal to the depth of the excavation.

3.06 EXCAVATION BOTTOM CONDITIONS

Based on conditions encountered in our exploratory borings, materials exposed at the base of excavations are expected to be variable ranging from lean clay with sand and gravel to silty sand with gravel.

Generally, some form of excavation bottom stabilization will be necessary where wet, unstable soils are exposed. Since we do not know the extent of potential locally soft or unstable areas, our field representative shall provide mitigation recommendations in the field at the time of construction. Typical mitigation alternatives include overexcavation and replacement with a gravel mat wrapping in geosynthetic fabric to provide a stable bottom.

The weight of pipe, contents and compacted backfill above the pipe will not result in significant increased load over present overburden. Assuming soft and/or unsuitable subgrade areas are mitigated, pipeline settlement should be negligible.

END OF SECTION

SECTION 02400
SHEETING, WALING, AND SHORING

PART 1: GENERAL

1.01 DESCRIPTION

The work of this section covers protective installations consisting of shores, wales, braces, posts, piling, sheeting, anchorages and fastenings required for the work of this project.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 01330: Submittals
- B. Section 02223: Trenching, Backfilling, and Compaction

1.03 QUALITY ASSURANCE

Design Criteria. Contractor shall design and construct temporary and permanent sheeting, shoring, and cofferdams, which are to be used as an aid in construction and portions shall be left in permanently to prevent sediment scour. Design shall be prepared in conformance with applicable requirements of Article 6, "Excavations, Trenches, Earthwork" of Construction Safety Orders of California State Division of Occupational Health and Safety. In addition, sheet piling design shall be based on the material requirements specified herein. Sloping of excavations shall not be employed below the groundwater or maximum aqueduct water elevation. Designs shall be prepared and signed by a Civil Engineer registered in the State of California and shall be based on the stresses for various materials of construction contained in the Uniform Building Code 1994 Edition and latest supplement. The allowable stresses permitted by the Uniform Building Code may be increased 15 percent for temporary shoring used as an aid to construction.

1.04 SUBMITTALS

- A. In accordance with Section 01300.
- B. Submit to the Engineer for record purposes copies of the drawings and calculations used to determine the strength, size, and stability of the protective installations. All designs submitted under this section shall be signed by a Structural or Civil Engineer duly registered in the State of California.
- C. Prior to the start of any work involving sheeting and bracing, the Contractor shall obtain a valid excavation permit from the Cal OSHA District office as required. A copy of the permit and all accompanying drawings, data, and calculations shall be submitted to the Engineer for record purposes only and not for review or approval.

1.05 ALTERNATIVES

The use or application of alternative methods and materials, and the employment of propriety systems under lease or franchise in lieu of that specified herein, may be allowed. Demonstration of suitability and compliance with these specifications and approval of the Owner shall be required.

PART 2: PRODUCTS

2.01 MATERIALS

A. Sheet Piling

1. Sheeting shall be continuous interlock type. Steel sheeting shall be made in accordance with ASTM A857 from steel meeting the requirements of ASTM A570, Grade 30. Sheeting shall be hot-dipped galvanized per ASTM A123 at a rate of two ounces per square foot total both sides. The sides of each piece of sheeting shall be furnished with an interlock that is continuous for the full length of the sheeting. The interlock shall have an opening of sufficient width to allow free slippage of the adjoining sheet. Sheeting shall be "Metric Sheeting" as manufactured by Contech Construction Products, Inc, or approved equal.
2. Dimensions and Section Properties. Steel sheet piling used for cofferdams or shall be standard rolled metric sections. The sheeting shall be galvanized after fabrication and have the minimum physical and sectional properties; Physical Properties: 5 gauge (0.209 inches), Sectional Properties: Modulus – 6.28 in³, Moment of Inertia – 11.04 in⁴.

PART 3 – EXECUTION

3.01 INSTALLATION

- #### **A. General.**
- Install sheeting and bracing for trench and structure excavation as the work requires. Butt planks to and/or interlock sheets to exclude groundwater and fines, preventing the erosion of voids outside sheeting. In soft, wet ground drive sheeting to a lower level as excavation progresses so that sheeting is embedded in undisturbed earth. Bracing of sheet piling may be permitted to penetrate the structural concrete only as approved by the Engineer. Refer to Section 03100. Install wales and struts at close intervals so as to prevent displacement of the surrounding earth and to maintain safe conditions in the work area. Any damage proven to result from improper installation shall be the responsibility of the Contractor.

Temporary sheeting for trench and structure excavation may be removed and re-used. Withdraw individual planks alternatively as the backfill is raised, maintaining sufficient sheeting and bracing to protect the work and workmen. Remove bracing completely. Where unstable conditions occur in the underlying strata from any cause, and withdrawal of sheeting will endanger the work, a portion of the sheeting, including bracing, may be left in place with approval of

the Owner. Remove all wood within a zone extending to four (4) feet below finished grade. Leaving such material in place shall not be cause of an increase in Contract in price.

