

ENGINEER'S NOTICE TO CONTRACTOR

THE ESTIMATED QUANTITY FOR EACH SPECIFIC ITEM OF THE WORK DESIGNATED ON THE PLANS SHALL BE CONSIDERED AS APPROXIMATE ONLY AND NO GUARANTEE IS MADE THAT THE QUANTITIES WHICH CAN BE DETERMINED BY COMPUTATIONS, BASED ON THE DETAILS AND DIMENSIONS SHOWN ON THESE PLANS, WILL EQUAL THE ESTIMATED QUANTITIES. THE ESTIMATE OF QUANTITIES IS PROVIDED BY THE ENGINEER ONLY FOR THE CONVENIENCE OF THE CITY. ANY ITEM OF WORK, OR PORTION THEREOF, REQUIRED BY THESE PLANS WHICH IS NOT SPECIFICALLY LISTED IN THE ESTIMATE OF QUANTITIES SHALL BE CONSIDERED AS INCLUDED IN THE OTHER ITEMS OF WORK.

LEGEND

— X — X — X — X —	CHAIN LINK FENCE
— — — — —	CITY BOUNDARY
— — — — —	STREET CENTERLINE
— — — — —	STORM DRAIN LINE
— — — — —	WROUGHT IRON FENCE
— — — — —	PROPERTY LINE

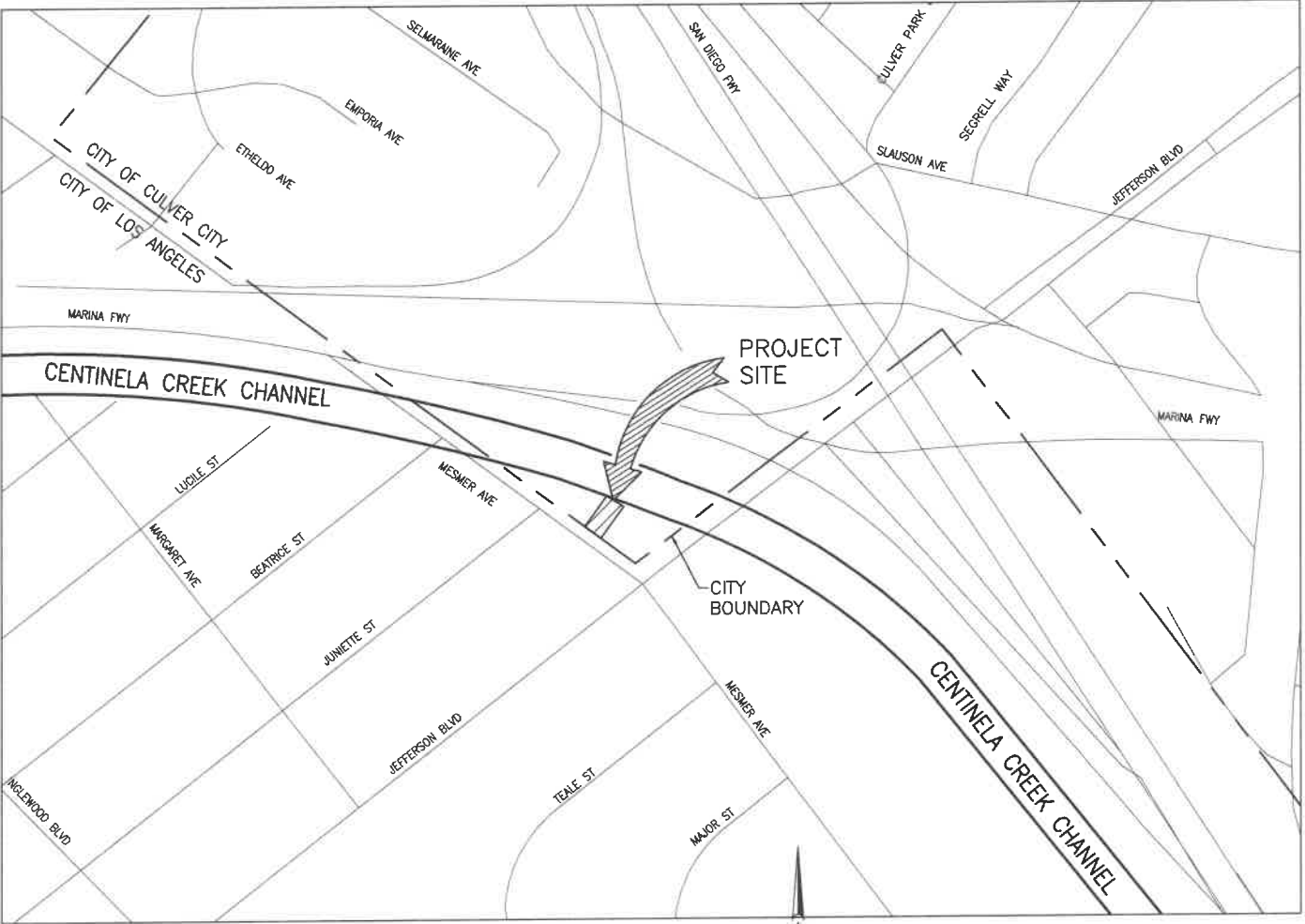
ABBREVIATIONS

ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS	NTS	NOT TO SCALE
AC	ASPHALT/CONCRETE	O.C.	ON CENTER
cfs	CUBIC FEET PER SECOND	O.D.	OUTSIDE DIAMETER
CMB	CRUSHED MISCELLANEOUS BASE	P	PROPERTY LINE
DIP	DUCTILE IRON PIPE	PERF.	PERFORATED
EL.	ELEVATION	PVC	POLYVINYL CHLORIDE
EX.	EXISTING	R/W	RIGHT-OF-WAY
FG	FINISH GRADE	RD	ROAD
fps	FEET PER SECOND	RT	RIGHT
GPM	GALLONS PER MINUTE	SCH	SCHEDULE
HGL	HYDRAULIC GRADE LINE	STD.	STANDARD
I.D.	INSIDE DIAMETER	SPPWC	STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION
INV.	INVERT	STA	STATION
LACDPW	LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS	ST	STREET
LACFCD	LOS ANGELES COUNTY FLOOD CONTROL DISTRICT	TELE	TELECOMMUNICATION
LF	LINEAR FEET	TG	TOP OF GRATE
LT	LEFT	TYP.	TYPICAL
MH	MANHOLE	VCP	VETRIFIED CLAY PIPE
		W	WIDTH

SYMBOLS

MANHOLE
STREET CENTERLINE

MESMER LOW FLOW DIVERSION PROJECT, PR-005



LOCATION MAP  
SCALE: 1"=200'

BASIS OF BEARINGS

THE BEARING N 54° 05' 54" W OF THE CENTERLINE OF MESMER AVENUE AS SHOWN ON MAP OF TRACT NO. 17553, M.B. 424/45-46 WAS USED AS A BASIS OF BEARINGS FOR THIS PROJECT.

BENCHMARK

CITY OF LOS ANGELES BENCH MARK NO. 05708, ELEVATION 20.646 NGVD 1929, YEAR OF RECORD 1985, WIRE SPK IN NW CURB JEFFERSON BLVD; 15 FT NE OF BC CURB RETURN NE OF MESMER AVE.



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**CWE**  
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PLANS PREPARED UNDER THE SUPERVISION OF:

Project Number: PR- 005

Drawing No.

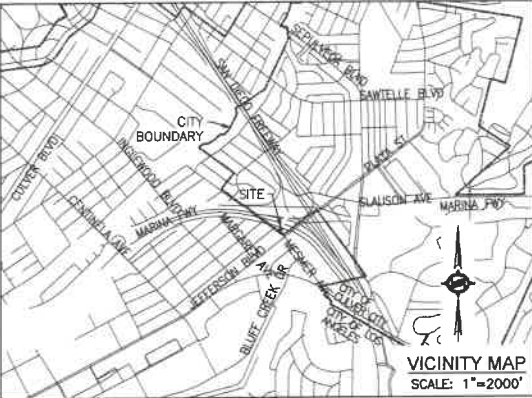


NO.

REVISION

SHEET LIST TABLE

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11	E-05	ELECTRICAL DETAILS
12	E-06	CONTROL AND COMMUNICATION SYSTEM BLOCK DIAGRAM AND PERFORMANCE SPECIFICATIONS



CITY OF CULVER CITY  
PUBLIC WORKS DEPARTMENT

MESMER LOW FLOW DIVERSION PROJECT, PR-005

TITLE SHEET

APPROVED BY: CHARLES D. HERBERSTON, P.E., L.S.  
PUBLIC WORKS DIRECTOR / CITY ENGINEER  
DATE: 7/21/2021  
SHEET T-01  
Sheet 1 Of 12 Sheets

Drawing Name: C:\Users\user\Documents\Drawings\05\05-01\05-01-01\05-01-01-01.dwg  
User: user  
Date: 7/21/2021  
Scale: 1"=200'



GENERAL NOTES:

1. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
2. PRIOR TO COMMENCING CONSTRUCTION THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS IN THE FIELD. IF THE FIELD CONDITIONS DIFFER FROM THOSE SHOWN ON THE PLANS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER.
3. NOTES AND DETAILS ON THESE PLANS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS. WHERE NO DETAILS ARE GIVEN, CONSTRUCTION SHALL BE AS SHOWN FOR SIMILAR WORK.
4. THE WORK SHOWN ON THESE PLANS REQUIRES THE PRIME CONTRACTOR TO POSSESS A VALID CALIFORNIA CLASS A OR C34 CONTRACTOR'S LICENSE.

EXISTING & PROPOSED UTILITIES

5. INFORMATION ON LOCATION, SIZES AND DEPTH OF THE EXISTING UTILITIES WAS TAKEN FROM EXISTING DRAWINGS AND DATA, AND IS FOR REFERENCE ONLY. THE CONTRACTOR SHALL BECOME FAMILIAR WITH THE PLANS AND SHALL VERIFY SITE CONDITIONS PRIOR TO THE ORDERING OF MATERIALS AND COMMENCING WORK.
6. ANY UTILITY INVESTIGATION DONE BY EXPLORATORY EXCAVATION POTHOLING SHALL USE VACUUM EXTRACTION OR HAND EXCAVATION METHODS ONLY.
7. BEFORE CONSTRUCTION IS STARTED, CONTRACTOR SHALL COORDINATE WITH THE OWNER OF EACH UTILITY AND DEFINE THE REQUIREMENTS AND METHODS TO ACCOMMODATE THE PROTECTION, TEMPORARY SUPPORT, ADJUSTMENT, OR RELOCATION OF ANY UTILITIES AFFECTED BY THE PROPOSED WORK.
8. IT SHALL BE CONTRACTOR'S RESPONSIBILITY TO ADJUST TO FINISHED GRADE EXISTING SEWER AND STORM DRAIN MAINTENANCE HOLE COVERS AND ANY OTHER UTILITY BOX COVERS AND FURNISH AND INSTALL CONCRETE COLLARS AS REQUIRED TO MATCH PROPOSED PAVEMENT.
9. THE CONTRACTOR SHALL BE COGNIZANT OF ALL OVERHEAD LINES AT ALL TIMES.

JOB SITE

10. ALL FIRE HYDRANTS, WATER CONTROL VALVES, AND MAINTENANCE HOLES SHALL BE KEPT FREE FROM OBSTRUCTIONS AND AVAILABLE FOR USE AT ALL TIMES.
11. IN CASE OF SUSPENSION OF WORK FROM ANY CAUSE, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL MATERIALS AND SHALL PROPERLY STORE THEM IF NECESSARY AND SHALL ERECT TEMPORARY STRUCTURES WHERE NECESSARY. CITY WILL NOT BE HELD RESPONSIBLE FOR THE CARE OR PROTECTION OF ANY MATERIAL OR PARTS OF THE WORK PRIOR TO FINAL ACCEPTANCE, UNLESS OTHERWISE SPECIFIED.
12. THE CONTRACTOR SHALL MAINTAIN AND CLEAN, IF NECESSARY, ALL EXISTING ONSITE AND/OR ADJACENT STORM DRAIN INLETS AFFECTED BY CONSTRUCTION DURING THE COURSE OF CONSTRUCTION AND UNTIL THE WORK IS ACCEPTED BY THE CITY.
13. ALL CONSTRUCTION DEBRIS AND FOREIGN MATERIAL SHALL BE REMOVED FROM THE SITE OF THE WORK AND DISPOSED OF AT APPROVED DISPOSAL SITE. THE CONTRACTOR SHALL OBTAIN NECESSARY PERMITS FOR THE TRANSPORTATION AND DISPOSAL OF MATERIAL.

SURVEY & LAYOUT

14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL PROPERTY CORNER MARKERS. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR REPLACING ANY SURVEY MONUMENTS THAT ARE DISTURBED DURING CONSTRUCTION. PROPERTY CORNER MARKERS AND SURVEY MONUMENTS DAMAGED BY CONSTRUCTION ACTIVITIES SHALL BE RE-ESTABLISHED BY A PROFESSIONAL SURVEYOR LICENSED IN THE STATE OF CALIFORNIA.
15. THE PROPOSED GRADE IS THE FINAL GRADE AND NOT THE ROUGH GRADE. THE CONTRACTOR SHALL SUBTRACT THE THICKNESS OF THE PAVED SECTION TO ARRIVE AT THE ROUGH GRADE ELEVATION.
16. CONSTRUCTION STAKING FOR IMPROVEMENTS SHOWN ON THESE PLANS SHALL BE PERFORMED BY A PROFESSIONAL LAND SURVEYOR, POSSESSING A VALID STATE OF CALIFORNIA LAND SURVEYOR LICENSE.

PUBLIC HEALTH, SAFETY & WELFARE

17. CONTRACTOR SHALL COMPLY WILL ALL LOCAL SOUND CONTROL AND NOISE LEVEL RULES, REGULATIONS AND ORDINANCES, INCLUDING BUT NOT LIMITED TO ALL APPLICABLE PROVISIONS OF CHAPTER 9.07 OF THE CULVER CITY MUNICIPAL CODE.

MISCELLANEOUS

18. AT LEAST 72 HOURS SHALL ELAPSE FROM THE TIME CONCRETE IS PLACED BEFORE VEHICULAR TRAFFIC IS PERMITTED TO TRAVEL ON IT, UNLESS OTHERWISE APPROVED BY THE ENGINEER.
19. IN AREAS SHOWN ON THESE PLANS TO BE CONSTRUCTED OR RECONSTRUCTED AND WHERE EXISTING PAVEMENT OR SUBGRADE IS FOUND TO BE UNSTABLE, THE CONTRACTOR SHALL REMOVE AND REPLACE THE TOP 3 FEET OF SUBGRADE WITH CRUSHED MISCELLANEOUS BASE (CMB) AND COMPACT TO 90% OF MAX. DRY DENSITY OBTAINABLE AS MEASURED BY ASTM D-1157. IF SHALLOW UTILITIES PREVENT REMOVAL OF 3 FEET OF SUBGRADE SOIL, AN APPROVED WOVEN GEOTABRIC OR GEOGRID SHALL BE USED TO PROVIDE STRENGTH TO THE SUBGRADE.
20. SAWING OF JOINTS SHALL BEGIN AS SOON AS THE CONCRETE HAS SUFFICIENTLY HARDENED TO PERMIT SAWING WITHOUT RAVELING, BUT NOT EXCEEDING TWELVE (12) HOURS AFTER PLACEMENT OF CONCRETE.

PLACEMENT OF CONCRETE SHALL BE SCHEDULED TO BEGIN AND BE COMPLETED IN SUFFICIENT TIME TO ALLOW SAWING OF JOINTS AS PREVIOUSLY STATED.

21. CONCRETE SHALL HAVE A STRENGTH OF 4,000 PSI.
22. ALL FILL SOILS OR SOILS DISTURBED OR OVER-EXCAVATED DURING CONSTRUCTION SHALL BE COMPACTED TO 90% MAXIMUM DENSITY AS DETERMINED BY SOIL COMPACTION TEST D-1157.
23. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE EXPENSE AND TO REPAIR OR REPLACE ANY DAMAGES TO THE PUBLIC RIGHT-OF-WAY, TO INCLUDE TRAFFIC LOOPS, SIGNAL, LIGHTING, ELECTRICAL SYSTEMS, AND UNDERGROUND INSTALLATIONS (WHETHER OR NOT PHYSICALLY MARKED OR SHOWN ON THE CONTRACT PLANS). SUCH REPAIRS OR REPLACEMENT SHALL BE COMPLETED TO THE SATISFACTION OF THE CITY ENGINEER.

DESIGN & CONSTRUCTION STANDARDS:

24. THE FOLLOWING STANDARD PLANS & SPECIFICATIONS ARE APPLICABLE TO THIS PROJECT:
- A. STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (SPPWC), 2018 (OR LATEST) EDITION AND SUPPLEMENTS.
- B. STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION (SPPWC), 2012 EDITION.
- C. LOS ANGELES COUNTY STANDARD PLANS REF. 3080-3, 2008 EDITION.

PUBLIC NOTIFICATION REQUIREMENTS:

32. THE CONTRACTOR SHALL PROVIDE THE FOLLOWING PUBLIC NOTICES PRIOR TO BEGINNING CONSTRUCTION ON THE PROJECT:
- A. UPON RECEIVING THE NOTICE TO PROCEED DATE, THE CONTRACTOR SHALL ISSUE A NOTICE BY U.S. MAIL, PREPARED OR APPROVED BY THE CITY, NOTIFYING RESIDENTS AND BUSINESSES WITHIN 500 FEET OF THE PROJECT LIMITS ABOUT THE SCHEDULED WORK.
- B. 2 WEEK PRIOR TO THE START OF CONSTRUCTION, CONTRACTOR SHALL PREPARE AND DISTRIBUTE A NOTICE APPROVED BY THE CITY TO RESIDENTS AND BUSINESSES IMMEDIATELY ADJACENT TO THE PROJECT LIMITS.
- C. CONTRACTOR SHALL PREPARE AND INSTALL/PLACE A PROJECT SIGN ON ALUMINUM BACKING AND MOUNTED ON TWO (2) 4X4 WOODEN POSTS WITHIN THE PROJECT LIMITS. THE SIGN SHALL PROVIDE INFORMATION REGARDING THE PROJECT, CONSTRUCTION DATES AND TIMES, ALONG WITH GENERAL AND EMERGENCY CONTACT INFORMATION. LETTERS USED ON THE SIGN SHALL BE 4-6 INCHES HIGH.

GRADING NOTES:

33. NO WORK SHALL BE STARTED IN OR ABOUT A GRADING PROJECT WITHOUT FIRST NOTIFYING THE ENGINEER.
34. NO GRADING WORK, INCLUDING IMPORT AND EXPORT, SHALL BE DONE OUTSIDE OF CITY SPECIFIED CONSTRUCTION HOURS, EXCEPT IN EMERGENCIES. A HAUL ROUTE SHALL BE PREPARED BY THE CONTRACTOR SATISFACTORY TO THE PUBLIC WORKS DEPARTMENT, ENGINEERING DIVISION.
35. NO PERSON SHALL, WHEN HAULING ANY EARTH, SAND, GRAVEL, ROCK, STONE, DEBRIS, PAPER OR ANY OTHER SUBSTANCE OVER ANY PUBLIC STREET, ALLEY OR OTHER PUBLIC PLACE, ALLOW SUCH MATERIALS TO BLOW OR SPILL OVER AND UPON THE PUBLIC STREET, ALLEY OR OTHER PUBLIC PLACE OR ADJACENT PRIVATE PROPERTY.
36. THE LOADING OR DUMPING OF EXCESS SOIL SHALL BE APPROVED BY THE ENGINEER PRIOR TO STARTING EXCAVATION.
37. IF AT ANY STAGE OF WORK ON AN EXCAVATION OR FILL THE ENGINEER DETERMINES THAT FURTHER WORK AS AUTHORIZED BY AN EXISTING PERMIT IS LIKELY TO ENDANGER ANY PROPERTY OR PUBLIC WAY THE ENGINEER MAY REQUIRE, AS A CONDITION TO ALLOW THE WORK TO CONTINUE, THAT PLANS FOR SUCH WORK BE AMENDED TO INCLUDE ADEQUATE SAFETY PRECAUTIONS.
38. ~~INSPECTIONS OF EXCAVATION AND FILLS.~~ THE CONTRACTOR SHALL NOTIFY THE ENGINEER WHEN THE GRADING OPERATION IS READY FOR EACH OF THE FOLLOWING INSPECTIONS:

- A. INITIAL MEETING/ INSPECTION: WHEN THE PERMITTEE IS READY TO BEGIN WORK, BUT BEFORE GRADING OR BRUSHING IS STARTED, A MEETING SHALL BE HELD AT THE PROJECT SITE WITH THE CONTRACTOR AND THE INSPECTOR TO DISCUSS THE APPROVED PLANS, AND THE SEQUENCE OF THE GRADING OPERATION.
- B. EXCAVATION INSPECTION: AFTER THE EXCAVATION IS STARTED, BUT BEFORE THE VERTICAL HEIGHT DEPTH OF THE EXCAVATION EXCEEDS TEN FEET.
- C. FILL INSPECTION: AFTER THE FILL PLACEMENT IS STARTED, BUT BEFORE THE VERTICAL HEIGHT OF THE LIFT EXCEEDS TEN FEET.
- D. DRAINAGE DEVICE INSPECTION: AFTER FORMS AND PIPE ARE IN PLACE, BUT BEFORE ANY CONCRETE IS PLACED.
- E. FINAL: WHEN ALL WORK, INCLUDING INSTALLATION OF ALL DRAINAGE STRUCTURES AND OTHER PROTECTIVE DEVICES, HAS BEEN COMPLETED AND THE AS-GRADED PLAN AND REQUIRED REPORTS HAVE BEEN SUBMITTED.
40. THE CONTRACTOR SHALL OBTAIN A PERMIT FROM CALIFORNIA DIVISION OF INDUSTRIAL SAFETY FOR THE CONSTRUCTION OF TRENCHES OR EXCAVATIONS WHICH ARE FIVE FEET OR DEEPER. SHEETING, SHORING, AND BRACING FOR THE TRENCH EXCAVATION SHALL CONFORM TO THE REQUIREMENTS OF "CONSTRUCTION SAFETY ORDERS," TITLE 8, DIVISION OF INDUSTRIAL SAFETY, STATE OF CALIFORNIA.
41. A COPY OF THE APPROVED PLANS MUST BE IN THE POSSESSION OF A RESPONSIBLE PERSON AND AVAILABLE AT THE SITE AT ALL TIMES.
42. WORK SHALL BE PERFORMED IN ACCORDANCE WITH THIS PLAN SET, TECHNICAL SPECIFICATIONS, PROVISIONS OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (SSPWC), AND ALL REFERENCES.

43. FILL PLACEMENT AREAS SHALL BE INSPECTED AND APPROVED BY THE CONSULTANT GEOLOGIST AND SOILS ENGINEER PRIOR TO PLACEMENT OF ANY FILL.
44. EXCAVATION SHALL BE DONE UNDER THE SUPERVISION OF A SOILS ENGINEER WHO SHALL CERTIFY THAT ALL FILL HAS BEEN PROPERLY PLACED AND WHO SHALL SUBMIT A FINAL COMPACTION REPORT FOR ALL FILLS OVER ONE FOOT DEEP.
45. THE EXISTING TOPOGRAPHY AS DELINEATED ON THESE DRAWINGS SHALL BE UTILIZED AS THE BASIS FOR ALL EARTHWORK COMPUTATIONS. SAID TOPOGRAPHY SHALL BE PRESUMED TO BE ACCEPTABLE TO ALL INTERESTED PARTIES UNLESS A DEVIATION IS FOUND PRIOR TO THE START OF GRADING IN ANY SPECIFIC AREAS. ANY DEVIATION SO DETERMINED SHALL BE PROMPTLY TRANSMITTED TO ALL INTERESTED PARTIES.
46. OVER-EXCAVATION AND/OR EXCESS BACKFILLING OR DUPLICATION OF GRADING ACTIVITIES IS NOT A BASIS FOR ADDITIONAL COMPENSATION. THIS ALSO APPLIES WHERE MATERIAL IS TO BE REMOVED AND REPLACED TO REDUCE MOISTURE CONTENT.

CONCRETE REMOVAL NOTES:

WHERE REINFORCEMENT IS REQUIRED TO EXTEND THROUGH THE NEW JOINT, CONCRETE SHALL BE REMOVED IN THE FOLLOWING SEQUENCE:

1. A SAWCUT SHALL BE MADE ONE AND ONE-HALF INCHES DEEP AT THE REMOVAL LIMITS. CARE SHALL BE EXERCISED IN SAWING AT THE REMOVAL LIMITS SO AS NOT TO CUT THE REINFORCING STEEL IN THE REMAINING SLAB. THE EXISTING REINFORCING STEEL SHALL BE RETAINED AND EXTENDED INTO THE NEW CONSTRUCTION AS INDICATED ON THE PLANS.
2. USING HANDHELD EQUIPMENT, THE CONCRETE SHALL BE CAREFULLY REMOVED FOR THE FULL DEPTH OF THE WALL OR SLAB AND FOR A MINIMUM DISTANCE FROM THE SAWCUT EQUAL TO THE LONGEST EXTENSION OF THE EXISTING BARS TO BE EXTENDED INTO THE NEW CONSTRUCTION. THIS EXTENSION SHALL BE 30 BAR DIAMETERS, UNLESS OTHERWISE SHOWN.
3. EXISTING REINFORCEMENT SHALL BE CUT TO THE REQUIRED BAR EXTENSION.
4. THE REMAINING CONCRETE SHALL BE REMOVED BY ANY SUITABLE METHOD UPON APPROVAL OF THE ENGINEER, WHO SHALL BE THE SOLE JUDGE OF THE USE OF ANY CONCRETE REMOVAL EQUIPMENT. WRECKING BALLS OR OTHER SIMILAR DEVICES, WHICH ARE LIKELY TO DAMAGE THE CONCRETE TO BE LEFT IN PLACE, SHALL NOT BE USED.

WORK AREA RESTRICTION NOTES:

1. PRIOR TO ANY WORK WITHIN THE CHANNEL, THE CONTRACTOR SHALL SUBMIT A WATER DIVERSION PLAN TO THE CITY AND THE LOS ANGELES COUNTY FLOOD CONTROL DISTRICT (LACFCD) TO PROVIDE BYPASS CAPACITY AS FOLLOWS:
- APRIL 16 TO MAY 31: 33%
  - JUNE 1 TO AUGUST 31: 5%
  - SEPTEMBER 1 TO OCTOBER 14: 33%
  - NO WORK WILL BE ALLOWED IN THE CHANNEL DURING THE PERIOD OF OCTOBER 15 TO APRIL 15.
2. THE CONTRACTOR SHALL SUBMIT THE WATER DIVERSION PLAN A MINIMUM OF 60-DAYS PRIOR TO THE ANTICIPATED START DATE OF THE WORK TO OCCUR WITHIN THE CHANNEL. THE WATER DIVERSION PLAN IS REQUIRED TO BE REVIEWED AND APPROVED BY THE CITY AND LACFCD.

CHANNEL WORK NOTES:

1. THE CONTRACTOR SHALL BE EXTRA CAUTIOUS WORKING IN THE VICINITY OF THE EXISTING CHANNEL. FOR THE PURPOSE OF SOIL COMPACTION, THE CONTRACTOR, SHALL USE HANDHELD EQUIPMENT WHEN WORKING ADJACENT TO OR OVER THE DRAIN IN ORDER TO NOT CAUSE ANY STRUCTURAL DAMAGE TO THE CHANNEL.
2. THE CONTRACTOR SHALL OBTAIN THE ACCEPTANCE OF THE ENGINEER BEFORE CUTTING ANY EXISTING REINFORCING BARS.
3. THE CONTRACTOR SHALL SUBMIT SHORING PLANS TO THE ENGINEER AND THE AGENCY FOR REVIEW AND APPROVAL.

USACE NOTES:

1. PROVISIONS SHALL BE MADE TO PREVENT DEBRIS FROM FALLING INTO THE CHANNEL DURING CONSTRUCTION.
2. COMPACTION EQUIPMENT USED TO PLACE BACKFILL BEHIND CHANNEL WALL MUST NOT EXCEED 35,000 POUNDS INCLUDING DYNAMIC FORCED FROM VIBRATOR COMPACTOR.
3. NO EQUIPMENT IN EXCESS OF H-10 HIGHWAY LOADING (AASHTO), AND NO STOCKPILING OF MATERIAL WILL BE PERMITTED ALONG THE CHANNEL WITHIN A DISTANCE OF WALL HEIGHT.
4. NO EQUIPMENT IN EXCESS OF H-20 HIGHWAY LOADING WILL BE PERMITTED TO OPERATE ON THE INVERT OF THE CHANNEL. ONLY RUBBER-TIRED, LEGALLY LOADED EQUIPMENT SHALL BE OPERATED ON THE EXPOSED CHANNEL INVERT. IF STEEL CRAWLER TYPE EQUIPMENT IS USED, WOODEN MATTING SHALL BE PROVIDED OVER THE INVERT IN THE OPERATING AREA. LOADS FROM TRACK VEHICLES SHALL NOT EXCEED 300 PSF ON A SURFACE AT THE BOTTOM OF THE INVERT SLAB.

PUMP NOTES:

GENERAL NOTES:

1. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND SITE CONDITIONS PRIOR TO BEGINNING CONSTRUCTION.
2. SUPERVISION FOR INSTALLATION, START-UP, AND TESTING TO BE PROVIDED BY MANUFACTURER'S REPRESENTATIVE.
3. ALL ELECTRICAL WIRING AND EQUIPMENT INSTALLED IN THE "WET WELL" SECTION MUST BE RATED FOR SUBMERGED CONDITIONS.
4. ALL CONDUITS SHALL BE AS NOTED ON PLANS, OR AGENCY APPROVED EQUAL.
5. ALL ELECTRICAL WIRE SHALL BE "RHW" OR "THW" COPPER CONDUCTOR, OR AGENCY APPROVED EQUAL.
6. THE FLOOR OF THE WET WELL SHALL BE SMOOTH AND LEVEL.
7. ALL NUTS, BOLTS, AND WASHERS SHALL BE 304 S.S./316 S.S. NO EXCEPTIONS.
8. PUMP STATION PERFORMANCE AT CONNECTION LIMITS SHALL BE AS NOTED IN THE PLANS. THE CAPACITY, DISCHARGE PRESSURE, AND DISCHARGE PIPE DIMENSIONS SHALL BE PER PLANS. THE POWER SUPPLY TO THE STATION SHALL BE AS SHOWN ON THE ELECTRICAL DRAWINGS.
9. PUMP STATIONS SHALL BE COMPLETELY WIRED, DYNAMICALLY FLOW AND PRESSURE TESTED PRIOR TO SHIPMENT.

SEQUENCE OF OPERATION:

1. WATER WILL BE DRAWN OUT OF THE WET WELL AS LONG AS THE USER ADJUSTABLE LEVEL SET POINTS IDENTIFIED ON SHEET C-03 ARE SATISFIED AND RAIN DEPTHS EQUAL TO OR GREATER THAN 0.1 INCHES HAVE NOT BEEN MEASURED AT THE ONSITE RAIN GAUGE IN THE PREVIOUS 72 HOURS.
2. LEAD PUMP SELECTION WILL ALTERNATE. THE RUNTIME, FLOW RATE, AND GALLONS PUMPED SHALL BE RECORDED USING A COUNTING SYSTEM. THE COUNTER MUST RECORD AND SAVE PERIODIC READINGS FOR DOWNLOAD. BOTH PUMPS SHALL NOT OPERATE SIMULTANEOUSLY.
3. PUMP SHALL SHUT OFF IF THE WATER LEVEL IN THE EXISTING MESMER SEWER PUMP WET WELL REACHES THE EMERGENCY LEVEL, RESULTING WITH ALL THREE SEWER PUMPS ON (5.20').
4. PUMP SHALL SHUT OFF IF THE ONSITE RAIN GAGE MEASURES GREATER THAN OR EQUAL TO 0.1 INCHES OF RAIN. PUMPS SHALL REMAIN OFF UNTIL 72 HOURS AFTER THE LAST MEASURED RAIN GREATER THAN OR EQUAL TO 0.1 INCHES. PUMP ALARMS AND SHUTOFFS ARE FURTHER DETAILED ON SHEET C-03 AND IN THE PROJECT SPECIFICATIONS.

CITY OF CULVER CITY  
PUBLIC WORKS DEPARTMENT

DATE: APRIL 2021

MESMER LOW FLOW DIVERSION PROJECT, PR-005

GENERAL NOTES

APPROVED BY: SEAN SINGLETARY, P.E.

  
SENIOR CIVIL ENGINEER

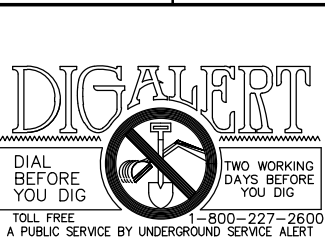
7-11-2021

DATE

SHEET

C - 01

Sheet 2 Of 12 Sheets



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PLANS PREPARED UNDER THE SUPERVISION OF:

Project Number: PR- 005

Drawing No.



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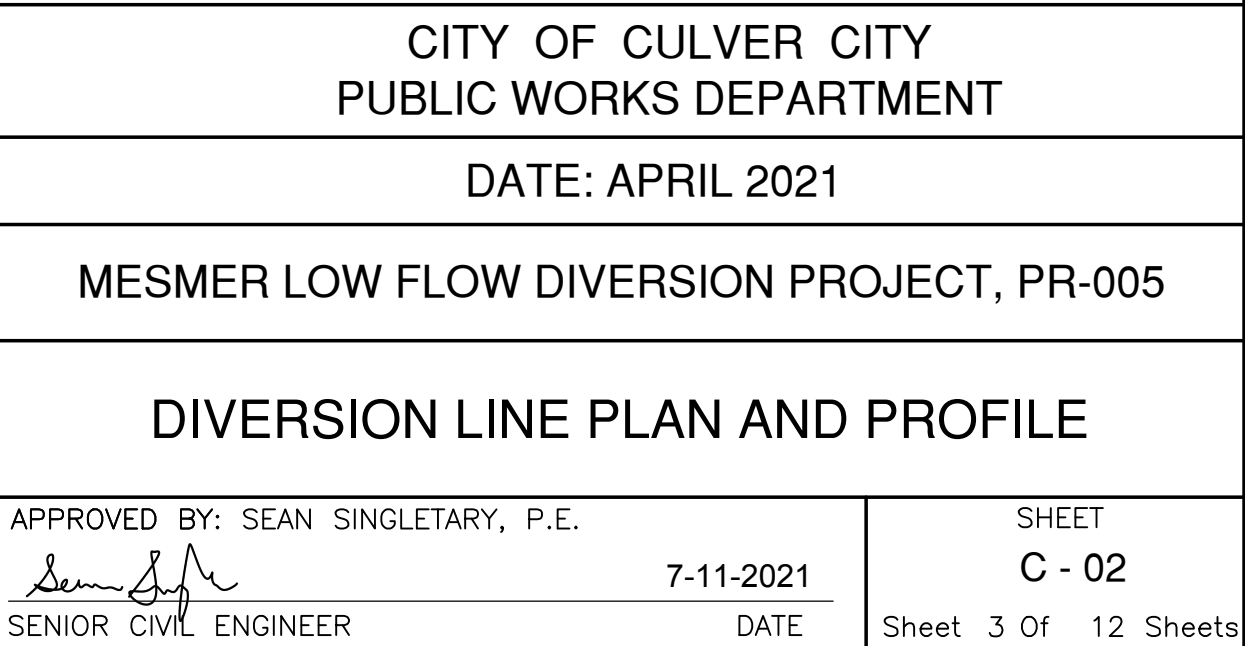
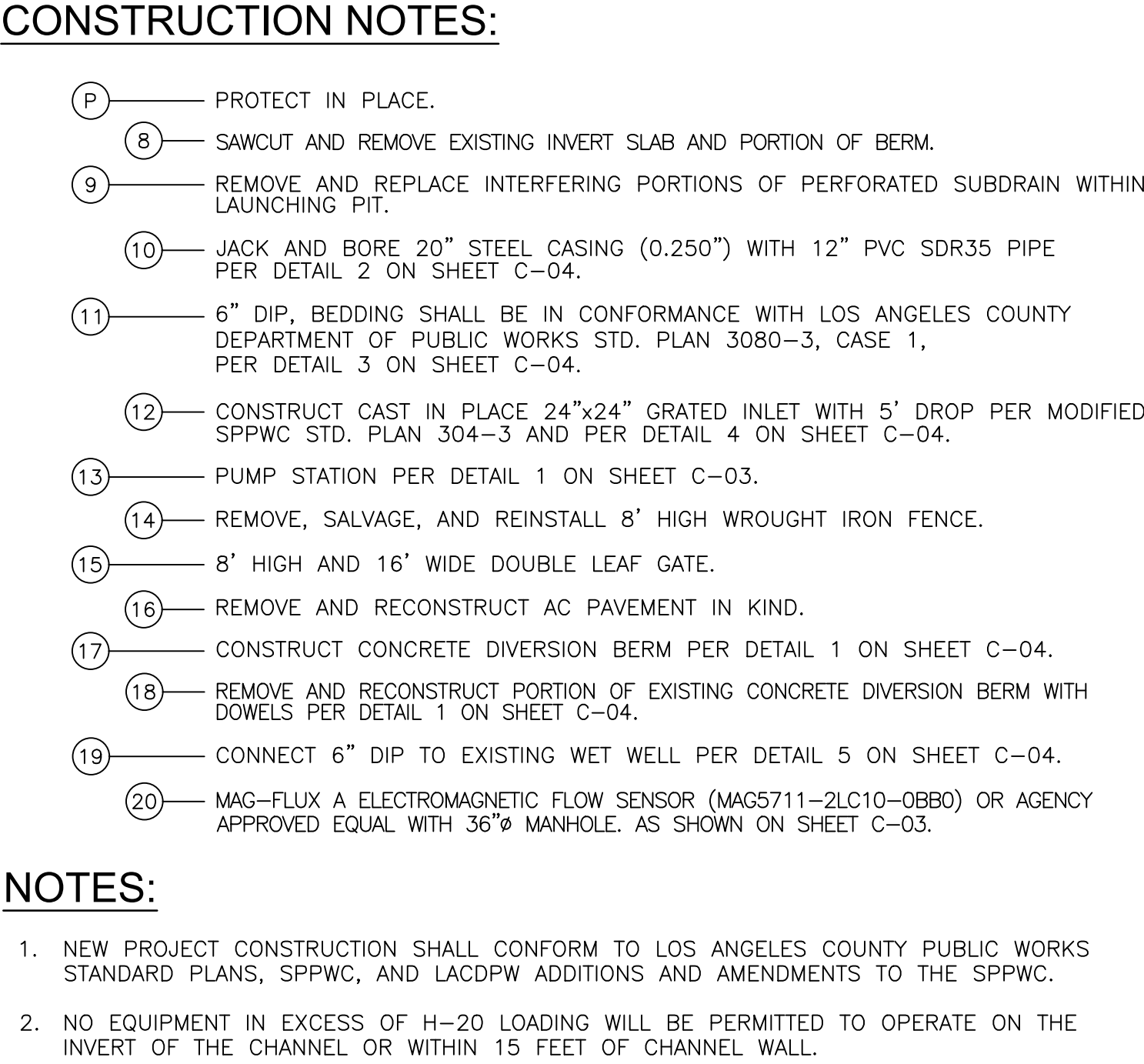
REVISION

BY

APPR.

DATE



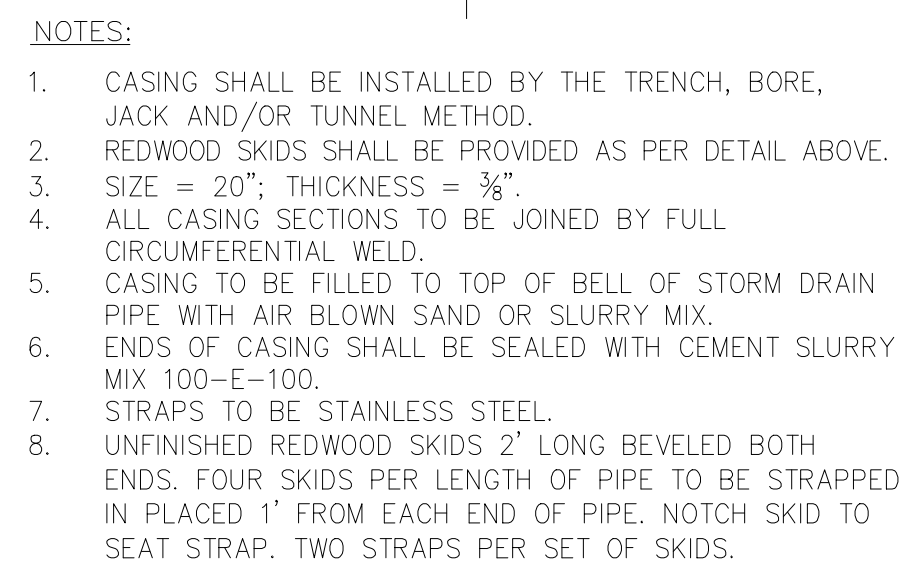
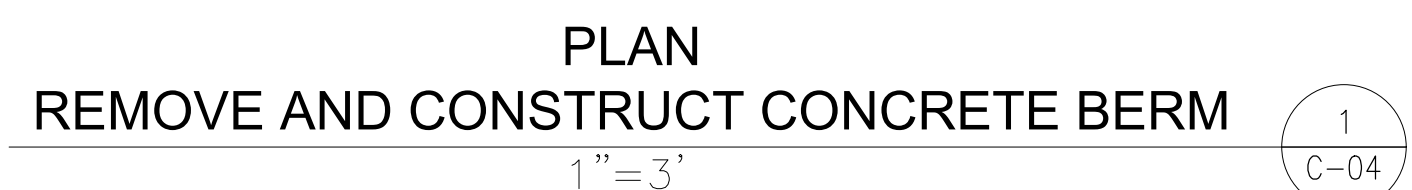
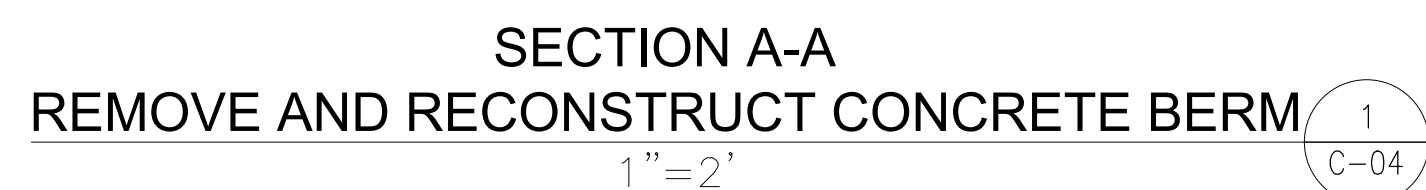


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Last Opened: Jun 30, 2021 - 8:46am by ttokigawa









CHANNEL FLOOR

6'w x 7'h  
CONCRETE DIVERSION BERM

6"

6" MIN.

2'

3"

7"

4'

2'

PLACE CONCRETE ADHESIVE BETWEEN CONCRETE DIVERSION BERM AND CONCRETE CHANNEL FLOOR

#4 @ 24"x24" GRID

#4 @ 24"x24" GRID WITH SIMPSON SET EPOXY OR APPROVED EQUAL

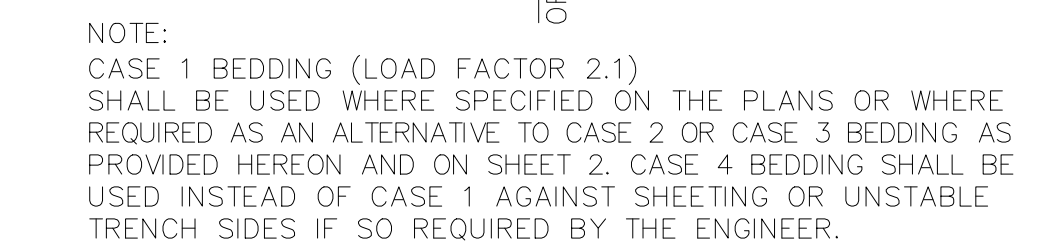
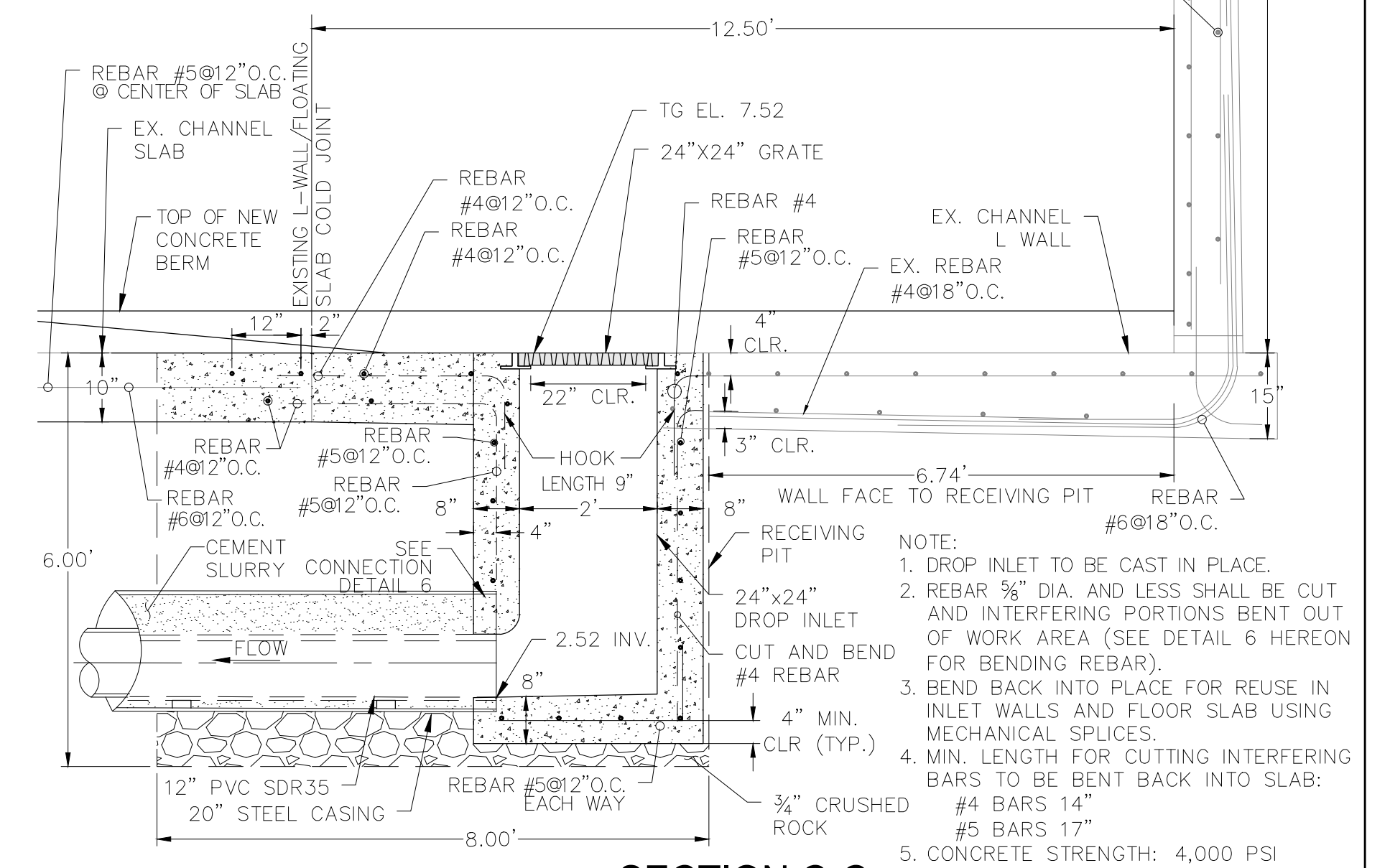
**SECTION B-B**

**CONCRETE DIVERSION BERM**

1" = 1'

1

C-04

[illegible]

8"x6" RECEIVING PIT

20" STEEL CASING

12" PVC SDR35

FLOW

REBAR #5@12"O.C.

REBAR #5@12"O.C.

STEEL GRATE FRAME CAST INTO TOP

CHANNEL WALL

6" PERF. PIPE SUBDRAIN

LIMIT OF L-WALL

NEW CONCRETE BERM

6.7'

3.33'

2'

22"

0.8'

7.4'


C

C

PLAN  
CONNECT ENCASED 12" PVC TO 24" X 24" DROP INLET

1"=2'


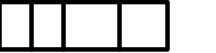
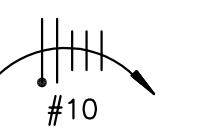

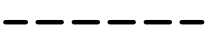
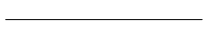
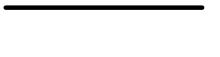

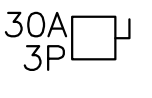



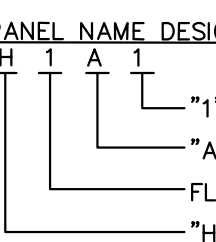
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C-04

<p align="center"><b>CITY OF CULVER CITY</b> <b>PUBLIC WORKS DEPARTMENT</b></p>			
<p align="center"><b>DATE: APRIL 2021</b></p>			
<p align="center"><b>MESMER LOW FLOW DIVERSION PROJECT, PR-005</b></p>			
<p align="center"><b>DETAILS</b></p>			
<p>APPROVED BY: SEAN SINGLETARY, P.E.</p> <p></p> <p>SENIOR CIVIL ENGINEER</p>		<p align="center"><b>7-11-2021</b></p> <p align="center">DATE</p>	<p align="center">SHEET</p> <p align="center"><b>C - 04</b></p> <p align="center">Sheet 5 Of 12 Sheets</p>

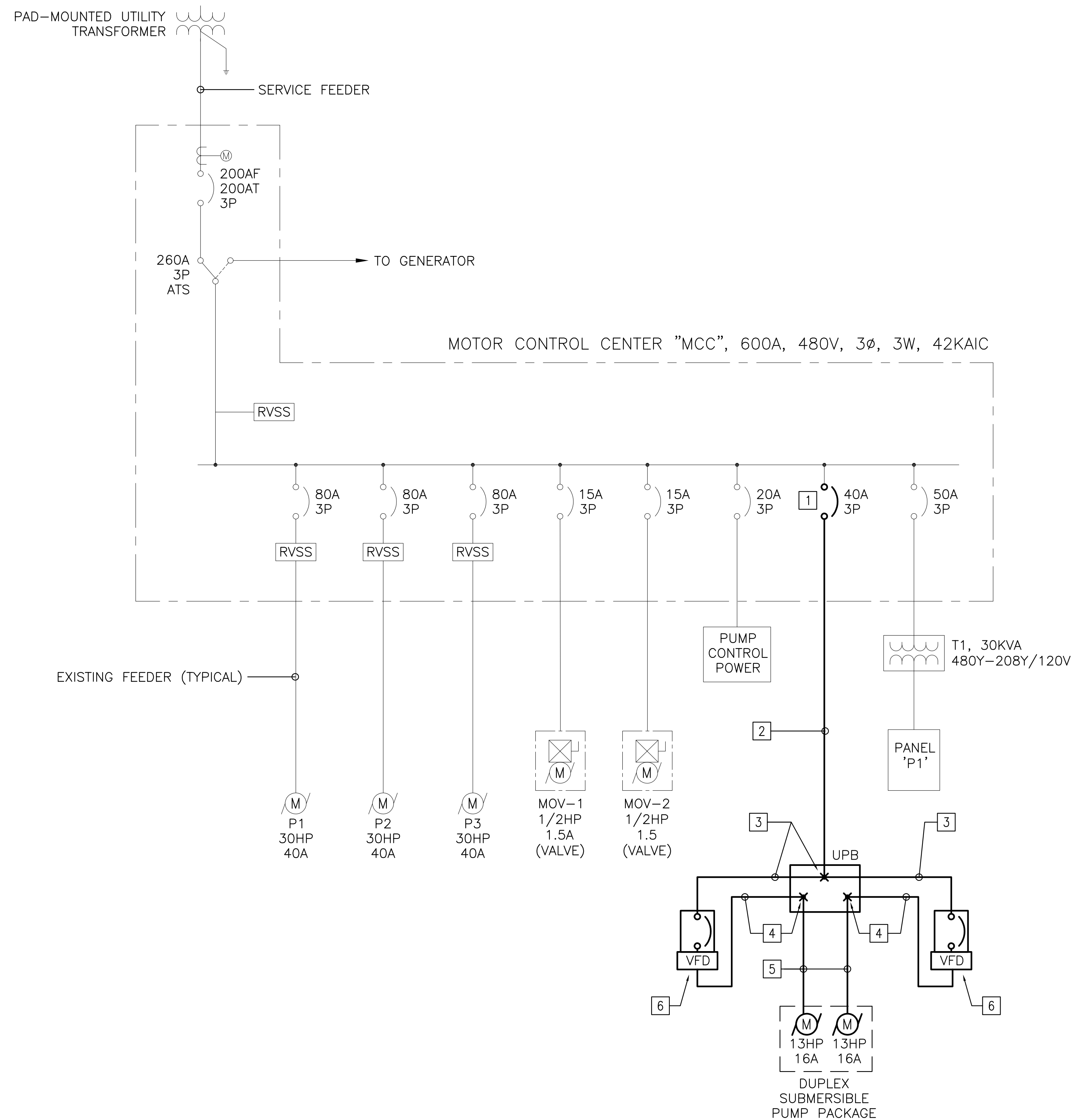






GENERAL NOTES				SYMBOL LIST				DRAWING INDEX											
<p>1. <u>GENERAL:</u></p> <p>THE PROVISIONS OF THE GENERAL CONDITIONS ARE PART OF THIS SECTION AS THOUGH FULLY SET FORTH HEREIN. BEFORE SUBMITTING THE BID, THE BIDDER SHALL VISIT THE SITE AND DETERMINE ANY EXISTING CONDITIONS WHICH MAY AFFECT THE COST OF WORK UNDER THIS SECTION; AND SHALL INCLUDE IN THE BID ALLOWANCE FOR SUCH COST.</p> <p>THE ELECTRICAL GENERAL NOTES ARE PROVIDED ONLY TO EMPHASIZE PORTIONS OF WORK OR INFORMATION REQUIRED FOR THE SCOPE OF WORK. CONTRACTOR TO REFER TO ALL OTHER INFORMATION INCLUDED IN THE COMPLETE DRAWINGS PACKAGE FOR ALL DISCIPLINES IN THE PROJECT, PROJECT MANUALS AND SPECIFICATIONS AS WELL AS ALL OTHER DOCUMENTS AND INFORMATION PROVIDED OR REFERENCED IN CONTRACT DOCUMENTS.</p> <p>2. <u>WORK INCLUDED:</u></p> <p>PROVIDE MATERIALS AND PERFORM LABOR REQUIRED TO EXECUTE THIS WORK AS INDICATED ON THE DRAWINGS, AS SPECIFIED AND AS NECESSARY TO COMPLETE THE CONTRACT, INCLUDING, BUT NOT LIMITED TO, THESE MAJOR ITEMS:</p> <p>A. PROVIDE NEW ELECTRICAL SERVICE TO SERVE THE NEW LOADS. COORDINATE WITH ALL UTILITY (SCE) FOR ALL REQUIREMENT, INCLUDING BUT NOT LIMITED TO SCE STANDARDS SUCH AS THE ELECTRICAL SERVICE REQUIREMENTS (ESR) AND UNDERGROUND STRUCTURES (UGS).</p> <p>B. ALL ELECTRICAL AND CONTROL EQUIPMENT, INCLUDING 480V INCOMING SERVICE, METERING, 480V SWITCHBOARD, TRANSFORMERS, 208Y/120V PANELBOARD AND ALL CONTROL EQUIPMENT AND DEVICES, SHALL BE HOUSED IN A MULTI-SECTION OUTDOOR ELECTRICAL ENCLOSURE.</p> <p>C. CONTRACTOR SHALL DESIGN THE CONTROL SYSTEM BASED ON PERFORMANCE REQUIREMENTS ON DRAWINGS AND SPECIFICATIONS. REFER TO DWG E-03 FOR FURTHER INFORMATION.</p> <p>D. PROVIDE POWER FEEDERS TO PUMPS, BRANCH CIRCUITS TO AUXILIARY LOADS, DEVICES, INSTRUMENTS, VALVES, RECEPTACLES, OUTLETS, ETC.</p> <p>E. PROVIDE LOW-VOLTAGE AND CONTROL WIRING FOR PUMP CONTROL, TO MONITOR PUMP SAFETY SYSTEMS (i.e. LEAK DETECTION, OVERLOAD, OVERHEAT, ETC.), MONITOR AND CONTROL POSITION OF VALVES, FLOWMETERS, LEVEL SENSORS, RAIN SENSORS/GAUGES, AND OTHER FIELD DEVICES AND INSTRUMENT</p> <p>F. MAINTAIN ALL EXISTING ELECTRICAL WORK WITHIN THE CONSTRUCTION AREA REQUIRED TO CONTINUE EXISTING ELECTRICAL SYSTEMS OPERATION BEYOND THE CONSTRUCTION AREA.</p> <p>G. PROVIDE "AS-BUILT" DRAWINGS SHOWING CHANGES FROM THE CONTRACT DOCUMENTS.</p> <p>H. TEST THE COMPLETED WORK. CORRECT ANY DEFECTS TO THE SATISFACTION OF PROJECT REPRESENTATIVE.</p>				<p>9. <u>TESTING AND COMMISSIONING:</u></p> <p>A. CONTRACTOR SHALL CONDUCT SUCH TESTING AND COMMISSIONING OF ANY PORTION OF INSTALLATIONS AS MAY BE NECESSARY TO ENSURE FULL COMPLIANCE WITH PLANS AND SPECIFICATIONS. COST OF TESTING AND COMMISSIONING SHALL BE BORNE BY CONTRACTOR AND CONTRACTOR SHALL PROVIDE ALL THE INSTRUMENTS, EQUIPMENT, LABOR AND MATERIALS TO COMPLETE TESTS.</p> <p>B. TESTING AND COMMISSIONING SHALL BE DONE IN A COMPREHENSIVE MANNER APPLIED TO THE ENTIRE SYSTEM AS A WHOLE. FOR EXAMPLE, THE ELECTRICAL, MECHANICAL AND PLUMBING SYSTEM AS WELL AS THEIR INTERCONNECTION AND FUNCTIONALITY WITH THE CONTROL AND COMMUNICATIONS SYSTEM SHALL BE TESTED AND COMMISSIONED IN THEIR ENTIRETY TO DEMONSTRATE A COMPLETE AND FUNCTIONAL SYSTEM.</p> <p>C. SHOULD THESE TESTS DEVELOP ANY DEFECT IN MATERIALS OR POOR WORKMANSHIP OR VARIANCE WITH REQUIREMENTS OF SPECIFICATIONS, THEN CONTRACTOR SHALL MAKE ANY CHANGES NECESSARY AND REMEDY ANY DEFECTS AT THE CONTRACTOR'S OWN EXPENSE.</p> <p>D. WHERE ANY FAILURE OR UNSATISFACTORY RESULTS FROM THE TESTING AND COMMISSIONING PROCESS ARE RECORDED OR OBSERVED, THE CONTRACTOR SHALL PROVIDE ALL LABOR AND MATERIAL AS NECESSARY TO RESOLVE THE ISSUE IN SUCH A WAY THAT TESTING AND COMMISSIONING IS COMPLETED SUCCESSFULLY. TESTING AND COMMISSIONING OF THE SYSTEM AS A WHOLE SHALL BE REPEATED IN SUCH CASES UNTIL ALL ISSUES HAVE BEEN RESOLVED. SATISFACTORY RESULTS ARE ACHIEVED AND RECORDED AND SYSTEM FUNCTIONALITY IS ITS ENTIRETY IS DEMONSTRATED AND PROVEN.</p> <p>10. <u>WARRANTY / GUARANTEE:</u></p> <p>EQUIPMENT AND ACCESSORIES INSTALLED UNDER THIS SECTION SHALL CARRY THE MANUFACTURER'S WARRANTY AND/OR GUARANTEE FOR A PERIOD OF NOT LESS THAN ONE YEAR FROM THE DATE OF ACCEPTANCE OF THE EQUIPMENT. THE CONTRACTOR SHALL GUARANTEE IN WRITING, IN A FORM ACCEPTABLE TO THE PROJECT MANAGER, THE ENTIRE ELECTRICAL INSTALLATION AGAINST DEFECTIVE MATERIALS AND/OR IMPROPER WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE. DURING THE PERIOD COVERED BY THE GUARANTEE CONTRACTOR SHALL MAKE NECESSARY REPLACEMENTS AND REPAIR AT NO COST TO THE CITY. REFER TO PROJECT SPECIFICATIONS FOR FURTHER INFORMATION ON WARRANTY AND/OR GUARANTEE REQUIREMENTS. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS ON WARRANTY/GUARANTEE FOR SPECIFIC EQUIPMENT, DEVICES AND SYSTEMS.</p> <p>11. <u>COOPERATION WITH OTHERS:</u></p> <p>THE CONTRACTOR SHALL CONSULT AND COOPERATE FULLY WITH ALL OTHER CONTRACTORS AND SUB-CONTRACTORS FURNISHING LABOR, MATERIALS OR SERVICES, SO THAT THE WORK AS A WHOLE, SHALL BE EXECUTED IN THE MOST EFFICIENT MANNER, AND WITHOUT CONFLICT OR DELAY.</p> <p>12. <u>MATERIAL:</u></p> <p>ALL MATERIALS AND EQUIPMENT USED IN THE WORK SHALL BE NEW (UNLESS OTHERWISE NOTED OR SCHEDULED) AND SUITED TO THE INTENDED USE, AND SHALL BE LISTED BY THE UNDERWRITERS LABORATORIES INC. AND SHALL MEET THEIR REQUIREMENTS AND BEAR THEIR LABEL WHENEVER STANDARDS HAVE BEEN ESTABLISHED AND LABEL SERVICE IS REGULARLY FURNISHED BY THAT AGENCY. ALL MATERIALS AND EQUIPMENT SHALL BE OF THE MAKES AND TYPES SPECIFIED, AND NO SUBSTITUTIONS WILL BE ALLOWED UNLESS APPROVED IN WRITING. THE PROJECT MANAGER RESERVES THE RIGHT TO REJECT ANY MATERIAL OR EQUIPMENT, EITHER BEFORE OR AFTER INSTALLATION, WHICH, IN THE PROJECT MANAGER'S OPINION IS NOT IN COMPLIANCE WITH THE CONTRACT DOCUMENTS OR INTENDED USE.</p> <p>13. <u>CONDUIT INSTALLATION:</u></p> <p>A. USE RIGID METAL CONDUIT FOR ALL EXPOSED EXTERIOR WORK.</p> <p>B. ALL UNDERGROUND CONDUIT SHALL BE PVC SCHEDULE 80. ALL TRANSITIONS FROM UNDERGROUND TO ABOVE GROUND, EXPOSED CONDUIT SHALL UTILIZE RIGID METAL ELBOWS AND FITTINGS.</p> <p>C. PENETRATE AND SEAL ACCESS TO MANHOLES, WELL, VAULTS, ETC. AS REQUIRED TO ROUTE POWER AND CONTROL CONDUCTORS TO PUMP AND OTHER COMPONENTS. SUCH PENETRATIONS SHALL BE SEALED TO COMPLETE WATERTIGHT CONDITIONS. IN ADDITION, ALL CONDUIT PENETRATIONS TO AND FROM WELLS AND VAULTS SHALL BE EQUIPPED WITH EXPLOSION-PROOF FITTING, SIMILAR TO "COOPER INDUSTRIES" TYPE "EYS AND EZS" FITTING. SUCH FITTINGS SHALL BE PROVIDED WITH APPROPRIATE LISTED SEALANT TO PREVENT GASES TRAVELING THROUGH CONDUITS TO AND FROM WELLS TO VAULTS AND OTHER PARTS OF THE SYSTEM.</p> <p>D. WHERE UNDERGROUND BORING IS REQUIRED, CONTRACTOR SHALL PROVIDE ALL NECESSARY SITE PREPARATION, EQUIPMENT, STAGING, ETC. TO ROUTE THE CONDUIT AS INDICATED ON PLANS.</p> <p>E. WHEN ROUTING ANY UNDERGROUND CONDUIT, CAREFULLY COORDINATE WITH UTILITIES SHOWN ON CIVIL SHEETS. CONTRACTOR IS RESPONSIBLE FOR CONDUCTING A COMPLETE SURVEY TO CONFIRM EXISTING UTILITIES SHOWN. VERIFY ALL OTHER EXISTING UTILITIES AND ADJUST WORK TO AVOID DISRUPTION OF ALL EXISTING UTILITIES IN WORK AREA.</p> <p>14. <u>WIRE AND CABLE:</u></p> <p>A. PROVIDE WIRES AND CABLES OF THE SIZE AND TYPE SHOWN ON DRAWINGS AND AS SPECIFIED HEREIN. UNLESS OTHERWISE SPECIFIED ALL WIRE AND CABLE SHALL BE U.L. STANDARD ANNEALED COPPER WIRE WITH U.S. 600 VOLT INSULATION. THE MINIMUM SIZE WIRE FOR LIGHTING OR POWER CIRCUITS SHALL BE NO.12 AWG. ALL CONDUCTORS SHALL BE STRANDED. INSULATION OF CONDUCTORS SHALL BE TYPE THHN/THWN.</p> <p>B. COLOR CODE NO. 12 THROUGH NO. 8 BRANCH CIRCUIT WIRES. USE BLACK, RED, BLUE &amp; WHITE FOR 120/208V CIRCUITS. USE YELLOW, ORANGE, BROWN &amp; GRAY FOR 277/480V CIRCUITS. USE GREEN WIRES FOR EQUIPMENT GROUNDS ONLY.</p> <p>C. WIRES AND CABLES FOR CONTROL AND COMMUNICATIONS SYSTEMS HAVE NOT BEE SHOWN ON THE DRAWINGS AS THESE ITEMS ARE A PART OF THE DELEGATED DESIGN SCOPE OF WORK. THE CONTRACTOR IS RESPONSIBLE FOR SELECTING TYPE, SIZE AND QUANTITY OF WIRES AND CABLES AS REQUIRED TO PROVIDE THE COMPLETE SYSTEMS DESCRIBED IN THE DELEGATED DESIGN SCOPE OF WORK.</p> <p>15. <u>CONDUCTOR IDENTIFICATION:</u></p> <p>A. ALL FEEDERS SHALL BE TAGGED AT EACH POINT WHERE THE CONDUIT RUN IS BROKEN. ALL BRANCH CIRCUIT CONDUCTORS AT PANELBOARDS AND SWITCHBOARDS SHALL BE IDENTIFIED WITH "E-Z" CODE MARKERS.</p> <p>B. ALL CONTROL AND COMMUNICATION WIRING SHALL BE TAGGED NEAR THE POINT OF TERMINATION OF THE EQUIPMENT TO WHICH THE WIRING IS CONNECTED. THE TAGS SHALL BE TYPEWRITTEN, UV RESISTANT AND WATERPROOF.</p> <p>16. <u>BOXES AND ENCLOSURES:</u></p> <p>A. ALL OUTDOOR BOXES AND ENCLOSURES SHALL BE NEMA 3R.</p> <p>B. ALL BOXES AND ENCLOSURES USED IN VAULTS AND WELLS SHALL BE NEMA 4X STAINLESS STEEL TYPE.</p>				<p>17. <u>WIRING DEVICES:</u></p> <p>A. ALL WIRING DEVICES SHALL BE FIRST QUALITY, HEAVY-DUTY "SPECIFICATION" GRADE, AND SHALL BE OF IVORY COLOR, GFCI TYPE.</p> <p>B. ALL WIRING DEVICES IN VAULTS AND WELLS SHALL BE HOUSED IN WEATHERPROOF NEMA 4X STAINLESS STEEL BOX OR ENCLOSURE.</p> <p>18. <u>LIGHTING FIXTURES:</u></p> <p>THE CONTRACTOR SHALL INSTALL ALL LIGHTING FIXTURES AS AN INTEGRAL PART OF THE ELECTRICAL ENCLOSURE. EXACT LOCATION OF LIGHTING IS NOT INDICATED ON THE DRAWINGS BUT IT IS EXPECTED THAT SLIM STYLE, LOW-WATTAGE, LED STRIP LIGHTING WILL BE PROVIDED. PROVIDE LOCAL SWITCH MOUNTED IN AN ACCESSIBLE LOCATION NEAR THE ENCLOSURE DOOR.</p> <p>19. <u>CLEANING:</u></p> <p>THE CONTRACTOR SHALL REMOVE FROM SITE ALL PACKING CARTONS, SCRAP MATERIALS AND OTHER RUBBISH AND LEAVE THE AREA IN A CONDITION ACCEPTABLE TO THE PROJECT MANAGER.</p> <p>20. <u>CODE COMPLIANCE:</u></p> <p>ALL ELECTRICAL WORK SHALL COMPLY WITH THE LATEST APPLICABLE FOLLOWING CODES AND REGULATIONS, AS ADOPTED AND AMENDED BY LOCAL, CITY, COUNTY, MUNICIPAL AND STATE REGULATIONS:</p> <ul style="list-style-type: none"><li>• 2019 CALIFORNIA BUILDING CODE, VOLUMES I, II, III</li><li>• 2019 CALIFORNIA ELECTRICAL CODE</li><li>• 2019 CALIFORNIA FIRE CODE</li><li>• 2019 CALIFORNIA MECHANICAL CODE</li><li>• 2019 CALIFORNIA PLUMBING CODE</li><li>• ALL OTHER CODES AND REGULATIONS AS REQUIRED BY DRAWINGS OF OTHER TRADES OR INCLUDED IN THE SPECIFICATIONS</li></ul> <p>21. <u>SAFETY:</u></p> <p>A. ALL ELECTRICAL WORK SHALL BE CONDUCTED IN ACCORDANCE WITH CAL/OSHA "LOCK OUT / TAG OUT " PROCEDURES.</p> <p>B. CONTRACTOR IS RESPONSIBLE FOR PROVIDING A SHORT-CIRCUIT DEVICE COORDINATION STUDY AND AN ARC FLASH STUDY. STUDIES SHALL BE BASED ON ACTUAL AVAILABLE FAULT CURRENT OBTAINED FROM THE LOCAL UTILITY. SUBMIT STUDIES TO PROJECT MANAGER FOR REVIEW AND APPROVAL. AFTER THE STUDIES HAVE BEEN COMPLETED, REVIEWED AND APPROVED, THE CONTRACTOR SHALL PROVIDE AND APPLY ARC FLASH HAZARD LABELS AT EACH ELECTRICAL SWITCHBOARD, PANELBOARD AND INDUSTRIAL CONTROL PANEL.</p> <p><u>TRAINING:</u></p> <p>A. AT THE CONCLUSION OF WORK, AFTER ALL POWER AND CONTROL EQUIPMENT HAVE BEEN INSTALLED, ENERGIZED, PROGRAMMED, TESTED/COMMISSIONED AND READY FOR USE, PROVIDE TRAINING FOR THE CITY STAFF.</p> <p>B. TRAINING SESSION SHALL BE NO LESS THAN 8 HOURS AND SHALL COVER THE OPERATION AND MAINTENANCE OF THE PUMP CONTROL, COMMUNICATIONS AND TELEMETRY / SCADA SYSTEMS.</p> <p>C. TRAINING SHALL BE PERFORMED BY A FACTORY TECHNICIAN OR AUTHORIZED VENDOR OF THE SPECIFIC PRODUCTS USED IN THE SYSTEM.</p> <p>D. CONTRACTOR SHALL PROVIDE A COMPREHENSIVE NARRATIVE DESCRIBING THE COMPLETE OPERATION OF THE PUMP SYSTEM, CONTROL SYSTEM, COMMUNICATION AND TELEMETRY/SCADA SYSTEMS. THE INTENT OF REQUIRING THIS DOCUMENT IS FOR THE CURRENT OPERATORS OR PERSONS OPERATING THE SYSTEMS IN THE FUTURE TO BE ABLE TO REFER BACK TO ONE COMPREHENSIVE DOCUMENT THAT DESCRIBES THE OVERALL OPERATION OF THESE SYSTEM AS A WHOLE AS WELL AS INDIVIDUAL PARTS OF THE SYSTEM. SUBMIT (3) THREE COPIES OF THE OPERATION NARRATIVE TO THE PROJECT MANAGER FOR REVIEW AND APPROVAL. NOTE THAT THIS NARRATIVE MAY BE THE SAME DOCUMENT REQUIRED AS A PART OF THE CONTROL SYSTEM DELEGATED DESIGN SCOPE OF WORK.</p> <p><u>CONTACT INFORMATION:</u> TOM WILLIAMS tom.williams@uscubed.com (619)546-4281 UTILITY SYSTEMS SCIENCE &amp; SOFTWARE (US<sup>3</sup>) 1250 PIONEER WAY SUITE F, EL CAJON CA 92020</p> <p>3. CONTRACTOR IS RESPONSIBLE FOR DESIGNING, FURNISHING, INSTALLING, PROGRAMMING, TESTING AND COMMISSIONING A COMPLETE AND FUNCTIONAL SYSTEM, INCLUDING BUT NOT LIMITED TO PLC, TELEMETRIC / SCADA EQUIPMENT, CONTROLLERS, ANALOG AND DISCRETE INPUT/OUTPUT MODULES, LEVEL AND PRESSURE SENSORS AND TRANSDUCERS, ANTENNAS, INSTRUMENTS, LOW-VOLTAGE AND LINE-VOLTAGE RELAYS, HUMAN MACHINE INTERFACE (HMI) TOUCH-SCREEN DISPLAYS, INDICATOR LIGHTS, SELECTOR SWITCHES, PUSH-BUTTONS, POWER SUPPLIES, TRANSFORMERS, ENCLOSURES, MOUNTING HARDWARE, TERMINATIONS AND WIRING FOR ALL COMPONENTS INCLUDING INTERFACE WITH FIELD EQUIPMENT AND DEVICES SUCH AS PUMPS, STARTERS/VARIABLE FREQUENCY DRIVES, SENSORS, TRANSDUCERS, ACTUATORS, VALVES, GATES, ETC. SEE DRAWINGS FOR COMPLETE REQUIREMENTS, PAYING SPECIAL ATTENTION TO DWG E0.6.</p> <p>4. CONTRACTOR IS RESPONSIBLE FOR SUBMITTING THE DELEGATED DESIGN IN A SHOP DRAWINGS PACKAGE, INCLUDING DATA SHEETS FOR ALL COMPONENTS, SPECIFICATIONS FOR ALL COMPONENTS, DETAILED DRAWINGS SHOWING ALL COMPONENTS OF THE PLC AND ALL FIELD DEVICES USING POINT-TO-POINT CONNECTION DIAGRAMS, ELEVATIONS AND FLOOR VIEW OF ALL EQUIPMENT AND DEVICES AS WELL AS EXACT LOCATION OF ALL EQUIPMENT AND DEVICES ON FLOOR OR SITE PLANS. IN ADDITION, CONTRACTOR SHALL PROVIDE A COMPREHENSIVE NARRATIVE DESCRIBING THE COMPLETE OPERATION OF THE SYSTEM INCLUDING ALL FIELD DEVICES. SUBMIT SHOP DRAWINGS PACKAGE TO THE PROJECT MANAGER FOR REVIEW AND APPROVAL.</p> <p>5. AT THE CONCLUSION OF THE PROJECT, PROVIDE AS-BUILT RECORD DRAWINGS OF THE FINAL SYSTEM CONDITION AND CONFIGURATION, COMPREHENSIVE NARRATIVE DESCRIBING COMPLETE OPERATION OF THE SYSTEM, MAINTENANCE AND OPERATIONS MANUALS, WARRANTY / GUARANTEE CERTIFICATES AND ALL OTHER DOCUMENTATION TO THE PROJECT MANAGER.</p>				<p> 20A, 120V, GFCI DUPLEX RECEPTACLE, NEMA 5-20R IN WEATHERPROOF BOX</p> <p> SECTIONAL POWER &amp; CONTROLS ENCLOSURE PER DETAIL ON SHEET E-06</p> <p> BRANCH CIRCUIT CONDUIT AND CONDUCTOR, HASH MARKS INDICATE THE QUANTITY OF CONDUCTORS REQUIRED. #10 AWG CONDUCTORS ARE INDICATED. WHERE A NUMBER, #, IS NOT INDICATED THE CONDUCTORS ARE #12 AWG. MINIMUM. SHORT LINES (HASH MARKS) DENOTES PHASE CONDUCTOR, LINE (HASH MARKS) DENOTES NEUTRAL CONDUCTOR, LINE (HASH MARKS) WITH DOT DENOTES #12 AWG INSULATED GROUNDING WIRE. CONDUIT SIZE SHALL BE PER NEC, EXCEPT MINIMUM SIZE SHALL BE 3/4", U.O.N.</p> <p> BRANCH CIRCUIT CONDUIT AND CONDUCTOR NO HASH MARKS INDICATES 2#12 AWG AND 1#12 INSULATED GROUNDING WIRE. CONDUIT SIZE SHALL BE 3/4", U.O.N.</p> <p> HEAVY BROKEN LINE INDICATES CONDUIT, WIRES OR EQUIPMENT RUN UNDERGROUND</p> <p> THIN LINES INDICATE EXISTING</p> <p> HEAVY, THICK LINES INDICATE NEW</p> <p> GROUND CONNECTION TO STRUCTURAL BUILDING STEEL</p> <p> DISCONNECT SWITCH 30A, 3-POLE</p> <p> POWER PULLBOX</p> <p> SIGNAL PULLBOX</p> <p> JUNCTION BOX</p> <p><u>PANEL NAME DESIGNATION:</u></p> <p> "1" INDICATES 1ST SUBPANEL, "2" 2ND SUBPANEL, "3" 3RD SUBPANEL, ETC "A" INDICATES 1ST PANEL, "B" 2ND PANEL, "C" 3RD PANEL, ETC FLOOR DESIGNATION ("B" BASEMENT, "R" ROOF, "1" 1ST FLR, "2" 2ND FLR, ETC.) "H" = HIGH VOLTAGE (480Y/277V) "L" = LOW VOLTAGE (208Y/120V) "MCC" = MOTOR CONTROL CENTER (480/277V) "MS" = MAIN SWITCHBOARD (USUALLY FOLLOWED BY AN "H" OR AN "L") "DP" = DISTRIBUTION PANEL (USUALLY FOLLOWED BY AN "H" OR AN "L")</p>				<p><b>SHEET</b></p> <p>E-01 ELECTRICAL GENERAL NOTES</p> <p>E-02 ELECTRICAL SINGLE-LINE DIAGRAM AND PANEL SCHEDULES</p> <p>E-03 LOW FLOW DIVERSION PUMP PLAN</p> <p>E-04 LOW FLOW DIVERSION PUMP ELECTRICAL DETAIL</p> <p>E-05 ELECTRICAL DETAILS</p> <p>E-06 CONTROL AND COMMUNICATION SYSTEM BLOCK DIAGRAM AND PERFORMANCE SPECIFICATIONS</p>			
								<b>DEFINITION</b>											
								<p>1. PROVIDE IS DEFINED TO MEAN THAT THE CONTRACTOR SHALL FURNISH, INSTALL, ADJUST, TEST AND INTEGRATE INTO A COMPLETE SYSTEM THE ITEM INDICATED, INCLUDING ALL HARDWARE, WIRING, AND MISCELLANEOUS ITEMS AS NECESSARY FOR A COMPLETE AND OPERATIONAL SYSTEM.</p>											
								<b>ABBREVIATIONS</b>											
								AFF	ABOVE FINISHED FLOOR	(N)	NEW								
								AIC	AMPERE INTERRUPTING CAPACITY	PLC	PROGRAMMABLE LOGIC CONTROLLER								
								C	CONDUIT	SUR	SURFACE								
								CU	COPPER	TYP	TYPICAL								
								(E)	EXISTING	UON	UNLESS OTHERWISE NOTED								
								EGC	EQUIPMENT GROUNDING CONDUCTOR	VFD	VARIABLE FREQUENCY DRIVE								
								DWG	DRAWING	WP	WEATHER PROOF								
								G, GND	GROUND	XFMR	TRANSFORMER								
								GC	GENERAL CONTRACTOR	#	NUMBER								
								GEC	GROUNDING ELECTRODE CONDUCTOR										
								GFI	GROUND FAULT INTERRUPTER										
								L	LENGTH										
								MCB	MAIN CIRCUIT BREAKER										
								MH	MANHOLE										





SINGLE LINE DIAGRAM

SINGLE LINE DIAGRAM NOTES

- 1 PROVIDE 40A, 480V, 3-POLE CIRCUIT BREAKER TO REPLACE THE (E) 20A SPARE BREAKER IN (E) MCC. KAIC OF (N) CIRCUIT BREAKER TO MATCH THE MCC RATING.
- 2 PROVIDE 1"C-3#6 + 1#8GND TO UNDERGROUND PULLBOX.
- 3 PROVIDE COLD-SHRINK SPLICE KIT RATED FOR OUTDOOR CONDITIONS IN THE UNDERGROUND PULLBOX. SPLICE INCOMING FEEDER AND CONTINUE RUNNING TWO (2) 1"C-3#10 +1#10GND, ONE TO EACH VFD FOR EACH OF THE PUMPS.
- 4 PROVIDE COLD-SHRINK SPLICE KIT RATED FOR OUTDOOR CONDITIONS IN THE UNDERGROUND PULLBOX. SPLICE FEEDER FROM VFD WITH POWER LEADS FROM EACH SUBMERSIBLE PUMP, ONE SET OF FEEDERS FROM EACH PUMP.
- 5 PROVIDE 1" CONDUIT FROM PUMP TO UNDERGROUND PULLBOX. PULL SUBMERSIBLE PUMP POWER CONDUCTOR LEADS THROUGH TO THE PULLBOX. VERIFY THE LENGTH OF CONDUIT RUN IN THE FIELD AND COORDINATE WITH SUBMERSIBLE PUMP PACKAGE MANUFACTURER PRIOR TO ORDER TO ENSURE THE MANUFACTURER PROVIDES THE RIGHT LENGTH OF CONDUCTOR TO REACH THE UNDERGROUND PULLBOX.
- 6 PROVIDE 15HP (21 FLA), 480V, 3φ VARIABLE FREQUENCY DRIVE BY SCHNEIDER ELECTRIC (CAT#: ATV660D11T4HNY), WITH INPUT CIRCUIT BREAKER, FULL-SIZE BYPASS AND LOW HARMONICS (THD: <5%), IN NEMA 3R ENCLOSURE. SEE DETAIL 4 ON E-05.

EXISTING SYSTEMS NOTE:

ALL ITEMS, INCLUDING MOTOR CONTROL CENTER, PANELBOARD, TRANSFORMERS, EQUIPMENT, OVERCURRENT PROTECTION, FEEDERS, ETC. SHOWN IN THE SINGLE LINE DIAGRAM ON THIS DWG ARE EXISTING, ARE TO REMAIN AND TO BE PROTECTED IN PLACE, UNLESS OTHERWISE NOTE IN THE KEYNOTES BELOW.

CONTROL SYSTEM NOTE:

THE EXISTING PUMP CONTROL SYSTEM IN THE CONTROL ROOM BUILDING SHALL BE UTILIZED FOR CONTROL. ALL NEW PUMPS, VFD UNITS AND OTHER DEVICES AND INSTRUMENTS REQUIRE CONNECTION TO THE EXISTING CONTROL SYSTEM. THE CONTROL SYSTEM SHALL BE A DELEGATED DESIGN SYSTEM BASED ON REQUIREMENT STATED IN THE DRAWINGS AND SPECIFICATIONS. REFER TO DWGS E-01 AND E-06 FOR MORE INFORMATION.

LOAD SUMMARY

P1	40A
P2	40A
P3	40A
MOV-1	1.5A
MOV-2	1.5A
PUMP CONTROLS	2A
DUPLEX PUMPS	16A
TRANSFORMER T-1	36A
25% OF LML = 40A x 0.25 =	10A
25% OF LCL = N/A	
TOTAL	187A

CITY OF CULVER CITY  
PUBLIC WORKS DEPARTMENT

DATE: APRIL 2021

MESMER LOW FLOW DIVERSION PROJECT, PR-005

ELECTRICAL SINGLE-LINE  
DIAGRAM AND PANEL SCHEDULES

APPROVED BY: SEAN SINGLETARY, P.E.

SEAN SINGLETARY  
SENIOR CIVIL ENGINEER

7-11-2021

DATE

SHEET

E-02

Sheet 8 Of 12 Sheets

**CWE**  
1561 E. ORANGETHORPE AVE.  
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FULLERTON, CA 92631  
TEL (714) 526-7500

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1845 VAN NESS AVE., SUITE 200  
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REGISTERED ARCHITECTS

REGISTERED PROFESSIONAL ENGINEER  
SEAN SINGLETARY  
No. E22793  
Exp. 6/30/21  
ELECTRICAL  
STATE OF CALIFORNIA



NO.

REVISION

BY

APPR.

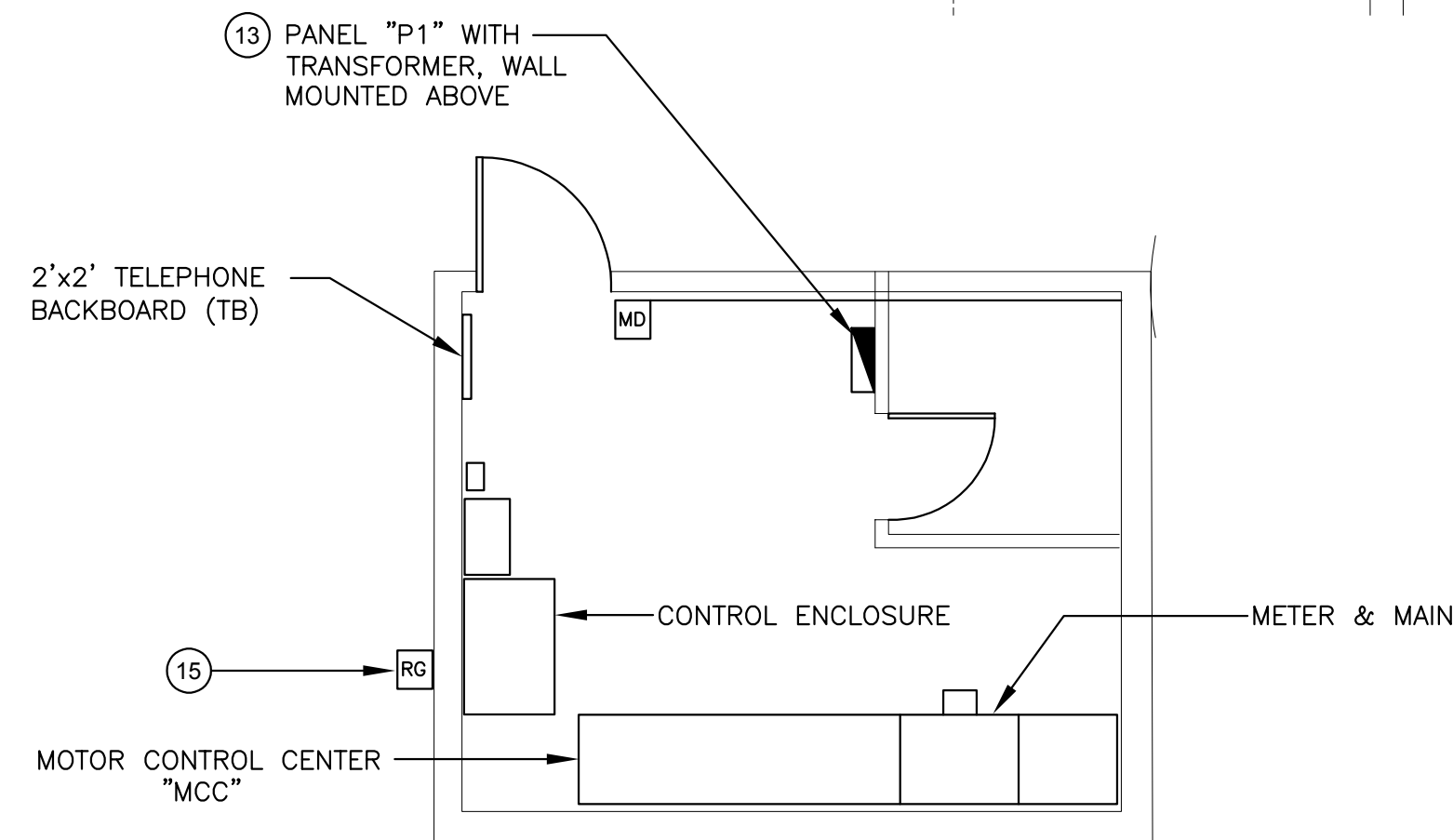
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① PROVIDE WALLMOUNTED PULLBOX. ROUTE FEEDER FROM (E) MCC IN CONTROL ROOM BUILDING. TRANSITION UNDERGROUND AND CONTINUE RUNNING TO LOCATION OF VFD UNIT.

- ### GENERAL NOTES:

1. SEE DETAIL 1 ON DWG E-05 FOR TYPICAL DUCTBANK DETAIL.
2. WET WELL IS CLASSIFIED AS CLASS 1, DIVISION 1 HAZARDOUS.
3. PROVIDE RIGID METALLIC EXPLOSION-PROOF CONDUIT SEAL FITTING FOR ALL CONDUITS ENTERING VALVE VAULTS, WET WELLS AND MANHOLES PER DETAIL 3 ON E-05.
4. SEE DWG E-04 FOR LOW FLOW WET WELL AND VAULT DETAILS.
5. CAREFULLY COORDINATE TYPE, SIZE AND QUANTITY OF WIRING AND CONDUIT BETWEEN SITE PLAN AND SINGLE LINE DIAGRAMS. VERIFY THE WIRING TYPE AND SIZE INFORMATION WITH MANUFACTURER OF EQUIPMENT AND DEVICES. ADJUST CONDUIT SIZES IF NECESSARY TO ACCOMMODATE MANUFACTURER WIRING REQUIREMENTS.