- B. Sheet Piling. The Contractor has the option of using steel sheet piling for temporary protective installations. All piling installations shall be continuous.
1. Installation of Sheet Piling. Depth of piling shall be sufficient to prevent heave when the trench is dewatered. Piles shall be driven with a hammer with an adequate capacity to complete pile driving without changing hammers. The use of air or water jets to assist in driving the sheet piling will be permitted, providing that the last 5 feet of advance is by driving. Piles shall be driven accurately to the lines and grades shown or required, with each section interlocked with the sheet piles driven previously. To ensure proper alignment of the sheet piles, a driving template or jig shall be used. If any pile is damaged during driving, it shall be removed and replaced. If piles are driven out of interlock or are not properly plumbed or aligned, the piles shall be pulled and re-driven.
 2. Prevention of Damage. In installing, cutting off, or removing sheet piles, every precaution shall be taken to ensure that damage to the structure or pipeline does not occur. If damage does occur, the Contractor shall perform the necessary repairs at his own expense.

3.02 PROTECTION OF EXISTING FACILITIES

It is the Contractor's responsibility to protect existing facilities from the consequences of his work. Where any sloped excavation infringes on or potentially endangers any existing facilities or structures, provide shoring, sheeting, and bracing according to shop drawings and calculations signed and stamped by a structural or civil engineer registered in the State of California.

END OF SECTION

SECTION 02510

PAVING AND ROAD SURFACING

PART 1: GENERAL

1.1 SECTION INCLUDES

- A. Contractor furnished labor, materials, equipment, and incidentals necessary to construct paving shown on the Plans, and/or specified herein. The work shall include, but not necessarily be limited to, scarifying and preparing the subgrade, placing and compacting engineered fill materials, placing and compacting Class 2 aggregate base, applying paint binder, placing and compacting asphalt concrete, and all related works.

1.2 REFERENCED SECTIONS

- A. The following Sections are referenced in this Section
1. Section 01300: Submittals
 2. Section 02200: Earthwork

1.3 SUBMITTALS

- A. Contractor shall submit the following information:
1. Manufacturer's Data or Certificate of Compliance
 - a. Aggregate base
 - b. Prime coat and paint binder
 - c. Asphalt concrete
 - d. Independent test laboratory name
 2. Certificate of compliance
 - a. A certificate of compliance signed by the manufacturer shall be furnished prior to the use of any asphalt materials.
 - b. The certificate shall state that the material complies with the requirements of these Specifications.
 - c. A certificate shall be furnished with each lot of material delivered to the site; the material provided shall be clearly identified in the certificate.
 - d. Certificates of compliance shall be provided for each type of asphalt product used.

1.4 REFERENCE PUBLICATIONS

Reference	Title
ASTM D2922	Density of Soil and Soil Aggregate in Place by Nuclear Methods
ASTM D3017	Moisture Content of Soil and Soil Aggregate Place by Nuclear Methods

PART 2: MATERIALS

2.1 ENGINEERING FILL

- A. Engineered fill shall be per these Specifications.

2.2 CLASS 2 AGGREGATE BASE

- A. Class 2 aggregate base shall meet all requirements of the most recent Caltrans Standard Specification Section 26-1.02 A for ¾-inch maximum grading.

2.3 PAINT BINDER (TACK COAT)

- A. The paint binder (tack coat) shall meet all the requirements of the most recent Caltrans Standard Specification Section 94.

2.4 HOT MIX ASPHALT

- A. Asphalt concrete shall meet the requirements of the most recent Caltrans Standard Specification for Type A Hot Mix Asphalt (1/2-inch maximum aggregate, medium grading).
- B. The asphalt to be mixed with the aggregate shall meet the section of the most recent Caltrans Standard Specification Section 92 for PG 64-10 steam-refined paving asphalt.

2.5 HEADER BOARD

- A. Composite of recycled wood and plastic fibers.

PART 3: EXECUTION

3.1 FINAL GRADING

- A. The final grade of the hot mix asphalt shall vary not more than 0.05 foot from the elevations indicated on the Plans and shall conform to the requirements of the most recent Caltrans Standard Specification Section 39. All areas shall be graded to drain. All personnel pathways and areas shall conform to minimum slopes as required by ADA Standards.

3.2 SCARIFYING AND COMPACTING

- A. All the subgrade material underlying asphalt concrete surfacing shall be over excavated and filled per these specifications and compacted to a relative compaction of not less than ninety-five percent (95%).

3.3 IMPORTED FILL

- A. Imported fill material under paved areas shall be placed and compacted to a relative compaction of not less than ninety-five percent (95%) to a depth of 24 inches in accordance with these Specifications.

3.4 CLASS 2 AGGREGATE BASE

- A. Class 2 aggregate base shall be placed to depth as shown. Placement, moisturizing, spreading, and compaction of Class 2 aggregate base shall meet all

requirements of State Standard Specification Section 26, State Standard Specification Section 17, and the details on the Plans.

3.5 PAINT BINDER (TACK COAT)

- A. After the sub-base and aggregate base are placed, compacted, and tested, to the satisfaction of the Engineer, tack coat shall be applied in accordance with State Standard Specification Section 39.

3.6 HOT MIX ASPHALT

- A. Asphalt concrete shall be placed where indicated on the Plans to a total thickness as shown on the plans. Storing, proportioning, mixing, equipment, spreading, compacting, and miscellaneous asphalt concrete shall conform to the requirements of the most recent Caltrans Standard Specification Section 39, and the most recent Caltrans Standard Specification Section 22.

3.7 HEADER BOARD

- A. A header board shall be placed at all limits of paving not abutting a concrete structure. Attached to 12-inch plastic stakes at three feet on center with metal screws.

3.8 TESTING

- A. The Construction Manager will perform laboratory and the initial field testing for density, moisture, and compaction of the asphalt base. The Contractor shall pay for re-testing of locations failing to meet the specified compaction in the initial test. Test laboratory shall provide written reports on the following test methods:
- B. Moisture, density, and compaction per ASTM D2922 and D3017.

3.9 TRENCH RESTORATION WITHIN PAVED SECTION

- A. Trench restoration within paved sections shall conform to City Standard Detail ST-31.
- B. Roadway features such as brick sidewalks and crosswalks shall be replaced in kind during trench restoration.

END OF SECTION

SECTION 02601
MANHOLES AND CLEANOUTS

PART 1: GENERAL

1.01 DESCRIPTION

The work of this section consists of the furnishing of materials and constructing therewith new manholes and cleanouts as shown on the drawings.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 01300: Submittals
- B. Section 01666: Testing of Gravity Sewer Lines and Manholes
- C. Section 02223: Trenching, Backfilling, and Compacting
- D. Section 02225: Structure Excavation and Backfill
- E. Section 03100: Concrete

1.03 QUALITY ASSURANCE

Standards, American Association of State Highway and Transportation Officials (AASHTO) and American Society for Testing and Materials (ASTM).

1.04 SUBMITTALS

Shop Drawings and catalog cut sheets shall be submitted for manhole, frames and covers, precast manhole bases and sections, and joint sealer accordance with Section 01300.

PART 2: MATERIALS

2.01 FRAMES AND COVERS

- A. Manhole frames and covers shall be per City Standard Details, cast iron manhole frame and cover set, or approved equal.
- B. Horizontal surfaces of manhole cover seats and under surface of the seat cover which rests upon the frame shall be machined. After machining, it shall not be possible to rock any cover after it has been seated in any position in its frame. Manhole frames and covers shall be designed for heavy duty, H-20 traffic loading. All manholes shall be provided with a nominal 24-inch diameter cover unless otherwise noted on the drawings. Manhole frames shall be capable of receiving standard non-shifting manhole extension (riser) rings.

2.02 PRECAST CONCRETE MANHOLE SECTIONS

Manholes shall be constructed of precast reinforced manhole sections conforming to ASTM C478 and as shown. Precast concrete rings, cones, and flat slabs shall be manufactured by a process that will produce a dense, homogeneous concrete section of

first quality. The sections shall be steel reinforced and have a minimum wall thickness of four (4) inches. Cement used in manufacturing the sections shall be Type V, Portland cement, as specified in ASTM C150. Precast concrete sections, cones, and grade rings shall be joined using preformed joint sealant only. Use of mortar will not be allowed. All manholes shall have cast-in-place concrete bases and formed channels with inverts to match the adjoining pipes. Precast manhole base-blocks will not be allowed.

2.03 PRECAST MANHOLE BASES

Precast manhole bases as manufactured by Central Pre-Cast; Teichert Precast; Hanson Precast, or approved equal.

2.04 DESIGN LOADS

A. Vertical Loads: Design all precast manhole rings and accessories to support an AASHTO H-20 truck loading, in addition to soil weight above sloping ring sections and the dead load of all material supported above.

B. Lateral Loads: Lateral loads shall be as dictated by the following formula or the geotechnical report requirements, whichever are more stringent.

Operating: $95 \times H$ (psf) triangular equivalent fluid pressure for dead load plus a live load surcharge from an H-20 truck, including impact.

Seismic: $23 \times H^2$ (psf) uniform pressure distribution.

Where H = depth below finished grade.

2.05 CONES

All manhole cones shall be as shown on the plans and conform to ASTM designation C478.

2.06 JOINT SEALER

The joint sealer shall be Ram-Nek by K.T. Snyder Company, Inc.; Kent Seal No. 2, or approved equal.

2.07 CLEANOUTS - NOT USED

2.08 MORTAR

Mortar will not be allowed.

2.09 INTERIOR AND EXTERIOR COATINGS - NOT USED

2.10 MECHANICAL RUBBER SEAL

A. Modular, mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill the annular space between the pipe and the wall opening.

B. EPDM seal element suitable for service to 250 degrees F, except seal element shall be silicone or viton suitable for 300 degrees F for aeration piping.