2  
E0.3

**ENLARGED VIEW**

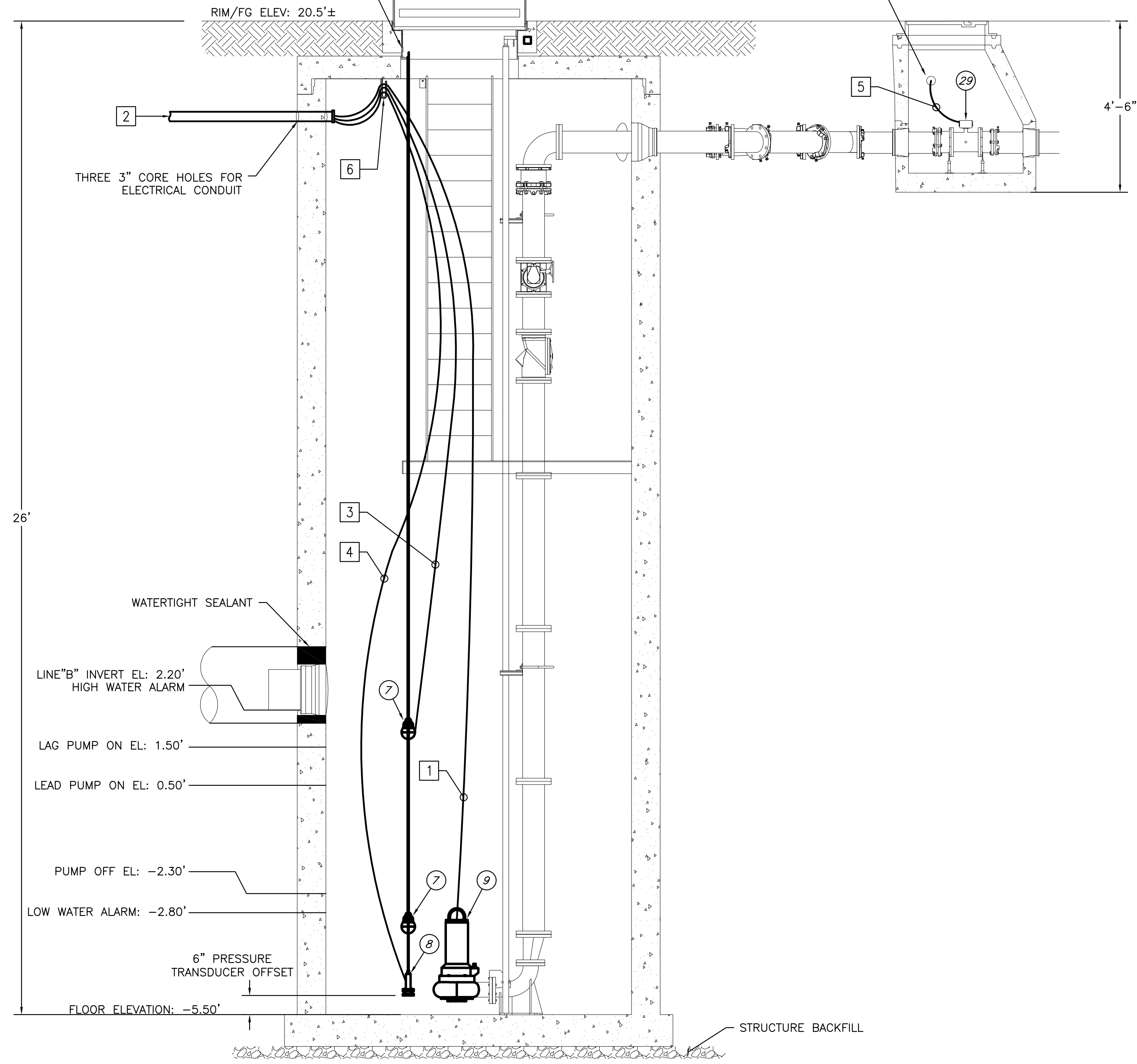
SCALE: 0 1 2 4 FEET 8

$\frac{1}{4}" = 1'-0"$

CITY OF CULVER CITY PUBLIC WORKS DEPARTMENT	
DATE: APRIL 2021	
MESMER LOW FLOW DIVERSION PROJECT, PR-005	
ELECTRICAL SITE PLAN	
APPROVED BY: SEAN SINGLETARY, P.E.  SENIOR CIVIL ENGINEER	SHEET E-03 Date 7-11-2021 Sheet 9 Of 12 Sheets

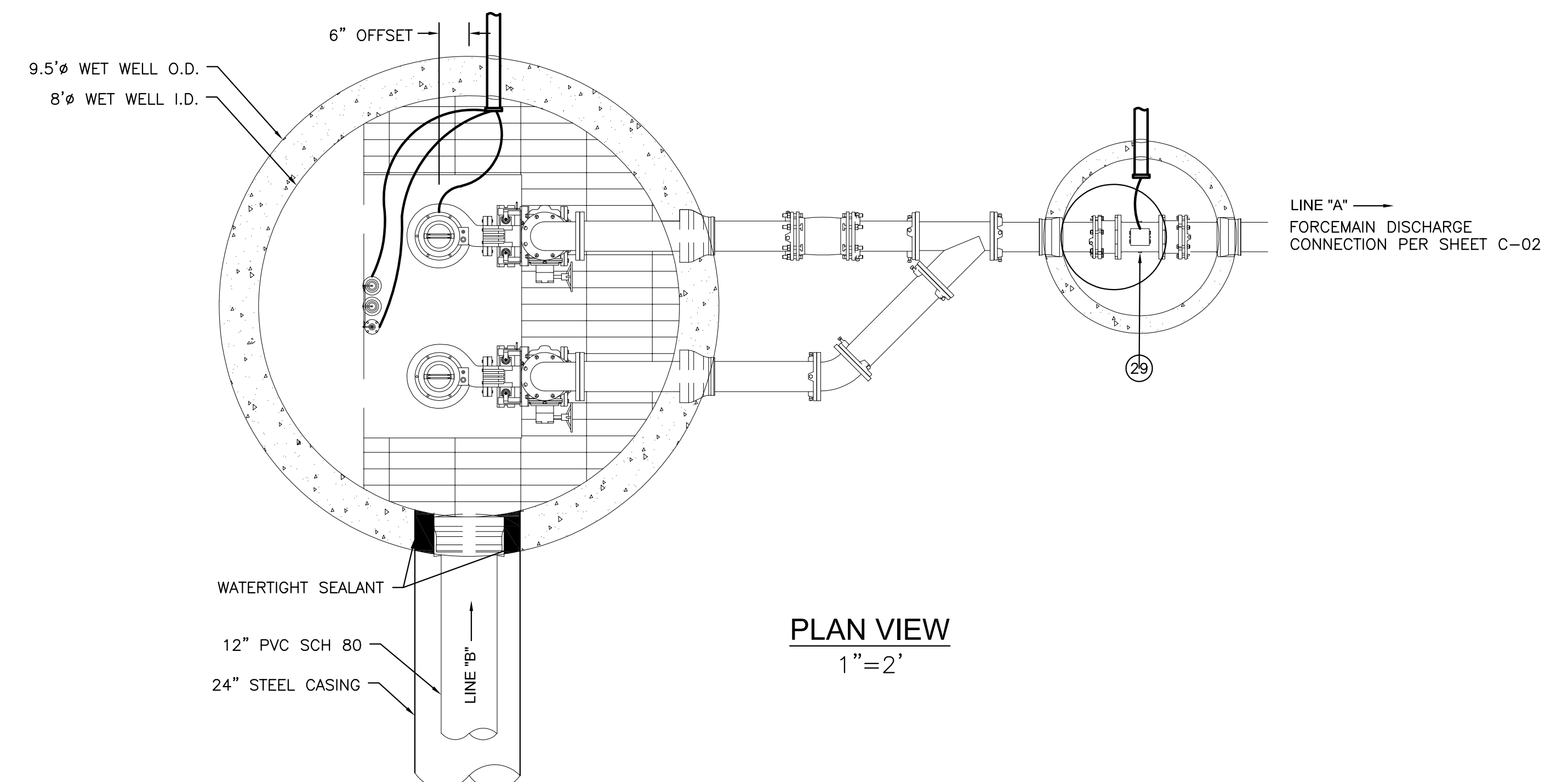



- 1 (2) TWO PUMP POWER CONDUCTOR LEADS AND PUMP CONTROL WIRING LEADS (OVERTEMPERATURE, LEAK DETECTION, ETC.) FROM HIGH FLOW DIVERSION PUMPS.
- 2 POWER AND CONTROL CONDUITS. COORDINATE WITH ELECTRICAL SITE PLAN AND SINGLE LINE DIAGRAM FOR CONDUIT QUANTITY AND SIZING.
- 3 POWER/CONTROL WIRING FROM FLOAT LEVEL SENSOR.
- 4 POWER/CONTROL WIRING FROM PRESSURE TRANSDUCER LEVEL SENSOR.
- 5 POWER/CONTROL WIRING FROM FLOW METER.
- 6 304 STAINLESS STEEL CABLE HOOK BRACKET.



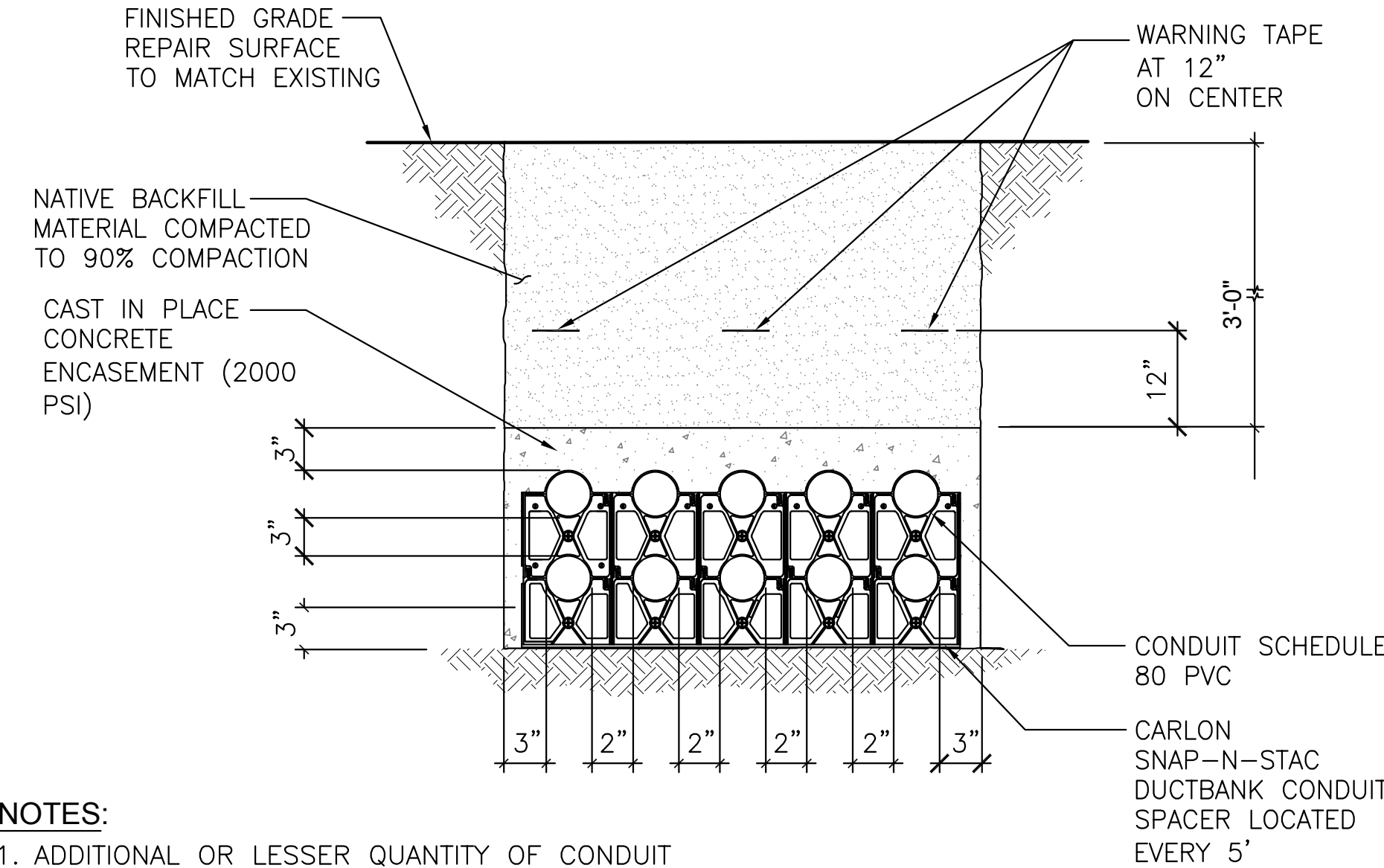
SYSTEM CHARACTERISTICS	
DESCRIPTION	VALUE
DUTY POINT	672 gpm @ 37.7' TDH
MANUFACTURER	HOMA OR AGENCY APPROVED EQUAL
MODEL NUMBER	AMS444-220/13P/C
PUMP TYPE	SUBMERSIBLE PUMP
MOTOR SIZE	13 hp, 32/16 A
MAX PUMP RUN SPEED	1750 rpm
VOLTAGE	230/460 V, 3 Ph
WET WELL LINER/COATING	CRYSTALLINE WATERPROOF (INSIDE WALLS)
ACCESS HATCH LOADING CRITERIA	DIRECT H-20

PARTS LIST		
ITEM	QTY	DESCRIPTION
6	1	304SS 3-HOOK FLOAT BRACKET
7	2	OPTICAL FLOAT SWITCH BY OPTI-FLOAT W/ 100' CABLE
8	1	PRESSURE TRANSDUCER
9	2	HOMA NON-CLOG PUMP, 4" DISCHARGE, 9.8HP, THERMAL & SEAL FAIL SENSORS, STANDARD CABLE LENGTH 50FT, EXTERIOR COATED W/ HIGH SOLIDS POLY-AMIDE EPOXY, 4" SOLIDS HANDLING (OR AGENCY APPROVED EQUAL)
29	1	MAG-FLUX A ELECTROMAGNETIC FLOW SENSOR



CITY OF CULVER CITY PUBLIC WORKS DEPARTMENT	
DATE: APRIL 2021	
MESMER LOW FLOW DIVERSION PROJECT, PR-005	
LOW FLOW DIVERSION PUMP ELECTRICAL DETAIL	
APPROVED BY: SEAN SINGLETARY, P.E.  SENIOR CIVIL ENGINEER	7-11-2021 DATE
SHEET E-04 Sheet 10 of 12 Sheets	





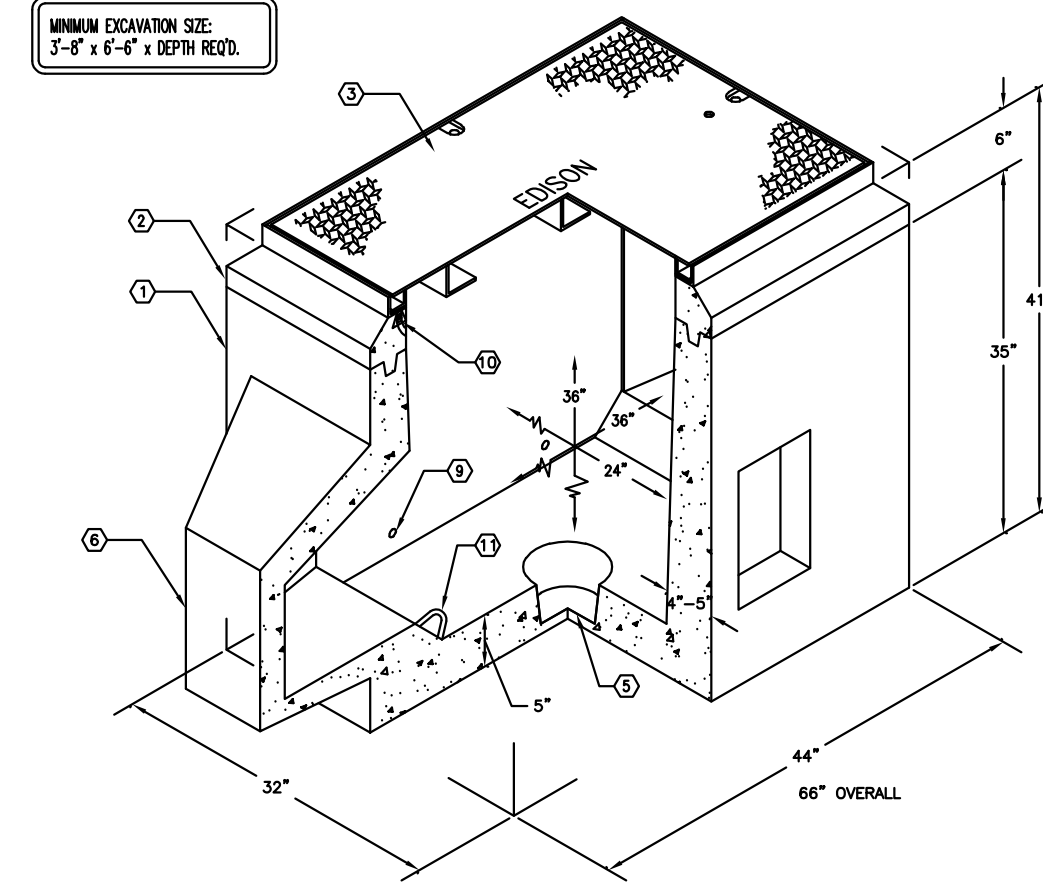
- NOTES:**
1. ADDITIONAL OR LESSER QUANTITY OF CONDUIT REQUIRES SAME SPACING.
  2. REPAIR AND PATCH ALL SURFACES. TO MATCH EXISTING OR AS REQUIRED BY CIVIL DRAWINGS.
  3. MINIMUM CONDUIT SWEEP RADIUS SHALL BE 36".
  4. CONDUIT SIZES AND QUANTITY SHALL BE PER SITE & FLOOR PLANS.

**TYPICAL UNDERGROUND CONDUIT DUCT BANK DETAIL** 1  
NOT TO SCALE E-05

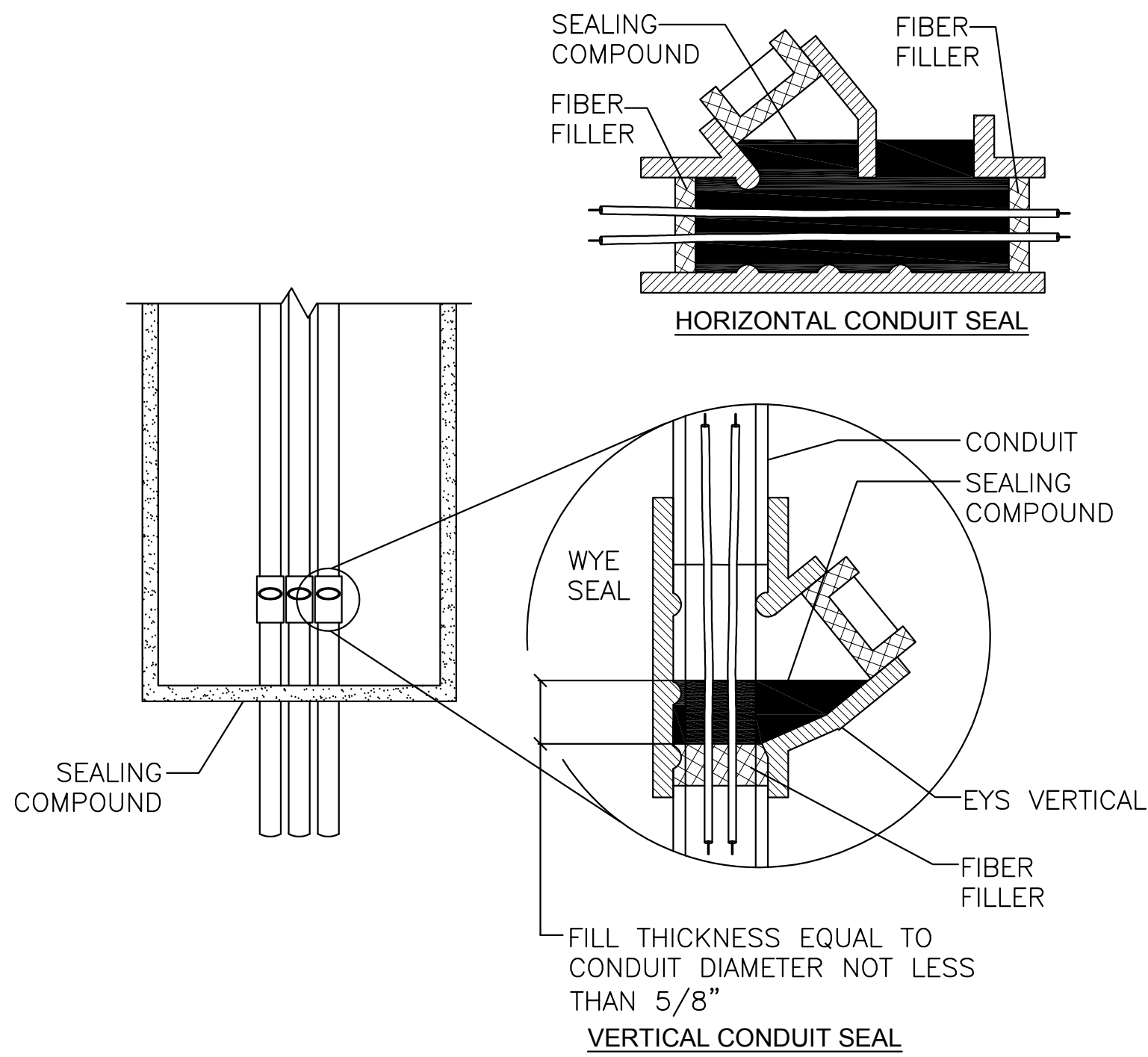
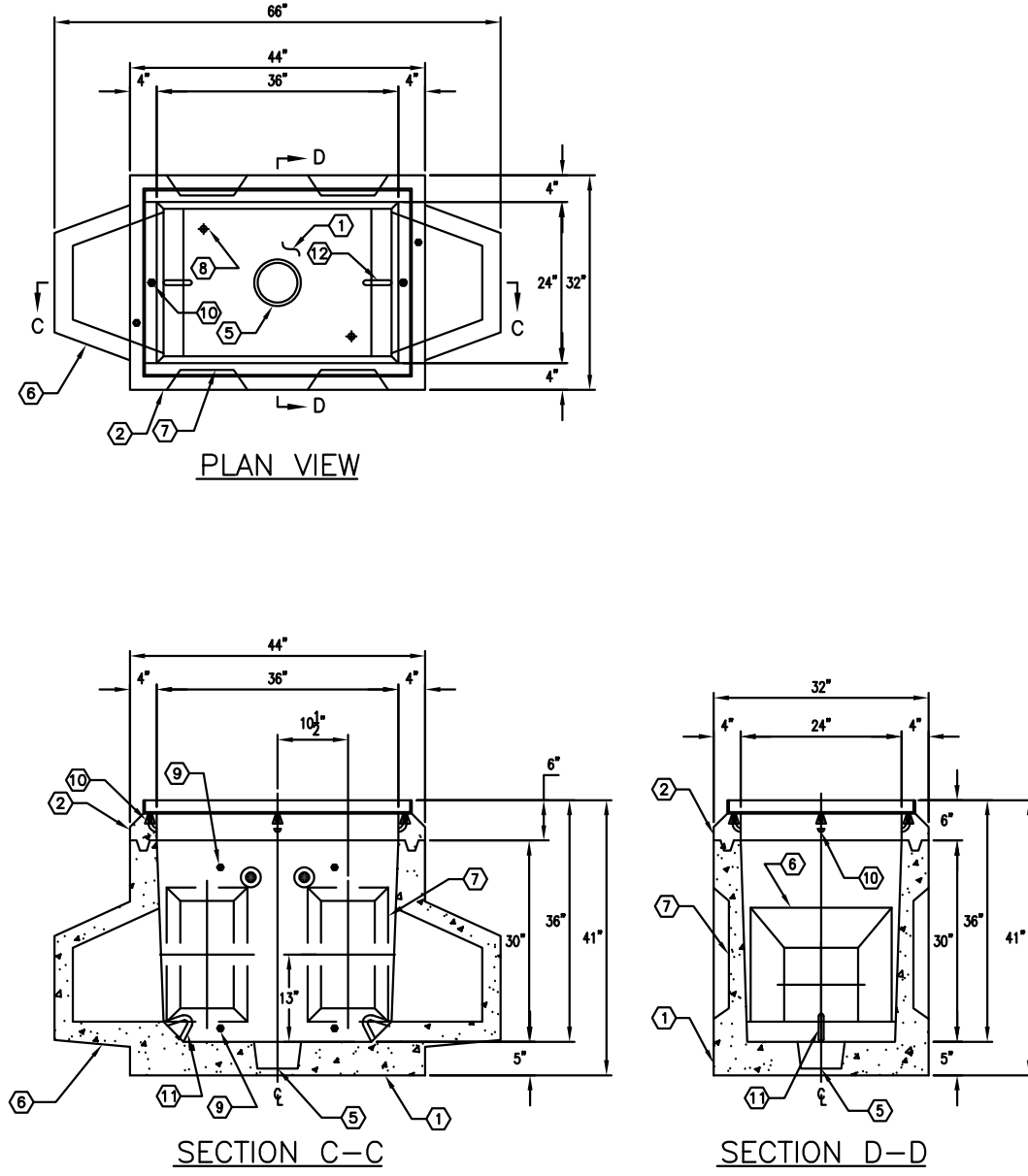
- NOTES:**
- PULL BOX DESIGNED IN ACCORDANCE WITH AASHTO H-20-44 TRAFFIC BRIDGE LOADING USING 5,000 PSI COMPRESSIVE STRENGTH CONCRETE AND 60,000 PSI YIELD STRENGTH ASTM A-706 STEEL REINFORCEMENT.
  - STEEL COVER DESIGNED FOR H-20-44 TRAFFIC LOADING.
  - RPM COVER DESIGNED FOR PARKWAY LOADING.
  - PULL BOX TO BE PLACED ON A MIN 6" THICK OF CRUSHER RUN FOR EASE OF INSTALLATION AND END LOAD DISTRIBUTION.
- ORDERING INFORMATION:**  
PER EDITION SPEC: USE 215-1 PB-2  
TOTAL WEIGHT OF ASSEMBLY SHOWN IS 2,150 lbs.
- MINIMUM EXCAVATION SIZE:**  
3'-8" x 6'-6" x 4'-0" DEPTH REQ'D.
- CONCRETE:**  
① PB2436-830-05, 30" BOTTOM SECTION, WT. 1,822 lbs.  
② PB2436-786, 6" TOP SECTION, W/72436-PB-ANG GALV. FRAME CAST IN, WT. 105 lbs.  
③ A. SC2436-700, ONE PIECE TRAFFIC COVER, GALVANIZED FINISH, MARKED "EDISON", WT. 134 lbs. (AS SHOWN).  
B. 12-18" DIA. RIMP, ONE PIECE RPM COVER, MARKED "EDISON", (NOT SHOWN).

**STEEL:**  
④ 8" x 7" DIA. RIMP x 4" DEEP, BOTTOM SECTION.  
⑤ 11" x 11" DUCTED K.O. x 13 1/2" DEEP, BOTTOM SECTION.  
⑥ 8" x 16" K.O. x 3" DEEP, BOTTOM SECTION.  
⑦ 1" DIA. BLIND GROUND ROD HOLE, BOTTOM SECTION.  
⑧ 1/2" P-35-T INSERT, BOTTOM SECTION.  
⑨ 1/2" P-35-T INSERT W/CLEAN-OUT HOLE, TOP SECTION.  
⑩ 7/8" DIA. x 9" VERTICAL GULLY, PULL IRON, BOTTOM SECTION.  
⑪ CABLE PACK.

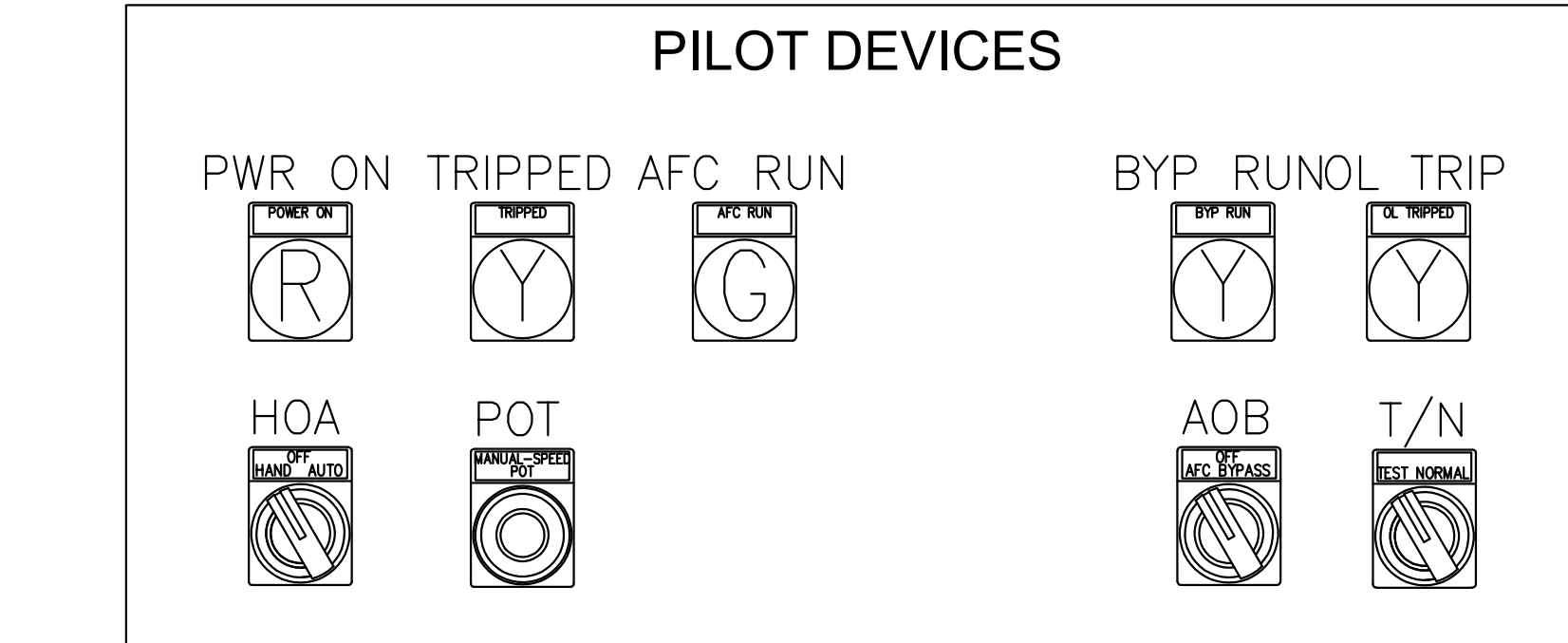
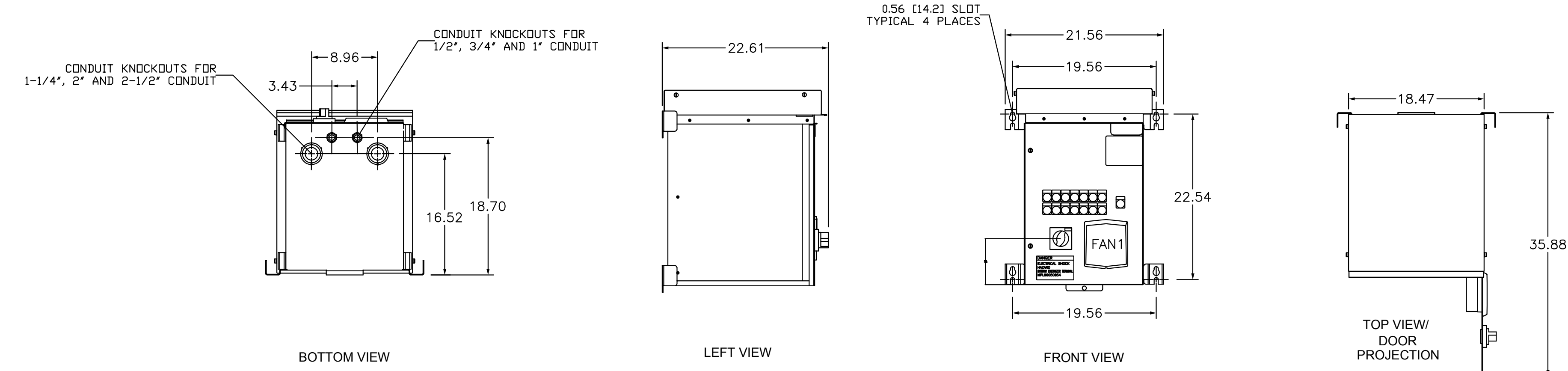
PARKWAY ASSEMBLY WITH RPM COVER K2436-DP36-11P.  
LIGHT TRAFFIC ASSEMBLY WITH STEEL COVER K2436-DP36-11T.



**UNDERGROUND PULLBOX DETAIL** 2  
NOT TO SCALE E-05



**CONDUIT SEAL DETAIL** 3  
SCALE: N.T.S. E-05



ATV660	D11	T4	N	H	N	Y
MAX FLA	KILOWATTS/HP	VOLTAGE/PH	DUTY TYPE	ENCLOSURE TYPE	HARMONIC MITIGATION	POWER CIRCUIT TYPE
21 AMPS	11KW/15HP	480V/3 PH	NORMAL	TYPE 3R	CHOKE	BYPASS

**VARIABLE (ADJUSTABLE) FREQUENCY DRIVE** 4  
NOT TO SCALE E-05

#### BASIS OF DESIGN

BASIS OF DESIGN PRODUCT IS BY "SCHNEIDER ELECTRIC" (SQUARE D) AS SPECIFIED BELOW. PRODUCTS WITH EQUIVALENT OR GREATER PERFORMANCE ARE PERMISSIBLE, SUBJECT TO REVIEW AND APPROVAL BY THE CITY AND ENGINEER OF RECORD.

#### SPECIFICATIONS

ATV660D11T4N2HNYABKC - ALTIVAR 660  
DESIGNATION: 13HP 480V N3R VFD.  
MAIN CIRCUIT BREAKER DISCONNECT.  
SERVICE ENTRANCE RATED.  
100K AIC RATED.  
SELECTED FOR 460 VAC 3 PHASE MOTOR.  
15 HORSEPOWER.  
SIZED FOR NORMAL DUTY.  
DRIVE CONTROLLER RATED FOR 21 MAX OUTPUT AMPS MAX.  
OUTPUT CURRENT RATING WILL BE LOWER THAN THE CONTINUOUS OUTPUT CURRENT RATING OF THE DRIVE WHEN BYPASS OPTION IS SELECTED.  
TYPE 3R ENCLOSURE  
UL508A LABEL  
RAL7035 (GRAY)  
STANDARD IEC RATED BYPASS CONTACTORS  
ISOLATION AND BYPASS CONTACTORS  
(WITH MECHANICAL AND ELECTRICAL INTERLOCKING).  
ISOLATION AND BYPASS CONTACTOR SEQUENCING PROVIDES TRUE MOTOR ISOLATION.  
REMOTE AUTOMATIC BYPASS OPERATION USING AUTO START CONTACTS.  
ETHERNET/IP, MODBUS TCP, MULTIDRIVE-LINK - VW 3A 3721  
I/O EXTENSION CARD DISCRETE 6I/2O, ANALOG 2I 3% LINE IMPEDANCE AS STANDARD

**CONTROL OPTIONS:**  
AFC-OFF-BYPASS SELECTOR SWITCH  
HAND-OFF-AUTO SELECTOR SWITCH  
TEST-NORMAL SELECTOR SWITCH  
SPEED POTENTIOMETER

**PILOT LIGHT OPTIONS:**  
BYPASS PILOT LIGHT (YELLOW)  
OVERLOAD TRIP PILOT LIGHT (YELLOW)  
POWER ON PILOT LIGHT (RED)  
RUN PILOT LIGHT (GREEN)  
TRIP PILOT LIGHT (YELLOW)

**AUXILIARY CONTACTS:**  
1 NO/NC RUN CONTACT  
1 NO/NC TRIP CONTACT  
1 NO/NC BYPASS RUN CONTACT

CITY OF CULVER CITY  
PUBLIC WORKS DEPARTMENT

DATE: APRIL 2021

MESMER LOW FLOW DIVERSION PROJECT, PR-005

ELECTRICAL DETAILS

APPROVED BY: SEAN SINGLETARY, P.E.

SEAN SINGLETARY  
SENIOR CIVIL ENGINEER

7-11-2021

DATE

SHEET

E-05

Sheet 11 Of 12 Sheets



CONTROL SYSTEM PERFORMANCE SPECIFICATIONS

GENERAL REQUIREMENTS:

1. THERE IS AN EXISTING PUMP CONTROL, COMMUNICATION AND TELEMETRIC / SCADA SYSTEMS AT THIS SITE INSIDE THE CONTROL ROOM BUILDING. ALL NEW PUMPS, VFD UNITS AND OTHER DEVICES AND INSTRUMENTS WHICH REQUIRE CONTROL AND MONITORING SHALL BE CONNECTED AND INTERFACED WITH THE EXISTING SYSTEM.

2. THE PUMP CONTROL, COMMUNICATION AND TELEMETRIC / SCADA SYSTEMS ARE DELEGATED DESIGN ITEMS. THE CONTRACTOR SHALL RETAIN THE SERVICES OF "UTILITY SYSTEMS SCIENCE & SOFTWARE (US<sup>3</sup>)" COMPANY WHICH CURRENTLY INSTALLS, SERVICES AND MAINTAINS THE EXISTING SCADA / PLC SYSTEM FOR THE CITY AT THIS SITE.

CONTACT INFORMATION:  
TOM WILLIAMS  
tom.williams@uscubed.com  
(619)546-4281  
UTILITY SYSTEMS SCIENCE & SOFTWARE (US<sup>3</sup>)  
1250 PIONEER WAY SUITE F, EL CAJON CA 92020

3. CONTRACTOR IS RESPONSIBLE FOR DESIGNING, FURNISHING, INSTALLING, PROGRAMMING, TESTING AND COMMISSIONING A COMPLETE AND FUNCTIONAL SYSTEM, INCLUDING BUT NOT LIMITED TO PLC, TELEMETRIC / SCADA EQUIPMENT, CONTROLLERS, ANALOG AND DISCRETE INPUT/OUTPUT MODULES, LEVEL AND PRESSURE SENSORS AND TRANSDUCERS, ANTENNAS, INSTRUMENTS, LOW-VOLTAGE AND LINE-VOLTAGE RELAYS, HUMAN MACHINE INTERFACE (HMI) TOUCH-SCREEN DISPLAYS, INDICATOR LIGHTS, SELECTOR SWITCHES, PUSH-BUTTONS, POWER SUPPLIES, TRANSFORMERS, ENCLOSURES, MOUNTING HARDWARE, TERMINATIONS AND WIRING FOR ALL COMPONENTS INCLUDING INTERFACE WITH FIELD EQUIPMENT AND DEVICES SUCH AS PUMPS, STARTERS/VARIABLE FREQUENCY DRIVES, SENSORS, TRANSDUCERS, ACTUATORS, VALVES, GATES, ETC.

PROGRAMMABLE LOGIC CONTROLLER (PLC):

1. REFER TO SPECIFICATION SECTION 26 09 15 "PROGRAMMABLE LOGIC CONTROLLER" FOR INFORMATION ON THE EXISTING PLC SYSTEM. ALL NEW PRODUCTS SHALL BE COMPATIBLE WITH THE EXISTING CITY PLCSCADA / TELEMETRY SYSTEM AND STANDARDS. THE EXISTING PLC IS AN "ACE3600" SERIES BY "MOTOROLLA". SUBSTITUTIONS ARE NOT PERMISSIBLE.
3. COORDINATE TYPE AND QUANTITY OF PLC INPUTS AND OUTPUTS WITH TYPE AND QUANTITY OF INSTRUMENTS, INPUT DEVICES, OUTPUT DEVICES, FIELD DEVICES AND FIELD EQUIPMENT.
4. PROVIDE ADDITIONAL INPUT/OUTPUT CARDS AND/OR MODULES AS REQUIRED TO INTERFACE AND INTEGRATE THE NEW ITEMS IN THE PROJECT WHILE ALLOWING 25% SPARE POINTS FOR FUTURE.

HUMAN MACHINE INTERFACE (HMI):

1. PROVIDE PROGRAMMING FOR THE EXISTING PLC AND HMI SCREEN TO VISUALLY/GRAPHICALLY DISPLAY THE NEW COMPONENTS OF THE SYSTEM INCLUDING, BUT NOT LIMITED TO, THE NEW PUMPS, STARTERS/VARIABLE FREQUENCY DRIVES, SENSORS AND INSTRUMENTS. THE VISUAL/GRAPHICS SHALL INCLUDE STATUS OF EACH COMPONENT, I.e. PUMPS RUNNING OR STOPPER, VFD STATUS, FLUID LEVELS IN THE WET WELLS, ETC.

PUSH BUTTONS, SELECTOR SWITCH AND INDICATOR LIGHTS:

1. PROVIDE "START" AND "STOP" PUSHBUTTONS FOR EACH PUMP SYSTEM. "START" BUTTON SHALL BE GREEN AND "STOP" BUTTON SHALL BE RED. "START" AND "STOP" PUSHBUTTONS SHALL BE INTEGRATED WITH THE PLC TO ALLOW FOR MANUAL REMOTE START OR STOPPING THE LOW-FLOW AND HIGH-FLOW PUMP SYSTEM. THE PUSHBUTTONS SHALL ONLY BE OPERABLE WHEN THE HAND-OFF-AUTO SELECTOR SWITCH IS IN THE "HAND" POSITION.
2. PROVIDE HAND-OFF-AUTO SELECTOR SWITCH AND INDICATOR LIGHTS IN AVAILABLE SPACE ON THE METALLIC COVER OF THE EXISTING PLC CONTROL ENCLOSURE AS FOLLOWS:
- a. "AUTO" MODE: THE PLC / SCADA SYSTEM OPERATES THE PUMP SYSTEMS BASED ON PROGRAMMING OR BASED ON OPERATOR INPUT THROUGH THE SCADA SYSTEM.
- b. "HAND" MODE: A LOCAL OPERATOR PHYSICALLY OPERATES THE PUMP SYSTEMS USING "START" AND "STOP" PUSHBUTTONS.
- c. "OFF" MODE: PUMP SYSTEMS ARE TURNED OFF. NEITHER THE PLC / SCADA SYSTEM NOR THE PUSHBUTTONS CAN OPERATE THE PUMP SYSTEM.
3. PROVIDE ONE "RED" AND ONE "GREEN" LED INDICATOR PILOT LIGHT FOR EACH PUMP SYSTEM (ONE SET OF INDICATOR LIGHTS FOR LOW-FLOW PUMP AND ONE SET FOR HIGH-FLOW PUMP). "RED" LIGHT SHALL BE ILLUMINATED WHEN THE ASSOCIATED PUMP IS NOT OPERATING. "GREEN" LIGHT SHALL BE ILLUMINATED WHEN THE ASSOCIATED PUMP IS OPERATING.
4. PROVIDE ENGRAVED WEATHERPROOF SIGNAGE IDENTIFYING EACH PUSHBUTTON, THE POSITIONS OF SELECTOR SWITCH AND FUNCTION OF EACH INDICATOR LIGHT. COORDINATE EXACT WORDING AND SIZE OF SIGNS WITH CULVER CITY REPRESENTATIVE.

RELAYS AND AUXILIARY MODULES:

1. PROVIDE ALL LINE-VOLTAGE AND LOW-VOLTAGE RELAYS, CONTROL MODULES, ISOLATION RELAYS / MODULES, ETC. AS REQUIRED FOR THE SEQUENCE OF OPERATION.

FLOW RECORDERS:

1. PROVIDE FLOW RECORDER PANELS COMPATIBLE WITH FLOW METERS. INTERFACE RECORDER PANELS WITH PLC / SCADA SYSTEM TO RECORD READINGS AND TRANSMIT RECORDED READINGS AND REAL-TIME READINGS TO THE CITY SCADA SYSTEM.

FIELD INSTRUMENTS, DEVICES AND EQUIPMENT:

1. FLOWMETER LOCATED IN LOW FLOW VAULT.
2. FLOAT LEVEL SENSORS LOCATED IN LOW FLOW WET WELL.

3. SUBMERSED PRESSURE TRANSDUCER LEVEL SENSORS LOCATED IN LOW FLOW WET WELL.
4. INTRUSION DETECTION CONTACTS AT LOW FLOW WELL COVER DOORS.
5. SUBMERSIBLE PUMP ALARMS, I.e. OVERTEMPERATURE ALARM, LEAK DETECTION ALARM, OVERLOAD ALARM, ETC.

CONDUITS AND WIRING:

1. THE ELECTRICAL DRAWINGS SHOW EXACT CONDUIT AND CONDUCTOR SIZING FOR POWER TO THE PUMPS ONLY. ALL OTHER CONDUIT AND WIRING HAS BEEN SHOWN TO ESTABLISH A SCOPE OF WORK FOR THE CONTRACTOR WHO IS RESPONSIBLE FOR COMPLETE DESIGN AND INSTALLATION OF THE SYSTEM.
2. CONTRACTOR DESIGN SCOPE INCLUDE SIZING, TYPE AND QUANTITY OF WIRING FOR POWER AND CONTROL OF ALL INSTRUMENTS, DEVICES, SENSORS, RELAYS, MODULES, POWER SUPPLIES, ETC. THAT ARE PART OF THE PUMP CONTROL PLC / SCADA / TELEMETRY SYSTEMS.
3. ONCE SIZE, TYPE AND QUANTITY OF WIRING HAS BEEN DETERMINED, REVIEW THE SIZE AND QUANTITY OF CONDUITS SHOWN ON ELECTRICAL SITE PLANS TO VERIFY AND CONFIRM THE INFORMATION. ADJUST SIZE AND QUANTITY OF CONDUITS IF NECESSARY TO ACCOMMODATE THE WIRING SYSTEMS.

SYSTEM CONTROL AND MONITORING FUNCTIONS:

1. PLC SYSTEM SHALL BE CAPABLE OF CONTROLLING THE FOLLOWING THROUGH PROGRAM, USING THE HMI TOUCHSCREEN, OR REMOTELY BY AN OPERATOR USING THE SCADA SYSTEM AT CULVER CITY:
- a. RUN / STOP COMMAND TO VFD
- b. SPEED CONTROL OF VFDs
- c. SUBMERSIBLE PUMP ALARMS, I.e. OVERTEMPERATURE ALARM, LEAK DETECTION ALARM, OVERLOAD ALARM, ETC.
2. THE PLC SYSTEM SHALL MONITOR THE FOLLOWING, TO BE DISPLAYED ON THE HMI TOUCHSCREEN AND TRANSMITTED THE INFORMATION THROUGH THE SCADA SYSTEM TO CULVER CITY:
- a. STATUS OF VFDs (RUNNING / STOPPED).
- b. SPEED OF VFDs.
- c. FLUID LEVELS IN EACH WET WELL AS INDICATED BY BOTH THE FLOAT LEVEL SENSOR AND SUBMERSIBLE PRESSURE TRANSDUCER LEVEL SENSOR.
- d. FLOWMETER READING FROM LOW FLOW VAULT.
- e. INTRUSION DETECTION CONTACTS AT LOW FLOW AND HIGH FLOW WELL COVER DOORS.

SYSTEM DESIGN AND SHOP DRAWINGS:

CONTRACTOR SHALL RETAIN THE SERVICES OF US<sup>3</sup> TO DESIGN THE PUMP CONTROL PLC / SCADA / TELEMETRY SYSTEM.

1. A COMPREHENSIVE NARRATIVE DESCRIBING THE OPERATION OF THE SYSTEM AS A WHOLE AS WELL AS FUNCTIONS OF THE VARIOUS COMPONENTS OF THE SYSTEM. THE INTENT IS FOR THE CURRENT OR FUTURE USERS AND OPERATORS OF THE SYSTEM TO BE ABLE TO HAVE REFER BACK TO THIS DOCUMENT AND CLEARLY UNDERSTAND THE OPERATION AND FUNCTIONS OF THE SYSTEM.
2. CUT-SHEETS / SPECIFICATION SHEETS FOR ALL EQUIPMENT, DEVICES AND INSTRUMENTS USED IN THE SYSTEM.
3. PLANS AND ELEVATIONS, INCLUDING SITE PLAN SHOWING CONNECTION TO FIELD DEVICES, EQUIPMENT AND INSTRUMENTS.
4. POINT-TO-POINT WIRING DIAGRAMS, IDENTIFYING EACH TERMINAL OF EVERY COMPONENTS, TYPE AND QUANTITY OF WIRING OR CONNECTION BETWEEN POINTS, FUNCTION OF EACH COMPONENT, INCLUDING ALL FIELD DEVICES, EQUIPMENT AND INSTRUMENTS.

SYSTEM PROGRAMMING:

1. PROVIDE PROGRAMMING OF THE PLC / SCADA / TELEMETRY SYSTEMS TO PROVIDE THE SEQUENCE OF OPERATION DESCRIBED IN THE CIVIL DRAWINGS, AND TO PROVIDE THE CONTROL AND MONITORING FUNCTIONS REQUIRED BY THE DRAWINGS AND SPECIFICATIONS.

TESTING AND COMMISSIONING:

1. AFTER INSTALLATION AND PROGRAMMING HAS BEEN COMPLETED, PROVIDE TESTING AND COMMISSIONING OF THE ENTIRE SYSTEM, INCLUDING FUNCTIONAL TESTING OF ALL INSTRUMENTS, INPUT DEVICES, OUTPUT DEVICES AND EQUIPMENT. FINAL TESTING SHALL DEMONSTRATE THAT ALL FUNCTIONS OF INPUT DEVICES AND ALL FUNCTIONS OF OUTPUT DEVICES, AS WELL AS EQUIPMENT AND DEVICES CONNECTED TO INPUT AND OUTPUT, ARE BEING PERFORMED PROPERLY. IF ANY PART OF THE SYSTEM IS NOT OPERATING CORRECTLY, CONTRACTOR SHALL IDENTIFY THE CAUSE, RESOLVE THE ISSUE AND REPEAT THE TESTING IN ITS ENTIRETY TO DEMONSTRATE A COMPLETE AND FUNCTIONAL SYSTEM.

SEQUENCE OF OPERATION:

1. SEE CIVIL DRAWINGS FOR COMPLETE SEQUENCE OF OPERATION

COORDINATION:

1. IT IS ESSENTIAL AND NECESSARY FOR THE CONTRACTOR TO CAREFULLY COORDINATE THE ELECTRICAL, IN PARTICULAR THE PUMP CONTROL PLC / SCADA / TELEMETRY SYSTEMS, WITH ALL OTHER DISCIPLINES. IT IS SPECIALLY IMPORTANT FOR ALL SUB-CONTRACTORS TO OBTAIN DRAWINGS AND SPECIFICATIONS FOR ALL DISCIPLINES AND UNDERSTAND THE COMPLETE SCOPE OF WORK. IN PARTICULAR, THE SEQUENCE OF OPERATION SHOWN ON THE CIVIL DRAWINGS MUST BE UNDERSTOOD CLEARLY BY CONTRACTOR OR SUBCONTRACTORS WHO ARE RESPONSIBLE FOR DESIGNING, PROGRAMMING, INSTALLING AND TESTING THE PUMP CONTROL IN ORDER TO PROVIDE ALL SYSTEM FUNCTIONALITY REQUIRED.

TRAINING:

1. AT THE CONCLUSION OF WORK, AFTER ALL POWER AND CONTROL EQUIPMENT HAVE BEEN INSTALLED, ENERGIZED, PROGRAMMED, TESTED/COMMISSIONED

AND READY FOR USE, PROVIDE TRAINING FOR CULVER CITY STAFF.

2. TRAINING SESSION SHALL BE NO LESS THAN 8 HOURS AND SHALL COVER THE OPERATION AND MAINTENANCE OF THE PUMP CONTROL PLC / SCAD / TELEMETRY SYSTEMS.

3. TRAINING SHALL BE PERFORMED BY A FACTORY TECHNICIAN OR AUTHORIZED VENDOR OF THE SPECIFIC PRODUCTS USED IN THE SYSTEM.

RECORD DOCUMENTS:

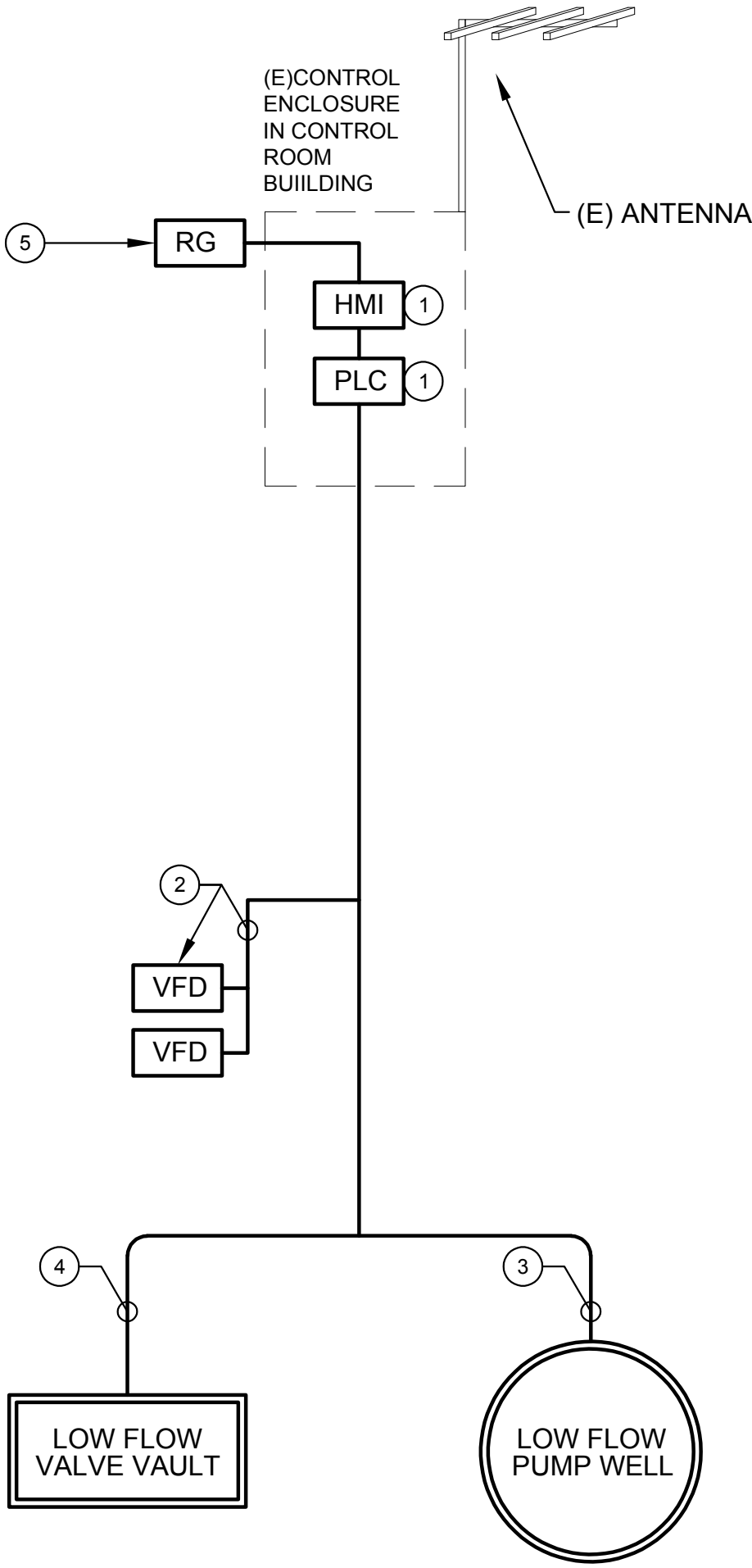
1. AFTER INSTALLATION, PROGRAMMING, TESTING AND COMMISSIONING HAVE ALL BEEN COMPLETED TO THE SATISFACTION OF INSPECTION AND CULVER CITY, PROVIDE (3) THREE HARD COPIES AND (3) THREE USB THUMB DRIVES WITH DIGITAL FORMAT COPIES OF RECORD DOCUMENTS TO CULVER CITY.
2. THE RECORD DOCUMENTS SHALL INCLUDE THE SHOP DRAWINGS PACKAGE BUT AMENDED BY THE CONTRACTOR TO REFLECT THE FINAL FIELD CONDITIONS OF THE INSTALLATION, INCLUDING FINAL LOCATION OF ALL EQUIPMENT AND DEVICES AS WELL AS ANY CHANGES, MODIFICATIONS OR OTHER INFORMATION THAT WERE NOT REFLECTED ON THE SHOP DRAWINGS.
3. THE RECORD DOCUMENTS PACKAGE SHALL ALSO INCLUDE ALL OPERATIONS & MAINTENANCE MANUALS, WARRANTY/GUARANTEE INFORMATION AND ALL OTHER DOCUMENTATION IN POSSESSION OF THE CONTRACTOR THAT ARE PERTINENT TO THE PUMP CONTROL PLC / SCADA / TELEMETRY SYSTEMS.

SEQUENCE OF OPERATIONS:









1. WATER WILL BE DRAWN OUT OF THE WET WELL AS LONG AS THE USER ADJUSTABLE LEVEL SET POINTS IDENTIFIED ON SHEET C-03 ARE SATISFIED.
2. LEAD PUMP SELECTION WILL ALTERNATE THE RUNTIME, FLOW RATE AND GALLONS PUMPED SHALL BE RECORDED USING A RECORD SYSTEM. THE COUNTER MUST RECORD AND SAVE PERIODIC READINGS FOR DOWNLOAD. BOTH PUMPS SHALL NOT OPERATE SIMULTANEOUSLY.
3. PUMP SHALL SHUT OFF IF THE WATER LEVEL IN THE EXISTING MESMER SEWER PUMP WET WELL REACHES THE EMERGENCY LEVEL, RESULTING WITH ALL THREE SEWER PUMPS ON (5.20').
4. PUMP ALARMS AND SHUTOFFS ARE FURTHER DETAILED ON SHEET C-03 AND IN THE PROJECT SPECIFICATIONS.

NEW WORK KEYNOTES:

- ① (E) CONTROL ENCLOSURE IN CONTROL ROOM BUILDING. THE (E) PLC SYSTEM IS A "MOTOROLLA ACE3600"
- ② INTERFACE (E) PLC WITH VFD UNITS FOR RUN/STOP AND SPEED CONTROL.
- ③ INTERFACE (E) PLC WITH LOW FLOW PUMP WELL FLOAT LEVEL SENSOR, PRESSURE TRANSDUCER LEVEL SENSOR, SUBMERSIBLE PUMP ALARMS AND INTRUSION DETECTION.
- ④ INTERFACE (E) PLC WITH LOW FLOW VALVE VAULT FLOW METER.
- ⑤ PROVIDE RAIN DETECTION DEVICE (RAIN GAUGE). INTERFACE (E) PLC WITH RAIN GAUGE.



CONTROL SYSTEM BLOCK DIAGRAM

INSTALLING AND TESTING THE SCADA CONTROL IN ORDER TO PROVIDE ALL SYSTEM FUNCTIONALITY REQUIRED.										CITY OF CULVER CITY PUBLIC WORKS DEPARTMENT																													
TRAINING:										DATE: APRIL 2021																													
1. AT THE CONCLUSION OF WORK, AFTER ALL POWER AND CONTROL EQUIPMENT HAVE BEEN INSTALLED, ENERGIZED, PROGRAMMED, TESTED/COMMISSIONED										MESMER LOW FLOW DIVERSION PROJECT, PR-005																													
<div><div><div><div>1561 E. ORANGETHORPE AVE. SUITE 240 FULLERTON, CA 92831 TEL (714) 526-7500</div></div><div><div>J.C. CHANG &amp; ASSOCIATES ARCHITECTS &amp; PLANNERS 1000 VAN NESS AVE., SUITE 204 TOWERSIDE, CA 95071 PH (916) 212-8844 FX (916) 212-8272 JCCHANG@CWA-CA.COM</div></div><div></div></div></div>										<div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div>NO.</div></div></div>										<div><div><div><div></div><div></div></div><div></div></div><div><div><div></div><div></div></div><div></div></div><div><div><div></div><div></div></div><div></div></div></div>										CONTROL AND COMMUNICATION SYSTEM BLOCK DIAGRAM AND PERFORMANCE SPECIFICATIONS									
										APPROVED BY: SEAN SINGLETARY, P.E.  SENIOR CIVIL ENGINEER										7-11-2021 DATE										SHEET E-06 Sheet 12 Of 12 Sheets									
										BY										APPR.										DATE									



CONTRACT DOCUMENTS  
AND  
SPECIFICATIONS  
FOR

**Mesmer Low Flow Diversion, PR-005**



**CITY OF CULVER CITY**

**BID NO. #2204**

**Public Works Department**  
City of Culver City

9770 Culver Boulevard  
Culver City, CA 90232-0507  
(310) 253-5600





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## NOTICE INVITING BIDS



**CITY OF CULVER CITY  
NOTICE INVITING SEALED BIDS  
FOR**

**Mesmer Low Flow Diversion, PR-005 BID NO. #2204**

**1. ANNOUNCEMENT**

Notice is hereby given that electronic bids will be accepted by Culver City PlanetBids, for furnishing all labor, services, materials, and equipment, and performing all work to provide for a complete and acceptable project for:

**Mesmer Low Flow Diversion, PR-005, BID NO. #2204**

In the City of Culver City and in strict accordance with the plans and specifications in the Office of the Public Works Director and City Engineer of the City of Culver City, 9770 Culver Boulevard, Culver City, CA. 90232.

**2. DESCRIPTION OF WORK:**

The work to be done consists of furnishing all materials, equipment, tools, labor and incidentals as required in the specifications and contract documents, for the following project: **"Mesmer Low Flow Diversion, PR-005"**.

**3. COMPLETION OF WORK:**

All work to be done under this contract shall be completed within **Ninety (90) working days**, beginning on the date stipulated in the written "Notice to Proceed" issued by the City Engineer.

**4. BIDDING PROCEDURES**

All bids and bidding procedures must comply with the "Instruction to Bidders", Section B of the Bid Documents.

**5. SUBMISSION OF BIDS**

Bid's must be submitted electronically through [Culver City PlanetBids](#), by or before 3:00 p.m. (PST) on Thursday, **9/23/2021**. ("Proposal Deadline").

The electronic procurement system will not accept any Bid's after the Deadline. Only a Proposal submitted electronically through Culver City's PlanetBids will be considered for evaluation. No separate hardcopy materials will be accepted by the City.

**6. BID SECURITY**

Each Bidder shall submit a form of Bid Guaranty such as a money order, a cashier's check, certified check, cash, or surety bond for the sum of ten percent (10%) of the total amount of the bid and made payable to the City of Culver City as a guaranty that the Bidder, if its bid is accepted, will enter into a satisfactory contract and furnish a bond for the faithful performance thereof, and for the payment of labor and materials costs, and insurance in accordance with the requirements of the contract documents.

Bid security must be submitted electronically through [Culver City PlanetBids](#) along with the bid proposal.

**7. BID DOCUMENTS**



A copy of the plans and specifications shall be available on [Culver City PlanetBids](#).

**8. PRE-BID CONFERENCE** (not required)

Not required.

**9. FORM AND STYLE OF BIDS**

Bids must be prepared on the forms provided with the BID DOCUMENTS and must be in compliance with the INSTRUCTIONS TO BIDDERS. Bidders shall not change the wording of the forms provided, except as required by Addendum.

**10. QUESTIONS/REQUESTS FOR INTERPRETATION**

Questions with regards to this bid should be submitted through [Culver City PlanetBids](#) by Wednesday, September 15, 2021. All firms registered for the bid will receive responses to all questions and any other addenda that may be released, electronically by Tuesday, September 21, 2021, or sooner.

**11. RIGHT TO REJECT BIDS**

The Owner reserves the right to reject any or all bids as the best interests of the Owner may dictate. Bidders are referred to Section B-18 of the "INSTRUCTIONS TO BIDDERS," for additional qualification requirements.

**12. WAGE RATES AND PUBLIC WORKS CONTRACTOR REGISTRATION PROGRAM**

In accordance with the California Labor Code, no worker employed in work under contract to the Owner shall be paid less than the State of California Prevailing wage rates. Contractor shall comply with all other Federal, State and local laws related to labor.

Pursuant to California Labor Code Section 1771.1(a), "A contractor or subcontractor shall not be qualified to bid on, be listed in a bid proposal, subject to the requirements of Section 4104 of the Public Contract Code, or engage in the performance of any contract for public work, as defined in this chapter, unless currently registered and qualified to perform public work pursuant to Section 1725.5. It is not a violation of this section for an unregistered contractor to submit a bid that is authorized by Section 7029.1 of the Business and Professions Code or by Section 10164 or 20103.5 of the Public Contract Code, provided the contractor is registered to perform public work pursuant to Section 1725.5 at the time the contract is awarded.

**13. CONTRACTOR'S LICENSE**

All bidders shall be licensed under provisions of Chapter 9, Division 3 of the Business and Professions Code of the State of California to do the type of work contemplated in the project. In accordance with provisions of California Public Contract Code Section 3300, the Owner has determined that the Contractor shall possess a valid Class "A" License at the time that the bid is submitted. Failure to possess the specified license shall render the bid as non-responsive.

BY ORDER OF THE COUNCIL OF THE CITY OF CULVER CITY, CALIFORNIA

By: \_\_\_\_\_  
City Clerk

--End of Section--



SECTION B

SECTION B

INSTRUCTIONS TO BIDDERS



## SECTION B - INSTRUCTIONS TO BIDDERS

## 1. DEFINITIONS

Alternate Bid

"Alternate Bid" shall mean an amount stated in the Bid as set forth in the supplementary bid forms, to be added to or deducted from the Total Base Bid, if the corresponding substitution or change in the Work, materials or other items as described in the Bid Documents, is accepted by Owner.

Total Base Bid

"Total Base Bid" shall mean the sum stated in the Total Base Bid Form for which the Bidder offers to perform the Work described in the Bidding Documents. The Total Base Bid is the base to which work, materials, or other items may be added to or from which work, materials, or other items may be deleted, for sums stated in the Alternate Bid form.

Bid Date

"Bid Date" shall mean the deadline (including date and time) set forth in the Notice Inviting Bids accompany these Instructions.

Bid Form

"Bid Forms" shall mean the Total Base Bid Form, the Supplementary Bid Forms, and other additions attached hereto, all of which constitute part of the Bid Documents.

Bid Documents

"Bid Documents" shall mean all documents provided by Owner to Bidder for Bidder's use and consideration in preparation of its Bid. Bidding documents include the Notice Inviting Bids, these Instructions to Bidders and any supplements or additions hereto, the Bid Proposal Form, the Supplementary Bid Forms, the Statement of Contractor's Qualifications, other sample bid and contract forms, the Contract Documents, Drawings, Plans, and Specifications, all documents referenced in the Contract Documents, and all Addenda issued prior to execution of the Contract.

Bidder

"Bidder" shall mean any individual, firm, partnership, corporation, or combination thereof, submitting a Bid for the work, acting directly or through a duly authorized representative.

Sub-bidder

"Sub-bidder" shall mean a person or entity who submits a Bid to a Bidder for materials, equipment or labor (including quantity surveyors) for a portion of the Work and who is identified on the appropriate Supplementary Bid Form.

Contract Documents

"Contract Documents" shall mean all documents executed by Owner and Bidder to evidence their agreements relating to the Work. The Contract Documents include, but are not limited to, the Owner-Contractor Agreement; any supplementary and other conditions or provisions; the Drawings, the Plans, the Specifications and all Addenda issued prior to execution of the Owner-Contractor Agreement; and all modifications thereof.

Unit Price

"Unit Price" shall mean an amount stated in the Supplementary Bid Form as a price unit of measurement for materials, equipment and/or services or a portion of the Work as described in the Bid Documents, and shall include all elements of the described portion of the Work, including materials, labor, overhead and profit.



Work

"Work" shall mean the construction required by the Contract Documents and includes all tools, materials, and labor necessary to produce such construction and all materials and equipment incorporated or to be incorporated in such construction.

## 2. BID AND BID FORMS

Owner Supplied Forms

Bid forms (Section C, "Bid Forms") have been provided with this document by the Office of the Public Works Director/City Engineer of the City of Culver City. All bids for this project must be submitted on said original supplied by the Office of the City Engineer of the City of Culver City. Bid forms shall be completely filled out and signed by the Bidder or, if a partnership, by all partners or, if a corporation, by its President, Secretary and Treasurer, in the designated spaces.

Filling-in Forms

All blank spaces for unit prices, extensions and totals must be filled in. Signatures shall be completely and personally executed. If erasures are made, they must be initialed by the Bidder over his signature.

Modifications Prohibited

Bids shall not contain any recapitulation, inserted by the Bidder, of work to be done. Alternative proposals will not be considered unless specifically requested. No oral or telephone modifications will be considered.

Submitting Bids

All bids must be submitted electronically via Culver City PlanetBids. The electronic procurement system will not accept any Bid's after the Deadline. Only a Proposal submitted electronically through Culver City's PlanetBids will be considered for evaluation. No separate hardcopy materials will be accepted by the City.

ALTERNATE BIDS

The Contractor shall complete bid schedules for all Alternate Bids. Failure to complete all bid schedules will be considered a non-responsive bid.

Bids May Be Rejected

Bids may be rejected if there is any alteration of the bid form, additions not called for, conditional bids, qualifying provisions, incomplete entries, or irregularities of any kind. The Owner reserves the right to reject any or all bids.

## 3. ADDENDA

## 3.1 Addenda

Addenda for the project will be posted on [Culver City PlanetBids](#).

PlanetBids automatically sends electronic alerts to registered bid holders of addenda notifications.

## 3.2 Acknowledgment of Addenda

Each Bidder shall ascertain prior to submitting a Bid that the Bidder has received all Addenda issued, and the Bidder shall acknowledge its receipt in the Bid Form. Failure to acknowledge all addenda may result the bid proposal being deemed as non-responsive by the City.

## 4. INTERPRETATION OF PLANS AND SPECIFICATIONS

If any person contemplating submitting a bid for the project is in doubt as to the meaning of any requirement of plans or specifications or finds any discrepancies in or omissions from the plans or



specifications, he may submit Culver City PlanetBids a written request for an interpretation or correction thereof. The person making the request will be responsible for its prompt delivery. Interpretations or corrections will be made by addenda to specifications or by dated revisions of plans with a copy of each addition or change being furnished, through the Public Works Director/City Engineer or Construction Manager, to each known prospective Bidder. Questions concerning the contract form, bonding requirements or similar documents shall be directed to Culver City PlanetBids.

5. EXAMINATION OF SITE, PLANS, SPECIFICATIONS AND OTHER DOCUMENTS

Each Bidder shall carefully examine the plans, these specifications and the forms for all other contract documents, and shall visit the site of the proposed work to fully inform him/herself of all existing conditions and limitations that may affect the execution and cost of work under the contract. He/She shall include in the individual bid prices the cost of all labor, materials, supplies, overhead and profit for each such bid item. The failure or omission of any Bidder to obtain and examine the plans or specifications, any form, instrument, addendum, or any other document, or to visit and acquaint him/herself with conditions at the construction site, shall in no respect relieve him/her from any obligation imposed by his/her bid or by award or execution of the contract. The submission of a bid shall be taken as prima facie evidence that the Bidder has read, understands and agrees to comply with all instructions contained herein.

6. COMPLETE BIDDING AND CONTRACT DOCUMENTS

A complete set of Bid documents contains the following documents:

1. Notice Inviting Bids, Section A;
2. Instruction to Bidders, Section B;
3. Any or all addenda/addendum;
4. Bid Forms, Section C;
5. Award and Execution of Contract, Section D;
6. Special Provisions, Section E;
7. Technical Specifications, Section F, appendices and appended drawings.

7. BID GUARANTY

Bid Guaranty Enclosed With Bid

Each bid shall be accompanied by an approved form of Bid Guaranty such as a cashier's check, money order, certified check or cash, or surety bond in favor of the Owner for an amount of at least ten percent (10%) of the amount of the bid as a guaranty that the Bidder will provide bonds and insurance, and enter into a contract with the Owner for construction of the project. No bid shall be considered, unless such Bid Guaranty is enclosed.

In lieu of the foregoing, any bid may be accompanied by a surety bond in said amount, furnished by a surety authorized to do surety business in the State of California, guaranteeing that said bidder will enter into the contract and file the required bonds within the designated period.

Bid security must be submitted electronically through Culver City PlanetBids along with the bid proposal.



Owner to Enforce Bid Guaranty

If within the time frame specified in Section B-18 of these Specifications, the successful bidder fails or neglects to enter into the contract and file the required bonds, the Owner may deposit in its treasury said bid security and not return it to the defaulting bidder.

Bid Guaranty Return

Upon execution of the contract with the successful Bidder, the Bid Guaranties of all Bidders will be returned by the City of Culver City.

8. REJECTION OF BIDS

The Owner reserves the right to reject any or all bids and to waive any apparent clerical errors or discrepancies, or minor informalities if to do so seems to best serve the interests of the Owner.

9. WITHDRAWAL OF BIDS

Any Bidder may withdraw his bid, without obligation, either personally or by written request, at any time prior to the scheduled closing time for receipt of bids, provided that such personal or written request is delivered to the place specified in Section 5 of the "NOTICE INVITING BIDS" for receipt of Bids, prior to the Bid Date.

10. FACSIMILE MODIFICATION OF BIDS

No facsimile modification of bids will be allowed.

11. OPENING OF BIDS

Bid results will be available after the closing on the Culver City Planet Bids portal.

12. BIDDERS INTERESTED IN MORE THAN ONE BID

Bid's must be submitted electronically through Culver City PlanetBids. A person, firm or corporation that has submitted a sub proposal to a Bidder or that has quoted prices of materials to a Bidder is not hereby disqualified from submitting a sub proposal or quoting prices to other Bidders.

13. NON-COLLUSION AFFIDAVITS

The Owner requires all Bidders to execute a Non-Collusion Affidavit in the form included in the Bid Documents. The Owner also reserves the right to require that the Bidder shall, before awarding any subcontract, obtain from any or all proposed Subcontractors a Non-Collusion Affidavit in the form included in the Bid Documents.

14. LIST OF SUBCONTRACTORS FILED WITH BID

In accordance with the provisions of the Public Contracts Code of the State of California relating to listing of subcontractors, each Bidder must submit with his bid the name and location of place of business of each proposed Subcontractor who will perform work or labor or render service to the Bidder for the construction of the project covered by the bid, in an amount in excess of one-half of one percent (0.5%) of the Bidder's bid and shall state the portion of the work which will be done by each Subcontractor.

15. LICENSING OF CONTRACTORS

All Bidders and Subcontractors submitting bids shall be licensed in accordance with the provisions of the Business and Professions Code of the State of California pertaining to the licensing of

contractors. The license shall be valid and active at the time of submitting a bid, and remain so throughout the duration of the Contract for the successful bidder and sub-bidders.

16. APPROXIMATE ESTIMATES

The quantities set forth on the bid form, if any, are approximate only, being given as a basis for the comparison of bids; and the Owner does not, expressly or by implication, agree that these will be the final quantities. The Bidder agrees that the Owner will not be responsible if any of said quantities are found to be incorrect; and the Bidder agrees not to make any claim for damages or for loss of profits because of a difference between the quantities of the various classes of work as estimated and the work actually done. If any error, omission or misstatement shall be discovered in the estimated quantities, the same shall not invalidate the contract executed pursuant to this bid or release the Bidder from the execution and completion of the whole or part of the work herein specified, in accordance with these specifications and the plans herein mentioned and the prices herein agreed upon and fixed therefore, or excuse him from any of the obligations or liabilities hereunder, or entitle him to any damages or compensation otherwise than as provided for in the contract executed pursuant to this bid.

17. GENERAL REQUIREMENTS

It is the purpose of the Owner, pursuant to these specifications, to realize work on a project, which is complete in every detail and respect. The Bidder shall furnish all equipment, materials and labor and perform all work required to accomplish this purpose. The Bidder shall not omit any item of work or fail to furnish any element, component or part thereof, whether or not such is specifically called for in the Contract Documents, which is necessary for a satisfactory completion of the project.

18. AWARD OF CONTRACT

The contract will be awarded to the lowest responsible and responsive Bidder. If award is made, it will be based on the lowest responsive and responsible total base bid Contract price. Selection of any or all alternates shall be at the sole discretion of the Owner. The Owner, however, reserves the right to reject any or all bids, and, so far as permitted by law, to waive any informality in the bids received in order to serve the best interests of the Owner. If an award is made, the contract shall be awarded within ninety (90) days after the opening of the bids. Within ten (10) days of the mailing by the Owner of notification of award of contract and the contract form, Bidder shall provide and return to the Owner all required bonds and insurance documents and the executed formal contract. In determining if a Bidder is a responsive bidder, the Owner shall consider the following in addition to other requirements in these bid documents:

- a. Quality of services offered.
- b. Proven capacity of the Bidder to perform the contract or provide the supplies or services required in a timely and competent manner. The evaluation of the Contractor's capacity to perform the contract or provide the supplies or services required in a timely and competent manner shall be based on the information provided by the Contractor in Section C-5 "Declaration of Bidder's Qualifications," as well as other pertinent data available to the Owner.
- c. Character, integrity, reputation, judgment, experience and efficiency of the Bidder.

19. BONDS

The successful bidder will be required to file and pay for costs of bonds in the proper sums from a bonding company acceptable to the Owner. Forms for these bonds are included in Section D. The



"Labor and Materials Payment Bond" and "Faithful Performance Bond" shall be for one hundred percent (100%) of the contract price (including base bid, adjustments and addenda).

20. INSURANCE CERTIFICATES AND POLICIES

Proof of insurance in an amount required by the Bid Specifications Section D-6 must be provided and endorsed to name: the City of Culver City, members of its City Council, its boards and commissions, officers, agents, and employees as additional insured for the particular operations of the insured which affect the Owner.

21. INDEMNIFICATION.

To the fullest extent permitted by law, Contractor shall indemnify, defend (at Contractor's sole expense, with legal counsel approved by City) and hold harmless the City of Culver City, members of its City Council, its boards and commissions, officers, agents, and employees (hereinafter, "Indemnitees"), from and against all loss, damage, cost, expense, liability, claims, demands, suits, reasonable attorneys' fees and judgments arising from or in any manner connected to Contractor's or its employees or agent's acts, errors or omissions related to this Agreement. This indemnification includes, but is not limited to, tort liability to a third person for bodily injury and property damage.

Notwithstanding the foregoing, nothing herein shall be construed to require Contractor to indemnify an Indemnitee from any claim arising from the sole negligence, active negligence or willful misconduct of that Indemnitee.

The duty to defend referenced herein is wholly independent from the duty to indemnify, arises upon written notice by City to Contractor of a claim within the potential scope of this indemnification provision, and exists regardless of any determination of the ultimate liability of Contractor, City or any Indemnitee.

22. ASSIGNMENT OF CONTRACT RESTRICTED

No assignment by the Bidder of any contract to be entered into in accordance with Notice Inviting Bids and these instructions or any part thereof, or of funds to be received there under, will be recognized by the Owner unless such assignment had prior written approval of the Owner and the surety on all bonds had notice of such assignment in writing and has consented thereto in writing.

In entering into the Contract or any Subcontract for the Project, the Contractor and Subcontractor offer and agree to assign to the Owner all right, title and interest in and to all causes of action they 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 the Contract or any Subcontract. This assignment shall be deemed made and effective at the time the Owner tenders final payment to the Contractor, without further acknowledgment by the parties.

23. SHORING

Pursuant to the provisions of the California Labor Code Section 6707, each bid submitted in response to this Invitation to Bid shall contain, as a bid item, adequate sheeting, shoring, and bracing, or equivalent method, for protection of life and limb in trenches and open excavation, which shall conform to applicable safety orders. By listing this sum, the bidder warrants that its action does not convey tort liability to the Owner, the Engineer, the Construction Manager, and their employees, agents and subconsultants.

24. OTHER PERMITS, FEES AND LICENSES

The Contractor shall, prior to the start of construction, obtain, pay, and comply with all necessary permits as required as the result of its work, including but not limited to the permit(s) described herein and as attached in the appendix.

In addition to the requirements above noted, the Contractor **shall possess a valid City of Culver City business license** at the time of contract agreement execution and for the duration of the contract. The fee for said business license shall be based upon the total amount bid for the contract. Amount of fee may be obtained from the City of Culver City, Finance Department, Treasury Division at (310) 253-5870.

All bidders are encouraged to utilize Culver City subcontractors and suppliers to the extent they are available, competitive and qualified. However, no bid will be affected either positively or negatively by the inclusion or exclusion of such Culver City businesses.

-- End of Section --



**SECTION C**

**SECTION C**

**BID FORMS**

**BID FORM****FIRM  
NAME** \_\_\_\_\_**ADDRESS** \_\_\_\_\_  
\_\_\_\_\_**TELEPHONE** \_\_\_\_\_**FAX NUMBER** \_\_\_\_\_**FOR****Mesmer Low Flow Diversion, PR-005****FOR****CITY OF CULVER CITY  
CULVER CITY, CALIFORNIA****BID NO. #2204****1 TOTAL BID BASE FORM****TO THE HONORABLE CITY COUNCIL  
CITY OF CULVER CITY, CALIFORNIA**

This Bid is submitted in accordance with the advertised "Notice Inviting Bids" requesting sealed bids for furnishing all labor, services, materials and equipment and performing all work necessary for: **Mesmer Low Flow Diversion, PR-005.**

Having carefully examined the location of the proposed work and the Bid Documents for same and read the accompanying proposed requirements, and attended the pre-bid conference, the undersigned Bidder hereby proposes and agrees to enter into a contract to furnish all equipment, materials and labor necessary to complete all work described in the Bid Documents for the project under the supervision of the City Engineer of the City of Culver City for the sum set forth in the following schedule **Mesmer Low Flow Diversion, PR-005.**

The undersigned further agrees, in case of award, to execute the contract for the within described work and improvements, within ten (10) days following written notice of award of contract. All work to be done under this contract shall be completed within **Ninety (90) working days**, beginning on the date stipulated in the written Notice to Proceed issued by the City Engineer.

Liquidated damages of **\$4,000** per calendar day shall be assessed based upon the applicable number of days noted above. The Contract Time shall commence on the date the Contractor actually commences the Work or on the tenth (10th) day after the issuance of the Notice to Proceed, whichever comes first. The Contractor shall retain the right to fully complete (including Final Completion, Punch List Correction and project Close-Out) the Work in less days than established by above, however, neither shall a reduction or increase to the Contract Sum be made, if the Work



is so fully completed in less days than established by this Section C-1, no Claim shall be made or granted for Compensable Delay, or any other increase in Contract Sum, if, for any reason, including but not limited to delay caused by the Owner, the Contractor does not so fully complete the Work in less days than established herein.

(NOTE: All amounts and totals given in the Bid Schedule are subject to verification by the Owner.)

### Mesmer Low Flow Diversion, PR-005

#### BID SCHEDULE

ITEM NO.	ITEM DESCRIPTION	ESTIMATED QUANTITY	UNIT	Unit Cost	TOTAL
<b>Miscellaneous</b>					
1	Mobilization/Traffic Control	1	LS	\$	\$
2	Project Dewatering	1	LS	\$	\$
3	Surface Water Diversion Plan & Implementation	1	LS	\$	\$
4	Construction Schedule	1	LS	\$	\$
<b>Site Preparation</b>					
5	Removal & Disposal of Concrete (Reinforced)	6	CY	\$	\$
6	Sawcut Concrete	60	LF	\$	\$
7	Removal and Disposal of AC Pavement	350	SF	\$	\$
<b>Construction</b>					
8	Diversion Berm Concrete Structure and Channel Invert	9	CY	\$	\$
9	12" PVC SDR35 (Installation, Excavation, Backfill)	65	LF	\$	\$
10	20" Steel Casing (Trenchless Technology)	65	LF	\$	\$
11	6" DIP (Open Trench, Pipe Installation, Backfill)	80	LF	\$	\$
12	Cast In Place Drop Inlet	1	LS	\$	\$
13	Traffic Rated Grate and Frame	1	LS	\$	\$
14	Crushed Miscellaneous Base (Access Road)	330	SF	\$	\$
15	Flow Meter (Mag-Flux-A)	1	LS	\$	\$

ITEM NO.	ITEM DESCRIPTION	ESTIMATED QUANTITY	UNIT	Unit Cost	TOTAL
16	Remove and Reinstall 8' High Fence (Wrought Iron)	65	LF	\$	\$
17	8'H x 16'W Double Leaf Gate (Wrought Iron)	1	LS	\$	\$
18	6" DIP Connection to Existing Wet Well	1	LS	\$	\$
19	Pump Station (Excavation, Shoring, Installation)	1	LS	\$	\$
<b>Site Restoration</b>					
20	AC Pavement	9	TON	\$	\$
<b>Electrical</b>					
21	Electrical System	1	LS	\$	\$
<b>TOTAL BID SCHEDULE IN FIGURES (Bid items 1-21):</b>					\$
<b>TOTAL BID SCHEDULE IN WORDS (Bid items 1-21):</b>					

**THE CONTRACT WILL BE AWARDED TO THE RESPONSIBLE CONTRACTOR WHO SUBMITS THE LOWEST TOTAL BASE BID AMOUNT WITH RESPONSIVE AND RESPONSIBLE BID PROPOSAL. THE CITY RESERVES THE RIGHT TO AWARD THE CONTRACT AMOUNT BASED ON AVAILABLE BUDGET AND PRIORITIES.**

**Note to Bidders:**

1.	The contract will be awarded to the responsible contractor who submits the lowest TOTAL BASE BID Amount (including the deletable items), with responsive bid proposal. The contract award amount by the City may or may not include the deletable items, based on available budget and priorities.
2.	The Prime Contractor shall perform, with its own organization, contract work amounting to at least <b>50%</b> of the contract price. Any items designated as specialty items by the City and performed by Subcontractors shall be deducted from the contract price before computing the amount of the work required to be performed by the Prime Contractor with its own forces. This percentage shall be of the original contract price, exclusive of specialty items performed by Subcontractors, but include the cost of materials and manufactured products purchased or produced by the Prime Contractor.



The undersigned has carefully checked the above figures and understands that the City, or any officer thereof, will not be responsible for any errors or omissions on the part of the undersigned in submitting this bid. In case of a discrepancy between words and figures, the figures shall prevail, and in case of a discrepancy between unit prices and totals, the unit prices shall prevail. The unit price amounts for each item shall include all indirect costs (i.e., permit fee, business license fee, mobilization, coordination, supervision, overhead and profit, etc.), incidental work (i.e. traffic control, safety devices, protection of utilities, utility investigation and "pot holes," work necessary for the protection of life and limb, etc.) and other work required by the contract but not listed above.

Payment for all work on the above items shall be made subject to verification in the field of the actual quantity of work performed.

Exclusions: Includes everything necessary to complete the project with the following exceptions only:

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## 2 RECEIPT AND ACKNOWLEDGMENT OF ADDENDUM

We acknowledge that the following addenda numbers have been received and have been examined as part of the Contract Documents. Failure to acknowledge any or all addenda or addendum may result the bid proposal being deemed as non-responsive by the City. Indicate **None**, if none received.

Addenda Number	Date Received	Initials

**3 CERTIFICATION**

The undersigned Bidder certifies that:

1. Bidder has, by investigation of the site of the work and otherwise, understands the nature and location of the work and has fully informed the Owner as to all conditions and matters, which can in any way affect the work or cost thereof.
2. Bidder will cooperate fully with the Owner to ensure the Owner's best interests are protected and the work expedited to completion. In the event of any disagreement, the City Engineer shall fully review the matter and provide a determination. His judgment shall be final and binding upon all parties concerned.
3. Where demolition is necessary for the project described herein, the successfully awarded Contractor shall conform with the South Coast Air Quality Management District (S.C.A.Q.M.D.) Rule 1403, as amended. The Contractor shall mail the Rule 1403 Notification within five (5) calendar days after the Notice to Commence Work is mailed by the Owner. Once the S.C.A.Q.M.D Rule 1403 Notification has been post marked and mailed, the Contractor shall begin work no later than fifteen (15) calendar days after the mailing date. The duration set for the completion of this project will begin on the date work actually commences by the Contractor. In any case, the work shall not begin later than twenty (20) days after the date in which the Owner mailed the Notification to Commence Work.
4. All bonds, certificates, endorsement forms shall be submitted at the time of the execution of the contract.

THE UNDERSIGNED BIDDER IS AWARE OF THE FACT THAT THE OWNER RESERVES THE RIGHT TO REJECT ANY OR ALL BIDS BUT THAT IF A BID IS ACCEPTED, THE CONTRACT WILL BE AWARDED TO THE LOWEST RESPONSIBLE AND RESPONSIVE BIDDER.

**4 BIDDER INFORMATION**

Name of Individual Bidder: \_\_\_\_\_

Bid Prepared By: \_\_\_\_\_

Business Address: \_\_\_\_\_

\_\_\_\_\_

Business Telephone Number: \_\_\_\_\_

Fax Number: \_\_\_\_\_

Contractor License No: \_\_\_\_\_ Class: \_\_\_\_\_

OR:

Name of Partnership Bidder: \_\_\_\_\_

Bid Prepared By: \_\_\_\_\_

Business Address: \_\_\_\_\_

Fax Number: \_\_\_\_\_

Business Telephone Number: \_\_\_\_\_

List Names and Business addresses of All Partners Below:

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If the Bidder is a Corporation, list corporate information below:

Name of Corporate Bidder: \_\_\_\_\_

By: \_\_\_\_\_  
(Signature of President of Corporation)By: \_\_\_\_\_  
(Signature of Secretary of Corporation)By: \_\_\_\_\_  
(Signature of Treasurer of Corporation)

Business Address: \_\_\_\_\_

---

Business Telephone Number: \_\_\_\_\_

Fax Number: \_\_\_\_\_

Corporation organized under laws of State of: \_\_\_\_\_

Contractor License No: \_\_\_\_\_ Class: \_\_\_\_\_

**5 DECLARATION OF BIDDER'S QUALIFICATIONS**

Each Bidder must be properly licensed and must submit the following information on this form. If necessary, include supplement information as a separate package.



## 5.1 Authorization and Declaration

The undersigned hereby authorizes and requests any person, firm or corporation to furnish any information requested by Owner or their designated representative in verification of the recitals comprising this Declaration of Bidder's Qualifications. The undersigned declares under penalty of perjury that all of the qualification information submitted with this form is true and correct and that this Declaration was executed in

\_\_\_\_\_  
(City, County) of California, on \_\_\_\_\_ (Date).

Signature: \_\_\_\_\_

Title (Printed): \_\_\_\_\_

## 5.2 Business Name, Address, Telephone Numbers (if different than Section C-4)

\_\_\_\_\_  
Business Name: \_\_\_\_\_

Business Address: \_\_\_\_\_

Business Telephone & Fax Numbers: \_\_\_\_\_

\_\_\_\_\_

## 5.3 License

Bidders must be licenses in the State of California as **"A" or "C-10" Contractor**.

Complete the information requested below.

_____ License Number	_____ Class	_____ Date Issued	_____ Expiration Date
_____ License Number	_____ Class	_____ Date Issued	_____ Expiration Date
_____ License Number	_____ Class	_____ Date Issued	_____ Expiration Date

## 5.4 Surety

- A. Indicate the names of all surety companies utilized by Bidder in last five (5) years and state if the Surety(ies) bonding the Bidder's jobs have had to complete any part of Bidder's Contract (attach separate sheet if necessary).

Surety Name & Address	Period Covered
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Jobs Completed by Surety

Surety Name & Address	Period Covered
-----------------------	----------------

Jobs Completed by Surety

- B. If a Bid Guaranty (Section C-7) is provided in lieu of a Bid Bond (Section C-6), the Bidder shall attach a notarized statement from Surety(ies) proposed to be utilized on the project, indicating Bidder's total bonding capacity and certifying that: (1) currently available bonding capacity exceeds **\$500,000** and (2) Surety(ies) will provide bonding in the event that Bidder is awarded the project.
- C. Indicate below that the surety is licensed and admitted as a surety insurer in the State of California.

Surety Name and Address

Licensed & Admitted in CA  
(Y/N)

Surety Name and Address

Licensed & Admitted in CA  
(Y/N)

Surety Name and Address

Licensed & Admitted in CA  
(Y/N)

- D. Indicate below those projects with disputed amounts in excess of \$50,000 or portions of any such project, which have been terminated by an Owner, Owner's representative, or other contracting party and which required completion by another party in the last five (5) years. State the project Name, Location, Owner, with address and phone number, contract amount, and reason for disputed amount or termination (attach separate sheet if necessary.)

Project Name and Location

Owner	Contract Value
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Reasons for Disputed Amount or Termination
--

Disputed Amount
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#### 5.5 Insurance

- A. Provide a statement from the Worker's Compensation carrier specifying Contractor's current Experience Modification Rate for Worker's Compensation for the State of California. In addition, provide a list of the above referenced ratings and corresponding company for the last three (3) years.
- B. Provide statement from insurance carrier indicating that the minimum scope and limits of insurance will be provided as required in Section D-4, of this document.
- C. Indicate below that the surety is licensed and admitted as a surety insurer in the State of California.

Ins. Co. Name and Address
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Licensed & Admitted in CA/Y/N
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Ins. Co. Name and Address
---------------------------

Licensed & Admitted in CA/Y/N
-------------------------------

#### 5.6.1 Construction Experience

Furnish a list of at least three (3) similar projects completed in the past five (5) years, two (2) of which must have been built in the State of California. Provide the following information for each project on the attached form. Copy additional forms as required.

- i* Project name and location
- ii* Contact name, address and telephone number for Owner & Architect/Engineer
- iii* Base and final contract amounts
- iv* Type of project and major project components. Provide approximate percent of construction cost associated with each construction component.
- v* Date project was completed (i.e., date of filing of Notice of Completion, etc.).



- vi* Indicate completion rate of projects by showing initial contract time, time extensions, and number of days that project was completed early or late, all expressed in calendar days

### **SIMILAR PROJECTS FOR LAST FIVE (5) YEARS**

1. \_\_\_\_\_  
Project Name and Location  
  
Owner \_\_\_\_\_ Engineer \_\_\_\_\_  
  
Address and telephone \_\_\_\_\_  
  
Project Components \_\_\_\_\_  
  
Contract Amounts (\$) \_\_\_\_\_ Date Completed \_\_\_\_\_
  
2. \_\_\_\_\_  
Project Name and Location  
  
Owner \_\_\_\_\_ Engineer \_\_\_\_\_  
  
Address and telephone \_\_\_\_\_  
  
Project Components \_\_\_\_\_  
  
Contract Amounts (\$) \_\_\_\_\_ Date Completed \_\_\_\_\_
  
3. \_\_\_\_\_  
Project Name and Location  
  
Owner \_\_\_\_\_ Engineer \_\_\_\_\_  
  
Address and telephone \_\_\_\_\_  
  
Project Components \_\_\_\_\_  
  
Contract Amounts (\$) \_\_\_\_\_ Date Completed \_\_\_\_\_

4. \_\_\_\_\_  
Project Name and Location

\_\_\_\_\_  
Owner

\_\_\_\_\_  
Engineer

\_\_\_\_\_  
Address and telephone

\_\_\_\_\_  
Project Components

\_\_\_\_\_  
Contract Amounts (\$)

\_\_\_\_\_  
Date Completed

5. \_\_\_\_\_  
Project Name and Location

\_\_\_\_\_  
Owner

\_\_\_\_\_  
Engineer

\_\_\_\_\_  
Address and telephone

\_\_\_\_\_  
Project Components

\_\_\_\_\_  
Contract Amounts (\$)

\_\_\_\_\_  
Date Completed

#### 5.7 Staff Roster/Functions

List all members of your staff that will be assigned to or responsible for work on this project (except clerical) and show their job titles/functions. Include Company Officers.

_____ Name	_____ Function	_____ Years w/Firm	_____ Years Total
_____ Name	_____ Function	_____ Years w/Firm	_____ Years Total
_____ Name	_____ Function	_____ Years w/Firm	_____ Years Total
_____ Name	_____ Function	_____ Years w/Firm	_____ Years Total

Name	Function	Years w/Firm	Years Total
------	----------	-----------------	----------------

### 5.8 Arbitration and Litigation History

Indicate below all arbitration and/or litigation against bidder in the last five (5) years, including all claims by owners. Indicate yes or no (Y/N) which claims were resolved against bidder in litigation or arbitration or which resulted against in any payment by the Bidder or its insurers/sureties or reduction in compensation on any Bidder. Failure to provide this information on any contract undertaken in the past five (5) years may result in disqualification. Indicate final status (Resolved or Unresolved) of each claim. Attach separate sheet if necessary.

Project Name	Amount of Claim
Nature of Claim	Resolution (Y/N) Against Bidder
	Final Status

Project Name	Amount of Claim
Nature of Claim	Resolution (Y/N) Against Bidder
	Final Status

Project Name	Amount of Claim
Nature of Claim	Resolution (Y/N) Against Bidder
	Final Status



**6 BID BOND**

KNOW ALL MEN BY THESE PRESENTS:

That we, \_\_\_\_\_, as Principal, and  
 \_\_\_\_\_, as Surety (Local Agent  
 Contact Telephone Number , \_\_\_\_\_ ), are held and firmly bound unto the Owner in  
 the sum of \_\_\_\_\_ Dollars  
 (\$\_\_\_\_\_) to be paid to said Owner its successors and assigns, for which payment  
 well and truly will be made, we bind ourselves, our heirs, executors, administrators, successors  
 and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH:

That if the certain Bid of the above-bounden Principal submitted for the following improvement  
 project:

**MESMER LOW FLOW DIVERSION, PR-005**

is accepted by the Owner through action of its legally constituted contracting authorities and if the  
 above-bounden Principal, its heirs, executors, administrators, successors and assigns shall duly  
 enter into and execute a contract for such construction in strict accordance with the specifications  
 and drawings on file at the office of the City Engineer, in the City Hall, Culver City, and shall execute  
 and deliver the required Faithful Performance Bond and Payment Bond, and Insurance Certificates  
 within ten (10) days after the date of notification by and from said Owner that said contract is ready  
 for execution, then this obligation shall become null and void; otherwise, it shall be and remain in  
 full force and virtue.

IN WITNESS WHEREOF, we hereunto set our hands and seals this \_\_\_\_\_  
 day of \_\_\_\_\_, 20\_\_.