C. Composite pressure plates.

- D. 316 stainless steel nuts and bolts.
- E. Thunderline Link-Seal, or equal.

PART 3: EXECUTION

3.01 SETTING BASES

- A. Construct to grades, lines and elevations shown on the drawings or staked in the field. Shape tops of the bases by means of accurate bell-ring forms to receive the barrel section. Wet setting is not permitted. Joint sealer shall be placed on the first joint after the Engineer has approved the manhole base for stacking. The concrete shall cure a minimum of 24 hours before stacking the barrel sections.

Pour foundations on 12-inches of compacted crushed rock wrapped in filter fabric. See plans for manhole details.

- B. Precast bases shall be installed in strict conformance with the manufacturer's written instructions, on a foundation of clean, undisturbed soil or native soil compaction to at least 95% maximum dry density and 6" of $\frac{3}{4}$ " crushed rock.

3.02 SETTING PRECAST SECTIONS

- A. Precast-reinforced concrete sections shall be set so as to be vertical and with sections in true alignment. Joints shall be primed and made with sealer applied in strict accordance with the manufacturer's printed instructions.

3.03 FIELD CONNECTIONS

- A. Openings for field connections shall be made with a motor-driven cutting tool which will provide a smooth round opening no more than 3 inches larger than the outside diameter of the pipe being connected. The new pipe shall be inserted with a waterstop conforming to City Standard Detail SS-03. Jack hammers and chipping hammers will not be allowed. Seal field connections with non-shrink grout.

3.04 INTERIOR DROPS - NOT USED

3.05 INVERT CHANNELS

- A. Smooth and semi-circular in shape conforming to the inside of the adjacent sections. Make changes in flow direction by a smooth curve of radius as large as permitted by manhole size. Make changes in size and grade gradually and evenly. See plans for details.

3.06 SETTING FRAMES AND COVERS

- A. Frames and covers shall be set as detailed on the plans for various locations.

3.07 CLEANOUTS - NOT USED

3.08 EPOXY MANHOLES - NOT USED

3.09 MANHOLE TESTING

A. Vacuum Testing: All Project manholes shall be vacuum tested. Vacuum test procedures and requirements shall be as follows:

1. After completion of the manhole barrels but prior to backfilling and grade ring installation, all openings in the manholes are sealed with plugs and a rubber ring "donut" type plug inserted inside the opening of the cone.
2. A small vacuum pump is attached to a hose connected to the plug and 4 psi of vacuum applied.
3. The vacuum is permitted to stabilize at 3.5 psi for 1 minute; then the test is begun.
4. The manhole must maintain vacuum such that no greater than 0.5 psi of vacuum is lost during the specified test period.
5. The specified test period is as follows:

Manhole depth, ft	Test period, min
0-5	4.5
5-10	5.5
10-15	6.0
Greater than 15	6.5

6. Manholes that fail the test shall be patched as required and retested.
7. A vacuum regulator shall be provided on the vacuum pump such that no greater than 10 psi can be applied to the manhole during the test. All manholes that do not meet the leakage test, or are unsatisfactory from visual inspection, shall be repaired to the satisfaction of the Construction Manager.

END OF SECTION

SECTION 02960

TEMPORARY SEWER BYPASS PUMPING

PART 1: GENERAL

1.01 DESCRIPTION

- A. The Contractor shall provide a complete sewer bypassing system including, but not limited to, the following:
 - 1. Developing a sewer bypassing plan
 - 2. Developing a spill prevention and emergency response plan
 - 3. Submitting and obtaining approval from the City for the sewer bypassing plan and the spill prevention and emergency response plan
 - 4. Implementing the bypassing and spill prevention and emergency response plan
 - 5. Providing bypassing in accordance with the approved plans throughout the duration of the work

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 01300: Submittals
- B. Section 15071: Plastic Pipe and Fittings

1.03 SUBMITTALS

- A. In accordance with Section 01300.
- B. Within 10 days of Notice to Proceed, submit drawings and complete design data for bypass pumping plan. Show all proposed methods, equipment, and discharge locations for bypassing. No construction activities related to bypassing shall begin prior to the approval of the required submittals by the City. Approval of the Contractor's Bypassing and Spill Prevention and Emergency Response Plan in no way relieves the Contractor of his responsibility to maintain sewage service or provide sewer bypassing at all times during construction and to prevent any spills.
- C. Bypassing Plan
 - 1. The Contractor shall design the bypass system to handle the flows of the system. Contractor shall assume the sewer lines are flowing half full at the slopes indicated on the Contract Drawings for the purposes of estimating the flow rate.
 - 2. The Contractor shall develop and submit to the City, for review and approval, a written Bypassing Plan including sequence of work outlining how sewage flows will be maintained and bypassed during construction. The bypassing plan shall include, but not be limited to:

- a. A primary and 100% redundant backup pumping system, each capable of handling the peak flow of the system. Which shall be on site and available 24 hours a day.
 - b. A flow monitoring plan describing the method of monitoring and showing the location of upstream and downstream monitoring units for all of the construction locations.
 - 3. The bypassing plan shall be developed in conjunction with the traffic control plans in order to minimize the impact to the community. See the City Standard Specifications.
- C. Spill Prevention and Emergency Response Plan
 - 1. The Contractor shall develop and submit to the City, for review and approval, a written Spill Prevention and Emergency Response Plan. The Spill Prevention and Emergency Response Plan shall be developed to prevent and respond to any construction related sewage spills. The plan shall include, but not be limited to:
 - a. Identification of all nearby waterways, channels, catch basins and entrances to underground storm drains.
 - b. Furnishing of all the necessary materials, supplies, tools equipment, labor and other services to prevent sewage from coming into contact with these areas.
 - c. Arrangements for an emergency response unit comprised of emergency response equipment and trained personnel to be immediately dispatched to the site in the event of sewage spill(s).
 - d. An emergency notification procedure, which includes an emergency response roster with telephone numbers and arrangements for backup personnel and equipment and an emergency notification roster of designated City representatives.
 - e. Direct phone numbers (no voicemail) for 3 Contractor representatives who shall be accessible and available at all times to respond immediately to any construction related emergency.

1.04 RESPONSIBILITIES OF CONTRACTOR

- A. The Contractor shall observe and comply with all Federal, State, and local laws, ordinances, codes, orders, and regulations which in any manner affect the conduct of the work, specifically as it relates to sewage and prevention of sewage spills. The Contractor shall be fully responsible for preventing sewage spills, containing any sewage spills, recovery and legal disposal of any spilled sewage, paying any and all fines, incurring and handling any penalties, claims, or liability arising from negligently causing or allowing a sewage spill, failure to prevent a sewage spill, or any violation of any law, ordinance, code, order, or regulation as a result of the spillage.

PART 2: MATERIALS

2.01 GENERAL

- A. All equipment and tools used for sewer bypassing shall be designed to prevent any and all sewage leaks or spills.
- B. All equipment used as part of the bypassing system shall not cause a significant noise impact to the community in accordance with local noise ordinances. If noise complaints from residents occur due to the Contractor's activities, the Contractor shall immediately replace the noise-generating equipment or reduce the noise generated with mitigating devices to the satisfaction of the City.
- C. Sewage shall be conveyed/pumped in closed conduits and disposed of in a sanitary sewer system. Sewage shall not be permitted to flow in trenches or be covered by backfill.
- D. Suction and discharge manholes shall be sealed to prevent odors.
- E. Access to driveways may not be blocked by the bypass pipe. Flat pipe, a raised platform above bypass pipe, or a shallow trench shall be used to provide access to residents.
- F. If bypass pumping must cross any major arterial streets/roads, piping must be installed in a shallow trench. Flat piping or raised traffic platforms across these streets will not be allowed. Trench shall be backfilled or covered with recessed, secured trench plating.
- G. All shallow trenching shall be backfilled and paved in accordance with the standard specifications following demobilization of sewer bypass. All costs to install, maintain, backfill, and pave temporary shallow trenching shall be included in Contractor's bid item for sewer bypassing and no additional compensation shall be made therefor.
- H. If deemed necessary due to lack of preparedness on the Contractor's part, the City has the option to clean up a sewage spill caused by the Contractor. Clean up costs incurred by the City shall be recoverable in addition to the penalties from the Contractor's progress payments.

2.02 PUMPING EQUIPMENT

- A. All pumps used for sewer bypassing shall be the submersible type and shall only be operated below ground in the sewer manhole or other sewer facility. The use of above ground pumps or pumps not specifically designed for submersible service are not allowed.
- B. The pumps shall be sized to fit in manholes or other confined areas necessary to successfully complete the sewer bypassing. The Contractor shall ensure all equipment used for bypassing will operate under the conditions required and the Contractor will be responsible for all costs associated with changes to the

bypassing system due to inappropriate equipment or non-conformance with the Contract Documents.

- C. Electric or fuel/generator driven pumps shall be used. The Contractor shall provide an emergency standby power generator, sized to operate the bypass system at a minimum, to be used to operate the submersible pumps if electrical power is lost during the progress of the work and a sewage spill will occur.
- D. The pumps shall be specifically intended for use with raw sewage and shall be capable of passing a 3-inch diameter solid.
- E. Regardless of power used, the total noise of any equipment used by the Contractor as part of the bypassing system shall be under 68 dba as measured standing thirty (30) feet from the equipment.

PART 3: EXECUTION

3.01 GENERAL

- A. The Contractor shall exercise care not to damage existing public and private improvements, interrupt existing services and/or facility operations which may cause a sewage spill. Any reasonably anticipated utility and/or improvement which is damaged by the Contractor shall be immediately repaired at the Contractor's expense. In the event that the Contractor damages an existing utility or interrupts an existing service which causes a sewage spill, the Contractor shall immediately notify the City representatives. The Contractor shall request and obtain from the City an emergency roster of the designated City representatives with their respective telephone numbers. The Contractor shall take all measures necessary to prevent further damage or service interruption, and to control, contain, and clean up the resultant impacts of the damage, service interruption, and any resulting sewage spill(s).
- B. The Contractor shall continuously monitor the flow levels downstream and upstream of the construction location to detect any possible failure that may cause a sewage backup and spill. The Contractor shall include the means and methods of monitoring the flow in their Sewer Bypassing Plan.