\_\_\_\_\_  
 Signature

\_\_\_\_\_  
 Surety

\_\_\_\_\_  
 Title

By: \_\_\_\_\_

\_\_\_\_\_  
 Company

**7 BID GUARANTY****BID GUARANTY**

Note: The following statement shall be used if other than a bid surety bond accompanies bid.

"Accompanying this proposal is a money order\*, certified check\*, cashier's check\*, cash\*, payable to the order of the Owner in the amount of Dollars (\$ \_\_\_\_\_) which is ten percent (10%) of the total amount of this bid. The proceeds of this bid guaranty shall become the property of said Owner provided this bid is accepted by said Owner, through action of its legally constituted contracting authorities, and the undersigned fails to execute a contract and furnish the required bonds within the stipulated time. Otherwise, the proceeds of this bid guaranty shall be returned to the undersigned."

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Company

(\*Delete the inapplicable words)

**8 NONCOLLUSION DECLARATION****NONCOLLUSION DECLARATION**

(To Be Executed By Bidder and Submitted With Bid)

The undersigned declares:

I am the \_\_\_\_\_ of \_\_\_\_\_, the party making the foregoing bid.

The bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation. The bid is genuine and not collusive or sham. The bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid. The bidder has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or to refrain from bidding. 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. All statements contained in the bid are true. 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, to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof, to effectuate a collusive or sham bid, and has not paid, and will not pay, any person or entity for such purpose.

Any person executing this declaration on behalf of a bidder that is a corporation, partnership, joint venture, limited liability company, limited liability partnership, or any other entity, hereby represents that he or she has full power to execute, and does execute, this declaration on behalf of the bidder.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on \_\_\_\_\_ [date], at \_\_\_\_\_ [city], \_\_\_\_\_ [state].

Name: \_\_\_\_\_

Title: \_\_\_\_\_

\_\_\_\_\_  
Signature of Bidder

**9 SUPPLEMENTARY BID FORMS, NO. 1****SUPPLEMENTARY BID FORM NO. 1****LISTING OF PROPOSED SUBCONTRACTORS**

Pursuant to **INSTRUCTIONS TO BIDDERS** for the Work titled:

**Mesmer Low Flow Diversion, PR-005**

For portions of the Work equaling or exceeding 1/2 of one percent (0.5%) of the Base Bid, the undersigned Bidder proposes to use the subcontractors listed below. Except as otherwise approved by the Owner, the undersigned Bidder shall perform all other portions of the Work with his own forces.

<u>Portion of the Work</u> <u>Bid Number &amp; \$ amount of subcontracting work</u>	<u>Subcontractor Name, Address, &amp; License #</u> <u>Public Works Contractor (PWC) Registration #:</u>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

The signature must  
be identical to that  
shown on the Bid.

If additional sheets  
are required, you must  
copy this form.

Bidder: \_\_\_\_\_

By: \_\_\_\_\_

Its: \_\_\_\_\_



## LISTING OF PROPOSED SUPPLIERS

Pursuant to **INSTRUCTIONS TO BIDDERS** for the Work titled:

[illegible]

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*August 2021*

## **SECTION D**

### **AGREEMENT, BONDS AND INSURANCES**

**SECTION D - AWARD AND EXECUTION OF CONTRACT****1 SAMPLE AGREEMENT****CITY OF CULVER CITY  
AGREEMENT WITH****Contractor**

This Agreement is made and entered into by and between the City of Culver City (City) and Name of Contractor (Contractor)

WHEREAS, Contractor submitted its total base bid the total lump sum for: Amount of Bid Dollars (\$00.00) for the completion of the Name of Project (Project. No. P-) as further described in the Scope of Services; and

WHEREAS, Contractor represents it has that degree of specialized expertise and holds all licenses necessary to practice and perform the service contemplated; and

WHEREAS, after reviewing all bids submitted and declaring that the Contractor submitted the lowest responsible and responsive bid, City's City Council, at its meeting of meeting date, awarded the contract for the work to Contractor.

NOW, THEREFORE, THE PARTIES HERETO AGREE as follows:

**1. SCOPE OF SERVICES**

Contractor shall provide all services described in accordance with the Contract Documents, as defined below, relating to the Name of Project (Project. No. P-) and follow the work schedules defined therein.

**2. CONTRACT DOCUMENTS**

The documents comprising the entire agreement between City and Contractor shall be collectively referred to as the "CONTRACT DOCUMENTS," and shall consist of and include the following:

This Agreement – including:

This Agreement – including:

- Contract Documents and Specifications for Name of Project (P-), Bid # \_\_\_\_ ;
- All addenda setting forth any modifications or interpretations of those documents,
  - Addendum No. 1 dated \_\_\_\_\_;
  - Addendum No. 2 dated \_\_\_\_\_;
  - Addendum No. 3 dated \_\_\_\_\_;
- Bid Proposal submitted by Contractor to City on or before DATE;
- All documents incorporated into the foregoing;
- Schedule of Values, if applicable;
- List of Subcontractors;
- Labor and Materials Payment Bond;
- Faithful Performance Bond (including agent's Power of Attorney for each Bond);
- Non-Collusion Declaration (General and Subcontractor) ;
- Certificates of Insurance;
- Change Orders;
- Notice to Proceed; and
- Notice of Completion

All the Contract Documents are intended to complement one another, so that any work called for in one and not mentioned in another is to be performed as if mentioned in all documents.

The terms of this Agreement shall prevail over any inconsistent provision of the other Contract Documents.

The Contract Documents constitute the entire agreement between the parties and supersede any and all other writings and oral negotiations.

### **3. NOTICE**

All notices given or required to be given pursuant to this Agreement shall be in writing and may be given by personal delivery, facsimile, overnight delivery, or by U.S. Mail. All written notices or correspondence sent pursuant to this paragraph will be deemed given to a party on whichever date occurs first; the date of personal delivery; the date of transmission, if sent by facsimile (with proof of transmission); the next business day following deposit with an overnight mail carrier; the fifth day following deposit in the U.S. Mail, when sent by "first class mail."

Notices required to be given to City shall be addressed as follows:

Charles D. Herbertson  
Public Works Director/City Engineer  
Public Works Department  
City of Culver City  
9770 Culver Blvd.  
Culver City, CA 90232

Notices required to be given to the Contractor shall be addressed as follows:

Contractor  
Address

It shall be the duty of Contractor to notify all subcontractors of the above Notice provisions.

### **4. CONTRACT PRICE**

For Contractor's satisfactory completion of the scope of services, City shall pay Contractor a total sum of \$00.00.

### **5. EFFECTIVE DATE**

The effective date of this agreement is the date it is signed on behalf of City. This Agreement shall remain in full force and effect until amended or terminated; provided, that the indemnification and hold harmless provisions shall survive the termination.

### **6. AUTHORITY TO ENTER INTO AGREEMENT**

The individual(s) executing this Agreement on behalf of each party is (are) authorized to execute this Agreement on behalf of said party. Each party has taken all actions required by law to approve the execution of this Agreement.

CONTRACTOR

Dated: \_\_\_\_\_

By: \_\_\_\_\_



CITY OF CULVER CITY, CALIFORNIA

Dated: \_\_\_\_\_

By: \_\_\_\_\_  
John Nachbar  
City Manager

APPROVED AS TO CONTENT:

APPROVED AS TO FORM:

\_\_\_\_\_  
Charles D. Herbertson  
Public Works Director/City Engineer

\_\_\_\_\_  
Carol A. Schwab  
City Attorney

**2 LABOR AND MATERIALS PAYMENT BOND**

KNOW ALL MEN BY THESE PRESENTS: that

**WHEREAS**, THE City of Culver City, County of Los Angeles, State of California, has awarded to:

---

hereinafter designated as the Principal, a contract for:

**Mesmer Low Flow Diversion, PR-005**

in the City of Culver City, California, which contract is incorporated wherein by this reference; and

**WHEREAS**, said Principal is required to furnish a bond in connection with said contract, providing that if said Principal or any of his or its Subcontractors shall fail to pay for any materials, provisions, equipment or supplies used in, upon or about the performance of the work contracted to be done, or for any work or labor done thereon of any kind, the Surety on this bond will pay the same to extent hereinafter set forth;

**NOW, THEREFORE, WE,** \_\_\_\_\_

---

as Principal and \_\_\_\_\_

---

as Surety, are held and firmly bound unto the City of Culver City, hereinafter called the Owner in the sum of: \_\_\_\_\_ Dollars (\$ \_\_\_\_\_) lawful money of the United States of America for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

**THE CONDITION OF THIS OBLIGATION IS SUCH THAT** if said Principal, his or its heirs, executors, administrators, successors or assigns shall fail to pay for any materials, provisions or other supplies used in, upon, for or about the performance of the work contracted to be done, or for any work or labor thereon of any kind, as required by the provisions of an act of the Legislature of the State of California entitled, "An Act to secure the payment of claims or persons employed by Contractors upon public works, and the claim of persons who furnish materials, supplies, teams, implements or machinery used or consumed by such Contractors in the performance of such work, and prescribing the duties of certain public officers with respect thereto," approved May 10, 1919, as amended, and provided that the persons, companies or corporations so furnishing said materials, provisions or other supplies, appliances or power used in, upon, for or about the performance of the work contracted to be executed or performed, or any person, company or corporation renting or hiring implements, machinery or power for or contributing to said work to be done, or any person who performs work or labor upon the same, or any person who supplies both work or labor upon the same, or any person who supplies both work and material therefor, shall have complied with the provision of said Act, then said Surety will pay the same in or to an amount not exceeding the amount herein above set forth, and also will pay in case suit is brought upon this bond, such reasonable attorneys' fees, as shall be fixed by the court, awarded and taxed as in aforementioned Statute provided. This bond shall inure to the benefit of any and all persons, companies, and corporations entitled to file claims under said Act, so as to give a right of action to them or their assigns in any suit brought upon this bond.

FURTHER, the said Surety for value received hereby stipulates and agrees that no change, extension of time, alteration or modification of the contract documents or of the work to be performed thereunder shall in any way affect its obligations on this bond and it does hereby waive notice of any such change, extension of time, alteration or modifications of the contract documents or of work to be performed thereunder.

---

IN WITNESS WHEREOF, this original instrument has been duly executed by the Principal and Surety herein named, on the \_\_\_\_\_ day of \_\_\_\_\_, 200\_\_. The name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative pursuant to authority of its governing body.

Principal

\_\_\_\_\_

By: \_\_\_\_\_

Surety

\_\_\_\_\_

By: \_\_\_\_\_

**3 FAITHFUL PERFORMANCE BOND****FAITHFUL PERFORMANCE BOND**

KNOW ALL MEN BY THESE PRESENTS: that

**WHEREAS**, the City of Culver City, in the County of Los Angeles, State of California, has awarded to:

\_\_\_\_\_ herein designated as the Principal, a contract for the construction of

**Mesmer Low Flow Diversion, PR-005**

in the City of Culver City, California, which contract is incorporated herein by this reference; and

**WHEREAS**, said Principal is required under the terms of said contract to furnish a bond for the faithful performance of said contract;

**NOW, THEREFORE, WE** \_\_\_\_\_

as Principal and \_\_\_\_\_  
as Surety, are held and firmly bound unto the City of Culver City, hereinafter called the Owner in the sum of:

\_\_\_\_\_ Dollars (\$\_\_\_\_\_) lawful money of the United States of America for payment of which sum well and truly to be made we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

**THE CONDITION OF THIS OBLIGATION** is such that, if the hereby bound Principal, his or its heirs, executors, administrators, successors or assigns shall in all things stand to and abide by and well and truly keep and perform all the undertakings, terms, covenants, conditions and agreements in the said contract and any alteration thereof, made as therein provided, all within the time and in the manner therein designated and in all respects according to their true intent and meaning, then this obligation shall become null and void; otherwise, it shall be and remain in full force and effect.

**FURTHER**, the said surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or modification of the contract documents or of the work to be performed thereunder, shall in any way affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration or modification of the contract documents or of work to be performed thereunder.

**IN WITNESS WHEREOF**, this original instrument has been duly executed by the Principal and Surety herein named on the \_\_\_\_\_ day of \_\_\_\_\_, 200\_\_. The name and corporate seal of each corporate party being hereto affixed, and these presents duly signed by its undersigned representative pursuant to authority of its governing body.

Principal

\_\_\_\_\_  
By: \_\_\_\_\_

Surety

\_\_\_\_\_  
By: \_\_\_\_\_



#### 4 INSURANCE REQUIREMENTS

##### A. Policy Requirements.

Contractor/ Consultant shall submit duly executed certificates of insurance for the following:

1. An occurrence based Commercial General Liability ("CGL") policy, at least as broad as ISO Form CG 0001, in the minimum amount of Three Million Dollars (\$3,000,000) each occurrence, with not less than Six Million Dollars (\$6,000,000) in annual aggregate coverage.

The CGL Policy shall have the following requirements:

- a. The policy shall provide coverage for personal injury, bodily injury, death, accident and property damage and advertising injury, as those terms are understood in the context of a CGL policy. The coverage shall be utilized to satisfy, to the extent of the coverage limits, the City's self-insured retention under any other policy of insurance. The coverage shall not be excess or contributing with respect to the City's self-insurance, commercial liability insurance, or any pooled risk arrangements;
- b. The policy shall provide \$3,000,000 coverage per accident, for owned, hired and non-owned automobile liability; automobile liability coverage may be satisfied with a stand-alone policy or as a component of the CGL policy;
- c. The policy shall include coverage for liability undertaken by contract covering, to the maximum extent permitted by law. Contractor's obligation to indemnify the Indemnitees as required under Paragraph 6 of this agreement;
- d. The Policy shall not exclude coverage for Completed Operations Hazards or Athletic or Sports Participants; and;
- e. **The City of Culver City, members of its City Council, its boards and commissions, officers, agents, and employees will be named as an additional insured** in an endorsement to the policy, which shall be provided to the City and approved by the City Attorney.
- f. The Policy shall not contain an "Independent Negligence" provision that would void or otherwise nullify the insurer's obligation to defend and indemnify the City of Culver City in the event that its independent negligence is alleged or proven.
- g. The CGL limits may be satisfied with a primary policy with \$3,000,000 occurrence/ \$6,000,000 annual aggregate, OR, by a primary policy with lower limits of coverage plus an Excess or Umbrella policy which will satisfy the occurrence and aggregate limit requirement. If Contractor's insurance coverage provides coverage in excess of these required limits, but is eroded by payment or claim reserves, then Contractor or its insurance carrier shall notify the City of Culver City within ten (10) days when the contractual coverage limits provided are below the required coverage limits.
- h. The City of Culver City reserves the right to review and waive or modify the CGL aggregate requirement in the event that an adequate project specific policy and limits are provided.

2. Business Automobile Liability Insurance coverage in the amount of Three Million Dollars (\$3,000,000), providing coverage for use of mobile equipment (i.e. heavy mobile equipment or vehicles primarily for use in an off-road environment), to the extent that (1) such mobile equipment will be used within the City limits or on City business, and (2) coverage for mobile equipment is not otherwise covered by the CGL policy listed in subparagraph (a), above.
3. Professional/Negligent Acts, Errors and Omissions Insurance in the minimum amount of One Million Dollars (\$1,000,000) per claim, and shall include coverage for separate "personal injury" alleged to have been committed in the course of rendering professional services, unless such coverage is provided by the CGL policy listed in subparagraph (a), above.
4. If the Agreement will have Contractor employees working within the City limits, Contractor shall maintain Workers' Compensation Insurance (Statutory Limits) and Employer's Liability Insurance (with limits of at least one million dollars [\$1,000,000] per accident.) Contractor shall submit to City, along with the certificate of insurance, a Waiver of Subrogation endorsement in favor of City, its officers, agents, employees and volunteers.

**B. Waiver by City.**

City may waive one or more of the coverages listed in Section A, above. This waiver must be express and in writing, and will only be made upon a showing by the Consultant that its operations in and with respect to City are not such as to impose liability within the scope of that particular coverage.

**C. Additional Insurance Requirements.**

1. All insurance listed in Paragraph A shall be issued by companies licensed to do business in the State of California, with a claims paying ability rating of "BBB" or better by S&P (and the equivalent by any other Rating Agency) and a rating of A-:VIII or better in the current Best's Insurance Reports;
2. Consultant shall provide City with at least thirty (30) days prior written notice of any modification, reduction or cancellation of any of the Policies required in Paragraph A, or a minimum of ten (10) days' notice for cancellation due to non-payment.
3. City may increase the scope or dollar amount of coverage required under any of the policies described above, or may require different or additional coverages, upon prior written notice Consultant.

SECTION E

**SPECIAL PROVISIONS**

(SUPPLEMENTS AND MODIFICATIONS TO  
THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION)

## **PART 1 – GENERAL PROVISIONS**

### **SECTION 1 – TERMS, DEFINITIONS, ABBREVIATIONS, AND SYMBOLS**

#### **1-1 GENERAL.**

Add the following:

Except as modified by the Special Provisions, Technical Provisions, Standard Drawings, and the Project Plans, all work shall be in accordance with the Provisions of the latest edition of the STANDARD SPECIFICATION FOR PUBLIC WORKS CONSTRUCTION (SPPWC), including all Supplemental Amendments, as published by Building News, Inc., Los Angeles, California, which Specifications hereinafter referred to as the Standard Specifications.

The herein stated Special Provisions supplement and revise the aforementioned Standard Specifications. Any reference to “Section” or “Subsection” in these Special Provisions shall refer to the aforementioned Standard Specifications unless noted otherwise.

#### **1-2 DEFINITIONS.**

Add or redefine the following:

**Agency** – The City of Culver City, for which the work is being performed.

**Board** – The City Council of the City of Culver City.

**City** – The City of Culver City

**Engineer (or) City Engineer** – The City Engineer of the City of Culver City or other person designated by the City Engineer acting either directly or through authorized agents.

**Working Day** – All days beginning with the Notice to Proceed and ending with the “completion date”, except the following, unless otherwise approved by the Agency in advance:

- a) Saturday and Sunday.
- b) Any day designated as a holiday by the Agency.
- c) Any day designated as a holiday in a Master Labor Agreement binding the Contractor.
- d) Any day the Contractor is prevented from working for cause as established in Section 6-6.1 of these specifications.
- e) Any day the Contractor is prevented from working during the first five (5) hours of the workday with at least 60 percent of normal work force for cause as established in Section 6-6.1 of these specifications.

#### **1-7 AWARD AND EXECUTION OF THE CONTRACT.**

##### **1-7.1 General.**

Add the following:

The Bidder is required to examine carefully the site of work, Bid Proposal forms, and all other Contract Documents for the Work contemplated. The Submission of a Bidder's Proposal shall be considered conclusive evidence that the Bidder has investigated and is satisfied as to the conditions to be encountered, as to the character, quality, and quantities of work to be performed and materials to be furnished, and as to the requirements of all the above documents.

## **SECTION 2 – SCOPE OF THE WORK**

### **2-2 PERMITS.**

Add the following:

The Contractor shall secure all necessary permits from all governing agencies having authority over any portion of the Work. The Contractor shall obtain and pay for all other permits.

The Contractor shall obtain, pay, and comply with all permits, including, but not limited to, the permit requirements shown in the “Instruction to Bidders” part of this contract document, and give all notices necessary and incident to the due and lawful prosecution of the Work and to the preservation of the public health and safety.

The Contractor shall prepare required documentation associated with the permits indicated in the subsections below. The Agency will submit said documentation to the permitting agencies. The Contractor shall not proceed with associated Work until all approvals have been received by the permitting agencies.

Add the following subsections:

#### **2-2.1 United States Army Corps of Engineers.**

Work within Centinela Creek is subject to Section 408 and Section 404 of the Clean Water Act. Section 408 and 404 permits are required from the United States Army Corps of Engineers and were obtained by the Agency. The City has processed the permits under the following:

- 408-SPL-2019-0028 (Section 408)
- SPL-2017-00711-GLH (Section 404)

The Contractor must comply with associated permit requirements. Permit/approvals, including associated conditions, are included as part of the Contract Documents. Full compensation for complying with Section 408 and 404 requirements shall be considered as included in the price for the improvements within Centinela Creek right-of-way, as these are the items requiring permits, unless indicated otherwise in the bid item descriptions.

#### **2-2.2 California Department of Fish and Wildlife.**

Work within Centinela Creek is subject to the final Streambed Alteration Agreement issued by the California Department of Fish and Wildlife. The Agency has obtained the agreement, which is included as part of the Contract Documents. The Contractor shall comply with the terms of the agreement (1600-2017-0212-R5). Full compensation for complying with the agreement shall be considered as included in the price for the improvements within Centinela Creek right-of-way, unless indicated otherwise in the bid item descriptions.

#### **2-2.3 Los Angeles Regional Water Quality Control Board.**

Work within Centinela Creek is subject to the requirements set forth in Section 401 of the Clean Water Act. A Section 401 permit is required from the Los Angeles Regional Water Quality Control Board and was obtained by the Agency. The Contractor shall comply with the terms of the permit (4WQC40117153), which is included as part of the Contract Documents. Full compensation for complying with the permit shall be considered as included in the price for the improvements within Centinela Creek right-of-way, unless indicated otherwise in the bid item descriptions.



#### 2-2.4 Los Angeles County Public Works.

A permit is required from the Los Angeles County Department of Public Works (LACPW) and must be secured by the Contractor. The Contractor shall prepare documentation, if necessary, and obtain required bonds and insurance. The Contractor shall inform the Agency of required inspection fees, for which the Agency will issue payment directly to LACPW. The approved plans and permit may be obtained from: Los Angeles County Department of Public Works, 900 South Fremont Avenue, 3rd Floor, Alhambra, California 91803, (626) 458-4936. Plan checks have been completed under the permit/plan check number FCDP2018000279.

Full compensation for complying with the above requirements shall be considered as included in the price for the improvements within Centinela Creek right-of-way, as these are the items requiring a permit.

Unless otherwise authorized by the LACPW Permit and approved plan, all channel work shall be performed in accordance with the Plans and Specifications.

### 2-5 THE CONTRACTOR'S EQUIPMENT AND FACILITIES.

#### 2-5.1 General.

Add the following:

The routing of trucks with gross vehicle weight exceeding 6,000 pounds through the City shall be subject to the provision of City Code Section 7.02.210 and the Contract Documents. Contractor shall submit a proposed haul route plan to the Engineer for approval. Said plan shall be approved prior to mobilization. **The Contractor is advised of that any violation of the California Vehicle Code and Culver City Code (such as truck routing, overweight, improper licensing, etc.) will result in citation and fines by the Police Department.** Contractor shall be responsible for the immediate cleanup of all spills of any nature resulting from his/her operation.

Parking of Contractor's employee's vehicles or any other vehicles not utilized in the construction activity will be restricted during construction and shall not take place in public parking areas outside of the construction zone, unless shown otherwise on the Plans or unless by arrangement with the Engineer.

Any commercial vehicle, the laden or unladen weight of which exceeds 6,000 pounds, shall use the following streets designated as truck routes:

- a) Adams Boulevard.
- b) Centinela Avenue.
- c) Culver Boulevard, between west City boundary and Sepulveda Boulevard.
- d) Fairfax Avenue.
- e) Higuera Street, between Hayden Avenue/Place and Jefferson Boulevard.
- f) Jefferson Boulevard.
- g) La Cienega Boulevard.
- h) National Boulevard.
- i) Sawtelle Boulevard, between Culver/Washington off-ramp of the San Diego Freeway and Braddock Drive.
- j) Sawtelle Boulevard, between Matteson Avenue and Venice Boulevard.
- k) Sepulveda Boulevard.
- l) Slauson Avenue, east of Jefferson Boulevard.
- m) Venice Boulevard.
- n) Washington Boulevard, east of La Cienega Boulevard.

Most direct route shall be used to and from the restricted street from the truck route.

**2-5.2 Temporary Utility Service.**

Add the following:

Contractor is responsible to obtain and pay for construction water. Any water drawn from fire hydrant shall be coordinated through the applicable water company for which contact information is included in the Plans.

**2-8 EXTRA WORK.****2-8.1 General.**

Add the following:

The Contractor shall not perform any extra work without prior written authorization from the Engineer.

**2-9 CHANGED CONDITIONS.**

Add the following after the last paragraph:

This subsection shall not apply to utilities.

**2-10 DISPUTED WORK.**

Add the following:

All claims which do not exceed the sum of three hundred seventy-five thousand dollars (\$375,000) shall be resolved pursuant to the provisions of Public Contract Code Section 20104 through 20104.6, "Resolution of Construction Claims".

Notice – The Contractor shall notify the Engineer, in writing, of its intention to make claim. Claims pertaining to decisions provided above for such other determinations by the Engineer shall be filed in writing to the Engineer prior to the commencement of such work. Written notice shall use the words "Notice of Potential Claim". Such Notice of Potential Claim shall state the circumstances and the reasons for the claim, but need not state the amount.

Additionally, no claim for additional compensation or extension of time for a delay will be considered unless the above provisions are complied with. No claim filed after the date of final payment will be considered.

It is agreed that unless notice is properly given, the Contractor shall not recover costs incurred by it as a result of the alleged extra work, changed work, or other situation which had proper notice been given would have given rise to right for additional compensation. The Contractor shall understand that timely notice of potential claim is of great importance to the Engineer and Agency, and is not merely a formality. Such notice allows the Agency to consider preventative action, to monitor the Contractor's increases in costs resulting from the situation, to marshal facts, and to plan its affairs. Such notice by the Contractor, and the fact that the Engineer has kept account of the cost as aforesaid, shall not in any way be construed as proving the validity of the claim.

Records of Disputed Work – In proceeding with a disputed portion of the Work, the Contractor shall keep accurate records of its costs and shall make available, to the Public Works Director/City Engineer, a daily summary of the hours and classification of equipment and labor utilized on the disputed work, as well as a summary of any materials or any specialized services which are used. Such information shall be submitted to the Engineer on a monthly basis, receipt of which shall not be construed as an authorization for or acceptance of the disputed work.

Submission of Claim Costs – Within 30 days after the last cost of work for which the Contractor contends it is due additional compensation is incurred, but if costs are incurred over a span of more than 30 days, then within 15 days after the thirtieth day and every month thereafter, the Contractor shall submit to the Public Works Director/City Engineer as best the Contractor is able its costs incurred for the claimed matter. Claims shall be made in itemized detail and should the Engineer be dissatisfied with format or detail of presentation, upon request for more or different information, the Contractor will promptly comply, to the satisfaction of the Engineer. If the additional costs are in any respect not quantifiable with certainty, they shall be estimated as best can be done. In case the claim is found to be just, it shall be allowed and paid for as provided in the Standard Specification.

## **SECTION 3 – CONTROL OF THE WORK**

### **3-6 THE CONTRACTOR'S REPRESENTATIVE.**

Add the following:

When and as directed by the Engineer, the Contractor shall attend all conferences and meetings which the Engineer deems necessary for the proper progress of Work under this Contract.

### **3-7 CONTRACT DOCUMENTS.**

#### **3-7.1 General.**

Add the following:

Except as modified by the Special Provisions, Technical Provisions, Standard Drawings, and the Project Plans, all work shall be in accordance with the Provisions of the latest edition of the STANDARD SPECIFICATION FOR PUBLIC WORKS CONSTRUCTION (SSPWC), including all Supplemental Amendments, as published by Building News, Inc., Los Angeles, California, which Specifications are hereinafter referred to as the Standard Specifications, and when applicable, the California Department of Transportation (Caltrans) Standard Specifications, latest edition.

If the contractor, in the course of the work, becomes aware of any claimed errors or omissions in the Contract Documents or in the Agency's field work, it shall immediately inform the City Engineer. The City Engineer shall promptly review the matter, and if he/she finds an error or omission has been made, he/she shall determine the corrective actions and advise the Contractor accordingly. If the corrective work associated with an error or omission increase or decrease the amount of work called for in the Contract, the Agency shall issue an appropriate Change Order. After discovery of an error or omission by the Contractor, any related work performed by the Contractor shall be done at its risk unless authorized by the Engineer.

Where applicable, the latest edition of the Uniform Building Code (UBC), and Amendments, and the Culver City Municipal Code shall be adhered to.

Comply with the provisions for safety practices set forth in the "Manual of Accident Prevention on Construction", published by the Associated General Contractors of America (AGC) 213/263-1500, and to comply with the State of California Occupational Safety and Health Act (Cal-OSHA).

### **3-8 SUBMITTALS.**

#### **3-8.2 Working Drawings.**

Add the following to Table 3-8.2:

Item	Section No.	Title	Subject
15	As Shown on Plans	Trenchless Pipe Installation	Trenchless Operations
16	7-10.4.2	Contractor Safety Program	Safety Program
17	7-10.4.5	Confined Spaces	CSEP
18	As Shown on Plans and 1-4.13 of Technical Specifications	Flow Meter	Product literature and operation and maintenance procedures
19	As Shown on Plans and 1-4.17 of Technical Specifications	Pump Station	Installation procedure, shoring design, product data, performance curves, and operation and maintenance procedures

Replace the fourth paragraph with the following:

Working Drawings listed as Items 2, 4, 5, 6, 7, 9, 10, 11, 12, 13, 15, 18, and 19 in Table 2-5.3.2 shall be prepared, wet stamped, and signed by a Civil or Structural Engineer registered by the State of California.

### 3-8.3 Shop Drawings.

Add the following:

Within fourteen (14) calendar days after the Award of Contract, the Contractor shall, at his/her expense, transmit by letter to the Engineer for review and acceptance, shop drawings, and/or other available instructive and descriptive information from the manufacturer, when and as required by the Plans or Special Provisions, or requested by the Engineer. Shop drawings will normally not be required for standard items in common use for which adequate manufacturers' literature is available.

The Contractor shall consecutively number, thoroughly check, approve, and sign each Shop Drawing and transmit the Shop Drawings by letter to the Engineer for review. In the event that certain Shop Drawings are unacceptable to the Agency, they will be rejected by the Engineer. The Contractor shall thereafter, correct said drawings and resubmit same in quadruplicate within seven (7) calendar days.

In the event that in the process of development of the Shop Drawings, it is discovered that there are defects and/or errors on the Plans, resulting in conflict between said Plans and the Shop Drawings, or if the Shop Drawings show variation from the Plans and/or Contract requirements because of standard shop practice or other reasons, the Contractor shall thoroughly describe and explain said defects and/or conflicts in his/her transmittal letter to the Engineer.

The Engineer's review of the Shop Drawings will be for general design and arrangement only and shall not relieve the Contractor from responsibility for errors of any sort in the Shop Drawings or of the responsibility for executing the work in accordance with the Contract. The Contractor shall be solely responsible for the correctness of the drawings, for shop fits and field connections, and for the results obtained by use of such drawings. The Contractor shall verify and be fully responsible for all dimensions and job-site conditions affecting the Work and shall be responsible for furnishing and installing the proper materials required by the Contract, whether or not indicated on the Shop Drawings when reviewed.

Add the following to Table 3-8.3:

Item	Section No.	Title	Subject
9	As Shown on Plans and 1-4.11 of Technical Specifications	Traffic-Rated Grate and Frame	Fabrication and Dimensional Details

Item	Section No.	Title	Subject
10	As Shown on Plans and 1-4.13 of Technical Specifications	Flow Meter	Fabrication and Dimensional Details
11	As Shown on Plans and 1-4.17 of Technical Specifications	Pump Station	Fabrication and Dimensional Details

Add the following:

Shop Drawings listed above as Items 7, 8, 9, 10, and 11 shall be prepared, wet stamped, and signed by a Civil or Structural Engineer registered by the State of California.

### 3-8.4 Supporting Information.

Modify the second paragraph as follows:

Submittals are required for the following:

- 1) List of subcontractors per 3-3.
- 2) Construction sign per 3-11.
- 3) List of materials per 4-4.
- 4) Certificates of compliance per 4-5.
- 5) Safety Plan and safety information per 5-7.
- 6) Construction schedule per 6-1.
- 7) Spill Prevention and Emergency Response Plan per 3-12.5.3.
- 8) Confined Space Entry Program per 5-7.5.1.
- 9) Lean concrete base mix designs per 200-4.
- 10) Concrete mix designs per 201-1.1 and 201-6.1.1. All concrete mix designs and curing methods shall be prepared, signed, and sealed by a Civil Engineer registered in the State of California.
- 11) Asphalt concrete mix designs per 203-6.3. All asphalt concrete mix designs shall be prepared, signed, and sealed by a Civil Engineer registered in the State of California.
- 12) Pipeline layout diagrams per 207-2.1.
- 13) Equipment and materials list per 700-1.
- 14) Controller cabinet wiring diagram per 701-17.2.2.
- 15) Haul route and export disposal location per 300-1.3.1.
- 16) Pump manufacturer's technical data including technical data (capacities and operating characteristics), performance curves, installation procedures, and operation and maintenance procedures/instructions per Section 1-4.17 of the Technical Specifications.
- 17) Manufacturer's parts catalog showing part numbers for procurement of replacement parts.
- 18) Electrical and mechanical components and systems.
- 19) All written manufacturer's warranties.
- 20) Pump operation control schematic.
- 21) All necessary data and details including, but not limited to, catalog sheets, manufacturer's brochures, technical bulletins, specifications, diagrams, product samples, testing reports, and other information necessary to describe a system, product or item. This information is required for any material, product, manufactured item, or system.



### **3-9 SUBSURFACE DATA.**

Add the following:

The Agency will provide a copy of the Revised Geotechnical Engineering Report for the Mesmer Low Flow Diversion Project upon request (dated July 3, 2018 and revised December 19, 2019). The report is provided for the Contractors convenience and contains information on subsurface conditions as they existed only at the dates and times indicated in the report. The aforementioned report does not govern the Work and shall not be considered a Contract Document.

### **3-10 SURVEYING.**

#### **3-10.1 General.**

Replace the third paragraph with the following:

The Contractor shall pay and provide usual and customary construction staking. The Contractor shall submit to the Agency for approval, the qualifications of the Licensed Land Surveyor prior to commencing the construction staking.

Add the following:

The Contractor shall preserve and replace any obliterated survey markers or monuments at his/her cost throughout the Project limits.

### **3-11 CONTRACT INFORMATION SIGNS.**

Add the following:

Contract information signs must conform to requirements identified based on funding agreements. The contract information sign shall be a 3MM Polymetal sign, 36 inches by 24 inches (minimum). It is anticipated that the sign will read "Funding for this project has been provided in full or in part from the Department of Water Resources from the Water Quality, Supply, and Infrastructure Improvement Act of 2014, Los Angeles County Flood Control District's Safe, Clean Water Program, and City of Culver City.". The sign shall include color logos of agencies/programs contributing funding to the Project, including the Department of Water Resources (Proposition 1), Los Angeles County Flood Control District (Safe Clean Water), and City of Culver City, which will be provided by the City upon request. The Contractor shall submit a sample sign to the City for approval in accordance with SPPWC Section 3-8.4.

### **3-12 WORK SITE MAINTENANCE.**

#### **3-12.1 General.**

Add the following:

When and as often as required by the Engineer, the Contractor shall furnish and operate self-loading motor sweepers with spray nozzles, to keep paved areas affected by the Work acceptably clean and dust free.

The Contractor shall remove graffiti from all work, materials, equipment, and signs within the Project. Equipment, materials, or signs containing graffiti shall not be brought to the Project. Any graffiti found on Work, materials, equipment, or signs shall be cleaned or removed from the project within 24 hours from its discovery. The cost of graffiti removal shall be borne by the Contractor, and shall be considered as being included in the various Contract items.

Upon project completion, the contractor shall remove all dig-alert utility markings.

The Contractor shall have sole responsibility for providing security for his/her materials and equipment on and about the Work site against theft and vandalism at all times for the duration of the Contract. Contractor shall immediately replace all furniture, equipment, supplies, etc., which is being used or owned by the Agency or his/her designee at or on the Project site or other areas under the security of the Contractor that is stolen, lost, or damaged through theft, vandalism, graffiti, Contractor's negligence, or any similar activity.

### **3-12.2 Air Pollution Control.**

Add the following:

The Contractor shall comply with all air pollution control rules, regulations, ordinances, and statutes which apply to any work performed pursuant to the Contract, including any air pollution control rules, regulations, ordinances, and statutes, specified in Section 11017 of the Government Code.

In the absence of any applicable air pollution control rules, regulations, ordinances, or statutes governing solvents, all solvents, including but not limited to the solvent portions of paints, thinners, curing compounds, and liquid asphalt used on the Project shall comply with the applicable material requirements of the South Coast Air Quality Management District (SCAQMD). All containers of paint, thinner, curing compound, or liquid asphalt shall be labeled to indicate that the contents fully comply with said requirements.

Material to be disposed of shall not be burned, either inside or outside of the premises. Provisions of the SSPWC permitting disposal of material by burning shall not apply.

### **3-12.3 Noise Control.**

Replace the subsection with the following:

The Contractor shall comply with all local sound control and noise level rules, regulations, and ordinances which apply to any Work performed pursuant to the Contract.

The noise level requirements shall apply to all equipment on the job or related to the job, including, but not limited to, trucks, transit mixers, or transient equipment that may or may not be owned by the Contractor. Each internal combustion engine used for any purpose on the job shall be equipped with a muffler of a type recommended by the manufacturer. The noise level shall be in compliance with Chapter 9, Section 9.07 of the Culver City Municipal Code.

#### Residential Restrictions

For residential zones, hours of work shall be limited, in accordance with the Culver City Municipal Code pertaining to Mechanical Noise or Construction Noise near Residential Zones, which prohibits:

- a) The use or operation of any automobile, motorcycle, engine, machine or mechanical device, or other contrivance or facility, or the carrying on of any trade or business, causing between the hours of 8:00 p.m. and 8:00 a.m., any loud or unusual noise or sound, disturbing the peace of residents of a residentially zoned neighborhood.
- b) The use of any of the foregoing in construction or excavation work between the hours of 8:00 p.m. and 8:00 a.m., on weekdays, or between the hours of 7:00 p.m. and 9:00 a.m. on a Saturday, or between the hours of 7:00 p.m. and 10:00 a.m. on a Sunday, which cause any loud or unusual noise or sound disturbing the peace of residents of a residentially zoned neighborhood.

Interference with Business Prohibited

Contractor must comply with Section 9.04.020(D) of the Culver City Municipal Code pertaining to Mechanical Devices, etc., Interfering with Business or Industrial Operations, which prohibits: the operation of any automobile, motorcycle, engine, machine or mechanical device, or other contrivance or facility, or the carrying on of any trade or business, any loud or unusual noise or sound from which interferes with the transaction, or conduct of any business or industrial operation in the surrounding area, unless the making of such noise is incident to the construction or repair of buildings or equipment or is otherwise necessary to the protection or preservation of the property from which such noise or sound emanates.

Noise Reduction Requirements (Mitigation Measures)

The following requirements are identified in the Project's California Environmental Quality Act (CEQA) documentation related to noise mitigation:

- a) Construction haul trucks and materials delivery traffic shall avoid residential areas whenever feasible. If no alternatives are available, truck traffic shall be routed on streets with the fewest residences.
- b) Construction staging areas shall be located away from sensitive uses (such as residential areas).
- c) When construction activities are located within 500 feet of noise-sensitive (residential) areas, noise barriers (e.g., temporary walls or piles of excavated material) shall be constructed between activities and noise sensitive uses.
- d) Impact pile drivers shall be avoided where possible in noise-sensitive (residential) areas. Drilled piles or the use of a sonic vibratory driver are quieter alternatives that shall be utilized where geological conditions permit their use. Noise shrouds shall be used when necessary to reduce noise of pile drilling/driving.
- e) Construction equipment shall be equipped with mufflers that comply with manufacturers' requirements.
- f) On-site electrical sources to power equipment shall be used rather than diesel generators where feasible.

**3-12.4 Storage of Equipment and Materials.****3-12.4.1 General.**

Add the following:

It shall be the Contractor's responsibility to locate any storage sites for materials and equipment needed and such sites must be approved in advance by the Engineer, and must be free of objectionable material. The Contractor must submit to the Engineer for approval any and all agreement(s) between the Contractor and the property owner(s) of said storage site(s) and/or construction site(s) for approval prior to the start of construction. Said agreement(s) must provide for the restoration of the site(s) by the Contractor prior to the filing of "Notice of Completion" by the Engineer.

**3-12.4.2 Storage in Public Streets.**

Add the following:

Stockpiling or storage of materials on any other portions of the public right-of-way will not be permitted without the approval of the Engineer. Materials spilled along or on said right-of-way or parking areas shall be removed completely and promptly. All stockpile and storage areas shall be kept in a safe, neat, clean, and orderly fashion, and shall be restored to equal or better than original condition upon completion of the Work.

Contractor shall only use a haul route approved in writing by the Engineer. The Contractor shall keep the work site, as well as the route to and from the disposal site, clean at all times. The Contractor shall immediately remove and haul away all materials included in the various items of removals.

### **3-12.6 Water Pollution Control.**

#### **3-12.6.1 General.**

Add the following:

The Contractor shall comply with the requirements of Section 3-12.6 and shall conduct his/her operations so as to prevent Portland cement, mud, silt, or other materials from entering the surface drainage structures of the adjoining street and any underground storm drainage system. Contractor shall comply with the requirements of project specific Erosion Control Plans included in the Plans.

In addition to complying with all applicable federal, state and local laws and regulations, the Contractor shall take note of the National Pollution Discharge Elimination System (NPDES) Requirements. The Contractor shall take all precautionary actions and implement all necessary Best Management Practices (BMPs) to prevent polluted discharges to any portion of the storm drain conveyance system including discharge of pollutants from activities such as paving operations, concrete waste washouts, cold-milling, vehicle and equipment fueling from entering storm drain systems. At the minimum, the following shall be implemented:

- a) Handle, store, and dispose of materials properly
- b) Avoid excavation and grading activities during wet-weather
- c) Construct diversion dikes and drainage swales around working sites
- d) Cover stockpiles and excavated soil with secured tarps or plastic sheeting
- e) Implement erosion control plans included in the Plans
- f) Check and repair leaking equipment away from construction sites
- g) Designate a location away from storm drains for refueling
- h) Cover and seal catch basins if work in their vicinity may allow debris or deleterious liquids to enter
- i) Use vacuum with all concrete sawing operations
- j) Never wash excess material from aggregate, concrete, or equipment onto a street
- k) Catch drips from paving equipment with drip pans or absorbent material
- l) Clean up all spills using dry methods

### **3-13 COMPLETION, ACCEPTANCE, AND WARRANTY.**

#### **3-13.1 Completion.**

Add the following before the first paragraph:

**Completion Date** – The Project is considered complete, and the counting of days for time of completion ends, when the Agency confirms in writing that the Contractor has completed the Work in accordance with the Contract, including completion of all physical work and punch list items, and cleanup work including removal of construction materials/equipment/signage, and does not include warranties or maintenance. Any documentation required in the Contract and by law does not necessarily need to be furnished by the Contractor by completion date, but must be received prior to final payment.

#### **6-8.2 Acceptance.**

Add the following:

**Final Acceptance Date** – The date on which the City Council accepts the Work as complete.

**6-8.3 Warranty.**

Replace the entire subsection with the following:

The Contractor shall warranty that all work performed by him/her under this Contract fully meets the requirements thereof as to quality of workmanship and materials furnished. If any defects in materials or workmanship become evident within a period of one (1) year from the date of the acceptance of the Work by the Board, the Contractor shall, at his/her own expense, make any repair or replacement necessary, including repair of settled backfill and resurfacing, pay administrative costs relative to inspection, testing, Contract administration, and attorney fees to restore the Work to full compliance with the Plans and Specifications.

The warranty period for specific items covered under manufacturers' or suppliers' warranties shall commence on the date they are placed into service at the direction of or as approved by the Engineer in writing, except when specified differently in the Contract Documents and Special Provisions.

All warranties, expressed or implied, from subcontractors, manufacturers, or suppliers, of any tier, for the materials furnished and work performed shall be assigned, in writing, to the Agency, and such warranties shall be delivered to the Engineer prior to acceptance of the Contractor's performance of the Contract.

The guarantees and agreements set forth hereof shall be secured by a surety bond. Said bond the Contractor may, at his/her option, provide for the faithful performance bond furnished under the Contract to remain in force and effect for said amount until the expiration of said one (1) year period.

Such repair and replacement shall be made promptly upon receipt of written notice from the Engineer. If the Contractor fails to make such repair and replacement promptly, the Engineer may cause the Work to be done and the costs incurred thereby shall become the liability of the Contractor and his/her Surety.

If in the opinion of the Engineer, defective work creates a dangerous condition or requires immediate correction or attention to prevent further loss to the Agency or to prevent interruption of operations of the Agency, the Agency will attempt to give the notice required by this article. If the Contractor cannot be contacted or does not comply with the Engineer's request for correction within a reasonable time as determined by the Engineer, the Agency may, notwithstanding the Provisions of this subsection, proceed to make such correction or provide such attention, and the costs of such correction or attention shall be charged against the Contractor.

This subsection does not in any way limit the warranty on any items for which a longer warranty is specified or on any items for which a manufacturer gives a guarantee for a longer period, nor does it limit other remedies of the Agency in respect to latent defect, fraud implied warranties, or assigned claims.

**SECTION 4 – CONTROL OF MATERIALS****4-1 GENERAL.**

Add the following:

No materials, supplies, or equipment for the Work under this Contract shall be purchased subject to any security agreement or other agreement by which an interest therein or any part thereof is retained by the seller or supplier. The Contractor warrants clear and good title to all materials, supplies, and equipment installed and incorporated in the Work, and agrees upon completion of all Work to deliver the premises, together with all improvements and appurtenances constructed or placed thereon by Contractor, to the Agency free from any claims, liens, encumbrances, or charges, and further agrees that neither Contractor nor any person, firm, or corporation furnishing any material or labor for any work covered by the Contract shall have any right to a lien upon the premises or any improvement or appurtenance thereon, provided that this shall not preclude the Contractor from installing metering devices or other equipment of utility



companies the title of which is commonly retained by the utility company. Nothing contained in this article, however, shall defeat or impair the right of such persons furnishing materials or labor under any bond given by the Contractor for their protection of any right under any law permitting such persons to look to funds due the Contractor in the hands of the Agency.

The provisions of this Section shall be inserted in all subcontracts and material contracts, and notices of its provisions shall be given to all persons furnishing materials for the work when no formal contracts are entered into for such materials.

#### **4-2 PROTECTION.**

Add the following:

Until acceptance of the Work, the Contractor shall have the charge and care of the Work and Materials to be used therein and shall bear the risk of injury, loss, or damage, to any part thereof (regardless of whether partial payments have been made on such damaged portions of the Work) by the action of the elements or from any other cause, whether or not arising from the non-execution of the Work. The Contractor shall rebuild, repair, and restore and make good all injuries, losses, or damages to any portions of the Work or materials occasioned by any cause before its completion and acceptance and shall bear the expense thereof, except for such injuries, losses, or damages as are directly and proximately caused by the acts of the Agency.

#### **4-4 TESTING.**

Revise the third sentence of the first paragraph to read as follows:

Unless otherwise called for hereinafter in these Special Provisions, all testing during construction will be performed by the City in such number and at such locations as deemed necessary by the Engineer to ensure compliance with the Plans and Specifications; the cost of all initial testing will be borne by the Agency; the cost of all retesting will be borne by the Contractor, and the amount due the Agency for said retesting will be deducted from the Contractor's progress payments.

#### **4-6 TRADE NAMES.**

Replace the subsection with the following:

Wherever catalog numbers and specific brands or trade names are used in conjunction with a designated material, product, installation, or service mentioned in these Specifications, no substitutions will be favorably reviewed to ensure compatibility with existing facilities, except when said name/number is preceded by the designation "or Agency approved equal" or "or equal".

A listing of materials is not intended to be comprehensive, or in order of preference. The Contractor may offer any material or product it considers to be an equivalent to that specified.

If the Contractor wishes to request consideration of a proposed "equal" product or material, he/she shall submit such request in writing to the Agency within ten (10) working days from the date of bid opening, at their own expense. The written request shall be accompanied by complete descriptive information from the manufacturer, samples as requested by the Engineer, complete detailed test results from a licensed independent testing laboratory of the Agency's choice if requested by the Engineer, and if requested by the Engineer, an evaluation report from a qualified licensed professional engineer, all for final evaluation by the Engineer. If in the Engineer's opinion, the requested substitution is of lesser quality or in variance with that specified, or if the information submitted is insufficient or incomplete, the requested substitution will be disallowed and the specified materials or equipment shall be furnished. Except as hereafter

provided, no request for substitutions submitted after the 10 working day deadline specified will be considered.

If alternative named or substitutions are proposed by the Contractor and favorably reviewed by the Agency, the Contractor is responsible for providing at no additional cost to the Agency, any engineering designs, any electrical, mechanical, structural, or other related changes or testing that may be required to accommodate or provide the particular material or equipment the Contractor desires to use. Any deviation from the Specifications or the Plans resulting from the type of material or equipment to be used shall not be the basis for any "extra charges" above and in excess of the original bid price of the Work.

In addition the Contractor is responsible for all additional costs to the Agency, and its agents and representatives, for evaluation of data submitted by the Contractor for alternative named or substitutions and any redesign necessary. The Agency shall deduct said costs from the Contract monies due the Contractor.

In the event that a substitute is favorably reviewed, 50 percent of all savings shall be credited to the Agency.

The Agency will review the supporting information within 5 Working Days from the date of submission. The findings of the Agency shall be final.

Agency-approved "equal" products or materials shall not be installed nor put into usage without the prior approval of the Engineer.

The Contract time of completion specified in 6-3 shall not be affected by any circumstance arising from the provisions of this subsection.

#### **4-3 INSPECTION.**

Add the following:

The Engineer, or his/her authorized agent, shall at all times have access to Work during construction, and shall be furnished with every reasonable facility for ascertaining full knowledge regarding the process, workmanship, and character of materials used and employed in the Work. Whenever required, the Contractor shall furnish to the Agency for test, and free of charge, samples of any one of the materials proposed to be used in the Work. Said samples shall be delivered by the Contractor at the place within the City designated by the Engineer. Rejected material must be immediately removed from the Work by the Contractor and shall not again be brought back to the site of the improvement.

The Contractor shall be responsible to reimburse the City for its actual inspection services cost for any work that is outside the normal working days or working hours (as defined by Section 6-3 of these Special Provisions), if approved by the Engineer.

See permits for additional inspection requirements.

##### Twenty-Four Hour Notice

The Contractor shall give at least 24 hours advance notice of the time when Contractor or Contractor's subcontractor will start or resume the various units of operations of the work as per the contract, or resume said units of operations when they have been suspended per the contract.

The above notice is to be directed to the Engineer and is to be given during the defined hours (8 a.m. to 5 p.m.; closed alternate Fridays), exclusive of Saturday, Sunday, or holidays for the purpose of permitting the Engineer to make necessary assignments of the Engineer's representative or inspector on the Work.

Uncovering of Uninspected Work

Any work performed in conflict with said notice, without the presence or approval of the inspector, or work covered up without notice, approval, or consent may be rejected or ordered to be uncovered for examination at Contractor's expense and shall be removed at Contractor's expense, if so ordered by the Engineer or his/her representative or inspector on the Work. Any unauthorized or defective work, defective material or workmanship, or any deficient work that may be discovered shall be corrected immediately without extra charge even though it may have been overlooked in previous inspections and estimates.

Changes Authorized in Writing

All authorized alterations affecting the requirements and information given on the approved plans shall be in writing. No changes shall be made on any original plan or drawing after the same has been approved by the Engineer. Deviations from the approved plans, as may be required by the exigencies of construction, will be determined in all cases by the Engineer and authorized in writing.

Protests

If the Contractor considers any work demanded of Contractor to be outside the requirements of the Contract, or if Contractor considers any instruction, ruling, or decision of the Inspector or Engineer to be unfair, Contractor shall within three (3) calendar days after any such demand is made, or instruction, ruling, or decision is given, state clearly and in detail the Contractor's objections and reasons therefore. Except for such protest and objections as are made of record, in the manner and within the time above stated, the Contractor shall be deemed to have waived and does thereby waive all claims for extra work, damages, and extensions of time on account of demands, instructions, rulings, and decisions of the Public Works Director/City Engineer.

Upon receipt of any such protest from the Contractor, the Engineer shall review the demand, instruction, ruling, or decision objected to and shall promptly advise the Contractor, in writing, of Engineer's final decision, which shall be binding on all parties, unless within the ten (10) calendar days thereafter the Contractor shall file with the Agency, a formal protest against said decision of the Engineer. The Agency shall consider and render a final decision on any such protest within 30 calendar days of receipt of same.

**SECTION 5 – LEGAL RELATIONS AND RESPONSIBILITIES****5-1 LAWS TO BE OBSERVED.**

Replace the subsection with the following:

The Contractor shall keep fully informed of all existing and future State and Federal laws and county and municipal ordinances and regulations which in any manner affect those engaged or employed in the Work, or the materials used in the Work, or which in any way affect the conduct of the work, and of all such orders and decrees of bodies or tribunals having any jurisdiction or authority over the same. Contractor shall, at all times, observe and comply with, and shall cause all his/her agents and employees to observe and comply with, all such existing and future laws, ordinances, regulations, orders, and decrees of bodies or tribunals having any jurisdiction or authority over the Work; and shall protect and indemnify the Agency, and all its officers and employees connected with the Work, and including but not limited to the Engineer, against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order, or decree, whether by Contractor or Contractor's employees.

If any discrepancy or inconsistency is discovered in the Plans, Drawings, Specifications, or Contract for the Work in relation to any such law, ordinance, regulation, order, or decree, the Contractor shall forthwith report the same to the Engineer in writing.

## **5-3 LABOR.**

### **5-3.2 Prevailing Wages.**

Add the following:

Attention is directed to the provisions in Sections 1777.5 (Chapter 1411, Statutes of 1968) and 1777.6 of the Labor Code concerning the employment of apprentices by the Contractor or any Subcontractor under the Contractor. The Contractor and any Subcontractor under him/her shall comply with the requirements of said Sections in the employment of apprentices.

Pursuant to the provisions of Section 1770 of the Labor Code, the Owner has ascertained the general prevailing rate of wages (which rate includes employer payments for health and welfare, vacation, pension, and similar purposes) applicable to the Work to be done, for straight time, overtime, Saturday, Sunday, and holiday work. The holiday wage rate listed shall be applicable to all holidays recognized in the collective bargaining agreement of the particular craft, classification, or type of workmen concerned. These rates are set and on file with the City Clerk of Culver City. The Contractor shall pay travel and subsistence payments to each worker as such payments are defined and required in applicable collective bargaining agreements filed in connection with Labor Code Section 1773.8.

Any Contractor who shall be found in violation of the nondiscrimination provisions of the State of California Fair Employment Practices Act or similar provisions of Federal law or executive order in the performance of any Contract with the Agency, thereby shall be found in material breach of such contract and thereupon the Agency shall have power to cancel or suspend the contractor, in whole or in part, or to deduct from the amount payable to such Contractor the sum of twenty-five dollars (\$25.00) for each person for each calendar day during which such person was discriminated against, as damages for said breach of contract; or both. Only a finding of the State of California Fair Employment Practices Commission or the equivalent Federal agency or officer shall constitute evidence of a violation of Contract under this section.

### **5-3.3 Payroll Records.**

The Contractor's attention is directed to the following provisions of Labor Code Section 1776 (Stats. 1978, Ch. 1249). The Contractor shall be responsible for the compliance with these provisions by his/her Subcontractors.

- a) Each Contractor and Subcontractor shall keep an accurate payroll record, showing the name, address, social security number, work classification, and straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed by him/her in connection with the public Work.
- b) The payroll records enumerated under subdivision (a) shall be certified and shall be available for inspection at all reasonable hours at the principal office of the Contractor on the following basis:
  - i. A certified copy of an employee's payroll record shall be made available for inspection or furnished to such employee or his/her authorized representative on request.
  - ii. A certified copy of all payroll records enumerated in subdivision (a) shall be made available for inspection or furnished upon request to a representative of the body awarding the Contract, the Division of Labor Standards Enforcement, and the Division of Apprenticeship Standards of the Department of Industrial Relations.
  - iii. A certified copy of all payroll records enumerated in subdivision (a) shall be made available upon request to the public for inspection or for copies thereof. However, a request by the public shall be made through either the body awarding the Contract, the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement. If the requested payroll records have not been provided pursuant to paragraph (ii), the requesting party shall, prior to being provided the records, reimburse the costs of preparation by the Contractor, subcontractors, and the entity through which the request

was made. The public shall not be given access to such records at the principal office of the Contractor.

- c) The certified payroll records shall be on forms provided by the Division of Labor Standards Enforcement or shall contain the same information as the forms provided by the division.
- d) Each Contractor shall file a **certified copy** of the records enumerated in subdivision (a) with the entity that requested such records within **10 days** after receipt of a written request.
- e) Any copy of records made available for inspection as copies and furnished upon request to the public or any public agency by the awarding body, the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement shall be marked or obliterated in such a manner as to prevent disclosure of an individual's name, address, and social security number. The name and address of the Contractor awarded the contract or performing the contract shall not be marked or obliterated.
- f) The Contractor shall inform the body awarding the Contract of the location of the records enumerated under subdivision (a), including the street address, city and county, and shall, within five (5) Working Days, provide a notice of a change of location and address.
- g) The Contractor shall have **10 days** in which to comply subsequent to receipt of written notice specifying in what respects the Contractor must comply with this section. In the event that the Contractor fails to comply within the **10 day period**, he/she shall, as a penalty to the state or political subdivision on whose behalf the Contract is made of or awarded, forfeit **twenty-five dollars (\$25)** for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement, these penalties shall be withheld from progress payments then due.
- h) The Contractor and Subcontractors shall submit to the Engineer certified payrolls and copies of all payroll checks and paystubs showing all itemized deductions for each employee on a weekly basis during the term of this Contract.

## **5-7 SAFETY.**

### **5-7.1 Work Site Safety.**

#### **5-7-1.1 General.**

Add the following:

The Contractor shall be solely and completely responsible for conditions of the job site, including safety of all persons and property during performance of the Work. This requirement shall apply continuously and not be limited to normal working hours. Safety provisions shall conform to United States Department of Labor, the California Occupational Safety and Health Act (Cal/OSHA), and all other applicable Federal, State, County, and local laws, ordinances, codes, requirements set forth below, and any regulations that may be detailed in other parts of these Contract Documents. Where any of these are in conflict, the more stringent requirements shall be followed.

No provision of the Contract Documents shall act to make the Agency, Engineer, or any other party than the Contractor responsible for safety. The Engineer shall not have authority for safety on the Project. The Contractor shall indemnify, defend, and hold harmless the Agency, Engineer, or other authorized representatives of the Agency, from and against any and all actions, damages, fines, suits, and losses arising from the Contractor's failure to meet all safety requirements and/or provide a safe work site.

If death or serious injuries or serious damages are caused, the accident shall be reported immediately by telephone or messenger to both the Engineer and the Agency. In addition, the Contractor must promptly report in writing to the Engineer all accidents whatsoever arising out of, or in connection with, the performance of the Work whether on, or adjacent to, the Site, giving full details and statements of witnesses. The Contractor shall make all reports as are, or may be, required by authority having jurisdiction, and permit all safety inspections of the Work being performed under this Contract.

If a claim is made by anyone against the Contractor or any subcontractor on account of any accident, the Contractor shall promptly report the facts in writing to the Engineer, giving full details of the claim.

#### **5-7.1.2 Work Site Safety Official.**

Add the following:

The Contractor shall appoint an employee as Safety Supervisor who is qualified and authorized to supervise and enforce compliance with the Safety Program, as described in Section 5-7.2.1. The Contractor shall notify the Engineer in writing prior to the commencement of Work of the name of the person who will act as the Contractor's Safety Supervisor and furnish the safety supervisor's resume to the Engineer.

The Contractor, will, through and with his/her Safety Supervisor, ensure that all of its employees and its subcontractors of any tier, fully comply with the Project Safety Policies. The Safety Supervisor shall be a full-time employee of the Contractor whose responsibility shall be for supervising compliance with applicable safety requirements on the Work site and for developing and implementing safety training classes for all job personnel. The Agency shall have the authority to request removal of the Contractor's Safety Supervisor if that representative is judged to be improperly or inadequately performing the duties; however, this authority shall not in any way affect the Contractor's sole responsibility for performing this Work safely, nor shall it impose any obligation upon the Agency to ensure the Contractor perform its Work safely.

#### **5-7.2 Safety Orders.**

##### **5-7.2.1 General.**

Add the following:

The Contractor shall establish, implement, and maintain a written injury prevention program as required by Labor Code Section 6401.7. Before beginning the Work, the Contractor shall prepare and submit to the Engineer a Contractor Safety Program that provides for the implementation of all the Contractor's safety responsibilities in connection with the Work at the site and the coordination of that program and its associated procedures and precautions with the safety programs, precautions, and procedures of each of its subcontractors and other prime Contractors performing Work at the site. The Contractor shall be solely responsible for initiating, maintaining, monitoring, coordinating, and supervising all safety programs, precautions, and procedures in connection with the Work and for coordinating its programs, precautions, and procedures of the subcontractors and other prime contractors performing Work at the site. The Safety Program shall contain all the necessary elements for the Contractor to administer its program within the site.

The Contractor's compliance with requirements for safety and/or the Engineer's review of the Contractor's Safety Program shall not relieve or decrease the liability of the Contractor for safety. The Engineer's review of the Contractor's Safety Program is only to determine if the above listed elements are included in the program.

Add the following subsections:

##### **5-7.2.4 Safety and Protection.**

The Contractor shall take all necessary protection to prevent damage, injury, and loss to:

- a) All employees on the Project, employees of all subcontractors, and other persons and organizations who may be affected thereby;
- b) All the Work and materials and equipment to be incorporated therein, whether in storage on or off the site; and



- c) Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities and underground facilities not designated for removal, relocation, or replacement in the course of construction.

The Contractor shall comply with all applicable laws and regulations of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury, or loss and shall erect and maintain all necessary safeguards for such safety and protection. The Contractor shall notify owners of adjacent property and of underground facilities and utility owners when prosecution of the Work may affect them and shall cooperate with them in the protection, removal, relocation, and replacement of their property. All injury or loss to any property caused, directly or indirectly, in whole or in part, by the Contractor, any subcontractor, supplier, or any other person or organization part, by the Contractor, any subcontractor, supplier, or any other person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, shall be remedied by the Contractor. The Contractor's duties and responsibilities for the safety and protection of the Work shall continue until such time as all the Work is completed and the Agency has issued a notice of final completion to the Contractor.

#### **5-7.2.5 Safety Emergencies.**

In emergencies affecting the safety or protection of persons or the Work or property at the site or adjacent thereto, the Contractor, without special instruction or authorization from the Engineer, is obligated to act to prevent threatened damage, injury, or loss. The Contractor shall give the Engineer prompt written notice if the Contractor believes that any significant changes in the Work or variations from the Contract have been caused thereby.

#### **5-7.2.6 Safety Violations.**

Should the Contractor fail to correct an unsafe condition, the Engineer shall immediately notify the Agency of the Contractor's failure to correct the unsafe condition. The Agency shall then notify the Contractor through the Engineer that the unsafe condition must be corrected or the Work in question will be stopped until the condition is corrected to the satisfaction of the Agency. No extension of time or additional compensation will be granted as a result of any stop order so issued.

The Owner shall have the authority to require the removal from the Project of the foreman and/or superintendent in responsible charge of the Work where safety violations occur.

#### **5-7.2.7 Equipment Safety Provisions.**

The completed Work shall include all necessary permanent safety devices, such as machinery guards and similar ordinary safety items, required by the State and Federal (OSHA) industrial authorities and applicable local and national codes. Further, any features of the Work, including Agency-selected equipment subject to such safety regulations shall be fabricated, furnished, and installed in compliance with these requirements. All equipment furnished shall be grounded and provided guards and protection as required by safety codes, and where vapor-tight or explosion-proof electrical installation is required by safety codes, this shall be provided. Contractors and manufacturers of equipment shall be held responsible for compliance with the requirements included herein. The Contractor shall notify all equipment suppliers and subcontractors of the provisions of this paragraph.

#### **5-7.2.8 On-Site Copies Required.**

The Contractor shall have at the Work site copies or suitable extracts of: Construction Safety Orders and General Industrial Safety Orders issued by the State Division of Industrial Safety.

**5-7.2.9 Compliance Required.**

Contractor shall comply with provision of these and all other applicable laws, ordinances, and regulations, including but not limited to the Occupational Safety and Health Act of 1970 and current amendments, if any, to which particular attention is directed.

**5-7.4 Hazardous Substances.**

Add the following:

Contractor acknowledges that Contractor is aware of and in compliance with the provisions of the Hazard Communication Standards (California Administrative Code, Title 8, Section 4194). Contractor shall, at the request of the Agency, demonstrate that Contractor is in complete compliance with the Hazard Communication Standards.

In addition, Contractor shall, at the request of the Engineer, provide to the Agency a Material Safety Data Sheet for any product handled or used by the Contractor on Agency property or in an area where an Agency's employee is working.

Add the following subsections:

**5-8 RECORD DRAWINGS.**

At the beginning of the project, one print of each applicable drawing will be issued by the City for use in preparing record drawings.

Actual construction conditions shall be accurately and completely recorded on the prints as the Project progresses. Contractor shall make complete, current, Record Drawings available for review by the Agency during the time the Contractor's Application for Payment is being reviewed. Incomplete Record Drawings may delay approval of said Application. Upon completion of the Work, the Contractor shall sign the record drawings and shall submit same to the Agency's Inspector for checking and approval prior to the Notice of Completion is filed.

**SECTION 6 – PROSECUTION AND PROGRESS OF THE WORK****6-1 CONSTRUCTION SCHEDULE AND COMMENCEMENT OF THE WORK.****6-1.1 Construction Schedule.**

Add the following:

The Contractor must provide to the Engineer's Representative within five (5) days after receiving the "Notice to Proceed", a Critical Path Method (CPM) construction schedule in the format of a Gantt Chart and revised schedules thereafter as required by the Engineer when the Contractor's activities differ or are expected to differ from the latest existing schedule.

In addition, if requested by the Engineer, the Contractor shall submit a detailed "two-week look-ahead" schedule bi-weekly, including a narrative report, showing the activities or portions of activities completed and look ahead during the reporting period. The report shall state the percentage of the work completed and scheduled, the remaining duration, and the progress along the critical path in terms of days ahead or behind the allowable dates as of the report date. Any changes made by the Contractor to the schedule shall be listed.

If, in the opinion of the Construction Manager, the project is behind schedule, the Contractor shall also submit a narrative report with each updated analysis which shall include but not be limited to a description

of current and anticipated problem areas, delaying factors and their impact, and an explanation of corrective actions taken or proposed.

Notice To Procure Equipment and Material will be issued prior to the Notice to Proceed with construction.

### **6-3 TIME OF COMPLETION.**

#### **6-3.1 General.**

Replace the first sentence with the following:

The Contractor shall complete the Work within **90 Working Days** from the start date specified in the Notice to Proceed.

Add the following subsections:

#### **6-3.3 Working Day.**

**Working Day** – see definition in Section 1-2.

The following days have been designated as holidays by the City.

New Year's Day	January 1
Martin Luther King, Jr. Day	3 <sup>rd</sup> Monday in January
Memorial Day	Last Monday in May
Independence Day	July 4
Labor Day	1 <sup>st</sup> Monday in September
Thanksgiving	4 <sup>th</sup> Thursday in November
Day after Thanksgiving	
Christmas Day	December 25

In addition, the **City observes a "Holiday Slowdown" during which no Work may take place within the public right-of-way.** On arterial streets and commercial streets, Holiday Slowdown will be observed during the Thanksgiving week, the Christmas week, and the New Year's week. On all other streets, Holiday Slowdown will be observed during the Thanksgiving days (including the days before and after), the Christmas days (including the days before and after), and the New Year's Days (and the day before). During the slowdown, the Contractor shall maintain job site and public safety and schedule to perform Work outside the public right-of-way. No time extension will be granted due to the failure of the Contractor to schedule the Work appropriately. Any deviation from the Holiday Slowdown shall be approved by the Engineer. If no work is performed during the Holiday Slowdown period, no Working Days will be charged against the Contractor.

#### **6-3.4 Work Hours.**

**Normal work hours shall be from 8:00 AM until 5:00 PM Monday through Friday, 9:00 AM to 7:00 PM on Saturday, and 10:00 AM to 7:00 PM on Sunday.**

Workdays are defined in Sections 1-2 and 6-3.3. Work hours, other than normal work hours, will not be allowed without prior consent of the Engineer. The Public Works Director/City Engineer shall approve, in writing, overtime work requiring inspection proposed to be performed by the Contractor. The decision with regard to the type of work requiring inspection shall be the sole responsibility of the Engineer and as defined in Section 4-3.

If Work is performed at night, the Contractor shall provide adequate light for proper prosecution of the work for the safety of the workmen and the public, and for proper inspection.

## **6-4 DELAYS AND EXTENSIONS OF TIME.**

### **6-4.1 General.**

Replace the second paragraph with the following:

Only the physical shortage of material, caused by unusual circumstances, will be considered under these provisions as a cause for extension of time, and no consideration will be given to any claim that material could not be obtained at a reasonable, practical, or economical cost or price, unless it is shown to the satisfaction of the Public Works Director/City Engineer that such material could have been obtained only at exorbitant prices entirely out of line with current rates, taking into account the quantities involved and usual practices in obtaining such quantities. A time extension for shortage of material will not be considered for material ordered or delivered late or whose availability is affected by virtue of the mishandling of procurement. The above provisions apply equally to equipment to be installed in the Work.

Add the following:

The Contractor shall retain the right to fully complete (include final completion, punch list, and Project close out) the Work in less days than established by the Contract Agreement. However, neither shall a reduction or increase to the Contract Sum be made, if the Work is so fully completed in less days than established by the Contract Agreement nor shall a Claim be made or granted for Compensable Delay, or any other increase in Contract Sum, if, for any reason, including but not limited to delay caused by Agency, the Contractor does not so fully complete the Work in less days than established herein.

When the Contractor foresees a delay in the prosecution of the Work and, in any event, immediately upon the occurrence of a delay, the Contractor shall notify the Engineer in writing of the probability of the occurrence and the estimated extent of the delay, and its cause. The Contractor shall take immediate steps to prevent, if possible, the occurrence or continuance of the delay. The Contractor agrees that no claim shall be made for delays which are not called to the attention of the Engineer at the time of their occurrence.

Non-excusable delays in the prosecution of the Work shall include delays which could have been avoided by the exercise of care, prudence, foresight, and diligence on the part of the Contractor or its subcontractors, at any tier level, or suppliers.

## **6-6 SUSPENSION OF THE WORK.**

### **6-6.1 General.**

Add the following:

If the Contractor fails to correct defective or unauthorized Work as required by the Contract Documents or fails to carry out the Work in accordance with the Contract Documents or any other applicable rules and regulations, the Agency, by a written order of the Agency's representative or signed personally by an agent specifically so empowered by the Agency, in writing, may order the Contractor to stop the work, or any portion thereof, until the cause for such order has been eliminated; however, this right of the Agency to stop the Work shall not give rise to any duty on the part of the Agency to exercise this right for the benefit of the Contractor or any other person or entity. All delays in the Work occasioned by such stoppage shall not relieve the Contractor of any duty to perform the Work or serve to extend the time for its completion. Any and all necessary corrective work done in order to comply with the Contract Documents shall be performed at no cost to the Agency.

In the event that a suspension of Work is ordered, as provided in this paragraph, the Contractor, at its expense, shall perform all work necessary to provide a safe, smooth, and unobstructed passageway through construction for use by public, pedestrian, and vehicular traffic, during the period of such use by suspension. Should the Contractor fail to perform the Work as specified, the Agency may perform such work and the cost thereof may be deducted from monies due the Contractor under the Contract.

The Agency shall also have authority to suspend the Work wholly or in part, for such period as the Agency may deem necessary, due to unsuitable weather, or to such other conditions as are considered unfavorable for the suitable prosecution of the Work. Such temporary suspension of the Work will be considered justification for time extensions to the Contract in an amount equal to the period of such suspension if such suspended work includes the current critical activity on the latest favorably reviewed progress schedule.

## **6-7 TERMINATION OF THE CONTRACT FOR DEFAULT.**

### **6-7.1 General.**

Add the following:

The Contract may be canceled by the Agency without liability for damage when, in the Agency's opinion, the Contractor is not complying in good faith, has become insolvent, or has assigned or subcontracted any part of the Work without the Agency's consent. In the event of such cancellation, the Contractor will be paid the actual amount due based on the quantity of work satisfactorily completed at the time of cancellation, less damages caused to the Agency by acts of the Contractor causing the cancellation. The Contractor, in having tendered a bid, shall be deemed to have waived any and all claims for damages because of cancellation of the Contract for any such reason. If the Agency declares the Contract canceled, for any of the above reasons, written notice to that effect shall be served upon the Surety. The Surety shall, within five (5) working days, assume control and perform the Work as successor to the Contractor.

If the Contractor fails to begin delivery of material and equipment, to commence Work within the time specified, to maintain the rate of delivery of material, to execute the Work in the manner and at such locations as specified, or fails to maintain a work program which will ensure the Agency's interest or, if the Contractor is not carrying out the intent of the Contract, the Public Works Director/City Engineer's written notice may be served upon Contractor, and the Surety on Contractor's faithful performance bond, demanding satisfactory compliance with the Contract.

If the Contractor or Contractor's Surety does not comply with such notice within five (5) working days after receiving it, or after starting to comply fails to continue, the Agency may exclude the Contractor from the premises and take possession of all material and equipment, and complete the work by Agency forces or by letting the unfinished work to another contractor, or by a combination of such methods. In any event, the cost of completing the Work will be charged against the Contractor and Contractor's Surety, and may be deducted from any money due or becoming due from the Agency. If the sums under the Contract are insufficient for completion, the Contractor or Surety shall pay to the Agency within five (5) working days after the completion, all costs in excess of the Contract price.

If the Surety assumes any part of the work, Surety shall take the Contractor's place in all respects for that part, and shall be paid by the Agency for all work performed by Surety in accordance with the Contract. If the Surety assumes the entire Contract, all money due the Contractor at the time of Contractor's default shall be payable to the Surety as the work progresses subject to the terms of the Contract.

The provisions of this Section shall be in addition to all other rights and remedies available to the Agency under law.

## **6-8 TERMINATION OF THE CONTRACT FOR CONVENIENCE.**

Add the following:

The Agency may terminate the Contract at its own discretion or when conditions encountered during the Work make it impossible or impracticable to proceed, or when the Agency is prevented from proceeding with the Contract by law, or by official action of a public authority. The Contractor will be compensated for works satisfactorily completed up to the date of termination of the contract by the Agency.

If all or any part of the Work shall be damaged or destroyed by war, or acts of foreign aggression, fire, storm, lighting, flood, earthquake, settlement of defective soil, expansion or contraction, cracking or deflection, tidal wave, water, oil (surface or subsurface), mob violence or other casualty before the final completion of the Work, the Contractor, upon notice from the Agency, shall resume construction and proceed in accordance with the Plans and Specifications. Provided that such damage or destruction was not caused by any condition related to Contractor's non-conformance with the provisions of these Contract Documents, the Agency will bear the total cost of removing and/or replacing all damaged and/or destroyed Work. However, if the Agency exercises its option to abandon the Project because of damage or destruction to the Work by any of the above-mentioned causes, Agency may terminate this Contract upon three (3) days' notice to the Contractor. Within 30 days after the date of such termination, the Contractor shall be paid all actual costs of the Work to the date of termination for which it had not been previously paid.

If the Agency abandons the Project, the Agency shall have the right, at any time, to terminate this Contract by notice to the Contractor, in which event, the Agency shall pay the Contractor pro rata for all Work actually provided up to the date of such notice, for which it had not been previously paid, and the Agency shall have no further liability or obligations under this Contract.

## **6-9 LIQUIDATED DAMAGES.**

Replace the entire subsection with the following:

Failure of the Contractor to complete the Work within the time allowed will result in damages being sustained by the Agency. Such damages are, and will continue to be, impracticable and extremely difficult to determine. For each consecutive calendar day in excess of the time specified for completion of the Work, as adjusted in accordance with 6-4, the Contractor shall pay to the Agency, or have withheld from moneys due it, the sum of **\$1,000**. Execution of the contract under these Specifications shall constitute agreement by the Agency and Contractor that **\$1,000** per calendar day is the minimum value of the costs and actual damage caused by failure of the Contractor to complete the Work within the allotted time. Such sum is liquidated damages and shall not be construed as a penalty, and may be deducted from payments due the Contractor if such delay occurs

In addition to the liquidated damages specified, if the Contractor fails to complete the work within the time specified for completion, plus any authorized time extensions, the Agency shall have the right to charge to the Contract all or any part, as it may deem proper, of the actual costs of inspection, supervision, and other overhead expenses that are directly chargeable to the project and that accrue after the expiration of such specified time for completion plus authorized extensions. This charge will be addition to the payment of liquidated damages.

Add the following subsection:

## **6-10 LEGAL ACTIONS AGAINST THE CITY.**

In the event litigation is brought against the Agency concerning compliance by the City with State or Federal laws, rules, or regulations applicable to the Work, the provisions of this subsection shall apply.



- a) If, pursuant to court order, the Agency prohibits the Contractor from performing all or any portion of the work, the delay will be considered a right of way delay within the meaning of Section 6-4, unless the contract is terminated as hereinafter provided, in which event compensation payable to the Contractor shall be determined in accordance with said termination provisions.
- b) If, pursuant to court order (other than an order to show cause) the Agency is prohibited from requiring the Contractor to perform all or any portion of the work, the Agency may, if it so elects, eliminate the enjoined work pursuant to Section 3 or terminate the Contract in accordance with Sections 6-3 and 6-5.
- c) If the final judgment in the action prohibits the Agency from requiring the Contractor to perform all or any portion of the Work, the Agency will either eliminate the enjoined work pursuant to Section 2 or terminate the Contract in accordance with Sections 6-6 and 6-8.
- d) Termination of the Contract and the total compensation payable to the Contractor in the event of termination shall be governed by the following:
  - 1. The Engineer will issue the Contractor a written notice specifying that the Contract is to be terminated. Upon receipt of said written notice and, except as otherwise directed in writing by the Engineer, the Contractor shall:
    - a. Stop all Work under the Contract, except that specifically directed to be completed prior to acceptance.
    - b. Perform Work the Engineer deems necessary to secure the Project for termination.
    - c. Remove equipment and plan from the site of the Work.
    - d. Take such action as is necessary to protect materials from damage.
    - e. Notify all Subcontractors and suppliers that the Contract is being terminated and that their contracts or orders are not to be further performed unless otherwise authorized in writing by the Engineer.
    - f. Provide the Engineer with an inventory list of all materials previously produced, purchased, or ordered from suppliers for use in the Work and not yet used in the Work, including its storage location and such other information as the Engineer may request.
    - g. Dispose of materials not yet used in the work as directed by Engineer. It shall be the Contractor's responsibility to provide the Agency with good title to all materials purchased by the Agency hereunder, including materials for which partial payment has been made as provided in Section 7-3.2, and with bills of sale or other documents of title for such materials.
    - h. Subject to the prior written approval of the Engineer, settle all outstanding liabilities and all claims arising out of subcontracts or orders for materials terminated hereunder. To the extent directed by the Engineer, the Contractor shall assign to the Agency all the right title and interest of the Contractor under subcontracts or orders for materials terminated hereunder.
    - i. Furnish the Engineer with the documentation required to be furnished by the Contractor under the provisions of the contract including, on projects as to which Federal funds are involved, all documentation required under the Federal requirements included in the contract.
    - j. Take such other actions as the Engineer may direct.
  - 2. Acceptance of the Contract as hereinafter specified shall not relieve the Contractor of responsibility for damage to materials except as follows:
    - a. The Contractor's responsibility for damage to materials for which partial payment has been made as provided in Section 7-3.2, and for materials furnished by the Agency for use in the Work and unused, shall terminate when the Engineer certifies that such materials have been stored in the manner and at the locations he/she has directed.
    - b. The Contractor's responsibility for damage to materials purchased by the Agency subsequent to the issuance of the notice that the Contract is to be terminated shall terminate when title and delivery of the materials has been taken by the Agency.

- c. When the Engineer determines that the Contractor has completed the Work under the Contract directed to be completed prior to termination and such other work as may have been ordered to secure the Project for termination, he/she will recommend that the Engineer formally accept the Contract, and immediately upon and after such acceptance by the Engineer, the Contractor will not be required to perform any further Work thereon and shall be relieved of his/her contractual responsibilities for injury to persons or property which occurs after the formal acceptance of the project by the Engineer.
- 3. The total compensation to be paid to the Contractor shall be determined by the Engineer on the basis of the following:
  - a. The reasonable cost to the Contractor, without profit, for all Work performed under the Contract, including mobilization, demobilization, and Work done to secure the Project for termination. Reasonable cost will include a reasonable allowance for Project overhead and general administrative overhead not to exceed a total of seven (7) percent of direct costs of such Work.

When in the opinion of the Engineer, the cost of a Contract item of Work is excessively high due to costs incurred to remedy or replace defective or rejected Work, the reasonable cost to be allowed will be the estimated reasonable cost of performing such work in compliance with the requirements of the Plans and Specifications and the excessive actual cost shall be disallowed.

  - b. A reasonable allowance for profit on the cost of the work performed as determined under Subsection (a), provided the Contractor establishes to the satisfaction of the Engineer that it is reasonably probable that he/she would have made a profit had the contract been completed and provided further that the profit allowed shall in no event exceed four (4) percent of said cost.
  - c. The reasonable cost to the Contractor of handling material returned to the vendor, delivered to the Agency or otherwise disposed of as directed by the Engineer.
  - d. A reasonable allowance for the Contractor's administrative costs in determining the amount payable due to termination of the contract.

All records of the Contractor and his/her Subcontractors, necessary to determine compensation in accordance with the provisions of this section, shall be open to inspection or audit by representatives of the Agency at all times after issuance of the notice that the Contract is to be terminated and for a period of three (3) years, and such records shall be retained for that period.

After acceptance of the Work by the Engineer, the Engineer may make payments on the basis of interim estimates pending issuance of the Final Estimate when in his/her opinion the amount thus paid, together with all amounts previously paid allowed, will not result in total compensation in excess of that to which the Contractor will be entitled. All payments, including payment upon the Final Estimate shall be subject to deduction for prior payments and amounts, if any, to be kept or retained under the provisions of the Contract.

The provisions of this section shall be included in all subcontracts.

## **SECTION 7 – MEASUREMENT AND PAYMENT**

### **7-3 PAYMENT.**

#### **7-3.1 General.**

Add the following at the end of the second paragraph:

Payment for cost of Work to comply with the General Provisions or the Standard Specifications for Public Works Construction and as modified by this Contract shall be included in the various bid items, and no additional payment will be made.

Bid prices provided on the appropriate Bid Form will remain in force as Unit Prices under the Contract Documents until the Contract has been fully performed. No cost escalation is allowed due to material price increase for the term of the Project.

When an item of work is not listed in the "Bid Schedule" in the bid proposal, the cost of such Work shall be considered to be included in the cost of the other Work that is listed. The Contractor is to provide all labor, material, and equipment necessary to complete the Project in accordance with the Plans and Specifications including, but not limited to the following:

- a) All "Special Provisions" Work required to complete the Project in a safe and orderly manner including, but without being limited to, safety measures, hoists, flagmen, clean-up, barricades, fences, temporary utilities, utility fees and charges, parking for the Contractor's and subcontractor's personnel, and temporary facilities as may apply to this Work;
- b) All insurance in accordance with the insurance requirements of the Contract;
- c) Maintain and update current record drawings onsite. Upon project completion, provide the Agency a legible set of record drawings, operation and maintenance manuals, warranties, and guarantees;
- d) All permits required;
- e) Construction schedule indicating material lead times, shop drawings, order dates, start and end dates, milestone dates. The schedule shall be updated monthly;
- f) All engineering, testing, and inspection costs for defective Work, and work performed outside of the work hours set forth in Section 6-3;
- g) Repair or replace all existing improvements (public or private) damaged by the Contractor. The Contractor is responsible to provide evidence of pre-existing conditions;
- h) All scheduling of utility connections turn on/off including, but not limited to electrical services (for electrical panel, street lighting, traffic signals, and irrigation controllers) and water meters;
- i) All construction survey/staking necessary to set grade for all improvements. The survey provider shall be appropriately licensed by the State of California and is subject to approval by the Agency.
- j) Watchman or security service, as necessary;
- k) Perimeter fencing of work zones and staging area as necessary for public safety and protection of equipment and materials;
- l) Dust control, street cleaning, and protection and/or replacement of existing surfaces or properties;
- m) Submittal Log of all submittals required to the Agency including, but not limited to, material, products, concrete testing data, batch plant testing data, shop drawings, and traffic control and phasing plans. Said log shall be updated for each weekly project meeting.

All costs for the preceding shall be included in the other items for which bids are entered.

The Agency may keep any monies which would otherwise be payable at any time hereunder and apply the same, or so much as may be necessary therefore, to the payment of any expense, losses, or damages, as determined by the Engineer, incurred by the Agency, for which the Contractor is liable under the Contract.

#### Other Withholds

In addition to the amount which the Agency may otherwise retain under the Contract, the Agency may withhold a sufficient amount or amounts of any payment or payments otherwise due the Contractor, as in its judgment may be necessary to cover:

- a) Payments which may be past due and payable for just claims against the Contractor or any subcontractor for labor or materials furnished for the performance of this Contract.
- b) Defective Work not remedied.

- c) Failure of the Contractor to make proper payments to its subcontractors or suppliers.
- d) A reasonable doubt that the Contract can be completed for the balance remaining.
- e) Damage to another Contractor or third party, or to private or Agency property.
- f) Failure of the Contractor to keep its Work progressing in accordance with its progress schedule or maintaining current Record Drawings.
- g) The Agency's costs for the Contractor's failure to complete Work within the allowed time.
- h) Cost of insurance arranged by the Agency due to cancellation or reduction of the Contractor's insurance.
- i) Failure of the Contractor to make proper submissions, as herein specified.
- j) Failure to submit, revise, resubmit, or otherwise conform to the requirements herein for preparing and maintaining a construction schedule.
- k) Payments due the Agency from the Contractor.
- l) Provisions of law that enable or require the Agency to withhold such payments in whole or in part.

The Agency, in its discretion, may apply any withheld amount or amounts to the payment of valid claims. In so doing, the Agency shall be deemed the agent of the Contractor, and any payment so made by the Agency shall be considered as a payment made under the Contract by the Agency to the Contractor, and the Agency shall not be liable to the Contractor for such payment made in good faith. Such payments may be made without prior judicial determination of the claim or claims. The Agency will render to the Contractor a proper accounting of such funds disbursed in behalf of the Contractor.

Pursuant to Public Contract Code Section 22300, for monies earned by the Contractor and withheld by the Agency to ensure the performance of the Contract, the Contractor, may, at its option, choose to substitute securities meeting the requirements of said Public Contract Code Section 22300. There would be an associated administrative charge of \$75 per each Contractor's Progress Invoice.

### **7-3.3 Delivered Materials.**

Replace the subsection with the following:

Unless included in the Bid Schedule, or unless otherwise called for in Technical Provisions, no payment will be made for materials or equipment delivered, but not yet incorporated in the Work.

### **7-3.4 Mobilization**

Add the following:

Section F of the Contract Documents (Technical Specifications) identifies additional requirements related to mobilization, including how payments will be made.

### **7-3.5 Contract Unit Prices.**

#### **7-3.5.1 General.**

Add the following:

When the estimated quantities for a specific portion of the work are designated as a final payment quantities, said estimated quantities shall be the final quantities for which payment for such specific portion of the work will be made unless the dimensions of said portions of the work shown on the plans are revised by the Engineer. If such dimensions are revised and such revisions result in an increase or decrease in the quantities of such work, the final quantities for payment will be revised in the amount represented by the changes in the dimensions. The estimated quantities for such specified portion of the work shall be considered as approximate only, and no guarantee is made that the quantities which can be determined by computations made based on the details and dimensions shown on the plans will equal the estimated quantities. No allowance will be made in the event that the quantities based on computations do not equal the estimated quantities.

## **7-4 PAYMENT FOR EXTRA WORK.**

### **7-4.3 Markup.**

#### **7-4.3.1 Work by Contractor.**

Replace with the following:

When extra work is to be paid for on a force account basis, the labor, materials, equipment rental, and other items of expenditures, the percentage of markup applied to the Contractor's direct cost for all overhead and profit shall be as follows:

- (1) Labor..... 12%
- (2) Materials ..... 12%
- (3) Equipment Rental ..... 12%
- (4) Other Items and Expenditure ..... 12%

To the sum of the costs and markups provided for in this section, 1% shall be added as compensation for bonding.

#### **7-4.3.2 Work by Subcontractor.**

Replace with the following:

When all or any part of the extra work is performed by a Subcontractor, the markup established in Section 7-4.3.1 shall be applied to the Subcontractor's actual cost of such work. A markup of 10 percent on the first \$5,000 of the subcontracted portion of the extra work and a markup of 5 percent on work added in excess of \$5,000 of the subcontracted portion of the extra work may be added by the Contractor.

To the sum of the costs and markups provided for in this section, 1% shall be added as compensation for bonding.

### **7-4.4 Daily Reports.**

Add the following:

Material changes shall be substantiated by valid copies of vendor's invoices. Such invoices shall be submitted with the daily extra work reports, or if not available, they shall be submitted with subsequent daily extra work reports. When these daily extra work reports are agreed upon and signed by both parties, said reports shall become the basis of payment for the Work performed.

## **SECTION 8 – FACILITIES FOR AGENCY PERSONNEL**

Facilities for Agency Personnel is not required on this project.

Add the following Section:

## **SECTION 9 – EXISTING IMPROVEMENTS**

Refer to Part 4 (Sections 400 and 402) of the Standard Specifications for Public Works Construction for additional requirements, conditions, and specifications.

## **9-1 PROTECTION AND RESTORATION.**

### **9-1.1 General.**

Add the following after the first paragraph of Section 400-1:

The Contractor shall examine all adjoining premises (including for the purposes hereof, streets and sidewalks) and buildings, and ascertain, before beginning Work, the depth of cellars, materials, and construction of buildings and all existing conditions of such premises and the buildings thereon, and shall be governed thereby for the necessary, thorough, safe and satisfactory execution of all Work called for herein, whether indicated on Plans and/or specified, or not, and all work and protective measures necessary to keep and leave the said premises and buildings in the same condition as they were before commencing work shall be done without any addition to the Contract Price. Wherever any parts of the existing adjoining buildings interfere with or are interfered with by the Work to be performed hereunder, the Contractor shall make whatever changes necessary thereby, whether shown on the Plans, called for in the Specifications, or not shown or not called for. The Contractor, before commencing Work on the premises shall make a written report of the conditions as found at that time, noting particularly any defects in evidence, taking photographs of the exteriors, and, if necessary, photographs of interiors, and shall deliver to the Agency a copy of the written report of the examination and copies of photographs with the date of taking thereon. The Contractor shall invite the Agency and the owners of the respective properties and buildings to join with them in the examination of the premises and buildings. The Agency may, at its option, be present during the examination. If the Contractor fails to make the examination and report as herein specified, it will be deemed that the adjoining buildings and premises are in good condition, and all claims for damages, repairs, and replacements must be treated by the Contractor on the basis that the buildings and premises were in good condition before Work began.

The Contractor shall shore up, brace, underpin, secure, and protect all foundations, improvements, and other parts of existing structures adjacent to the Work site, which may in any way be affected by excavation or other operations in connection with the Work to be performed under this Contract. The Contractor shall be responsible for giving all required notices to any joining property owner or other party before commencement of work.

## **9-1 UTILITIES.**

### **9-1.1 Location.**

#### **9-1.1.1 General.**

Add the following to Section 402-1.1:

Prior to performing any excavation, the Contractor shall determine, by potholing, the location and depth of all utilities, including service connections, which have been marked by the respective owners and which may affect or be affected by its operations. The Contractor shall pothole all utility crossings on public streets. The Contractor shall verify depth of all service utility crossings under sidewalk. Contractor shall locate all existing utilities, including storm and sewer main and laterals, within the project vicinity and shall exercise due care to ensure that existing utility facilities are not damaged during his/her operations. The existence of sewer mains or storm drains is evidenced by the manhole structures and catch basins. Where water lines exist, at each angle point, cross connection, and "T" connection, the Contractor shall assume the existence of a concrete thrust block located such as to resolve thrust loads. When in doubt, the Contractor shall contact the utility operator concerned before proceeding further.

Pipelines, conduits, and other facilities may be buried within the limits of the work or adjacent thereto and may or may not be shown or indicated on the Plans. The Engineer possesses records of certain utility facilities located within the public right-of-way. These records are available for inspection by the Contractor at the Engineer's Office. In making these records available, the Agency does not warrant or



guarantee the accuracy or completeness of the information contained therein and does not represent that the facilities shown on said records actually exist at the locations shown or elsewhere or that the Contractor may not encounter facilities not identified in said records. The sewer service laterals are owned by the property owners and will not be marked by the City. Sewer system atlas sheets are available upon request for Contractor's reference. However, the City shall not guarantee the accuracy of the information. It shall be the Contractor's responsibility to locate and pothole all laterals. The Contractor, at their own expense, shall repair sewer laterals that are damaged as the result of Contractor's activities.

The Contractor shall immediately notify the Engineer of any potential conflict with the proposed improvements. The cost of repair to any utility damaged by the Contractor due to failure to determine location and depth as required herein shall be borne by the Contractor.

#### **9-1.2 Payment.**

Replace the entire 402-1.2 subsection with the following:

Full compensation for determining location and depth of utilities shall be considered as included in the prices bid for other items of work, and no additional compensation will be allowed.

#### **9-2 PROTECTION.**

Add the following to Section 402-2:

The Contractor shall adjust all existing sewer, storm drain, and other utility manhole lids and covers, water meter boxes and covers, gas meter boxes and covers, valve covers, etc. to grade unless specifically designated for adjustment by others on the Plans. Payment for adjustment of said items to grade shall be considered as part of related bid items for which payment is made and no separate payment will be made therefore.