3.02 SEWAGE SPILLS

- A. In case of sewage spill, the Contractor shall act immediately, within fifteen minutes – without instructions from the City – to control the spill and take all appropriate steps to contain it in accordance with their Spill Response Plan.
- B. The Contractor shall immediately notify the City representatives of the sewage spill(s) and all remedial actions taken.
- C. The Contractor shall, within 24 hours from the occurrence of the spill, submit to the City a draft written report describing the following information related to the spill: the location; the nature and volume; the date and time; the duration; the cause; the type of remedial and/or preventive actions taken; and the water body impacted and results of any necessary monitoring. The City will review the draft

report, and if revisions are required, the Contractor shall make those revisions and submit the final report to the City within 24 hours of the receipt of comments. Requests for additional compensation for the handling of the spill shall be submitted to the Engineer as a construction claim. The Contractor shall assure the validity, accuracy, and correctness of the claim under penalty of perjury. The Engineer may institute further corrective actions, as deemed necessary, to fully comply with existing law, ordinance, code, order, or regulation. The Contractor shall be responsible for all costs incurred for the corrective actions.

- D. It shall be the Contractor's responsibility to assure that all field forces, including Subcontractors, know and obey all safety and emergency procedures, including the Spill Response Plan, to be maintained and followed at the site.

3.03 SEWER BYPASSING

- A. The Contractor shall provide temporary means to maintain and handle the sewage flow in the existing system as required to complete the necessary construction.
- B. The Contractor shall size the bypass system to handle the peak flow of the system. The Contractor shall provide a redundant, identically sized, one-hundred percent (100%) backup bypass system. The Contractor shall utilize the backup system to mitigate any additional wet weather flows, perform the necessary maintenance and repairs on the primary bypass system, and exercise and ensure the operability of the backup system. Each pump, including the backup pumps, shall be a complete unit with its own suction and discharge piping. The Contractor shall operate the backup bypass system for a minimum of twenty-five percent (25%) of the time on a weekly basis. The backup bypass system shall be fully installed and operationally ready at all times.
- C. Prior to the full operation of the bypass system, the Contractor shall demonstrate, to the satisfaction of the City, that both the primary and backup bypass systems are fully functional and adequate and shall certify the same, in writing, in a manner acceptable to the City.
- D. The Contractor shall provide all equipment necessary to minimize the noise generated by the bypassing operations. Noise levels from the complete bypassing system shall not exceed the levels allowable under the local jurisdictional codes and requirements.
- E. The Contractor shall continuously (while in use) monitor the operation of the bypass system and all impacted facilities. The Contractor shall submit, as part of their bypass plan, their system monitoring procedure and frequency. The Contractor shall maintain a log of the monitoring in a manner acceptable to the Engineer.
- F. The Contractor shall continuously monitor the flow levels downstream and upstream of the bypass to detect any possible failure that may cause a sewage backup and/or spill. The Contractor shall include the means and methods of monitoring the flow in their Bypassing Plan. The Contractor shall provide flow monitoring data to the City on a weekly basis in a format acceptable to the City.

- G. The Contractor shall routinely inspect and maintain the bypass system, including the backup system. The Contractor shall submit as part of their Bypassing Plan their maintenance procedures and frequency. The Contractor shall maintain a log of all pertinent inspection, maintenance and repair records in a manner acceptable to the Engineer.
- H. At the end of each day's work, the Contractor shall re-establish sewer flows in the gravity sewer system. Work undertaken each day shall only include work that can be completed during that working day.

END OF SECTION

SECTION 15030

PIPE REMOVAL

PART 1: GENERAL

1.01 SUMMARY

- A. Includes general specifications for removing raw water or sewer pipe.

1.02 SUBMITTALS

- A. Submittals shall be provided in accordance with Section 01300 and shall include the following:
 - 1. A removal plan for review by the Engineer prior to the start of removal after field verification of pipe location, material, and size.
 - 2. Names and descriptions of materials to be used.

PART 2: PRODUCTS

2.01 EQUIPMENT AND MATERIALS

- A. Equipment and materials shall be selected by Contractor as necessary to achieve desired results for removal. Selected equipment and materials are subject to review of Engineer through submittals.
- B. All equipment shall be in good repair and operating order.
- C. Sufficient standby equipment and materials shall be kept available to ensure continuous operation, where required.

PART 3: EXECUTION

3.01 PIPE REMOVAL

- A. Existing sewer pipes shall not be removed until the corresponding new sewer pipes are fully in service or bypass pumping has been established.
- B. Service outages shall not be allowed. Service must be maintained at all times through temporary sewer bypass pumping in accordance with Section 02960.
- C. Pipe shall be removed and salvaged if requested by the Owner; otherwise, pipe shall be removed and disposed of in accordance with all applicable laws.
- D. Backfill pipe removal area with Class II aggregate base.