## SECTION F

### **TECHNICAL SPECIFICATIONS**

(SUPPLEMENTS AND MODIFICATIONS TO  
THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION)

**SECTION F – TECHNICAL SPECIFICATIONS****SECTION 1 - GENERAL****1-1 Description and Scope of Work**

1-1.1 This work includes furnishing labor, materials, tools, equipment, transportation, delivery, and services required for complete and satisfactory installation and construction of all components associated with:

**MESMER LOW FLOW DIVERSION PROJECT PR-005**

1-1.2 The Scope of Work for the referenced project includes, but is not limited to, the jack and bore of 20" steel casing and installation of 12-inch PVC (SDR35) pipe; installation of 6-inch DIP force main and connection with existing sewer wet well; construction of a concrete diversion berm; installation of a duplex submersible pumping station with mounted rail removal system, specified controls, valves, internal piping, and precast concrete wet well; flow meter in a precast valve vault; removal, salvage, and reinstallation of 8-foot high wrought iron fence with 16-foot wide double leaf gate; removal and replacement of AC pavement; installation of a 24-inch by 24-inch drop inlet with a 5-foot depth and grate; and removal and reconstruction of an existing concrete berm.

**1-2 Construction Scheduling**

1-2.1 The Contractor shall be responsible to develop a more detailed phase of construction and sequence of work summary with all components identified in the Construction Schedule. A Sequence of Work items and requirements are summarized in Section 1-3.

1-2.2 The Contractor must provide to the Engineer's Representative within five (5) days after receiving the "Notice to Proceed", a Critical Path Method (CPM) construction schedule in the format of a Gantt Chart and revised schedules thereafter as required by the Engineer when the Contractor's activities differ or are expected to differ from the latest existing schedule. Section 1-3 has provided a summary of the proposed improvements and existing facility modifications for the project. The project design plans and contract requirements provide the detailed requirements that the contractor shall reference for the preparation of the bid proposal.

1-2.3 The Contractor shall provide a detailed schedule of construction activities. The schedule shall be updated a minimum of once every month. The schedule shall include the critical delivery of equipment, any special operation periods, and nighttime construction, as applicable. The Contractor shall attend field meetings with the construction manager at least twice a month.

1-2.4 The Contractor shall schedule all pretests and equipment certification tests. A final witness test will be performed with all equipment manufacturer's representatives present. The test shall allot a minimum of 8 hours total for the system supplier and manufacturer's representatives of the Pumps, MCC, Controls, and related improvements.

1-2.5 If the Contractor desires to make a major change in the method of operations after commencing construction, or if the schedule fails to reflect the actual progress, the Contractor shall submit to the Engineer a revised construction schedule in advance of beginning revised operations.

1-2.6 The schedule must comply with the United States Army Corps of Engineers

(USACE) HH Policy HHPM16, which includes limitations on scheduling work within Centinela Creek. The schedule must also comply with other requirements, as indicated in applicable permits.

### **1-3 Sequence of Work**

The Contractor shall provide a detailed sequence of work summary that corresponds to the Contractor's Construction Schedule and all related activities required. The project's sequence of work shall include the details of all following events:

1. Remove and salvage 8-foot high wrought iron fence.
2. Sawcut Centinela Creek Channel berm and invert for excavation of receiving pit. Excavate launching/jacking pit in the channel access road.
3. Jack and Bore 20-inch steel casing.
4. Install 12-inch PVC (SDR35) pipe.
5. Construct cast in place concrete drop inlet and berm.
6. Reconstruct channel berm and invert.
7. Excavate (in addition to excavation done for launching/jacking pit) for installation of precast concrete pump station wet well and valve vault, including removal of AC pavement.
8. Excavate trench for installation of 6-inch DIP force main.
9. Install precast concrete pump station wet well and valve vault.
10. Install pump station components, valves, pipe, flow meter, and appurtenances.
11. Install 6-inch DIP force main.
12. Connect 6-inch DIP force main to existing sewer wet well.
13. Install control panels, floats, and electrical service for pump station and valve vault.
14. Reinstall 8-foot high wrought iron fence and install 16-foot wide double leaf gate.
15. Replace AC pavement in access road.
16. Pump test.
17. Site clean-up.
18. O & M Manual and As-Builts.

**1-4 BID ITEMS****1-4.1 BID ITEM NO. 1 - MOBILIZATION****1-4.1.1 GENERAL**

Mobilization shall conform to the provisions of Sections 7-3.4 of the Standard Specifications and Special Provisions. The maximum price for this bid item shall not exceed 10 percent of the total contract price at the time of award. Mobilization shall include the following:

- Mobilization of the work area.
- Construction notices to business owners and the surrounding community.
- Obtaining all Contractor required bonds and insurance.
- Obtaining all required construction-related permits.
- Submittals (shop drawings, working drawings, supporting information, etc. as specified in Section 3-8 of the Standard Specifications and as modified in the Special Provisions.
- Proper removal and disposal of all materials. Tracking records shall be submitted at the end of the project.
- Tools and equipment for common tasks.
- Demobilization from the work area.

**1-4.1.2 PAYMENT**

Payment for **BID ITEM NO. 1 - MOBILIZATION** shall be at the contract lump sum bid price and shall be payable as follows for each payment upon approval of the Public Works Director/City Engineer.

- a. Payment of up to 50 percent of the contract lump sum bid price for mobilization at the first progress payment.
- b. Payment to 75 percent of the contract lump sum bid price for mobilization when the monthly partial payment estimate of the total amount earned to date, not including the amount earned for mobilization, is 30 percent or more of the original contract amount.
- c. Payment to 100 percent of the contract lump sum bid price for mobilization when the monthly partial payment estimate of the total amount earned to date, not including the amount earned for mobilization, is 100 percent or more of the original contract amount.

**1-4.2 BID ITEM NO. 2 – PROJECT DEWATERING AND BID ITEM NO. 3 – SURFACE WATER DIVERSION PLAN AND IMPLEMENTATION**

Add the following to Subsection 306-5 of the Standard Specifications:

**1-4.2.1 GENERAL**

- a. The Contractor is referred to subsection 306-5, "Dewatering" of the Standard Specifications and . The Contractor shall provide and maintain at all times during construction, ample means and devices with which to promptly remove and properly dispose of all water from any source entering the excavations or other parts of the work. Dewatering shall be

accomplished by methods that will ensure a dry excavation and preservation of the final lines and grades of the bottoms of excavations.

- b. Dewatering shall commence when groundwater is first encountered or nuisance water collecting and shall be continuous until such times as water can be allowed to rise in accordance with the provisions of this section or other requirements.
- c. Standby pumping equipment shall be provided on the jobsite. A minimum of one standby unit (a minimum of one for each ten in the event well points are used) shall be available for immediate installation should any well unit fail. The design and installation of well points or deep wells shall be suitable for the accomplishment of the work.
- d. Disposal of surface water and from dewatering operations shall be the sole responsibility of the Contractor. Proper permits and approvals must be obtained related to the disposal, as needed.
- e. The Contractor shall submit a Surface Water Diversion Plan and Implementation plans prior to the start of construction that meets the requirements of the applicable permits.
- f. The Contractor shall dispose of the water from the work in a suitable manner without damage to adjacent property. Conveyance of the water shall be such as to not interfere with traffic flow or other construction. No water shall be drained into work built or under construction without prior consent of the Engineer.
- g. Water shall be desanded before disposal in any sewer or storm drain system. The system used for desanding the water shall be a baffled structure and shall provide not less than five minutes detention time and shall be designed to have a "flow-through" velocity not exceeding 0.2 feet per second at the anticipated peak flow. The desanding box shall be cleaned as required to maintain the detention time and flow-through limitations specified above.

#### 1-4.2.2 PAYMENT

Payment for **BID ITEM NO. 2 - DEWATERING & BID ITEM NO. 3 – SURFACE WATER DIVERSION PLAN AND IMPLEMENTATION** shall be at the contract bid Lump Sum (LS) price and shall include full compensation for conforming to the requirements, to include all labor, equipment, transportation, tools, material, and incidentals necessary to do all the work thereof complete, in place and accepted.

### 1-4.3 **BID ITEM NO. 4 – CONSTRUCTION SCHEDULING**

#### 1-4.3.1 GENERAL

Refer to Subsection 1-2 above for schedule requirements.

#### 1-4.3.2 PAYMENT

Payment for **BID ITEM NO. 4 – CONSTRUCTION SCHEDULING** shall be at the contract bid Lump Sum (LS) and shall include full compensation for preparing,



maintaining, updating, and submitting schedules.

#### **1-4.4 BID ITEM NO. 5 – REMOVAL AND DISPOSAL OF CONCRETE (REINFORCED)**

##### **1-4.4.1 GENERAL**

This contract bid item REMOVAL AND DISPOSAL OF CONCRETE (REINFORCED) shall conform to Section 401 of the Standard Specifications. This item includes removal, and disposal of reinforced concrete within Centinela Creek (channel invert and berm) and in accordance with the notes and details included in the Plans. Concrete shall be removed to neatly sawed edges and the limits of concrete removal shall be confirmed in the field by the Engineer. Concrete removal within Centinela Creek shall meet the requirements of the environmental permits (and any other permits) issued for the project.

##### **1-4.4.2 PAYMENT**

Payment for **BID ITEM NO. 5 – REMOVAL AND DISPOSAL OF CONCRETE (REINFORCED)** shall be at the contract bid price per Cubic Yard (CY) and shall include full compensation for removal and disposal of existing reinforced concrete, furnishing all labor, materials, tools, equipment, demolition, removal, disposal, and incidentals necessary to do all the work thereof.

#### **1-4.5 BID ITEM NO. 6 – SAWCUT CONCRETE**

##### **1-4.5.1 GENERAL**

This contract bid item SAWCUT CONCRETE shall conform to Section 401 of the Standard Specifications. This item includes sawcutting of concrete within Centinela Creek and as noted on the Plans. The limits of sawcutting shall be confirmed in the field by the Engineer. Sawcutting within Centinela Creek shall meet the requirements of the environmental permits (and any other permits) issued for the project.

##### **1-4.5.2 PAYMENT**

Payment for **BID ITEM NO. 6 – SAWCUT CONCRETE** shall be at the contract bid price per Linear Foot (LF) and shall include full compensation for all labor, materials, tools, equipment, and incidentals necessary to do all the work thereof.

#### **1-4.6 BID ITEM NO. 7 – REMOVAL AND DISPOSAL OF AC PAVEMENT**

##### **1-4.6.1 GENERAL**

This contract bid item REMOVAL AND DISPOSAL OF AC PAVEMENT shall conform to Section 401 of the Standard Specifications. This item includes removal and disposal of AC pavement in the Centinela Creek access road, where the launching pit, pump well, and flow meter with vault will be located. Edges shall be sawcut full-depth at clean lines and edges. The limits of AC removal shall be confirmed with the Engineer in the field prior to work being performed. The thickness of the AC and base sections shall be measured and observed by the Contractor during removal, such that they can be replaced in kind under separate bid items. Sawcutting and AC removal within Centinela Creek access road shall meet the requirements of the environmental permits (and any other permits) issued for the project.

#### 1-4.6.2 PAYMENT

Payment for **BID ITEM NO. 7 – REMOVAL AND DISPOSAL OF AC PAVEMENT** shall be at the contract bid price per Square Foot (SF) and shall include full compensation for removal and disposal of existing AC pavement, furnishing all labor, materials, tools, equipment, sawcutting, demolition, removal, disposal, and incidentals necessary to do all the work thereof.

### 1-4.7 **BID ITEM NO. 8 – DIVERSION BERM CONCRETE STRUCTURE AND CHANNEL INVERT**

#### 1-4.7.1 GENERAL

The contract bid item no. 8 - DIVERSION BERM CONCRETE STRUCTURE AND CHANNEL INVERT shall conform to Section 201-1, 201-2, 217, 301, and 303 of the Standard Specifications along with any notes and details included in the Plans and Specifications.

Concrete for this work shall be 4,000 psi minimum compressive strength with maximum slump of 4 inches. The water/cement ratio shall be 0.45. The maximum aggregate size shall be 1-½ inches. The steel reinforcement shall be 40,000 psi minimum yield strength.

Base materials identified in the Plans under the concrete structures is included under Section 1-4.8 below for the filter/bedding layers. Otherwise, base materials shall include ¾-inch crushed rock in accordance with Section 200-1.2 of the Standard Specifications.

All steel reinforcement lapping and splicing shall conform to ACI 318-14 and bonding compound shall be in conformance with ACI 548.13-14 specification for bonding new concrete to existing concrete.

The Contractor shall submit the following related to concrete work:

- Concrete mix designs: prior to beginning the work, the Contractor shall submit concrete mix designs that show the proportions and gradations of all materials proposed for each class and type of concrete specified herein. The mix designs shall be designed by an independent testing laboratory. All costs related to such mix designs shall be borne by the Contractor.
- Certified delivery tickets: where ready-mix concrete is used, the Contractor shall provide certified weight master delivery tickets at the time of delivery of each load of concrete. Each certificate shall show the total quantities, by weight of cement and each size of aggregate, amounts of water in the aggregate and added at the batching plant as well as the amount of water allowed to be added at the site for the specific mix design.
- Concrete admixtures: when a water-reducing admixture is to be used, the Contractor shall furnish mix designs for concrete both with and without the admixture.

At the Contractor's option, ready-mixed concrete may be used if it meets requirements related to materials, batching, mixing, transporting, and placing as specified herein, and the requirements of the "Specifications for Ready-Mixed Concrete" (ASTM Designation C94). The use of non-agitating equipment for transporting ready-mixed concrete will not be permitted. Combination truck and

trailer equipment for transporting ready-mixed concrete will not be permitted. The quality and quantity of materials used in ready-mixed concrete and in batched aggregates shall be subject to inspection at the batching plant.

Forms to confine the concrete and shape it to the required lines shall be used wherever necessary. The Contractor shall furnish all materials for concrete formwork, bracing, shoring, and supports and shall assume full responsibility for the adequate design of all forms and false work. Forms for all exposed concrete surfaces, including the interior surfaces of all underground structures, shall be of new Plyform at least 5/8-inch thick. All other forms shall be smooth, tongue and groove boards, shiplap, or plywood. Exposed corners of all concrete structures shall be given a 3/4-inch chamfer. Removal of forms and shoring are subject to the approval of the Engineer.

All finished or formed surfaces shall conform accurately to the shape, alignment, grades, and sections as shown on the Plans or prescribed by the Engineer. Surfaces shall be free from fins, bulges, ridges, offsets, honey-combing, or roughness of any kind, and shall present a finished, smooth continuous, hard surface, and shall in no place vary more than 3/16-inch from the lower edge of a 10-foot straightedge laid on the slab in any direction.

Exposed unformed surfaces of concrete shall be given a steel trowel finish. Excessive floating of surfaces while the concrete is plastic will not be permitted. Dusting on of dry cement and sand to absorb excess moisture will not be permitted. Edges of exposed surfaces shall be worked with a suitable edging tool.

#### 1-4.7.2 PAYMENT

Payment for **BID ITEM NO. 8 – DIVERSION BERM CONCRETE STRUCTURE AND CHANNEL INVERT** shall be at the contract bid price per Cubic Yard (CY) and shall include full compensation for conforming to the requirements, to include all labor, equipment, structural concrete, steel reinforcement, transportation, tools, incidentals and other materials necessary to do all the work thereof and accepted.

#### 1-4.8 **BID ITEM NO. 9 – 12" PVC SDR35 (INSTALLATION, EXCAVATION, BACKFILL) & BID ITEM NO. 10 – 20" STEEL CASING (TRENCHLESS TECHNOLOGY)**

##### 1-4.8.1 GENERAL

The contract bid items no. 9 – 12" PVC SCH 80 (INSTALLATION, EXCAVATION, BACKFILL) and item no. 10 – 20" STEEL CASING (TRENCHLESS TECHNOLOGY) shall conform to the provisions of Sections 207-17, 209-2, and 307-1 of the Standard Specifications and details/information included in the Plans.

The 20-inch steel casing shall be installed by jack and bore methods. The launching and receiving pits shall be excavated as indicated in the Plans or as specified in an approved submittal prepared by the Contractor and approved by the Agency. The Contractor shall, in accordance with Section 3-8 of the Standard Specifications and associated Special Provisions, submit working drawings of the jacking and receiving pit bracing and shoring, casing, jacking head, methods, equipment, and grouting pressure proposed to be used prior starting excavation. Leave-in shoring is not allowed in the launching or receiving pit. A maximum overcut of 1/2-inch shall be held outside the casing to minimize the annulus between the casing and soil.

The Contractor can propose other methods for installing the casing for City Engineer's approval without additional cost.

12" PVC SDR35 shall be installed as shown on the Plans and Details. Cement slurry shall be used between the steel casing the PVC, as shown in the Plans.

Interfering sections of existing subdrain pipe and filter material shall be temporarily removed during jacking operations and replaced after completion of the installation of the casing pipe. Replacement of subdrain shall be of SDR35 pipe of like material as the existing 6" perforated pipe. Couplings will be used to connect new to existing subdrain pipe. The area shown on the plans surrounding the perforated pipe, between the bottom of the invert slab and the filter material, shall be drain material, made up of 3/8-inch crushed rock in accordance with Section 200-1.2 of the Standard Specifications.

The filter material identified around the subdrain shall be placed as shown on the Plans and in accordance with the following requirements.

Filter material shall consist of gravel, crushed gravel, crushed rock, natural sands, manufactured sand, or combinations thereof and shall conform to the following grading requirements:

<b>Seive Size</b>	<b>Percent Passing</b>
3/4-inch	100
3/8-inch	80-100
No. 100	0-8
No. 200	0-3

That portion of filter material passing a No. 4 (4.75 mm) sieve shall have a sand equivalent of not less than 60.

Fill material identified beneath the filter material shall be pervious backfill. The pervious backfill material shall be placed in layers along with and by the same methods specified for structure backfill in accordance with Section 217-3 of the Standard Specifications. Pervious backfill material (subdrain fill material) at any one location shall be approximately the same grading.

If the existing subdrain system (made of up the perforated pipes and surrounding materials) is found to be significantly different than this specification, the Contractor shall bring the difference to the attention of the Engineer immediately. If geotextile fabric exists as part of the subdrainage system, then it shall be placed back in accordance with Section 213-5 of the Standard Specifications.

Geotechnical observation shall be conducted as part of field investigation preceding excavations of the launching and receiving pits and submittal of bracing and shoring plans and shall be paid for by the Contractor. Settlement monitoring shall be performed before, during, and after jack and bore operations to determine if pipe installation resulted in any structural impacts to the channel structure. Any impacts observed shall be brought to the immediate attention of the Engineer.

Removal and replacement of the existing channel invert and berm (reinforced concrete) is included under bid items no. 5 and 8 for removal and replacement,

respectively.

The work shall include all labor, equipment, materials, tools, transportation, excavation, incidentals, and all other work to install the 12" PVC Pipe and 20" Steel Casing.

#### 1-4.8.1 PAYMENT

Payment for **BID ITEM NO. 9 – 12" PVC SCH 80 (INSTALLATION, EXCAVATION, BACKFILL)** and **BID ITEM NO. 10 – 20" STEEL CASING (TRENCHLESS TECHNOLOGY)** shall be at the contract bid price per Linear Foot (LF) and shall include full compensation for conforming to the requirements, to include all labor, equipment, materials, tools, transportation, excavation, disposal of spoils, incidentals, and all other work to complete and accepted.

### 1-4.9 **BID ITEM NO. 11 – 6" DIP (OPEN TRENCH, PIPE INSTALLATION, BACKFILL)**

#### 1-4.9.1 GENERAL

Contract bid item no. 11 - 6" DIP (OPEN TRENCH, PIPE INSTALLATION, BACKFILL) shall conform to the provisions of Sections 209-1, 217, 300 and 306 of the Standard Specifications and details included in the Plans. The 6-inch DIP force main shall be installed from the pump station to the existing sewer wet well.

This item shall include all labor, work, and materials necessary for the installation of the 6-inch DIP force main to the line, grade, and dimensions shown in the Plans. Connection to the existing sewer wet well is included separately as bid item no. 19.

The contract bid item shall include sawcutting PCC pavement, removal/disposal of PCC pavement and base materials, unclassified excavation, pipe placement, backfill, and PCC paving, including all labor, work, and materials necessary to construct the new work.

Trench Backfill shall conform to the provisions of Section 306-12.3 of the Standard Specifications and include all required backfill material and its construction within and above pipe zone as specified in Plans. Pipe bedding shall conform to Los Angeles Department of Public Works (LADW) Standard Plan 3080-3, Case 1.

#### 1-4.9.1 PAYMENT

Payment for **BID ITEM NO. 11 – 6" DIP (OPEN TRENCH, PIPE INSTALLATION, BACKFILL)** shall be at the contract bid price per Linear Foot (LF) and shall include full compensation for conforming to the requirements and shall include all labor, equipment, materials, tools, transportation, excavation, backfilling, disposal, PCC work, and incidentals necessary to do all the work involved thereof and accepted.

### 1-4.10 **BID ITEM NO. 12 – CAST IN PLACE DROP INLET**

#### 1-4.10.1 GENERAL

This contract bid item no. 12 – CAST IN PLACE DROP INLET shall conform to

the provisions of Sections 200-1.2, 201-1, 201-2, 217, 301, and 303 of the Standard Specifications and the details and notes included in the Plans.

Concrete for this work shall be 4,000 psi minimum compressive strength. The steel reinforcement shall be 40,000 psi minimum yield strength. The concrete structure shall be placed on  $\frac{3}{4}$ -inch crushed rock. The concrete requirements indicated in Section 1-4.7 (Bid Item 8) shall also apply to the concrete used for this structure.

This item shall include all labor, work, and materials necessary for the construction of the drop inlet to the line, grade, and dimensions shown in the Plans and shall include connections to the 20-inch steel casing with 12-inch PVC pipe and channel invert slab, including the reinforcement shown in the Plans.

#### 1-4.10.1 PAYMENT

Payment for **BID ITEM NO. 12 – CAST IN PLACE DROP INLET** shall be at the contract bid price per Lump Sum (LS) and shall include full compensation for conforming to the requirements, and shall include all labor, equipment, materials, concrete, base, steel reinforcement, tools, transportation, backfilling, and incidentals necessary to do all the work involved thereof and accepted.

### 1-4.11 **BID ITEM NO. 13 – TRAFFIC RATED GRATE AND FRAME**

#### 1-4.11.1 GENERAL

This contract bid item no. 13 – TRAFFIC RATED GRATE AND FRAME shall be Alhambra Foundry, 24-inch by 24-inch cast iron, Part No. A-2012 or Agency approved equal. The frame and grate shall be traffic rated (H-20 loading).

This item shall include all labor, work, and materials necessary for installing the Traffic Rated Grate and Frame to the Drop Inlet as shown on the Plans.

#### 1-4.11.1 PAYMENT

Payment for **BID ITEM NO. 13 – TRAFFIC RATED GRATE AND FRAME** shall be at the contract bid price per Lump Sum (LS) and shall include full compensation for conforming to the requirements, and shall include all labor, equipment, materials, tools, transportation, and incidentals necessary to do all the work involved thereof and accepted.

### 1-4.12 **BID ITEM NO. 14 – CRUSHED MISCELLANEOUS BASE (ACCESS ROAD)**

#### 1-4.12.1 GENERAL

This contract bid item no. 14 – CRUSHED MISCELLANEOUS BASE (ACCESS ROAD) shall conform to the provisions of Sections 200-2.4 and 301-2 of the Standard Specifications.

The contract bid item for shall include all labor, work, and materials necessary to construct Crushed Miscellaneous Base (CMB) complete in place. The thickness of the CMB shall match existing. The Contractor shall identify the existing thickness of CMB during removal of the AC pavement in the access road. The work shall include subgrade preparation, base rock placement, grading, compaction, and all other work necessary to construct CMB complete

in place.

This contract bid item shall include preparation and compaction of subgrade to relative compaction of 90% and placement, grading, and compaction of the CMB to 95% of the laboratory maximum dry density as defined by ASTM Standard D1557 test method.

**The quantities for this bid item do not include CMB required under the channel invert and along the 6-inch DIP force main.**

#### 1-4.12.1 PAYMENT

Payment for **BID ITEM NO. 14 – CRUSHED MISCELLANEOUS BASE (ACCESS ROAD)** shall be at the contract bid price per Square Foot (SF) and shall include full compensation for conforming to the requirements, and shall include all labor, equipment, materials, tools, transportation, and incidentals necessary to do all the work involved thereof and accepted.

### 1-4.13 **BID ITEM NO. 15 – FLOW METER (MAG-FLUX-A)**

#### 1-4.13.1 GENERAL

This contract bid item no. 15 – FLOW METER (MAG-FLUX-A) shall include a Mag-Flux-A Electromagnetic Flow Sensor assembly (or Agency approved equal), 36-inch diameter precast manhole, and connections to the proposed pump station and 6-inch DIP force main, as shown in the Plans. The Mag-Flux-A flow meter shall be part number MAG5711-2LC10-0BB0 or Agency approved equal.

The Contractor shall, in accordance with Section 3-8, submit working drawings for the Engineer's approval.

This item shall include all labor, work, materials, and testing necessary for the installation of flow meter to the line, grade, and dimensions as shown on the Plans.

The contract bid item shall include unclassified excavation, including all labor, work, and materials necessary to excavate soils, and other improvements and materials as necessary to construct the new work. The work shall include removal of base materials, disposal of excess materials, and all other work necessary to excavate existing materials and install flow meter and valve vault. Excavations and backfilling shall be in accordance with Section 300 of the Standard Specifications.

#### 1-4.13.1 PAYMENT

Payment for **BID ITEM NO.15 – FLOW METER (MAG-FLUX-A)** shall be at the contract bid price per Lump Sum (LS) and shall include full compensation for conforming to the requirements, and shall include all labor, equipment, materials, tools, transportation, excavation, backfilling, testing, and incidentals necessary to do all the work involved thereof and accepted.

### 1-4.14 **BID ITEM NO. 16 – REMOVE AND REINSTALL 8' HIGH FENCE (WROUGHT IRON)**

#### 1-4.14.1 GENERAL



The contract bid item no. 16 – REMOVE AND REINSTALL 8' HIGH FENCE (WROUGHT IRON) shall include all labor, equipment, materials, incidentals, and work necessary to remove and reinstall the existing 8-foot high wrought iron fence to the limits shown on the Plans. The work shall include footings, materials, curing, protection, and all other work necessary to remove and reinstall the 8-foot high wrought iron fence. Once the fence is removed, the Contractor is responsible for protecting and preserving the condition, such that it can be reinstalled successfully and in a condition that matches pre-project conditions or better.

The Contractor will be responsible for repairing/replacing the existing structure if it is damaged due to removal of existing fence without additional cost to the Agency.

#### 1-4.14.1 PAYMENT

Payment for **BID ITEM NO.16– REMOVE AND REINSTALL 8' HIGH FENCE (WROUGHT IRON)** shall be at the contract bid price per Linear Foot (LF) and shall include full compensation for furnishing all labor, materials, tools, equipment, removal, reinstallation, protection, footing removal/reconstruction, transportation, and incidentals necessary to do all the work involved thereof and accepted.

### 1-4.15 **BID ITEM NO. 17 – 8' H X 16' W DOUBLE LEAF GATE (WROUGHT IRON)**

#### 1-4.15.1 GENERAL

These contract bid item no.17 – 8' H x 16' W DOUBLE LEAF GATE (WROUGHT IRON) shall include all labor, equipment, materials, incidentals, and work necessary to furnish and install the 8-foot high wrought iron gate at the location shown in the Plans. The gate shall match the existing picket size and spacing and shall be of the same color as the existing fence. The gate shall be lockable and be installed such that maintenance vehicles can access the Centinela Creek access road and improvements.

The contract bid item shall include gate lock, footings, wrought iron posts, painting, material, curing, protection, excavations, backfilling, and all other work necessary to install the 8' high wrought iron double leaf gate.

#### 1-4.15.1 PAYMENT

Payment for **BID ITEM NO. 17 – 8' H X 16' W DOUBLE LEAF GATE (WROUGHT IRON)** shall be at the contract bid price per Lump Sum (LS) and shall include full compensation for furnishing all labor, materials, tools, equipment, transportation, and incidentals necessary to do all the work involved thereof and accepted.

### 1-4.16 **BID ITEM NO. 18 – 6" DIP CONNECTION TO EXISTING WET WELL**

#### 1-4.16.1 GENERAL

This contract bid item no. 18 – 6" DIP CONNECTION TO EXISTING WET WELL shall include all labor, work, and materials necessary for connecting the 6" DIP force main to the existing sewer wet well as shown in the Plans. The connection shall be sealed, as shown in the Plans. The Contractor may submit an alternative connection detail for the Engineer's approval, while modifications

would be required to meet the design intent detailed in the Plans. Any damages to the existing wet well must be corrected by the Contractor at no additional expense to the Agency.

#### 1-4.16.1 PAYMENT

Payment for **BID ITEM NO. 18 – 6” DIP CONNECTION TO EXISTING WET WELL** shall be at the contract bid price per Lump Sum (LS) and shall include full compensation for conforming to the requirements and shall include all labor, equipment, materials, tools, transportation, demolition, excavation, backfilling, and incidentals necessary to do all the work involved thereof and accepted.

### 1-4.17 **BID ITEM NO. 19 – PUMP STATION (EXCAVATION, SHORING, INSTALLATION)**

#### 1-4.17.1 GENERAL

The contract bid item no. 19 – PUMP STATION (EXCAVATION, SHORING, INSTALLATION) shall include all labor, equipment, materials, tools, transportation, excavation, backfilling, compaction, installation, and other materials necessary for the Pump Station to be furnished, installed, and tested in accordance with the Plans. Submittals, in accordance with Section 3-8 of the Standard Specifications and associated Special Provisions are required for the pump station components and all precast concrete structures.

This contract bid item includes the following:

1. Precast concrete wet well (12-foot diameter) with hatch riser and double leaf opening access door and frame (H-20 loaded). System shall be water tight.
2. 2 units – HOMA submersible non-clog pump (model number AMS444-220/13P/C), 13 HP motor, with 6-inch discharge or Agency approved equal.
3. Guide rails, stainless steel, Type 304, with pump guide brackets.
4. Pump Mounting.
5. Pumping station control panels.
6. Piping integral to pumping station including necessary valves.
7. Quality control testing.
8. Operation and maintenance (O&M) manual.
9. Excavation, backfilling, and compaction (most excavation is included as part of the jack and bore pipe operations).
10. And all other appurtenances as show on the Plans.

This contract bid item shall comply with all applicable sections of the Standard Specifications and to the Plans.

#### 1-4.17.2 SUBMITTALS

- a. Product Data: Provide manufacturer's technical data including station capacities and operating characteristics.
- b. Pump Performance Curves.
- c. Shop Drawings: Show fabrication and installation details.
- d. Field reports: Provide quality-control test report documenting station operation performance.
- e. Warranty: Signed dopy of manufacturer's warranty.
- f. Operation and Maintenance Manual: Include approved submittals and

schedule for maintenance requirements.

#### 1-4.17.3 QUALITY ASSURANCE

- a. Manufacturer Qualifications: NPCA-certified plant, with experience and demonstrated capability to produce work specified in this Section.
- b. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

#### 1-4.17.4 WARRANTY

- a. Manufacturer's Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of pumping stations that fail in materials or workmanship within specified warranty period.
  - i. Failures include, but are not limited to, the following:
    - 1. Structural failures including precast concrete structures, hatches, and other accessories.
    - 2. Faulty operation of pumps, controls, or pumping and piping system accessories.
    - 3. Deterioration of metals, metal finishes, and other materials beyond normal use.
  - ii. Warranty Period for Complete Packaged Pump Station provided by a Single Source Supplier (Including Concrete, Pumps, and Control Panel): One year from date of Substantial Completion.

#### 1-4.17.5 PRODUCTS

Provide site assembled precast wastewater utility pumping station (for use with urban runoff – dry-weather flows), including specified controls, pumps, valves, internal piping, and precast concrete well and valve vault to be manufactured and furnished by Jensen Precast, or Agency approved equal.

##### 1-4.17.5.1 PRECAST PUMPING STATION DESIGN CRITERIA

- a. Pump station Peak Design Flow: 672 gpm
- b. Force Main:
  - i. 6-inch DIP, length per Plan
  - ii. Inlet size 12-inch with 6-inch discharge size
  - iii. Discharge elevation per Plan
- c. Precast Concrete Wet Well:
  - i. 12-foot diameter barrel
  - ii. Contractor to provide base, barrel, and flat top precast sections at the height and sizes indicated in the Plans

##### 1-4.17.5.2 PRECAST CONCRETE STRUCTURES

- a. General: Size indicated in the Plans, with provision for sealant at joints, meeting ASTM C 913, designed according to ASTM C 890 for A-16 (AASHTO HS20-44), heavy traffic, structural loading.
- b. Round Precast Concrete Wells: ASTM C 478, precast, reinforced concrete.
  - i. Joint Sealant: ASTM C 990, bitumen or butyl rubber.
  - ii. Flexible Resilient Pipe Connectors: ASTM C 923.

- c. Joint sealant: ASTM C990, bitumen or butyl rubber.
- d. Mix Design:
  - i. General: Precast concrete according to ACI 318/318R.
  - ii. 4,000 psi minimum, with 0.45 maximum water/cementitious materials ratio.

#### 1-4.17.5.3 ACCESS DOORS AND FRAMES

- a. Access Door: Double-leaf opening. 36-inch by 60-inch steel access hatch manufactured by Jensen MetalTech, USF Fabrication, or Agency approved equal, angle frame. Includes: lift assist, bituminous paint, flush lifting handle, 316 stainless steel nuts & bolts, hinges, slamlock, and hold-open arm.
- b. Loading Capacity: Support AASHTO H20 Direct Traffic

#### 1-4.17.5.4 WET WELL ACCESSORIES

- a. Guide Rail Assembly: Guide rails, stainless steel, Type 304, with pump guide brackets configured to match requirements of selected pumps.
- b. Flexible Resilient Pipe Connectors: Flexible connector, ASTM C923

#### 1-4.17.5.5 PUMPS

- a. Basis of Design: Furnish and install (2) Homa submersible non-clog type centrifugal pump with a self-engaging Autocoupling Assembly, or a comparable product approved by Engineer prior to bid.
- b. General Conditions:
  - i. Capable of either repeatedly passing spherical solids up to 4 inches in diameter OR have the ability to macerate all solids prior to the solid entering the volute by using a rotating cutter mounted on the shaft immediately adjacent to the impeller.
  - ii. Pumps shall be designed to handle raw, unscreened stormwater, sludge, or similar contaminated liquid, with induction type electric motor assembled in a single body, watertight NEMA Type D chamber.
  - iii. Capable to maintain watertight integrity submerged under 80 feet of water.
- c. Pump System Characteristics
  - i. Number of Pumps: 2
  - ii. Capacity: 672 gpm
  - iii. Motor rating: 13.0 hp
  - iv. TDH: 37.7 feet
  - v. Speed: 1750 rpm
  - vi. Efficiency: 60%, minimum
  - vii. Shut-off Head: 63.7 feet
  - viii. 240/460 V/3 Phase/60Hz
  - ix. Full-load Amps: 32/16

#### 1-4.17.5.6 PUMPING STATION CONTROLS

- a. Control Sequence of Operation: Cycle each pump on and off automatically to maintain well water level. Automatic control operates both pumps in parallel if well level rises above starting point of low-level pump, until shutoff level is reached. Automatic alternator, with manual disconnect switch, changes sequence of lead-lag pumps at completion of each pumping cycle.

- b. Motor Controllers: Magnetic, full voltage, non-reversing. Include under-voltage release, thermal-overload heaters in each phase, manual reset buttons, and hand-automatic selector switches. Include circuit breakers to provide branch-circuit protection for each controller.
- c. Install labels to identify switches and controls.
- d. Control Panel: Complying with UL 508A, with weatherproof enclosure, covered compartments sized to accommodate controllers, circuit breakers, transformers, alternators, and programmable logic controller.
  - i. Basis of Design Product: Provide California Motor Control Systems, Inc., PV2 Series Duplex Control Panels, or a comparable product approved by Engineer prior to bid.
  - ii. Enclosure: NEMA 250, Type 3R, powder-coated sheet steel.
  - iii. Control panel must be supplied with a dead front panel door. PLC module
  - iv. Secondary Main Disconnect: A secondary main disconnect panel must be installed in the immediate vicinity of the primary control panel. This main disconnect must have the ability to be locked out/tagged out during control panel maintenance.
- e. Level Control System: Senses variations of water level in well. The system shall utilize a submersible pressure transducer as the primary level detection device. Redundant back up will be provided by two intrinsically safe, non-mercury mechanical floats.
  - i. Basis of Design (Pressure Transducer): PMC VL2000 series Submersible Level Transmitter, or pre-approved Agency equal.
  - ii. Basis of Design (Mechanical Float): OPTI-FLOAT Internally Weighted, Non-Mercury Float Switch (or pre-approved Agency equal).

#### 1-4.17.5.7 PIPING

- a. Ductile Iron, Mechanical Joint Pipe and Fittings:
  - i. Ductile-Iron Pipe: AWWA C151/A21.51, with mechanical-joint bell and plain spigot end unless flanged ends are indicated.
  - ii. Provide flanged ends within well and vault.
  - iii. Ductile Iron Fittings: AWWA C110/A21.10, mechanical-joint, ductile- or gray-iron standard pattern or AWWA C153/A21.53, ductile-iron compact pattern.
  - iv. Glands, Gaskets, and Bolts: AWWA C111/A21.11, ductile- or gray-iron glands, rubber gaskets, and steel bolts.
  - v. Application: Buried service after wet well.
- b. Stainless Steel Pipe and Fittings
  - i. Pipe and Fittings: ASME A112.31, socket and spigot ends.
  - ii. Application: Within submersed portion of well where indicated in Plans.
- c. Check Valves: Flanged swing check valves or ball check valves, suitable for use in stormwater manufactured by Val-Matic, AVK, or Agency approved equal.
- d. Isolation Valves: Flanged eccentric plug valves, manufactured by Val-Matic, AVK, or Agency approved equal.

#### 1-4.17.6 EXECUTION

##### 1-4.17.6.1 PRECAST CONCRETE STRUCTURES

- a. Install precast concrete structure sections with sealants per ASTM C891.

#### 1-4.17.6.2 FIELD QUALITY CONTROL

- a. Perform tests and inspections and prepare test reports.
  - i. Manufacturer's Field Service: Engage the pump station manufacturer's authorized service representative to assist in testing and startup.
- b. Tests and Inspections:
  - i. Test completed piping systems according to requirements of authorities having jurisdiction. Submit reports.
  - ii. After installing pumping stations and after electrical circuitry has been energized, test pumps and controls for compliance with requirements.
  - iii. After electrical circuitry has been energized, start units to confirm the station can run at pre-specified design parameters.
  - iv. Test piping for leaks and defects.
  - v. Test and adjust controls and safeties.
  - vi. Force Main: Test at pressure not less than 1-1/2 times the maximum system operating pressure, but not less than 150 psig.
- c. Remove and replace components of the pumping station that do not pass test and inspections and retest as specified above.

#### 1-4.17.7 PAYMENT

Payment for **BID ITEM NO. 19 – PUMP STATION (EXCAVATION, SHORING, INSTALLATION)** shall be at the contract bid price per Lump Sum (LS) and shall include full compensation for conforming to the requirements and shall include all labor, equipment, materials, tools, transportation, excavation, backfilling, shoring, and incidentals necessary to do all the work involved thereof, complete, in place, and accepted.

### 1-4.18 **BID ITEM NO. 20 – AC PAVEMENT**

#### 1-4.18.1 GENERAL

This contract bid item no. 20 – AC PAVEMENT shall include all labor, equipment, materials, incidentals, and work necessary to construct AC Pavement in the Centinela Creek access road, complete in place.

Asphalt Mix shall be C1-PG 64-10 in accordance with Section 203-1 of the Standard Specifications. The work shall include AC pavement compaction to 95%, finishing, protection, testing, and all other work necessary to construct the AC pavement complete in place per Sections 203 and 302-5 of the Standard Specifications. The thickness of the AC pavement shall match existing.

#### 1-4.18.2 PAYMENT

Payment for **BID ITEM NO. 20 – AC PAVEMENT** shall be at the contract bid price per TON (TON) and shall include full compensation for conforming to the requirements and shall include all labor, equipment, transportation, prime coat, tack coat, tools, incidentals, and other materials necessary to do all the work thereof and accepted.

**1-4.18 BID ITEMS NO. 21 – ELECTRICAL****1-4.18.1 GENERAL**

This contract bid item no. 21 – ELECTRICAL shall include all labor, equipment, materials, incidentals, and work necessary to connect the pump station and electrical components to the existing electrical panel in accordance with the Plans and Technical Specifications (Section G). This bid item includes circuit breaker, underground power conduit, underground control conduit, conduit seal, pull boxes, stainless steel pull boxes, PLC pump control, telemetric/hardwire connectivity, testing and commissioning, and other incidentals required to complete the work. All surfaces disturbed during construction of the electrical system shall be restored to match existing condition or better.

**1-4.18.2 PAYMENT**

Payment for **BID ITEM NO. 21 – ELECTRICAL** shall be at the contract bid price per Lump Sum (LS) and shall include full compensation for conforming to the requirements and shall include all labor, equipment, transportation, tools, testing, site restoration, incidentals, and other materials necessary to do all the work thereof and accepted.

**1-5 GUARDING UNDERGROUND CONSTRUCTION**

The walls and faces of all excavations over 5 feet in depth shall be effectively guarded by a shoring system, sloping of the ground, or other equivalent means. Trenches less than 5 feet in depth shall also be guarded when examination indicates hazardous ground movement may be expected.

The Contractor shall obtain a permit to perform excavation or trench work from the Division of Industrial Safety, State of California, prior to any construction.

Compensation for guarding underground construction and complying with all the provisions of this section, including the cost of providing all necessary information to obtain the permit and the cost of complying with the provisions of the permit, shall be included in each of the items requiring the guarding of underground construction and no additional compensation shall be allowed therefor.

**1-6 GENERAL GUARANTEE**

Unless otherwise provided in these specifications, the Contractor shall guarantee for a period of one year after Acceptance. All equipment, materials, and workmanship furnished under these Specifications shall be free from defects. Contractor shall repair or replace all such defective equipment, materials, or workmanship.

**1-7 COMPACTION TESTING**

Compaction testing method for pipelines shall be per the Standard Specifications. Compaction testing method for wet well, valve vault, and drop inlet base shall be per the 5-layer test ASTM Standard D-1557-70.

Unless otherwise called for in the Section D, Special Provisions, all testing will be performed by the City in such number and at such locations as deemed necessary by the Engineer to insure compliance with the Plans and Specifications; the cost of all initial testing will be borne by the City; the cost of all retesting will be borne by the Contractor, and the amount due the City for said retesting will be deducted from the Contractor's



progress payments.

#### **1-8 SURFACE DATA**

The Contractor's attention is directed to the provisions of Section 3-9, "Subsurface Data" of the Standard Specifications. Section 3-9 of the Standard Specifications is hereby amended in that a copy of the soils report entitled "Messmer Low Flow Diversion Project", prepared by Terracon Consultants, dated 07-03-18, is included for the Contractor's review and information. This report is for general use and is not included as a part of these Contract Documents.

#### **1-9 CONSTRUCTION SURVEYING AND STAKING**

The Contractor shall be responsible for all construction staking for the entire project with no exceptions. The construction survey and staking shall include all labor, work, and materials necessary to provide survey information and staking for construction of improvements; to restore existing survey monuments; to preserve monuments; and to set new centerline monuments for street alignment, as needed. New monuments shall be set with covers as per County requirements, when applicable. The work shall include review and verification of plan limits and grades in the field and with the Engineer, setting reference stations and hubs throughout the project limits, provision of cut sheets to the Contractor and the Engineer, setting of hubs and stakes, verification of Contractor's working limits and finished grades, restoration or resetting of monuments that are disturbed during construction, setting of new monuments, filling of survey maps, and all other work necessary to provide complete construction surveying for throughout the project. The costs for construction surveying and staking shall be included in each of the items of Work requiring surveying and staking.

#### **1-10 CONTRACTOR CONTINUOUS SUPERVISION OF ALL WORK**

The Contractor shall conform to Section 3-6 of the Standard Specifications to provide supervision of all work completed at the project site.

Contractor shall maintain continuous supervision for all work related to the project at all times. Subcontractors shall not be allowed on the site without the supervision from the general contractor.

#### **1-11 OPERATION AND MAINTENANCE (O&M) MANUALS**

The Contractor shall submit electronic copies of all manufacturer's operation and maintenance manuals and data pertinent to equipment supplied for the pump station and other electrical components. These electronic manuals are in addition to the individual operation and maintenance manuals submitted with each final shop drawing submittal. The Contractor shall prepare and organize the material in three-ring binders with divider tabs and labels and include a table of contents. The manuals shall be submitted per Section 1-12 except that the final O&M manuals shall be submitted within 30 days prior to completion of the project.

The O&M Manual contents shall include the following:

1. List of all equipment furnished for the project with name, address, and telephone number of vendor.
2. List of serial numbers of all equipment furnished.
3. A copy of shop drawings revised to show the "As Built" conditions for mechanical, electrical, and instrumentation and telemetry equipment in final form.
4. Manufacturer's operation and maintenance instructions and parts lists.

5. Tabulation of motor nameplate horsepower, nameplate current, and field measured current, overload relay setting, and catalog number.
6. List of fuses, lamps, seals, and other expendable equipment and devices. Specify size, type, and ordering description.
7. A detailed list of set points for the station's pressures, time delays, and computer operation settings. This will be submitted with a detailed narrative description of how to access all the set points in the system. A printout of all the Panel View PLC Screens shall be provided with a written description of all the functions.
8. The O&M manual will also include all the as-built plans for modifications from the original plans required in the field. A detailed set of AutoCAD drawings for the Control System and motor control center shall be provided along with the markup field plans highlighting all the field changes completed during the entire duration of the project. The as-built plan markup on the original plans shall be submitted to the engineer prior acceptance of the O&M manuals.

#### **1-12 SHOP DRAWING, ASSEMBLY, LAYOUT DRAWINGS, AND MATERIALS**

- 1-12.1 The Contractor shall furnish to the Engineer such working drawings, data on materials, and equipment and samples as are required for the proper control of the work, including, but not limited to pumps, piping, valves, materials, controls, electrical equipment, and related equipment required for the construction of this project, as indicated in the Contract Documents and Section 3-8 of the Standard Specifications and Special Provisions. All working drawings, data, and samples shall be subject to review by the Engineer for conformity with the Plans and Specifications.
- 1-12.2 Working drawings include without limitation, shop detail drawings, fabrication drawings, false work and formwork drawings, pipe layouts, steel reinforcement and similar classes of drawings. They shall contain all required details and information in reasonable scale.
- 1-12.3 Data on materials and equipment include, without limitation, materials and equipment lists, catalog data sheets, cuts, performance curves, diagrams, and similar descriptive lists. Materials and equipment lists shall give, for each item thereon, the name and location of the supplier or manufacturer, trade name, catalog reference, size, finish, and all other pertinent data.
- 1-12.4 The Contractor shall furnish to the Engineer for review one electronic copy of each shop drawing. The Contractor shall properly check and correct all working drawings and data before their submission, whether they are prepared within their own organization or by a subcontractor or supplier. The shop drawings shall be submitted at least 30 calendar days before drawings will be required for commencing the work. Within ten days of receipt of said submissions, the Engineer will return an electronic copy of each drawing to the Contractor with their comments noted thereon. Shop drawings submitted via a FAX machine or MAILED will not be considered for review.
  - (1) If the drawing is returned to the Contractor marked "NO EXCEPTIONS TAKEN", a revision of said drawing will not be required.
  - (2) If the drawing is returned to the Contractor marked "MAKE CORRECTIONS NOTED", formal revision of said drawing will not be required, but the Contractor shall immediately submit a corrected electronic copy to the Engineer.
  - (3) If the drawing is returned to the Contractor marked "REVISE AND RESUBMIT", the Contractor shall revise said drawing and

shall resubmit an electronic copy of said revised drawing to the Engineer.

- (4) If the drawing is returned to the Contractor marked "REJECTED", the Contractor shall revise said drawing and shall resubmit an electronic copy of said revised drawing to the Engineer, as in the case of an original submittal.

Fabrication of an item shall not be commenced before the Engineer has reviewed the pertinent shop drawings and returned a response to the Contractor without rejection or revisions.

- 1-12.5 Revisions indicated on shop drawings shall be considered as changes necessary to meet the requirements of the Contract Plans and Specifications and shall not be taken as the basis of claims for extra work. The Contractor shall have no claim for damages or extension of time due to any delay resulting from making required revisions to shop drawings. The review of said drawings by the Engineer will apply to general design only and will in no way relieve the Contractor of responsibility for errors or omissions contained therein nor will such review operate to waive or modify any provisions or requirements contained in these Contract Plans and Specifications.
- 1-12.6 The Contractor may request a payment of 10% of item after approval of shop drawing or other required submittals.

SECTION G

**TECHNICAL SPECIFICATIONS**

(SUPPLEMENTS AND MODIFICATIONS TO  
THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION)

RELATED TO ELEMENTS SHOWN ON THE ELECTRICAL SHEETS

**30 June 2021  
100% Submittal**

**MESMER LOW FLOW DIVERSION  
CITY OF CULVER CITY  
9770 CULVER BLVD, CULVER CITY, CA**

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**ELECTRICAL SPECIFICATIONS**

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Prepared for:

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Culver City, California 90232



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**JCCA 18040-1**

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## SECTION 260519

## LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

## 1.2 SUMMARY

## A. Section Includes:

- 1. Copper Building wires and cables rated 2000 V and less.
- 2. Connectors, splices, and terminations rated 2000 V and less.

## B. Related Requirements:

- 1. Section 260523 "Control-Voltage Electrical Power Cables" for control systems communications cables and Classes 1, 2, and 3 control cables.

## 1.3 DEFINITIONS

- A. VFC: Variable-frequency controller.

## 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Product Schedule: Indicate type, use, location, and termination locations.

## 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For manufacturer's authorized service representative.
- B. Field quality-control reports.

## 1.6 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Member company of NETA.
  - 1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.



## PART 2 - PRODUCTS

### 2.1 CONDUCTORS AND CABLES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:
  - 1. Alpha Wiring Company
  - 2. Belden Inc.
  - 3. Southwire Company
  - 4. Wesco
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."
- D. Conductors: Copper, complying with ASTM B3 for bare annealed copper and with ASTM B8 and ASTM B496 for stranded conductors.
- E. Comply with UL 1277, UL 1685, and NFPA 70 for Type TC-ER cable used in VFC circuits.
- F. Conductors: Copper.
  - 1. Conductor Insulation: Comply with UL 83 for Type THHN/THWN-2.
- G. Shield:
  - 1. Type TC-ER: Cable designed for use with Variable-Frequency Motor Controllers (VFCs), with oversized crosslinked polyethylene insulation, spiral-wrapped foil plus 85 percent coverage braided shields and insulated full-size ground wire, and sunlight- and oil-resistant outer PVC jacket.

### 2.2 CONNECTORS AND SPLICES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:
  - 1. 3M Electrical Products
  - 2. Hubbell Power Systems, Inc.
  - 3. NSi Industries LLC
  - 4. O-Z/Gedney
  - 5. Thomas & Betts Corporation
- B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated; listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. Lugs: One piece, seamless, designed to terminate conductors specified in this Section.

1. Material: Copper.
2. Type: Two hole with standard barrels.
3. Termination: Compression.

## PART 3 - EXECUTION

### 3.1 CONDUCTOR MATERIAL APPLICATIONS

- A. Feeders: Copper; solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- B. Feeders: Copper for feeders smaller than No. 4 AWG; copper or aluminum for feeders No. 4 AWG and larger. Conductors shall be solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- C. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- D. Branch Circuits: Copper. Solid for No. 12 AWG and smaller; stranded for No. 10 AWG and larger.
- E. VFC Output Circuits Cable: Extra-flexible stranded for all sizes.

### 3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN/THWN-2, single conductors in raceway.
- B. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN/THWN-2, single conductors in raceway.
- C. VFC Output Circuits: Type TC-ER cable with braided shield in conduit.

### 3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.
- B. Complete raceway installation between conductor and cable termination points according to Section 260533 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.
- C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

- E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
- F. Support cables according to Section 260529 "Hangers and Supports for Electrical Systems."

### 3.4 CONNECTIONS

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.
- B. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
  - 1. Use oxide inhibitor in each splice, termination, and tap for aluminum conductors.
- C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches (150 mm) of slack.

### 3.5 IDENTIFICATION

- A. Identify and color-code conductors and cables according to Section 260553 "Identification for Electrical Systems."
- B. Identify each spare conductor at each end with identity number and location of other end of conductor, and identify as spare conductor.

### 3.6 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Install sleeves and sleeve seals at penetrations of all concrete walls, floors and ceilings, including underground structures such as boxes, vaults and wells. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

### 3.7 FIRESTOPPING

- A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly.

### 3.8 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
  - 1. After installing conductors and cables and before electrical circuitry has been energized, testservice entrance and feeder conductors and conductors feeding the following critical equipment and services for compliance with requirements.

2. Perform each of the following visual and electrical tests:
  - a. Inspect exposed sections of conductor and cable for physical damage and correct connection according to the single-line diagram.
  - b. Test bolted connections for high resistance using one of the following:
    - 1) A low-resistance ohmmeter.
    - 2) Calibrated torque wrench.
    - 3) Thermographic survey.
  - c. Inspect compression applied connectors for correct cable match and indentation.
  - d. Inspect for correct identification.
  - e. Inspect cable jacket and condition.
  - f. Insulation-resistance test on each conductor with respect to ground and adjacent conductors. Apply a potential of 500-V dc for 300-V rated cable and 1000-V dc for 600-V rated cable for a one-minute duration.
  - g. Continuity test on each conductor and cable.
  - h. Uniform resistance of parallel conductors.
- B. Cables will be considered defective if they do not pass tests and inspections.
- C. Prepare test and inspection reports to record the following:
  1. Procedures used.
  2. Results that comply with requirements.
  3. Results that do not comply with requirements and corrective action taken to achieve compliance with requirements.

END OF SECTION 260519

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## SECTION 260523

## CONTROL-VOLTAGE ELECTRICAL POWER CABLES

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

## 1.2 SUMMARY

- A. Section Includes:
  - 1. UTP cabling.
  - 2. Low-voltage control cabling.
  - 3. Control-circuit conductors.
  - 4. Identification products.

## 1.3 DEFINITIONS

- A. EMI: Electromagnetic interference.
- B. Low Voltage: As defined in NFPA 70 for circuits and equipment operating at less than 50 V or for remote-control and signaling power-limited circuits.
- C. Plenum: A space forming part of the air distribution system to which one or more air ducts are connected. An air duct is a passageway, other than a plenum, for transporting air to or from heating, ventilating, or air-conditioning equipment.
- D. RCDD: Registered Communications Distribution Designer.
- E. UTP: Unshielded twisted pair.

## 1.4 ACTION SUBMITTALS

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

## 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency, installation supervisor, and field inspector.
- B. Source quality-control reports.

- C. Field quality-control reports.

## 1.6 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Accredited by NETA.

## PART 2 - PRODUCTS

### 2.1 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

### 2.2 PERFORMANCE REQUIREMENTS

- A. Flame Travel and Smoke Density in Plenums: As determined by testing identical products according to NFPA 262, by a qualified testing agency. Identify products for installation in plenums with appropriate markings of applicable testing agency.
  - 1. Flame Travel Distance: 60 inches (1520 mm) or less.
  - 2. Peak Optical Smoke Density: 0.5 or less.
  - 3. Average Optical Smoke Density: 0.15 or less.
- B. Flame Travel and Smoke Density for Riser Cables in Non-Plenum Building Spaces: As determined by testing identical products according to UL 1666.
- C. Flame Travel and Smoke Density for Cables in Non-Riser Applications and Non-Plenum Building Spaces: As determined by testing identical products according to UL 1685.

### 2.3 UTP CABLE

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. 3M
  - 2. Alpha Wire Company
  - 3. Genesis Cable Products
  - 4. Superior Essex Inc.
- B. Description: 100-ohm, 25-pair UTP covered with a thermoplastic jacket.
  - 1. Comply with ICEA S-102-700 for mechanical properties of Category 6 cables.
  - 2. Comply with TIA-568-C.1 for performance specifications.
  - 3. Comply with TIA-568-C.2, Category 6A.
  - 4. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with NEMA WC 66, UL 444 and NFPA 70 for the following types:
    - a. Communications, Plenum Rated: Type CMP complying with UL 1685.

- b. Communications, Plenum Rated: Type CMP in metallic conduit installed per NFPA 70, Article 300.22, "Wiring in Ducts, Plenums, and Other Air-Handling Spaces."

## 2.4 UTP CABLE HARDWARE

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:
  - 1. ADC
  - 2. Belden Inc.
  - 3. Hubbel Incorporated
  - 4. Leviton Manufacturing Company
  - 5. Molex Premise Network
  - 6. Panduit Corp
- B. General Requirements for Cable Connecting Hardware: Comply with TIA-568-C.2, IDC type, with modules designed for punch-down caps or tools. Cables shall be terminated with connecting hardware of same category or higher.
- C. Connecting Blocks: Provide blocks for the number of cables terminated on the block, plus 25 percent spare. Integral with connector bodies, including plugs and jacks where indicated.
- D. Cross-Connect: Modular array of connecting blocks arranged to terminate building cables and permit interconnection between cables.
  - 1. Number of Terminals per Field: One for each conductor in assigned cables.
- E. Patch Panel: Modular panels housing multiple-numbered jack units with IDC-type connectors at each jack for permanent termination of pair groups of installed cables.
  - 1. Number of Jacks per Field: One for each four-pair UTP cable indicated.
- F. Jacks and Jack Assemblies: 100-ohm, balanced, twisted-pair connector; four-pair, eight-position modular. Comply with TIA-568-C.1.
- G. Patch Cords: Factory-made, four-pair cables in 36-inch (900-mm) lengths; terminated with eight-position modular plug at each end.
  - 1. Patch cords shall have bend-relief-compliant boots and color-coded icons to ensure Category 6 performance. Patch cords shall have latch guards to protect against snagging.
  - 2. Patch cords shall have color-coded boots for circuit identification.
- H. Legend:
  - 1. Factory labeled by silk-screening.
  - 2. Machine printed, in the field, using adhesive-tape label.
  - 3. Snap-in, clear-label covers and machine-printed paper inserts.



## 2.5 RS-485 CABLE

### A. Standard Cable: NFPA 70, Type CMG.

1. Paired, one pair, twisted, No. 22 AWG, stranded (7x30) tinned-copper conductors.
2. PVC insulation.
3. Unshielded.
4. PVC jacket.
5. Flame Resistance: Comply with UL 1685.

## 2.6 LOW-VOLTAGE CONTROL CABLE

### A. Paired Cable: NFPA 70, Type CMP.

1. One pair, twisted, No. 16 AWG, stranded (19x29) tinned-copper conductors.
2. PVC insulation.
3. Unshielded.
4. PVC jacket.
5. Flame Resistance: Comply with UL 1685.

## 2.7 CONTROL-CIRCUIT CONDUCTORS

- A. Class 1 Control Circuits: Stranded copper, Type THHN/THWN-2, complying with UL 83 in raceway.
- B. Class 2 Control Circuits: Stranded copper, Type THHN/THWN-2, complying with UL 83 in raceway.
- C. Class 3 Remote-Control and Signal Circuits: Stranded copper, Type THHN/THWN-2, complying with UL 83 in raceway.

## 2.8 SOURCE QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to evaluate cables.
- B. Factory test UTP cables according to TIA-568-C.2.
- C. Factory test optical-fiber cables according to TIA-568-C.3.
- D. Cable will be considered defective if it does not pass tests and inspections.
- E. Prepare test and inspection reports.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Test cables on receipt at Project site.
  - 1. Test each cable for open and short circuits.

### 3.2 INSTALLATION OF RACEWAYS AND BOXES

- A. Comply with requirements in Section 260533 "Raceways and Boxes for Electrical Systems" for raceway selection and installation requirements for boxes, conduits, and wireways as supplemented or modified in this Section.
  - 1. Outlet boxes shall be no smaller than 2 inches (50 mm) wide, 3 inches (75 mm) high, and 2-1/2 inches (64 mm) deep.
  - 2. Flexible metal conduit shall not be used.
- B. Comply with TIA-569-C for pull-box sizing, length of conduit, and number of bends between pull points.
- C. Install manufactured conduit sweeps and long-radius elbows unless physically not feasible. Obtain written authorization from Owner and Engineer of Record where not feasible before proceeding.
- D. Raceway Installation in Equipment Rooms:
  - 1. Position conduit ends adjacent to a corner on the board or box where conduit is terminated.
  - 2. Secure conduits per California Electrical Code requirements
  - 3. Extend conduits 3 inches (75 mm) above finished floor.
  - 4. Install metal conduits with grounding bushings and connect with grounding conductor to grounding system.

### 3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Comply with NECA 1.
- B. General Requirements for Cabling:
  - 1. Comply with TIA-568-C Series of standards.
  - 2. Comply with BICSI ITSIMM, Ch. 5, "Copper Structured Cabling Systems" and Ch. 6, "Optical Fiber Structured Cabling Systems."
  - 3. Terminate all conductors; no cable shall contain unterminated elements. Make terminations only at indicated outlets, terminals, and cross-connect and patch panels.
  - 4. Cables may not be spliced.
  - 5. Secure and support cables at intervals not exceeding 30 inches (760 mm) and not more than 6 inches (150 mm) from cabinets, boxes, fittings, outlets, racks, frames, and terminals.

6. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI ITSIMM, Ch. 5, "Copper Structured Cabling Systems" and Ch. 6, "Optical Fiber Structured Cabling Systems." Install lacing bars and distribution spools.
  7. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation and replace it with new cable.
  8. Cold-Weather Installation: Bring cable to room temperature before dereeling. Do not use heat lamps for heating.
  9. Pulling Cable: Comply with BICSI ITSIMM, Ch. 5, "Copper Structured Cabling Systems" and Ch. 6, "Optical Fiber Structured Cabling Systems." Monitor cable pull tensions.
  10. Support: Do not allow cables to lay on removable ceiling tiles.
  11. Secure: Fasten securely in place with hardware specifically designed and installed so as to not damage cables.
- C. UTP Cable Installation:
1. Comply with TIA-568-C.2.
  2. Do not untwist UTP cables more than 1/2 inch (12 mm) at the point of termination to maintain cable geometry.
- D. Installation of Control-Circuit Conductors:
1. Install wiring in raceways. Comply with requirements specified in Section 260533 "Raceways and Boxes for Electrical Systems."
- E. Open-Cable Installation:
1. Open-Cable installation is are not permitted. All wiring must be in conduit.
- F. Separation from EMI Sources:
1. Comply with BICSI TDMM and TIA-569-C recommendations for separating unshielded copper voice and data communications cable from potential EMI sources including electrical power lines and equipment.
  2. Separation between open communications cables or cables in nonmetallic raceways and unshielded power conductors and electrical equipment shall be as follows:
    - a. Electrical Equipment or Circuit Rating Less Than 2 kVA: A minimum of 5 inches (127 mm).
    - b. Electrical Equipment or Circuit Rating between 2 and 5 kVA: A minimum of 12 inches (305 mm).
    - c. Electrical Equipment or Circuit Rating More Than 5 kVA: A minimum of 24 inches (600 mm).
  3. Separation between communications cables in grounded metallic raceways and unshielded power lines or electrical equipment shall be as follows:
    - a. Electrical Equipment or Circuit Rating Less Than 2 kVA: A minimum of 2-1/2 inches (64 mm).

- b. Electrical Equipment or Circuit Rating between 2 and 5 kVA: A minimum of 6 inches (150 mm).
  - c. Electrical Equipment or Circuit Rating More Than 5 kVA: A minimum of 12 inches (305 mm).
- 4. Separation between communications cables in grounded metallic raceways and power lines and electrical equipment located in grounded metallic conduits or enclosures shall be as follows:
  - a. Electrical Equipment or Circuit Rating Less Than 2 kVA: No requirement.
  - b. Electrical Equipment or Circuit Rating between 2 and 5 kVA: A minimum of 3 inches (75 mm).
  - c. Electrical Equipment or Circuit Rating More Than 5 kVA: A minimum of 6 inches (150 mm).
- 5. Separation between Communications Cables and Electrical Motors and Transformers, 5 kVA or 5 HP and Larger: A minimum of 48 inches (1200 mm).
- 6. Separation between Communications Cables and Fluorescent Fixtures: A minimum of 5 inches (127 mm).

### 3.4 REMOVAL OF CONDUCTORS AND CABLES

- A. Remove abandoned conductors and cables. Abandoned conductors and cables are those installed that are not terminated at equipment and are not identified with a tag for future use.

### 3.5 CONTROL-CIRCUIT CONDUCTORS

- A. Minimum Conductor Sizes:
  - 1. Class 1 remote-control and signal circuits; No 14 AWG.
  - 2. Class 2 low-energy, remote-control, and signal circuits; No. 16 AWG.
  - 3. Class 3 low-energy, remote-control, alarm, and signal circuits; No 12 AWG.

### 3.6 FIRESTOPPING

- A. Comply with TIA-569-C, Annex A, "Firestopping."
- B. Comply with BICSI TDMM, "Firestopping" Chapter.

### 3.7 GROUNDING

- A. For data communication wiring, comply with TIA-607-B and with BICSI TDMM, "Bonding and Grounding (Earthing)" Chapter.
- B. For low-voltage control wiring and cabling, comply with requirements in Section 260526 "Grounding and Bonding for Electrical Systems."

### 3.8 IDENTIFICATION

- A. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."
- B. Identify data and communications system components, wiring, and cabling according to TIA-606-A; label printers shall use label stocks, laminating adhesives, and inks complying with UL 969.

### 3.9 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Tests and Inspections:
  - 1. Visually inspect UTP cable jacket materials for UL or third-party certification markings. Inspect cabling terminations to confirm color-coding for pin assignments, and inspect cabling connections to confirm compliance with TIA-568-C.1.
  - 2. Visually inspect cable placement, cable termination, grounding and bonding, equipment and patch cords, and labeling of all components.
  - 3. Test UTP cabling for direct-current loop resistance, shorts, opens, intermittent faults, and polarity between conductors. Test operation of shorting bars in connection blocks. Test cables after termination, but not after cross-connection.
    - a. Test instruments shall meet or exceed applicable requirements in TIA-568-C.2. Perform tests with a tester that complies with performance requirements in its "Test Instruments (Normative)" Annex, complying with measurement accuracy specified in its "Measurement Accuracy (Informative)" Annex. Use only test cords and adapters that are qualified by test equipment manufacturer for channel or link test configuration.
- C. Document data for each measurement. Print data for submittals in a summary report that is formatted using Table 10.1 in BICSI TDMM as a guide, or transfer the data from the instrument to the computer, save as text files, print, and submit.
- D. End-to-end cabling will be considered defective if it does not pass tests and inspections.
- E. Prepare test and inspection reports.

END OF SECTION 260523

## SECTION 260526

## GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

## 1.2 SUMMARY

- A. Section includes grounding and bonding systems and equipment.

## 1.3 ACTION SUBMITTALS

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

## 1.4 INFORMATIONAL SUBMITTALS

- A. As-Built Data: Plans showing dimensioned as-built locations of grounding features specified in "Field Quality Control" Article, including the following:
  - 1. Test wells.
  - 2. Ground rods.
  - 3. Ground rings.
  - 4. Grounding arrangements and connections for separately derived systems.
- B. Qualification Data: For testing agency and testing agency's field supervisor.
- C. Field quality-control reports.

## 1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Certified by NETA.

## PART 2 - PRODUCTS

## 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:

1. ERICO International
2. ILSCO
3. O-Z/Gedney
4. Siemens Power Transmission
5. Thomas & Betts Corporation

## 2.2 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with UL 467 for grounding and bonding materials and equipment.

## 2.3 CONDUCTORS

- A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- B. Bare Copper Conductors:
  1. Solid Conductors: ASTM B 3.
  2. Stranded Conductors: ASTM B 8.
  3. Tinned Conductors: ASTM B 33.
  4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch (6 mm) in diameter.
  5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
  6. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.
  7. Tinned Bonding Jumper: Tinned-copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.

## 2.4 CONNECTORS

- A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.
- B. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.
- C. Cable-to-Cable Connectors: Compression type, copper or copper alloy.
- D. Conduit Hubs: Mechanical type, terminal with threaded hub.
- E. Service Post Connectors: Mechanical type, bronze alloy terminal, in short- and long-stud lengths, capable of single and double conductor connections.
- F. Straps: Solid copper, copper lugs. Rated for 600 A.

- G. U-Bolt Clamps: Mechanical type, copper or copper alloy, terminal listed for direct burial.
- H. Water Pipe Clamps:
  - 1. Mechanical type, two pieces with stainless-steel bolts.
    - a. Material: Die-cast zinc alloy.
    - b. Listed for direct burial.
  - 2. U-bolt type with malleable-iron clamp and copper ground connector rated for direct burial.

### PART 3 - EXECUTION

#### 3.1 APPLICATIONS

- A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.
- B. Conductor Terminations and Connections:
  - 1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.

#### 3.2 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors with all feeders and branch circuits.
- B. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:
  - 1. Feeders and branch circuits.
  - 2. Lighting circuits.
  - 3. Receptacle circuits.
  - 4. Single-phase motor and appliance branch circuits.
  - 5. Three-phase motor and appliance branch circuits.
  - 6. Flexible raceway runs.

#### 3.3 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

#### 3.4 FIELD QUALITY CONTROL

- A. Perform tests and inspections with the assistance of a factory-authorized service representative.



- B. Tests and Inspections:
  - 1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
  - 2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
- C. Grounding system will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.
- E. Report measured ground resistances that exceed the following values:
  - 1. Power and Lighting Equipment or System with Capacity of 500 kVA and Less: 10 ohms.
- F. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Construction Manager promptly and include recommendations to reduce ground resistance.

END OF SECTION 260526

## SECTION 260529

## HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

## 1.2 SUMMARY

- A. Section Includes:

- 1. Hangers and supports for electrical equipment and systems.
  - 2. Construction requirements for concrete bases.

## 1.3 ACTION SUBMITTALS

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

- 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:
    - a. Hangers.
    - b. Steel slotted support systems.
    - c. Nonmetallic support systems.
    - d. Trapeze hangers.
    - e. Clamps.
    - f. Turnbuckles.
    - g. Sockets.
    - h. Eye nuts.
    - i. Saddles.
    - j. Brackets.
  - 2. Include rated capacities and furnished specialties and accessories.

- B. Shop Drawings: Signed and sealed by a qualified professional engineer. For fabrication and installation details for electrical hangers and support systems.

- 1. Trapeze hangers. Include product data for components.
  - 2. Steel slotted-channel systems.
  - 3. Equipment supports.

- C. Delegated-Design Submittal: For hangers and supports for electrical systems.

1. Include design calculations and details of trapeze hangers.
2. Include design calculations for seismic restraints.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Seismic Qualification Certificates: For hangers and supports for electrical equipment and systems, accessories, and components, from manufacturer.
  1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
  2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
  3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
- B. Welding certificates.

#### 1.5 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M.
- B. Welding Qualifications: Qualify procedures and personnel according to the following:
  1. AWS D1.1/D1.1M.
  2. AWS D1.2/D1.2M.

### PART 2 - PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer licensed in the State of California to design hanger and support system.
- B. Seismic Performance: Hangers and supports shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
  1. The term "withstand" means "the supported equipment and systems will remain in place without separation of any parts when subjected to the seismic forces specified and the system will be fully operational after the seismic event."
  2. Component Importance Factor: 1.0.
- C. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
  1. Flame Rating: Class 1.
  2. Self-extinguishing according to ASTM D 635.

## 2.2 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

- A. Steel Slotted Support Systems: Comply with MFMA-4 factory-fabricated components for field assembly.
  - 1. Material: Galvanized steel.
  - 2. Channel Width: 1-5/8 inches (41.25 mm).
  - 3. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
  - 4. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
  - 5. Channel Dimensions: Selected for applicable load criteria.
- B. Conduit and Cable Support Devices: Steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- C. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for nonarmored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be made of malleable iron.
- D. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M steel plates, shapes, and bars; black and galvanized.
  - 1. Concrete Inserts: Steel or malleable-iron, slotted support system units are similar to MSS Type 18 units and comply with MFMA-4 or MSS SP-58.
  - 2. Clamps for Attachment to Steel Structural Elements: MSS SP-58 units are suitable for attached structural element.
  - 3. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
  - 4. Toggle Bolts: Stainless-steel springhead type.
  - 5. Hanger Rods: Threaded steel.

## 2.3 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

- A. Description: Welded or bolted structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.

## PART 3 - EXECUTION

### 3.1 APPLICATION

- A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems unless requirements in this Section are stricter.
- B. Comply with requirements for raceways and boxes specified in Section 260533 "Raceways and Boxes for Electrical Systems."

- C. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMTs, IMCs, and RMCs as scheduled in NECA 1, where its Table 1 lists maximum spacings that are less than those stated in NFPA 70. Minimum rod size shall be 1/4 inch (6 mm) in diameter.
- D. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted or other support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
  - 1. Secure raceways and cables to these supports with two-bolt conduit clamps.
- E. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch (38-mm) and smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.

### 3.2 SUPPORT INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this article.
- B. Raceway Support Methods: In addition to methods described in NECA 1, EMTs, IMCs, and RMCs may be supported by openings through structure members, according to NFPA 70.
- C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb (90 kg).
- D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
  - 1. To Wood: Fasten with lag screws or through bolts.
  - 2. To New Concrete: Bolt to concrete inserts.
  - 3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
  - 4. To Existing Concrete: Expansion anchor fasteners.
  - 5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches (100 mm) thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches (100 mm) thick.
  - 6. To Steel: Welded threaded studs complying with AWS D1.1/D1.1M, with lock washers and nuts.
  - 7. To Light Steel: Sheet metal screws.
  - 8. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate by means that comply with seismic-restraint strength and anchorage requirements.

- E. Drill holes for expansion anchors in concrete at locations and to depths that avoid the need for reinforcing bars.

### 3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

- A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.
- B. Field Welding: Comply with AWS D1.1/D1.1M.

### 3.4 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
  - 1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils (0.05 mm).
- B. Touchup: Comply with all requirements for cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal.
- C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION 260529

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## SECTION 260533

## RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

## 1.2 SUMMARY

## A. Section Includes:

1. Metal conduits, tubing, and fittings.
2. Nonmetal conduits, tubing, and fittings.
3. Metal wireways and auxiliary gutters.
4. Boxes, enclosures, and cabinets.
5. Handholes and boxes for exterior underground cabling.

## B. Related Requirements:

1. Section 260543 "Underground Ducts and Raceways for Electrical Systems" for exterior ductbanks, manholes, and underground utility construction.

## 1.3 DEFINITIONS

- A. GRC: Galvanized rigid steel conduit.

## 1.4 ACTION SUBMITTALS

- A. Product Data: For surface raceways, wireways and fittings, hinged-cover enclosures, and cabinets.
- B. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, and attachment details.

## 1.5 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Conduit routing plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of items involved:
  1. Structural members in paths of conduit groups with common supports.



2. HVAC and plumbing items and architectural features in paths of conduit groups with common supports.
- B. Qualification Data: For professional engineer.
- C. Seismic Qualification Certificates: For enclosures, cabinets, and conduit racks and their mounting provisions, including those for internal components, from manufacturer.
1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
  2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
  3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
  4. Detailed description of conduit support devices and interconnections on which the certification is based and their installation requirements.
- D. Source quality-control reports.

## PART 2 - PRODUCTS

### 2.1 METAL CONDUITS, TUBING, AND FITTINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:
1. Allied Tube & Conduit
  2. O-Z/Gedney
  3. Southwire Company
  4. Thomas & Betts Corporation
  5. Western Tube and conduit
  6. Cooper
- B. Listing and Labeling: Metal conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. GRC: Comply with ANSI C80.1 and UL 6.
- D. PVC-Coated Steel Conduit: PVC-coated rigid steel conduit.
1. Comply with NEMA RN 1.
  2. Coating Thickness: 0.040 inch, minimum.
- E. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.
- F. Fittings for Metal Conduit: Comply with NEMA FB 1 and UL 514B.
1. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 886 and NFPA 70.
  2. Fittings for EMT:

- a. Material: Steel.
  - b. Type: Compression.
- 3. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.
- 4. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch, with overlapping sleeves protecting threaded joints.
- G. Joint Compound for GRC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.
- H. Fittings for conduits in pump wells, in valve boxes or in any other underground box or structure that contains any piping or system other than Electrical systems:
  - 1. Type EYS (Vertical applications) and type EZS (Horizontal applications). It is acceptable to use one type in lieu of the other only if the manufacturer has listed the box for use in the applicable orientation.
  - 2. In addition, provide Sealing Fittings in the Electrical Enclosure where conduits enter the equipment to avoid allowing gasses to travel into the equipment.
  - 3. Provide and apply sealing compound as recommended by the fitting manufacturer.

## 2.2 NONMETALLIC CONDUITS, TUBING, AND FITTINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:
  - 1. AFC Cable Systems
  - 2. Conducx International
  - 3. Electri-Flex Company
  - 4. RACO; Hubbell
  - 5. Thomas & Betts Corporation
- B. Listing and Labeling: Nonmetallic conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.
- D. Rigid HDPE: Comply with UL 651A.
- E. Continuous HDPE: Comply with UL 651B.
- F. Coilable HDPE: Preassembled with conductors or cables, and complying with ASTM D 3485.
- G. RTRC: Comply with UL 1684A and NEMA TC 14.
- H. Fittings for RNC: Comply with NEMA TC 3; match to conduit or tubing type and material.

- I. Solvents and Adhesives: As recommended by conduit manufacturer.

## 2.3 METAL WIREWAYS AND AUXILIARY GUTTERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:
  - 1. B-Line
  - 2. Hoffman
  - 3. Monosystems, Inc.
  - 4. Square D
- B. Description: Sheet metal, complying with UL 870 and NEMA 250, Type 3R unless otherwise indicated, and sized according to NFPA 70.
  - 1. Metal wireways installed outdoors shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. Fittings and Accessories: Include covers, couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.
- D. Wireway Covers: Hinged type unless otherwise indicated.
- E. Finish: Manufacturer's standard enamel finish.

## 2.4 BOXES, ENCLOSURES, AND CABINETS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:
  - 1. Crouse-Hinds
  - 2. FSR
  - 3. Hoffman
  - 4. Hubbell Incorporated
  - 5. Oldcastle Enclosure
  - 6. O-Z/Gedney
  - 7. RACO; Hubbell
  - 8. Thomas & Betts Corporation
- B. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.
- C. Utilize Stainless Steel boxes and fittings in the pump wells, in valve boxes or in any other underground box or structure that contains any piping or system other than Electrical system.
- D. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.
- E. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, ferrous alloy, Type FD, with gasketed cover.

- F. Luminaire Outlet Boxes: Nonadjustable, designed for attachment of luminaire weighing 50 lb. Outlet boxes designed for attachment of luminaires weighing more than 50 lb shall be listed and marked for the maximum allowable weight.
- G. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- H. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, cgalvanized, cast iron with gasketed cover.
- I. Box extensions used to accommodate new building finishes shall be of same material as recessed box.
- J. Device Box Dimensions: 4 inches by 2-1/8 inches by 2-1/8 inches deep.
- K. Gangable boxes are allowed.
- L. Hinged-Cover Enclosures: Comply with UL 50 and NEMA 250, Type 4x Stainless-steel with continuous-hinge cover with flush latch unless otherwise indicated.
  - 1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
  - 2. Interior Panels: Steel; all sides finished with manufacturer's standard enamel.
- M. Cabinets:
  - 1. NEMA 250, Type 4X Stainless-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
  - 2. Hinged door in front cover with flush latch and concealed hinge.
  - 3. Key latch to match panelboards.
  - 4. Metal barriers to separate wiring of different systems and voltage.
  - 5. Accessory feet where required for freestanding equipment.
  - 6. Nonmetallic cabinets shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

## 2.5 HANDHOLES AND BOXES FOR EXTERIOR UNDERGROUND WIRING

- A. General Requirements for Handholes and Boxes:
  - 1. Boxes and handholes for use in underground systems shall be designed and identified as defined in NFPA 70, for intended location and application.
  - 2. Boxes installed in wet areas shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Polymer-Concrete Handholes and Boxes with Polymer-Concrete Cover: Molded of sand and aggregate, bound together with polymer resin, and reinforced with steel, fiberglass, or a combination of the two.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Carson Industries LLC
    - b. Olcastle Precast, Inc.

- c. Synertech Moulded Products.
  - d. Standard: Comply with SCTE 77.
2. Configuration: Designed for flush burial with closed bottom unless otherwise indicated.
  3. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure and handhole location.
  4. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
  5. Cover Legend: Molded lettering, "ELECTRIC."
  6. Conduit Entrance Provisions: Conduit-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.
  7. Handholes **12 Inches Wide by 24 Inches Long**] and Larger: Have inserts for cable racks and pulling-in irons installed before concrete is poured.

## 2.6 SOURCE QUALITY CONTROL FOR UNDERGROUND ENCLOSURES

- A. Handhole and Pull-Box Prototype Test: Test prototypes of handholes and boxes for compliance with SCTE 77. Strength tests shall be for specified tier ratings of products supplied.
  1. Tests of materials shall be performed by an independent testing agency.
  2. Strength tests of complete boxes and covers shall be by either an independent testing agency or manufacturer. A qualified registered professional engineer shall certify tests by manufacturer.
  3. Testing machine pressure gages shall have current calibration certification complying with ISO 9000 and ISO 10012 and traceable to NIST standards.

## PART 3 - EXECUTION

### 3.1 RACEWAY APPLICATION

- A. Outdoors: Apply raceway products as specified below unless otherwise indicated:
  1. Exposed Conduit: GRC.
  2. Underground Conduit: RNC, Type EPC-40-PVCconcrete encased.
  3. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
  4. Boxes and Enclosures, Aboveground: NEMA 250, Type 4X, stainless-steel.
- B. Minimum Raceway Size: 3/4-inch trade size.
- C. Raceway Fittings: Compatible with raceways and suitable for use and location.
  1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
  2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.

3. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.
- D. Install nonferrous conduit or tubing for circuits operating above 60 Hz..
- E. Do not install aluminum conduits, boxes, or fittings.
- F. Install surface raceways only where indicated on Drawings.
- G. Do not install nonmetallic conduit where ambient temperature exceeds 120 deg F.

### 3.2 INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum conduits. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.
- B. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- C. Complete raceway installation before starting conductor installation.
- D. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for hangers and supports.
- E. Arrange stub-ups so curved portions of bends are not visible above finished slab.
- F. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches of changes in direction.
- G. Support conduit within 12 inches of enclosures to which attached.
- H. Utilize Stainless Steel boxes and fittings in the pump wells, in valve boxes or in any other underground box or structure that contains any piping or system other than Electrical systems.
- I. Utilize type EYS / EZS Sealing Fittings in pump wells, in valve boxes or in any other underground box or structure that contains any piping or system other than Electrical systems. In addition, provide Sealing Fittings in the Electrical Enclosure where conduits enter the equipment to avoid allowing gasses to travel into the equipment.
- J. Raceways Embedded in Slabs:
  1. Run conduit larger than 1-inch trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support. Secure raceways to reinforcement at maximum 10-foot intervals.
  2. Arrange raceways to cross building expansion joints at right angles with expansion fittings.
  3. Arrange raceways to keep a minimum of 2 inches of concrete cover in all directions.

4. Do not embed threadless fittings in concrete unless specifically approved by Architect for each specific location.
  5. Change from ENT to GRC before rising above floor.
- K. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.
- L. Coat field-cut threads on PVC-coated raceway with a corrosion-preventing conductive compound prior to assembly.
- M. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.
- N. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch trade size and insulated throat metal bushings on 1-1/2-inch trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.
- O. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.
- P. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.
- Q. Cut conduit perpendicular to the length. For conduits 2-inch trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.
- R. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.
- S. Surface Raceways:
1. Install surface raceway with a minimum 2-inch radius control at bend points.
  2. Secure surface raceway with screws or other anchor-type devices at intervals not exceeding 48 inches and with no less than two supports per straight raceway section. Support surface raceway according to manufacturer's written instructions. Tape and glue are not acceptable support methods.
- T. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings according to NFPA 70.
- U. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:
1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.

2. Where an underground service raceway enters a building or structure.
  3. Where otherwise required by NFPA 70.
- V. Comply with manufacturer's written instructions for solvent welding RNC and fittings.
- W. Expansion-Joint Fittings:
1. Install in each run of aboveground RNC that is located where environmental temperature change may exceed 30 deg F and that has straight-run length that exceeds 25 feet. Install in each run of aboveground RMC conduit that is located where environmental temperature change may exceed 100 deg F and that has straight-run length that exceeds 100 feet.
  2. Install type and quantity of fittings that accommodate temperature change listed for each of the following locations:
    - a. Outdoor Locations Not Exposed to Direct Sunlight: 125 deg F temperature change.
    - b. Outdoor Locations Exposed to Direct Sunlight: 155 deg F temperature change.
  3. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per deg F of temperature change for PVC conduits. Install fitting(s) that provide expansion and contraction for at least 0.000078 inch per foot of length of straight run per deg F of temperature change for metal conduits.
  4. Install expansion fittings at all locations where conduits cross building or structure expansion joints.
  5. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at time of installation. Install conduit supports to allow for expansion movement.
- X. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inches of flexible conduit for equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
1. Use LFMC in damp or wet locations subject to severe physical damage.
  2. Use LFMC or LFNC in damp or wet locations not subject to severe physical damage.
- Y. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.
- Z. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a raintight connection between box and cover plate or supported equipment and box.
- AA. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.
- BB. Locate boxes so that cover or plate will not span different building finishes.
- CC. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.



- DD. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.
- EE. Utilize Stainless Steel boxes and fittings in the pump wells, in valve boxes or in any other underground box or structure that contains any piping or system other than Electrical system.

### 3.3 INSTALLATION OF UNDERGROUND CONDUIT

#### A. Direct-Buried Conduit:

1. Excavate trench bottom to provide firm and uniform support for conduit.
2. Install backfill. Comply with requirements of other specifications in the project manual relating to backfill.
3. After installing conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 12 inches of finished grade, make final conduit connection at end of run and complete backfilling with normal.
4. Install manufactured duct elbows for stub-ups at poles and equipment and at building entrances through floor unless otherwise indicated. Encase elbows for stub-up ducts throughout length of elbow.
5. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through floor.
  - a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches of concrete for a minimum of 12 inches on each side of the coupling.
  - b. For stub-ups at equipment mounted on outdoor concrete bases and where conduits penetrate building foundations, extend steel conduit horizontally a minimum of 60 inches from edge of foundation or equipment base. Install insulated grounding bushings on terminations at equipment.
6. Warning Planks: Bury warning planks approximately 12 inches above direct-buried conduits but a minimum of 6 inches below grade. Align planks along centerline of conduit.
7. Underground Warning Tape: Comply with requirements in Section 260553 "Identification for Electrical Systems."

### 3.4 INSTALLATION OF UNDERGROUND HANDHOLES AND BOXES

- A. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting conduits to minimize bends and deflections required for proper entrances.
- B. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1/2-inch sieve to No. 4 sieve and compacted to same density as adjacent undisturbed earth.
- C. Elevation: In paved areas, set so cover surface will be flush with finished grade. Set covers of other enclosures 1 inch above finished grade.

- D. Install removable hardware, including pulling eyes, cable stanchions, cable arms, and insulators, as required for installation and support of cables and conductors and as indicated. Select arm lengths to be long enough to provide spare space for future cables but short enough to preserve adequate working clearances in enclosure.
- E. Field-cut openings for conduits according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

### 3.5 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

### 3.6 PROTECTION

- A. Protect coatings, finishes, and cabinets from damage and deterioration.
  - 1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
  - 2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION 260533

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## SECTION 260543

## UNDERGROUND DUCTS AND RACEWAYS FOR ELECTRICAL SYSTEMS

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

## 1.2 SUMMARY

- A. Section Includes:

- 1. Concrete-encased conduit, ducts, and duct accessories.
  - 2. Handholes and boxes.

## 1.3 DEFINITIONS

- A. Trafficways: Locations where vehicular or pedestrian traffic is a normal course of events.

## 1.4 ACTION SUBMITTALS

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

- 1. Include duct-bank materials, including separators and miscellaneous components.
  - 2. Include ducts and conduits and their accessories, including elbows, end bells, bends, fittings, and solvent cement.
  - 3. Include accessories for, handholes, boxes, and other utility structures.
  - 4. Include warning tape.
  - 5. Include warning planks.

- B. Shop Drawings:

- 1. Precast or Factory-Fabricated Underground Utility Structures:
    - a. Include plans, elevations, sections, details, attachments to other work, and accessories.
    - b. Include duct entry provisions, including locations and duct sizes.
    - c. Include reinforcement details.
    - d. Include frame and cover design.
    - e. Include grounding details.
    - f. Include dimensioned locations of cable rack inserts and pulling-in and lifting irons
    - g. Include joint details.

2. Factory-Fabricated Handholes and Boxes Other Than Precast Concrete:

- a. Include dimensioned plans, sections, and elevations, and fabrication and installation details.
- b. Include duct entry provisions, including locations and duct sizes.
- c. Include cover design.
- d. Include grounding details.
- e. Include dimensioned locations of cable rack inserts, and pulling-in and lifting irons.

1.5 INFORMATIONAL SUBMITTALS

- A. Duct-Bank Coordination Drawings: Show duct profiles and coordination with other utilities and underground structures.
  - 1. Include plans and sections, drawn to scale, and show bends and locations of expansion fittings.
  - 2. Drawings shall be signed and sealed by a qualified professional engineer.
- B. Product Certificates: For concrete and steel used in precast concrete handholes, as required by ASTM C 858.
- C. Qualification Data: For professional engineer and testing agency responsible for testing nonconcrete handholes and boxes.
- D. Source quality-control reports.
- E. Field quality-control reports.

1.6 MAINTENANCE MATERIALS SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
- B. Furnish cable-support stanchions, arms, insulators, and associated fasteners in quantities equal to 5 percent of quantity of each item installed.

1.7 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.

1.8 FIELD CONDITIONS

- A. Interruption of Existing Electrical Service: Do not interrupt electrical service to facilities occupied by Owner or others unless permitted under the following conditions, and then only after arranging to provide temporary electrical service according to requirements indicated:

1. Notify Construction Manager no fewer than ten days in advance of proposed interruption of electrical service.
  2. Do not proceed with interruption of electrical service without Owner's written permission.
- B. Ground Water: Assume ground-water level is at grade level unless a lower water table is noted on Drawings.

## PART 2 - PRODUCTS

### 2.1 GENERAL REQUIREMENTS FOR DUCTS AND RACEWAYS

- A. Comply with ANSI C2.

### 2.2 CONDUIT

- A. Rigid Steel Conduit: Galvanized. Comply with ANSI C80.1.
- B. RNC: NEMA TC 2, Type EPC-40-PVC, UL 651, with matching fittings by same manufacturer as the conduit, complying with NEMA TC 3 and UL 514B.

### 2.3 NONMETALLIC DUCTS AND DUCT ACCESSORIES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:
1. ARNCO Corp
  2. Beck Manufacturing
  3. Endot Industries, Inc.
  4. IPEX USA LLC
- B. Solvents and Adhesives: As recommended by conduit manufacturer.
- C. Duct Accessories:
1. Duct Separators: Factory-fabricated rigid PVC interlocking spacers, sized for type and size of ducts with which used, and selected to provide minimum duct spacing indicated while supporting ducts during concreting or backfilling.
  2. Warning Tape: Underground-line warning tape specified in Section 260553 "Identification for Electrical Systems."
  3. Concrete Warning Planks: Nominal 12 by 24 by 3 inches in size, manufactured from 6000-psi concrete.
    - a. Color: Red dye added to concrete during batching.
    - b. Mark each plank with "ELECTRIC" in 2-inch- high, 3/8-inch- deep letters.

## 2.4 PRECAST CONCRETE HANDHOLES AND BOXES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:
  - 1. Jensen Precast
  - 2. Oldcastle Precast, Inc.
  - 3. Rinker Group
  - 4. Utility Concrete Products
  - 5. Utility Vault Co
- B. Comply with ASTM C 858 for design and manufacturing processes.
- C. Description: Factory-fabricated, reinforced-concrete, monolithically poured walls and bottom unless open-bottom enclosures are indicated. Frame and cover shall form top of enclosure and shall have load rating consistent with that of handhole or box.
  - 1. Frame and Cover: Weatherproof cast-iron frame, with cast-iron cover with recessed cover hook eyes and tamper-resistant, captive, cover-securing bolts.
  - 2. Frame and Cover: Weatherproof steel frame, with steel cover with recessed cover hook eyes and tamper-resistant, captive, cover-securing bolts.
  - 3. Frame and Cover: Weatherproof steel frame, with hinged steel access door assembly with tamper-resistant, captive, cover-securing bolts.
    - a. Cover Hinges: Concealed, with hold-open ratchet assembly.
    - b. Cover Handle: Recessed.
  - 4. Frame and Cover: Weatherproof aluminum frame with hinged aluminum access door assembly with tamper-resistant, captive, cover-securing bolts.
    - a. Cover Hinges: Concealed, with hold-open ratchet assembly.
    - b. Cover Handle: Recessed.
  - 5. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
  - 6. Cover Legend: Molded lettering, "ELECTRIC."
  - 7. Configuration: Units shall be designed for flush burial and have closed bottom unless otherwise indicated.
  - 8. Extensions and Slabs: Designed to mate with bottom of enclosure. Same material as enclosure.
    - a. Extension shall provide increased depth of 12 inches (300 mm).
    - b. Slab: Same dimensions as bottom of enclosure, and arranged to provide closure.
  - 9. Joint Sealant: Asphaltic-butyl material with adhesion, cohesion, flexibility, and durability properties necessary to withstand maximum hydrostatic pressures at the installation location with the ground-water level at grade.
  - 10. Windows: Precast openings in walls, arranged to match dimensions and elevations of approaching ducts and duct banks, plus an additional 12 inches vertically and horizontally to accommodate alignment variations.

- a. Windows shall be located no less than 6 inches (150 mm) from interior surfaces of walls, floors, or frames and covers of handholes, but close enough to corners to facilitate racking of cables on walls.
  - b. Window opening shall have cast-in-place, welded-wire fabric reinforcement for field cutting and bending to tie in to concrete envelopes of duct banks.
  - c. Window openings shall be framed with at least two additional No. 3 steel reinforcing bars in concrete around each opening.
- 11. Duct Entrances in Handhole Walls: Cast end-bell or duct-terminating fitting in wall for each entering duct.
  - a. Type and size shall match fittings to duct or conduit to be terminated.
  - b. Fittings shall align with elevations of approaching ducts and be located near interior corners of handholes to facilitate racking of cable.
- 12. Handholes 12 inches wide by 24 inches long (300 mm wide by 600 mm long) and larger shall have inserts for cable racks and pulling-in irons installed before concrete is poured.

## 2.5 UTILITY STRUCTURE ACCESSORIES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:
  - 1. Jensen Precast
  - 2. Oldcastle Precast
  - 3. Rinker Group, Ltd
  - 4. Utility Concrete Products
  - 5. Utility Vault Co.
- B. Pulling Eyes in Concrete Walls: Eyebolt with reinforcing-bar fastening insert, 2-inch- diameter eye, and 1-by-4-inch bolt.
  - 1. Working Load Embedded in 6-Inch (150-mm), 4000-psi (27.6-MPa) Concrete: 13,000-lbf (58-kN) minimum tension.
- C. Pulling Eyes in Nonconcrete Walls: Eyebolt with reinforced fastening, 1-1/4-inch- diameter eye, rated 2500-lbf minimum tension.
- D. Pulling-In and Lifting Irons in Concrete Floors: 7/8-inch- diameter, hot-dip galvanized, bent steel rod; stress relieved after forming; and fastened to reinforcing rod. Exposed triangular opening.
  - 1. Ultimate Yield Strength: 40,000-lbf (180-kN) shear and 60,000-lbf (270-kN) tension.
- E. Bolting Inserts for Concrete Utility Structure Cable Racks and Other Attachments: Flared, threaded inserts of noncorrosive, chemical-resistant, nonconductive thermoplastic material; 1/2-inch ID by 2-3/4 inches deep, flared to 1-1/4 inches minimum at base.
  - 1. Tested Ultimate Pullout Strength: 12,000 lbf (53 kN) minimum.



- F. Expansion Anchors for Installation after Concrete Is Cast: Zinc-plated, carbon-steel-wedge type with stainless-steel expander clip with 1/2-inch bolt, 5300-lbf rated pullout strength, and minimum 6800-lbf rated shear strength.
- G. Cable Rack Assembly: Steel, hot-dip galvanized, except insulators.
  - 1. Stanchions: T-section or channel; 2-1/4-inch (56-mm) nominal size; punched with 14 holes on 1-1/2-inch (38-mm) centers for cable-arm attachment.
  - 2. Arms: 1-1/2 inches wide, lengths ranging from 3 inches with 450-lb minimum capacity to 18 inches with 250-lb minimum capacity. Arms shall have slots along full length for cable ties and be arranged for secure mounting in horizontal position at any vertical location on stanchions.
  - 3. Insulators: High-glaze, wet-process porcelain arranged for mounting on cable arms.
- H. Duct-Sealing Compound: Nonhardening, safe for contact with human skin, not deleterious to cable insulation, and workable at temperatures as low as 35 deg F. Capable of withstanding temperature of 300 deg F without slump and adhering to clean surfaces of plastic ducts, metallic conduits, conduit coatings, concrete, masonry, lead, cable sheaths, cable jackets, insulation materials, and common metals.

## 2.6 SOURCE QUALITY CONTROL

- A. Test and inspect precast concrete utility structures according to ASTM C 1037.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Coordinate layout and installation of ducts, handholes, and boxes with final arrangement of other utilities, site grading, and surface features as determined in the field. Notify Architect if there is a conflict between areas of excavation and existing structures or archaeological sites to remain.
- B. Coordinate elevations of ducts and duct-bank entrances into, handholes, and boxes with final locations and profiles of ducts and duct banks, as determined by coordination with other utilities, underground obstructions, and surface features. Revise locations and elevations as required to suit field conditions and to ensure that duct runs drain to and handholes, and as approved by Architect.
- C. Clear and grub vegetation to be removed and protect vegetation to remain as required. Remove and stockpile topsoil for reapplication as required.

### 3.2 UNDERGROUND DUCT APPLICATION

- A. Ducts for Electrical Feeders 600 V and Less: RNC, NEMA Type EPC-40, in concrete-encased duct bank unless otherwise indicated.

- B. Ducts for Electrical Branch Circuits: RNC, NEMA Type EPC-40-PVC, in concrete-encased duct bank unless otherwise indicated.
- C. Underground Ducts Crossing Paved Paths and Driveways Roadways and Railroads: RNC, NEMA Type EPC-40-PVC, encased in reinforced concrete.

### 3.3 UNDERGROUND ENCLOSURE APPLICATION

- A. Handholes and Boxes for 600 V and Less:
  1. Precast concrete. AASHTO HB 17, H-20 structural load rating.
  2. Cover design load shall not exceed the design load of the handhole or box.

### 3.4 EARTHWORK

- A. Excavation and Backfill: Comply with requirements of Civil drawings and specifications.
- B. Restore surface features at areas disturbed by excavation and re-establish original grades unless otherwise indicated. Replace removed sod immediately after backfilling is completed.
- C. Restore areas disturbed by trenching, storing of dirt, cable laying, and other work. Restore vegetation and include necessary topsoiling, fertilizing, liming, seeding, sodding, sprigging, and mulching. Refer to Civil drawings and specifications, and coordinate all requirements.
- D. Cut and patch existing pavement in the path of underground ducts and utility structures.

### 3.5 DUCT INSTALLATION

- A. Install ducts according to NEMA TCB 2.
- B. Slope: Pitch ducts a minimum slope of 1:300 down toward handholes and away from buildings and equipment. Slope ducts from a high point in runs between two points, to drain in both directions.
- C. Curves and Bends: Use 5-degree angle couplings for small changes in direction. Use manufactured long sweep bends with a minimum radius of 48 inches 25 feet, both horizontally and vertically, at other locations unless otherwise indicated.
- D. Joints: Use solvent-cemented joints in ducts and fittings and make watertight according to manufacturer's written instructions. Stagger couplings so those of adjacent ducts do not lie in same plane.
- E. Installation Adjacent to High-Temperature Steam Lines: Where duct banks are installed parallel to underground steam lines, perform calculations showing the duct bank will not be subject to environmental temperatures above 40 deg C. Where environmental temperatures are calculated to rise above 40 deg C, and anywhere the duct bank crosses above an underground steam line, install insulation blankets listed for direct burial to isolate the duct bank from the steam line.

- F. Duct Entrances to Concrete and Polymer Concrete Handholes: Use end bells, spaced approximately 10 inches o.c. for 5-inch ducts, and vary proportionately for other duct sizes.
  - 1. Begin change from regular spacing to end-bell spacing 10 feet (3 m) from the end bell without reducing duct line slope and without forming a trap in the line.
  - 2. Direct-Buried Duct Banks: Install an expansion and deflection fitting in each conduit in the area of disturbed earth adjacent to manhole or handhole. Install an expansion fitting near the center of all straight line direct-buried duct banks with calculated expansion of more than 3/4 inch.
  - 3. Grout end bells into structure walls from both sides to provide watertight entrances.
- G. Structure Wall Penetrations: Make a transition from underground duct to rigid steel conduit at least 10 feet outside the structure wall, without reducing duct line slope away from the building, and without forming a trap in the line. Use fittings manufactured for duct-to-conduit transition. Install conduit penetrations of building walls as specified in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."
- H. Sealing: Provide temporary closure at terminations of ducts that have cables pulled. Seal spare ducts at terminations. Use sealing compound and plugs to withstand at least 15-psig hydrostatic pressure.
- I. Pulling Cord: Install 100-lbf- test nylon cord in empty ducts.
- J. Concrete-Encased Ducts: Support ducts on duct separators.
  - 1. Excavate trench bottom to provide firm and uniform support for duct bank. Prepare trench bottoms as specified in Section 312000 "Earth Moving" for pipes less than 6 inches (150 mm) in nominal diameter.
  - 2. Width: Excavate trench 12 inches wider than duct bank on each side.
  - 3. Width: Excavate trench 3 inches wider than duct bank on each side.
  - 4. Depth: Install top of duct bank at least 24 inches below finished grade in areas not subject to deliberate traffic, and at least 30 inches below finished grade in deliberate traffic paths for vehicles unless otherwise indicated.
  - 5. Support ducts on duct separators coordinated with duct size, duct spacing, and outdoor temperature.
  - 6. Separator Installation: Space separators close enough to prevent sagging and deforming of ducts, with not less than four spacers per 20 feet of duct. Secure separators to earth and to ducts to prevent floating during concreting. Stagger separators approximately 6 inches between tiers. Tie entire assembly together using fabric straps; do not use tie wires or reinforcing steel that may form conductive or magnetic loops around ducts or duct groups.
  - 7. Minimum Space between Ducts: 3 inches between ducts and exterior envelope wall, 2 inches between ducts for like services, and 4 inches between power and signal ducts.
  - 8. Elbows: Use manufactured duct elbows for stub-ups at poles and equipment, at building entrances through floor, and at changes of direction in duct run unless otherwise indicated. Extend concrete encasement throughout length of elbow.
  - 9. Elbows: Use manufactured rigid steel conduit elbows for stub-ups at poles and equipment, at building entrances through floor, and at changes of direction in duct run.
    - a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches (75 mm) of concrete.

- b. Stub-Ups to Equipment: For equipment mounted on outdoor concrete bases, extend steel conduit horizontally a minimum of 60 inches from edge of base. Install insulated grounding bushings on terminations at equipment.
- 10. Reinforcement: Reinforce concrete-encased duct banks where they cross disturbed earth and where indicated. Arrange reinforcing rods and ties without forming conductive or magnetic loops around ducts or duct groups.
- 11. Forms: Use walls of trench to form side walls of duct bank where soil is self-supporting and concrete envelope can be poured without soil inclusions; otherwise, use forms.
- 12. Concrete Cover: Install a minimum of 3 inches of concrete cover at top and bottom, and a minimum of 2 inches on each side of duct bank.
- 13. Concreting Sequence: Pour each run of envelope between terminations in one continuous operation.
  - a. Start at one end and finish at the other, allowing for expansion and contraction of ducts as their temperature changes during and after the pour. Use expansion fittings installed according to manufacturer's written recommendations, or use other specific measures to prevent expansion-contraction damage.
  - b. If more than one pour is necessary, terminate each pour in a vertical plane and install 3/4-inch reinforcing-rod dowels extending a minimum of 18 inches into concrete on both sides of joint near corners of envelope.
- 14. Pouring Concrete: Comply with requirements Civil drawings and specifications. Place concrete carefully during pours to prevent voids under and between conduits and at exterior surface of envelope. Do not allow a heavy mass of concrete to fall directly onto ducts. Allow concrete to flow to center of bank and rise up in middle, uniformly filling all open spaces. Do not use power-driven agitating equipment unless specifically designed for duct-bank application.

K. Direct-Buried Duct Banks:

- 1. Excavate trench bottom to provide firm and uniform support for duct bank.
- 2. Support ducts on duct separators coordinated with duct size, duct spacing, and outdoor temperature.
- 3. Space separators close enough to prevent sagging and deforming of ducts, with not less than four spacers per 20 feet of duct. Secure separators to earth and to ducts to prevent displacement during backfill and yet permit linear duct movement due to expansion and contraction as temperature changes. Stagger spacers approximately 6 inches between tiers.
- 4. Depth: Install top of duct bank at least 36 inches below finished grade unless otherwise indicated.
- 5. Set elevation of bottom of duct bank below frost line.
- 6. Install ducts with a minimum of 3 inches between ducts for like services and 6 inches between power and signal ducts.
- 7. Elbows: Install manufactured duct elbows for stub-ups at poles and equipment, at building entrances through floor, and at changes of direction in duct run unless otherwise indicated. Encase elbows for stub-up ducts throughout length of elbow.
- 8. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment, at building entrances through floor, and at changes of direction in duct run.

- a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches (75 mm) of concrete.
  - b. For equipment mounted on outdoor concrete bases, extend steel conduit horizontally a minimum of 60 inches from edge of equipment pad or foundation. Install insulated grounding bushings on terminations at equipment.
- 9. After installing first tier of ducts, backfill and compact. Start at tie-in point and work toward end of duct run, leaving ducts at end of run free to move with expansion and contraction as temperature changes during this process. Repeat procedure after placing each tier. After placing last tier, hand place backfill to 4 inches (100 mm) over ducts and hand tamp. Firmly tamp backfill around ducts to provide maximum supporting strength. Use hand tamper only. After placing controlled backfill over final tier, make final duct connections at end of run and complete backfilling with normal compaction.
  - a. Place minimum 3 inches (75 mm) of sand as a bed for duct bank. Place sand to a minimum of 6 inches (150 mm) above top level of duct bank.
  - b. Place minimum 6 inches of engineered fill above concrete encasement of duct bank.
- L. Warning Planks: Bury warning planks approximately 12 inches above direct-buried ducts and duct banks, placing them 24 inches o.c. Align planks along the width and along the centerline of duct bank. Provide an additional plank for each 12-inch increment of duct-bank width over a nominal 18 inches. Space additional planks 12 inches apart, horizontally.
- M. Warning Tape: Bury warning tape approximately 12 inches above all concrete-encased ducts and duct banks. Align tape parallel to and within 3 inches of centerline of duct bank. Provide an additional warning tape for each 12-inch increment of duct-bank width over a nominal 18 inches. Space additional tapes 12 inches apart, horizontally.

### 3.6 INSTALLATION OF CONCRETE HANDHOLES, AND BOXES

- A. Precast Concrete Handhole and Manhole Installation:
  - 1. Comply with ASTM C 891 unless otherwise indicated.
  - 2. Install units level and plumb and with orientation and depth coordinated with connecting ducts, to minimize bends and deflections required for proper entrances.
  - 3. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1-inch sieve to No. 4 sieve and compacted to same density as adjacent undisturbed earth.
- B. Elevations:
  - 1. Install handholes with bottom below frost line.
  - 2. Handhole Covers: In paved areas and trafficways, set surface flush with finished grade. Set covers of other handholes 1 inch above finished grade.
  - 3. Where indicated, cast handhole cover frame integrally with handhole structure.
- C. Drainage: Install drains in bottom of where indicated. Coordinate with drainage provisions indicated.

- D. Hardware: Install removable hardware, including pulling eyes, cable stanchions, and cable arms, and insulators, as required for installation and support of cables and conductors and as indicated.
- E. Field-Installed Bolting Anchors in Concrete Handholes: Do not drill deeper than 3-7/8 inches for and 2 inches for handholes, for anchor bolts installed in the field. Use a minimum of two anchors for each cable stanchion.

### 3.7 GROUNDING

- A. Ground underground ducts and utility structures according to Section 260526 "Grounding and Bonding for Electrical Systems."

### 3.8 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections and prepare test reports:
  - 1. Demonstrate capability and compliance with requirements on completion of installation of underground ducts and utility structures.
  - 2. Pull solid aluminum or wood test mandrel through duct to prove joint integrity and adequate bend radii, and test for out-of-round duct. Provide a minimum 6-inch- long mandrel equal to 80 percent fill of duct. If obstructions are indicated, remove obstructions and retest.
  - 3. Test handhole grounding to ensure electrical continuity of grounding and bonding connections. Measure and report ground resistance as specified in Section 260526 "Grounding and Bonding for Electrical Systems."
- B. Correct deficiencies and retest as specified above to demonstrate compliance.

### 3.9 CLEANING

- A. Pull leather-washer-type duct cleaner, with graduated washer sizes, through full length of ducts. Follow with rubber duct swab for final cleaning and to assist in spreading lubricant throughout ducts.
- B. Clean internal surfaces. Remove foreign material.

END OF SECTION 260543

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## SECTION 260544

## SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLING

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

## 1.2 SUMMARY

- A. Section Includes:
  - 1. Sleeve-seal systems.
  - 2. Sleeve-seal fittings.
  - 3. Grout.
  - 4. Silicone sealants.

## 1.3 ACTION SUBMITTALS

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

## PART 2 - PRODUCTS

## 2.1 SLEEVES

- A. Wall Sleeves:
  - 1. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, plain ends.
  - 2. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.
- B. PVC-Pipe Sleeves: ASTM D 1785, Schedule 40.
- C. Molded-PVC Sleeves: With nailing flange for attaching to wooden forms.
- D. Molded-PE or -PP Sleeves: Removable, tapered-cup shaped, and smooth outer surface with nailing flange for attaching to wooden forms.
- E. Sleeves for Rectangular Openings:
  - 1. Material: Galvanized sheet steel.



2. Minimum Metal Thickness:

- a. For sleeve cross-section rectangle perimeter less than 50 inches (1270 mm) and with no side larger than 16 inches (400 mm), thickness shall be 0.052 inch (1.3 mm).
- b. For sleeve cross-section rectangle perimeter 50 inches (1270 mm) or more and one or more sides larger than 16 inches (400 mm), thickness shall be 0.138 inch (3.5 mm).

2.2 SLEEVE-SEAL SYSTEMS

- A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:
  - a. Advance Products & Systems
  - b. CALPICO, Inc
  - c. Metraflex Company (The)
  - d. Pipeline Seal and Insulation
  - e. Proco Products, Inc
- 2. Sealing Elements: EPDM rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
- 3. Pressure Plates: Carbon steel.
- 4. Connecting Bolts and Nuts: Carbon steel, with corrosion-resistant coating of length required to secure pressure plates to sealing elements.

2.3 SLEEVE-SEAL FITTINGS

- A. Description: Manufactured plastic, sleeve-type, waterstop assembly made for embedding in concrete slab or wall. Unit shall have plastic or rubber waterstop collar with center opening to match piping OD.

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:
  - a. HOLDRITE
  - b. Or approved equal

- B. Fittings for conduits in pump wells, in valve boxes or in any other underground box or structure that contains any piping or system other than Electrical systems:

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Cooper

- b. Eaton
  - c. Appleton
  - d. Or approved equal
2. Utilize type EYS (Vertical applications) and type EZS (Horizontal applications). It is acceptable to use one type in lieu of the other only if the manufacturer has listed the box for use in the applicable orientation.
  3. In addition, provide Sealing Fittings in the Electrical Enclosure where conduits enter the equipment to avoid allowing gasses to travel into the equipment.
  4. Provide and apply sealing compound as recommended by the fitting manufacturer.

## 2.4 GROUT

- A. Description: Nonshrink; recommended for interior and exterior sealing openings in non-fire-rated walls or floors.
- B. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
- C. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.
- D. Packaging: Premixed and factory packaged.

## 2.5 SILICONE SEALANTS

- A. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below.
  1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces that are not fire rated.
- B. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

## PART 3 - EXECUTION

### 3.1 SLEEVE INSTALLATION FOR NON-FIRE-RATED ELECTRICAL PENETRATIONS

- A. Comply with NECA 1.
- B. Comply with NEMA VE 2 for cable tray and cable penetrations.
- C. Sleeves for Conduits Penetrating Above-Grade Non-Fire-Rated Concrete and Masonry-Unit Floors and Walls:
  1. Interior Penetrations of Non-Fire-Rated Walls and Floors:

- a. Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Section 079200 "Joint Sealants."
    - b. Seal space outside of sleeves with mortar or grout. Pack sealing material solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect material while curing.
  - 2. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
  - 3. Size pipe sleeves to provide 1/4-inch (6.4-mm) annular clear space between sleeve and raceway or cable unless sleeve seal is to be installed or unless seismic criteria require different clearance.
  - 4. Install sleeves for wall penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of walls. Cut sleeves to length for mounting flush with both surfaces of walls. Deburr after cutting.
  - 5. Install sleeves for floor penetrations. Extend sleeves installed in floors 2 inches (50 mm) above finished floor level. Install sleeves during erection of floors.
- D. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies:
- 1. Use circular metal sleeves unless penetration arrangement requires rectangular sleeved opening.
  - 2. Seal space outside of sleeves with approved joint compound for gypsum board assemblies.
- E. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.
- F. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.
- G. Underground, Exterior-Wall and Floor Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch (25-mm) annular clear space between raceway or cable and sleeve for installing sleeve-seal system.

### 3.2 SLEEVE-SEAL-SYSTEM INSTALLATION

- A. Install type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.
- B. Install EYS and EZY Sealing Fittings for conduits in pump wells, in valve boxes or in any other underground box or structure that contains any piping or system other than Electrical systems. In addition, provide Sealing Fittings in the Electrical Enclosure where conduits enter the equipment to avoid allowing gasses to travel into the equipment.

### 3.3 SLEEVE-SEAL-FITTING INSTALLATION

- A. Install sleeve-seal fittings in new concrete slabs, structures and boxes as they are constructed.
- B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.
- C. Secure nailing flanges to concrete forms.
- D. Using grout, seal the space around outside of sleeve-seal fittings.

END OF SECTION 260544

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## SECTION 260553

## IDENTIFICATION FOR ELECTRICAL SYSTEMS

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

## 1.2 SUMMARY

## A. Section Includes:

1. Identification for raceways.
2. Identification of power and control cables.
3. Identification for conductors.
4. Underground-line warning tape.
5. Warning labels and signs.
6. Instruction signs.
7. Equipment identification labels, including arc-flash warning labels.
8. Miscellaneous identification products.

## 1.3 ACTION SUBMITTALS

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

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for electrical identification products.

## B. Samples: For each type of label and sign to illustrate composition, size, colors, lettering style, mounting provisions, and graphic features of identification products.

## C. Identification Schedule: For each piece of electrical equipment and electrical system components to be an index of nomenclature for electrical equipment and system components used in identification signs and labels. Use same designations indicated on Drawings.

## D. Delegated-Design Submittal: For arc-flash hazard study.

## PART 2 - PRODUCTS

## 2.1 PERFORMANCE REQUIREMENTS

- A. Comply with ASME A13.1 and IEEE C2.

- B. Comply with NFPA 70.
- C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.
- D. Comply with ANSI Z535.4 for safety signs and labels.
- E. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.
- F. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
  - 1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

## 2.2 COLOR AND LEGEND REQUIREMENTS

- A. Raceways and Cables Carrying Circuits at 600 V or Less:
  - 1. Black letters on an orange field.
  - 2. Legend: Indicate voltage and system or service type.
- B. Raceways and Cables Carrying Circuits at More Than 600 V:
  - 1. Black letters on an orange field.
  - 2. Legend: "DANGER - CONCEALED HIGH VOLTAGE WIRING."
- C. Warning labels and signs shall include, but are not limited to, the following legends:
  - 1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
  - 2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES (915 MM)."

## 2.3 LABELS

- A. Vinyl Labels for Raceways Carrying Circuits at 600 V or Less: Preprinted, flexible labels laminated with a clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing label ends.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:
    - a. Brady Corporation
    - b. Champion America
    - c. HellermannTyton
    - d. Marking Service, Inc
    - e. Panduit Corp

- B. Snap-Around Labels for Raceways and Cables Carrying Circuits at 600 V or Less: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeves, with diameters sized to suit diameters of raceways they identify, and that stay in place by gripping action.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:
    - a. Brady Corporation
    - b. HellermannTyton
    - c. Marking Service, Inc
    - d. Panduit Corp
- C. Self-Adhesive Labels:
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:
    - a. Brady Corporation
    - b. Marking Services, Inc.
    - c. Panduit Corp
  - 2. Preprinted, 3-mil- (0.08-mm-) thick, vinyl flexible label with acrylic pressure-sensitive adhesive.
    - a. Self-Lamination: Clear; UV-, weather- and chemical-resistant; self-laminating, protective shield over the legend. Labels sized to fit the cable diameter, such that the clear shield overlaps the entire printed legend.
  - 3. Vinyl, thermal, transfer-printed, 3-mil- (0.08-mm-) thick, multicolor, weather- and UV-resistant, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment unless otherwise indicated.
    - a. Nominal Size: 3.5-by-5-inch (76-by-127-mm).
  - 4. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.
  - 5. Marker for Tags: Machine-printed, permanent, waterproof, black ink recommended by printer manufacturer.

## 2.4 BANDS AND TUBES:

- A. Snap-Around, Color-Coding Bands for Raceways and Cables: Slit, pretensioned, flexible, solid-colored acrylic sleeves, 2 inches (50 mm) long, with diameters sized to suit diameters of raceways or cables they identify, and that stay in place by gripping action.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:
    - a. Brady Corporation
    - b. Panduit Corp



c. Marking Services, Inc.

- B. Heat-Shrink Preprinted Tubes: Flame-retardant polyolefin tubes with machine-printed identification labels, sized to suit diameters of and shrunk to fit firmly around cables they identify. Full shrink recovery occurs at a maximum of 200 deg F (93 deg C). Comply with UL 224.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Brady Corporation
  - b. Panduit Corp
  - c. Marking Services, Inc.

## 2.5 TAPES AND STENCILS:

- A. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:
  - a. Carlton Industries
  - b. Champion America
  - c. HellermannTyton
  - d. Marking Services, Inc.
  - e. Panduit Corp

- B. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; not less than 3 mils (0.08 mm) thick by 1 to 2 inches (25 to 50 mm) wide; compounded for outdoor use.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:
  - a. Brady Corporation
  - b. Carlton Industries, LP
  - c. Marking Services, Inc

- C. Tape and Stencil for Raceways Carrying Circuits 600 V or Less: 4-inch- (100-mm-) wide black stripes on 10-inch (250-mm) centers placed diagonally over orange background that extends full length of raceway or duct and is 12 inches (300 mm) wide. Stop stripes at legends.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:
  - a. HellermannTyton
  - b. marking Services, Inc
  - c. Seton Identification Products

- D. Floor Marking Tape: 2-inch- (50-mm-) wide, 5-mil (0.125-mm) pressure-sensitive vinyl tape, with black and white stripes and clear vinyl overlay.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:
    - a. Carlton Industries, LP
    - b. Seton Identification Products
- E. Underground-Line Warning Tape
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:
    - a. Brady Corporation
    - b. marking Services, Inc
    - c. Seton Identification Products
  2. Tape:
    - a. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical and communications utility lines.
    - b. Printing on tape shall be permanent and shall not be damaged by burial operations.
    - c. Tape material and ink shall be chemically inert and not subject to degradation when exposed to acids, alkalis, and other destructive substances commonly found in soils.
  3. Color and Printing:
    - a. Comply with ANSI Z535.1, ANSI Z535.2, ANSI Z535.3, ANSI Z535.4, and ANSI Z535.5.
    - b. Inscriptions for Red-Colored Tapes: "ELECTRIC LINE, HIGH VOLTAGE".
    - c. Inscriptions for Orange-Colored Tapes: "TELEPHONE CABLE, CATV CABLE, COMMUNICATIONS CABLE, OPTICAL FIBER CABLE".
  4. Tag: Type I:
    - a. Pigmented polyolefin, bright colored, continuous-printed on one side with the inscription of the utility, compounded for direct-burial service.
    - b. Width: 3 inches (75 mm).
    - c. Thickness: 4 mils (0.1 mm).
    - d. Weight: 18.5 lb/1000 sq. ft. (9.0 kg/100 sq. m).
    - e. Tensile according to ASTM D 882: 30 lbf (133.4 N) and 2500 psi (17.2 MPa).
  5. Tag: Type II:
    - a. Multilayer laminate, consisting of high-density polyethylene scrim coated with pigmented polyolefin; bright colored, continuous-printed on one side with the inscription of the utility, compounded for direct-burial service.
    - b. Width: 3 inches (75-mm).
    - c. Thickness: 12 mils (0.3 mm).

- d. Weight: 36.1 lb/1000 sq. ft. (17.6 kg/100 sq. m).
  - e. Tensile according to ASTM D 882: 400 lbf (1780 N) and 11,500 psi (79.2 MPa).
6. Tag: Type ID:
- a. Detectable three-layer laminate, consisting of a printed pigmented polyolefin film, a solid aluminum-foil core, and a clear protective film that allows inspection of the continuity of the conductive core; bright colored, continuous-printed on one side with the inscription of the utility, compounded for direct-burial service.
  - b. Width: 3 inches (75 mm).
  - c. Overall Thickness: 5 mils (0.125 mm).
  - d. Foil Core Thickness: 0.35 mil (0.00889 mm).
  - e. Weight: 28 lb/1000 sq. ft. (13.7 kg/100 sq. m).
  - f. Tensile according to ASTM D 882: 70 lbf (311.3 N) and 4600 psi (31.7 MPa).
7. Tag: Type IID:
- a. Reinforced, detectable three-layer laminate, consisting of a printed pigmented woven scrim, a solid aluminum-foil core, and a clear protective film that allows inspection of the continuity of the conductive core; bright-colored, continuous-printed on one side with the inscription of the utility, compounded for direct-burial service.
  - b. Width: 3 inches (75-mm).
  - c. Overall Thickness: 8 mils (0.2 mm).
  - d. Foil Core Thickness: 0.35 mil (0.00889 mm).
  - e. Weight: 34 lb/1000 sq. ft. (16.6 kg/100 sq. m).
  - f. Tensile according to ASTM D 882: 300 lbf (1334 N) and 12,500 psi (86.1 MPa).
- F. Stenciled Legend: In nonfading, waterproof, black ink or paint. Minimum letter height shall be 1 inch (25 mm).

## 2.6 Tags

- A. Metal Tags: Brass or aluminum, 2 by 2 by 0.05 inch (50 by 50 by 1.3 mm), with stamped legend, punched for use with self-locking cable tie fastener.
- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:
    - a. Brady Corporation
    - b. Carlton Industries, LP
    - c. Marking Services, Inc
- B. Nonmetallic Preprinted Tags: Polyethylene tags, 0.015 inch (0.38 mm) thick, color-coded for phase and voltage level, with factory printed permanent designations; punched for use with self-locking cable tie fastener.
- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:

- a. Brady Corporation
- b. Carlton Industries, LP
- c. Marking Services, Inc
- d. Panduit Corp

C. Write-On Tags:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:
  - a. Carlton Industries, LP
  - b. LEM Products Inc.
  - c. Seton Identification Products
2. Polyester Tags: 0.010 inch (0.25 mm) thick, with corrosion-resistant grommet and cable tie for attachment to raceway, conductor, or cable.
3. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.
4. Marker for Tags: Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.

## 2.7 Signs

A. Baked-Enamel Signs:

1. Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application.
2. 1/4-inch (6.4-mm) grommets in corners for mounting.
3. Nominal Size: 7 by 10 inches (180 by 250 mm).
4. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:
  - a. Carlton Industries, LP
  - b. Champion America
  - c. Marking Services, Inc

B. Metal-Backed Butyrate Signs:

1. Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs, with 0.0396-inch (1-mm) galvanized-steel backing and with colors, legend, and size required for application.
2. 1/4-inch (6.4-mm) grommets in corners for mounting.
3. Nominal Size: 10 by 14 inches (250 by 360 mm).
4. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:
  - a. Brady Corporation
  - b. Champion America
  - c. Marking Services, Inc

C. Laminated Acrylic or Melamine Plastic Signs:

1. Engraved legend.
2. Thickness:
  - a. For signs up to 20 sq. inches (129 sq. cm), minimum 1/16-inch- (1.6-mm-).
  - b. For signs larger than 20 sq. inches (129 sq. cm), 1/8 inch (3.2 mm) thick.
  - c. Engraved legend with black letters on white face.
  - d. Self-adhesive.
  - e. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.
3. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:
  - a. Brady Corporation
  - b. Carlton Industries, LP
  - c. Marking Services, Inc

2.8 CABLE TIES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:
  1. HellermannTyton
  2. Ideal Industries, Inc
  3. Marking Services, Inc
  4. Panduit Corp
- B. General-Purpose Cable Ties: Fungus inert, self-extinguishing, one piece, self-locking, Type 6/6 nylon.
  1. Minimum Width: 3/16 inch (5 mm).
  2. Tensile Strength at 73 deg F (23 deg C) according to ASTM D 638: 12,000 psi (82.7 MPa).
  3. Temperature Range: Minus 40 to plus 185 deg F (Minus 40 to plus 85 deg C).
  4. Color: Black, except where used for color-coding.
- C. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self-extinguishing, one piece, self-locking, Type 6/6 nylon.
  1. Minimum Width: 3/16 inch (5 mm).
  2. Tensile Strength at 73 deg F (23 deg C) according to ASTM D 638: 12,000 psi (82.7 MPa).
  3. Temperature Range: Minus 40 to plus 185 deg F (Minus 40 to plus 85 deg C).
  4. Color: Black.
- D. Plenum-Rated Cable Ties: Self-extinguishing, UV stabilized, one piece, self-locking.
  1. Minimum Width: 3/16 inch (5 mm).

2. Tensile Strength at 73 deg F (23 deg C) according to ASTM D 638: 7000 psi (48.2 MPa).
3. UL 94 Flame Rating: 94V-0.
4. Temperature Range: Minus 50 to plus 284 deg F (Minus 46 to plus 140 deg C).
5. Color: Black.

## 2.9 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Retain paint system applicable for surface material and location (exterior or interior).
- B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Self-Adhesive Identification Products: Before applying electrical identification products, clean substrates of substances that could impair bond, using materials and methods recommended by manufacturer of identification product.

### 3.2 INSTALLATION

- A. Verify and coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and operation and maintenance manual. Use consistent designations throughout Project.
- B. Install identifying devices before installing acoustical ceilings and similar concealment.
- C. Verify identity of each item before installing identification products.
- D. Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment. Install access doors or panels to provide view of identifying devices.
- E. Apply identification devices to surfaces that require finish after completing finish work.
- F. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
- G. Attach plastic raceway and cable labels that are not self-adhesive type with clear vinyl tape, with adhesive appropriate to the location and substrate.
- H. Cable Ties: For attaching tags. Use general-purpose type, except as listed below:
  1. Outdoors: UV-stabilized nylon.

2. In Spaces Handling Environmental Air: Plenum rated.

- I. Painted Identification: Comply with requirements in painting Sections for surface preparation and paint application.
- J. Aluminum Wraparound Marker Labels and Metal Tags: Secure tight to surface of conductor or cable at a location with high visibility and accessibility.
- K. System Identification Color-Coding Bands for Raceways and Cables: Each color-coding band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot (15-m) maximum intervals in straight runs, and at 25-foot (7.6-m) maximum intervals in congested areas.
- L. During backfilling of trenches, install continuous underground-line warning tape directly above cable or raceway at 6 to 8 inches (150 to 200 mm) below finished grade. Use multiple tapes where width of multiple lines installed in a common trench or concrete envelope exceeds 16 inches (400 mm) overall.

### 3.3 IDENTIFICATION SCHEDULE

- A. Concealed Raceways, Duct Banks, More Than 600 V, within Buildings: Tape and stencil 4-inch- (100-mm-) wide black stripes on 10-inch (250-mm) centers over orange background that extends full length of raceway or duct and is 12 inches (300 mm) wide. Stencil legend "DANGER CONCEALED HIGH VOLTAGE WIRING" with 3-inch- (75-mm-) high black letters on 20-inch (500-mm) centers. Stop stripes at legends. Apply stripes to the following finished surfaces:
  - 1. Floor surface directly above conduits running beneath and within 12 inches (300 mm) of a floor that is in contact with earth or is framed above unexcavated space.
  - 2. Wall surfaces directly external to raceways concealed within wall.
  - 3. Accessible surfaces of concrete envelope around raceways in vertical shafts, exposed in the building, or concealed above suspended ceilings.
- B. Accessible Raceways, Armored and Metal-Clad Cables, More Than 600 V: Self-adhesive vinyl labels. Install labels at 10-foot (3-m) maximum intervals.
- C. Accessible Raceways and Metal-Clad Cables, 600 V or Less, for Service, Feeder, and Branch Circuits, More Than 30 A and 120 V to Ground: Identify with self-adhesive vinyl label. Install labels at 10-foot (3-m) maximum intervals.
- D. Accessible Raceways and Cables within Buildings: Identify the covers of each junction and pull box of the following systems with self-adhesive vinyl labels containing the wiring system legend and system voltage. System legends shall be as follows:
  - 1. "EMERGENCY POWER."
  - 2. "POWER."
  - 3. "UPS."

- E. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use color-coding conductor tape to identify the phase.
  - 1. Color-Coding for Phase- and Voltage-Level Identification, 600 V or Less: Use colors listed below for ungrounded service, feeder and branch-circuit conductors.
    - a. Color shall be factory applied or field applied for sizes larger than No. 8 AWG if authorities having jurisdiction permit.
    - b. Colors for 208/120-V Circuits:
      - 1) Phase A: Black.
      - 2) Phase B: Red.
      - 3) Phase C: Blue.
    - c. Colors for 480/277-V Circuits:
      - 1) Phase A: Brown.
      - 2) Phase B: Orange.
      - 3) Phase C: Yellow.
    - d. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches (150 mm) from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.
- F. Power-Circuit Conductor Identification, More Than 600 V: For conductors in vaults, pull and junction boxes, manholes, and handholes, use nonmetallic preprinted tags colored and marked to indicate phase, and a separate tag with the circuit designation.
- G. Install instructional sign, including the color code for grounded and ungrounded conductors using adhesive-film-type labels.
- H. Control-Circuit Conductor Identification: For conductors and cables in pull and junction boxes, manholes, and handholes, use self-adhesive vinyl labels with the conductor or cable designation, origin, and destination.
- I. Control-Circuit Conductor Termination Identification: For identification at terminations, provide self-adhesive, self-laminating polyester labels with the conductor designation.
- J. Conductors To Be Extended in the Future: Attach marker tape to conductors and list source.
- K. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.
  - 1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.
  - 2. Use system of marker-tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.
  - 3. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and operation and maintenance manual.



- L. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, and control wiring and optical-fiber cable.
  - 1. Limit use of underground-line warning tape to direct-buried cables.
  - 2. Install underground-line warning tape for direct-buried cables and cables in raceways.
- M. Workspace Indication: Install floor marking tape to show working clearances in the direction of access to live parts. Workspace shall comply with NFPA 70 and 29 CFR 1926.403 unless otherwise indicated. Do not install at flush-mounted panelboards and similar equipment in finished spaces.
- N. Arc Flash Warning Labeling: Self-adhesive thermal transfer vinyl labels.
  - 1. Comply with NFPA 70E and ANSI Z535.4.
  - 2. Comply with Section 260574 "Overcurrent Protective Device Arc-Flash Study" requirements for arc-flash warning labels.
- O. Operating Instruction Signs: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.
- P. Emergency Operating Instruction Signs: Install instruction signs with white legend on a red background with minimum 3/8-inch- (10-mm-) high letters for emergency instructions at equipment.
- Q. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and operation and maintenance manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm unless equipment is provided with its own identification.
  - 1. Labeling Instructions:
    - a. Outdoor Equipment: Stenciled legend 4 inches (100 mm) high.
    - b. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.
    - c. Unless labels are provided with self-adhesive means of attachment, fasten them with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.
  - 2. Equipment To Be Labeled:
    - a. Panelboards: Typewritten directory of circuits in the location provided by panelboard manufacturer. Panelboard identification shall be in the form of a self-adhesive, engraved, laminated acrylic or melamine label.
    - b. Enclosures and electrical cabinets.
    - c. Access doors and panels for concealed electrical items.
    - d. Switchgear.
    - e. Switchboards.

- f. Transformers: Label that includes tag designation shown on Drawings for the transformer, feeder, and panelboards or equipment supplied by the secondary.
- g. Substations.
- h. Emergency system boxes and enclosures.
- i. Motor-control centers.
- j. Enclosed switches.
- k. Enclosed circuit breakers.
- l. Enclosed controllers.
- m. Variable-speed controllers.
- n. Push-button stations.
- o. Power-transfer equipment.
- p. Contactors.
- q. Remote-controlled switches, dimmer modules, and control devices.
- r. Battery-inverter units.
- s. Battery racks.
- t. Power-generating units.
- u. Monitoring and control equipment.
- v. UPS equipment.

END OF SECTION 260553

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## SECTION 260915

## PROGRAMMABLE LOGIC CONTROLLERS

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

## 1.2 SUMMARY

- A. The pump control, communication and telemetric / SCADA systems are delegated design items. Retain the services of "Utility System Science & Software (US<sup>3</sup>)" company which currently installs, services and maintains the existing SCADA / PLC systems for Culver City.

## Contact Information:

Tom Williams  
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 UTILITY SYSTEMS SCIENCE & SOFTWARE (US<sup>3</sup>)  
 1250 Pioneer Way, Suite F, El Cajon CA 92020

- B. Scope: Provide labor, material, equipment, related services and supervision required, including but not limited to, manufacturing, fabrication, configuration and installation for Programmable Automation Controllers (also identified as PAC, PLC or Programmable Logic Controllers) as required for the complete performance of the work, as shown on the Drawings and as specified herein.
- C. All system components specified or shown on the Drawings shall be provided, as well as any ancillary or incidental equipment or devices, whether identified or not, required for a complete functioning system and allow full use of system capabilities.
- D. Refer to the Electrical Drawings, paying special attention to sheet E-06. This sheet shows Block Diagram and Performance Specifications for the Pump Control, PLC and Telemetric systems. This drawing is provided as a general guideline to define the scope of work expected as a part of the delegated design. It is intended to guide the Contractor in understanding the Scope of Work not be used as an exact document for construction. It is expected the outcome of the delegated design will be a complete system that can perform all the required functions described in the Performance Specifications.
- E. Refer to Appendix 260915 – A.

### 1.3 DEFINITIONS

- A. KY Pulse: Term used by the metering industry to describe a method of measuring consumption of electricity that is based on a relay opening and closing in response to the rotation of the disk in the meter.
- B. PC: Personal computer.
- C. PLC: Programmable Logic Controller.
- D. I/O: Input and output cards.
- E. SCADA: Supervisory Control and Data Acquisition

### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For PLC equipment.
  - 1. Dimensioned plans and sections or elevation layouts.
  - 2. Wiring Diagrams: For power, signal, and control wiring. Identify terminals and wiring designations and color-codes to facilitate installation, operation, and maintenance. Indicate recommended types, wire sizes, and circuiting arrangements for field-installed wiring, and show circuit protection features.
  - 3. Performance Narrative: Describe the sequence of operation including all monitoring and control functions of discrete and analog, input and output cards.
  - 4. Surge suppressors.

### 1.5 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

### 1.6 CLOSEOUT SUBMITTALS

- 1. Operation and Maintenance Data. In addition to items specified in other specifications, project manual, drawings and other parts of contract as well as all standard manufacturer literature, include the following:
  - a. Application and operating software documentation.
  - b. Software licenses.
  - c. Software service agreement.
  - d. Hard copies of manufacturer's operating specifications, design user's guides for software and hardware, and PDF files on CD-ROM of the hard-copy Submittal.
  - e. Revised shop drawings reflecting final field conditions. Include all equipment and devices.

## 1.7 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

## 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Receive, store, and handle modular meter center according to NECA 400.

## 1.9 PROJECT CONDITIONS

- A. Interruption of Existing Electrical Service: Do not interrupt electrical service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electrical service according to requirements indicated:
  - 1. Notify Construction Manager no fewer than ten days in advance of proposed interruption of electrical service.
  - 2. Do not proceed with interruption of electrical service without Owner's written permission.

## 1.10 COORDINATION

- A. Coordinate requirements for monitoring and control of all equipment and devices including, but not limited to the following:
  - 1. Pumps.
  - 2. Valves / Gates
  - 3. Irrigation equipment.
  - 4. Rain monitoring and control equipment.
  - 5. Level sensors.
  - 6. Alarms.
  - 7. Communication equipment devices.

## 1.11 SOFTWARE SERVICE AGREEMENT

- A. Technical Support: Beginning with Substantial Completion, provide software support for two years.
- B. Upgrade Service: Update software to latest version at Project completion. Install and program software upgrades that become available within two years from date of Substantial Completion. Upgrading software shall include operating system. Upgrade shall include new or revised licenses for use of software.
  - 1. Provide 30 days' notice to Owner to allow scheduling and access to system and to allow Owner to upgrade his computer equipment if necessary.

## 1.12 WARRANTY

- A. Manufacturer Warranty: The manufacturer shall provide a 5 year warranty for the processors, input/output (I/O) systems, power supplies, racks, and communication interface product. The warranty period shall commence on the date of project Substantial Completion. The terms of the warranty shall provide for replacement of defective components, free of charge, at any time during the warranty period.

#### 1.13 TOOLS AND SPARE PARTS

- A. Spare parts shall be provided for each type and size of unit installed. At a minimum the following shall be provided:
  1. Provide the minimum spare parts recommended by the manufacturer.
  2. Provide 1 set of each type of power and control fuse installed within equipment.
  3. Processors: Provide a minimum of one spare for each type of processor unit furnished. Spare processors shall be identified and pre-configured for each application as specified.
  4. Power Supplies: Provide a minimum of two spares for each type of power supply furnished.
  5. Memory Cards: Provide a minimum of one spare for each type of card furnished.
  6. Input / Output Cards: Provide a minimum of one spare for each type of card furnished.
  7. Communication Modules: Provide a minimum of one spare of each type of module furnished.
  8. Specialty Modules: Provide a minimum of one spare of each type of module furnished.
- B. Any manufacturer specific special tool, not normally found in an electrician's toolbox, required to remove and install recommended or furnished spare parts shall be furnished. At a minimum the following shall be provided:
  1. If available from manufacture, provide PC-based configuration software tool and a minimum of one communication interface cable for each type of cable required to connect a PC-based computer to the devices specified herein for configuration and programming.
  2. Electronic configuration files, in a media format acceptable by the Owner (e.g. CD, USB stick, etc.), updated to an as-installed and commissioned state.
- C. Spare parts shall be properly marked and packaged for long term storage. Printed circuit boards shall be provided in separate anti-static containers.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. In order to ensure the PLC / Telemetry equipment compatibility with existing Culver City systems and standards, the PLC / Telemetry equipment, devices and related material will be specified in detail by Utility Systems Science & Software (US<sup>3</sup>) as a part of the delegated design package.

- B. The PLC will utilize Motorola ACE3600 series equipment, devices and related material. Refer to Appendix 260915 – A, attached immediately following this specification section for a sample package of the material. This appendix is provided for reference only to establish an understanding of the type of material that will be required. The exact products will be specified by US<sup>3</sup> as stated in paragraph A above and is expected to be similar to the products show in the appendix.
- C. Refer to the Electrical Drawings, paying special attention to sheet E-06. This sheet shows Block Diagram and Performance Specifications for the Pump Control, PLC and Telemetric systems. This drawing is provided as a general guideline to define the scope of work expected as a part of the delegated design. It is intended to guide the Contractor in understanding the Scope of Work not be used as an exact document for construction.

## 2.2 GENERAL REQUIREMENTS

- D. PLCs shall collect data, perform process control functions and communicate with associated devices (e.g. remote I/O, HMIs, Drives, other PLCs, and/or SCADA servers) as required to exchange process information along the network(s) as specified or shown within the Contract Documents.
- E. PLCs shall be modular in design and capable of scalable expansion by adding modules of various functions (e.g. input/output signal modules, power supplies, communication modules, etc.).
- F. All PLCs shall be the same manufacturer and of the same series or product line unless specifically shown or specified otherwise within the Contract Documents. Processors, input/output hardware, communications modules, specialty modules, etc. shall be interchangeable among all Process Instrumentation and Control System control panels and interconnected process systems furnished. Third party PLC modules and hardware by other manufacturers will be acceptable only if the PLC manufacturer does not offer suitable modules and hardware for the same functions.
- G. PLC shall have the capability to exchange the CPU reference with another from the same product line series. This exchange must not interfere with the program execution or require firmware or programming updates, i.e. the application must be able to be executed seamlessly regardless of the CPU reference (provided the substitution CPU has sufficient capacity).
- H. Be able to have its program downloaded from a remote workstation over a network, or locally programmed from a portable laptop computer.
- I. Capacity and Installed Spares:
  - 1. Unless otherwise specified or shown, select the specific PLC model(s) and appurtenances based upon I/O, memory, communication, expansion, and other requirements necessary for the performance of its functions.
  - 2. Each PLC shall include provisions for expansion and shall have 25% spare I/O handling, data, and programming memory capacity of the memory capacity utilized.
  - 3. Each PLC, RIO, or DIO enclosure shall include a minimum of 25% installed spares of each I/O type provided, minimum of 2, within. Installed spares shall include all wiring, terminals, surge protection devices, fuses, disconnects, etc. that are provided for process utilized I/O.



4. Each PLC, RIO, or DIO enclosure shall include a minimum of 25% spare rack space for the addition of future I/O modules.
- J. Input/Output Signal Arrangement: Unless specifically stated otherwise, THE ORDER AND ARRANGEMENT OF I/O SIGNALS SHALL BE ARRANGED TO MINIMIZE FAILURES OF MULTIPLE EQUIPMENT TRAINS DUE TO THE FAILURE OF A SINGLE PLC MODULE.
1. Be modular, field expandable design. The capability shall exist to allow for the expansion of the system by addition of hardware or software.
  2. Be able to 'hot swap' input/output modules while under power without impacting operation of PLC system or causing destruction of PLC modules, racks, power supplies.
- K. Environmental Requirements: PLCs shall meet or exceed the following environmental requirements regardless of the service conditions they are installed in.
1. Minimum temperature range for indoor locations: 0 to +60°C (32 to +140°F)
  2. Minimum temperature range for outdoor locations: 0 to +60°C (32 to +140°F)
  3. Relative humidity: 30 to 95% non-condensing.
  4. Operation at Altitudes: 0-6,500 feet minimum.
  5. Degree of protection: NEMA 1 (IP20)
  6. Vibration resistance in accordance with both of the following:
    - a. Installed rating:
      1. DIN rail mounted PLC: 10-57 Hz, amplitude 0.075 mm, acceleration 25-100 Hz, and
      2. Panel or plate mounted PLC: 2-25 Hz, amplitude 1.6mm, acceleration 25-200 Hz.
    - b. In compliance with IEC 60068 and IEC 61131.
  7. Shock resistance: 147m/s<sup>2</sup> for 11ms.

## 2.6 PLC PROGRAMMING HARDWARE

- A. The programming device shall be a portable notebook computer provided by the contractor. System supplier shall provide two interconnecting cables, each 25 feet long, to connect the computer to the programmable automation controller. The cables shall be shielded and shall be terminated on both ends with the appropriate connectors.
  - B. PLCs shall utilize a USB to Mini B cable for programming. This cable shall be compatible with those designed for downloading digital cameras to USB compatible PC. Accordingly, this cable shall be available through most traditional retail stores serving the consumer electronics market.
- A. All specified PLC platforms will be programmed using the same programming software package. PLCs that use multiple software programming packages under similar trade names will not be accepted.
- B. The programming software will support languages compatible with the existing Culver City SCADA / PLC systems and standards.

- C. The system shall be designed to execute all languages without a significant decrease in processing speed.
- D. Programming software shall have:
  - 1. Embedded PLC simulator for debugging and program validation.
  - 2. Embedded network configuration tools that utilize FDT/DTM technologies. PLC's that use separate programming, communication, simulation and network configuration software shall not be accepted.

## 2.7 PLC PROGRAMMING AND CONFIGURATION

- A. Contractor shall

## 2.8 IDENTIFICATION

- A. Each process controller I/O point shall have its service description and / or tag identified and typeface labeled at the termination point on the I/O module. Where available space prohibits a meaningful identifier to be provided at the termination point, the point shall be numbered at the termination interface and a cross reference listing of I/O tags, service descriptions, module location, and point number shall be provided adhered to or laminated and placed within the control panels interior at the approval of the Engineer. This cross reference shall be a draft copy until after onsite demonstration testing when it shall be finalized and installed within the panel.
- B. Comply with requirements of Section 260553 "Identification for Electrical Systems".

## 2.9 PLC ENCLOSURES

- 1. Each PLC and its corresponding I/O modules, power supplies, communication modules, peripheral equipment shall be mounted inside suitable enclosures. All I/O wiring from the field to the I/O modules shall be terminated on terminal blocks in the enclosures.

# PART 3 - EXECUTION

## 3.1 INSTALLATION

- A. Comply with equipment installation requirements in NECA 1.
- B. Install meters furnished by utility company. Install raceways and equipment according to utility company's written requirements. Provide empty conduits for metering leads and extend grounding connections as required by utility company.
- C. Install modular meter center according to NECA 400 switchboard installation requirements.
- D. Installation shall comply with all requirements of Southern California Edison (SCE) Electrical Service Requirements (ESR).

### 3.2 IDENTIFICATION

- A. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."
  - 1. Series Combination Warning Label: Self-adhesive type, with text as required by NFPA 70.
  - 2. Equipment Identification Labels: Adhesive film labels with clear protective overlay. For residential meters, provide an additional card holder suitable for printed, weather-resistant card with occupant's name.

### 3.3 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
  - 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- B. Tests and Inspections:
  - 1. Connect a load of known kilowatt rating, 1.5 kW minimum, to a circuit supplied by metered feeder.
  - 2. Turn off circuits supplied by metered feeder and secure them in off condition.
  - 3. Run test load continuously for eight hours minimum, or longer, to obtain a measurable meter indication. Use test-load placement and setting that ensures continuous, safe operation.
  - 4. Check and record meter reading at end of test period and compare with actual electricity used, based on test-load rating, duration of test, and sample measurements of supply voltage at test-load connection. Record test results.
- C. Electricity metering will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

END OF SECTION 260915

## SECTION 262726

## WIRING DEVICES

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

## 1.2 SUMMARY

- A. Section Includes:
  - 1. GFCI receptacles, 125 V, 20 A.

## 1.3 DEFINITIONS

- A. EMI: Electromagnetic interference.
- B. GFCI: Ground-fault circuit interrupter.
- C. Pigtail: Short lead used to connect a device to a branch-circuit conductor.
- D. SPD: Surge protective device.

## 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: List of legends and description of materials and process used for premarking wall plates.
- C. Samples: One for each type of device and wall plate specified, in each color specified.

## 1.5 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

## 1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packing-label warnings and instruction manuals that include labeling conditions.

## 1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Receptacles: One for every 10 of each type installed, but no fewer than two of each type.

## PART 2 - PRODUCTS

### 2.1 GENERAL WIRING-DEVICE REQUIREMENTS

- A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
- B. Comply with NFPA 70.
- C. RoHS compliant.
- D. Comply with NEMA WD 1.
- E. Devices that are manufactured for use with modular plug-in connectors may be substituted under the following conditions:
  - 1. Connectors shall comply with UL 2459 and shall be made with stranding building wire.
  - 2. Devices shall comply with requirements in this Section.
- F. Devices for Owner-Furnished Equipment:
  - 1. Receptacles: Match plug configurations.
  - 2. Cord and Plug Sets: Match equipment requirements.
- G. Device Color:
  - 1. Wiring Devices Connected to Normal Power System: Almond unless otherwise indicated or required by NFPA 70 or device listing.
- H. Backbox and Housing: Suitable for installation in outdoor Electrical Enclosure and in field boxes.
- I. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.

### 2.2 GFCI RECEPTACLES, 125 V, 20 A

- A. Duplex GFCI Receptacles, 125 V, 20 A:
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:
    - a. Hubbell

- b. Cooper
    - c. Leviton
  - 2. Description: Integral GFCI with "Test" and "Reset" buttons and LED indicator light. Two pole, three wire, and self-grounding.
  - 3. Configuration: NEMA WD 6, Configuration 5-20R.
  - 4. Type: Non-feed through.
  - 5. Standards: Comply with UL 498, UL 943 Class A, and FS W-C-596.
- B. Tamper- and Weather-Resistant, GFCI Duplex Receptacles, 125 V, 20 A:
- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:
    - a. Hubbell
    - b. Cooper
    - c. Leviton
  - 2. Description: Integral GFCI with "Test" and "Reset" buttons and LED indicator light. Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle. Square face.
  - 3. Configuration: NEMA WD 6, Configuration 5-15R.
  - 4. Type: Non-feed through.
  - 5. Standards: Comply with UL 498 and UL 943 Class A.
  - 6. Marking: Listed and labeled as complying with NFPA 70, "Tamper-Resistant Receptacles" and "Receptacles in Damp or Wet Locations" articles.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.
- B. Coordination with Other Trades:
  - 1. Protect installed devices and their boxes. Do not place wall finish materials over device boxes, and do not cut holes for boxes with routers that are guided by riding against outside of boxes.
  - 2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
  - 3. Install wiring devices after all wall preparation, including painting, is complete.
- C. Conductors:
  - 1. Do not strip insulation from conductors until right before they are spliced or terminated on devices.

2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
3. The length of free conductors at outlets for devices shall comply with NFPA 70, Article 300, without pigtails.
4. Existing Conductors:
  - a. Cut back and pigtail, or replace all damaged conductors.
  - b. Straighten conductors that remain and remove corrosion and foreign matter.
  - c. Pigtailling existing conductors is permitted, provided the outlet box is large enough.

D. Device Installation:

1. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.
2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
4. Connect devices to branch circuits using pigtails that are not less than 6 inches (152 mm) in length.
5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, two-thirds to three-fourths of the way around terminal screw.
6. Use a torque screwdriver when a torque is recommended or required by manufacturer.
7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
8. Tighten unused terminal screws on the device.
9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.

E. Receptacle Orientation:

1. Install ground pin of vertically mounted receptacles up, and on horizontally mounted receptacles to the right.
2. Install hospital-grade receptacles in patient-care areas with the ground pin or neutral blade at the top.

- F. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multgang wall plates.

### 3.2 GFCI RECEPTACLES

- A. Install non-feed-through GFCI receptacles where protection of downstream receptacles is not required.

### 3.3 IDENTIFICATION

- A. Comply with Section 260553 "Identification for Electrical Systems."

- B. Identify each receptacle with panelboard identification and circuit number. Use hot, stamped, or engraved machine printing with black-filled lettering on face of plate, and durable wire markers or tags inside outlet boxes.
- C. Essential Electrical System: Mark receptacles supplied from the essential electrical system to allow easy identification using a self-adhesive label.

### 3.4 FIELD QUALITY CONTROL

- A. Test Instruments: Use instruments that comply with UL 1436.
- B. Test Instrument for Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.
- C. Perform the following tests and inspections:
  - 1. Test Instruments: Use instruments that comply with UL 1436.
  - 2. Test Instrument for Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.
- D. Tests for Receptacles:
  - 1. Line Voltage: Acceptable range is 105 to 132 V.
  - 2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is unacceptable.
  - 3. Ground Impedance: Values of up to 2 ohms are acceptable.
  - 4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
  - 5. Using the test plug, verify that the device and its outlet box are securely mounted.
  - 6. Tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault-current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new ones, and retest as specified above.
- E. Wiring device will be considered defective if it does not pass tests and inspections.
- F. Prepare test and inspection reports.

END OF SECTION 262726



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## SECTION 262923

## VARIABLE-FREQUENCY MOTOR CONTROLLERS

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

## 1.2 SUMMARY

- A. Section includes separately enclosed, preassembled, combination VFCs, rated 600 V and less, for speed control of three-phase, squirrel-cage induction motors.

## 1.3 DEFINITIONS

- A. CE: Conformance Europeene (European Compliance).
- B. CPT: Control power transformer.
- C. DDC: Direct digital control.
- D. EMI: Electromagnetic interference.
- E. LED: Light-emitting diode.
- F. NC: Normally closed.
- G. NO: Normally open.
- H. OCPD: Overcurrent protective device.
- I. PID: Control action, proportional plus integral plus derivative.
- J. RFI: Radio-frequency interference.
- K. VFC: Variable-frequency motor controller. The terms VFC and VFD (Variable Frequency Drive) are used interchangeably throughout the documents, including Drawings and Specifications.

## 1.4 ACTION SUBMITTALS

- A. Product Data: For each type and rating of VFC indicated.

1. Include dimensions and finishes for VFCs.
2. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

B. Shop Drawings: For each VFC indicated.

1. Include mounting and attachment details.
2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
3. Include diagrams for power, signal, and control wiring.

## 1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing agency.

B. Seismic Qualification Data: Certificates, for each VFC, accessories, and components, from manufacturer.

1. Certificate of compliance.
2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based, and their installation requirements.

C. Product Certificates: For each VFC from manufacturer.

D. Harmonic Analysis Report: Provide Project-specific calculations and manufacturer's statement of compliance with IEEE 519.

E. Source quality-control reports.

F. Sample Warranty: For special warranty.

## 1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For VFCs to include in emergency, operation, and maintenance manuals.

1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:
  - a. Manufacturer's written instructions for testing and adjusting thermal-magnetic circuit breaker and motor-circuit protector trip settings.
  - b. Manufacturer's written instructions for testing, adjusting, and reprogramming microprocessor control modules.
  - c. Manufacturer's written instructions for setting field-adjustable timers, controls, and status and alarm points.

## 1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Power Fuses: Equal to 10 percent of quantity installed for each size and type, but no fewer than three of each size and type.
  - 2. Control Power Fuses: Equal to 10 percent of quantity installed for each size and type, but no fewer than two of each size and type.
  - 3. Indicating Lights: Two of each type and color installed.
  - 4. Auxiliary Contacts: Furnish one spare(s) for each size and type of magnetic controller installed.  
Power Contacts: Furnish three spares for each size and type of magnetic contactor installed.

## 1.8 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Accredited by NETA.
  - 1. Testing Agency's Field Supervisor: Currently certified by NETA to supervise on-site testing.

## 1.9 DELIVERY, STORAGE, AND HANDLING

- A. If stored in space that is not permanently enclosed and air conditioned, remove loose packing and flammable materials from inside controllers and install temporary electric heating, with at least 250 W per controller.

## 1.10 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace VFCs that fail in materials or workmanship within specified warranty period.
  - 1. Warranty Period: Five years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Schneider Electric.
- B. Or approved equal.

### 2.2 SYSTEM DESCRIPTION

- A. General Requirements for VFCs:

1. VFCs and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
  2. Comply with NEMA ICS 7, NEMA ICS 61800-2, and UL 508A.
- B. Application: variable torque.
- C. VFC Description: Variable-frequency motor controller, consisting of power converter that employs pulse-width-modulated inverter, factory built and tested in an enclosure, with integral disconnecting means and overcurrent and overload protection; listed and labeled by an NRTL as a complete unit; arranged to provide self-protection, protection, and variable-speed control of one or more three-phase induction motors by adjusting output voltage and frequency.
1. Units suitable for operation of NEMA MG 1, Design A and Design B motors, as defined by NEMA MG 1, Section IV, Part 30, "Application Considerations for Constant Speed Motors Used on a Sinusoidal Bus with Harmonic Content and General Purpose Motors Used with Adjustable-Voltage or Adjustable-Frequency Controls or Both."
  2. Listed and labeled for integrated short-circuit current (withstand) rating by an NRTL acceptable to authorities having jurisdiction.
- D. Design and Rating: Match load type, such as fans, blowers, and pumps; and type of connection used between motor and load such as direct or through a power-transmission connection.
- E. Output Rating: Three phase; 10 to 60 Hz, with voltage proportional to frequency throughout voltage range; maximum voltage equals input voltage.
- F. Unit Operating Requirements:
1. Input AC Voltage Tolerance: Plus 10 and minus 15 percent of VFC input voltage rating.
  2. Input AC Voltage Unbalance: Not exceeding 5 percent.
  3. Input Frequency Tolerance: Plus or minus 3 percent of VFC frequency rating.
  4. Minimum Efficiency: 96 percent at 60 Hz, full load.
  5. Minimum Displacement Primary-Side Power Factor: 96 percent under any load or speed condition.
  6. Minimum Short-Circuit Current (Withstand) Rating: 42 kA.
  7. Ambient Temperature Rating: Not less than 32 deg F and not exceeding 104 deg F.
  8. Humidity Rating: Less than 95 percent (noncondensing).
  9. Altitude Rating: Not exceeding 3300 feet.
  10. Overload Capability: 1.5 times the base load current for 60 seconds; minimum of 1.8 times the base load current for three seconds.
  11. Starting Torque: Minimum 100 percent of rated torque from 3 to 60 Hz.
  12. Speed Regulation: Plus or minus 10 percent.
  13. Output Carrier Frequency: Selectable; 0.5 to 15 kHz.
  14. Stop Modes: Programmable; includes fast, free-wheel, and dc injection braking.
- G. Inverter Logic: Microprocessor based, 32 bit, isolated from all power circuits.
- H. Isolated Control Interface: Allows VFCs to follow remote-control signal over a minimum 40:1 speed range.
1. Signal: Electrical.

I. Internal Adjustability Capabilities:

1. Minimum Speed: 5 to 25 percent of maximum rpm.
2. Maximum Speed: 80 to 100 percent of maximum rpm.
3. Acceleration: 0.1 to 999.9 seconds.
4. Deceleration: 0.1 to 999.9 seconds.
5. Current Limit: 30 to minimum of 150 percent of maximum rating.

J. Self-Protection and Reliability Features:

1. Surge Suppression: Factory installed as an integral part of the VFC, complying with UL 1449 SPD, Type 1 or Type 2.
2. Loss of Input Signal Protection: Selectable response strategy, including speed default to a percent of the most recent speed, a preset speed, or stop; with alarm.
3. Under- and overvoltage trips.
4. Inverter overcurrent trips.
5. VFC and Motor-Overload/Overtemperature Protection: Microprocessor-based thermal protection system for monitoring VFCs and motor thermal characteristics, and for providing VFC overtemperature and motor-overload alarm and trip; settings selectable via the keypad.
6. Critical frequency rejection, with three selectable, adjustable deadbands.
7. Instantaneous line-to-line and line-to-ground overcurrent trips.
8. Loss-of-phase protection.
9. Reverse-phase protection.
10. Short-circuit protection.
11. Motor-overtemperature fault.

K. Automatic Reset/Restart: Attempt three restarts after drive fault or on return of power after an interruption and before shutting down for manual reset or fault correction; adjustable delay time between restart attempts.

L. Bidirectional Autospeed Search: Capable of starting VFC into rotating loads spinning in either direction and returning motor to set speed in proper direction, without causing damage to drive, motor, or load.

M. Torque Boost: Automatically varies starting and continuous torque to at least 1.5 times the minimum torque to ensure high-starting torque and increased torque at slow speeds.

N. Motor Temperature Compensation at Slow Speeds: Adjustable current fall-back based on output frequency for temperature protection of self-cooled, fan-ventilated motors at slow speeds.

O. Integral Input Disconnecting Means and OCPD: UL 489, instantaneous-trip circuit breaker with pad-lockable, door-mounted handle mechanism.

1. Disconnect Rating: Not less than 115 percent of NFPA 70 motor full-load current rating or VFC input current rating, whichever is larger.
2. Auxiliary Contacts: NO or NC, arranged to activate before switch blades open.
3. Auxiliary contacts "a" and "b" arranged to activate with circuit-breaker handle.
4. NO alarm contact that operates only when circuit breaker has tripped.

## 2.3 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: VFCs shall withstand the effects of earthquake motions determined according to ASCE/SEI 7. The designated VFCs shall be tested and certified by an NRTL as meeting the ICC-ES AC 156 test procedure requirements.
  - 1. The term "withstand" means "the unit will remain in place without separation of any parts when subjected to the applicable seismic forces and the unit will be fully operational after the seismic event." Contractor is responsible for determining the applicable seismic forces, including retaining a qualified Structural Engineer as needed to make the determination.

## 2.4 CONTROLS AND INDICATION

- A. Status Lights: Door-mounted LED indicators displaying the following conditions:
  - 1. Power on.
  - 2. Run.
  - 3. Overvoltage.
  - 4. Line fault.
  - 5. Overcurrent.
  - 6. External fault.
- B. Panel-Mounted Operator Station: Manufacturer's standard front-accessible, sealed keypad and plain-English-language digital display; allows complete programming, program copying, operating, monitoring, and diagnostic capability.
  - 1. Keypad: In addition to required programming and control keys, include keys for HAND, OFF, and AUTO modes.
  - 2. Security Access: Provide electronic security access to controls through identification and password with at least three levels of access: View only; view and operate; and view, operate, and service.
    - a. Control Authority: Supports at least four conditions: Off, local manual control at VFC, local automatic control at VFC, and automatic control through a remote source.
- C. Historical Logging Information and Displays:
  - 1. Real-time clock with current time and date.
  - 2. Running log of total power versus time.
  - 3. Total run time.
  - 4. Fault log, maintaining last four faults with time and date stamp for each.
- D. Indicating Devices: Digital display and additional readout devices as required, mounted flush in VFC door and connected to display VFC parameters including, but not limited to:
  - 1. Output frequency (Hz).
  - 2. Motor speed (rpm).
  - 3. Motor status (running, stop, fault).

4. Motor current (amperes).
5. Motor torque (percent).
6. Fault or alarming status (code).
7. PID feedback signal (percent).
8. DC-link voltage (V dc).
9. Set point frequency (Hz).
10. Motor output voltage (V ac).

E. Control Signal Interfaces:

1. Electric Input Signal Interface:
  - a. A minimum of two programmable analog inputs: Operator-selectable "x"- to "y"-mA dc.
  - b. A minimum of six multifunction programmable digital inputs.
2. Remote Signal Inputs: Capability to accept any of the following speed-setting input signals from the DDC system for HVAC or other control systems:
  - a. 0- to 10-V dc.
  - b. 4- to 20-mA dc.
  - c. Potentiometer using up/down digital inputs.
  - d. Fixed frequencies using digital inputs.
3. Output Signal Interface: A minimum of two programmable analog output signal(s) operator-selectable "x"- to "y"-mA dc , which can be configured for any of the following:
  - a. Output frequency (Hz).
  - b. Output current (load).
  - c. DC-link voltage (V dc).
  - d. Motor torque (percent).
  - e. Motor speed (rpm).
  - f. Set point frequency (Hz).
4. Remote Indication Interface: A minimum of two programmable dry-circuit relay outputs (120-V ac, 1 A) for remote indication of the following:
  - a. Motor running.
  - b. Set point speed reached.
  - c. Fault and warning indication (overtemperature or overcurrent).
  - d. PID high- or low-speed limits reached.
5. Hardwired Points:
  - a. Monitoring: On-off status, functions as indicated in sequences of operation on Drawings.
  - b. Control: On-off operation, functions as indicated in sequences of operation on Drawings.
6. Communication Interface: Comply with ASHRAE 135.



## 2.5 LINE CONDITIONING AND FILTERING

- A. Input Line Conditioning: Based on the manufacturer's harmonic analysis study and report, provide input filtering, as required, to limit total demand (harmonic current) distortion and total harmonic voltage demand at the defined point of common coupling to meet IEEE 519 recommendations.

## 2.6 BYPASS SYSTEMS

- A. Bypass Operation: Safely transfers motor between power converter output and bypass circuit, manually, automatically, or both. Selector switches set modes and indicator lights indicate mode selected. Unit is capable of stable operation (starting, stopping, and running) with motor completely disconnected from power converter.
- B. Bypass Mode: Field-selectable automatic or manual, allows local and remote transfer between power converter and bypass contactor and retransfer, either via manual operator interface or automatic-control system feedback.
- C. Bypass Controller: Three-contactor-style bypass allows motor operation via the power converter or the bypass controller; with input isolating switch and barrier arranged to isolate the power converter input and output and permit safe testing and troubleshooting of the power converter, both energized and de-energized, while motor is operating in bypass mode.
  - 1. Bypass Contactor: Load-break, NEMA-rated contactor.
  - 2. Input and Output Isolating Contactors: Non-load-break, NEMA-rated contactors.
  - 3. Isolating Switch: Non-load-break switch arranged to isolate power converter and permit safe troubleshooting and testing of the power converter, both energized and de-energized, while motor is operating in bypass mode; pad-lockable, door-mounted handle mechanism.
- D. Bypass Contactor Configuration: Reduced-voltage (autotransformer) type.
  - 1. NORMAL/BYPASS selector switch.
  - 2. HAND/OFF/AUTO selector switch.
  - 3. NORMAL/TEST Selector Switch: Allows testing and adjusting of VFC while the motor is running in the bypass mode.
  - 4. Contactor Coils: Pressure-encapsulated type with coil transient suppressors.
    - a. Operating Voltage: Depending on contactor NEMA size and line-voltage rating, manufacturer's standard matching control power or line voltage.
    - b. Power Contacts: Totally enclosed, double break, and silver-cadmium oxide; assembled to allow inspection and replacement without disturbing line or load wiring.
  - 5. Control Circuits: integral CPT, with primary and secondary fuses, with CPT of sufficient capacity to operate all integral devices and remotely located pilot, indicating, and control devices.
    - a. CPT Spare Capacity: 100 VA.

## 6. Overload Relays: NEMA ICS 2.

### a. Solid-State Overload Relays:

- 1) Switch or dial selectable for motor-running overload protection.
- 2) Sensors in each phase.
- 3) Class 10/20 selectable tripping characteristic selected to protect motor against voltage and current unbalance and single phasing.
- 4) Class II ground-fault protection, with start and run delays to prevent nuisance trip on starting.
- 5) Analog communication module.

- b. NO isolated overload alarm contact.
- c. External overload, reset push button.

## 2.7 OPTIONAL FEATURES

- A. Damper control circuit with end-of-travel feedback capability.
- B. Sleep Function: Senses a minimal deviation of a feedback signal and stops the motor. On an increase in speed-command signal deviation, VFC resumes normal operation.
- C. Motor Preheat Function: Preheats motor when idle to prevent moisture accumulation in the motor.
- D. Remote digital operator kit.
- E. Communication Port: RS-232 port, USB 2.0 port, or equivalent connection capable of connecting a printer and a notebook computer.

## 2.8 ENCLOSURES

- A. VFC Enclosures: NEMA 250, to comply with environmental conditions at installed location.
  1. Outdoor Locations: Type 3R.

## 2.9 ACCESSORIES

- A. General Requirements for Control-Circuit and Pilot Devices: NEMA ICS 5; factory installed in VFC enclosure cover unless otherwise indicated.
  1. Push Buttons: Covered.
  2. Pilot Lights: Push to test.
  3. Selector Switches: Rotary type.
  4. Stop and Lockout Push-Button Station: Momentary-break, push-button station with a factory-applied hasp arranged so padlock can be used to lock push button in depressed position with control circuit open.
- B. Reversible NC/NO bypass contactor auxiliary contact.

- C. Control Relays: Auxiliary and adjustable solid-state time-delay relays.
- D. Phase-Failure, Phase-Reversal, and Undervoltage and Overvoltage Relays: Solid-state sensing circuit with isolated output contacts for hard-wired connections. Provide adjustable undervoltage, overvoltage, and time-delay settings.
  - 1. Current Transformers: Continuous current rating, basic impulse insulating level (BIL) rating, burden, and accuracy class suitable for connected circuitry. Comply with IEEE C57.13.
- E. Supplemental Digital Meters:
  - 1. Elapsed-time meter.
  - 2. Kilowatt meter.
  - 3. Kilowatt-hour meter.
- F. Sun shields installed on fronts, sides, and tops of enclosures installed outdoors and subject to direct and extended sun exposure.
- G. Spare control-wiring terminal blocks; unwired.

## 2.10 SOURCE QUALITY CONTROL

- A. Testing: Test and inspect VFCs according to requirements in NEMA ICS 61800-2.
  - 1. Test each VFC while connected to a motor that is comparable to that for which the VFC is rated.
  - 2. Verification of Performance: Rate VFCs according to operation of functions and features specified.
- B. VFCs will be considered defective if they do not pass tests and inspections.
- C. Prepare test and inspection reports.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine areas, surfaces, and substrates to receive VFCs, with Installer present, for compliance with requirements for installation tolerances, and other conditions affecting performance of the Work.
- B. Examine VFC before installation. Reject VFCs that are wet, moisture damaged, or mold damaged.
- C. Examine roughing-in for conduit systems to verify actual locations of conduit connections before VFC installation.

- D. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Wall-Mounting Controllers: Install with tops at uniform height and with disconnect operating handles not higher than 79 inches above finished floor, unless otherwise indicated, and by bolting units to wall or mounting on lightweight structural-steel channels bolted to wall. For controllers not on walls, provide freestanding racks complying with Section 260529 "Hangers and Supports for Electrical Systems."
- B. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.
- C. Install fuses in each fusible-switch VFC.
- D. Install fuses in control circuits if not factory installed. Comply with motor and VFC manufacturer recommendations for fuse type and sizing.
- E. Install, connect, and fuse thermal-protector monitoring relays furnished with motor-driven equipment.
- F. Comply with NECA 1.

### 3.3 CONTROL WIRING INSTALLATION

- A. Install wiring between VFCs and remote devices and facility's central-control system. Comply with requirements in Section 260523 "Control-Voltage Electrical Power Cables."
- B. Bundle, train, and support wiring in enclosures.
- C. Connect selector switches and other automatic-control devices where applicable.
  - 1. Connect selector switches to bypass only those manual- and automatic-control devices that have no safety functions when switches are in manual-control position.
  - 2. Connect selector switches with control circuit in both manual and automatic positions for safety-type control devices such as low- and high-pressure cutouts, high-temperature cutouts, and motor-overload protectors.

### 3.4 IDENTIFICATION

- A. Identify VFCs, components, and control wiring. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."
  - 1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.
  - 2. Label each VFC with engraved nameplate.

3. Label each enclosure-mounted control and pilot device.
- B. Operating Instructions: Frame printed operating instructions for VFCs, including control sequences and emergency procedures. Fabricate frame of finished metal, and cover instructions with clear acrylic plastic. Mount on front of VFC units.

### 3.5 FIELD QUALITY CONTROL

- A. Perform tests and inspections with the assistance of a factory-authorized service representative.
- B. Acceptance Testing Preparation:
  1. Test insulation resistance for each VFC element, bus, component, connecting supply, feeder, and control circuit.
  2. Test continuity of each circuit.
- C. Tests and Inspections:
  1. Inspect VFC, wiring, components, connections, and equipment installation. Test and adjust controllers, components, and equipment.
  2. Test insulation resistance for each VFC element, component, connecting motor supply, feeder, and control circuits.
  3. Test continuity of each circuit.
  4. Verify that voltages at VFC locations are within 10 percent of motor nameplate rated voltages. If outside this range for any motor, notify Owner before starting the motor(s).
  5. Test each motor for proper phase rotation.
  6. Perform tests according to the Inspection and Test Procedures for Adjustable Speed Drives stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
  7. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
  8. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.
- D. VFCs will be considered defective if they do not pass tests and inspections.
- E. Prepare test and inspection reports, including a certified report that identifies the VFC and describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations made after remedial action.

### 3.6 STARTUP SERVICE

- A. Engage a factory-authorized service representative to perform startup service.
  1. Complete installation and startup checks according to manufacturer's written instructions.

### 3.7 ADJUSTING

- A. Program microprocessors for required operational sequences, status indications, alarms, event recording, and display features. Clear events memory after final acceptance testing and prior to Substantial Completion.
- B. Set field-adjustable switches, auxiliary relays, time-delay relays, timers, and overload-relay pickup and trip ranges.
- C. Adjust the trip settings of instantaneous-only circuit breakers and thermal-magnetic circuit breakers with adjustable, instantaneous trip elements. Initially adjust to 6 times the motor nameplate full-load amperes and attempt to start motors several times, allowing for motor cool-down between starts. If tripping occurs on motor inrush, adjust settings in increments until motors start without tripping. Do not exceed 8 times the motor full-load amperes (or 11 times for NEMA Premium Efficient motors if required). Where these maximum settings do not allow starting of a motor, notify Owner before increasing settings.
- D. Set the taps on reduced-voltage autotransformer controllers.
- E. Set field-adjustable circuit-breaker trip ranges as recommended by motor and VFC manufacturer.
- F. Set field-adjustable pressure switches.

### 3.8 PROTECTION

- A. Temporary Heating: Apply temporary heat to maintain temperature according to manufacturer's written instructions until controllers are ready to be energized and placed into service.
- B. Replace VFCs whose interiors have been exposed to water or other liquids prior to Substantial Completion.

### 3.9 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, reprogram, and maintain VFCs. Provide three copies of Training material, including presentation, manuals and samples to the Owner.

END OF SECTION 262923

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## **APPENDIX 260915A**

# **PRODUCT DATA FOR PROGRAMMABLE LOGIC CONTROLLER**



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## 1 ACE Motorola RTU



**ACE3600** is a state-of-the-art high performance Remote Terminal Unit (RTU) with exceptional communication capability. The unit is designed to provide scalability and modularity to optimize the performance of any control system. The unit's rugged design offers compliance for the requirements of most demanding SCADA system environments. Motorola has developed this innovative RTU to provide a cost effective RTU solution by minimizing the installation and configuration time.

# 1 Main Features:

- Power PC based processor provides very high performance
- VX-Works based real-time operating system
- Up to three Ethernet ports
- Up to four serial communication ports
- Up to two radio modem ports
- 0,3,5,7 or 8 I/O slot wall mount frames, 19" rack mount on 8 slot frame
- Single and double density I/O modules
- Mixed analog input and output modules
- Hot Swap I/O replacement
- Wide operating temperature range -40 to +70 °C
- NEMA 4 / IP65 Housing, 40 x 40 cm and 50 x 50 cm
- Two-way/trunking/ digital radio models
- AC and DC controlled power supply
- 6.5 or 10 Ah Backup battery, smart battery charger
- GPS and NTP for time synchronization
- System building tool for configuration and programming
- Remote firmware and program download
- Compatible with MOSCAD family of RTUs
- Multiple Protocol Support: Modbus, DNP 3.0, DF1, IEC 60870-5-101

# 2 Advanced Control Equipment

## SPECIFICATION SHEET

December 2007. Motorola reserves the rights to change the specifications without notice.

## LOCAL INTELLIGENCE

ACE3600 is a microprocessor-based RTU with large memory capacity that can make control decisions on-site, based on status conditions and values from local and remote sources. Local intelligence permits control decisions without the need for real-time messages from other supervisory centers; ACE3600 can operate in sophisticated control systems.

## PROGRAMMABLE

ACE3600 uses an advanced symbolic ladder logic application language to develop the data base conditions, values, and RTU profile that must exist for each control action, message transmission, etc. to occur. Routines written in 'C' may be executed as a whole or part of the total application. Powerful applications may easily be defined using industry accepted ladder logic and 'C'. The task is made easier by using the SCADA application development software and a PC-style computer.

## PROTOCOLS

ACE3600 uses the OSI-based MDLC communication protocol for all data signaling. Third party MODBUS, DNP 3.0 DF1 (Allen Bradley) and IEC 60870-5 protocols are also supported. MDLC was specifically developed for radio use but is completely applicable to Ethernet, wireline, and other media. It permits large volumes of data to be quickly transferred between units using packet transmission techniques. The MDLC protocol enables adding the ACE3600 easily to existing MOSCAD systems where system expansion is required.

## COMMUNICATIONS

ACE3600 permits communication to occur RTU-to-central and RTU-to-RTU (peer-to-peer). Communication may occur between individual units or may be broadcast to several units simultaneously. Store-&-forward may be employed to pass messages RTU-to-RTU throughout the system. Direct communication, where possible, or repeated messaging over one or multiple communication media, may be intermixed within the system.

## UPLOAD/DOWNLOAD

ACE3600, via the MDLC data transfer capability, uploads the data collected and calculated by the application program to a central site. It also receives downloaded changes to the application program and/or to the parameters that control how the application operates. The process being supervised does not need to be static; operational variables and limits, and the process definition itself, can be easily changed and transmitted to the RTU from anywhere in the system's network. A unique feature of ACE3600, also enables remote firmware safe download from anywhere in the system's network. This allows remote firmware upgrades. The above features minimize site visits by maintenance personnel after the unit's initial installation.

## COMMUNICATION PORTS

Connectors on the various CPU modules permit the connection for local application programming, or connection to other onsite devices to supervise their operation, and to the communication media device. Multiple connectors, multiple communication types, and variable data speeds allow practically all external data devices to be connected to the CPU module.

## CHASSIS AND ENCLOSURES

ACE3600 can be provided on a metal chassis or in a painted steel NEMA-4X (IP56) rated outdoor enclosure that can hold the RTU frame, modules, battery and up to two radios (depending on enclosure size). An optional tamper switch can be ordered with the enclosure.

## 19" RACKMOUNT

ACE3600 may be ordered with frame and mounting accessories that permit direct mounting onto standard 19" equipment racks. The frame contains space for power supply, CPU module and up to eight I/O modules. Optionally, a 19" metal chassis can be ordered for installation of backup battery, accessories and up to two radios.

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## ACE3600 GENERAL SPECIFICATIONS

Frames No I/O slots - PS and CPU modules only, wall mount 117 W x 244 H x 198\* D mm (4.61" x 8.23" x 7.80"\*), 0.95 Kg (2.1 Lb)

3 I/O slots - PS, CPU and up to 3 I/O modules, wall mount 234 W x 244 H x 198\* D mm (9.21"x 9.61" x 7.80" \*), Approx. 1.9 Kg (4.19 Lb)

5 I/O slots - PS, CPU and up to 5 I/O modules, wall mount 314 W x 244 H x 198\* D mm (12.36"x 9.61" x 7.80" \*), Approx. 2.4 Kg (5.3 Lb)

7 I/O slots - PS, CPU and up to 7 I/O modules 391 W x 244 H x 198\* D mm (15.39" x 9.61" x 7.80" \*), 3. Kg (6.6 Lb)

8 I/O slots - PS, CPU and up to 8 I/O modules, wall mount or 19" rack 435 W x 244 H x 198\* D mm (17" x 9.61" x 7.80" \*), Approx. 3.3 Kg (7.3 Lb)

\* Depth including module panel Metal Chassis Large - for PS, CPU and up to 7 I/O slot frame, two radios and 6.5 or 10 Ah backup battery, wall mount , 448 x 468 mm x 200\* D mm (17.64" x 18.43" x 7.88"\*) Small - for PS, CPU and up to 3 I/O slot frame, one radio and 6.5 Ah backup battery, wall mount, 335 W x 355 H x 198\* D mm (17.64" x 18.43" x 7.80"\*)

\* Depth Including Frame and Module Housing Large NEMA 4X /IP65 painted metal - up to 7 I/O slot frame, two radios and 6.5 or 10 Ah, backup battery, 500 W x 500 H x 210 D mm (19.7" x 19.7" x 8.26" ) Small NEMA 4 /IP65 painted metal - up to 3 I/O slot frame one radio and 6.5 Ah backup battery, 380 W x 380 H x 210 D mm (15" x 15" x 8.26")  
 Power Supply 10.8-16 V DC 10.8-16 V DC low-tier  
 18-72 V DC  
 18-72 V DC with 12 V smart battery charger  
 90- 264 V AC, 50-60 Hz  
 90- 264 V AC, 50-60 Hz, with 12 V smart battery charger  
 Backup Battery 6.5 Ah - Sealed Lead-Acid 10 Ah - Sealed Lead-Acid  
 Operating Temperature -40 °C to +70 °C (-40 °F to 158 °F)

Notes:

(1) when using a metal housing option, the maximum operating temp. outside the housing is +60 °C (140 °F).