END OF SECTION

SECTION 15071
PLASTIC PIPE AND FITTINGS

PART 1: GENERAL

1.01 DESCRIPTION

The work of this section consists of furnishing and installing polyvinyl chloride pipe and fittings.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 01300: Submittals
- B. Section 02223: Trenching, Backfilling, and Compacting
- C. Section 15080: Piping Accessories and Appurtenances

1.03 QUALITY ASSURANCE REFERENCES

This section contains references to some or all of the following documents, most recent edition. They are a part of this section as specified and modified. In case of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.

Reference	Title
ASTM D1248	Polyethylene Plastics Molding and Extrusion Materials.
ASTM D1784	Rigid Polyvinyl Chloride (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
ASTM D1785	Polyvinyl Chloride (PVC) Plastic Pipe, Schedules 40, 80, and 120
ASTM D2241	Polyvinyl Chloride (PVC) Pressure Rated Pipe (SDR series)
ASTM D2464	Threaded Polyvinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 80
ASTM D2466	Polyvinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 40
ASTM D2467	Socket Type Poly Vinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 80
ASTM D2564	Solvent Cements for Polyvinyl Chloride (PVC) Plastic Pipe and Fittings
ASTM D3034	Type PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings
ASTM D4101	Propylene Plastic Injection and Extrusion Materials
ASTM F402	Practice for Safe Handling of Solvent Cements and Primers Used for Joining Thermoplastic Pipe and Fittings

1.04 SUBMITTALS

- A. In accordance with Section 01300.
- B. Submit materials list and catalog data sheets naming each product to be used identified by manufacturer and type number.

- C. The Contractor shall prepare and submit one copy to the City of Oroville of shop drawings and laying diagrams of all pipe, joints, bends, special fittings, and piping appurtenances.

PART 2: MATERIALS

2.01 PVC PRESSURE PIPE

- A. Not Used.

2.02 PVC SEWER PIPE

- A. General: Pipe and fittings shall be made of PVC plastic having a cell classification of 12454-B as defined in ASTM D1784 and shall be SDR-35 (PVC). Additives and fillers including but not limited to stabilizers, antioxidants, lubricants, colorants, etc. shall not exceed 10 parts by weight per 100 of PVC resin in the compound.
- B. Pipe: All sewer mains shall be eight inch minimum diameter pipe, and shall be continuously and permanently marked with the manufacturer's name, pipe size, dimension ratio and/or pressure rating in psi. PVC pipe shall have a solid cross-section rubber ring gasket. The gasket shall be securely attached to the pipe to prevent displacement of the gasket when installed in the field. All rubber ring gaskets shall be in accordance with ASTM F477. Lubricant used for field assembly of gasketed PVC pipe shall have no detrimental effect on the gasket, joint, fitting, or pipe and shall be as recommended by the manufacturer. Provide rubber waterstops at the entry of all PVC pipe into manhole bases. PVC gravity sewer pipe and fittings shall conform to ASTM D3034 for diameters from 4-inches to 15-inches. Pipe joints shall conform to ASTM D3212. Pipe shall be solid wall only; profile wall pipe is not allowed.
- C. Fittings: Pipe fittings shall be gasketed fittings matching the pipe SDR and conforming to ASTM D3034, Class SDR-35. The ring groove and gasket ring shall be compatible with PVC pipe ends. Flanged fittings shall be compatible with cast-iron or ductile-iron pipe fittings. The strength class of the fittings shall be not less than the strength class of any adjoining pipe.

PART 3: EXECUTION

3.01 GENERAL

- A. All laying, jointing, and testing for defects and for leakage shall be performed in the presence of the Engineer and shall be subject to inspection before acceptance. All material found during the progress of the work to have defects will be rejected, and the Contractor shall promptly remove such defective materials from the site of the work.
- B. Installation shall conform to the requirements of ASTM D2321 and to the supplementary requirements or modifications specified herein. Wherever the provisions of this Section and the requirements of ASTM D2321 are in conflict, the more stringent provision shall apply.

3.02 INSTALLATION OF PIPE AND FITTINGS

- A. General: In accordance with the Construction Drawings and Specifications, manufacturer's recommendations, and ASTM 2321. Where a conflict exists in language, the Contractor shall adhere to the most stringent requirements.
- B. Plastic piping exposed to sunlight shall be painted with two coats of latex paint. Color shall be white unless otherwise specified.
- C. Pipe and fittings shall be of the sizes indicated. Clean pipe interior of all foreign matter before installing. Pipe shall be square cut with fine tooth saw or other cutter or knife designed for use with plastic pipe. Remove burrs by smoothing edges with a knife, file, or sandpaper. Replace any section of pipe found to be defective or damaged with new acceptable pipe. Handle pipe carefully to prevent gouging or scratching. Any length of pipe having a gouge, scratch, or other permanent indentation more than 10 percent of the wall thickness in depth shall be rejected.

3.03 INSTALLATION OF SOLVENT WELD JOINT TYPE PIPE

In accordance with the recommendations of the pipe manufacturer and the following supplementary requirements:

- A. Do not solvent weld joints if it is raining, if atmospheric temperature is below 40 degrees F or above 90 degrees F, if the pipe is exposed to direct sunlight.
- B. Test fit dry pipe and fittings before applying cement. Pipe should enter socket without forcing at least one third but not more than two thirds the depth of socket. Fittings that are looser or tighter shall not be used. Thoroughly clean and dry the pipe end and socket of fitting with methyl ethyl ketone, acetone, or similar cleaner. Apply cement evenly to outside surface and end of pipe and inside surface of socket. Avoid excess application of cement but insure complete coverage of all bonding surfaces. Mark depth of socket on pipe to guide application of cement and insure full insertion of pipe. Insert pipe in socket, twisting pipe or fitting approximately ½ turn as pipe is being seated in socket. Make sure pipe is fully seated providing a bond between end of pipe and shoulder of socket. Immediately wipe excess cement from pipe leaving no more than a 1/8-inch fillet at fitting end. Hold assembled joint in place for approximately 15 seconds and allow to set for 30 minutes before moving. Avoid rough handling for 48 hours. Longer periods may be required in cold or wet weather.

3.04 INSTALLATION OF PUSH-ON JOINT TYPE PIPE

Clean gaskets and seats of foreign materials prior to joint assembly. Apply lubricant as recommended by the pipe manufacturer. Carefully insert the spigot end into the bell to prevent entry of dirt and incorrect entry angle. With suitable fork tool, crowbar, or by hand, make the joint to the insertion depth recommended by the manufacturer. When the selected pipe uses joints not designed for full depth insertion, prevent further closure of previously completed joints by restraining movement of the installed line while making succeeding joints.

3.05 INSTALLATION OF TUBING

Not Used.

3.06 TESTING

- A. Pressure Testing: Shall be in accordance with Section 01666.
- B. Field Inspection for Plastic Pipe and Fittings: Installed pipe shall be tested to ensure that vertical deflections for plastic pipe do not exceed the maximum allowable deflection. All SDR 26 and 35 PVC Sewer Pipe shall be mandrel tested by the Contractor as outlined below. All C905 PVC pipe may be measured by the Engineer for overdeflection above 3%. Maximum allowable deflections for SDR 26 and 35 pipe shall be governed by the mandrel requirements stated herein and shall nominally be the percentage listed of the maximum average ID.

Nominal Pipe Size	Percentage
Up to and including 12-inch	5.0
Over 12-inch to and including 30-inch	4.0
Over 30-inch	3.0

The maximum average ID shall be equal to the average OD per applicable ASTM Standard minus two minimum wall thicknesses per applicable ASTM Standards. Manufacturing and other tolerances shall not be considered for determining maximum allowable deflections.

Deflection tests shall be performed not sooner than 30 days after completion of placement and densification of backfill. The pipe shall be cleaned and inspected for offsets and obstructions prior to testing.

For all pipes less than 24-inch ID, a rigid mandrel shall be pulled through the pipe by hand to ensure that maximum allowable deflections have not been exceeded. Prior to use, the mandrel shall be certified by the Engineer. Use of an uncertified mandrel or mandrel altered or modified after certification will invalidate the test. If the mandrel fails to pass, the pipe will be deemed to be overdeflected.

Unless otherwise permitted by the Engineer any overdeflected pipe shall be uncovered and, if not damaged, reinstalled. Damaged pipe shall not be reinstalled but shall be removed from the Work site. Any pipe subjected to any method or process other than removal, which attempts, even successfully, to reduce or cure any overdeflection, shall be uncovered, removed from the Work site and replaced with new pipe.

The mandrel shall:

1. Be rigid, non-adjustable, odd-numbering-leg (9 legs minimum) mandrel having an effective length not less than its nominal diameter.
2. Have a minimum diameter at any point along the full length as follows:

Pipe Material	Nominal Size (inches)	Minimum Mandrel Diameter * (inches)
PVC-ASTM D 3033 (SDR 35)	6	5.619
	8	7.309
	10	9.137
	12	10.963
	15	13.849
PVC-ASTM F 679 (T-1 Wall)	18	16.924
	21	19.952
	24	22.446
	27	25.297
	30	28.502
	36	35.03

* Mandrel diameters of SDR 26 pipe shall be based on 4% deflection of the average inside diameter.

3. Be fabricated of steel, be fitted with pulling rings at each end, be stamped or engraved on some segment other than a runner indicating the pipe material specification, nominal size and mandrel OD, (e.g., PVC D 3034-8"-7.524"; and be furnished in a suitable carrying case labeled with the same data as stamped or engraved on the mandrel.

All costs incurred by the Contractor attributable to mandrel and deflection testing, including any delays, shall be borne by the Contractor at no cost to the Owner.

END OF SECTION