(2) Motorola radios and ACT module operating temp. range is: -30 °C to +60 °C (-22 °F to 140 °F)

Storage Temperature -55 °C to +85 °C (-67 °F to 185 °F)

Operating Humidity 5% to 95% RH @ 50 °C without condensation

Mechanical Vibrations Per EIA/TIA 603 Base station, Sinusoidal 0.07mm @ 10 to 30 Hz, 0.035 mm @ 30-60 Hz

Operating Altitude -400m to +4000 meter (-1312 ft to + 13120 ft) above sea level

Note: 90- 264 V AC and 18-72 V DC PS operating altitude is -400m to +2000 meter (-1312 ft to + 6560 ft)

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## REGULATORY STANDARDS

Safety UL 60950-1:2001

CSA 22.2-60950-1

IEC 60950-1

AS/NZS 60950

Emission Emission standards per:

CFR 47 FCC part 15, subpart B (class A)

EN55022:2003 Class A

EN61000-3-2

EN61000-3-3

Immunity Immunity standards for industrial environments per EN50082-2 /IEC 61000-6-2

IEC 61000-4-2

IEC 61000-4-3

IEC 61000-4-4

IEC 61000-4-5

IEC 61000-4-6

IEC 61000-4-11

## COMMUNICATIONS

- Communication Ports: Up to 5 ports per CPU
- Serial - up to 4 x RS-232 ports
- Multi-drop – up to 3 x RS485 ports
- Ethernet - up to 2 x 10/100 MB ports and 1 x 10 MB port
- Two-way radio/analog trunked radio - up 2 x modem ports
- Motorola Radio Support Mobile conventional two-way radios - CM200, CM340, GM3188, EM200, CDM750
- Portable conventional two way radios – HT750, GP320, GP328, PRO5150
- Analog Trunk radios – XTL5000, XTL2500
- Digital Trunk radios – XTL5000, XTL2500, XTS2500, MTM800 (Tetra)
- Third Party Radio Support Two way radios, data radios, TETRA radio (PD)
- Modem Support Dial-up modems, cellular modems (dial mode & PD)
- Protocols MDLC, TCP, UDP, IP, PPP, NTP, DHCP
- Third Party Protocol Support MODBUS RTU: master on RS-232 / RS-485, slave on RS-232 / RS-485 / Ethernet
- DF1 (Allen Bradley): master on RS-232
- DNP 3.0 Plus: master & slave on RS-232 / RS-485 / Ethernet
- IEC 60870-5-101: slave on RS-232
- User Protocol (user program) Possible on RS-232, RS-485 and Ethernet ports

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### 3 CPU 3610/CPU 3640 MODULES SPECIFICATIONS



Microprocessor Freescale – Power PC II, MPC8720, 32-bit, extended communication capability, DMA and floating point calculation support Microprocessor Clock 200 MHz Memory Flash: 16 MB DRAM: 32 MB SRAM plug-in board (optional): 4 MB Real-Time Clock Full calendar with leap year support (Year, Month, Day, Hours, Minutes, Seconds). Time drift: max. 2.5 seconds per day (when power is on) SRAM and RTC Retention 3 V Rechargeable lithium backup battery

- Serial Port 1 Configurable RS-232C or RS-485 port:
  - RS-232C: A synch, Full Flow Control, up to 230.4 kb/s, GPS receiver interface
  - RS-485, multi-drop 2-Wire up to 460.8 kb/s
- Serial Port 2 RS-232C, Asynch, Full Flow Control, up to 230.4 kb/s, GPS receiver interface
- Plug-In Port 1 Supports the following Plug-In ports:
  - Radio Modem, DPSK 1.2 kb/s, FSK 1.2 / 1.8 / 2.4 kb/s, DFM 2.4/3.6/4.8 kb/s
  - RS-232, Sync/Asynch, Full Flow Control, up to 230.4 kb/s, GPS receiver interface
  - RS-485, multi-drop 2-wire, up to 460.8 kb/s
  - Ethernet 10/100 Mb/s
- Plug-In Port 2 Supports the following Plug-In ports:
  - Radio Modem, DPSK 1.2 kb/s, FSK 1.2 / 1.8 / 2.4 kb/s, DFM 2.4/3.6/4.8 kb/s and
  - RS-232, Sync/Asynch, Full Flow Control, up to 230.4 kb/s, GPS receiver interface
  - RS-485, multi-drop 2-Wire up to 460.8 kb/s
  - Ethernet 10 Mb/s
- Ethernet Port 1 10/100 Mb/s, (on CPU 3640 only)
- LEDs Display 4 CPU diagnostics LEDs, port status LEDs and user application LEDs
- Power Consumption Typical: 4W (280 mA @ 13.8 VDC at PS) LEDs on: 4.4W (320 mA @ 13.8 VDC at PS)
- Operating Voltage 10. 8 -16 V DC (from the motherboard connector)
- Dimensions 56 mm W x 225 mm H x 180 mm D (2.2" W x 8.7" H x 7.1" D)
- Weight Approx. 0.38 Kg (0.84 Lb)

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#### 12 V DC POWER SUPPLY MODULE (DEFAULT)

- Input Voltage 10.8 - 16 V DC
- Outputs Motherboard connector (to CPU and I/O modules): equal to input voltage, max. 4 A
- AUX1A/AUX1B: equal to input voltage, max. 8 A, on/off controlled by user program
- AUX2A/AUX2B (configurable): equal to input voltage (default), max. 8A, or 3.3, 5, 7.5, 9 V DC  $\pm 10\%$ , max. 2.5A, on/off controlled by user program
- **Note:** max. 8 A total current consumption from all outputs
- No Load power consumption Max. 50 mA
- Diagnostics LEDs Status LED for: input voltage, AUX1 and AUX2 outputs, 12V control for DO modules
- Input Protection Internal Line Fuse, replaceable
- Output Protection AUX2A/B Short Circuit, automatic recovery on 3.3, 5, 7.5, 9 V
- Dimensions 56 mm W x 225 mm H x 180 mm D (2.2" W x 8.7" H x 7.1" D)
- Weight Approx. 0.43Kg (0.95 Lb)

## 12 V DC LOW-TIER POWER SUPPLY MODULE

- Input Voltage 10.8 - 16 V DC
- Outputs Motherboard connector (to CPU and I/O modules): The same as input voltage / max. 4 A
- AUX1A/AUX1B: equal to input voltage max. 8A
- **Note:** max. 8 A total current consumption from all outputs
- Input Protection Internal Line Fuse, replaceable
- Dimensions 56 mm W x 225 mm H x 180 mm D (2.2" W x 8.7" H x 7.1" D)
- Weight Approx. 0.4Kg (0.9 Lb)

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## 18-72 V DC POWER SUPPLY MODULES

- Input Voltage 18-72 V DC
- Total Power 18-72 V DC: Max. 60 Watt continuous, Max. 105 Watt peak @ 25% duty cycle
- Outputs Motherboard connector (to CPU and I/O modules): 13.2 V DC  $\pm 20\%$ , max. 4 A
- AUX1A/AUX1B: equal to input voltage, max. 8 A, on/off controlled by user program
- AUX2A/AUX2B (configurable): equal to input voltage (default), max. 8A, or 3.3, 5, 7.5, 9 V DC  $\pm 10\%$ , max. 2.5A, on/off controlled by user program

**Note:** max. 8 A total current consumption from all outputs

- Battery Charger 12 V Lead-Acid battery charger (in PS model with charger)
- Automatic charging of 6.5 or 10 Ah backup battery, battery temperature sensing, overcharging protection, battery capacity test and diagnostics, automatic battery switch-over
- Diagnostics LEDs Status LED for: input voltage, AUX1 and AUX2 outputs, 12V control for DO modules and battery
- No Load power consumption Max. 250 mA
- Efficiency 80% typical, 76% with full load
- In-rush Current 10 A maximum, for 2 mSec. Max, cold start at 25°C
- Protection Internal line input fuse (replaceable), Short Circuit automatic recover
- Output Protection AUX2A/B Short Circuit, automatic recovery on 3.3, 5, 7.5, 9 V
- Insulation Input to case: 500 V DC, input to output: 500 V DC
- Dimensions 56 mm W x 225 mm H x 180 mm D (2.2" W x 8.7" H x 7.1" D)
- Weight Approx. 1Kg (2.2 Lb)

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## AC POWER SUPPLY MODULES



Input Voltage 90-264 V AC, 50/60 Hz

Total Power Max. 60 Watt continuous, Max. 105 Watt peak @ 25% duty cycle Outputs Motherboard connector (to CPU and I/O modules): 13.2 V DC  $\pm 20\%$ , max. 4 A AUX1A/AUX1B user connectors: 13.2V DC  $\pm 20\%$ , max. 8 A, on/off controlled by user program AUX2A/AUX2B: 13.2 V DC  $\pm 20\%$ , max. 8A or 3.3, 5, 7.5, 9 V DC  $\pm 10\%$  (configurable), max. 2.5A , on/off controlled by user program

**Note:** max. 8 A total current consumption from all outputs Battery Charger 12 V Lead-Acid battery charger (in PS with charger) Automatic charging of 6.5 or 10 Ah backup battery, battery temperature sensing, overcharging protection, battery capacity test and diagnostics, automatic battery switch-over

- Diagnostics LEDs Status LED for: input voltage, AUX1 and AUX2 outputs, 12V control for DO modules and battery
- No Load power consumption 130 mA @ 220 V AC
- Efficiency 80% typical @230 V AC, 76% typical @115 V AC (full load)
- Inrush Current 25 A maximum, for 2 mSec. Max, cold start at 25°C
- Power Factor 0.98 typical at 230 V AC, 0.99 typical at 115 V AC
- Protection Internal Line Fuse, replaceable
- Output Protection AUX2A/B Short Circuit, automatic recovery on 3.3, 5, 7.5, 9 V
- Insulation Input to case: 1500 V AC, input to output: 3000 V AC
- Dimensions 56 mm W x 225 mm H x 180 mm D (2.2" W x 8.7" H x 7.1" D)
- Weight Approx. 1Kg (2.2 Lb)

## 24 V DC PLUG-IN POWER SUPPLY



- Input Voltage 10.8-16V (from I/O module)
- Output 24V floating, max. 150 mA
- Efficiency 75% typical
- Protection Automatic output shut down on over-voltage and over-current
- Insulation Input to output: 1500 V AC
- Dimensions 78 mm W x 15 mm H x 68 mm D (3.1" W x 0.6" H x 2.7" D)
- Weight Approx. 0.04 Kg (0.09 Lb)

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### 16/32 DI FAST 24 V MODULE

- Total Number of Inputs 16 DI or 32 DI
- Input Arrangement Isolated groups of 16 inputs with shared common
- Fast Counter Inputs Inputs that can be used as fast counters:
  - All inputs in 16 DI module
  - First 20 inputs in 32 DI module
- AC Input Frequency 45 – 65 Hz
- AC Input Delay Maximum 0.2 mS
- Fast Counter Input Frequency 0 - 12.5 KHz, minimum pulse width 40  $\mu$ S
- Max. DC Input Voltage Max.  $\pm 40$  V DC (relative to input common)
- "ON" DC Voltage Range +9 to +30 V DC, -30 to -9 V DC
- "OFF" DC Voltage Range -3 to +3 V DC
- "ON" AC Voltage Range 10 to 27 V AC (RMS)
- "OFF" AC Voltage Range 0 to 5 V AC (RMS)
- Input Current Max. 2.5 mA
- Fast Capture Resolution 1 mS (Interrupt upon change of state)
- Event Time Tagging Resolution 1 mS (Interrupt upon change of state)
- Input Filtering 0 to 50.8 mS (DC, programmable in 0.2 mSec steps)
- Counter Input Filtering 0 to 12.75 mS (Programmable in 0.05 mSec steps for inputs configured as high speed counters)
- 24 V DC Output Supports optional isolated 24 V plug-in "Wetting" Power Supply (One in 16 DI, two in 32 DI)
- Diagnostics LEDs Status LED per each input, module error LED, Plug-In 24V status LED
- User Connection 2 or 4 Terminal Blocks (3.5mm pitch), Maximum 18 AWG
- Cable & TB Holder 20 or 40 Wire cable with Terminal Block Holder connector, 26 AWG wires
- Module Replacement Hot swap replacement – module extraction/insertion under voltage
- Input Isolation 2.5 k V DC/AC between input and module logic per IEC255-5
- Input Insulation Insulation resistance 100 M $\Omega$  @ 500 V DC, Insulation impulse 5 kV per IEC255-5
- Operating Voltage 10.8 -16 V DC and 3.3 V DC (from the motherboard connector)
- Power Consumption 16 DI: 0.32 W typical with all LEDs on (23 mA @ 13.8 VDC at PS)
- 32 DI: 0.55 W typical with all LEDs on (40 mA @ 13.8 VDC at PS) (Not including 24 V DC Plug-in Power Supply power consumption)
- Dimensions 37 mm W x 225 mm H x 180 mm D (1.5" W x 8.7" H x 7.1" D)
- Weight 16 DI: approx. 0.28 Kg (0.62 Lb), 32 DI: approx. 0.29 Kg (0.63 Lb)

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### 16/32 DIGITAL INPUT FAST 24 V IEC 61131-2 TYPE II MODULE

- Total Number of Inputs 16 DI or 32 DI
- Input Arrangement Isolated Groups of 16 inputs with shared common
- Fast Counter Inputs Inputs that can be used as fast counters:
  - All inputs in 16 DI
  - First 20 inputs in 32 DI
- Fast Counter Input Frequency 0 - 10 KHz, minimum pulse width 50  $\mu$ S
- Max. DC Input Voltage Max.  $\pm 40$  V DC
- "ON" DC Voltage Range +11 to +30 V DC, -30 to -11 V DC
- "OFF" DC Voltage Range -5 to +5 V DC
- Input Current 6-10 mA
- Fast Capture Resolution 1 mS (Interrupt upon change of state)
- Event Time Tagging Resolution 1 mS (Interrupt upon change of state)

- Input Filtering 0 to 50.8 mS (DC, programmable in 0.2 mSec steps)
- Counter Input Filtering 0 to 12.75 mS (Programmable in 0.05 mSec steps for inputs used as high speed counters)
- 24 V DC Output Supports isolated 24 V plug-in "Wetting" Power Supply (one in 16 DI, two in 32 DI)
- Diagnostics LEDs LED per each input status, module error LED, 24V Plug-In status LED
- User Connection 2 or 4 Terminal Blocks (3.5mm pitch), Maximum 18 AWG
- Cable & TB Holder 20 or 40 Wire Cable with Terminal Block Holder connector, 26 AWG
- Module Replacement Hot swap replacement– module extraction/insertion under voltage
- Input Isolation 2.5 kV DC/AC between input and module logic per IEC255-5
- Input Insulation Insulation resistance 100 M $\Omega$  @ 500 V DC, Insulation impulse 5 kV per IEC255-5
- Operating Voltage 10.8 -16 V DC and 3.3 V DC (from the motherboard connector)
- Power Consumption 16 DI: 0.32 W typical when all LEDs on (23 mA @ 13.8 VDC at PS)
- 32 DI: 0.55 W typical when all LEDs on (40 mA @ 13.8 VDC at PS) (Not including 24 V Plug-in Power Supply consumption)
- Dimensions 37 mm W x 225 mm H x 180 mm D (1.5" W x 8.7" H x 7.1" D)
- Weight 16 DI: approx. 0.28 Kg (0.62 Lb), 32 DI: approx. 0.29 Kg (0.63 Lb)

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### 8/16 RELAY OUTPUT MODULE

- Total Number of Outputs 8 EE relay outputs or 16 EE relay outputs
- 8 ML relay outputs
- 16 ML relay outputs
- Output Arrangement 8 DO: 3 X Form C (SPDT) and 5 X Form A (SPST)
- 16 DO: 6 X Form C (SPDT) and 10 X Form A (SPST)
- Contact Voltage Ratings Max. 60 V DC, or 30 V AC RMS (42.4 V peak).
- Contact Power Ratings 2A @ 30 V DC, 0.6A @ 60V DC or 0.6A @ 30V AC (resistive load)
- Relay Back Indication Contact position - hardware back indication
- DO Frequency Max. 10 Hz
- Diagnostics LEDs LED per each output status, module error LED
- User Connection 2 or 4 Terminal Blocks (3.5mm pitch), Maximum 18 AWG
- Cable & TB Holder 20 or 40 Wire Cable with Terminal Block Holder connector, 26 AWG
- Fail State Configurable relay state on CPU fail: On, Off or 'last value'
- All Relays Disable/Enable Selectable per module, controlled from the power supply
- Module Replacement Hot swap replacement– module extraction/insertion under voltage
- Output Isolation Between open contacts: 1kV, between contact and coil: 1.5 kV, between contact sets: 1.5 kV
- Insulation resistance 100 M $\Omega$  @ 500 V DC per IEC255-5,
- Insulation impulse 1.5 kV between input and logic
- Operating Voltage 10.8 -16 V DC and 3.3 V DC (from the motherboard connector)
- Power Consumption 8 DO: 0.2 W typical when all LEDs on and all relays off (14 mA @ 13.8 VDC at PS)
- 16 DO: 0.3 W typical when all LEDs on and all relays off (22 mA @ 13.8 VDC at PS)
- For each EE Relay on : 0.2 W typical (15 mA @ 13.8 VDC at PS)
- Dimensions 37 mm W x 225 mm H x 180 mm D (1.5" W x 8.7" H x 7.1" D)
- Weight 8 DO: approx. 0.29 Kg (0.64 Lb), 16 DO: approx. 0.32 Kg (0.7 Lb)

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### 8/16 ANALOG INPUT MODULE



- Total Number of Inputs 8 AI,  $\pm 20$  mA, 16 AI,  $\pm 20$  mA, 8 AI,  $\pm 5$  V, 16 AI,  $\pm 5$  V and Input Configuration Isolated (floating) analog inputs A to D Resolution 16 Bit (including sign)
- Input Accuracy  $\pm 0.1\%$  of full scale
- Input Sampling Time 10 mSec @ 50 Hz filtering
- 8.33 mSec @ 60 Hz filtering
- Smoothing Selectable input averaging: 1, 2, 4, 8, 16, 320, 64 or 128 samples (x10 mS)
- Permitted potential between Inputs 75 V DC, 60 V AC (RMS)
- Input Impedance  $\pm 20$  mA input:  $R_{in} < 250 \Omega$
- $\pm 5$  V input:  $R_{in} > 1 M\Omega$
- Crosstalk Rejection Better than 80 dB between any pair of inputs
- Temperature Stability Better than  $\pm 25$  PPM/ $^{\circ}\text{C}$
- Interference Suppression Selectable 50 or 60 Hz filtering,
- Common mode rejection  $> 80$  dB,
- Differential mode rejection  $> 50$  dB
- 24 V DC Output Supports optional isolated 24V Plug-in Power Supply (one in 16 DI, two in 32 DI)
- Diagnostics LEDs Overflow and Underflow LED per each input, module error LED, 24V Plug-In status LED
- The module Overflow and Underflow levels can be configured to:
- Current inputs:  $\pm 20\text{mA}/4\text{-}20$  mA
- Voltage inputs:  $\pm 5$  V/0-5 V/1-5 V
- User Connection 2 or 4 Terminal Blocks (3.5mm pitch), Maximum 18 AWG
- Cable & TB Holder 20 or 40 Wire Cable with Terminal Block Holder connector, 26 AWG
- Module Replacement Hot swap replacement– module extraction/insertion under voltage
- Input Isolation 1.5 kV between input and module logic
- Input Insulation resistance 100 M $\Omega$  @ 500 V DC, per IEC255-5
- Operating voltage 10.8-16 V DC and 3.3 V DC (from the motherboard connector)
- Power Consumption 8 AI: 0.9 W typical when all LEDs on (65 mA @ 13.8 VDC at PS))
- 16 AI: 1.3W typical when all LEDs on (95 mA @ 13.8 VDC at PS) (Not including 24 V Plug-in Power Supply)

- Dimensions 37 mm W x 225 mm H x 180 mm D (1.5" W x 8.7" H x 7.1" D)
- Weight 8 AI: approx. 0.32 Kg (0.71 Lb), 16 AI: approx. 0.34 Kg (0.75 Lb)

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#### 4 ANALOG OUTPUT MODULE

- Total Number of Outputs 4 and Output Configuration Isolated floating channels, each channel can be connected as 0 -20 mA or 0-10 V DC voltage D to A Resolution 14 Bit Output Accuracy  $\pm 0.1\%$  of full scale @25°C
- Temperature Stability Better than  $\pm 25$  PPM/°C
- Internal Settling Time Max. 1 ms
- Output Load Voltage:  $> 1.0$  k $\Omega$ ,  $< 1.0$   $\mu$ f, Current:  $< 750$   $\Omega$  (internal power source)
- Crosstalk Rejection Better than 50 dB between any pair of outputs
- Interference Suppression Common Mode Rejection:  $> 60$  dB
- Output protection Voltage output: short-circuit current, max. 30 mA
- Current output: No-load voltage max. 22 V DC
- Diagnostics LEDs Module Error LED, Voltage mode LED, Current mode LED, Calibration LED per channel
- User Connection 2 Terminal Blocks (3.5mm pitch), Maximum 18 AWG
- Cable & TB Holder 20 Wire Cable with Terminal Block Holder connector, 26 AWG
- Module Replacement Hot swap replacement- module extraction/insertion under voltage
- Isolation 1.5 kV between output and module logic
- Insulation Insulation resistance 100 M $\Omega$  @ 500 V DC, per IEC255-5
- Operating voltage 10.8 -16 V DC and 3.3 V DC (from the motherboard connector)
- Power Consumption 1.8 W typical when all LEDs on and outputs off (130 mA @ 13.8 VDC at PS)
  - W typical when all LEDs on and all outputs 20 mA (250 mA @ 13.8 VDC at PS)
- Dimensions 37 mm W x 225 mm H x 180 mm D (1.5" W x 8.7" H x 7.1" D)
- Weight 0.29 Kg (0.64 Lb)

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#### MIXED 4 ANALOG OUTPUT 8 ANALOG INPUT MODULES

- Total Number of I/Os 4 AO + 8 AI (AI:  $\pm 20$  mA or  $\pm 5$  V DC) I/O Arrangement AO - each channel can be connected as 0 -20 mA or 0-5 V, AI - Isolated (floating) analog inputs
- AO D to A Resolution 14 Bit
- AO Accuracy  $\pm 0.1\%$  of full scale @25°C
- AO Temperature Stability Better than  $\pm 25$  PPM/°C
- AO Internal Settling Time Max. 1 ms
- AO Load Voltage:  $> 1.0$  k $\Omega$ ,  $< 1.0$   $\mu$ f, Current:  $< 750$   $\Omega$
- AO Crosstalk Rejection Better than 50 dB between any pair of outputs
- AO Interference Suppression Common Mode Rejection:  $> 60$  dB
- AO Voltage Output Protection Short-circuits protection, max. 30 mA
- (all other operating channels remain fully functional)
- AO Current output no-load voltage Max. 22 V DC
- AO Isolation 1.5 kV between output and module logic
- AO Insulation resistance 100 M $\Omega$  @ 500 V DC, per IEC255-5
- AI A to D Resolution 16 Bit (including sign)
- AI Accuracy  $\pm 0.1\%$  of full scale @ -40°C to +70°C
- AI Sampling Time 10 mSec @ 50 Hz filtering
- 8.33 mSec @ 60 Hz filtering
- AI Smoothing Selectable input averaging: 1, 2, 4, 8, 16, 32, 64 or 128 samples (x10 mS)
- Permitted Potential between Inputs 75 V DC, 60 V AC (RMS)
- AI Input Impedance  $\pm 20$  mA input:  $R_{in} < 250$   $\Omega$
- $\pm 5$  V input:  $R_{in} > 1$  M $\Omega$
- AI Crosstalk Rejection Better than 80 dB between any pair of inputs
- AI Temperature Stability Better than  $\pm 25$  PPM/°C
- AI Interference Suppression Selectable 50 or 60 Hz filtering, Common mode rejection  $> 80$  dB, Differential mode rejection  $> 50$  dB
- 24 V DC Output Supports one optional isolated 24V Plug-in Power Supply
- Diagnostics LEDs AO - Voltage mode LED, Current mode LED, Calibration LED per channel

- AI - Overflow and Underflow LED per each input, 24V Plug-in status LED
- The module Overflow and Underflow levels can be configured to:  $\pm 20\text{mA}/4\text{-}20\text{ mA}$  or  $\pm 5\text{ V}/0\text{-}5\text{ V}/1\text{-}5\text{ V}$
- General - Module error LED
- AI Input Isolation 1.5 kV between input and module logic
- AI Input Insulation Insulation resistance 100 M $\Omega$  @ 500 V DC, per IEC255-5
- User Connection 4 Terminal Blocks (3.5mm pitch), Maximum 18 AWG
- Cable & TB Holder 40 Wire Cable with Terminal Block Holder connector, 26 AWG
- Module Replacement Hot swap replacement— module extraction/insertion under voltage
- Operating Voltage 10.5-16 V DC and 3.3 V DC (from the motherboard connector)
- Power Consumption 1.9 W typical when all LEDs on and outputs off (140 mA @ 13.8 VDC at PS)
- W typical when all LEDs on and all outputs 20 mA (250 mA @ 13.8 VDC at PS)
- Dimensions 37 mm W x 225 mm H x 180 mm D (1.5" W x 8.7" H x 7.1" D)
- Weight Approx. 0.34 Kg (0.75 Lb)

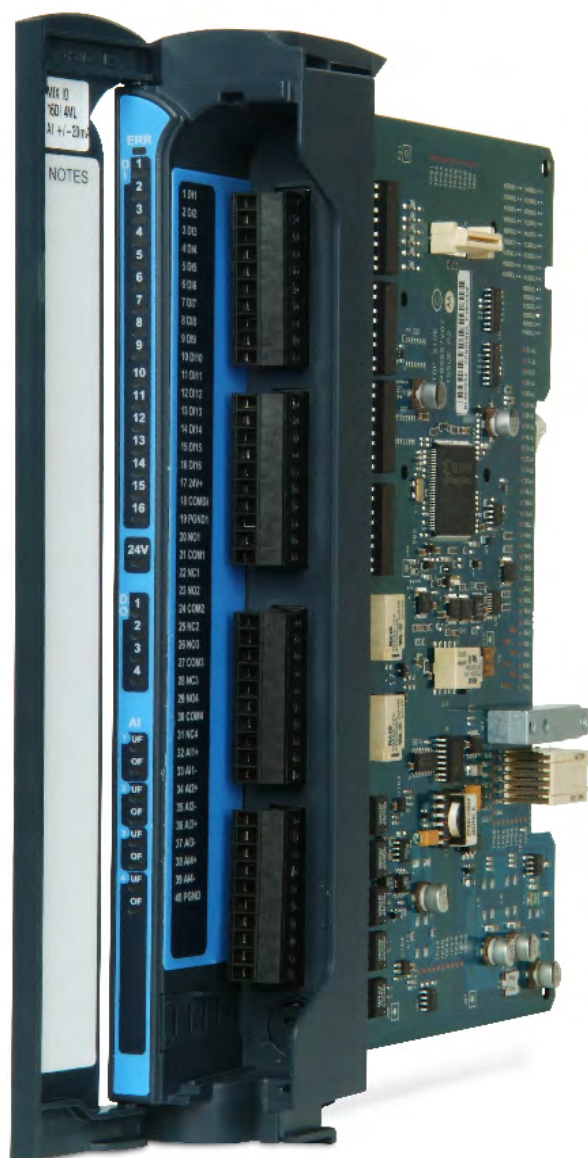
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### **16/32 DIGITAL OUTPUT/DIGITAL INPUT MODULE (16/32 DO/DI)**

- Total Number of Inputs/Outputs 16/32
- I/O Arrangement 2/4 groups of 8 I/Os with shared common
- Each group can be configured to function as FET DO or dry contact DI
- Counter Inputs 20 first inputs can be used as counter inputs
- Counter Input Frequency 0 - 1 KHz, minimum pulse width 500  $\mu\text{s}$
- Max. DC Input Voltage Max. 30 V DC (relative to input common)
- Input "ON" Resistance 0-4 k $\Omega$
- Input "OFF" Resistance  $\geq 50\text{ k}\Omega$
- Fast Capture Resolution 1 mS (Interrupt upon change of state)
- Event Time Tagging Resolution 1 mS (Interrupt upon change of state)
- Input Current Max. 0.3 mA (when the input is shorted)
- Input Filtering 0 to 50.8 mS (programmable in 0.2 mSec steps) Not relevant, minimum allowed is 1mSec
- Counter Input Filtering 0 to 12.75 mS (programmable in 0.05 mSec steps) Not relevant, minimum allowed is 1mSec
- Output Type MOSFET
- Output Voltage Range 5-30 V DC (user-supplied voltage)
- DO Frequency Max. 1 KHz (resistive load)
- DO Output current Max. 500 mA sink current (resistive load)
- Output Fail State Configurable output state on CPU fail: On, Off or 'last value'
- Diagnostics LEDs LED per each input/output status, module error LED
- User Connection 4 Terminal Blocks (3.5mm pitch), Maximum 18 AWG
- Cable & TB Holder 20 or 40 Wire Cable with Terminal Block Holder connector, 26 AWG
- Module Replacement Hot swap replacement— module extraction/insertion under voltage
- Input/Output Isolation 2.5 kV between input/output and module logic
- Input Insulation Insulation resistance 100 M $\Omega$  @ 500 V DC per IEC255-5
- Operating Voltage 10.8-16 V DC and 3.3 V DC (from the motherboard connector)
- Power Consumption 16 DO/DI: 0.55 W typical when all LEDs on and all outputs on (40 mA @ 13.8 VDC at PS)
- 32 DO/DI: 1 W typical when all LEDs on and all outputs on (72 mA @ 13.8 VDC at PS)
- Dimensions 37 mm W x 225 mm H x 180 mm D (1.5" W x 8.7" H x 7.1" D)
- Weight Approx. 0.25 Kg (0.55 Lb)

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### **MIXED I/O 16DI + 4 DO + 4AI MODULE**



Total Number of Inputs/Outputs 16 Digital Inputs + 4 EE Relay Outputs + 4 Analog Inputs,  $\pm 20$  mA  
 16 Digital Inputs + 4 ML Relay Outputs + 4 Analog Inputs,  $\pm 20$  mA I/O Arrangement 1 group of 16 DIs with shared common, 4 relay outputs - Form C, 4 isolated analog inputs

- DI Counter Inputs All inputs can be configured as fast counters
- DI Frequency 0 - 1 KHz
- DI Fast Counter Frequency 0 - 5 KHz minimum pulse width 100  $\mu$ S
- DI Max. DC Voltage Max. 40 V DC
- DI "ON" DC Voltage Range +11 to +30 V DC, -30 to -11 V DC
- DI "OFF" DC Voltage Range -5 to +5 V DC
- DI Current 6-10 mA
- Fast Capture Resolution 1 mS (Interrupt upon change of state)
- Event Time Tagging Resolution 1 mS (Interrupt upon change of state)
- DI Filtering 0 to 255 mSec (DC, programmable in 1 mSec steps)
- DI Counter Filtering 0 to 6.375 mSec (programmable in 0.025 mSec steps for inputs configured as high speed counter)
- DO Contact Voltage Ratings Max. 60 V DC or 30 V AC RMS (42.4 V peak).
- DO Contact Power Ratings 2A @ 30 V DC, 0.6A @ 60V DC or 0.6A @ 30V AC (resistive load)

- DO Relay Back Indication Contact position - hardware back indication
- DO Fail State Configurable relay state on CPU fail: On, Off or 'last value'
- AI Resolution 16 Bit (including sign)
- AI Accuracy  $\pm 0.1\%$  @  $-40^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$
- AI Sampling time 10 mSec @ 50 Hz filtering, 8.33 mSec @ 60 Hz filtering
- AI Smoothing Selectable input averaging: 1, 2, 4, 8, 16, 32, 64 or 128 samples (x10 mS)
- AI max. Potential between AIs 75 V DC, 60 V AC (RMS)
- AI Impedance  $R_{in} < 250 \Omega$
- AI Crosstalk Rejection Better than 80 dB between any pair of inputs
- AI Temperature Stability Better than  $\pm 25 \text{ PPM}/^{\circ}\text{C}$
- AI Interference Suppression Selectable 50 or 60 Hz filtering, common mode rejection  $> 80 \text{ dB}$ , differential mode rejection  $> 50 \text{ dB}$
- Diagnostics LEDs LED per each input/output status, module error LED, 24V Plug-in status LED
- 24 V DC Output Supports one isolated 24V plug-in "Wetting" Power Supply
- User Connection 4 Terminal Blocks (3.5mm pitch), Maximum 18 AWG
- Cable & TB Holder 40 Wire Cable with Terminal Block Holder connector, 26 AWG
- Module Replacement Hot swap replacement— module extraction/insertion under voltage
- Input / Output Isolation DI: 2.5 kV DC/AC between input and module logic per IEC255-5
- DO: Between open contacts: 1kV, between contact and coil: 1.5 kV, between contact sets: 1.5 kV
- AI: 1.5 kV between input and module logic
- Input Insulation Insulation resistance 100 M $\Omega$  @ 500 V DC per IEC255-5
- Operating Voltage 10.8-16 V DC and 3.3 V DC (from the motherboard connector)
- Power Consumption 1.5 W typical when all LEDs on and outputs off (110 mA @ 13.8 VDC at PS)
- EE Relay on : 0.2 W typical (15 mA @ 13.8 VDC at PS)
- (Not including 24 V Plug-in Power Supply)
- Dimensions 37 mm W x 225 mm H x 180 mm D (1.5" W x 8.7" H x 7.1" D)
- Weight Approx. 0.31 Kg (0.68 Lb)

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## Ordering Information

*Note: For detailed ordering information, refer to the ACE3600 Catalog.*

## ACE3600 MODELS

All RTU models include no I/O slots frame, 10.8-15.5 V DC PS and CPU3610. All radio models require Metal Chassis or Housing option.

- **No Radio Model**
  - ACE3600 Basic Model No Radio F7509
- **Conventional VHF Radio Models**
  - ACE3600 CM200/CM140/EM200/GM3188 VHF F7573
  - ACE3600 with CDM750 136-174 MHz F7563
  - ACE3600 with HT750/GP320/GP328 /PRO5150 VHF F7553
- **Conventional UHF Radio Models**
  - ACE3600 with CM200/CM140/EM200/GM3188 UHF F7574
  - ACE3600 with CDM750 403-512 MHz F7564
  - ACE3600 with HT750/GP320/GP328 /PRO5150 UHF F7554
- **Analog Trunked VHF Radio Models**
  - ACE3600 with XTL5000 136-174 MHz Analog F7523
  - ACE3600 with XTL5000 136-174 MHz Digital F7513
  - ACE3600 with XTS2500 136-174 MHz Digital F7543
- **Trunked UHF Radio Models**
  - ACE3600 with XTL5000 380-520 MHz Analog F7524
  - ACE3600 with XTL5000 380-520 MHz Digital F7514
  - ACE3600 with XTS2500 380-520 MHz Digital F7544
- **Trunked 800 MHz Radio Models**
  - ACE3600 with XTL5000 800 MHz Analog F7585
  - ACE3600 with XTL5000 800 MHz Digital F7586

- ACE3600 with XTS2500 800 MHz Digital
- **Software Tools**
  - ACE3600 System Tools Suite (STS) F7500
  - ACE3600 C Toolkit (CTK) F7600
- **STS add-on Software**
  - ACE3600 AGA 7+8 CD FVN5510
  - ACE3600 DNP 3.0 Plus Master Drivers CD FVN5511
  - ACE3600 DNP 3.0 Plus Slave Drivers CD FVN5512
  - ACE3600 IEC60870-5-101 Slave driver CD FVN5513

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## ACE3600 OPTIONS

### Regional Radio Options CM200/CM140/EM200/CM3188

- One of the following options must be ordered for models F7573 and
- F7574:
  - CM200 V851
  - CM140 V852
  - GM3188 V853
  - EM200 V854

### HT750/GP320/GP328/PRO5150

- One of the following options must be ordered for models F7553 and
- F7554.
  - HT750 V951
  - GP320 V952
  - GP328 V953
  - PRO5150 V954

### Frames

- 3 I/O slots frame V103
- 5 I/O slots frame V105
- 7 I/O slot frame V107
- 8 I/O slots frame V108
- 19" rack brackets for 8 I/O slots frame V051

## 4 Metal Chassis

- 48 x 48 cm Metal Chassis (up to 7 I/O slots) V056
- 38 x 38 cm Metal Chassis (up to 3 I/O slots) V214
- 8 I/O (19") Metal Chassis V269

### Housing

- 50 x 50 cm Metal Housing (up to 7 I/O slots) V228
- 50 x 50 cm Metal Housing with padlock accessory VA00405
- 40 x 40 cm Metal Housing (up to 3 I/O slots) V276
- 40 x 40 cm Metal Housing with padlock accessory VA00406
- Housing Tamper Switch V224



### Power Supply, Battery Charger and Backup Battery

*Note: The default PS is 10.8-16 V DC input*

- AC Power Supply 85-264 V V346
- AC PS 85-264 V with Battery charger V261
- DC Power Supply 18-72 V V251
- DC PS 18-72 V with Battery charger V367
- DC Low Tier PS 10.8 -16 V V149



- 6.5 Ah Backup Battery V114
- 10 Ah Backup Battery V328

### CPU Upgrade

*Note: The default CPU is CPU3610*

- ACE CPU3640 V446

### CPU Plug-in Ports / Memory

- Plug-in RS-232 Port V184
- Plug-in RS 485 Port V440
- Plug-in Ethernet 10 M Port V204
- Plug-in Ethernet 10/100 M Port V212
- Plug-in Radio Port VA00362
- Plug-in 4 MB SRAM V447

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### Digital Input Modules

- 16 DI FAST 24V DC V265
- 32 DI FAST 24V DC V379
- 16 DI FAST 24V IEC TP2 V117
- 32 DI FAST 24V IEC TP2 V959

### Relay Output Modules

- 8 DO EE relay 2A V508
- 16 DO EE relay 2A V616
- 8 DO ML relay 2A V314
- 16 DO ML relay 2A V516

### Analog Modules

- 8 AI  $\pm 20$  mA V318
- 16AI  $\pm 20$  mA V463
- 8 AI  $\pm 5$  V V741
- 16AI  $\pm 5$  V V742
- 4 AO V118
- 4 AO / 8 AI (AI =  $\pm 20$  mA) V562
- 4 AO / 8 AI (AI =  $\pm 5$  V) V460

### Mixed Input/Output Modules

- 16 DI/DO FET V480
- 32 DI/DO FET V481
- 16 DI 4 DO EE 4 AI,  $\pm 20$  mA V245
- 16 DI 4 DO ML 4 AI,  $\pm 20$  mA V453

### I/O Modules Cables and Accessories

- 20 wire cable with TB holder 3 m V253
- 40 wire cable with TB holder 3 m V358
- 40 pin TB holder kit V153
- 20 pin TB holder kit V158
- Blank I/O module V20

### Communications Interface

- RS-485 Junction Box V186

### Radio Installation Kits

- CM200/CM140/EM200/GM3188 Installation kit V148
- CDM750 Installation kit V143
- HT750/GP320/GP328 /PRO5150 Installation kit V154
- XTL5000/XTL2500 Digital Installation kit V681
- XTL5000/XTL2500 Analog Installation kit V157
- XTS2500 Digital Installation kit V156
- MDS X710/9810 installation kit V152
- MDS iNET900/Transnet Installation Kit V680

- Transnet 900 OEM Installation Kit VA00225

#### Software License (RTU options)

- 3rd Party Protocol License (ModBus, DF1) V377
- AGA 8 License V284
- DNP3 License master/slave - RTU V283
- IEC 60870-5 License V242

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## 3 Antenna Cable and Connectors

### Cable:



[Large Image View >>](#)

Part L D F 4 R N -  
Number: 5 0 A

Manufacturer: Andrew Corporation

1/2" Fire Retardant Foam  
Helix 50 Ohm Coax Cable

1/2" Standard 50 Ohm Foam HELIAX®  
Coaxial Cable. LDF4RN-50A is Riser  
Rated.

#### Attenuation (dB)/100 Ft.

30 MHz	0.357
150 MHz	0.815
450 MHz	1.45
824 MHz	2.00
960 MHz	2.17
1500 MHz	2.77
2000 MHz	3.25
2300 MHz	3.52
5800 MHz	5.97

#### General Characteristics

Max. Frequency	8.8 GHz
Propagation Velocity	88%
Overall Diameter(in)	.63
Dielectric	Low Density Closed Cell Foam
Outer Conductor	Polyethylene Corrugated
Inner Conductor	Solid Copper Copper Clad Aluminum
Min. Bending Radius(in)	5"
Warranty	10 Year
Shipping Method	Less Than 350 Ft - UPS
Jacket Material	Gray Non- Halogenated Fire Retardant(CAT VR)
Ship Weight (lbs.)	.15

## 5 Connectors: Qty 4

**Part Number:** L 4 T N M - P S

**Body Attachment**  
**Body Plating**  
**Pin Attachment**  
**Pin Plating**

Ring Flare  
Trimetal  
Captivated  
Silver

**Manufacturer:** Andrew Corporation

Conn, Positive Stop N-Male  
for 1/2" Foam Heliax

## 6 Polyphaser: Qty 1

Specifications



[Large Image View >>](#)

**Part Number:** I S - 5 0 N X - C 2 -  
M E

**Manufacturer:** PolyPhaser  
r:

125-1000 MHz Flange Mount Coax  
Protector, N(M) Eq-N(F) Ant"

Broadband HF/VHF/UHF gas tube coaxial protector with multi-strike capability for general radio use. Not recommended for transmitter combining. Not weather resistant.

Connector options:-MA for male on antenna port. -ME for male on equipment port.

<b>Frequency Range</b>	125-1000 MHz
<b>Power</b>	VHF 375W, UHF 125W, 800-1000 MHz 50W
<b>Connectors</b>	N-Female
<b>Turn-on Voltage</b>	600 Vdc
<b>Throughput Energy</b>	<=220μJ

## 7 Grounding Kit: Qty 1

Product Description

Specifications

**Part Number:** C S G L 4 - 1 5 B 4

**Manufacturer:** Andrew Corporation

1/2" HELIAX Compact SureGrnd  
Kit 60"Lead Fld Att 2-Hole Lug

The new Compact Sureground™ Grounding Kit is a one-piece grounding assembly with the weatherproofing

molded right into the grounding strap. The self-locking "Snap and lock" installation is ideal for tight cable bundles or crowded towers. Self-sealing weatherproof boot eliminates loose hardware and taping. Waterproof to IEC529, IP68. Exclusive universal grounding lug can be fitted to a one- or two- hole earthing attachment point.

## 8 Antenna: Qty 1



[Large Image View >>](#)

**Part Number:**

**Manufacturer:** Kathrein/Scala

150-200 MHZ, SCALA 7-ELEM YAGI  
ANT, 10dBd, 250W, N-F CONN

7-element rugged broadband yagi antenna. Fabricated of 6061-T6 aluminum rod and seamless drawn pipe, anodized for corrosion resistance. The internal balun, coax feed and connector are sealed in a foam potting system to prevent moisture penetration.

<b>Gain</b>	12 dBi
<b>Bandwidth (MHz)</b>	50
<b>Electrical Downtilt</b>	0 Deg
<b>Power</b>	250 Watts
<b>Vert. Beamwidth</b>	41 Deg
<b>Horz. Beamwidth</b>	53 Deg
<b>Front-to-Back Ratio</b>	> 18 dB
<b>Polarization</b>	Horizontal or Vertical
<b>Termination</b>	N-Female
<b>Mounting Hardware</b>	For mast up to 2.375"
<b>Wind Rating (mph.)</b>	120
<b>Overall Length (in.)</b>	39.9
<b>Dim (H x W x D) - (in.)</b>	39.9 x 14.9 x 6
<b>Net Weight (lbs.)</b>	6.5
<b>Ship Weight (lbs.)</b>	9
<b>Shipping Method</b>	UPS
<b>Warranty</b>	5 Year
<b>Frequency Range (MHz)</b>	450-470

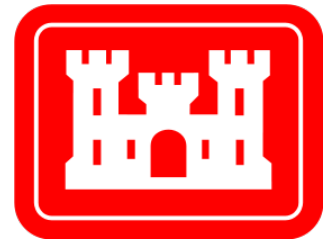
## **APPENDIX I**

### **ENVIRONMENTAL/REGULATORY PERMITS**

**UNITED STATES ARMY CORPS OF ENGINEERS (USACE) SECTION 408**



**DEPARTMENT OF THE ARMY**  
**33 U.S.C. § 408 PERMISSION**  
U. S. Army Corps of Engineers  
Los Angeles District



**REQUESTER / NON-FEDERAL SPONSOR:** Los Angeles County Flood Control District, 900 S. Fremont Avenue, Alhambra, CA 91803

**THIRD PARTY PERMITTEE:** Culver City

**PERMISSION NUMBER:** 408-SPL-2019-0028

**ISSUING OFFICE:** U.S. Army Corps of Engineers, Los Angeles District, Engineering Division (USACE-SPL)

**USACE-SPL PERMISSION COORDINATOR:** Mr. Rafiqul Talukder, (213) 452-3745, [spl.408permits@usace.army.mil](mailto:spl.408permits@usace.army.mil)

**AFFECTED FEDERAL PROJECT AND DESCRIPTION:** Centinela Creek Channel, a feature of the Los Angeles County Drainage Area Project (USACE Project)

**LOCATION:** LAT 33°59'53.38" N, LON 118°24'55.28" W

**APPROVED MODIFICATION OR ALTERATION OF THE FEDERAL PROJECT:**

A diversion project that will capture low flow run off from the Centinela Creek Channel into Culver City's existing Mesmer Sewer Pump Station by installing a 24-inch x 24-inch inlet with a 60-inch drop and a 12-inch PVC connection pipe inside a 20-inch steel casing by jack and boring method below Centinela Creek in Culver City, Los Angeles County, California (Section 408 Activity)

The "approved plans and specifications," dated 21 July 2020, upon which this Permission is based are retained by USACE-SPL and filed pursuant to the Permission number listed above.

**I. General Conditions**

1. USACE-SPL acknowledges that the Section 408 Activity shall be carried out by the Third Party Permittee and that this Permission is being issued to the Requester, pursuant to the Requester's obligations under any applicable the U.S. Army Corps of Engineers (USACE) Project agreement and as codified in 33 U.S.C. 2213 (j). The Requester shall ensure compliance with and enforce all requirements referenced in General Condition "3" and Special Conditions, below,

against the Third Party Permittee by separate agreement or permit. USACE-SPL reserves the right to enforce all conditions stated herein against the Requester directly. This Permission shall not diminish the overall responsibility of the Requester to operate and maintain the USACE Project as described in the USACE Project's Operation and Maintenance (O&M) Manual.

2. In the event the Third Party Permittee fails to maintain the Section 408 Activity in good condition and in conformance with the terms and conditions of this Permission or the agreement or separate Permit referenced in General Condition "3" and Special Conditions, below, the Requester shall be responsible for taking any and all actions necessary to prevent or mitigate any interference with the operation of the USACE Project that may result from the Third Party Permittee's failure, in accordance with the following:
  - a. Except when immediate action is necessary to prevent or minimize injury to persons or damage to property or the environment, the Requester shall, prior to commencing any such actions other than the Section 408 Activity, provide notice to USACE-SPL of the proposed actions and obtain USACE-SPL's approval.
  - b. When the Requester takes immediate action to prevent injury to persons or damage to property or the environment, the Requester shall notify USACE-SPL Permission Coordinator of such actions as soon as reasonably practical and shall obtain USACE-SPL's approval of any additional actions reasonably necessary to prevent or mitigate the interference with the operation of the USACE Project.
  - c. In the event that actions by the Requester in accordance with this General Condition "2" fail to prevent interference or potential interference with the operation of the USACE Project resulting from modifications or alterations by the Third Party Permittee, the Requester then shall be responsible to remove the Section 408 Activity in a manner acceptable to USACE-SPL. Removal shall be conducted only after consultation with USACE-SPL and upon modification or amendment of this Permission.
3. Prior to the commencement of any construction related to the Section 408 Activity, the Requester shall enter into an agreement with, or issue a separate permit to, the Third Party Permittee which shall impose the following requirements on the Third Party Permittee:
  - a. The USACE shall not be responsible for damages to property or injuries to persons which may arise from or be incident to the construction, operation, maintenance, repair, rehabilitation, or replacement of the Section 408 Activity, or for damages to the USACE Project. the Third Party Permittee shall repair any damage to the existing USACE Project by Section 408 Activity. The repair shall be accomplished to the satisfaction of USACE-SPL and no cost the USACE.



- b. The Third Party Permittee shall acknowledge that the issuance of the Permission shall not excuse or exempt the Third Party Permittee's compliance with any Federal, state, or local law or regulation that is otherwise applicable, including, but not limited to, those regarding construction, health, safety, water supply, sanitation, use of pesticides, and licenses or permits necessary for the Section 408 Activity.
- c. The Third Party Permittee shall maintain the Section 408 Activity in good condition and in conformance with the terms and conditions of this Permission. The Third Party Permittee shall not be relieved of this requirement even if the Section 408 Activity is abandoned. Should the Third Party Permittee wish to cease to maintain the Section 408 Activity or desire to abandon it, the Third Party Permittee shall request the Requester to obtain from USACE-SPL a modification or amendment of this Permission, which may require to perform additional construction activities to abandon the facility.
- d. If previously unknown historic or archeological remains are discovered in carrying out the Section 408 Activity, the Third Party Permittee shall immediately cease activity and protect the site in consideration of 36 CFR §800.13. Within 24 hours of the discovery, the Requester shall notify USACE-SPL Permission Coordinator. The Third Party Permittee shall not resume construction or activity in the area containing the potential cultural resources until USACE-SPL issues a notice to proceed. Compliance with Special Condition Item 5 below is also required.
- e. If the scope of the Section 408 Activity changes from the approved plans and specifications upon which this Permission is based, the Third Party Permittee shall contact the Requester to resubmit the Section 408 Permission request with the Permission number and revisions clearly identified. Work associated with the Section 408 Activity that does not pertain to the revised portion of the project may continue while the revisions are being reviewed unless USACE-SPL indicates otherwise. If USACE-SPL determines that changes in scope or details have an impact outside approved alteration area, a new 408 permit application will be required.
- f. The Third Party Permittee shall notify the Requester and USACE-SPL's Permission Coordinator of the anticipated start and completion dates of construction of the Section 408 Activity within two (2) weeks of execution of this Permission.
- g. The Third Party Permittee shall notify the Requester and USACE -SPL Permission Coordinator of the start date for construction and a copy of the construction schedule at least two (2) weeks prior to starting. Updated construction schedules shall be made available upon request.

Construction activities shall not impair USACE-SPL access to perform maintenance services, inspections, and patrolling activities. An invitation shall be sent to the Requester and USACE-SPL for any kick-off meetings and final walk-through, as applicable.

- h. The Third Party Permittee and/ or contractor(s) shall allow the Requester and USACE-SPL representatives to inspect the Section 408 Activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of this Permission.
  - i. The Third Party Permittee and/or their contractor(s) shall oversee the conduct of the work and ensure the Section 408 Activity is being constructed in accordance with the plans and specifications approved by USACE-SPL.
  - j. Upon completion of construction of the Section 408 Activity, the Third Party Permittee shall submit electronic copies of the as-built plans of the Section 408 Activity to the Requester and USACE-SPL. The as-built plans must be signed by the Third Party Permittee's engineer of record. Electronic copies of the as-built plans shall be submitted in .pdf format to the Requester and USACE\_SPL. As-built plans must be provided within 180 days of construction completion.
  - k. Operations and Maintenance (O&M) Manual Updates. The Third Party Permittee must provide the Requester and USACE-SPL with the Final updated O&M Manual within 180 days of construction completion. Any changes to the USACE Project O&M Manual must be noted. Final updated O&M Manual must have an enclosed excerpt of the USACE Project O&M Manual with changes noted.
  - l. Work shall not begin in waters/navigable waters of the United States until the Third Party Permittee first obtains a separate, additional Department of the Army permit for activities which involve the discharge of dredge or fill material into waters of the United States or work or structures in or affecting navigable waters of the United States, pursuant to the provisions of Section 404 of the Clean Water Act ( 33 USC 1344) and/or Section 10 of the Rivers and Harbors Act of 3 March 1899 (33 USC 403).
  - m. Should construction activities fail to commence within two (2) years after the effective date of this Permission, this Permission shall be immediately revoked.
4. In reliance on the information submitted by the Third Party Permittee, USACE-SPL determined that issuance of the Permission is not contrary to the public interest. USACE-SPL may reevaluate its decision on this Permission at any time

it determines the circumstances warrant it. Circumstances that could require a reevaluation include, but are not limited to, the following:

- a. Third Party Permittee fails to comply with any of the requirements contained in the agreement or separate Permission referenced in General Condition "3", above, and the Requester fails to take appropriate action, within a reasonable period of time, to enforce those requirements and/or to prevent any interference with operation of the USACE Project caused by, or related to, the Third Party Permittee's non-compliance.
  - b. The information provided by the Requester in support of the 408 Permission request proves to be incomplete or inaccurate.
  - c. Significant new information surfaces which USACE-SPL did not consider in reaching the original public interest decision.
5. USACE-SPL has examined this Permission and determined that the Permission conditions are sufficient. USACE-SPL may incorporate new Permission conditions if required for the affected the USACE Project.

## **II. Special Conditions**

1. The Third Party Permittee is required to provide USACE-SPL Reservoir Regulation Section with a completed Site Access Coordination Form if construction will take place within or downstream of any the USACE Flood Control Basin. The Site Access Coordination form is found here: [\[http://www.spl.usace.army.mil/Missions/CivilWorks/ReservoirRegulation.aspx\]](http://www.spl.usace.army.mil/Missions/CivilWorks/ReservoirRegulation.aspx), under 'Contact Us' see LAD Site Access Form]. The Third Party Permittee shall provide a Point of Contact (POC) so that the Reservoir Regulation Section can be in contact with the POC regarding project information and coordination of reservoir operations. The POC shall use all reasonable efforts to contact USACE-SPL's Reservoir Operation Center (ROC) by calling (213) 452-3623 at least two (2) business days prior to commencement of approved modification/alteration.
2. The Third Party Permittee's construction schedule must adhere to USACE-SPL Hydrology and Hydraulics (HH) Policy titled *Channel Improvement Limitations for Permits*, dated April 2008, provided at: <https://www.spl.usace.army.mil/Missions/Section-408-Permits/>
3. The Third-Party Permittee must implement Best Management Practices (BMPs) as necessary to reduce air quality impacts from fugitive dust and/or particulate matter, including road watering, if the Section 408 Activity generates wind speed in excess of 20 mph.
4. The Third-Party Permittee must implement BMPs as necessary to ensure that water quality is not adversely affected by the Section 408 Activity.

5. The Third-Party Permittee shall ensure a qualified archaeological monitor is present during all ground-disturbing activities associated with the authorized activities. The monitor shall have the authority to halt project activities to ensure adverse effects to historic properties are avoided. The qualified archaeologist, in coordination with the Corps, may reduce or discontinue monitoring if it is determined that the possibility of encountering buried archaeological deposits is low based on observations of soil stratigraphy or other factors.

Nothing in this Permission shall be construed as abrogating or otherwise diminishing the responsibility of the Requester to hold and save the USACE free from all damages arising from construction, operation, maintenance, repair, rehabilitation, or replacement of the USACE Project and any alterations or modifications, including any alteration or modification approved herein, except to the extent caused by the fault or negligence of the USACE-SPL or its contractors.

By signing this Permission, the signatory to this Permission hereby represents and warrants that they are duly authorized to execute and bind the Los Angeles County Flood Control District to the terms and conditions contained within this Permission. This Permission shall become effective upon signature below by USACE-SPL official.

*Barbara Childers*  
 for Greg Even, P.E.  
 Assistant Deputy Director  
 Los Angeles County Flood Control District

1/19/2021  
 Date

Eric H. Stevens, P.E., P.M.P.  
 Chief, Engineering Division  
 Los Angeles District  
 U.S. Army Corps of Engineers

01/20/2021  
 Date

**UNITED STATES ARMY CORPS OF ENGINEERS (USACE) SECTION 404**



**DEPARTMENT OF THE ARMY  
U.S. ARMY CORPS OF ENGINEERS  
LOS ANGELES DISTRICT  
60 SOUTH CALIFORNIA STREET, SUITE 201  
VENTURA, CALIFORNIA 93001-2598**

January 22, 2021

SUBJECT: Nationwide Permit (NWP) Verification

Alfredo Magallanes  
Los Angeles, Bureau of Sanitation  
1149 S. Broadway, 10<sup>th</sup> Floor  
Los Angeles, California 90015

Dear Mr. Magallanes:

I am responding to your request (SPL-2017-00711-GLH) for a Department of the Army permit for your proposed project, Ballona Creek Bacteria TMDL Project: Mesmer (Centinela Creek Channel). The proposed project is located within Centinela Creek Channel, in the city of Culver City, Los Angeles County, California at approximately 33.986855°, - 118.401562°.

Because this project would result in a discharge of dredged and/or fill material into waters of the U.S., a Department of the Army permit is required pursuant to Section 404 of the Clean Water Act (33 USC 1344; 33 CFR parts 323 and 330).

I have determined construction of your proposed project, if constructed as described in your application, would comply with NWP 43 Stormwater Management Facilities. Specifically, and as shown in the enclosed figure(s), you are authorized to:

1. Permanently impact 0.0027 acre of non-wetland waters of the U.S. related to the installation/construction of in-channel diversion structure within Centinela Creek Channel.
2. Temporarily impact 0.471 acre of non-wetland waters of the U.S. related to installation of temporary in-channel diversion structures needed during the construction of in-channel intake system within Centinela Creek Channel.

For this NWP verification letter to be valid, you must comply with all of the terms and conditions in Enclosure 1. Furthermore, you must comply with the non-discretionary Special Conditions listed below:

1. The Permittee shall clearly mark the limits of the workspace with flagging or similar means to ensure mechanized equipment does not enter preserved waters of the U.S. on Figure 8: Mesmer Site Impact Map. Adverse impacts to waters of the U.S. beyond the Corps-approved construction footprint are not authorized. Such impacts could result in

permit suspension and revocation, administrative, civil or criminal penalties, and/or substantial, additional, compensatory mitigation requirements.

2. Pursuant to 36 C.F.R. section 800.13, in the event of any discoveries during construction within waters within the Corps Permit Area (Figure 8: Mesmer Site Impact Map) of either human remains, archaeological deposits, or any other type of historic property, the Permittee shall notify the Corps Regulatory Project Manager (Jerry Hidalgo at 805-585-2145) and the Corps' Regulatory Archaeology Staff (Daniel Grijalva at 760-520-4736) within 24 hours. The Permittee shall immediately suspend all work in any area(s) where potential cultural resources are discovered. The Permittee shall not resume construction in the area surrounding the potential cultural resources until the Corps Regulatory Division re-authorizes project construction, per 36 C.F.R. Section 800.13.
3. No later than one month following completion of authorized work in waters of the U.S., the permittee shall ensure all sites within waters of the U.S. subject to authorized, temporary impacts are restored to pre-project alignments, elevation contours, and conditions to the maximum extent practicable to ensure expeditious resumption of aquatic resource functions. No later than 45 calendar days following completion of authorized work in waters of the U.S., the permittee shall submit a memorandum documenting compliance with this special condition.
4. Within 45 calendar days of completion of authorized work in waters of the U.S., the Permittee shall submit to the Corps Regulatory Division a post-project implementation memorandum including the following information:
  - A) Date(s) work within waters of the U.S. was initiated and completed;
  - B) Summary of compliance status with each special condition of this permit (including any noncompliance that previously occurred or is currently occurring and corrective actions taken or proposed to achieve compliance);
  - C) Color photographs (including map of photopoints) taken at the project site before and after construction for those aspects directly associated with permanent impacts to waters of the U.S. such that the extent of authorized fills can be verified;
  - D) One copy of "as built" drawings for the entire project. Electronic submittal (Adobe PDF format) is preferred. All sheets must be signed, dated, and to-scale. If submitting paper copies, sheets must be no larger than 11 x 17 inches; and
  - E) Signed Certification of Compliance (attached as part of this permit package).

This verification is valid through March 18, 2022. If on March 18, 2022 you have commenced or are under contract to commence the permitted activity you will have an additional twelve (12) months to complete the activity under the present NWP terms and conditions. However, if I discover noncompliance or unauthorized activities associated with the permitted activity I may request the use of discretionary authority in accordance with procedures in 33 CFR part 330.4(e) and 33 CFR part 330.5(c) or (d) to modify, suspend, or revoke this specific

verification at an earlier date. Additionally, at the national level the Chief of Engineers, any time prior to March 18, 2022, may choose to modify, suspend, or revoke the nationwide use of a NWP after following procedures set forth in 33 CFR part 330.5. It is incumbent upon you to comply with all of the terms and conditions of this NWP verification and to remain informed of any change to the NWPs.

A NWP does not grant any property rights or exclusive privileges. Additionally, it does not authorize any injury to the property, rights of others, nor does it authorize interference with any existing or proposed Federal project. Furthermore, it does not obviate the need to obtain other Federal, state, or local authorizations required by law.

Thank you for participating in the Regulatory Program. If you have any questions, please contact Jerry Hidalgo at (805) 585-2145 or via email at [Gerardo.L.Hidalgo@usace.army.mil](mailto:Gerardo.L.Hidalgo@usace.army.mil). Please help me to evaluate and improve the regulatory experience for others by completing the customer survey form at [http://corpsmapu.usace.army.mil/cm\\_apex/f?p=regulatory\\_survey](http://corpsmapu.usace.army.mil/cm_apex/f?p=regulatory_survey).

Sincerely,

Antal Szijj  
Team Lead  
North Coast Branch  
Regulatory Division

Enclosures





**LOS ANGELES DISTRICT  
U.S. ARMY CORPS OF ENGINEERS**

**CERTIFICATE OF COMPLIANCE WITH  
DEPARTMENT OF THE ARMY NATIONWIDE PERMIT**

**Permit Number:** *SPL-2017-00711-GLH*

**Name of Permittee:** *Alfredo Magallanes; Los Angeles Bureau of Sanitation*

**Date of Issuance:** *January 20, 2021*

Upon completion of the activity authorized by this permit and the mitigation required by this permit, sign this certificate, and return it by **ONE** of the following methods:

- 1) Email a digital scan of the signed certificate to  
Gerardo.L.Hidalgo@usace.army.mil

**OR**

- 2) Mail the signed certificate to  
U.S. Army Corps of Engineers  
ATTN: Regulatory Division SPL-2020-00033-GLH  
60 South California Street, Suite 201  
Ventura, California 93001-2598

I hereby certify that the authorized work and any required compensatory mitigation has been completed in accordance with the NWP authorization, including all general, regional, or activity-specific conditions. Furthermore, if credits from a mitigation bank or in-lieu fee program were used to satisfy compensatory mitigation requirements I have attached the documentation required by 33 CFR 332.3(l)(3) to confirm that the appropriate number and resource type of credits have been secured.

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Signature of Permittee

---

Date

## **Enclosure 1: NATIONWIDE PERMIT NUMBER(S) NWP 43 Stormwater Management Facilities**

### **1. Nationwide Permit(s) NWP 43 Stormwater Management Facilities Terms:**

43. Stormwater Management Facilities. Discharges of dredged or fill material into non-tidal waters of the United States for the construction of stormwater management facilities, including stormwater detention basins and retention basins and other stormwater management facilities; the construction of water control structures, outfall structures and emergency spillways; the construction of low impact development integrated management features such as bioretention facilities (e.g., rain gardens), vegetated filter strips, grassed swales, and infiltration trenches; and the construction of pollutant reduction green infrastructure features designed to reduce inputs of sediments, nutrients, and other pollutants into waters to meet reduction targets established under Total Daily Maximum Loads set under the Clean Water Act.

This NWP authorizes, to the extent that a section 404 permit is required, discharges of dredged or fill material into non-tidal waters of the United States for the maintenance of stormwater management facilities, low impact development integrated management features, and pollutant reduction green infrastructure features. The maintenance of stormwater management facilities, low impact development integrated management features, and pollutant reduction green infrastructure features that are not waters of the United States does not require a section 404 permit.

The discharge must not cause the loss of greater than 1/2-acre of non-tidal waters of the United States. The discharge must not cause the loss of more than 300 linear feet of stream bed, unless for intermittent and ephemeral stream beds the district engineer waives the 300 linear foot limit by making a written determination concluding that the discharge will result in no more than minimal adverse environmental effects. This NWP does not authorize discharges into non-tidal wetlands adjacent to tidal waters. The loss of stream bed plus any other losses of jurisdictional wetlands and waters caused by the NWP activity cannot exceed 1/2-acre. This NWP does not authorize discharges of dredged or fill material for the construction of new stormwater management facilities in perennial streams.

Notification: For discharges into non-tidal waters of the United States for the construction of new stormwater management facilities or pollutant reduction green infrastructure features, or the expansion of existing stormwater management facilities or pollutant reduction green infrastructure features, the permittee must submit a pre-construction notification to the district engineer prior to commencing the activity. (See general condition 32.) Maintenance activities do not require pre-construction notification if they are limited to restoring the original design capacities of the stormwater management facility or pollutant reduction green infrastructure feature. (Authority: Section 404)

**2. General Conditions:** The following general conditions must be followed in order for any authorization by an NWP to be valid:

1. Navigation. (a) No activity may cause more than a minimal adverse effect on navigation.

(b) Any safety lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee's expense on authorized facilities in navigable waters of the United States.

(c) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

2. Aquatic Life Movements. No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. All permanent and temporary crossings of waterbodies shall be suitably culverted, bridged, or otherwise designed and constructed to maintain low flows to sustain the movement of those aquatic species. If a bottomless culvert cannot be used, then the crossing should be designed and constructed to minimize adverse effects to aquatic life movements.

3. Spawning Areas. Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.

4. Migratory Bird Breeding Areas. Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.

5. Shellfish Beds. No activity may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWP 4 and 48, or is a shellfish seeding or habitat restoration activity authorized by NWP 27.

6. Suitable Material. No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see section 307 of the Clean Water Act).

7. Water Supply Intakes. No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.

8. Adverse Effects From Impoundments. If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.

9. Management of Water Flows. To the maximum extent practicable, the pre-construction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization, storm water management activities, and temporary and permanent road crossings, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the pre-construction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).

10. Fills Within 100-Year Floodplains. The activity must comply with applicable FEMA-approved state or local floodplain management requirements.

11. Equipment. Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.

12. Soil Erosion and Sediment Controls. Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow, or during low tides.

13. Removal of Temporary Fills. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.

14. Proper Maintenance. Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety and compliance with applicable NWP general conditions, as well as any activity-specific conditions added by the district engineer to an NWP authorization.

15. Single and Complete Project. The activity must be a single and complete project. The same NWP cannot be used more than once for the same single and complete project.

16. Wild and Scenic Rivers. (a) No NWP activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a “study river” for possible inclusion in the system while the river is in an official study status, unless the appropriate Federal agency with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation or study status.

(b) If a proposed NWP activity will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a “study river” for possible inclusion in the system while the river is in an official study status, the permittee must submit a pre-construction notification (see general condition 32). The district engineer will coordinate the PCN with the Federal agency with direct management responsibility for that river. The permittee shall not begin the NWP activity until notified by the district engineer that the Federal agency with direct management responsibility for that river has determined in writing that the proposed NWP activity will not adversely affect the Wild and Scenic River designation or study status.

(c) Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency responsible for the designated Wild and Scenic River or study river (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service). Information on these rivers is also available at: <http://www.rivers.gov/>.

17. Tribal Rights. No NWP activity may cause more than minimal adverse effects on tribal rights (including treaty rights), protected tribal resources, or tribal lands.

18. Endangered Species. (a) No activity is authorized under any NWP which is likely to directly or indirectly jeopardize the continued existence of a threatened or endangered species or a species proposed for

such designation, as identified under the Federal Endangered Species Act (ESA), or which will directly or indirectly destroy or adversely modify the critical habitat of such species. No activity is authorized under any NWP which “may affect” a listed species or critical habitat, unless ESA section 7 consultation addressing the effects of the proposed activity has been completed. Direct effects are the immediate effects on listed species and critical habitat caused by the NWP activity. Indirect effects are those effects on listed species and critical habitat that are caused by the NWP activity and are later in time, but still are reasonably certain to occur.

(b) Federal agencies should follow their own procedures for complying with the requirements of the ESA. If pre-construction notification is required for the proposed activity, the Federal permittee must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation has not been submitted, additional ESA section 7 consultation may be necessary for the activity and the respective federal agency would be responsible for fulfilling its obligation under section 7 of the ESA.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the activity, or if the activity is located in designated critical habitat, and shall not begin work on the activity until notified by the district engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that might affect Federally-listed endangered or threatened species or designated critical habitat, the pre-construction notification must include the name(s) of the endangered or threatened species that might be affected by the proposed activity or that utilize the designated critical habitat that might be affected by the proposed activity. The district engineer will determine whether the proposed activity “may affect” or will have “no effect” to listed species and designated critical habitat and will notify the non-Federal applicant of the Corps’ determination within 45 days of receipt of a complete pre-construction notification. In cases where the non-Federal applicant has identified listed species or critical habitat that might be affected or is in the vicinity of the activity, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification that the proposed activity will have “no effect” on listed species or critical habitat, or until ESA section 7 consultation has been completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(d) As a result of formal or informal consultation with the FWS or NMFS the district engineer may add species-specific permit conditions to the NWPs.

(e) Authorization of an activity by an NWP does not authorize the “take” of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with “incidental take” provisions, etc.) from the FWS or the NMFS, the Endangered Species Act prohibits any person subject to the jurisdiction of the United States to take a listed species, where “take” means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The word “harm” in the definition of “take” means an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.

(f) If the non-federal permittee has a valid ESA section 10(a)(1)(B) incidental take permit with an approved Habitat Conservation Plan for a project or a group of projects that includes the proposed NWP activity, the non-federal applicant should provide a copy of that ESA section 10(a)(1)(B) permit with the PCN required by paragraph (c) of this general condition. The district engineer will coordinate with the agency that

issued the ESA section 10(a)(1)(B) permit to determine whether the proposed NWP activity and the associated incidental take were considered in the internal ESA section 7 consultation conducted for the ESA section 10(a)(1)(B) permit. If that coordination results in concurrence from the agency that the proposed NWP activity and the associated incidental take were considered in the internal ESA section 7 consultation for the ESA section 10(a)(1)(B) permit, the district engineer does not need to conduct a separate ESA section 7 consultation for the proposed NWP activity. The district engineer will notify the non-federal applicant within 45 days of receipt of a complete pre-construction notification whether the ESA section 10(a)(1)(B) permit covers the proposed NWP activity or whether additional ESA section 7 consultation is required.

(g) Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the FWS and NMFS or their world wide web pages at <http://www.fws.gov/> or <http://www.fws.gov/ipac> and <http://www.nmfs.noaa.gov/pr/species/esa/> respectively.

19. Migratory Birds and Bald and Golden Eagles. The permittee is responsible for ensuring their action complies with the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. The permittee is responsible for contacting appropriate local office of the U.S. Fish and Wildlife Service to determine applicable measures to reduce impacts to migratory birds or eagles, including whether “incidental take” permits are necessary and available under the Migratory Bird Treaty Act or Bald and Golden Eagle Protection Act for a particular activity.

20. Historic Properties. (a) In cases where the district engineer determines that the activity may have the potential to cause effects to properties listed, or eligible for listing, in the National Register of Historic Places, the activity is not authorized, until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.

(b) Federal permittees should follow their own procedures for complying with the requirements of section 106 of the National Historic Preservation Act. If pre-construction notification is required for the proposed NWP activity, the Federal permittee must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation is not submitted, then additional consultation under section 106 may be necessary. The respective federal agency is responsible for fulfilling its obligation to comply with section 106.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if the NWP activity might have the potential to cause effects to any historic properties listed on, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places, including previously unidentified properties. For such activities, the pre-construction notification must state which historic properties might have the potential to be affected by the proposed NWP activity or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties. Assistance regarding information on the location of, or potential for, the presence of historic properties can be sought from the State Historic Preservation Officer, Tribal Historic Preservation Officer, or designated tribal representative, as appropriate, and the National Register of Historic Places (see 33 CFR 330.4(g)). When reviewing pre-construction notifications, district engineers will comply with the current procedures for addressing the requirements of section 106 of the National Historic Preservation Act. The district engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts, which may include background research, consultation, oral history interviews, sample field investigation, and field survey. Based

on the information submitted in the PCN and these identification efforts, the district engineer shall determine whether the proposed NWP activity has the potential to cause effects on the historic properties. Section 106 consultation is not required when the district engineer determines that the activity does not have the potential to cause effects on historic properties (see 36 CFR 800.3(a)). Section 106 consultation is required when the district engineer determines that the activity has the potential to cause effects on historic properties. The district engineer will conduct consultation with consulting parties identified under 36 CFR 800.2(c) when he or she makes any of the following effect determinations for the purposes of section 106 of the NHPA: no historic properties affected, no adverse effect, or adverse effect. Where the non-Federal applicant has identified historic properties on which the activity might have the potential to cause effects and so notified the Corps, the non-Federal applicant shall not begin the activity until notified by the district engineer either that the activity has no potential to cause effects to historic properties or that NHPA section 106 consultation has been completed.

(d) For non-federal permittees, the district engineer will notify the prospective permittee within 45 days of receipt of a complete pre-construction notification whether NHPA section 106 consultation is required. If NHPA section 106 consultation is required, the district engineer will notify the non-Federal applicant that he or she cannot begin the activity until section 106 consultation is completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(e) Prospective permittees should be aware that section 110k of the NHPA (54 U.S.C. 306113) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation specifying the circumstances, the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/THPO, appropriate Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the permitted activity on historic properties.

21. Discovery of Previously Unknown Remains and Artifacts. If you discover any previously unknown historic, cultural or archeological remains and artifacts while accomplishing the activity authorized by this permit, you must immediately notify the district engineer of what you have found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The district engineer will initiate the Federal, Tribal, and state coordination required to determine if the items or remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

22. Designated Critical Resource Waters. Critical resource waters include, NOAA-managed marine sanctuaries and marine monuments, and National Estuarine Research Reserves. The district engineer may designate, after notice and opportunity for public comment, additional waters officially designated by a state as having particular environmental or ecological significance, such as outstanding national resource waters or state natural heritage sites. The district engineer may also designate additional critical resource waters after notice and opportunity for public comment.

(a) Discharges of dredged or fill material into waters of the United States are not authorized by NWPs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, 50, 51, and 52 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters.

(b) For NWPs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, 38, and 54, notification is required in accordance with general condition 32, for any activity proposed in the designated critical resource waters including wetlands adjacent to those waters. The district engineer may authorize activities under these NWPs only after it is determined that the impacts to the critical resource waters will be no more than minimal.

23. Mitigation. The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal:

(a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (i.e., on site).

(b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating for resource losses) will be required to the extent necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal.

(c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed 1/10-acre and require pre-construction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse environmental effects of the proposed activity are no more than minimal, and provides an activity-specific waiver of this requirement. For wetland losses of 1/10-acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in only minimal adverse environmental effects.

(d) For losses of streams or other open waters that require pre-construction notification, the district engineer may require compensatory mitigation to ensure that the activity results in no more than minimal adverse environmental effects. Compensatory mitigation for losses of streams should be provided, if practicable, through stream rehabilitation, enhancement, or preservation, since streams are difficult-to-replace resources (see 33 CFR 332.3(e)(3)).

(e) Compensatory mitigation plans for NWP activities in or near streams or other open waters will normally include a requirement for the restoration or enhancement, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, the restoration or maintenance/protection of riparian areas may be the only compensatory mitigation required. Restored riparian areas should consist of native species. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. If it is not possible to restore or maintain/protect a riparian area on both sides of a stream, or if the waterbody is a lake or coastal waters, then restoring or maintaining/protecting a riparian area along a single bank or shoreline may be sufficient. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where



riparian areas are determined to be the most appropriate form of minimization or compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses.

(f) Compensatory mitigation projects provided to offset losses of aquatic resources must comply with the applicable provisions of 33 CFR part 332.

(1) The prospective permittee is responsible for proposing an appropriate compensatory mitigation option if compensatory mitigation is necessary to ensure that the activity results in no more than minimal adverse environmental effects. For the NWP, the preferred mechanism for providing compensatory mitigation is mitigation bank credits or in-lieu fee program credits (see 33 CFR 332.3(b)(2) and (3)). However, if an appropriate number and type of mitigation bank or in-lieu credits are not available at the time the PCN is submitted to the district engineer, the district engineer may approve the use of permittee-responsible mitigation.

(2) The amount of compensatory mitigation required by the district engineer must be sufficient to ensure that the authorized activity results in no more than minimal individual and cumulative adverse environmental effects (see 33 CFR 330.1(e)(3)). (See also 33 CFR 332.3(f)).

(3) Since the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, aquatic resource restoration should be the first compensatory mitigation option considered for permittee-responsible mitigation.

(4) If permittee-responsible mitigation is the proposed option, the prospective permittee is responsible for submitting a mitigation plan. A conceptual or detailed mitigation plan may be used by the district engineer to make the decision on the NWP verification request, but a final mitigation plan that addresses the applicable requirements of 33 CFR 332.4(c)(2) through (14) must be approved by the district engineer before the permittee begins work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation (see 33 CFR 332.3(k)(3)).

(5) If mitigation bank or in-lieu fee program credits are the proposed option, the mitigation plan only needs to address the baseline conditions at the impact site and the number of credits to be provided.

(6) Compensatory mitigation requirements (e.g., resource type and amount to be provided as compensatory mitigation, site protection, ecological performance standards, monitoring requirements) may be addressed through conditions added to the NWP authorization, instead of components of a compensatory mitigation plan (see 33 CFR 332.4(c)(1)(ii)).

(g) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NWPs. For example, if an NWP has an acreage limit of 1/2-acre, it cannot be used to authorize any NWP activity resulting in the loss of greater than 1/2-acre of waters of the United States, even if compensatory mitigation is provided that replaces or restores some of the lost waters. However, compensatory mitigation can and should be used, as necessary, to ensure that an NWP activity already meeting the established acreage limits also satisfies the no more than minimal impact requirement for the NWPs.

(h) Permittees may propose the use of mitigation banks, in-lieu fee programs, or permittee-responsible mitigation. When developing a compensatory mitigation proposal, the permittee must consider appropriate and practicable options consistent with the framework at 33 CFR 332.3(b). For activities resulting in the loss of marine or estuarine resources, permittee-responsible mitigation may be environmentally preferable if there are no mitigation banks or in-lieu fee programs in the area that have marine or estuarine credits available for sale or transfer to the permittee. For permittee-responsible mitigation, the special conditions of the NWP verification must clearly indicate the party or parties responsible for the implementation and performance of the compensatory mitigation project, and, if required, its long-term management.

(i) Where certain functions and services of waters of the United States are permanently adversely affected by a regulated activity, such as discharges of dredged or fill material into waters of the United States that will convert a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may be required to reduce the adverse environmental effects of the activity to the no more than minimal level.

24. Safety of Impoundment Structures. To ensure that all impoundment structures are safely designed, the district engineer may require non-Federal applicants to demonstrate that the structures comply with established state dam safety criteria or have been designed by qualified persons. The district engineer may also require documentation that the design has been independently reviewed by similarly qualified persons, and appropriate modifications made to ensure safety.

25. Water Quality. Where States and authorized Tribes, or EPA where applicable, have not previously certified compliance of an NWP with CWA section 401, individual 401 Water Quality Certification must be obtained or waived (see 33 CFR 330.4(c)). The district engineer or State or Tribe may require additional water quality management measures to ensure that the authorized activity does not result in more than minimal degradation of water quality.

26. Coastal Zone Management. In coastal states where an NWP has not previously received a state coastal zone management consistency concurrence, an individual state coastal zone management consistency concurrence must be obtained, or a presumption of concurrence must occur (see 33 CFR 330.4(d)). The district engineer or a State may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.

27. Regional and Case-By-Case Conditions. The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state, Indian Tribe, or U.S. EPA in its section 401 Water Quality Certification, or by the state in its Coastal Zone Management Act consistency determination.

28. Use of Multiple Nationwide Permits. The use of more than one NWP for a single and complete project is prohibited, except when the acreage loss of waters of the United States authorized by the NWPs does not exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United States for the total project cannot exceed 1/3-acre.

29. Transfer of Nationwide Permit Verifications. If the permittee sells the property associated with a nationwide permit verification, the permittee may transfer the nationwide permit verification to the new owner

by submitting a letter to the appropriate Corps district office to validate the transfer. A copy of the nationwide permit verification must be attached to the letter, and the letter must contain the following statement and signature:

“When the structures or work authorized by this nationwide permit are still in existence at the time the property is transferred, the terms and conditions of this nationwide permit, including any special conditions, will continue to be binding on the new owner(s) of the property. To validate the transfer of this nationwide permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.”

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(Transferee)

---

(Date)

30. Compliance Certification. Each permittee who receives an NWP verification letter from the Corps must provide a signed certification documenting completion of the authorized activity and implementation of any required compensatory mitigation. The success of any required permittee-responsible mitigation, including the achievement of ecological performance standards, will be addressed separately by the district engineer. The Corps will provide the permittee the certification document with the NWP verification letter. The certification document will include:

(a) A statement that the authorized activity was done in accordance with the NWP authorization, including any general, regional, or activity-specific conditions;

(b) A statement that the implementation of any required compensatory mitigation was completed in accordance with the permit conditions. If credits from a mitigation bank or in-lieu fee program are used to satisfy the compensatory mitigation requirements, the certification must include the documentation required by 33 CFR 332.3(l)(3) to confirm that the permittee secured the appropriate number and resource type of credits; and

(c) The signature of the permittee certifying the completion of the activity and mitigation.

The completed certification document must be submitted to the district engineer within 30 days of completion of the authorized activity or the implementation of any required compensatory mitigation, whichever occurs later.

31. Activities Affecting Structures or Works Built by the United States. If an NWP activity also requires permission from the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers (USACE) federally authorized Civil Works project (a “USACE project”), the prospective permittee must submit a pre-construction notification. See paragraph (b)(10) of general condition 32. An activity that requires section 408 permission is not authorized by NWP until the appropriate Corps office issues the section 408 permission to alter, occupy, or use the USACE project,

and the district engineer issues a written NWP verification.

32. Pre-Construction Notification. (a) Timing. Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a pre-construction notification (PCN) as early as possible. The district engineer must determine if the PCN is complete within 30 calendar days of the date of receipt and, if the PCN is determined to be incomplete, notify the prospective permittee within that 30 day period to request the additional information necessary to make the PCN complete. The request must specify the information needed to make the PCN complete. As a general rule, district engineers will request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the district engineer. The prospective permittee shall not begin the activity until either:

(1) He or she is notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or

(2) 45 calendar days have passed from the district engineer's receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 18 that listed species or critical habitat might be affected or are in the vicinity of the activity, or to notify the Corps pursuant to general condition 20 that the activity might have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that there is "no effect" on listed species or "no potential to cause effects" on historic properties, or that any consultation required under Section 7 of the Endangered Species Act (see 33 CFR 330.4(f)) and/or section 106 of the National Historic Preservation Act (see 33 CFR 330.4(g)) has been completed. Also, work cannot begin under NWPs 21, 49, or 50 until the permittee has received written approval from the Corps. If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee may not begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) Contents of Pre-Construction Notification: The PCN must be in writing and include the following information:

(1) Name, address and telephone numbers of the prospective permittee;

(2) Location of the proposed activity;

(3) Identify the specific NWP or NWP(s) the prospective permittee wants to use to authorize the proposed activity;

(4) A description of the proposed activity; the activity's purpose; direct and indirect adverse environmental effects the activity would cause, including the anticipated amount of loss of wetlands, other special aquatic sites, and other waters expected to result from the NWP activity, in acres, linear feet, or other appropriate unit of measure; a description of any proposed mitigation measures intended to reduce the adverse

environmental effects caused by the proposed activity; and any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity, including other separate and distant crossings for linear projects that require Department of the Army authorization but do not require pre-construction notification. The description of the proposed activity and any proposed mitigation measures should be sufficiently detailed to allow the district engineer to determine that the adverse environmental effects of the activity will be no more than minimal and to determine the need for compensatory mitigation or other mitigation measures. For single and complete linear projects, the PCN must include the quantity of anticipated losses of wetlands, other special aquatic sites, and other waters for each single and complete crossing of those wetlands, other special aquatic sites, and other waters. Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the activity and when provided results in a quicker decision. Sketches should contain sufficient detail to provide an illustrative description of the proposed activity (e.g., a conceptual plan), but do not need to be detailed engineering plans);

(5) The PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial, intermittent, and ephemeral streams, on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters on the project site, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many wetlands, other special aquatic sites, and other waters. Furthermore, the 45 day period will not start until the delineation has been submitted to or completed by the Corps, as appropriate;

(6) If the proposed activity will result in the loss of greater than 1/10-acre of wetlands and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied, or explaining why the adverse environmental effects are no more than minimal and why compensatory mitigation should not be required. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan.

(7) For non-Federal permittees, if any listed species or designated critical habitat might be affected or is in the vicinity of the activity, or if the activity is located in designated critical habitat, the PCN must include the name(s) of those endangered or threatened species that might be affected by the proposed activity or utilize the designated critical habitat that might be affected by the proposed activity. For NWP activities that require pre-construction notification, Federal permittees must provide documentation demonstrating compliance with the Endangered Species Act;

(8) For non-Federal permittees, if the NWP activity might have the potential to cause effects to a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, the PCN must state which historic property might have the potential to be affected by the proposed activity or include a vicinity map indicating the location of the historic property. For NWP activities that require pre-construction notification, Federal permittees must provide documentation demonstrating compliance with section 106 of the National Historic Preservation Act;

(9) For an activity that will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a “study river” for possible inclusion in the system while the river is in an official study status, the PCN must identify the Wild and Scenic River or the “study river” (see general condition 16); and

(10) For an activity that requires permission from the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers federally authorized civil works project, the pre-construction notification must include a statement confirming that the project proponent has submitted a written request for section 408 permission from the Corps office having jurisdiction over that USACE project.

(c) Form of Pre-Construction Notification: The standard individual permit application form (Form ENG 4345) may be used, but the completed application form must clearly indicate that it is an NWP PCN and must include all of the applicable information required in paragraphs (b)(1) through (10) of this general condition. A letter containing the required information may also be used. Applicants may provide electronic files of PCNs and supporting materials if the district engineer has established tools and procedures for electronic submittals.

(d) Agency Coordination: (1) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the activity's adverse environmental effects so that they are no more than minimal.

(2) Agency coordination is required for: (i) all NWP activities that require pre-construction notification and result in the loss of greater than 1/2-acre of waters of the United States; (ii) NWP 21, 29, 39, 40, 42, 43, 44, 50, 51, and 52 activities that require pre-construction notification and will result in the loss of greater than 300 linear feet of stream bed; (iii) NWP 13 activities in excess of 500 linear feet, fills greater than one cubic yard per running foot, or involve discharges of dredged or fill material into special aquatic sites; and (iv) NWP 54 activities in excess of 500 linear feet, or that extend into the waterbody more than 30 feet from the mean low water line in tidal waters or the ordinary high water mark in the Great Lakes.

(3) When agency coordination is required, the district engineer will immediately provide (e.g., via e-mail, facsimile transmission, overnight mail, or other expeditious manner) a copy of the complete PCN to the appropriate Federal or state offices (FWS, state natural resource or water quality agency, EPA, and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will have 10 calendar days from the date the material is transmitted to notify the district engineer via telephone, facsimile transmission, or e-mail that they intend to provide substantive, site-specific comments. The comments must explain why the agency believes the adverse environmental effects will be more than minimal. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the pre-construction notification. The district engineer will fully consider agency comments received within the specified time frame concerning the proposed activity's compliance with the terms and conditions of the NWPs, including the need for mitigation to ensure the net adverse environmental effects of the proposed activity are no more than minimal. The district engineer will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each pre-construction notification that the resource agencies' concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5.

(4) In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation

recommendations, as required by section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act.

(5) Applicants are encouraged to provide the Corps with either electronic files or multiple copies of pre-construction notifications to expedite agency coordination.

### **3. Regional Conditions for the Los Angeles District:**

1. For all activities in waters of the U.S. that are suitable habitat for federally listed fish species, including designated critical habitat for such species, the permittee shall design all new or substantially reconstructed linear transportation crossings (e.g. roads, highways, railways, trails, bridges, culverts) to ensure that the passage and/or spawning of fish is not hindered. In these areas, the permittee shall employ bridge designs that span the stream or river, including pier- or pile-supported spans, or designs that use a bottomless arch culvert with a natural stream bed, unless determined to be impracticable by the Corps.
2. Nationwide Permits (NWP) 3, 7, 12-15, 17-19, 21, 23, 25, 29, 35, 36, or 39-46, 48-54 cannot be used to authorize structures, work, and/or the discharge of dredged or fill material that would result in the "loss" of wetlands, mudflats, vegetated shallows or riffle and pool complexes as defined at 40 CFR Part 230.40-45. The definition of "loss" for this regional condition is the same as the definition of "loss of waters of the United States" used for the Nationwide Permit Program. Furthermore, this regional condition applies only within the State of Arizona and within the Mojave and Sonoran (Colorado) desert regions of California. The desert regions in California are limited to four USGS Hydrologic Unit Code (HUC) accounting units (Lower Colorado -150301, Northern Mojave-180902, Southern Mojave-181001, and Salton Sea-181002).
3. When a pre-construction notification (PCN) is required, the Los Angeles District shall be notified in accordance with General Condition 32 using either the South Pacific Division PCN Checklist or a signed application form (ENG Form 4345) with an attachment providing information on compliance with all of the General and Regional Conditions. The PCN Checklist and application form are available at: <http://www.spl.usace.army.mil/Missions/Regulatory/PermitProcess.aspx>. In addition, unless specifically waived by the Los Angeles District, the PCN shall include:
  - a. A written statement describing how the activity has been designed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States;
  - b. Drawings, including plan and cross-section views, clearly depicting the location, size and dimensions of the proposed activity as well as the location of delineated waters of the U.S. on the site. The drawings shall contain a title block, legend and scale, amount (in cubic yards) and area (in acres) of fill in Corps jurisdiction, including both permanent and temporary fills/structures. The ordinary high water mark or, if tidal waters, the mean high water mark and high tide line, should be shown (in feet), based on National Geodetic Vertical Datum (NGVD) or other appropriate referenced elevation. All drawings shall follow the Updated Map and Drawing Standards for the South Pacific Division Regulatory Program (Feb 2016), or most recent update (available at the South Pacific Division website at: <http://www.spd.usace.army.mil/Missions/Regulatory/PublicNoticesandReferences.aspx/>);

- c. Numbered and dated pre-project color photographs showing a representative sample of waters proposed to be impacted on the project site, and all waters proposed to be avoided on and immediately adjacent to the project site. The compass angle and position of each photograph shall be documented on the plan-view drawing required in subpart b of this regional condition.
  - d. Delineation of aquatic resources in accordance with the current Los Angeles District's Minimum Standards for Acceptance of Aquatic Resources Delineation Reports (available at: <http://www.spl.usace.army.mil/Missions/Regulatory/Jurisdictional-Determination/>).
4. Submission of a PCN pursuant to General Condition 32 and Regional Condition 3 shall be required for specific regulated activities in the following locations:
- a. All perennial waterbodies and special aquatic sites throughout the Los Angeles District as well as intermittent waters within the State of Arizona for any regulated activity that would result in a loss of waters of the United States. The definition of "loss of waters of the United States" for this regional condition is the same as the definition used for the Nationwide Permit Program.
  - b. All areas designated as Essential Fish Habitat (EFH) by the Pacific Fishery Management Council, and that would result in an adverse effect to EFH, in which case the PCN shall include an EFH assessment and extent of proposed impacts to EFH. EFH Assessment Guidance and other supporting information can be found at: [http://www.westcoast.fisheries.noaa.gov/habitat/fish\\_habitat/efh\\_consultations\\_go.html](http://www.westcoast.fisheries.noaa.gov/habitat/fish_habitat/efh_consultations_go.html).
  - c. All watersheds in the Santa Monica Mountains in Los Angeles and Ventura counties bounded by Calleguas Creek on the west, by Highway 101 on the north and east, and by Sunset Boulevard and Pacific Ocean on the south.
  - d. The Santa Clara River watershed in Los Angeles and Ventura counties, including but not limited to Aliso Canyon, Agua Dulce Canyon, Sand Canyon, Bouquet Canyon, Mint Canyon, South Fork of the Santa Clara River, San Francisquito Canyon, Castaic Creek, Piru Creek, Sespe Creek and the main-stem of the Santa Clara River.
  - e. The Murrieta and Temecula Creek watersheds in Riverside County, California for any regulated activity that would result in a loss of waters of the U.S. The definition of "loss of waters of the United States" for this regional condition is the same as the definition used for the Nationwide Permit Program.
  - f. All waterbodies designated by the Arizona Department of Environmental Quality as Outstanding Arizona Waters (OAWs), within 1600 meters (or 1 mile) upstream and/or 800 meters (1/2 mile) downstream of a designated OAW, and on tributaries to OAWs within 1600 meters of the OAW (see <http://www.azdeq.gov/index.html>).



- g. All waterbodies designated by the Arizona Department of Environmental Quality as 303(d)-impaired surface waters, within 1600 meters (or 1 mile) upstream and/or 800 meters (1/2 mile) downstream of a designated impaired surface water, and on tributaries to impaired waters within 1600 meters of the impaired water (see <http://www.azdeq.gov/index.html>).
5. Individual Permits shall be required for all discharges of fill material in jurisdictional vernal pools, with the exception that discharges for the purpose of restoration, enhancement, management or scientific study of vernal pools may be authorized under NWP 5, 6, and 27 with the submission of a PCN in accordance with General Condition 32 and Regional Condition 3.
6. Within the Murrieta Creek and Temecula Creek watersheds in Riverside County the use of NWPs 29, 39, 42 and 43, and NWP 14 combined with any of those NWPs shall be restricted. The loss of waters of the U.S. cannot exceed 0.25 acre. The definition of “loss of waters of the United States” for this regional condition is the same as the definition used for the Nationwide Permit Program.
7. Individual Permits (Standard Individual Permit or 404 Letter of Permission) shall be required in San Luis Obispo Creek and Santa Rosa Creek in San Luis Obispo County for bank stabilization projects, and in Gaviota Creek, Mission Creek and Carpinteria Creek in Santa Barbara County for bank stabilization projects and grade control structures.
8. In conjunction with the Los Angeles District's Special Area Management Plans (SAMPs) for the San Diego Creek Watershed and San Juan Creek/Western San Mateo Creek Watersheds in Orange County, California, the Corps' Division Engineer, through his discretionary authority has revoked the use of the following 26 selected NWPs within these SAMP watersheds: 03, 07, 12, 13, 14, 16, 17, 18, 19, 21, 25, 27, 29, 31, 33, 39, 40, 41, 42, 43, 44, 46, 49, and 50. Consequently, these NWPs are no longer available in those watersheds to authorize impacts to waters of the United States from discharges of dredged or fill material under the Corps' Clean Water Act section 404 authority.
9. Any requests to waive the applicable linear foot limitations for NWPs 13, 21, 29, 39, 40 and 42, 43, 44, 51, 52, and 54, must include the following:
- a. A narrative description of the affected aquatic resource. This should include known information on: volume and duration of flow; the approximate length, width, and depth of the waterbody and characters observed associated with an Ordinary High Water Mark (e.g. bed and bank, wrack line, or scour marks) or Mean High Water Line; a description of the adjacent vegetation community and a statement regarding the wetland status of the associated vegetation community (i.e. wetland, non-wetland); surrounding land use; water quality; issues related to cumulative impacts in the watershed, and; any other relevant information.
  - b. An analysis of the proposed impacts to the waterbody in accordance with General Condition 32 and Regional Condition 3;
  - c. Measures taken to avoid and minimize losses, including other methods of constructing the proposed project; and
  - d. A compensatory mitigation plan describing how the unavoidable losses are proposed to be compensated, in accordance with 33 CFR Part 332.

10. The permittee shall complete the construction of any compensatory mitigation required by special condition(s) of the NWP verification before or concurrent with commencement of construction of the authorized activity, except when specifically determined to be impracticable by the Corps. When mitigation involves use of a mitigation bank or in-lieu fee program, the permittee shall submit proof of payment to the Corps prior to commencement of construction of the authorized activity.

**4. Further information:**

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:
  - ( ) Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).
  - (X) Section 404 of the Clean Water Act (33 U.S.C. 1344).
  - ( ) Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).
2. Limits of this authorization.
  - (a) This permit does not obviate the need to obtain other Federal, state, or local authorizations required by law.
  - (b) This permit does not grant any property rights or exclusive privileges.
  - (c) This permit does not authorize any injury to the property or rights of others.
  - (d) This permit does not authorize interference with any existing or proposed Federal project.
3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:
  - (a) Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.
  - (b) Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.
  - (c) Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.
  - (d) Design or construction deficiencies associated with the permitted work.
  - (e) Damage claims associated with any future modification, suspension, or revocation of this permit.
4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.
5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:
  - (a) You fail to comply with the terms and conditions of this permit.
  - (b) The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).
  - (c) Significant new information surfaces which this office did not consider in reaching the original public interest decision.

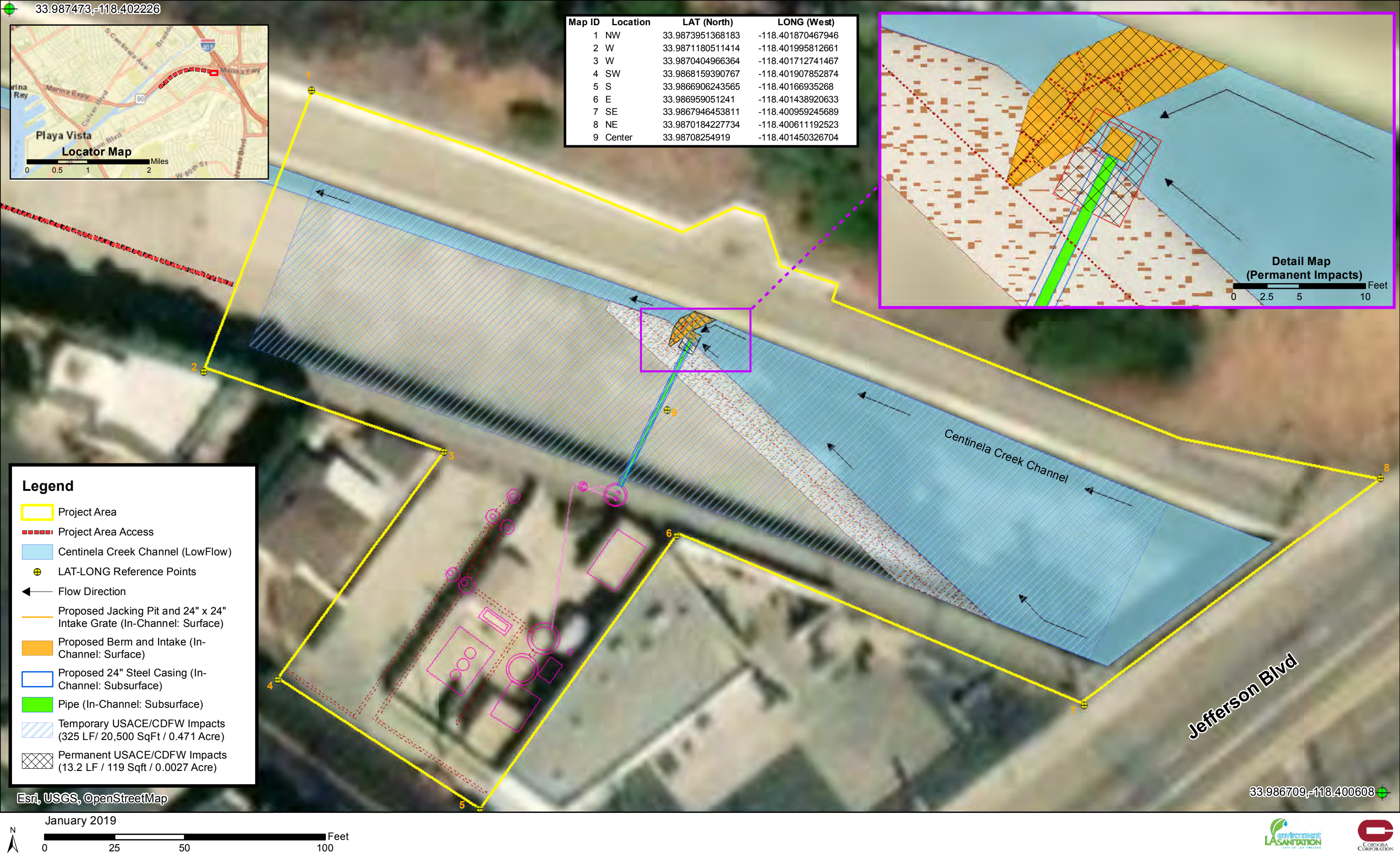
Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 330.5 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the

issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measure ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. This letter of verification is valid for a period not to exceed two years unless the nationwide permit is modified, reissued, revoked, or expires before that time.
7. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition H below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.
8. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished with the terms and conditions of your permit.



Ballona Creek Bacteria TMDL Project  
FIGURE 8: MESMER SITE: Updated Design Map Showing Temporary & Permanent Impacts





**CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE SECTION 1602  
(STREAMBED ALTERATION AGREEMENT)**



State of California – Natural Resources Agency  
DEPARTMENT OF FISH AND WILDLIFE  
South Coast Region  
3883 Ruffin Road  
San Diego CA, 92123  
(858) 467-4201  
[www.wildlife.ca.gov](http://www.wildlife.ca.gov)

GAVIN NEWSOM, Governor  
CHARLTON H. BONHAM, Director



August 13, 2019

Hubertus J. Cox  
Los Angeles Bureau of Sanitation  
1149 S. Broadway, 10<sup>th</sup> Floor  
Los Angeles, CA 90015  
[hubertus.cox@lacity.com](mailto:hubertus.cox@lacity.com)

Dear Mr. Cox:

**Final Lake or Streambed Alteration Agreement, Notification No. 1600-2017-0212-R5, Ballona Creek Bacteria Total Maximum Daily Load Project**

Enclosed is the final Streambed Alteration Agreement (Agreement) for the Ballona Creek Bacteria Total Daily Load Project (Project). Before the California Department of Fish and Wildlife (CDFW) may issue an Agreement, it must comply with the California Environmental Quality Act (CEQA). In this case, CDFW acting as a responsible agency filed a Notice of Determination (NOD) within five working days of signing the Agreement. The NOD was based on information contained in the final Environmental Impact Report prepared by the lead agency.

Under CEQA, the filing of an NOD triggers a 30-day statute of limitations period during which an interested party may challenge the filing agency's approval of the Project. You may begin the Project before the statute of limitations expires if you have obtained all necessary local, state, and federal permits or other authorizations. However, if you elect to do so, it will be at your own risk.

If you have any questions regarding this letter, please contact Audrey Kelly, Environmental Scientist, at (562) 430-7882 or by email at [Audrey.Kelly@wildlife.ca.gov](mailto:Audrey.Kelly@wildlife.ca.gov).

Sincerely,

Erinn Wilson  
Environmental Programs Manager I

ec: CDFW  
Victoria Tang, Senior Environmental Scientist (Supervisory)  
Audrey Kelly, Environmental Scientist

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE  
SOUTH COAST REGION  
3883 RUFFIN ROAD  
SAN DIEGO, CA 92123



**STREAMBED ALTERATION AGREEMENT**

NOTIFICATION NO. 1600-2017-0212, REV. 4  
BALLONA CREEK BACTERIA TOTAL MAXIMUM DAILY LOAD PROJECT

HUBERTUS H.J. COX  
LOS ANGELES BUREAU OF SANITATION  
1149 S. BROADWAY, 10<sup>TH</sup> FLOOR  
LOS ANGELES, CA 90015  
[HUBERTUS.COX@LACITY.ORG](mailto:HUBERTUS.COX@LACITY.ORG)

This Streambed Alteration Agreement (Agreement) is entered into between the California Department of Fish and Wildlife (CDFW) and Los Angeles Bureau of Sanitation (Permittee) as represented by Hubertus H.J. Cox.

**RECITALS**

WHEREAS, pursuant to Fish and Game Code (FGC) section 1602, Permittee notified CDFW on October 18, 2017, that Permittee intends to complete the project described herein.

WHEREAS, pursuant to FGC section 1603, CDFW has determined that the project could substantially adversely affect existing fish or wildlife resources and has included measures in the Agreement necessary to protect those resources.

WHEREAS, Permittee has reviewed the Agreement and accepts its terms and conditions, including the measures to protect fish and wildlife resources.

NOW THEREFORE, Permittee agrees to complete the project in accordance with the Agreement.

**PROJECT LOCATION**

The project site consists of three discrete areas that include:

1. Low Flow Treatment Facility No. 1: located in Ballona Creek (Area 1). The project site can be located using the following information: Latitude 34.01119°, Longitude -118.390829°; USGS 7.5 Minute Quadrangle Map Name Beverly Hills California, Township 2 South, Range 14 West, within Section 7.
2. Low Flow Treatment Facility No. 2: located at the Sepulveda Channel bridge crossing (Area 2). The project site can be located using the following information: Latitude 33.998245°, Longitude -118.415717°; USGS 7.5 Minute Quadrangle Map Name Venice California, Township 2 South, Range 15 West, within Section 14.



3. Mesmer Low Flow Diversion Facility, located at Centinela Creek (Area 3). The project site can be located using the following information: Latitude 33.986855°, Longitude -118.401562°; USGS 7.5 Minute Quadrangle Map Name Venice California, Township 2 South, Range 15 West, within Section 24.

## **PROJECT DESCRIPTION**

In order to comply with the Bacteria Total Maximum Daily Load (TMDL), the Permittee proposes the construction of three project facilities at three different locations.

### Area 1 – Low Flow Treatment Facility-1 (LFTF-1)

The LFTF-1 portion of the project is located in Ballona Creek and consists of repurposing the existing North Outfall Treatment Facility (NOTF), which is owned by the City of Los Angeles Bureau of Sanitation (City of LA Sanitation). LFTF-1 is located adjacent to Ballona Creek Reach 2 in the City of Culver City. LFTF-1 will treat up to 6 million gallons per day (MGD) of dry weather flow with in-line ultraviolet (UV) or Ozone disinfection technology. Development of LFTF-1 also includes the installation of a new North Outfall Sewer (NOS) connection that would convey up to 23 MGD of dry weather flow from Ballona Creek to the Hyperion Water Reclamation Plant (HWRP) for discharge or beneficial use.

LFTF-1 uses a hybrid approach to water treatment and release. Up to 29 MGD total of dry-weather flow will be diverted. Of this amount, 6 MGD will be treated at the improved NOTF facility, which is adjacent to Ballona Creek, and released back into the channel. The remaining flow balance, of up to 23 MGD, will be diverted to the new NOS connection and conveyed to the HWRP for discharge or beneficial use.

Project design elements within Ballona Creek Channel include the construction of two 39-inch wide saw-cut diversion channels, separated by an 18-inch wide island. The saw cut channels will stretch toe-toe across the entire width of Ballona Creek and will intercept dry-weather flow, diverting these flows to a transition channel and rock trap to be constructed in the Ballona Creek Channel wall. The diversion channels will be covered by Caltrans type 24-12 grating with 1/3 8-inch clear spacing to retain large debris. Micro-drilling will be used to install a 5-foot diameter reinforced concrete subsurface pipe which will convey dry-weather flow to the adjacent treatment facility.

### Area 2 – Low Flow Treatment Facility- 2 (LFTF-2)

The LFTF-2 portion of the project is located in Sepulveda Channel and includes construction of a LFTF at an existing water quality facility that is adjacent to Sepulveda Channel in the City of Los Angeles. LFTF-2 will include the development of a small treatment facility that would disinfect up to 1.3 MGD of dry weather flow with UV or ozone disinfection technology and release the treated flow in its entirety back to Sepulveda Channel.



Project design elements within Sepulveda Channel include the construction of a single 39-inch wide saw-cut diversion channel. The diversion channels will stretch toe-toe across the entire width of the Sepulveda Channel and will intercept dry-weather flow, diverting these flows to a transition channel and rock trap to be constructed in the Sepulveda Channel wall. The diversion channels will be covered by Caltrans type 24-12 grating with 1/3 8-inch clear spacing to retain large debris. Micro-drilling will be used to install a 10-inch diameter subsurface pipe which will convey dry-weather flow to the adjacent pump house and treatment facility.

#### Area 3 – Mesmer Low Flow Diversion

The Mesmer Low Flow Diversion portion of the project is located in Centinela Creek and involves repurposing the existing Mesmer pump station located adjacent to Centinela Creek to service dry weather runoff instead of wastewater. As part of this retrofit, a small diversion berm and grate inlet will be constructed in the low-flow portion of the channel, allowing for the conveyance of up to 0.96 MGD of dry weather flow from Centinela Creek to the HWRP for treatment, discharge or beneficial use.

Project design elements within Centinela Creek Channel include the construction of a, 8" PVC diversion pipe that will be installed using directional boring under the channel from the Mesmer Pump Station to the northerly side of the channel where a new grate inlet (24" x 24") will be constructed to capture the run-off. The grate inlet will be covered with Caltrans type 24-12 grating with 1/3 8-inch clear spacing to retain large debris. A small 3" high concrete diversion berm, will be constructed within the existing low flow channel and will connect the existing diversion berm to the north channel wall. This new berm will convey dry-weather run-off into the proposed grate inlet.

The proposed diversion pipe will then convey the dry weather run-off from the grate inlet to a grit chamber at Mesmer Pump Station. The grit chamber will contain check/control valves on the inlet and a trap area to collect sediments before conveyance to the existing sewer pump station wet well where existing sewer pumps will run off to a sanitary force main.

None of these facilities shall divert water during rain events.

### **PROJECT IMPACTS**

Both Ballona Creek Channel and Centinela Creek Channel flow to important aquatic resources, including the Ballona Estuary, the Del Rey Lagoon, and the Ballona Wetland Ecological Reserve.

The project will permanently impact a total of 0.03 acre of concrete-lined channel due to project construction, including:

- LFTF-1: 0.02 acre (825 square feet)
- LFTF-2: 0.006 acre (245 square feet)
- Mesmer: 0.003 acre (119 square feet)

The project will temporarily impact a total of 1.51 acres of concrete-lined channel due to water diversion during project construction, including:

- LFTF-1: 0.82 acre (35,594 square feet)
- LFTF-2: 0.22 acre (9,671 square feet)
- Mesmer: 0.47 acre (20,500 square feet)

In addition, this project involves unknown acreage of impacts due to indirect impacts to downstream resources caused by proposed water diversions.

Existing fish or wildlife resources the project could substantially adversely affect based on information received from the Permittee include: **Birds:** loggerhead shrike (*Lanius ludovicianus*), tricolored blackbird (*Agelaius tricolor*), Least Bittern (*Ixobrychus exilis*), yellow warbler (*Setophaga petechia*), light-footed clapper rail (*Rallus longirostris levipes*), vesper sparrow (*Pooecetes gramineus*), western snowy plover (*Charadrius alexandinus nivosus*), burrowing owl (*Athene cunicularia*), Redhead (*Aythya americana*), Olive-sided flycatcher (*Contopus cooperi*), Swainson's hawk (*Buteo swainsoni*); **Mammals:** south coast marsh vole (*Microtus californicus stephensi*), southern California salt marsh shrew (*Sorex ornatus salicornicus*), salt marsh harvest mouse (*Reithrodontomys raviventris*); and all other aquatic and wildlife resources in the area, including the riparian vegetation, which provides habitat for such species in the area.

The adverse effects the project could have on the fish or wildlife resources identified above include: restriction or increase in sediment transport; debris dams; debris transport impedence; increased turbidity; increased sedimentation (chronic or episodic); short-term release of contaminants (e.g., incidental from construction); long-term release of contaminants (e.g., concrete, creosote, wood preservative leachates); decline of vegetative diversity; disturbance from project activity; loss or decline of aquatic species' habitat: migration corridors, spawning, or rearing areas; loss or impediment of terrestrial animal species travel routes due to permanent structures (e.g., survey tape, sandbags, erosion protection materials etc.); loss or impediment of terrestrial animal species travel routes due to temporary structures; change in stream flow (Q); diversion of flow water from, or around, activity site; change in hydrology below diversion; habitat fragmentation below intake; change (increase or decrease) in sediment delivery below intake; change in flow depth, width or velocity; flow restriction (with risk of culvert or bridge failure); flow deflection; effect on another water project on the same watercourse; cumulative effect when other diversions on the same watercourse are considered; dewatering; impediment to migration of aquatic and terrestrial species; and direct loss of resources for aquatic organisms.

## MEASURES TO PROTECT FISH AND WILDLIFE RESOURCES

## **1. Administrative Measures**

Permittee shall meet each administrative requirement described below.

1.1 Documentation at Project Site. Permittee shall make the Agreement, any extensions and amendments to the Agreement, and all related notification materials and California Environmental Quality Act (CEQA) documents, readily available at the project site at all times and shall be presented to CDFW personnel, or personnel from another state, federal, or local agency upon request.

1.2 Providing Agreement to Persons at Project Site. Permittee shall provide copies of the Agreement and any extensions and amendments to the Agreement to all persons who will be working on the project at the project site on behalf of Permittee, including but not limited to contractors, subcontractors, inspectors, and monitors.

1.3 Notification of Conflicting Provisions. Permittee shall notify CDFW if Permittee determines or learns that a provision in the Agreement might conflict with a provision imposed on the project by another local, state, or federal agency. In that event, CDFW shall coordinate with Permittee to resolve any conflict.

1.4 Project Site Entry. Permittee agrees that CDFW personnel may enter the project site at any time to verify compliance with the Agreement.

1.5 Personnel Compliance On Site. If the Permittee or any employees, agents, contractors and/or subcontractors violate any of the terms or conditions of this agreement, all work shall terminate immediately and shall not proceed until CDFW has taken all of its legal actions.

1.6 Pre-construction briefing. A pre-construction meeting/briefing shall be held involving all the workers, contractors, and subcontractors concerning the conditions in this Agreement.

1.7 Notification Requirements. CDFW requires that the Permittee:

1.7.1 Immediately notify CDFW in writing if monitoring reveals that any of the protective measures were not implemented during the period indicated in this program, or if it anticipates that measures will not be implemented within the time period specified.

1.7.2 Immediately notify CDFW if any of the protective measures are not providing the level of protection that is appropriate for the impact that is occurring, and recommendations, if any, for alternative protective measures.

1.7.3 CDFW may, at its sole discretion, review relevant documents maintained by the Permittee, interview the Permittee's employees and agents, inspect the work site,



and take other actions to assess compliance with or effectiveness of protective measures in this Agreement. CDFW shall verify compliance with protective measures to ensure the accuracy of the Permittee's mitigation, monitoring and reporting efforts.

1.8 Implementation Requirements. The agreed work includes activities associated with the Project Location and Project Description that is provided above. Specific work areas and mitigation measures are described on/in the plans and documents submitted by the Permittee with the Notification Package, and shall be implemented as proposed unless directed differently by this Agreement.

1.9 Designated Biologist. At least thirty (30) days prior to initiating ground- or vegetation-disturbing activities, Permittee shall submit in writing the name, qualifications, business address, and contact information for the Designated Biologist to CDFW for written approval. The Designated Biologist shall be knowledgeable and experienced in the biology and natural history of local fish and wildlife resources and be able to identify those resources present at the project site.

1.10 Weather Limitations. The Permittee's activities within the stream shall be restricted to periods of low rainfall (less than ¼ inch per 24-hour period) and periods of dry weather (with less than a 40 percent chance of rain). All erosion control measures shall be initiated prior to all storm events. Permittee shall monitor the National Weather Service (NWS) 72-hr forecast for the project area. Weather forecasts shall be documented upon request by CDFW.

1.11 Post Storm Event Inspection. After any storm event, Permittee shall inspect all sites scheduled to begin or continue construction within the next 72 hours. Corrective action for erosion and sedimentation shall be taken as needed. National Weather Service 72-hour weather forecasts shall be reviewed prior to the start of any phase of the project that may result in sediment runoff to the stream, and construction plans adjusted to meet this requirement. The National Weather Service forecast can be found at: <http://www.nws.noaa.gov>.

## **2. Dams, Conduits, Screens, and Diversions (Fish and Game Code 5900 et seq)**

2.1 Diversion Plan for Construction. Permittee shall prepare a Diversion Plan for Construction (DPC). The DPC shall be submitted to CDFW 30 days **PRIOR** to initiation of project activities. The diversion plan shall include the following:

- Location of diversion points;
- Detailed drawings;
- Step-by-step installation and removal method;
- Materials to be used;
- Timing of diversion;

- Inspection, maintenance and repair of temporary diversion structures (berms, pumps, filters, etc.) during construction;
- Contingency plan for high flows;
- Sediment management, including monitoring and reporting turbidity levels;
- Provisions for aquatic species and habitat protection;
- Ingress/egress routes for entry into the channel(s)
- Vehicle decontamination protocols
- Pollution, litter and cleanup protocols

If CDFW determines the diversion plan impacts the resources beyond what has been authorized in this Agreement, additional mitigation may be required. The designs shall maintain existing hydrology conditions. Permittee shall resolve all CDFW comments prior to initiation of project activities. The Permittee may not commence diversion of water without the explicit approval from CDFW.

Diversion during the construction phase shall also comply with the following design/performance standards:

- 2.1.1 Flow Diversion: Flow diversions shall be done in a manner that shall prevent pollution and/or siltation and provide flows to downstream reaches. Flows to downstream reaches shall be provided during all times that the natural flow would have supported aquatic life. Said flows shall be sufficient quality and quantity, and of appropriate temperature to support fish and other aquatic life both above and below the diversion.
- 2.1.2 Turbidity and Siltation: The DPC shall comply with the Turbidity and Siltation conditions set forth in Sections 3.8, 3.10 and 3.11 of this agreement.
- 2.1.3 Concrete – Primary Contaminant: Provide details identifying how concrete will be cut, removed, poured, and stored during construction. Details shall provide assurance that no cement/concrete materials/waste shall come into contact with a flowing stream, or otherwise provide for avoidance of significant adverse impacts to the stream, water, or biota from use of such materials.
- 2.1.4 Unauthorized Materials: Any materials placed in seasonally dry portions of a stream that could be washed downstream or could be deleterious to aquatic life shall be removed prior to inundation by high flows.
- 2.1.5 Excavation Spoils: No castings or spoil from the excavation operations shall be placed on the stream side of the Project site. Spoil storage sites shall not be located within a stream, where spoils can be washed back into a stream, or where it will cover aquatic or riparian vegetation.
- 2.2 Diversion Structure Operations and Maintenance Plan. Permittee shall prepare a Diversion Structure Operations and Maintenance Plan (DSOMP). Permittee shall

submit the DSOMP for CDFW review and acceptance 30 days **PRIOR** to initiation of project activities. Permittee shall resolve all CDFW comments prior to initiation of project activities. Where relevant, the DSOMP shall include the following provisions:

- Details of maintenance activities;
- Details of flow diversion;
- Protocols for removal/disposal of debris/waste;
- Provisions for aquatic species and habitat protection;
- Ingress/egress routes for entry into the channel(s);
- Vehicle decontamination protocols (See: exotic species removal and control);
- Pollution, litter, and cleanup protocols (See: pollution litter and cleanup);
- A maintenance frequency schedule.

2.3 Flow Diversion: Flow diversions shall be done in a manner that shall prevent pollution and/or siltation and provide flows to downstream reaches. Flows to downstream reaches shall be provided during all times that the natural flow would have supported aquatic life. Said flows shall be sufficient quality and quantity, and of appropriate temperature to support fish and other aquatic life both above and below the diversion.

2.4 Turbidity and Siltation: The DSOMP shall comply with the Turbidity and Siltation conditions set forth in Sections 3.8, 3.10 and 3.11 of this agreement.

### **3. Avoidance and Minimization Measures**

To avoid or minimize adverse impacts to fish and wildlife resources identified above, Permittee shall implement each measure listed below.

#### **Resource Protection**

3.1 Protected Species. This Agreement does not authorize take, incidental or otherwise, of any protected species. For the purpose of this Agreement, "protected species" means the following:

- 3.1.1 A species fully protected under state law;
- 3.1.2 A candidate species or species listed as threatened or endangered under the California Endangered Species Act (CESA; Fish & G. Code § 2050 *et seq.*) and/or the Endangered Species Act (ESA; 16 U.S.C. § 1531 *et seq.*);
- 3.1.3 A state-listed rare plant species;



3.1.4 Or any other species for which take is prohibited under state or federal law.

No direct or indirect impacts shall occur to any protected species, except as may be authorized by one or more individual permits that authorize such impacts.

3.2 Observations of Protected Species and/or Rare Plant Species. If protected species are observed in the area, Permittee shall stop work until CDFW has been notified for further actions. Please note that additional state permits may be required prior to commencing project activities.

3.3 Notification to the California Natural Diversity Database. Permittee or Designated Biologist shall submit California Natural Diversity Data Base (CNDDB) forms to CNDDB for all preconstruction survey data within five (5) working days of survey completion. (See <https://www.wildlife.ca.gov/Data/CNDDB/Submitting-Data> for more information.)

3.4 Incidental Take Permit. An Incidental Take Permit (ITP) from CDFW may be required if the project, project construction, or any project-related activity during the life of the project will result in "take," as defined by the Fish and Game Code, of any species protected by CESA [Fish & G. Code, §§86, 2080, 2081, subd. (b) (c)]. This Agreement does not authorize take of any rare, threatened or endangered species that may occur within or adjacent to the proposed work area. If there is a potential for take, the Permittee shall immediately consult CDFW and obtain the necessary state permits and/or submit plans to avoid any impacts to the species. Consultation with U.S. Fish and Wildlife Service or National Ocean and Atmospheric Administration would be required to receive take authority for federal threatened and endangered species.

3.5 Leave Wildlife Unharmd. The Designated Biologist shall be present during work in all CDFW jurisdictional areas during all vegetation-removal and rough grading activities to monitor for non-listed, special-status, and/or common ground-dwelling vertebrates encountered in the path of project-related activities. The Designated Biologist shall make every effort to relocate the species out of harm's way to the extent feasible by doing one of the following:

- 1) Utilize shovel, rake, or similar hand tool to gently re-direct the animal out of work area;
- 2) Install silt fence or other exclusionary fencing to prevent species from re-entering disturbance area; or
- 3) If the Designated Biologist has the appropriate handling permits, he/she may capture/relocate species to appropriate habitat outside the disturbance area.

The Designated Biologist shall have the authority to temporarily stop construction activities until the species is determined to be out of harm's way. Any exclusionary devices shall be checked by a biological monitor on a daily basis to check/ensure

continued exclusionary device effectiveness. Should CDFW personnel visit the site during construction activities and no Designated Biologist is available per condition requirements, construction activities shall be halted.

3.6 Migratory Birds and Nests. Be advised, migratory nongame native bird species are protected by international treaty under the Federal Migratory Bird Treaty Act (MBTA) of 1918 (50 C.F.R. § 10.13). Permittee shall not take or destroy nests (or eggs) of birds, including raptors and other migratory nongame birds that are designated under Federal and California State laws, MBTA and Fish and Game code sections 3503, 3503.5, 3511, and 3513.

### **Habitat Protection**

3.7 Hours of Operation and Lighting. Permittee's construction activities shall take place during daylight hours only. No night work or lights are authorized.

### **Turbidity and Siltation**

3.8 Sediment and Runoff Control. Permittee shall take the necessary steps to contain sediment and reduce stream turbidity. Sediment from project-related activities shall not be placed in seasonally dry portions of the stream where it might likely be washed into the stream or inundated by high flows, or where it is likely to have a negative impact on emergent native vegetation, or where it is likely to have a negative impact on native trees. Where appropriate (if needed), preparation shall be made so that runoff from steep, erodible surfaces will be diverted into stable areas with little erosion potential. Frequent water checks shall be placed on dirt roads, cat tracks, or other work trails to control erosion.

3.9 Contaminated Site Water. Water containing mud, silt, or other pollutants from equipment washing or other activities, shall not be allowed to enter a flowing stream, dry ephemeral stream or into storm drains. Such water shall be settled, filtered, or otherwise treated prior to discharge back into the water body. Alternatively, contaminated water may be removed from the site for proper treatment and disposal.

3.10 Minimize Turbidity and Siltation. Silty/turbid water from dewatering or other activities shall not be discharged into the stream. Such water shall be settled, filtered, or otherwise treated prior to discharge. Methods to minimizing turbidity/siltation shall be included in the DPC. Methods to minimizing turbidity/siltation shall be included in the DPC. Permittee shall take precautions to minimize turbidity/siltation during construction and post-construction periods. Precautions shall include but are not limited to: pre-construction planning to identify site-specific turbidity and siltation minimization measures and best management practices; and settling, filtering, or otherwise treating silty and turbid water prior to discharge into a stream or storm drain.



**3.11 Turbidity Levels:** Turbidity levels in the stream resulting from project related activities shall not exceed 10 percent of the natural turbidity levels measured 200 feet upstream of the project site. Background conditions shall be routinely monitored, measured and sent to CDFW for review as outlined in the Diversion Plan. Upon CDFW determination that turbidity/siltation levels resulting from project related activities constitute a threat to aquatic life, activities associated with turbidity/siltation shall be halted until effective CDFW approved control devices are installed, or abatement procedures are initiated.

### **Pollution, Litter and Cleanup**

**3.12 Operating Equipment and Vehicle Leaks.** Any equipment or vehicles driven and/or operated within or adjacent to the ephemeral drainage shall be checked and maintained daily to prevent leaks of materials that could be deleterious to aquatic and terrestrial life or riparian habitat. All refueling and maintenance of equipment and vehicles shall be at least 150 feet from any aquatic habitat, wetland area, water body, or ephemeral drainages. Stationary equipment such as motors, pumps, generators, and welders, located within or adjacent to the stream, lake or ephemeral drainage shall be positioned over drip pans. Stationary heavy equipment shall have suitable containment to handle a catastrophic spill/leak. Clean up equipment such as extra boom, absorbent pads, skimmers, shall be on site prior to the start of project-related activities.

**3.13 Pollutants and Debris.** No debris, soil, silt, sand, bark, slash, sawdust, rubbish, construction waste, cement or concrete or washings thereof, asphalt, paint, oil or other petroleum products or any other substances which could be hazardous to aquatic life, or other organic or earthen material from any logging, construction, or other associated Project-related activity shall be allowed to contaminate the soil and/or enter into or placed where it may be washed by rainfall or runoff into, any stream/channel/culvert/ditch. Any of these materials, placed within or where they may enter a stream/channel/culvert/ditch, by the Permittee or any party working under contract, or with the permission of the Permittee, shall be removed immediately. When Project-related activities are completed, any excess materials or debris shall be removed from the work area. No rubbish shall be deposited within 150 feet of the high water mark of any stream.

**3.14 Pollution Compliance.** The Permittee shall comply with all litter and pollution laws. All contractors, subcontractors and employees shall also obey these laws and it shall be the responsibility of the Permittee to ensure compliance.

**3.15 Pollution Clean-up.** The clean-up of all spills shall begin immediately. CDFW shall be notified immediately by the Permittee of any spills that release hazardous material (oil, cement, fuel, etc.) into any stream/channel/culvert/ditch and CDFW shall be consulted regarding clean-up procedures.

3.16 Trash Receptacles. The Permittee shall install and use fully covered trash receptacles with secure lids (wildlife proof) that contain all food, food scrapes, food wrappers, beverage containers and other miscellaneous trash generated by work force personnel. Following construction, all trash and construction debris shall be removed from the project site.

3.17 Remove Temporary Flagging, Fencing, and Barriers. Permittee shall remove all temporary flagging, fencing, and/or barriers from the project site and vicinity of the stream upon completion of project activities.

### **Exotic Species Removal and Control**

The Permittee shall also perform exotic species removal and control as defined by the following measures.

3.18 Inspection of Project Equipment. Permittee shall inspect all vehicles, tools, waders and boots, and other project-related equipment and remove all visible soil/mud, plant materials, and animal remnants prior to entering and exiting the stream and/or between each use in different watersheds.

3.19 Decontamination of Project Equipment. If decontamination for invasive animal species is applicable, Permittee shall decontaminate project gear and equipment utilizing one of three methods: drying, using a hot water soak, or freezing, as appropriate to the type of gear or equipment. For all methods, Permittee shall begin the decontamination process by thoroughly scrubbing equipment, paying close attention to small crevices such as boot laces, seams, net corners, etc., with a stiff-bristled brush to remove all organisms. To decontaminate by drying, Permittee shall allow equipment to dry thoroughly (i.e., until there is a complete absence of water), preferably in the sun, for a minimum of 48 hours. To decontaminate using a hot water soak, Permittee shall immerse equipment in 140°F or hotter water and soak for a minimum of 5 minutes. To decontaminate by freezing, Permittee shall place equipment in a freezer 32°F or colder for a minimum of 8 hours. Repeat decontamination is required only if the equipment/clothing is removed from the site, used within a different watersheds, and returned to the project site.

3.20 Decontamination of Vehicles and Equipment. If decontamination for aquatic invasive animal species is applicable, Permittee shall decontaminate vehicles and other project-related equipment too large to immerse in a hot water bath by pressure washing with hot water a minimum of 140°F at the point of contact or 155°F at the nozzle. Additionally, Permittee shall flush watercraft engines and all areas that could contain standing water (e.g. storage compartments) for a minimum of 10 minutes. Following the hot water wash, Permittee shall dry all vehicles, watercraft, and other large equipment as thoroughly as possible.

3.21 Decontamination Sites. If decontamination for aquatic invasive animal species is applicable, Permittee shall perform decontamination of vehicles, watercraft, and other project gear and equipment in a designated location where runoff can be contained and not allowed to pass into CDFW jurisdictional areas and other sensitive habitat areas.

#### 4. Reporting Measures

Permittee shall meet each reporting requirement described below.

4.1 Notification Prior to Work. The Permittee shall notify CDFW, in writing, at least five (5) days prior to initiation of project-related activities and at least five (5) days prior to completion of project and mitigation activities. Notification shall be sent to the e-mail address: [R5LSACompliance@wildlife.ca.gov](mailto:R5LSACompliance@wildlife.ca.gov), Reference # 1600-2017-0212-R5.

4.2 Reporting. All surveys, pre and post construction notifications, monitoring reports and any other required communication between the Permittee and CDFW shall be submitted to [R5LSACompliance@wildlife.ca.gov](mailto:R5LSACompliance@wildlife.ca.gov) Reference # 1600-2017-0212-R5.

4.3 Final Construction Report. Permittee shall provide a final construction report to CDFW no later than **thirty (30) days after the project is fully completed**. The construction report at a minimum shall contain pre-project photographs, total amount of area impacted post-project (including staging and access areas), post-project photographs, and biological survey notes (including construction monitoring).

4.4 Format of Reports. All reports shall be submitted to CDFW electronically and shall include geographic information system (GIS) shapefiles, along with the appropriate metadata, of the project area and mitigation area. For more details on creating shapefiles, please visit <http://www.esri.com/library/whitepapers/pdfs/shapefile.pdf>.

#### CONTACT INFORMATION

Any communication that Permittee or CDFW submits to the other shall be in writing and any communication or documentation shall be delivered to the address below by U.S. mail, fax, or e-mail, or to such other address as Permittee or CDFW specifies by written notice to the other.

To Permittee:

Hubertus H.J. Cox  
Los Angeles Bureau of Sanitation  
1149 S. Broadway, 10<sup>th</sup> Floor  
Los Angeles, CA 90015  
[Hubertus.cox@lacity.org](mailto:Hubertus.cox@lacity.org)

To CDFW:



Department of Fish and Wildlife  
South Coast Region  
3883 Ruffin Road  
San Diego, California 92123  
Attn: Lake and Streambed Alteration Program  
Notification #1600-2017-0212-R5  
Email: [R5LSACompliance@wildlife.ca.gov](mailto:R5LSACompliance@wildlife.ca.gov)

## **LIABILITY**

Permittee shall be solely liable for any violations of the Agreement, whether committed by Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents or contractors and subcontractors, to complete the project or any activity related to it that the Agreement authorizes.

This Agreement does not constitute CDFW's endorsement of, or require Permittee to proceed with the project. The decision to proceed with the project is Permittee's alone.

## **SUSPENSION AND REVOCATION**

CDFW may suspend or revoke in its entirety the Agreement if it determines that Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, is not in compliance with the Agreement.

Before CDFW suspends or revokes the Agreement, it shall provide Permittee written notice that it intends to suspend or revoke. The notice shall state the reason(s) for the proposed suspension or revocation, provide Permittee an opportunity to correct any deficiency before CDFW suspends or revokes the Agreement, and include instructions to Permittee, if necessary, including but not limited to a directive to immediately cease the specific activity or activities that caused CDFW to issue the notice.

## **ENFORCEMENT**

Nothing in the Agreement precludes CDFW from pursuing an enforcement action against Permittee instead of, or in addition to, suspending or revoking the Agreement.

Nothing in the Agreement limits or otherwise affects CDFW's enforcement authority or that of its enforcement personnel.

## **OTHER LEGAL OBLIGATIONS**

This Agreement does not relieve Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and

subcontractors, from obtaining any other permits or authorizations that might be required under other federal, state, or local laws or regulations before beginning the project or an activity related to it.

This Agreement does not relieve Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, from complying with other applicable statutes in the FGC including, but not limited to, FGC sections 2050 *et seq.* (threatened and endangered species), 3503 (bird nests and eggs), 3503.5 (birds of prey), 5650 (water pollution), 5652 (refuse disposal into water), 5901 (fish passage), 5937 (sufficient water for fish), and 5948 (obstruction of stream).

Nothing in the Agreement authorizes Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, to trespass.

## **AMENDMENT**

CDFW may amend the Agreement at any time during its term if CDFW determines the amendment is necessary to protect an existing fish or wildlife resource.

Permittee may amend the Agreement at any time during its term, provided the amendment is mutually agreed to in writing by CDFW and Permittee. To request an amendment, Permittee shall submit to CDFW a completed CDFW "Request to Amend Lake or Streambed Alteration" form and include with the completed form payment of the corresponding amendment fee identified in CDFW's current fee schedule (see Cal. Code Regs., tit. 14, § 699.5).

## **TRANSFER AND ASSIGNMENT**

This Agreement may not be transferred or assigned to another entity, and any purported transfer or assignment of the Agreement to another entity shall not be valid or effective, unless the transfer or assignment is requested by Permittee in writing, as specified below, and thereafter CDFW approves the transfer or assignment in writing.

The transfer or assignment of the Agreement to another entity shall constitute a minor amendment, and therefore to request a transfer or assignment, Permittee shall submit to CDFW a completed CDFW "Request to Amend Lake or Streambed Alteration" form and include with the completed form payment of the minor amendment fee identified in CDFW's current fee schedule (see Cal. Code Regs., tit. 14, § 699.5).

## **EXTENSIONS**

In accordance with FGC section 1605(b), Permittee may request one extension of the Agreement, provided the request is made prior to the expiration of the Agreement's



term. To request an extension, Permittee shall submit to CDFW a completed CDFW "Request to Extend Lake or Streambed Alteration" form and include with the completed form payment of the extension fee identified in CDFW's current fee schedule (see Cal. Code Regs., tit. 14, § 699.5). CDFW shall process the extension request in accordance with FGC 1605(b) through (e).

If Permittee fails to submit a request to extend the Agreement prior to its expiration, Permittee must submit a new notification and notification fee before beginning or continuing the project the Agreement covers (FGC section 1605(f)).

### **EFFECTIVE DATE**

The Agreement becomes effective on the date of CDFW's signature, which shall be: 1) after Permittee's signature; 2) after CDFW complies with all applicable requirements under the California Environmental Quality Act (CEQA); and 3) after payment of the applicable FGC section 711.4 filing fee listed at [http://www.wildlife.ca.gov/habcon/ceqa/ceqa\\_changes.html](http://www.wildlife.ca.gov/habcon/ceqa/ceqa_changes.html).

### **TERM**

This Agreement shall expire on June 27, 2024, unless it is terminated or extended before then. All provisions in the Agreement shall remain in force throughout its term. Permittee shall remain responsible for implementing any provisions specified herein to protect fish and wildlife resources after the Agreement expires or is terminated, as FGC section 1605(a)(2) requires.

### **AUTHORITY**

If the person signing the Agreement (signatory) is doing so as a representative of Permittee, the signatory hereby acknowledges that he or she is doing so on Permittee's behalf and represents and warrants that he or she has the authority to legally bind Permittee to the provisions herein.

### **AUTHORIZATION**

This Agreement authorizes only the project described herein. If Permittee begins or completes a project different from the project the Agreement authorizes, Permittee may be subject to civil or criminal prosecution for failing to notify CDFW in accordance with FGC section 1602.

### **CONCURRENCE**

The undersigned accepts and agrees to comply with all provisions contained herein.

**FOR LOS ANGELES BUREAU OF SANITATION**

  
\_\_\_\_\_  
Hubertus H.J. Cox  
Designated Representative

07/30/2019

\_\_\_\_\_  
Date

**FOR DEPARTMENT OF FISH AND WILDLIFE**

  
\_\_\_\_\_  
~~Betty J. Courtney~~ ERINN Wilson  
Environmental Program Manager I

\_\_\_\_\_  
Date

8.13.2019

Prepared by: Audrey Kelly  
Environmental Scientist

**LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD SECTION 401**



**This page shall be replaced with the RWQCB Section 401 approval once received from the City of Los Angeles (application documents shared via email on June 10, 2021)**

**LOS ANGELES COUNT FLOOD CONTROL DISTRICT CONNECTION PERMIT**

**This page shall be replaced with the LACFCD Construction Permit once received (LACFCD provided sample via email on February 18, 2021)**

FACILITY MODIFICATION AGREEMENT  
NO. MOA2018000279  
FACILITY NAME: Centinela Creek  
FLOOD PERMIT NO. FCDP2018000279  
PARCEL NO.: 4220-003-903; 4220-003-904  
408 PERMIT NO. 408-SPL-2019-0028

**AGREEMENT RE MODIFICATION OF FLOOD CONTROL FACILITY**

This Agreement is entered into by and between the  
  
LOS ANGELES COUNTY FLOOD CONTROL DISTRICT,  
a body corporate and politic,  
  
herein referred to as "DISTRICT"  
  
and  
  
CITY OF CULVER CITY,

herein referred to as "PERMITTEE"

RECITALS

DISTRICT operates a flood control facility, known as Centinela Creek ("FACILITY"), located in City of Culver City, State of California; and

The FACILITY was constructed by the Federal Government and is subject to the provisions of 33 U.S.C. Section 408; and

PERMITTEE proposes to make certain modifications to the FACILITY that require prior approval from the Federal Government, pursuant to 33 U.S.C. Section 408; and

DISTRICT, as the non-Federal sponsor of the FACILITY, has obtained, on behalf of PERMITTEE, a permit under 33 U.S.C. Section 408 ("408 PERMIT") from the U.S. Army Corps of Engineers ("CORPS"), to implement PERMITTEE's proposed modifications to the FACILITY; and

The 408 PERMIT No. 408-SPL-2019-028 is attached hereto as Exhibit 1; and

The 408 PERMIT contains a condition under which the DISTRICT must enter into an agreement with the PERMITTEE that imposes certain requirements on the PERMITTEE, and this Agreement is intended to satisfy that 408 PERMIT condition; and

PERMITTEE has also applied for a permit from DISTRICT ("FLOOD PERMIT") to implement the PERMITTED ACTIVITY, and PERMITTEE and DISTRICT intend that the FLOOD PERMIT become operative concurrently with this Agreement; and

The FLOOD PERMIT No. FCDP2018000279 is attached hereto as Exhibit 2;

NOW, THEREFORE, in consideration of these recitals, the DISTRICT and PERMITTEE mutually agree as follows:

#### SECTION 1. Permitted Activity

- 1.1. PERMITTEE's modifications to the FACILITY, as described in and authorized by the 408 PERMIT, shall hereinafter be referred to as the "PERMITTED ACTIVITY".
- 1.2. PERMITTEE shall operate and maintain the PERMITTED ACTIVITY in a safe, clean, and orderly condition at all times, and in a manner that will not interfere with the operation or maintenance of the FACILITY by DISTRICT. PERMITTEE shall obtain a separate permit from DISTRICT prior to performing any maintenance work (including, without limitation, any repair, replacement or reconstruction) that involves entering upon or taking access to the FACILITY.
- 1.3. In the event PERMITTEE breaches PERMITTEE's obligations described in Section 1.2, or any of them, the following shall apply:
  - 1.3.1. In the event PERMITTEE fails to cure such breach within the time specified by DISTRICT in a written notice to PERMITTEE describing said breach, or within such other time period as may be agreed to by DISTRICT, DISTRICT may, in its sole discretion, take any and all actions reasonably necessary to prevent or mitigate any interference with DISTRICT's operation or maintenance of the FACILITY that may result from PERMITTEE's breach.
  - 1.3.2. Notwithstanding subsection 1.3.1, above, when immediate action is necessary to prevent injury to persons or damage to property or the environment caused by PERMITTEE's breach, DISTRICT may, in its sole discretion, take such immediate action without prior notice to PERMITTEE; provided, however, that DISTRICT shall provide notice to PERMITTEE as soon thereafter as is reasonably practical.
  - 1.3.3. If DISTRICT takes action(s) under subsections 1.3.1 or 1.3.2, above, DISTRICT shall submit a billing invoice to PERMITTEE indicating the costs and expenses reasonably incurred by DISTRICT in connection with said action(s) and PERMITTEE shall

reimburse DISTRICT all such costs and expenses within thirty (30) days of the billing invoice.

- 1.4. PERMITTEE acknowledges that the acquisition of any permits or other approvals for the operation and maintenance of the PERMITTED ACTIVITY required by other affected public agencies, and the consent of any affected owners or easement holder(s) other than the DISTRICT, are the responsibility of the PERMITTEE.
- 1.5. If PERMITTEE proposes to change the scope of the PERMITTED ACTIVITY from the approved plans and specifications upon which the 408 PERMIT and the FLOOD PERMIT were issued, PERMITTEE shall submit revised plans and specifications with the respective permit numbers and proposed revisions clearly identified, to DISTRICT. DISTRICT shall review the proposed revisions for conformance with DISTRICT's criteria and shall also request approval of the proposed revisions from the CORPS. If the proposed revisions are approved by both DISTRICT and the CORPS, DISTRICT shall provide written notice of the approval to PERMITTEE. PERMITTEE shall not implement any of the proposed revisions until it has received written approval from DISTRICT; however, any work or activity associated with the PERMITTED ACTIVITY that does not pertain to the proposed revisions may continue while the proposed revisions are being reviewed by DISTRICT and the CORPS, unless otherwise directed by either DISTRICT or the CORPS.
- 1.6. PERMITTEE shall allow DISTRICT and the CORPS to inspect the PERMITTED ACTIVITY at any reasonable time.
- 1.7. In the event that any property of DISTRICT becomes damaged as a result of the operation or maintenance of the PERMITTED ACTIVITY, PERMITTEE shall promptly obtain a separate permit from DISTRICT to repair or replace the damaged property, and, at PERMITTEE's sole expense, repair and/or replace the damaged property to the reasonable satisfaction of DISTRICT. Should PERMITTEE fail to do so, DISTRICT may perform such work and submit a billing invoice to PERMITTEE indicating the costs and expenses reasonably incurred by DISTRICT in connection with said work. PERMITTEE shall pay all such costs and expenses within thirty (30) days of the date of the invoice.
- 1.8. Should PERMITTEE wish to cease its operation and maintenance of the PERMITTED ACTIVITY, it shall be permitted to do so only in accordance with the provisions described in Section 2, below.
- 1.9. The provisions of this Agreement are intended to be supplemental to the FLOOD PERMIT. The provisions of the FLOOD PERMIT shall be deemed to be incorporated into this Agreement, by reference, and

PERMITTEE shall comply with all the provisions of both this Agreement and the provisions contained in the FLOOD PERMIT.

## SECTION 2. Termination of Permitted Activity

- 2.1. DISTRICT shall have the right to terminate the PERMITTED ACTIVITY in the event PERMITTEE breaches any term or condition of this Agreement and fails to cure such breach within the time specified by DISTRICT in a written notice to PERMITTEE describing said breach, or within such other time period as may be agreed to by DISTRICT.
- 2.2. PERMITTEE may terminate the PERMITTED ACTIVITY, for any reason, by giving DISTRICT at least thirty (30) days advance, written notice thereof.
- 2.3. If the PERMITTED ACTIVITY is terminated, DISTRICT may, in its sole discretion, provide to PERMITTEE a written notice to remove the PERMITTED ACTIVITY, and PERMITTEE shall remove the PERMITTED ACTIVITY and restore the FACILITY to the reasonable satisfaction of the DISTRICT, at no cost to DISTRICT, in accordance with the following:
  - 2.3.1. Prior to commencing the removal of the PERMITTED ACTIVITY, PERMITTEE shall apply for a separate permit therefor from DISTRICT. As part of DISTRICT's review of the permit application, DISTRICT shall request the CORPS to modify the 408 PERMIT to authorize the removal of the PERMITTED ACTIVITY.
  - 2.3.2. If the CORPS modifies the 408 PERMIT to authorize the removal of the PERMITTED ACTIVITY, and PERMITTEE's application is otherwise acceptable to DISTRICT, DISTRICT shall issue to PERMITTEE a permit to remove the PERMITTED ACTIVITY and restore the FACILITY. The removal/restoration permit shall include any conditions imposed by the CORPS as well as those conditions imposed by DISTRICT.
  - 2.3.3. PERMITTEE shall complete the removal of the PERMITTED ACTIVITY and all restoration of the FACILITY within the time specified in the removal/restoration permit issued by DISTRICT, or within such other time period as may be agreed to by DISTRICT.
- 2.4. If PERMITTEE fails to remove the PERMITTED ACTIVITY and restore the FACILITY in accordance with subsection 2.3, DISTRICT may, in its sole discretion, remove the PERMITTED ACTIVITY and restore the FACILITY.
- 2.5. If DISTRICT removes the PERMITTED ACTIVITY and restores the FACILITY pursuant to subsection 2.4, DISTRICT shall submit a billing invoice to PERMITTEE indicating the costs and expenses reasonably incurred by DISTRICT in connection with said removal and restoration,

and PERMITTEE shall reimburse DISTRICT all such costs and expenses within thirty (30) days of the billing invoice.

### SECTION 3. Miscellaneous Terms and Conditions

#### 3.1. Indemnification

3.1.1. PERMITTEE shall indemnify, defend, and hold DISTRICT, the County of Los Angeles (when acting on behalf of DISTRICT), and the United States, and their respective officers, employees, and agents harmless from and against any claims, demands, liability, damages, costs, and expenses, arising from or caused by the operation, maintenance, repair, rehabilitation, replacement, use or removal of the PERMITTED ACTIVITY, or any portion thereof; provided, however, that PERMITTEE's obligations to indemnify DISTRICT or the County of Los Angeles or the United States, respectively, shall not apply to any claim, demand, liability, damage, cost or expense to the extent that such claim, demand, liability, damage, cost or expense is caused by the fault or negligence of DISTRICT, or the County of Los Angeles, or the United States, respectively, or any of their respective officers, employees or agents.

3.1.2. PERMITTEE shall include DISTRICT, the County of Los Angeles and the United States within the protection of any indemnification clause contained in any ancillary contract relating to the PERMITTED ACTIVITY.

3.2. The CORPS and the DISTRICT shall not be responsible for damages to property or injuries to persons which may arise from or be incident to the construction, operation, maintenance, repair, rehabilitation, or replacement of the PERMITTED ACTIVITY, or for damages to the Federal Project. PERMITTEE shall hold the CORPS and the DISTRICT harmless from any and all such claims except to the extent caused by the fault or negligence of the CORPS, the DISTRICT or its contractors.

3.3. PERMITTEE acknowledges and agrees that the issuance of the FLOOD PERMIT and the 408 PERMIT does not excuse or exempt PERMITTEE's compliance with any federal, state or local law or regulation that is otherwise applicable to the operation or maintenance of the PERMITTED ACTIVITY.

3.4. PERMITTEE shall maintain the PERMITTED ACTIVITY in good condition and in conformance with the terms and conditions of the 408 PERMIT. PERMITTEE shall not be relieved of this requirement even if the Section 408 Activity is abandoned. Should PERMITTEE wish to cease to maintain the 408 Activity or desire to abandon it, PERMITTEE shall request the



DISTRICT to obtain from the Corps a modification of 408 PERMIT, which may require additional construction activities to abandon the facility.

- 3.5. If previously unknown historic or archeological remains are discovered in carrying out the Permitted Activity, PERMITTEE shall cease activity, protect the site, and immediately notify the DISTRICT and the CORPS. The CORPS will initiate Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.
- 3.6. If the scope of the Permitted Activity changes from the approved plans and specifications upon which this Permit is based, PERMITTEE shall request the DISTRICT to resubmit the permit application with the permit number and revisions clearly identified. Work associated with the Permitted Activity that does not pertain to the revised portion of the project, may continue while the revisions are being reviewed unless the CORPS indicates otherwise. If the CORPS determines that changes in scope or details have an impact outside approved alteration area, a new 408 permit application will be required.
- 3.7. PERMITTEE shall keep the DISTRICT and the CORPS' Permission Coordinator apprised of the anticipated start and completion dates of construction of the Permitted Activity.
- 3.8. PERMITTEE shall notify the DISTRICT and the CORPS of the start date for construction and a copy of the construction schedule at least one (1) week prior to starting. Construction activities shall not impair the DISTRICT and the CORPS access to perform maintenance services, inspections, and patrolling activities. An invitation shall be sent to the DISTRICT and the CORPS for any kick-off meetings and final walk-through, as applicable.
- 3.9. PERMITTEE shall allow the DISTRICT and CORPS representatives to inspect the Permitted Activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of this Permit.
- 3.10. PERMITTEE shall oversee the conduct of the work and ensure the Permitted Activity is being constructed in accordance with the plans and specifications approved by the CORPS.
- 3.11. Upon completion of construction of the Permitted Activity, PERMITTEE shall submit electronic copies of the as-built plans of the Permitted Activity to the DISTRICT and the CORPS, which are signed by the PERMITTEE's engineer of record. Electronic copies of the as-built plans shall be

submitted in .pdf format. As-built plans must be provided within 180 days of construction completion.

- 3.12. Operations and Maintenance (O&M) Manual Updates. PERMITTEE must provide the DISTRICT and the CORPS with the Final updated O&M Manual within 180 days after completion of the Permitted Activity. Any changes to the USACE Project O&M Manual must be noted. Final updated O&M Manual must have an enclosed excerpt of the USACE Project O&M Manual with changes noted.
- 3.13. Work shall not begin in waters of the United States until PERMITTEE first obtains a separate, additional Department of the Army permit for activities which involve the discharge of dredge or fill material or the placement of fixed structures in the waters of the United States, pursuant to the provisions of Section 10 of the Rivers and Harbors Act (33 USC 403), and Section 404 of the Clean Water Act (33 USC 1344).
- 3.14. Should construction activities fail to commence within two (2) years after the effective date of this permission, this permission shall be immediately revoked.
- 3.15. Except as to fuels, lubricants and products associated with motorized vehicles, equipment, gardening or maintenance-related substances, or all of the above, PERMITTEE shall not cause or allow the presence, use, storage, or disposal of any hazardous substances on or about the FACILITY without the prior written consent of DISTRICT which consent shall not be unreasonably denied. In the event of spillage, leakage or escape of any hazardous substance onto the FACILITY, PERMITTEE shall immediately notify DISTRICT by calling (800) 675-4357. If the spillage, leakage or escape was caused by PERMITTEE, PERMITTEE shall promptly remove any such substance from the PREMISES to DISTRICT's satisfaction. In addition to removing any of PERMITTEE's hazardous substances, PERMITTEE shall be liable for and reimburse DISTRICT for any and all cost and expenses that DISTRICT may incur or suffer as a result thereof. Such responsibility shall include cost or expenses as DISTRICT may incur by reason of Federal, State, local or other authoritative agency's laws and regulations. Notwithstanding the foregoing, PERMITTEE shall have no responsibility regarding any spill, leak or escape to the extent caused by any of DISTRICT's tenants, licensees or easement holders.
- 3.16. PERMITTEE and DISTRICT shall have no financial obligation to each other under this Agreement, except as herein expressly provided.
- 3.17. Any notice to be given or document to be delivered by DISTRICT or PERMITTEE to the other party may be delivered in person to either party

or by private courier or may be deposited in the United States mail, with postage prepaid and addressed to the party for whom intended as follows:

To DISTRICT:

Los Angeles County Flood Control District  
Attention: Land Development Division - Permits  
P.O. Box 1460  
900 South Fremont Avenue, Alhambra, CA 91802-1460  
tel.: (626) 458-3129  
for Emergencies, contact (626) 458-HELP (4357)

To PERMITTEE:

City of Culver City  
Attention: Kim Braun  
9505 W Jefferson Blvd.  
Culver City, CA 90232  
tel.: (310) 253-6421

- 3.18. PERMITTEE represents and warrants that it has the authority to enter into this Agreement on behalf of itself and its successors and assigns, and this Agreement shall be binding upon Permittee's successors and assignees, as well as Permittee.

#### SECTION 4. Special Conditions

- 4.1. PERMITTEE shall provide USACE-SPL Reservoir Regulation Section with a completed Site Access Coordination Form if construction will take place within or downstream of any the USACE Flood Control Basin. The Site Access Coordination form is found here: [<http://www.spl.usace.army.mil/Missions/CivilWorks/ReservoirRegulation.aspx>, under 'Contact Us' see LAD Site Access Form']. PERMITTEE shall provide a Point of Contact (POC) so that the Reservoir Regulation Section can be in contact with the POC regarding project information and coordination of reservoir operations. The POC shall use all reasonable efforts to contact USACE-SPL's Reservoir Operation Center (ROC) by calling (213) 452-3623 at least two (2) business days prior to commencement of approved modification/alteration.
- 4.2 PERMITTEE's construction schedule must adhere to USACE-SPL Hydrology and Hydraulics (HH) Policy titled Channel Improvement Limitations for Permits, dated April 2008, provided at: <https://www.spl.usace.army.mil/Missions/Section-408-Permits/>
- 4.3. PERMITTEE must implement Best Management Practices (BMPs) as necessary to reduce air quality impacts from fugitive dust and/or particulate matter, including road watering, if PERMITTED ACTIVITY

generates wind speed in excess of 20 mph.

- 4.4. PERMITTEE must implement BMPs as necessary to ensure PERMITTED ACTIVITY does not adversely affect water quality, per federal, state and local hazardous waste ordinances.
  
- 4.5 PERMITTEE shall ensure a qualified archaeological monitor is present during all ground-disturbing activities associated with the authorized activities. The monitor shall have the authority to halt project activities to ensure adverse effects to historic properties are avoided. The qualified archaeologist, in coordination with the CORPS, may reduce or discontinue monitoring if it is determined that the possibility of encountering buried archaeological deposits is low based on observations of soil stratigraphy or other factors.

Nothing in this Permission shall be construed as abrogating or otherwise diminishing the responsibility of the Requester to hold and save the Government free from all damages arising from construction, operation, maintenance, repair, rehabilitation, or replacement of the Federal Project and any alterations or modifications, including any alteration or modification approved herein, except to the extent caused by the fault or negligence of the United States or its contractors.

The parties hereto have caused this Agreement to be executed by and through their respective and duly authorized representatives on the day and year indicated below.

PERMITTEE: City of Culver City

By:\_\_\_\_\_ Date:\_\_\_\_\_

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT, a body corporate and politic

By:\_\_\_\_\_ Date:\_\_\_\_\_

AGREEMENT No. \_\_\_\_\_  
CENTINELA CREEK CHANNEL  
AIN 4220003902, 4220003903  
SECOND DISTRICT

### **USE AND MAINTENANCE AGREEMENT**

This USE AND MAINTENANCE AGREEMENT (hereinafter referred to as AGREEMENT), is made and entered by and between the Los Angeles County Flood Control District, a body corporate and politic (hereinafter referred to as DISTRICT), and City of Culver City, a municipal corporation (hereinafter referred to as CITY). DISTRICT and CITY are collectively referred to as PARTIES.

### **RECITALS**

WHEREAS, CITY proposes to construct the Mesmer Low Flow Diversion Project, PR-005 (hereinafter referred to as PROJECT); to treat and reuse dry weather flows to enhance water quality;

WHEREAS, DISTRICT owns and operates a Channel known as Centinela Creek Channel, and associated right of way, hereinafter collectively referred to as DISTRICT FACILITIES;

WHEREAS, the following portions of the PROJECT (hereinafter referred to as IMPROVEMENTS), depicted in Exhibit A, are proposed to be located within DISTRICT FACILITIES:

- A diversion berm in Centinela Creek Channel, Station 132+18.08 to 132+27.72
- A grate inlet in Centinela Creek Channel, Station 132+25.75
- A 20" steel casing with 12" PVC SDR35 pipe in Centinela Creek Channel, from inlet to pump station, Station 132+25.75 to 132+17.96
- A pump station in Centinela Creek access road, Station 132+00.20 to 132+22.24

WHEREAS, the DISTRICT will issue permit number FCDP2018000279, (hereinafter referred to as PERMIT), upon execution of this AGREEMENT to the CITY for construction of the IMPROVEMENTS;

NOW, THEREFORE, in consideration of the foregoing recitals, the mutual agreements contained herein, and for other good and valuable consideration, the receipt of which is hereby acknowledged, the PARTIES agree as follows:

## SECTION 1: Authorized Use

- 1.1. The CITY is authorized and permitted to use the DISTRICT FACILITIES for the construction, operation, maintenance, and repair of the IMPROVEMENTS in accordance with the terms and conditions of this AGREEMENT and PERMIT. Any other use of the DISTRICT FACILITIES or any portion thereof by the CITY is expressly prohibited.
- 1.2. The CITY is authorized and permitted to take access through the DISTRICT FACILITIES and associated DISTRICT property in accordance with and as depicted in Exhibit B, for the purpose of construction and maintenance of the IMPROVEMENTS;
- 1.3. The CITY's use of the DISTRICT FACILITIES in connection with the PROJECT shall be nonexclusive and shall be subordinate to the uses of the DISTRICT FACILITIES by the DISTRICT, and the CITY's use of the DISTRICT FACILITIES shall at no time interfere with the DISTRICT's use of the DISTRICT FACILITIES or the DISTRICT's use of its adjacent property.
- 1.4. This AGREEMENT is valid only to the extent of the DISTRICT's jurisdiction. The CITY shall be responsible for the acquisition of permits required by other affected agencies or agencies with regulatory jurisdiction over the PROJECT, and the consent of any underlying fee owners, as applicable, hereinafter collectively referred to as THIRD-PARTY APPROVALS. The CITY shall be responsible for all costs associated with obtaining and complying with the requirements and conditions of all THIRD-PARTY APPROVALS, including, by way of example, permit fees and compensatory mitigation expenses.

## SECTION 2: Construction and Implementation of PROJECT

- 2.1. The CITY understands and acknowledges that it is required to comply with the California Environmental Quality Act (hereinafter referred to as CEQA) prior to implementing the PROJECT and that the CITY shall be the lead agency with respect to any and all CEQA compliance related to the PROJECT. In addition to its other indemnification obligations as specified below, the CITY hereby agrees to indemnify, defend, and hold harmless the DISTRICT and their elected and appointed officers, employees, and agents from and against any and all claims and/or actions related to the PROJECT

that may be asserted by a third party or public agency alleging violations of CEQA or the CEQA Guidelines.

- 2.2. Upon completion of the construction of the PROJECT, the CITY shall provide to the DISTRICT a complete set of the as-built plans for the PROJECT in an electronic format. In addition, the CITY shall provide shapefiles for all maps depicting the PROJECT.

### SECTION 3: Operation and Maintenance of IMPROVEMENTS

- 3.1. The CITY shall prepare an operation and maintenance manual (hereinafter referred to as O&M MANUAL) describing the operation, maintenance, and inspection practices, required regulatory permits, procedures and standards for the PROJECT components located on property of the DISTRICT, including maintenance schedules, identification of any specialty maintenance service providers, equipment usage, and a maintenance log sheet.
  - 3.1.1. The CITY shall not commence any work authorized by this permit until it has submitted a draft of the O&M MANUAL to the DISTRICT and the DISTRICT has approved the draft.
  - 3.1.2. The DISTRICT shall provide the CITY with comments on the draft O&M MANUAL within forty-five (45) days of submittal.
  - 3.1.3. The CITY shall incorporate any and all reasonable comments submitted by the DISTRICT and shall deliver a final version of the O&M MANUAL to the DISTRICT prior to completion of work authorized by this permit. If the PARTIES cannot agree as to whether the DISTRICT's comments shall be incorporated, the PARTIES shall meet and confer in good faith to resolve such disagreement.
  - 3.1.4. The work authorized by this permit shall not be deemed complete until the CITY has delivered the final version of the O&M MANUAL to the DISTRICT as described above.
- 3.2. Discharges from the PROJECT shall comply with the following:
  - 3.2.1 The CITY shall not discharge any non-stormwater from the PROJECT to the DISTRICT FACILITIES or to any other storm drain owned or operated by the DISTRICT unless authorized by a permit to do so from the State Water Resources Control Board, the Los

Angeles Regional Water Quality Control Board (Regional Board), or express written permission from the Executive Officer of the Regional Board. The CITY shall provide a copy of any such permit or express written permission to the DISTRICT prior to discharging any non-stormwater from the PROJECT to the DISTRICT FACILITIES or to any other storm drains owned or operated by the DISTRICT.

3.2.2 The DISTRICT shall establish notification and monitoring requirements for discharges from the PROJECT to the DISTRICT FACILITIES or to any other storm drains owned or operated by the DISTRICT and shall notify CITY of these requirements in writing not later than the date DISTRICT provides the CITY with comments on the draft O&M MANUAL and the CITY shall comply with the requirements described in the written notice from the DISTRICT.

3.2.3. The DISTRICT may periodically update or revise the notification and monitoring requirements described in subsection 3.2.2 as the DISTRICT deems necessary to address changes in its MS4 Permit or other regulatory requirements or its operational requirements. The DISTRICT shall provide written notice to the CITY of any updated or revised requirements and the CITY shall comply with the updated or revised requirements immediately upon receipt of the written notice from the DISTRICT.

3.3. The CITY shall, upon completion of construction, be responsible for the operation, maintenance, and repair of the IMPROVEMENTS in accordance with the terms and conditions of this AGREEMENT and the provisions of the O&M MANUAL.

3.4. The DISTRICT shall not be responsible for any costs associated with the operation and maintenance of the IMPROVEMENTS, including but not limited to, any costs related to repairs and/or replacement of components and obtaining, complying with and renewing as necessary all required regulatory permits.

3.5. The CITY shall operate and maintain the IMPROVEMENTS in a safe, clean, and orderly condition, and in compliance with the O&M MANUAL and all applicable Federal and State laws, local ordinances (including the Los Angeles County Flood Control District Code) and applicable regulatory permits.

3.6. The CITY shall be responsible to inspect the IMPROVEMENTS and clear any obstructions, sediment, or debris that may interfere with the proper functioning of the DISTRICT FACILITIES, including upstream and



downstream of all connections to the DISTRICT FACILITIES (100 feet for open channels and 50 feet for covered storm drains, from ends of connections in both directions). The CITY shall take appropriate measures to make sure sediment does not enter the DISTRICT FACILITIES from the PROJECT.

- 3.7. The CITY shall provide the DISTRICT with 24-hour contact information for person(s) responsible for the operation and maintenance activities related to the IMPROVEMENTS. The DISTRICT shall provide the CITY with 24-hour contact information for person(s) responsible for maintaining the DISTRICT FACILITIES.
- 3.8. The CITY shall coordinate and communicate with the DISTRICT in regard to operation, maintenance, and repair activities related to the IMPROVEMENTS.
  - 3.8.1. The CITY shall notify the DISTRICT a minimum of thirty (30) days in advance of any major (nonroutine) proposed maintenance activities related to the IMPROVEMENTS; provided, however, that in the event the CITY becomes aware of the need to perform any such maintenance activities less than thirty (30) days from the date it proposes to perform said activities, it shall notify the DISTRICT immediately upon determining to perform the activities.
  - 3.8.2. The CITY shall notify the DISTRICT a minimum of forty-eight (48) hours in advance of accessing the DISTRICT FACILITIES to perform any routine maintenance activities related to the IMPROVEMENTS including trash removal, routine cleaning, and minor repairs.
  - 3.8.3. The CITY shall provide the DISTRICT with an annual summary report of its operations and maintenance of the IMPROVEMENTS and status of all related regulatory permits. The contents of the summary report shall include at a minimum the following information:
    - a. Name of PROJECT;
    - b. Location description;
    - c. Project contact information;
    - d. Description of the PROJECT and its function and direct impact to the DISTRICT FACILITIES and/or other DISTRICT right of way;

- e. Summary of operations within the reporting year, from July 1st to June 30th of the following year, type of activities (i.e. routine, nonroutine, and emergency), date and time of activities, and description of work performed;
- f. Summary of major repairs completed, including but not limited to, type of repairs, location of repairs, pre- and post-repair photographs, date and time of repairs;
- g. Summary of public inquiries and complaints related to the PROJECT and the CITY'S response;
- h. Summary of volume captured or discharged from PROJECT;
- i. Status of any regulatory permits affecting the operation or maintenance of the IMPROVEMENTS;
- j. Status of any specialty contractor agreements required for ongoing maintenance and repairs of the IMPROVEMENTS;

3.8.4. The annual summary report shall be mailed to the following address by July 30<sup>th</sup> each year:

Attention: Area Engineer  
 Los Angeles County Flood Control District  
 Los Angeles County Public Works  
 Stormwater Maintenance Division – Imperial Yard  
 5525 East Imperial Highway  
 South Gate, CA 90280

- 3.9. The DISTRICT shall coordinate and communicate with the CITY regarding any maintenance activities by the DISTRICT related to the DISTRICT FACILITIES that may impact the IMPROVEMENTS.
- 3.10. If the CITY fails to perform any maintenance activities as provided for in this AGREEMENT in a timely manner, the DISTRICT reserves the right to remedy any such maintenance deficiency that the DISTRICT determines impairs the functioning of the DISTRICT FACILITIES or the DISTRICT's flood protection activities. However, prior to taking any action to remedy any such maintenance deficiency, the DISTRICT shall provide written notice to the CITY of the deficiency. If the CITY fails to correct the deficiency within thirty-five (35) days from the date of the notice or such longer period as the DISTRICT, in its sole discretion may agree to, the DISTRICT shall thereafter be entitled to correct the deficiency. Notwithstanding the foregoing, if the DISTRICT determines that immediate remedial action is required to prevent or mitigate a dangerous condition, the DISTRICT shall be entitled to implement the remedial action(s) after giving the CITY as

much notice as the DISTRICT determines is feasible under the circumstances. If the DISTRICT takes any remedial action pursuant to this Section, it shall prepare and send to the CITY an invoice for all work undertaken by the DISTRICT to remedy any maintenance deficiency, and the CITY shall, within thirty (30) days from the receipt of the invoice, reimburse the DISTRICT for all costs and expenses reasonably incurred by the DISTRICT to remedy said deficiency.

- 3.11. The CITY shall be responsible for all community relations related to the PROJECT, including responding to public inquiries, complaints, etc. The DISTRICT shall forward to the CITY any community relations, public inquiries, complaints, etc., related to the PROJECT.

#### SECTION 4: Term

- 4.1. The term of this AGREEMENT shall be for fifty (50) years (Initial Term), subject to the DISTRICT's right to terminate the CITY'S use as provided for in Section 5 in this AGREEMENT.
- 4.2. This AGREEMENT shall expire at the end of the Initial Term provided; however, the Chief Engineer of the DISTRICT or his designee may extend the term of this AGREEMENT, beyond the Initial Term, up to ten (10) years, subject to such terms and conditions as they deem appropriate, upon receipt of a written request from the CITY, no earlier than twelve (12) months or later than six (6) months prior to the end of the Initial Term.

#### SECTION 5: Termination of AGREEMENT

- 5.1. The DISTRICT shall have the right to terminate this AGREEMENT by giving the CITY at least one hundred twenty (120) days prior written notice, under the following conditions:
  - 5.1.1. The DISTRICT proposes a project for flood control, water conservation and/or any other use or purpose authorized by the Los Angeles County Flood Control Act; and
  - 5.1.2. The DISTRICT determines, in good faith, that the IMPROVEMENTS or any portion thereof, would be substantially incompatible with the DISTRICT's proposed project; and
  - 5.1.3. The DISTRICT has notified the CITY of the basis for the DISTRICT'S determination that a substantial incompatibility will exist and has provided the CITY with a reasonable opportunity to propose

modifications to the IMPROVEMENTS that will eliminate the incompatibility; and

- 5.1.4. After consideration of any such modifications proposed by the CITY, the DISTRICT, in its sole but reasonable discretion, determines not to incorporate any such modifications or determines that, notwithstanding any such modifications, a substantially incompatibility would still exist.
- 5.2. The DISTRICT shall have the right to terminate this AGREEMENT in the event the CITY breaches any term or condition of this AGREEMENT and fails to cure such breach or breaches within a reasonable amount of time up to a maximum of one hundred twenty (120) days from the date the DISTRICT provides written notice of said breach or breaches to the CITY. Upon receipt of a written notice of breach, the CITY shall, within thirty (30) days of the date of the written notice, send the DISTRICT a written response describing the corrective measures that the CITY proposes to implement. The PARTIES shall thereafter promptly meet and confer, in good faith, to reach agreement on the corrective measures. The CITY shall not implement any corrective measure until it has been approved and agreed upon by the DISTRICT.
- 5.3. The DISTRICT shall have the right to terminate this AGREEMENT if construction of the PROJECT has not been completed within five (5) years from the date this AGREEMENT is fully executed.
- 5.4. The DISTRICT shall have the right to suspend or terminate this AGREEMENT in the DISTRICT's sole discretion, in the event the DISTRICT determines, in good faith, that it is necessary for the DISTRICT to enter and take exclusive possession of the DISTRICT FACILITIES or any portion thereof, in order to respond to an emergency as defined in Public Contract Code Section 1102.
- 5.5. The CITY shall have the right to terminate this AGREEMENT for any reason, by giving the DISTRICT at least sixty (60) days prior written notice, subject to the CITY's obligation to remove the IMPROVEMENTS described in Section 6, below.

#### SECTION 6: Removal of IMPROVEMENTS and Restoration of the DISTRICT FACILITIES

- 6.1. Upon termination of this AGREEMENT, the DISTRICT may, in its sole discretion, provide a written notice to the CITY to remove all or any portion of the IMPROVEMENTS, and to restore the DISTRICT FACILITIES to a

condition similar to or better than that which existed on the effective date of this AGREEMENT (including sealing off all connections between PROJECT and DISTRICT FACILITIES). If the DISTRICT provides such notice, the CITY shall comply with said notice within a reasonable time, but in no event exceeding one hundred eighty (180) days from the date of the notice or such longer period as the DISTRICT may in its sole discretion agree to.

- 6.2. Prior to commencing the removal of any IMPROVEMENTS within the DISTRICT FACILITIES, the CITY shall apply for and obtain a permit for the removal activities from the County of Los Angeles Public Works, Land Development Division, Permits and Subdivisions Section, and shall also apply for and obtain any and all other necessary local, State, and Federal permits applicable to the removal of the IMPROVEMENTS.
- 6.3. If the CITY fails to comply with the DISTRICT's notice referred to in subsection 6.1, the DISTRICT may, in its sole discretion, remove any or all IMPROVEMENTS referenced in the DISTRICT's notice to the CITY.
- 6.4. If the DISTRICT removes any IMPROVEMENTS pursuant to subsection 6.3, the DISTRICT shall submit a billing invoice to the CITY indicating the costs and expenses reasonably incurred by the DISTRICT in connection with the removal of the IMPROVEMENTS and the CITY shall reimburse the DISTRICT all such costs and expenses within thirty (30) days of the CITY's receipt of a billing invoice from the DISTRICT.

## SECTION 7: Miscellaneous Provisions

- 7.1. Damage to DISTRICT FACILITIES or PROJECT
  - 7.1.1. If any components of the PROJECT are damaged by any negligent act or omission of the DISTRICT, the DISTRICT shall repair and replace those components within a reasonable time frame after discovery or notice thereof. The DISTRICT shall be responsible for all costs related to these repairs and/or replacements.
  - 7.1.2. If any components of the DISTRICT FACILITIES are damaged by any negligent act or omission of the CITY (including its consultants and contractors), the CITY shall repair and replace those components within a reasonable time frame after discovery or notice thereof. The CITY shall be responsible for all costs related to these repairs and/or replacements.
- 7.2. The DISTRICT shall not be responsible for the expense of any relocation, alteration, or modification of the PROJECT, or any portion thereof.

7.3. Indemnification, Release, and Insurance.

- 7.3.1. The CITY shall indemnify, defend, and hold harmless the DISTRICT, the County of Los Angeles, and their respective officers and employees from and against any claims, demands, liability, damages, costs and expenses, including without limitation, reasonable attorney fees and costs of litigation, arising out of or in any way connected to the construction, operation, maintenance, repair, modification, or removal of the PROJECT, or any portion thereof, except to the extent caused by the negligence or willful misconduct of the DISTRICT, the County of Los Angeles, or their respective officers, employees or contractors.
- 7.3.2. The DISTRICT shall indemnify, defend, and hold harmless the CITY and its respective officers and employees from and against any claims, demands, liability, damages, costs and expenses, including without limitation, reasonable attorney fees and costs of litigation, arising out of or in any way connected to operation and maintenance of the DISTRICT FACILITIES exclusive of the IMPROVEMENTS, or any portion thereof, except to the extent caused by the negligence or willful misconduct of the CITY or its respective officers, employees or contractors.
- 7.3.3. The CITY releases the DISTRICT and waives all rights to damages for any loss, costs, or expenses the CITY may sustain as a result of any damage to, or destruction of, the PROJECT, or any portion thereof, attributable to flood or stormwaters, or any other runoff tributary to the DISTRICT FACILITIES, except to the extent such damages are caused by the negligence or willful misconduct of the DISTRICT or its officers, employees or contractors.
- 7.3.4. Without limiting the CITY's indemnification of the DISTRICT, the CITY shall procure and/or maintain, in full force and effect during the term of this AGREEMENT, insurance policies or a program of self-insurance providing for the following coverage related to the IMPROVEMENTS:
  - 7.3.4.1. Commercial general liability and property damage coverage with a combined single limit liability in the amount of not less than two million dollars (\$2,000,000) per occurrence.
  - 7.3.4.2. Worker's Compensation coverage in such amount as will fully comply with the laws of the State of California and which

shall indemnify, insure, and provide legal defense for both the DISTRICT and the CITY against any loss, claim, or damage arising from any injuries or occupational diseases occurring to any worker employed by, or any person retained by, the CITY in the course of carrying out the work or services contemplated in this AGREEMENT.

7.3.4.3. Automobile Liability Insurance: the CITY shall procure such policy with coverage of not less than one million dollars (\$1,000,000) per accident.

7.3.4.4. The County of Los Angeles and Los Angeles County Flood Control District, its governing board, officers, agents, contractors, and employees shall be named as Additional Insureds on all policies of liability insurance. The CITY shall furnish to the DISTRICT a Policy of Insurance evidencing the CITY'S insurance coverage no later than ten (10) working days after execution of the AGREEMENT. Upon renewal of said policy, the CITY shall furnish to the DISTRICT a Certificate evidencing the CITY's continued insurance coverage as required herein.

7.3.4.5. Should the CITY elect to comply with this section through a program of self-insurance, CITY shall provide a Certificate of Self-Insurance to DISTRICT indicating limits of such self-insurance coverage that meet or exceed those stated herein.

7.4. Relationship of Parties. The Parties are and shall remain at all times as to each other wholly independent entities. No Party to this AGREEMENT shall have power to incur any debt, obligation, or liability on behalf of another Party unless expressly provided to the contrary by this AGREEMENT. No employee, agent, or officer of a Party shall be deemed for any purpose whatsoever to be an agent, employee or officer of another Party.

7.5. Binding Effect. This AGREEMENT shall be binding upon, and shall be to the benefit of the respective successors, heirs, and assigns of each Party; provided, however, no Party may assign its respective rights or obligations under this AGREEMENT without prior written consent of the other Party.

- 7.6. Amendment. The terms and provisions of this AGREEMENT may not be amended, modified or waived, except by an instrument in writing signed by all the Parties.
- 7.7. Waiver. Waiver by any Party to this AGREEMENT of any term, condition, or covenant of this AGREEMENT shall not constitute a waiver of any other term, condition, or covenant. Waiver by any Party to any breach of the provisions of this AGREEMENT shall not constitute a waiver of any other provision, nor a waiver of any subsequent breach or violation of any provision of this AGREEMENT.
- 7.8. Governing Law. This AGREEMENT is made under and will be governed by the laws of the State of California. In the event of litigation between the Parties, venue in the state trial court shall lie exclusively in the County of Los Angeles.
- 7.9. No Presumption in Drafting. All Parties have been represented by legal counsel in the preparation and negotiation of this AGREEMENT. Accordingly, this AGREEMENT shall be construed according to its fair language.
- 7.10. Severability. The provisions of this AGREEMENT are severable, and the invalidity, illegality or unenforceability of any provision of this AGREEMENT will not affect the validity or enforceability of any other provisions. If any provision of this AGREEMENT is found to be invalid, illegal, or unenforceable, the Parties shall endeavor to modify that clause in a manner which gives effect to the intent of the Parties in entering into this AGREEMENT.
- 7.11. Counterparts. This AGREEMENT may be executed in counterparts, which together shall constitute the same and entire Agreement.
- 7.12. Administration. Each of the persons signing below on behalf of a Party represents and warrants that they are authorized to sign this AGREEMENT on behalf of such Party.
- 7.13. Notices

Any correspondence, communication, or contact concerning this AGREEMENT, and all notices that are to be given or that may be given by PARTIES shall be directed to the following:

Los Angeles County Flood Control District  
Los Angeles County Public Works



Stormwater Planning Division, 11th Floor  
900 South Fremont Avenue  
Alhambra, CA 91803-1331  
Attention: Assistant Deputy Director  
Phone No.: (626) 458-4300  
Fax: (626) 458-1526

Los Angeles County Flood Control District  
Los Angeles County Public Works  
Stormwater Maintenance Division, Annex Building Second Floor  
900 South Fremont Avenue  
Alhambra, CA 91803-1331  
Attention: Assistant Deputy Director  
Phone No.: (626) 458-4145  
Fax No.: (626) 458-4165

City of Culver City  
Public Works Department  
9770 Culver Boulevard  
Culver City, CA 90232  
Attention: Public Works Director/City Engineer  
Phone No.: (310) 253-5635

The PARTIES shall promptly notify each other of any change of the contact information specified in this Section, including personnel changes.

IN WITNESS WHEREOF, DISTRICT and CITY have caused this AGREEMENT to be executed by their respective duly authorized officers, by DISTRICT on November 25, 2020; by CITY on \_\_\_\_\_, 2020.

LOS ANGELES COUNTY  
FLOOD CONTROL DISTRICT,  
A body corporate and politic

By \_\_\_\_\_



Chief Engineer

APPROVED AS TO FORM:

MARY C. WICKHAM  
County Counsel

By \_\_\_\_\_



Deputy

CITY OF CULVER CITY.

By \_\_\_\_\_

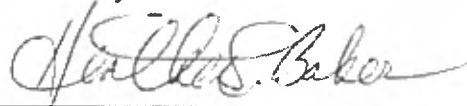


John Nachbar, City Manager

APPROVED AS TO FORM:

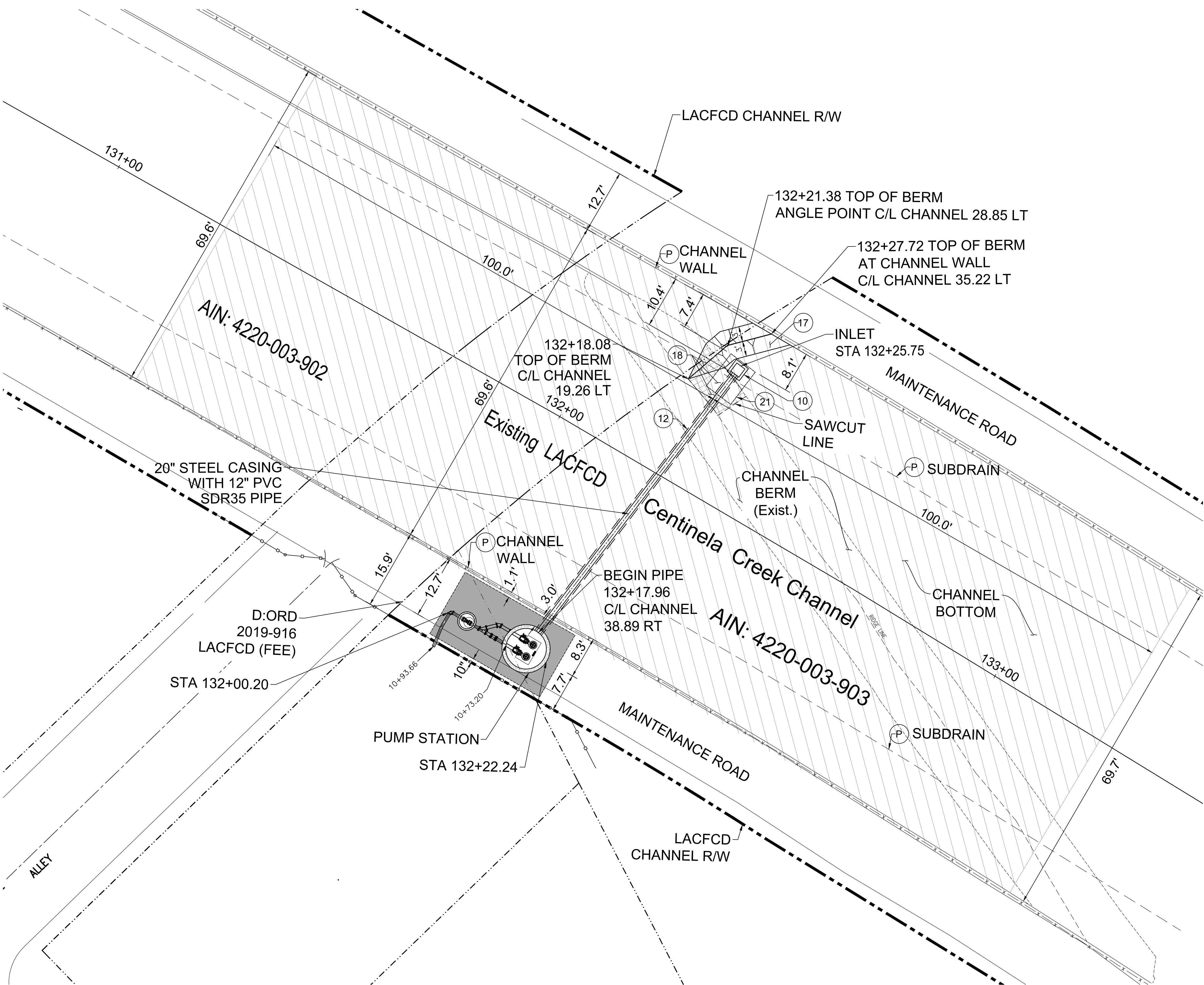
CAROL SCHWAB  
City Attorney

By \_\_\_\_\_



Heather Baker, Assistant City Attorney

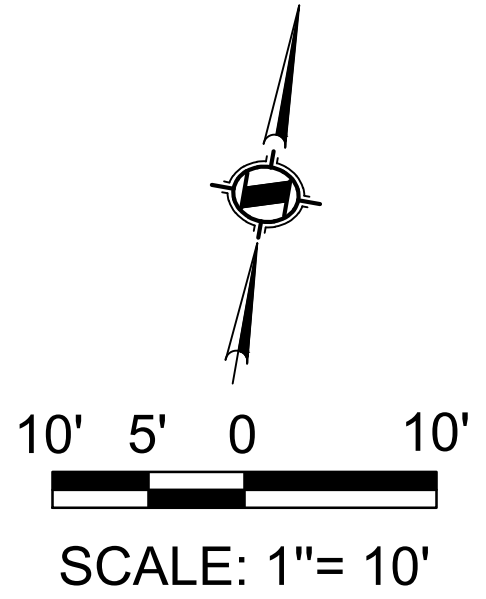
EXHIBIT A



- CONSTRUCTION NOTES:
- (P) — PROTECT IN PLACE.
  - (10) — CONSTRUCT CAST IN PLACE 24"x24" GRATED INLET WITH 5' DROP PER MODIFIED SPPWC STD. PLAN 304-3
  - (12) — JACK AND BORE 20" STEEL CASING (0.250") WITH 12" PVC SDR35 PIPE.
  - (17) — CONSTRUCT CONCRETE DIVERSION BERM.
  - (18) — REMOVE AND RECONSTRUCT PORTION OF EXISTING CONCRETE DIVERSION BERM WITH DOWELS.
  - (21) — SAWCUT AND REMOVE EXISTING INVERT SLAB AND PORTION OF BERM.

\* NEW PROJECT CONSTRUCTION SHALL CONFORM TO LOS ANGELES COUNTY PUBLIC WORKS STANDARD PLANS, SPPWC, AND LACDPW ADDITIONS AND AMENDMENTS TO THE SPPWC.

- LEGEND:
- CONCRETE BERM RECONSTRUCTION
  - PAVEMENT RECONSTRUCTION
  - CITY LIMITS OF MAINTENANCE
  - LACFCD R/W
  - EXISTING CHAIN LINK FENCE
  - WROUGHT IRON FENCE
  - PROPERTY LINE



CITY OF CULVER CITY  
PUBLIC WORKS DEPARTMENT

MESMER LOW FLOW DIVERSION PROJECT, PR-005

EXHIBIT A

APPROVED BY: LEE TORRES, P.E.  
SENIOR CIVIL ENGINEER

SHEET  
C-01  
Sheet 1 Of 1 Sheets

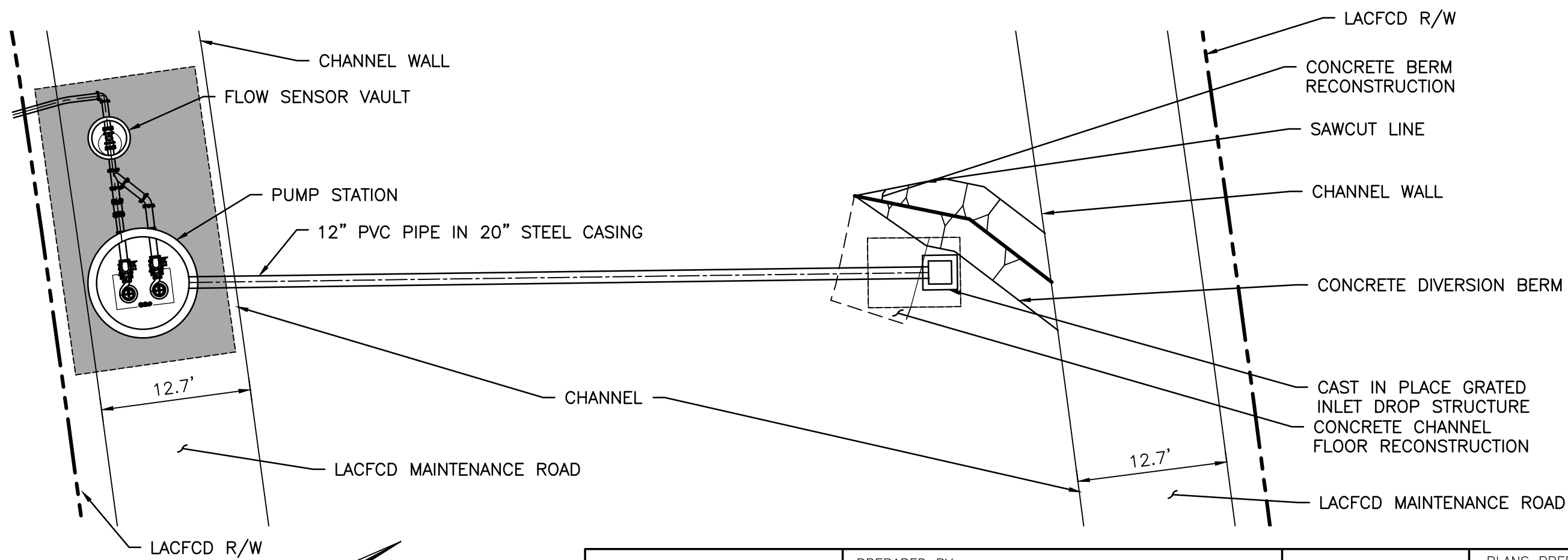
**DIGALERT**  
DIAL BEFORE YOU DIG  
CALL 800-487-2277  
A PUBLIC SERVICE BY UNDERGROUND SERVICE ALERT

PREPARED BY  
**CWE**  
1561 E. ORANGETHORPE AVE.  
SUITE 240  
FULLERTON, CA 92831  
TEL (714) 526-7500  
www.cwecorp.com

PLANS PREPARED UNDER THE SUPERVISION OF:		△					
Project Number: PR- 005		△					
Drawing No.		△					
NO.			REVISION	BY	APPR.	DATE	

Drawing Name: Z:\18271\08 Tables\01 Design\Exhibit A\Exhibit A.dwg  
Last Opened: Jan 13, 2020 - 12:28pm by Italegano





**LEGEND**

LACFCD MAINTENANCE ROAD

ACCESS ROUTE

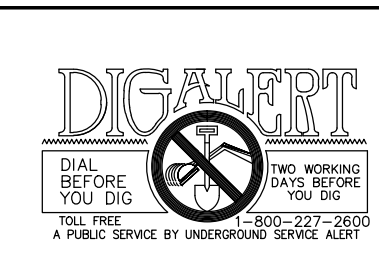
LACFCD RIGHT OF WAY

150' 50' 0 150'

SCALE: 1" = 150'

**PROPOSED IMPROVEMENTS**

SCALE: 1"=20'



PREPARED BY

1561 E. ORANGETHORPE AVE.  
SUITE 240  
FULLERTON, CA 92831  
TEL (714) 526-7500  
www.cwecorp.com

PLANS PREPARED UNDER THE SUPERVISION OF:	
Project Number: PR- 005	
Drawing No.	

NO.	REVISION	BY	APPR.	DATE

CITY OF CULVER CITY PUBLIC WORKS DEPARTMENT	
MESMER LOW FLOW DIVERSION PROJECT, PR-005	
EXHIBIT B	
APPROVED BY: LEE TORRES, P.E.	SHEET C-01
SENIOR CIVIL ENGINEER	Sheet 1 Of 1 Sheets

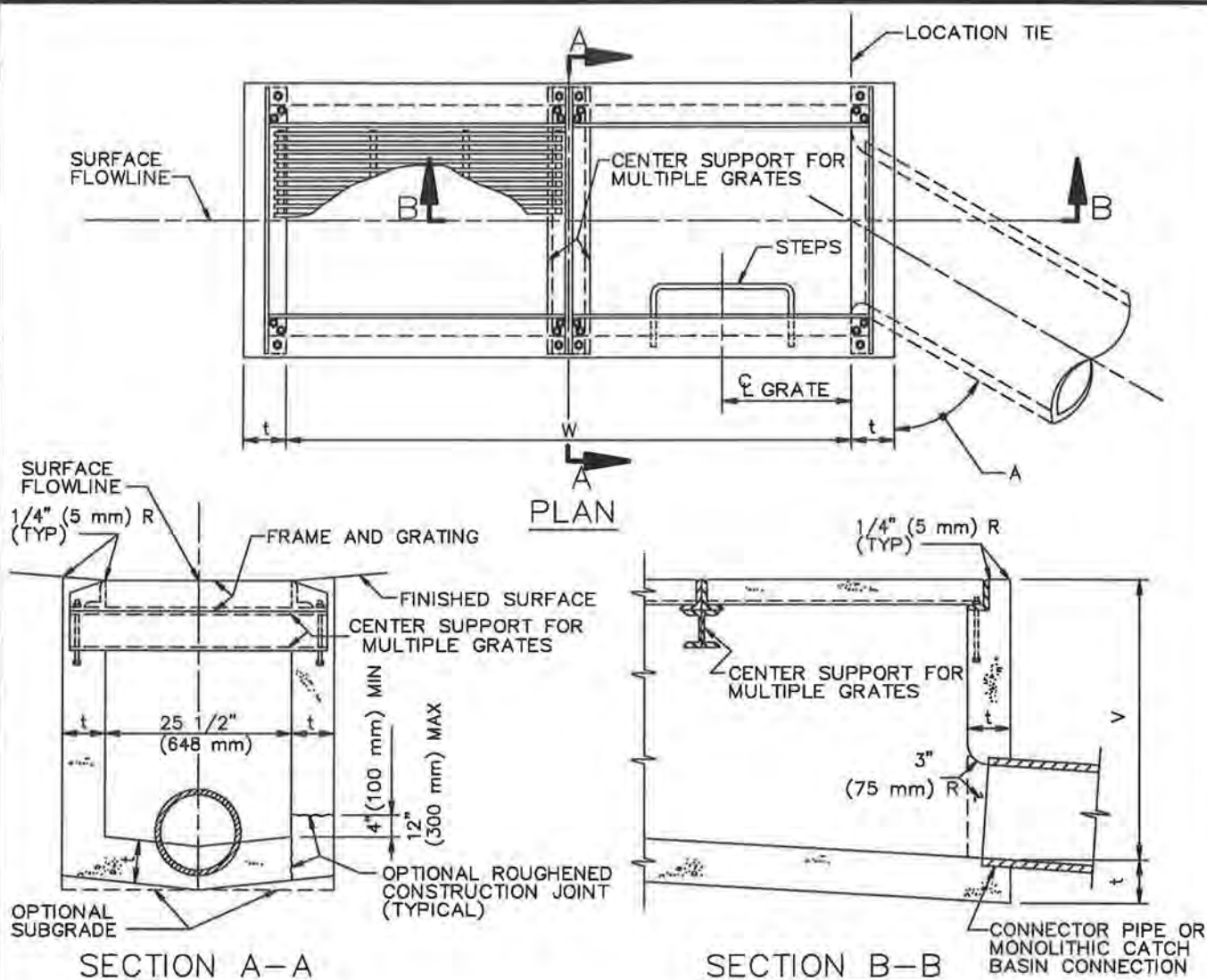
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**APPENDIX II**

**STANDARD PLANS**

## **SPPWC STANDARD PLANS**





STRUCTURAL DATA			
WALL AND SLAB DIMENSIONS AND REINFORCEMENT REQUIREMENTS			
NO. OF GRATES	MAX V	t	REINFORCEMENT FOR WALLS AND SLABS
1-2	4' (1.2 m)	6" (150 mm)	NOT REQUIRED
1-2	8' (2.4 m)	8" (200 mm)	
1-2	10' (3.0 m)	10" (250 mm)	
1-2	12' (3.5 m)	10" (250 mm)	REQUIRED
3-4	4' (1.2 m)	6" (150 mm)	NOT REQUIRED
3-4	7' (2.0 m)	8" (200 mm)	
3-4	8' (2.4 m)	8" (200 mm)	
3-4	12' (3.5 m)	10" (250 mm)	REQUIRED
5-6	4' (1.2 m)	6" (150 mm)	NOT REQUIRED
5-6	6' (1.8 m)	8" (200 mm)	
5-6	8' (2.4 m)	8" (200 mm)	
5-6	12' (3.5 m)	10" (250 mm)	REQUIRED
> 6	4' (1.2 m)	6" (150 mm)	
> 6	8' (2.4 m)	8" (200 mm)	
> 6	12' (3.5 m)	10" (250 mm)	

# STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE  
PUBLIC WORKS STANDARDS, INC.,  
GREENBOOK COMMITTEE  
1984  
REV. 1992, 1996, 2009

## GRATING CATCH BASIN-ALLEY (LONGITUDINAL)

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN

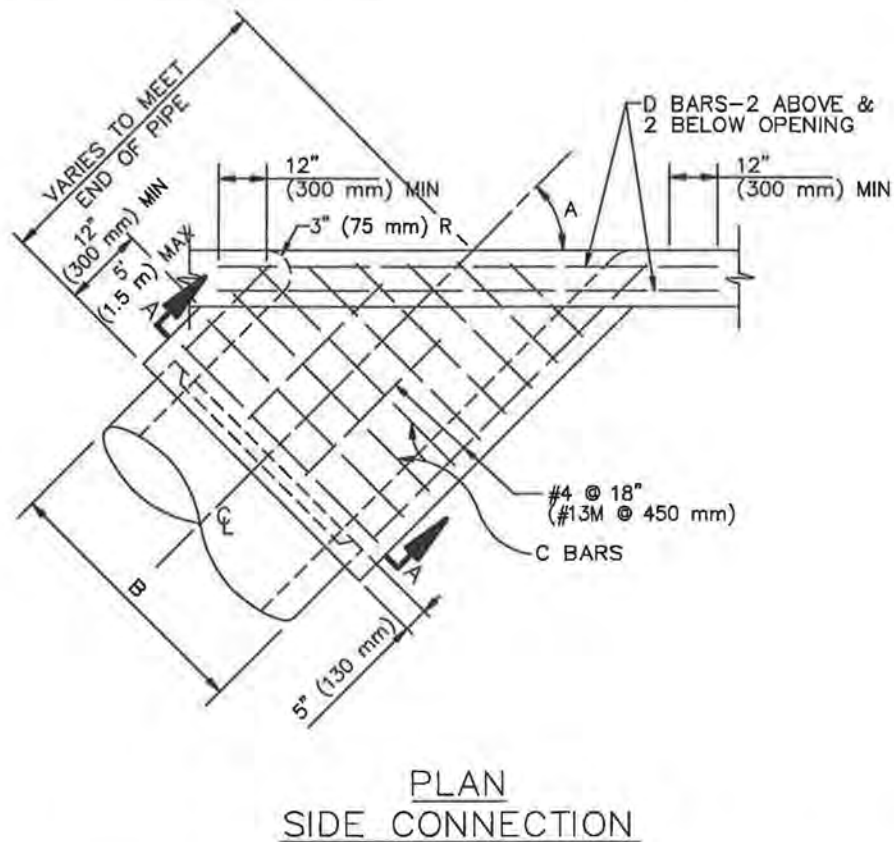
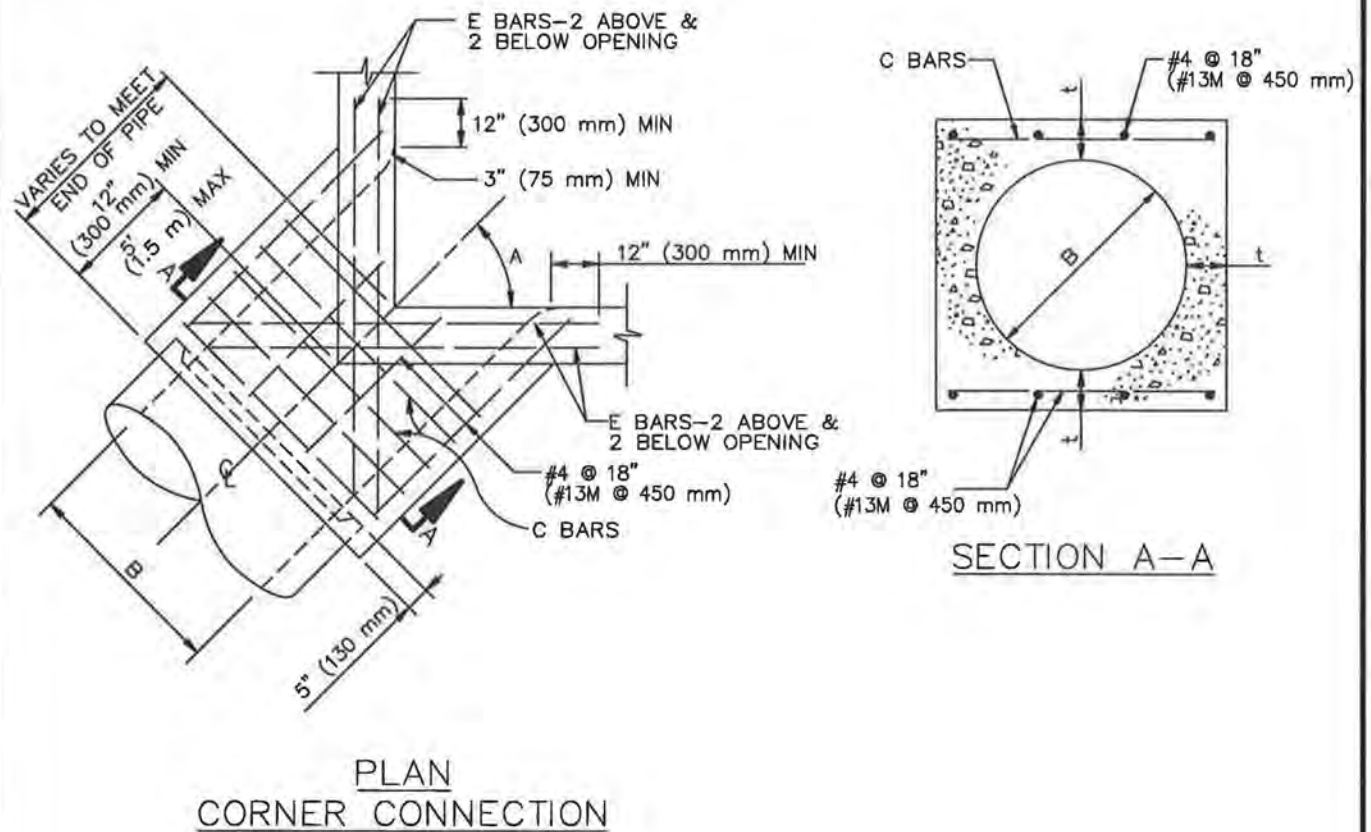
**304-3**

SHEET 1 OF 2

## NOTES:

1. ALL CURVED CONCRETE SURFACES SHALL BE FORMED BY CURVED FORMS, AND SHALL NOT BE SHAPED BY PLASTERING.
2. ONE GRATING IS REQUIRED UNLESS OTHERWISE SHOWN ON THE PLANS.
3. FLOOR OF BASIN SHALL BE GIVEN A STEEL TROWEL FINISH AND SHALL HAVE A LONGITUDINAL AND LATERAL SLOPE OF 1:12 MINIMUM AND 1:3 MAXIMUM, EXCEPT WHERE THE SURFACE GRADE EXCEEDS 8%, IN WHICH CASE THE LONGITUDINAL SLOPE OF THE FLOOR SHALL BE THE SAME AS THE SURFACE GRADE, SLOPE FLOOR FROM ALL DIRECTIONS TO THE OUTLET.
4. DIMENSIONS:  
 $B = 3'-6"$  (1.0 m)  
 $V_U$  = THE DEPTH AT THE UPSTREAM END OF THE BASIN AND SHALL BE DETERMINED BY THE REQUIREMENTS OF NOTE 3, BUT SHALL NOT BE LESS THAN 2.5' (750 mm).  
 $V_I$  = THE DEPTH AT THE INVERT OF THE INLET. NOTED ON THE PLANS.  
 $W = 2'-11 \frac{3}{8}"$  (900 mm) FOR ONE GRATING; ADD  $3'-5 \frac{3}{8}"$  (1051 mm) FOR EACH ADDITIONAL GRATING.  
 $A$  = THE ANGLE, IN DEGREES, INTERCEPTED BY THE CENTERLINE OF THE CONNECTOR PIPE AND THE CATCH BASIN WALL TO WHICH THE CONNECTOR PIPE IS ATTACHED.
5. PLACE CONNECTOR PIPES AS INDICATED ON THE PLANS. UNLESS OTHERWISE SPECIFIED, THE CONNECTOR PIPE SHALL BE LOCATED AT THE DOWNSTREAM END OF THE BASIN. WHERE THE CONNECTOR PIPE IS SHOWN AT A CORNER, THE CENTERLINE OF THE PIPE SHALL INTERSECT THE INSIDE CORNER OF THE BASIN. THE PIPE MAY BE CUT AND TRIMMED AT A SKEW NECESSARY TO INSURE MINIMUM 3" (80 mm) PIPE EMBEDMENT, ALL AROUND, WITHIN THE CATCH BASIN WALL, AND 3" (75 mm) RADIUS OF ROUNDING OF STRUCTURE CONCRETE, ALL AROUND, ADJACENT TO PIPE ENDS. A MONOLITHIC CATCH BASIN CONNECTION SHALL BE USED TO JOIN THE CONNECTOR PIPE TO THE CATCH BASIN WHENEVER ANGLE "A" IS LESS THAN 70° OR GREATER THAN 110°, OR WHENEVER THE CONNECTOR PIPE IS LOCATED IN A CORNER. THE OPTIONAL USE OF A MONOLITHIC CATCH BASIN CONNECTION IN ANY CASE IS PERMITTED. MONOLITHIC CATCH BASIN CONNECTIONS MAY BE CONSTRUCTED TO AVOID CUTTING STANDARD LENGTHS OF PIPE.
6. STEPS SHALL BE LOCATED AS SHOWN. IF THE CONNECTOR PIPE INTERFERES WITH THE STEPS, THEY SHALL BE LOCATED ON THE OPPOSITE WALL AT THE CENTERLINE OF THE DOWNSTREAM GRATING. STEPS SHALL BE SPACED 12" (300 mm) APART. THE TOP STEP SHALL BE 7" (175 mm) BELOW THE TOP OF THE GRATING AND PROJECT 2 1/2" (65 mm). ALL OTHER STEPS SHALL PROJECT 5" (130 mm).
7. THE FOLLOWING SPPWC ARE INCORPORATED HEREIN:  
308 MONOLITHIC CATCH BASIN CONNECTION  
309 CATCH BASIN REINFORCEMENT  
311 FRAME AND GRATING FOR CATCH BASINS  
635 STEEL STEP  
636 POLYPROPYLENE PLASTIC STEP





STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE  
PUBLIC WORKS STANDARDS, INC.,  
GREENBOOK COMMITTEE  
1984  
REV. 1996, 2009

**MONOLITHIC CATCH BASIN CONNECTION**

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN

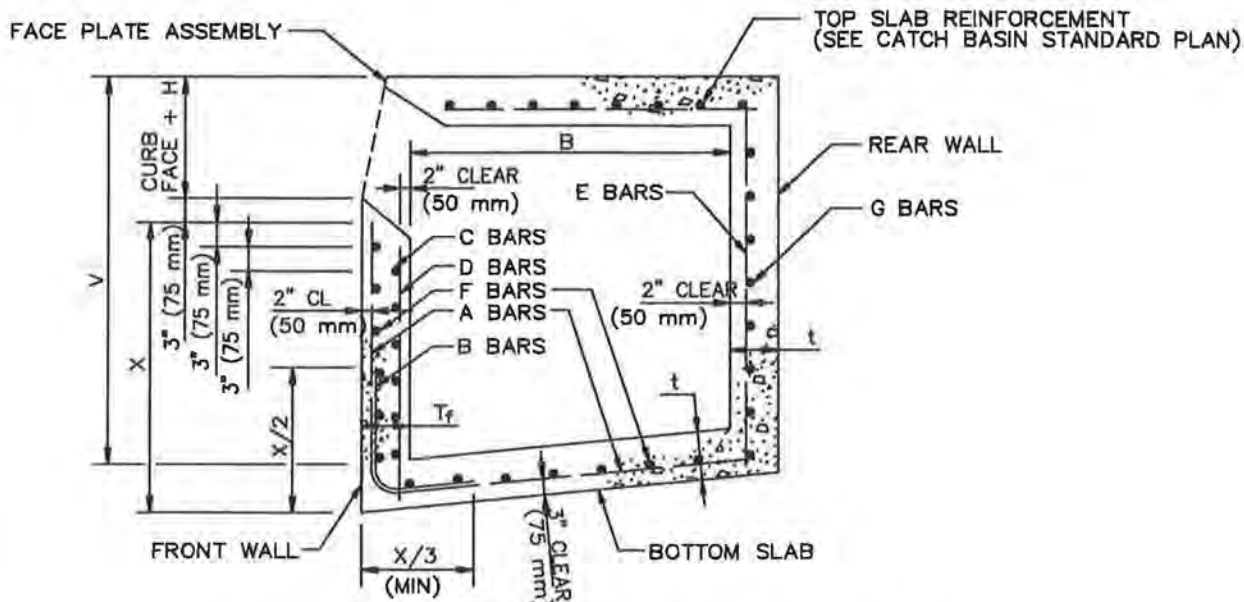
**308-2**

SHEET 1 OF 2

STRUCTURAL DATA							
B	t	C BARS	D&E BARS	B	t	C BARS	D&E BARS
12" (300 mm)	4" (115 mm)	#4 @ 6" (#13M @ 150 mm)	#5 (#16M)	42" (1050 mm)	7 1/2" (190 mm)	#5 @ 6" (#16M @ 150 mm)	#6 (#19M)
15" (375 mm)	4-1/4" (115 mm)			45" (1125 mm)	7 3/4" (190 mm)		
18" (450 mm)	4-1/2" (115 mm)			48" (1200 mm)	8" (215 mm)		
21" (525 mm)	5" (140 mm)			51" (1275 mm)	8 1/2" (215 mm)		
24" (600 mm)	5 1/4" (140 mm)			54" (1350 mm)	9" (240 mm)		
27" (675 mm)	5 1/2" (140 mm)			57" (1425 mm)	9 1/4" (240 mm)		
30" (750 mm)	6" (165 mm)			60" (1500 mm)	9 1/2" (240 mm)		
33" (825 mm)	6 1/4" (165 mm)			63" (1575 mm)	10" (260 mm)		
36" (900 mm)	6 1/2" (165 mm)			66" (1650 mm)	10 1/4" (260 mm)		
39" (975 mm)	7" (190 mm)			69" (1725 mm)	10 3/4" (280 mm)		
				72" (1800 mm)	11" (280 mm)		
FOR B GREATER THAN 72" (1800 mm) SEE PLANS							

#### NOTES

1. REINFORCING STEEL SHALL BE 1-1/2" (40 mm) CLEAR FROM FACE OF CONCRETE UNLESS OTHERWISE SHOWN.
2. REINFORCING STEEL FOR INSIDE FACE OF CATCH BASIN SHALL BE CUT AT CENTER OF OPENING AND BENT INTO WALLS OF MONOLITHIC CATCH BASIN CONNECTION. REINFORCING STEEL FOR OUTSIDE FACE OF CATCH BASIN SHALL BE CUT 2" (50 mm) CLEAR OF OPENING.
3. CONNECTION SHALL BE PLACED MONOLITHIC WITH CATCH BASIN. THE ROUNDED EDGE OF OUTLET SHALL BE CONSTRUCTED BY PLACING CONCRETE WITH THE SAME CLASS OF CONCRETE AS THE CATCH BASIN AGAINST A CURVED FORM WITH A RADIUS OF 3" (75 mm).
4. CONNECTIONS SHALL BE CONSTRUCTED WHEN:
  - (A) PIPES INLET OR OUTLET THROUGH CORNER OF CATCH BASIN
  - (B) ANGLE A FOR PIPES THROUGH 30" (750 mm) IN DIAMETER IS LESS THAN 70° OR GREATER THAN 110°.



TYPICAL REINFORCEMENT DETAILS

MAX. W	MAX. V	t	t <sub>f</sub>	A & B BARS	C BARS	D BARS	E BARS	F BARS	G BARS
3.5' (1 m)	8' (2.4m)	6" (150 mm)	6" (150 mm)	—	—	—	—	—	—
3.5' (1 m)	12' (3.5m)	8" (200 mm)	8" (200 mm)	—	—	—	—	—	—
7' (2 m)	6' (1.8m)	6" (150 mm)	6" (150 mm)	—	—	—	—	—	—
7' (2 m)	12' (3.5m)	8" (200 mm)	8" (200 mm)	—	—	—	—	—	—
14' (4 m)	4' (1.2m)	6" (150 mm)	6" (150 mm)	—	#4 @ 12" (13M @ 300 mm)	#4 @ 18" (13M @ 450 mm)	—	—	—
14' (4 m)	8' (2.4m)	6" (150 mm)	8" (200 mm)	—	#4 @ 12" (13M @ 300 mm)	#4 @ 18" (13M @ 450 mm)	—	—	—
14' (4 m)	12' (3.5 m)	8" (200 mm)	10" (250 mm)	—	#4 @ 6" (13M @ 150 mm)	#4 @ 18" (13M @ 450 mm)	—	—	—
28' (9 m)	4' (1.2m)	6" (150 mm)	6" (150 mm)	#4 @ 24" (13M @ 600 mm)	—	—	—	#4 @ 18" (13M @ 450 mm)	—
28' (9 m)	5' (1.5m)	6" (150 mm)	8" (200 mm)	#4 @ 24" (13M @ 600 mm)	—	—	—	#4 @ 18" (13M @ 450 mm)	—
28' (9 m)	6' (1.8m)	6" (150 mm)	8" (200 mm)	#4 @ 18" (13M @ 450 mm)	—	—	—	#4 @ 18" (13M @ 450 mm)	—
28' (9 m)	7' (2.1m)	8" (200 mm)	8" (200 mm)	#4 @ 17" (13M @ 425 mm)	—	—	—	#4 @ 18" (13M @ 450 mm)	—
28' (9 m)	8' (2.4m)	8" (200 mm)	8" (200 mm)	#4 @ 13" (13M @ 325 mm)	—	—	—	#4 @ 18" (13M @ 450 mm)	—
28' (9 m)	9' (2.7m)	8" (200 mm)	10" (250 mm)	#4 @ 15" (13M @ 375 mm)	—	—	—	#4 @ 18" (13M @ 450 mm)	—
28' (9 m)	10' (3.0m)	8" (200 mm)	10" (250 mm)	#4 @ 12" (13M @ 300 mm)	—	—	—	#4 @ 18" (13M @ 450 mm)	—
28' (9 m)	11' (3.3m)	8" (200 mm)	10" (250 mm)	#5 @ 15" (16M @ 375 mm)	—	—	#4 @ 10" (13M @ 250 mm)	#4 @ 18" (13M @ 450 mm)	#4 @ 18" (13M @ 450 mm)
28' (9 m)	12' (3.5m)	8" (200 mm)	10" (250 mm)	#4 @ 18" (13M @ 450 mm)	—	—	#4 @ 10" (13M @ 250 mm)	#4 @ 18" (13M @ 450 mm)	#4 @ 18" (13M @ 450 mm)

FOR W > 28' (9 m) OR B > 4' (1200 mm) SEE PLANS

## CURB OPENING CATCH BASIN REINFORCEMENT

### STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE  
PUBLIC WORKS STANDARDS, INC.,  
GREENBOOK COMMITTEE  
1984  
REV. 1996, 2009

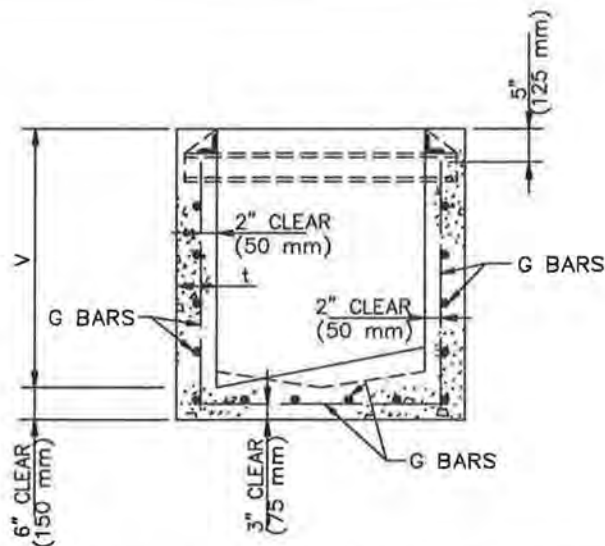
## CATCH BASIN REINFORCEMENT

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN

309-2

SHEET 1 OF 2



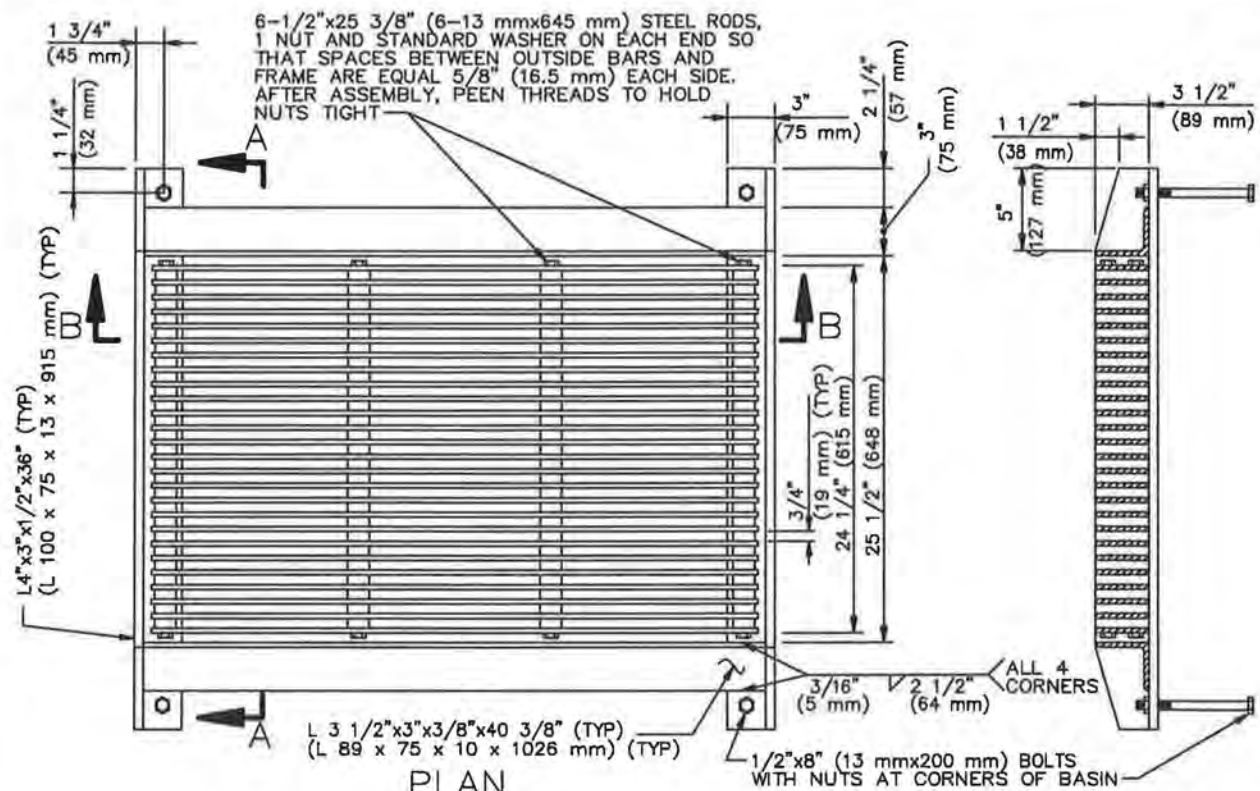
TYPICAL REINFORCEMENT DETAILS

V	t	SIDE AND END WALL STEEL
		G BARS
4' (1.2 m)	6" (150 mm)	#4 @ 10" (#13M @ 250 mm)
8' (2.4 m)	8" (200 mm)	#4 @ 6" (#13M @ 150 mm)
12' (3.5 m)	10" (250 mm)	#5 @ 6" (#16M @ 150 mm)
FOR V > 12' (3.5 m) SEE PLANS		

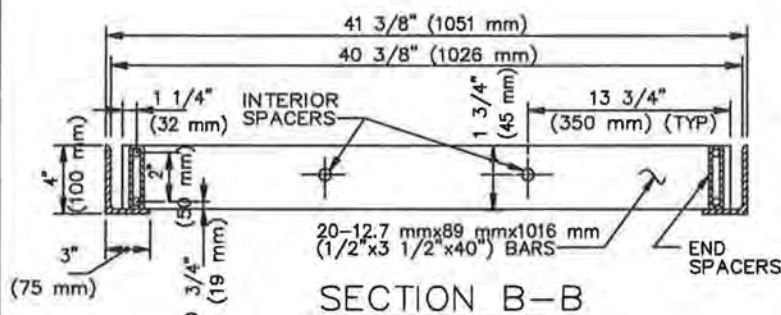
GRATING CATCH BASIN REINFORCEMENT

NOTE

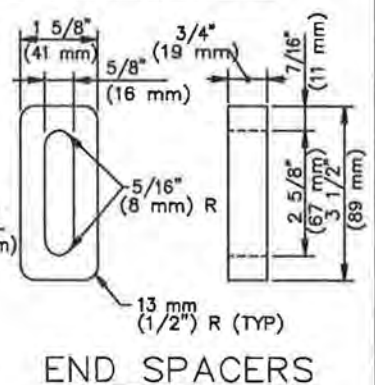
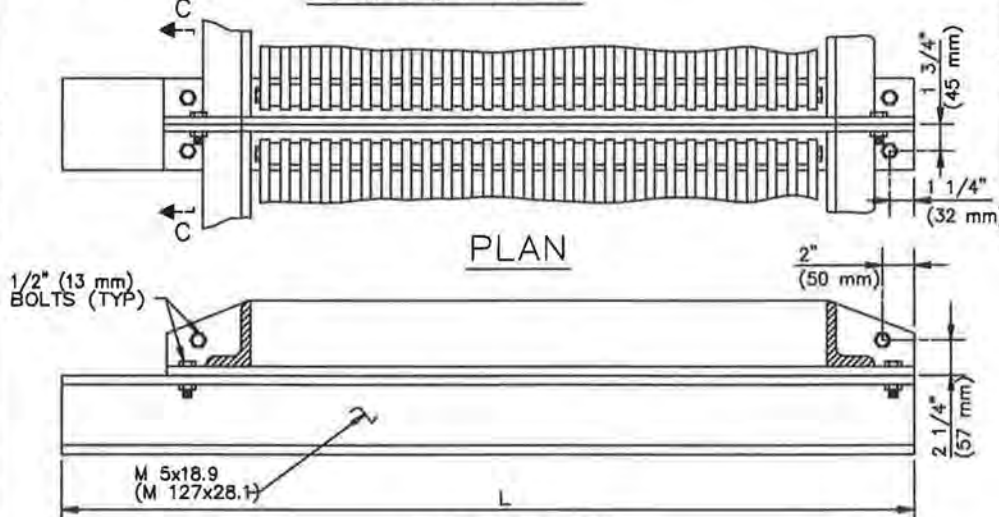
UNLESS OTHERWISE SPECIFIED, REINFORCEMENT FOR CURB OPENINGS AND GRATING CATCH BASINS SHALL TERMINATE 2" (50 mm) FROM FACE OF CONCRETE.



**SECTION A-A**



**STANDARD 13 mm (1/2") PIPE  
INTERIOR SPACERS**



**SECTION C-C**

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1984  
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# **FRAME AND GRATING FOR CATCH BASINS**

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN

**311-3**

SHEET 1 OF 2



NOTES:

1. ALL PARTS SHALL BE STEEL, EXCEPT THAT END SPACERS MAY BE CAST IRON.
2. ALL PARTS SHALL BE GALVANIZED AFTER FABRICATION, EXCEPT THAT GRATINGS SHALL BE ASSEMBLED AFTER COMPONENT PARTS ARE GALVANIZED.
3. ALL DIMENSIONS ARE FINISHED DIMENSIONS AND INCLUDE GALVANIZING.
4. ALL BOLT HOLES SHALL BE 5/8" (16 mm) DIAMETER.
5. ALL THREADS SHALL BE NATIONAL COARSE SERIES (NC).
6. CENTER SUPPORT ASSEMBLY REQUIRED WHEN TWO OR MORE GRATINGS ARE SPECIFIED ON PLANS.
  - L = 64" (1626 mm) FOR CURB OPENING CATCH BASIN WITH GRATING(S) AND DEBRIS SKIMMER (SPPWC 301).
  - L = 44" (1118 mm) FOR CURB OPENING CATCH BASIN WITH GRATING(S) (SPPWC 320.)
  - L = 36" (914 mm) FOR CURBSIDE GRATING CATCH BASIN (SPPWC 303).
  - L = 36" (914 mm) FOR GRATING CATCH BASIN—ALLEY (LONGITUDINAL) (SPPWC 304).

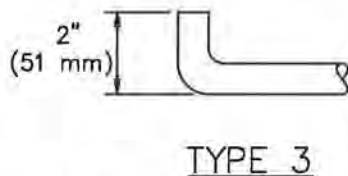
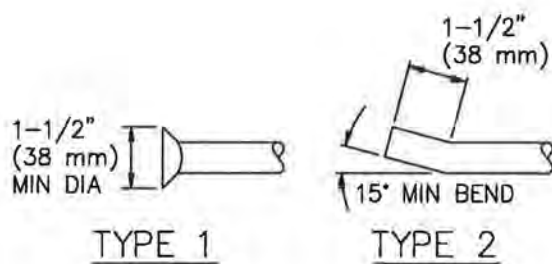
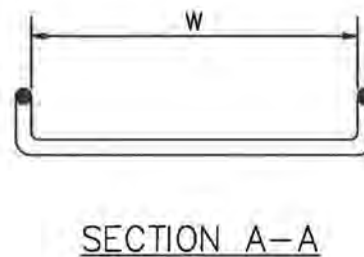
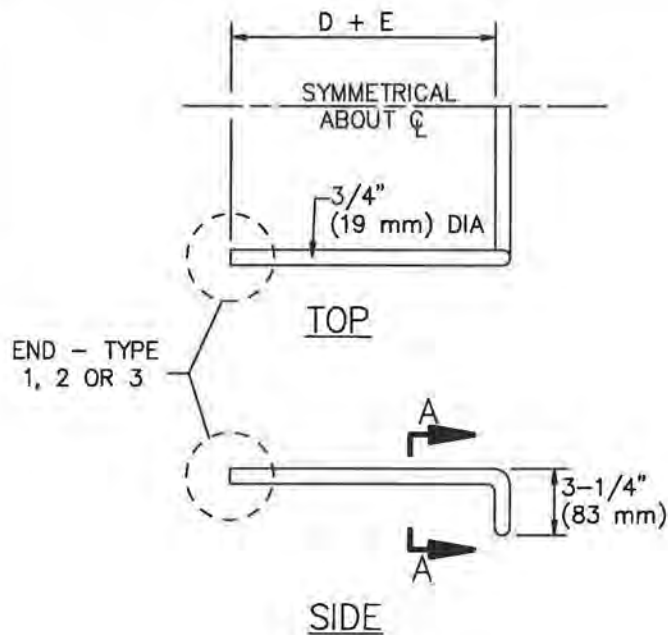
STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

**FRAME AND GRATING FOR CATCH BASINS**

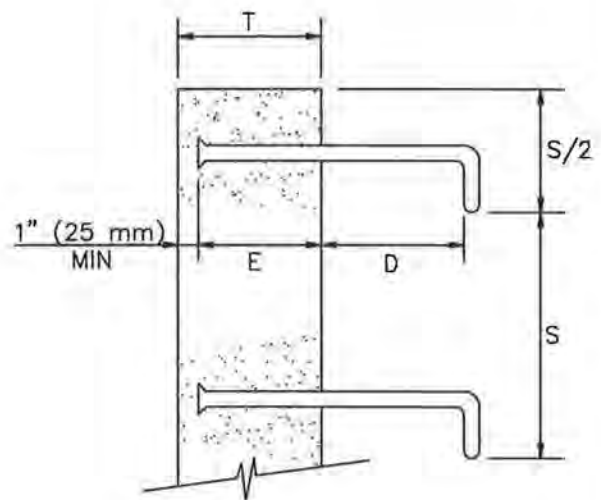
STANDARD PLAN

**311-3**

SHEET 2 OF 2



END DETAILS-SIDE VIEW



INSTALLATION DETAIL

UNLESS OTHERWISE NOTED:

D = 7" (175 mm)  
 E = 6" (150 mm) OR T - 1" (25 mm), WHICHEVER IS LESS  
 MINIMUM E IS 3" (75 mm)  
 S = 12" (300 mm) MAX, EVENLY SPACED  
 W = 16" (400 mm) MIN

FOR MANHOLES AND UNDERGROUND VAULTS:  
 S = 16" (400 mm) MAX, EVENLY SPACED  
 W = 14" (350 mm) MIN

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STEEL STEP

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN

635-3

SHEET 1 OF 2

NOTES:

1. STEPS SHALL BE STEEL CONFORMING TO ASTM A307 AND SHALL BE GALVANIZED AFTER FABRICATION. UNLESS OTHERWISE NOTED, STEPS MAY ALSO BE POLYPROPYLENE STEPS, STEEL REINFORCED, CONFORMING TO SPPWC 636.
2. IF STAINLESS STEEL STEPS ARE REQUIRED, THE MATERIAL SHALL CONFORM TO ASTM A276, 300 SERIES.
3. STEP ENDS MAY BE TYPE 1, 2 OR 3, AS SHOWN.
4. BOTTOM STEP SHALL BE A MAXIMUM OF 2' (600 mm) ABOVE FLOOR OR SHELF.
5. STEPS WITH TYPE 1 OR 2 ENDS MAY BE CAST IN PLACE, OR PLACED IN THE CENTER OF 1-1/2" (40 mm) MIN DIA DRILLED OR FORMED HOLES AND SET WITH HIGH STRENGTH NON-SHRINK GROUT, 6000 PSI (40 MPa) MIN. STEPS WITH TYPE 3 ENDS SHALL BE CAST-IN-PLACE.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

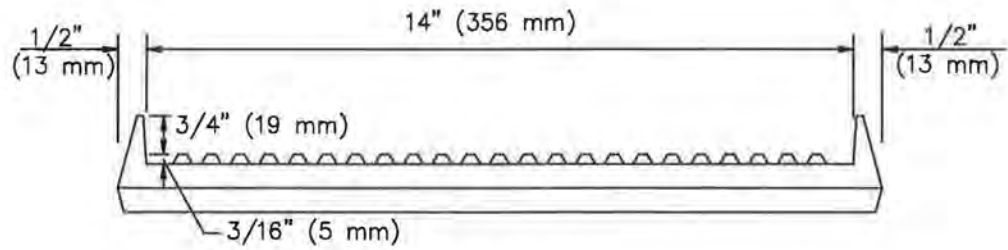
**STEEL STEP**

STANDARD PLAN

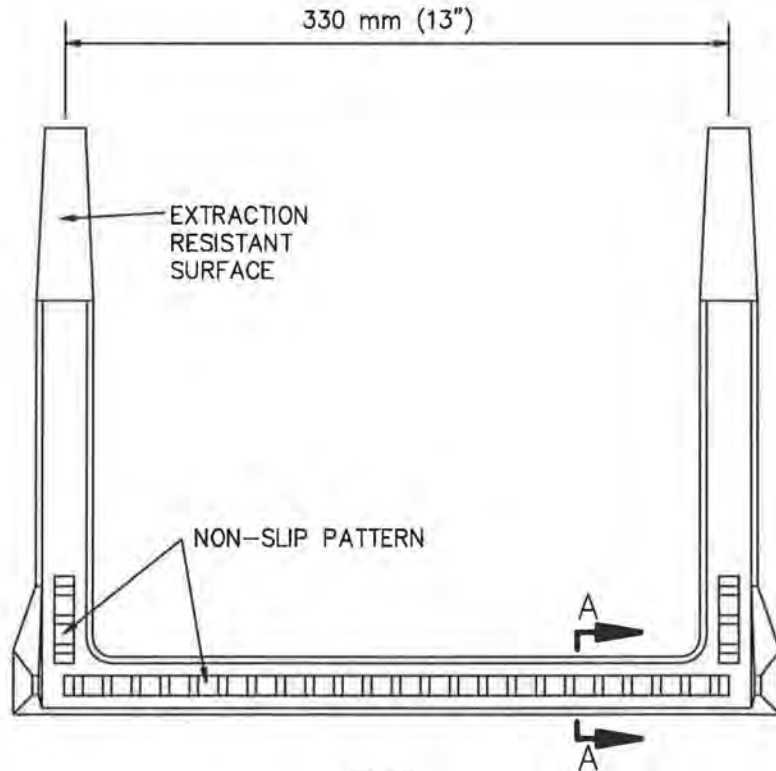
**635-3**

SHEET 2 OF 2

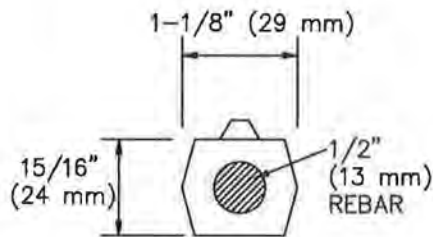




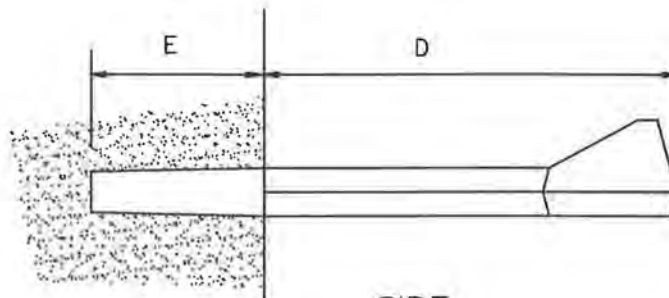
FRONT



TOP



SECTION A-A



SIDE

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

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PUBLIC WORKS STANDARDS INC.  
GREENBOOK COMMITTEE  
1991  
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**POLYPROPYLENE-PLASTIC STEP**

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN

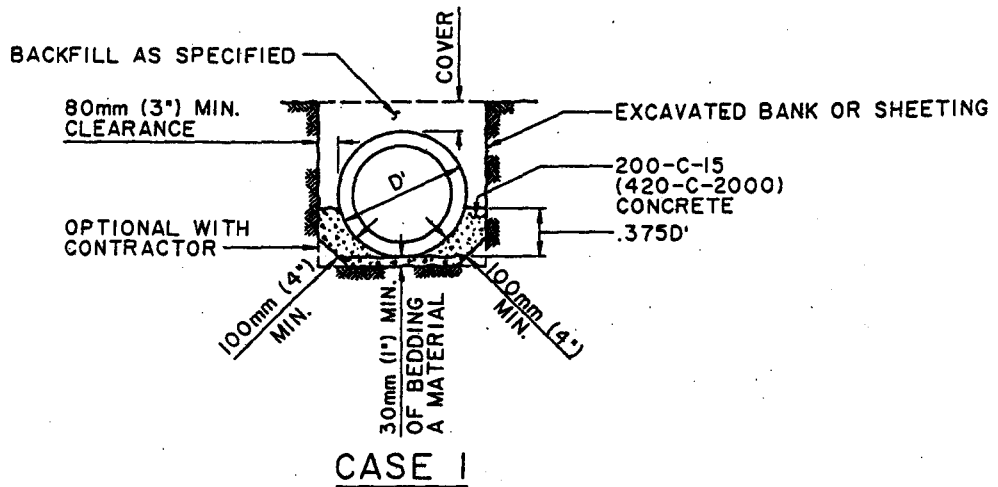
**636-2**

SHEET 1 OF 2

NOTES:

1. STEPS SHALL BE STEEL-REINFORCED COPOLYMER POLYPROPYLENE PLASTIC CONFORMING TO:
  - (A) ASTM D478 AND C497, EXCEPT THAT THE MINIMUM HORIZONTAL PULLOUT LOAD SHALL BE 1,500 LBS (6.7 kN).
  - (B) ASTM A615 GRADE 60 DEFORMED REINFORCING STEEL BAR.
  - (C) CALIFORNIA CODE OF REGULATIONS TITLE 8, GENERAL INDUSTRY SAFETY ORDERS.
2. STEPS SHALL BE CAPABLE OF WITHSTANDING AN IMPACT LOAD OF 70 FT-LBS (95 N.m) AT 20°F (-7°C) WITHOUT CRACKING OR FRACTURING.
3. THE MINIMUM TOTAL CROSS-SECTIONAL AREA OF THE EXPOSED PORTION OF THE STEP, INCLUDING THE DEFORMED STEEL BAR AND EXCLUDING THE NON-SLIP TREAD SURFACE, SHALL BE 1.0 SQ IN (645 mm<sup>2</sup>).
4. THE ENTIRE POLYPROPYLENE PLASTIC MATERIAL SURROUNDING THE REINFORCING STEEL BAR SHALL BE CAST MONOLITHICALLY. MINIMUM COVER SHALL BE 3/16" (5 mm).
5. A CERTIFICATION OF COMPLIANCE WITH THE REQUIREMENTS OF NOTES 1 THROUGH 4 PREPARED BY AN INDEPENDENT CERTIFIED LABORATORY SHALL BE SUBMITTED TO THE ENGINEER CONCURRENTLY WITH A REQUEST FOR APPROVAL.
6.  $E = 3-3/8"$  (86 mm). FOR VAULTS AND MANHOLES,  $D = 5-1/2"$  (140 mm). FOR OTHER INSTALLATIONS,  $D = 7-1/2"$  (190 mm). THESE DIMENSIONS MAY BE PLUS OR MINUS 1/4" (6 mm).
7. STEPS SHALL BE EVENLY SPACED. MAXIMUM VERTICAL SPACING OF STEPS SHALL BE 16" (400 mm), WITH THE BOTTOM STEP A MAXIMUM OF 2' (600 mm) ABOVE FLOOR OR SHELF.
8. IF TAPERED STEPS ARE INSTALLED INTO STRAIGHT DRILLED OR FORMED HOLES, APPROVED NON-SHRINK GROUT SHALL BE INJECTED INTO THE HOLE PRIOR TO INSTALLATION. HOLES SHALL BE STRAIGHT AND PARALLEL. EXCEPT AS OTHERWISE NOTED, STEPS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDED PROCEDURES.
9. A DROP STEP WITH A MINIMUM DROP OF 3/4" (19 mm) MAY BE USED. THE DROP STEP SHALL MEET ALL OTHER CRITERIA OF THIS PLAN.

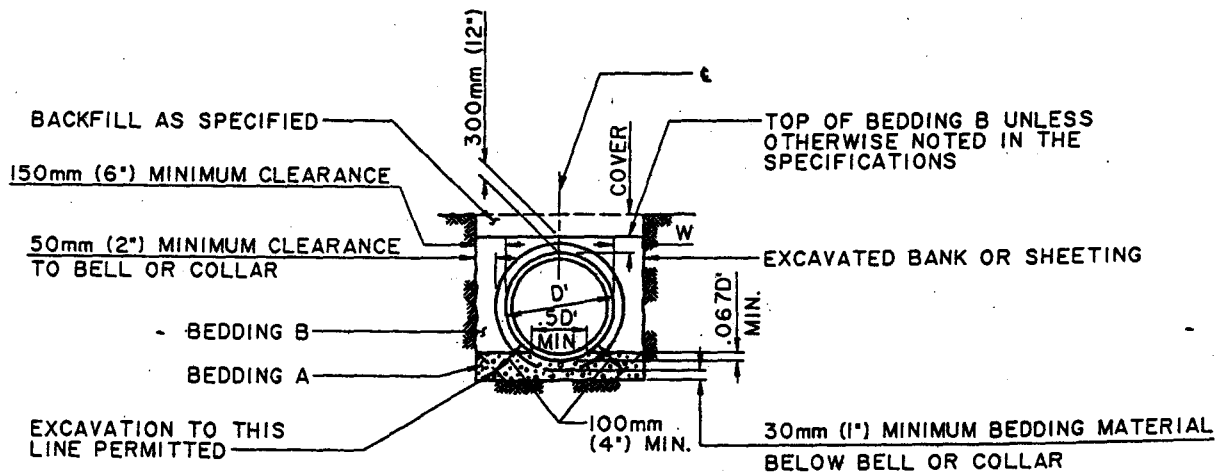
## **LACDPW STANDARD PLANS**



**NOTE:**

**CASE 1 BEDDING (LOAD FACTOR 2.1)**

SHALL BE USED WHERE SPECIFIED ON PROJECT DRAWINGS OR WHERE REQUIRED AS AN ALTERNATIVE TO CASE 2 OR CASE 3 BEDDING AS PROVIDED HEREON AND ON SH. 2. CASE 4 BEDDING SHALL BE USED INSTEAD OF CASE 1 AGAINST SHEETING OR UNSTABLE TRENCH SIDES IF SO REQUIRED BY THE ENGINEER.



**NOTES:**

**CASE 2 BEDDING & BACKFILL AROUND PIPE (LOAD FACTOR 1.8)**

- (a) W AT SPRING LINE SHALL NOT BE LESS THAN 150mm (6") FOR ANY DEPTH OF TRENCH. THIS DIMENSION MAY INCLUDE THE THICKNESS OF ANY SHEETING.
- (b) WHERE COVER IS 2.5m (8'-0") OR LESS, W MEASURED AT TOP OF PIPE MAY BE ANY DIMENSION GREATER THAN 150mm (6").
- (c) WHERE COVER IS GREATER THAN 2.5m (8'-0"), W MEASURED AT TOP OF PIPE SHALL NOT BE GREATER THAN 200mm (8") UNLESS THE CONTRACTOR AT HIS OWN EXPENSE PROVIDES CASE 1 BEDDING OR STRONGER PIPE. THE STATED 200mm (8") INCLUDES THE THICKNESS OF ANY SHEETING.
- (d) SCREED BEDDING A TO FIT CURVATURE AND GRADE OF PIPE. TYPE OF SCREED AND THE METHOD OF USE TO BE APPROVED BY THE ENGINEER.

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS

PIPE BEDDING IN TRENCHES

STANDARD PLAN  
METRIC

APPROVED

*Thomas A. Gilman*  
DIRECTOR OF PUBLIC WORKS

5/31/1992  
DATE

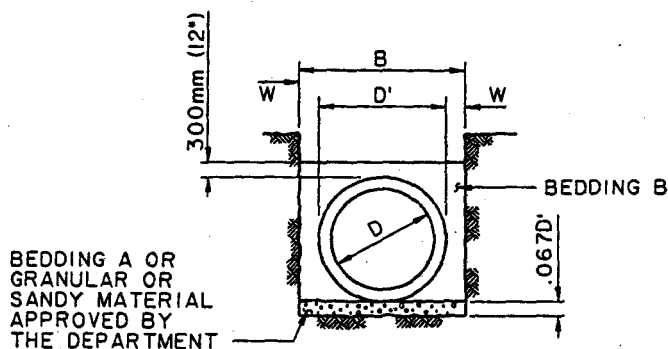
1995, 1999

REVISIONS

3080-2

SHEET 1 OF 3





## CASE 6

### NOTES

1. USE CASE 3 FOR RCP, CASE 2 FOR VITRIFIED CLAY, PLASTIC AND PLAIN CONCRETE PIPE UNLESS OTHERWISE SPECIFIED OR SHOWN ON THE PROJECT DRAWINGS.
2. FOR RCP 675mm (27") IN DIAMETER AND LARGER, BEDDING A SHALL BE COMPOSED OF SAND, 20mm (3/4") OR 15mm (1/2") CRUSHED ROCK, 5mm (NO.3 OR 4) CONCRETE AGGREGATE OR GRAVEL OR OTHER GRANULAR MATERIAL AS SPECIFIED AND SHALL HAVE A SAND EQUIVALENT VALUE OF NOT LESS THAN 20 UNLESS OTHERWISE APPROVED BY THE ENGINEER.
3. WHERE RCP SMALLER THAN 675mm (27") IN DIAMETER IS USED, THE REQUIREMENTS IN NOTE 2 SHALL BE MET EXCEPT THAT A GRADATION COARSER THAN 4.75mm (NO.4) CONCRETE AGGREGATE OR NO COARSER THAN 15mm (1/2") CRUSHED ROCK SHALL BE USED.
4. BEDDING B SHALL BE COMPOSED OF SAND OR OTHER GRANULAR MATERIAL AND SHALL HAVE A SAND EQUIVALENT VALUE NOT LESS THAN 20 AS SPECIFIED IN SUBSECTION 306-1.2.1 AS AMENDED UNLESS OTHERWISE APPROVED BY THE ENGINEER AND SHALL BE COMPLETED PRIOR TO PLACING THE BALANCE OF THE BACKFILL. THE MAXIMUM ROCK SIZE FOR BEDDING B SHALL BE 100mm (4") IN THE GREATEST DIMENSION. NESTING OF ROCKS WILL NOT BE PERMITTED.
5. UNLESS SPECIFIED ON THE PROJECT DRAWINGS, CONCRETE SHALL BE 200-C-15 (420-C-2000).
6. CONCRETE BACKFILL SHALL BE POURED FROM WALL TO WALL OF THE TRENCH AND FROM THE BOTTOM OF THE TRENCH TO A MINIMUM DEPTH OF 100mm (4") OVER THE TOP OF THE PIPE.
7. CONCRETE BACKFILL SHALL BE PROVIDED FOR RCP 525mm (21") IN DIAMETER OR LESS WHERE THE COVER IS EQUAL TO OR LESS THAN 600mm (24"), FOR RCP GREATER THAN 525mm (21") IN DIAMETER BUT LESS THAN 975mm (39") WHERE THE COVER IS LESS THAN 375mm (15") AND FOR RCP 975mm (39") OR GREATER WHERE THE COVER IS LESS THAN 300mm (12"). CONCRETE BACKFILL SHALL BE IN ACCORDANCE WITH NOTES 5 AND 6.
8. 3-EDGE BEARING TEST LOAD FACTOR = 1.0.
9. DIMENSIONS SHOWN ON THIS PLAN FOR METRIC AND ENGLISH UNITS ARE NOT EXACT EQUAL VALUES. IF METRIC VALUES ARE USED, ALL VALUES USED FOR CONSTRUCTION SHALL BE METRIC VALUES. IF ENGLISH UNITS ARE USED, ALL VALUES USED FOR CONSTRUCTION SHALL BE ENGLISH UNITS.

### NOTES:

CASE 6 BEDDING (LOAD FACTOR 1.5)

(a)

(b) NOTES (a), (b), AND (c) FROM CASE 3 SHALL APPLY.

WHERE SUBGRADE IS COMPOSED OF OTHER THAN GRANULAR OR SANDY MATERIAL, THE TRENCH SHALL BE EXCAVATED TO A DEPTH OF AT LEAST 80mm (3") BELOW THE PIPE AND BACKFILLED WITH A BEDDING MATERIAL OR OTHER MATERIALS AS MAY BE SPECIFIED OR OTHERWISE APPROVED BY THE DEPARTMENT.

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS

PIPE BEDDING IN TRENCHES

STANDARD PLAN  
METRIC

3080-2

SHEET 3 OF 3

### **APPENDIX III**

#### **GEOTECHNICAL REPORT (FOR REFERENCE)**

# Revised Geotechnical Engineering Report

**Mesmer Low Flow Diversion Project**

**5586 Mesmer Avenue  
Culver City, California 90230**

July 3, 2018

Revised on December 19, 2019

Terracon Project No. 60185026

**Prepared for:**

CWE Corporation  
Fullerton, California

**Prepared by:**

Terracon Consultants, Inc.  
Tustin, California

terracon.com

**Terracon**

Environmental



Facilities



Geotechnical



Materials



July 3, 2018  
Revised on December 19, 2019



CWE Corporation  
1561 E. Orangethorpe Avenue, Suite 240  
Fullerton, CA 92831

Attn: Mr. William Young, P.E.  
Director of Engineering  
P: 714-526-7500 ext.103  
E: WYoung@cwecorp.com

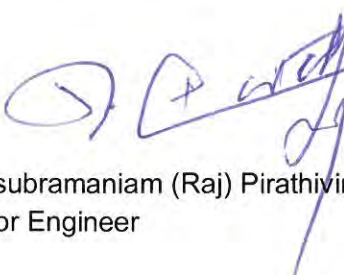
Re: **Revised Geotechnical Engineering Report  
Mesmer Low Flow Diversion Project  
5586 Mesmer Avenue  
Culver City, California 90230  
Terracon Project No. 60185026**

Dear Mr. Young:

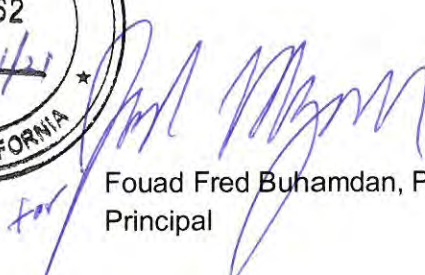
Terracon has completed geotechnical engineering exploration for the proposed diversion structure to be located **within the City's existing** Mesmer Sewer Pump Station at 5586 Mesmer Avenue, Culver City, California. The purpose of this study will be to evaluate the pertinent geotechnical conditions at the site and to develop geotechnical parameters which will assist in the design and construction of a diversion structure.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report, or if we may be of further service, please contact us.

Sincerely,  
**Terracon Consultants, Inc.**

  
Sivasubramaniam (Raj) Pirathiviraj, P.E., G.E.  
Senior Engineer



  
Fouad Fred Buhamdan, P.E.  
Principal

Terracon Consultants, Inc. 1421 Edinger Avenue, Suite C Tustin, California 92780  
P [949] 261 0051 F [949] 261 6110 [terracon.com](http://terracon.com)

Geotechnical



Environmental



Construction Materials



Facilities

## Revised Geotechnical Engineering Report

Mesmer Low Flow Diversion Project ■ Culver City, CA

July 3, 2018, Revised on December 19, 2019 ■ Terracon Project No. 60185026



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Exhibit A-1	Site Location Plan
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### APPENDIX B – LABORATORY TESTING

Exhibit B-1	Atterberg Limits Results
Exhibit B-2	Direct Shear Test

### APPENDIX C – SUPPORTING DOCUMENTS

Exhibit C-1	General Notes
Exhibit C-2	Unified Soil Classification

**REVISED GEOTECHNICAL ENGINEERING REPORT**  
**MESMER LOW FLOW DIVERSION PROJECT**  
**5586 MESMER AVENUE**  
**CULVER CITY, CALIFORNIA**  
**Terracon Project No. 60185026**  
**July 3, 2018, Revised on December 19, 2019**

## **1.0 INTRODUCTION**

This report presents the results of our geotechnical engineering services performed for the proposed project located within the City's existing Mesmer Sewer Pump Station at 5586 Mesmer Avenue, Culver City, California. The Site Location Plan (Exhibit A-1) is included in Appendix A of this report. The purpose of these services is to provide information and geotechnical engineering recommendations relative to:

- |                              |                                      |
|------------------------------|--------------------------------------|
| ■ subsurface soil conditions | ■ groundwater conditions             |
| ■ earthwork                  | ■ foundation design and construction |
| ■ seismic considerations     | ■ lateral earth pressures            |

Our geotechnical scope of work included the advancement of two (2) test borings to approximate depth of 19½ feet below existing ground surface (bgs).

Logs of the borings along with a Boring Location Diagram (Exhibit A-2) are included in Appendix A of this report. The results of the laboratory testing performed on soil samples obtained from the site during the field exploration are included in Appendix B of this report. Descriptions of the field exploration and laboratory testing are included in their respective appendices.

## **2.0 PROJECT INFORMATION**

### **2.1 Project Description**

Based on the information provided by the City, the City is proposing a diversion project that will capture low flow run off from Centinela Creek Channel into the City's existing Mesmer Sewer Pump Station. Per our conversation with CWE, CWE is proposing an underground pipe below the existing channel which would extend from an inlet at the bottom of channel to a new pump station. The inlet at the bottom of the channel is located near the eastern channel wall and the pump station is located just west of the western channel wall. The underground pipe will be installed using jack and bore technique. The underground pipe is a 12-inch diameter PVC pipe inside a 24-inch steel casing and the total length of the pipe is 60 feet. The invert elevation of the underground pipe ranges between 4.69 and 5.02 feet.

The new pump station will be connected through a ductile iron pipe (DIP) to the existing wet well located inside the facility. The invert elevation of this DIP is about 17 feet and this DIP is 6-inch in diameter.

## 2.2 Site Location and Description

ITEM	DESCRIPTION
<b>Location</b>	This project site is located within the City's existing Mesmer Sewer Pump Station at 5586 Mesmer Avenue, Culver City, California.
<b>Existing site features</b>	The project site is an existing pump station.
<b>Surrounding developments</b>	North: Centinela Creek Chan South: Mesmer Avenue West: Residential East: Commercial Building and Jefferson Street
<b>Current ground cover</b>	The existing ground is concrete
<b>Existing topography</b>	The project site is relatively flat

## 3.0 SUBSURFACE CONDITIONS

### 3.1 Field Exploration

The scope of the services performed for this project included site reconnaissance by a field representative, subsurface exploration program, laboratory testing, and engineering analyses for the proposed improvement. Two (2) test borings were drilled on site to an approximate depth of 19½ feet bgs as shown on Exhibit A-2 in Appendix A. The borings were marked on-site using a site plan, aerial photograph, and a handheld GPS device. The accuracy of the boring locations should only be assumed to the level implied by the method used.

Continuous lithologic logs of the test borings were recorded by our field representative during the drilling operations. At selected intervals, samples of subsurface materials and penetration tests were taken by driving split-spoon or ring-lined barrel samplers. Groundwater conditions were evaluated in the borings at the time of site exploration.

Penetration resistance measurements were obtained by driving the split-spoon and ring-barrel samplers into the subsurface materials with a 140-pound automatic hammer falling 30 inches. The penetration resistance value is a useful index in estimating the consistency or relative density of materials encountered.

An automatic hammer was used to advance the split-barrel sampler in the borings performed on this site. A significantly greater efficiency is achieved with the automatic hammer compared to the conventional safety hammer operated with a cathead and rope. This higher efficiency has an

appreciable effect on the SPT-N value. The effect of the automatic hammer's efficiency has been considered in the interpretation and analysis of the subsurface information for this report.

The samples were tagged for identification, sealed to reduce moisture loss, and taken to our laboratory for further examination, testing, and classification. Information provided on the boring logs attached to this report includes soil descriptions, consistency evaluations, boring depths, sampling intervals, and groundwater conditions. The borings were backfilled with auger cuttings and capped with concrete patch prior to the drill crew leaving the site.

Selected soils samples were tested for the following engineering properties:

- |                       |                         |
|-----------------------|-------------------------|
| ■ In-situ Dry Density | ■ In-situ Water Content |
| ■ Sieve Analysis      | ■ Atterberg Limits      |
| ■ Direct Shear Tests  |                         |

### **3.2 Typical Subsurface Profile**

Based on the results of the borings and our past experience and knowledge of the subsurface conditions in the vicinity of the project area, the native soils are predominantly clayey soils as encountered in Boring B-2. Boring B-1 encountered sandy materials to the depth of 19½ feet and it appears that these sandy materials are fill materials. The fill materials may have been placed during the construction of an existing adjacent wet well. However, based on the soil lithology and the measured in-situ density, it is unlikely that the fill materials received adequate compaction effort during placement.

Boring B-2 encountered loose clayey sand materials to the depth of about 5 feet bgs underlain by medium stiff to very stiff sandy lean and fat clay to the maximum depth explored at 19½ feet bgs.

Laboratory tests were conducted on selected soil samples and the test results are presented in Appendix B. Atterberg limits test results indicated that on-site clayey soils exhibit medium to high-plasticity behavior. A direct shear test was performed on the sandy fill materials at depth of 10 feet and indicated an ultimate friction angle of 35 degrees with corresponding cohesion value of 144 psf.

### **3.3 Groundwater**

Groundwater was observed at the depth of 17'-10" in Boring B-1 at the time of field exploration. These observations represent groundwater conditions at the time of the field exploration and may not be indicative of other times, or at other locations. Groundwater conditions can change with varying seasonal and weather conditions, and other factors.

In clayey soils with low permeability, the accurate determination of groundwater level may not be possible without long term observation. Long term observation after drilling could not be performed as borings were backfilled immediately upon completion due to safety concerns.

Groundwater levels can best be determined by implementation of a groundwater monitoring plan. Such a plan would include installation of groundwater monitoring wells, and periodic measurement of groundwater levels over a sufficient period of time.

Based on the Los Angeles County Department of Public Works groundwater monitoring well located near the project site, shallowest groundwater depth was encountered at 19 feet between the periods of 1985 and 2015.<sup>1</sup>

### **3.4 Corrosion Potential**

Results of soluble sulfate testing indicate that ASTM Type I/II Portland cement may be used for all concrete on and below grade. Foundation concrete may be designed for sulfate exposure category class S0 in accordance with the provisions of the ACI Design Manual, Section 318, Chapter 19.

Laboratory test results indicate the on-site soils have a pH of 8.09, a minimum resistivity of 1,407 ohm-centimeters, a water soluble sulfate content of 0.02%, Red-Ox potential of +675 mV, negligible sulfides, and a chloride content of 67 parts per million (ppm) as shown on the attached Results of Corrosivity Analysis sheet. These values should be used to evaluate corrosive potential of the on-site soils to underground ferrous metals.

Refer to the Results of Corrosivity Analysis sheet in Appendix B for the complete results of the corrosivity testing conducted in conjunction with this geotechnical exploration.

## **4.0 RECOMMENDATIONS FOR DESIGN AND CONSTRUCTION**

### **4.1 Pump Station Structure**

#### **4.1.1 Pump Station Structure Foundation**

The following foundation recommendations are presented for the shallow spread footing foundation systems for the pump station:

<b>DESCRIPTION</b>	<b>RECOMMENDATION</b>
<b>Foundation Type</b>	Conventional Shallow Foundation
<b>Bearing Material</b>	A minimum 18 inches of engineered fill below the bottom of the footing
<b>Allowable Bearing Pressure</b>	2,000 psf

<sup>1</sup> Data collected from County of Los Angeles, Department of Public Works, Historical Well Measurement Data, Well ID 1290P. The well is located approximately 3,000 feet northwest of the project site



**Revised Geotechnical Engineering Report**

Mesmer Low Flow Diversion Project ■ Culver City, CA

July 3, 2018, Revised on December 19, 2019 ■ Terracon Project No. 60185026



DESCRIPTION	RECOMMENDATION
<b>Embedment Depth Below Finished Grade</b>	Approximately 15 feet below existing grades.
<b>Total Estimated Settlement</b>	1 inch
<b>Estimated Differential Settlement</b>	½ inch across 40 feet

Finished grade is defined as the lowest adjacent grade within five feet of the foundation for perimeter (or exterior) footings. The allowable foundation bearing pressures apply to dead loads plus design live load conditions. The weight of the foundation concrete below grade may be neglected in dead load computations.

Foundation excavations should be observed by the geotechnical engineer. If the soil conditions encountered differ significantly from those presented in this report, supplemental recommendations will be required.

#### 4.1.2 Lateral Earth Pressure for the Pump Station Structure

The lateral earth pressure recommendations herein are applicable to the design of pump station structure walls and jack and bore supporting wall. The lateral earth pressures are based on the free draining level backfill conditions:

ITEM	VALUE <sup>1</sup>
Active Case Backfill	45 psf/ft
Passive Case	320 psf/ft
At-Rest Case	66 psf/ft
Surcharge Pressure	0.4*(Surcharge)
Ultimate Coefficient of Friction	0.3

<sup>1</sup> The values are based on-site soils.

The lateral earth pressures herein do not include any factor of safety. Above the groundwater table, if drainage is not provided, the lateral earth pressure below the groundwater table should be considered for the entire wall height.

The design of pump station structures should consider surcharge loads imposed by the existing buildings. In addition, the design should take into consideration anticipated vehicular loads in the vicinity of the pump station structure. In general, surcharge loads should be considered where they are located within a horizontal distance behind the pump station structure wall equal to the height of the wall or depth of the pump station.

Surcharge loads acting at the top of the wall should be applied to the wall over the backfill as a uniform pressure over the entire wall height, and should be added to the static earth pressures. Surcharge stresses due to point loads, line loads, and those of limited extent, such as compaction equipment, should be evaluated using elastic theory.

If drainage is provided, adequate drainage should be provided behind the walls to collect water from irrigation, landscaping, surface runoff, or other sources, to achieve a free-draining backfill condition. The wall back drain should consist of Class 2 permeable materials<sup>2</sup> that are placed behind the entire wall height to within 18 inches of ground surface at the top of the wall. As a minimum, the width of Class 2 permeable materials behind the wall should be two feet. Water collected by the back drain should be directed to an appropriate outlet, such as perforated pipes, for disposal.

Fill against foundation and walls should be compacted to densities specified in Earthwork. Compaction of each lift adjacent to walls should be accomplished with hand-operated tampers or other lightweight compactors. Over-compaction may cause excessive lateral earth pressures which could result in wall movement.

#### **4.1.3 Shoring Recommendations**

For the design of braced shoring, we recommend such shoring be designed using a rectangular-shaped distribution of lateral earth pressure of  $29H$  (in psf) ( $H$  is the total height of excavation).

The design of the shored excavation should be performed by an engineer knowledgeable and experienced with the on-site soil conditions. The contractor should be aware that slope height, slope inclination or excavation depths should in no case exceed those specified in local, state or federal safety regulations, e.g. OSHA Health and Safety Standards for Excavation, 29 CFR Part 1926, or successor regulations. Such regulations are strictly enforced and, if not followed, the owner or the contractor could be liable for substantial penalties.

#### **4.1.4 Trenchless Horizontal Borings Considerations**

It is our understanding that the pipe underneath the channel will utilize trenchless method, such as jack and bore method to install the pipes. Based on the subsurface conditions and presence of relatively shallow groundwater, consideration should be given to using continuous casing for horizontal bores/tunnels to prevent collapse of the borings.

#### **4.1.5 Below Grade Structures Considerations**

Based on our understanding of the project, we anticipate that excavations up to 18 feet below existing grade are planned for the construction of pump station structure. For vertical sided excavations, the excavations will require the use of shoring, bracing or some form of retention to prevent sloughing and caving of the soil into the excavation.

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<sup>2</sup> In accordance with the requirements and specifications of the State of California Department of Transportation.



Based on the depth to groundwater table, groundwater may be encountered during construction. Pumping from sumps may be utilized to control water within excavations. Well points may be required for significant groundwater flow, or where excavations penetrate groundwater to a significant depth.

As a safety measure, no equipment should be operated within 5 feet of the edge of the excavation and no materials should be stockpiled within 10 feet of the excavation. Excavations should not approach closer than 10 feet from existing structures/facilities without some form of protection for the facilities. Proper berm or ditch should be performed to divert any surface runoff away from the excavation.

Soils from the pits excavation should not be stockpiled higher than six (6) feet or within ten (10) feet of the edge of an open trench. Construction of open cuts adjacent to existing structures, including underground pipes, is not recommended within a 1½ H:1V plane extending beyond and down from the perimeter of structures. Cuts that are proposed within five (5) feet of light standards, other utilities, underground structures, and pavement should be provided with temporary shoring.

#### **4.1.6 Dewatering**

During the design phase of the project, additional evaluation of groundwater and fluctuations in groundwater levels should be performed. Depending upon the depth of excavation and seasonal conditions, groundwater may be encountered in the excavations planned on the site. The impacts associated with groundwater are anticipated to involve construction excavations and possible below grade structures.

Excavations that extend below groundwater would involve construction dewatering to maintain excavations in a relatively dry condition. Pumping from sumps may be utilized to control water within excavations. Well points may be required for significant groundwater flow, or where excavations penetrate groundwater to a significant depth. Excavation contractors are responsible for dewatering the planned temporary excavations.

Below grade structures that extend below groundwater, including pipelines, vaults, and manholes, would be designed to resist hydrostatic uplift pressures due to groundwater and would involve waterproofing, as appropriate.

#### **4.2 Earthwork**

The recommendations presented are for the design and construction of earth supported elements including foundations are contingent upon following the recommendations outlined in this report.

For the design and construction of the foundation for the pump station structure, a minimum of 18 inches of engineered fill is recommended below the bottom of the foundation. Onsite fat clay materials are not suitable to be used as engineered fill materials.

It is anticipated that excavations for the proposed construction can be accomplished with conventional earthmoving equipment. On-site soils may pump or become unworkable at high water contents. The workability of the subgrade may be affected by precipitation, repetitive construction traffic or other factors. Workability may be improved by scarifying and drying. Lightweight excavation equipment may be required to reduce subgrade pumping.

At the time of our study, moisture contents of the surface and near-surface native soils ranged from about 18 to 30 percent. Based on these moisture contents, some moisture conditioning may be needed for the project. The soils may need to be dried by aeration during dry weather conditions, or an additive, such as lime, cement, or kiln dust, may be needed to stabilize the soil. If the construction schedule does not allow for drying by aeration, clay soils may be stabilized using triaxial geogrid and coarse aggregate materials.

If the exposed soils at the bottom of the excavations have elevated water contents and are pumping or yielding during attempts to compact the bottom of the excavation, the bottom of the excavations should be overexcavated to a minimum depth of 12 inches, and replaced with granular engineered fill. As an alternative, aggregate materials wrapped (top, bottom and sides) with a non-woven geotextile such as Mirafi 140N, or an approved equivalent may be utilized. The crushed aggregate could have a nominal particle size of  $\frac{3}{4}$  to 1 inch. The aggregate layer and the geotextile layer are anticipated to create a stable platform beneath the proposed footings and overlying backfill materials.

The excavation bottom, once properly cleared, should be scarified, moisture conditioned, and compacted to a minimum depth of 10 inches. The subgrade soils should have a minimum of 95% relative compaction per the modified proctor test (ASTM D1557) with moisture contents ranging between -1% and +4% of optimum moisture content. The moisture content and compaction of subgrade soils should be maintained until foundation construction.

Underground utility lines may be encountered during construction. Furthermore, evidence of fill materials or underground facilities such as septic tanks, cesspools, and basements was not observed during the site reconnaissance, such features could be encountered during construction. If unexpected fills or utility lines or underground facilities are encountered, such features should be removed and the excavation thoroughly cleaned prior to backfill placement and/or construction.

### **4.3 Utility Trenches**

It is anticipated that the on-site soils will provide suitable support for underground utilities and piping that may be installed. Any soft and/or unsuitable material encountered at the bottom of excavations should be removed and be replaced with an adequate bedding material. A non-expansive granular material with a sand equivalent greater than 30 is recommended for bedding and shading of utilities, unless otherwise allowed by the utility manufacturer.

On-site fat clay materials are not considered suitable for backfill of utility and pipe trenches. However, on-site lean clay and sandy materials are considered suitable for backfill of utility and pipe trenches from one foot above the top of the pipe to the final ground surface, provided the material is free of organic matter and deleterious substances. Trench backfill should be mechanically placed and compacted to minimum of 95% of relative compaction per the modified proctor test (ASTM D1557) with moisture contents ranging between -1% and +4% of optimum moisture content. Compaction of initial lifts should be accomplished with hand-operated tampers or other lightweight compactors. Where trenches are placed beneath footings, the backfill should satisfy the gradation and expansion index requirements of engineered fill discussed in this report. Flooding or jetting for placement and compaction of backfill is not recommended.

#### 4.4 Seismic Considerations

DESCRIPTION	VALUE
2016 California Building Code (CBC) Site Classification <sup>1</sup>	D
Site Latitude (degrees)	33.9869
Site Longitude (degrees)	-118.4015
S <sub>s</sub> Spectral Acceleration for a Short Period	1.795 g
S <sub>1</sub> Spectral Acceleration for a 1-Second Period	0.655 g
F <sub>a</sub> Site Coefficient for a Short Period	1.000
F <sub>v</sub> Site Coefficient for a 1-Second Period	1.500

<sup>1</sup> Note: The 2016 California Building Code (CBC) requires a site soil profile determination extending to a depth of 100 feet for seismic site classification. The current scope does not include the required 100-foot soil profile determination. Borings were extended to a maximum depth of 19½ feet, and this seismic site class definition considers that similar or denser soils continue below the maximum depth of the subsurface exploration. Additional exploration to deeper depths would be required to confirm the conditions below the current depth of exploration

The subject site is located in Southern California, which is a seismically active area. The type and magnitude of seismic hazards affecting the site are dependent on the distance to causative faults, the intensity, and the magnitude of the seismic event. As calculated using the USGS Unified Hazard Tool, the Newport-Inglewood Fault is considered to have the most significant effect at the site from a design standpoint. This fault is located approximately 3.9 kilometers from the site and has a maximum credible earthquake magnitude of 6.59.

Based on the USGS Design Maps Summary Report, using the American Society of Civil Engineers (ASCE 7-10) standard, the peak ground acceleration (PGA<sub>M</sub>) at the project site is expected to be 0.647g. Based on the USGS Unified Hazard Tool, the project site has a mode magnitude of 6.35. Furthermore, the site is not located within an Alquist-Priolo Earthquake Fault Zone based on our review of the State Fault Hazard Maps.

## **5.0 GENERAL COMMENTS**

Terracon should be retained to review the final design plans and specifications so comments can be made regarding interpretation and implementation of our geotechnical recommendations in the design and specifications. Terracon also should be retained to provide observation and testing services during grading, excavation, foundation construction and other earth-related construction phases of the project.

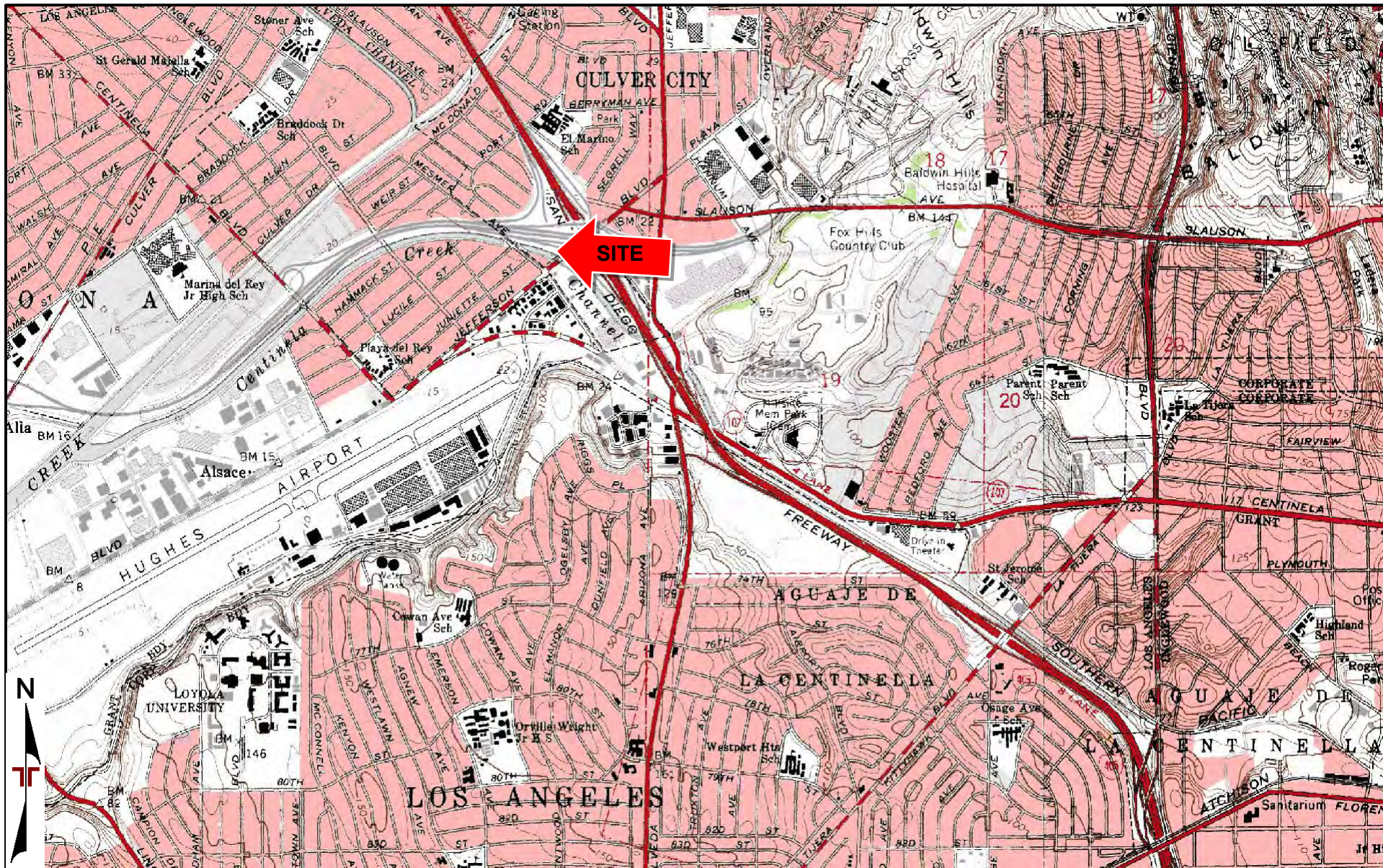
The analysis and recommendations presented in this report are based upon the data obtained from the borings performed at the indicated locations and from other information discussed in this report. This report does not reflect variations that may occur between borings, across the site, or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. If variations appear, we should be immediately notified so that further evaluation and supplemental recommendations can be provided.

The scope of services for this project does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

This report has been prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranties, either express or implied, are intended or made. Site safety, excavation support, and dewatering requirements are the responsibility of others. In the event that changes in the nature, design, or location of the project as outlined in this report are planned, the conclusions and recommendations contained in this report shall not be considered valid unless Terracon reviews the changes and either verifies or modifies the conclusions of this report in writing.

**APPENDIX A**  
**FIELD EXPLORATION**





TOPOGRAPHIC MAP IMAGE COURTESY OF  
THE U.S. GEOLOGICAL SURVEY  
QUADRANGLES INCLUDE: VENICE, CA  
(1/1/1981) and INGLEWOOD, CA (1/1/1981).

DIAGRAM IS FOR GENERAL LOCATION ONLY,  
AND IS NOT INTENDED FOR CONSTRUCTION  
PURPOSES

Project Manager:	SP	Project No.	60185026
Drawn by:	OF	Scale:	1"=2,000'
Checked by:	SP	File Name:	A-1
Approved by:	FH	Date:	05/2018

**Terracon**

1421 Edinger Ave, Ste C  
Tustin, CA 92780-6287

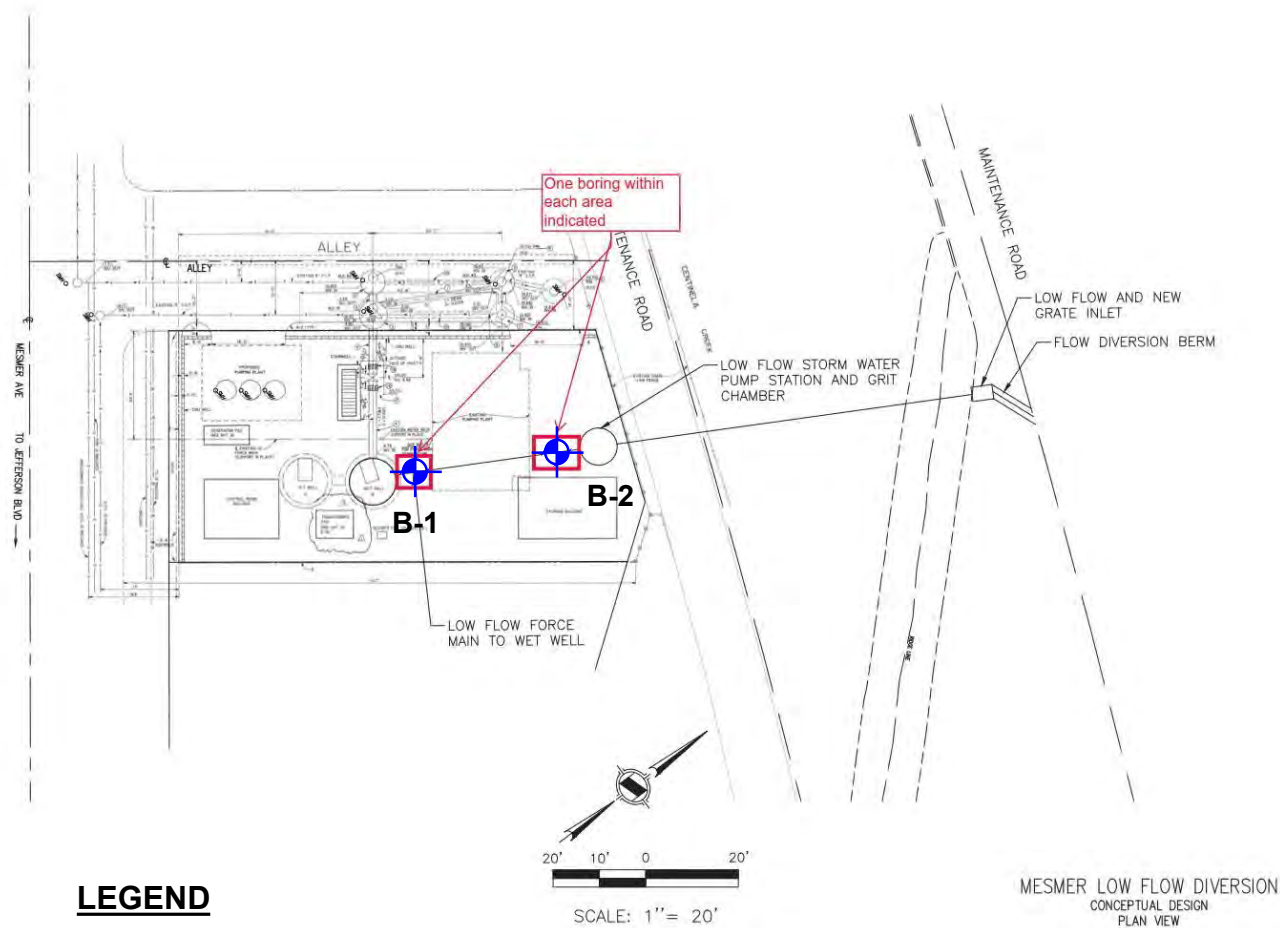
## SITE LOCATION

Mesmer Low Flow Diversion Project  
5586 Mesmer Avenue  
Culver City, CA

Exhibit

A-1





## LEGEND



**B-1 BORING APPROXIMATE LOCATION**

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Manager:	RP	Project No.	60185026
Drawn by:	OF	Scale:	AS SHOWN
Checked by:	RP	File Name:	A-2
Approved by:	FB	Date:	05/2018

**Terracon**  
Consulting Engineers & Scientists

1421 Edinger Avenue Ste C Tustin, California 92780  
PH. (949) 261-0051 FAX. (949) 261-6110

## BORING LOCATION PLAN

Mesmer Low Flow Diversion Project  
5586 Mesmer Avenue  
Culver City, CA

Exhibit

**A-2**

# BORING LOG NO. B-1

Page 1 of 1

**PROJECT:** Mesmer Low Flow Diversion

**CLIENT:** CWE Corporation  
Fullerton, CA

**SITE:** 5586 Mesmer Avenue  
Culver City, CA

GRAPHIC LOG	LOCATION See Exhibit A-2 Latitude: 33.9868° Longitude: 118.4016°	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	STRENGTH TEST			WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
						TEST TYPE	COMPRESSIVE STRENGTH (tsf)	STRAIN (%)				
	DEPTH											
	0.7 <b>CONCRETE</b> , 8" thickness											
	<b>FILL - POORLY GRADED SAND WITH CLAY (SP-SC)</b> , with gravel, dark brown											
	trace gravel, very dense				19-50/6"				12	110		7
	5.0 <b>FILL - POORLY GRADED SAND WITH SILT (SP-SM)</b> , tan, medium dense	5			31-20-25				8	110	NP	
	trace gravel				7-5-7 N=12							6
	10.0 <b>FILL - POORLY GRADED SAND (SP)</b> , tan, loose	10			7-7-8				4	109	NP	5
					1-2-3 N=5							
		15			1-2-4 N=6							
	<b>Boring Terminated at 19.5 Feet</b>											

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
Hollow Stem Auger

See Exhibit A-3 for description of field procedures.  
See Appendix B for description of laboratory procedures and additional data (if any).  
See Appendix C for explanation of symbols and abbreviations.  
Elevations estimated from Google Earth.

Notes:

Abandonment Method:  
Boring backfilled with Auger Cuttings  
Surface capped with concrete

## WATER LEVEL OBSERVATIONS

While drilling

**Terracon**  
1421 Edinger Ave, Ste C  
Tustin, CA

Boring Started: 05-14-2018

Boring Completed: 05-14-2018

Drill Rig: CME-75

Driller: 2R

Project No.: 60185026

Exhibit: A-3

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 60185026 BORING LOGS.GPJ TERRACON.DATATEMPLATE.GDT 7/3/18



# BORING LOG NO. B-2

Page 1 of 1

**PROJECT:** Mesmer Low Flow Diversion

**CLIENT:** CWE Corporation  
Fullerton, CA

**SITE:** 5586 Mesmer Avenue  
Culver City, CA

GRAPHIC LOG	LOCATION See Exhibit A-2  Latitude: 33.9869° Longitude: 118.4015°	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	STRENGTH TEST			WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS	PERCENT FINES
						TEST TYPE	COMPRESSIVE STRENGTH (tsf)	STRAIN (%)			LL-PL-PI	
	DEPTH											
	0.5	<b>CONCRETE</b> , 6" thickness										
		<b>CLAYEY SAND (SC)</b> , dark brown, loose										
					4-5-6				21	102	30-19-11	44
	5.0	<b>SANDY LEAN CLAY (CL)</b> , dark brown, medium stiff	5			1-3-2 N=5						60
		stiff				2-5-5			30	91		63
	10.0	<b>SANDY FAT CLAY (CH)</b> , dark brown, stiff	10			4-4-5 N=9					53-19-34	60
	15.0	<b>SANDY LEAN CLAY (CL)</b> , dark brown, very stiff	15			6-12-19			18	109		
		stiff				3-4-5 N=9						
19.5	<b>Boring Terminated at 19.5 Feet</b>											

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
Hollow Stem Auger

See Exhibit A-3 for description of field procedures.  
See Appendix B for description of laboratory procedures and additional data (if any).  
See Appendix C for explanation of symbols and abbreviations.  
Elevations estimated from Google Earth.

Notes:

Abandonment Method:  
Boring backfilled with Auger Cuttings  
Surface capped with concrete

## WATER LEVEL OBSERVATIONS

Groundwater not encountered

**Terracon**  
1421 Edinger Ave, Ste C  
Tustin, CA

Boring Started: 05-14-2018

Boring Completed: 05-14-2018

Drill Rig: CME-75

Driller: 2R

Project No.: 60185026

Exhibit: A-4

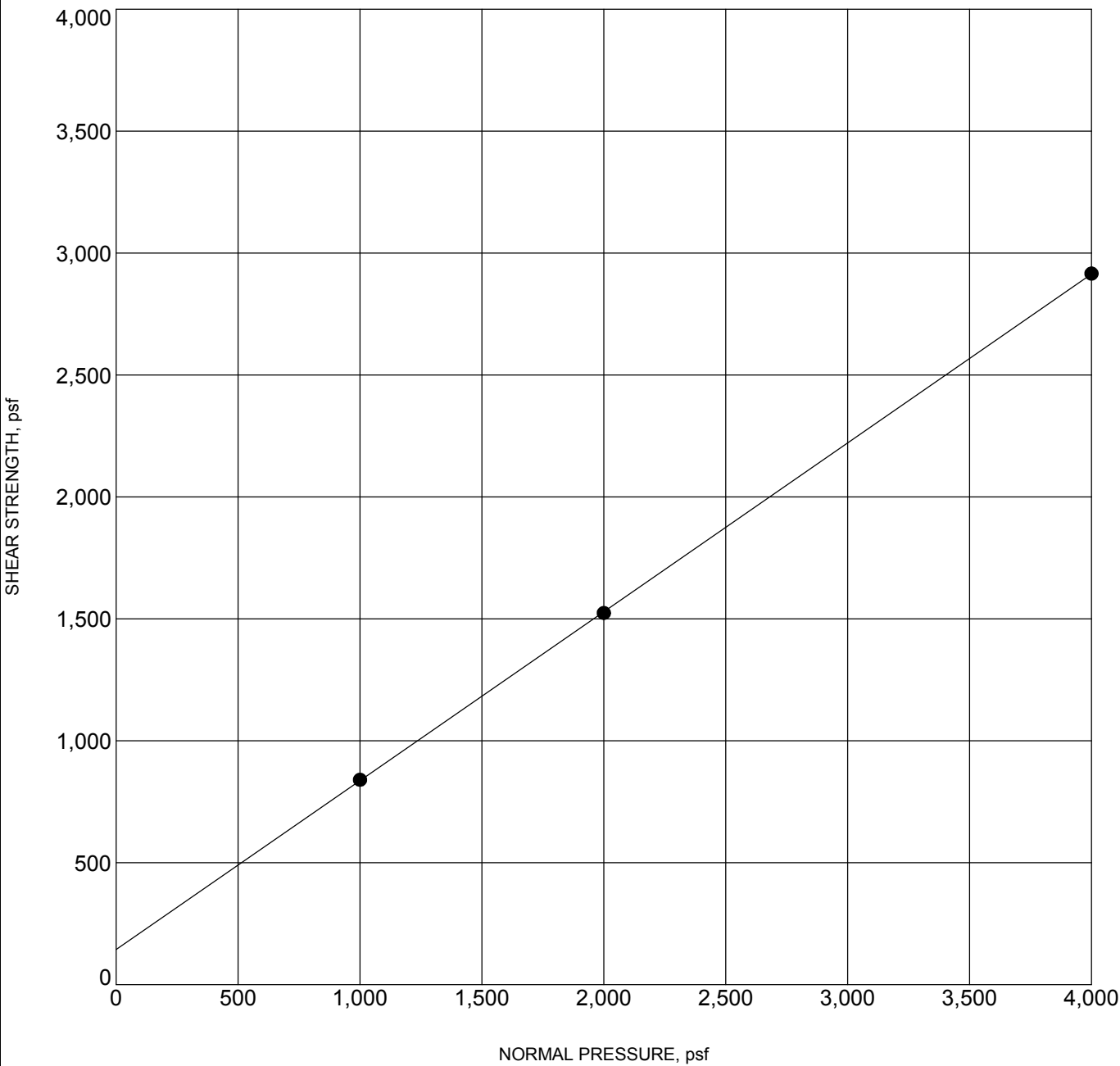
THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 60185026 BORING LOGS.GPJ TERRACON\_DATATEMPLATE.GDT 7/3/18

**APPENDIX B**  
**LABORATORY TESTING**

## ASTM D4318

EXHIBIT: B-1

# DIRECT SHEAR TEST ASTM D3080



Specimen Identification		Classification	$\gamma_d$ , pcf	WC, %	c, psf	$\phi^\circ$
●	B-1 10.0ft	FILL: POORLY GRADED SAND SP	109	4	144	35

PROJECT: Mesmer Low Flow Diversion		PROJECT NUMBER: 60185026
SITE: 5586 Mesmer Avenue Culver City, CA		CLIENT: CWE Corporation Fullerton, CA
		EXHIBIT: B-2

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ...TC\_DIRECT\_SHEAR\_60185026 BORING LOGS.GPJ TERRACON\_DATATEMPLATE.GDT 7/3/18

# CHEMICAL LABORATORY TEST REPORT

**Project Number:** 60185026  
**Service Date:** 05/31/18  
**Report Date:** 06/07/18  
**Task:**

**Terracon**

750 Pilot Road, Suite F  
Las Vegas, Nevada 89119  
(702) 597-9393

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## Client

CWE Corp

## Project

CWE: Mesmer Low Flow Diversion

**Sample Submitted By:** Terracon (60)

**Date Received:** 5/24/2018

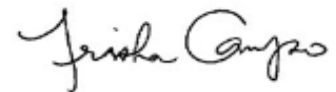
**Lab No.:** 18-0629

## *Results of Corrosion Analysis*

<i>Sample Number</i>	
<i>Sample Location</i>	B-2
<i>Sample Depth (ft.)</i>	Bulk
pH Analysis, AWWA 4500 H	8.09
Water Soluble Sulfate (SO <sub>4</sub> ), AWWA 4500 E (percent %)	0.02
Sulfides, AWWA 4500-S D, (mg/kg)	Nil
Chlorides, ASTM D 512, (mg/kg)	67
Red-Ox, AWWA 2580, (mV)	+675
Total Salts, AWWA 2540, (mg/kg)	1445
Resistivity, ASTM G 57, (ohm-cm)	1407

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**Analyzed By:**















Trisha Campo  
Chemist

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

**APPENDIX C**  
**SUPPORTING DOCUMENTS**

# GENERAL NOTES

## DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

<b>SAMPLING</b>				<b>WATER LEVEL</b>		Water Initially Encountered	<b>FIELD TESTS</b>	(HP) Hand Penetrometer
						Water Level After a Specified Period of Time		(T) Torvane
						Water Level After a Specified Period of Time		(b/f) Standard Penetration Test (blows per foot)
					Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.			N N value
								(PID) Photo-Ionization Detector
								(OVA) Organic Vapor Analyzer
								(WOH) Weight of Hammer

## DESCRIPTIVE SOIL CLASSIFICATION

Soil classification is based on the Unified Soil Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

## LOCATION AND ELEVATION NOTES

Unless otherwise noted, Latitude and Longitude are approximately determined using a hand-held GPS device. The accuracy of such devices is variable. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

<b>STRENGTH TERMS</b>	<b>RELATIVE DENSITY OF COARSE-GRAINED SOILS</b> (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance Includes gravels and sands.			<b>CONSISTENCY OF FINE-GRAINED SOILS</b> (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance Includes silts and clays.		
	Descriptive Term (Density)	Standard Penetration or N-Value Blows/Ft.	Ring Sampler Blows/Ft.	Descriptive Term (Consistency)	Unconfined Compressive Strength, Qu, psf	Standard Penetration or N-Value Blows/Ft.
	Very Loose	0 - 3	0 - 6	Very Soft	less than 500	0 - 1
	Loose	4 - 9	7 - 18	Soft	500 to 1,000	2 - 4
	Medium Dense	10 - 29	19 - 58	Medium-Stiff	1,000 to 2,000	4 - 8
	Dense	30 - 50	59 - 98	Stiff	2,000 to 4,000	8 - 15
	Very Dense	> 50	≥ 99	Very Stiff	4,000 to 8,000	15 - 30
				Hard	> 8,000	> 30
						> 42

## RELATIVE PROPORTIONS OF SAND AND GRAVEL

<u>Descriptive Term(s) of other constituents</u>	<u>Percent of Dry Weight</u>
Trace	< 15
With	15 - 29
Modifier	> 30

## GRAIN SIZE TERMINOLOGY

<u>Major Component of Sample</u>	<u>Particle Size</u>
Boulders	Over 12 in. (300 mm)
Cobbles	12 in. to 3 in. (300mm to 75mm)
Gravel	3 in. to #4 sieve (75mm to 4.75 mm)
Sand	#4 to #200 sieve (4.75mm to 0.075mm)
Silt or Clay	Passing #200 sieve (0.075mm)

## RELATIVE PROPORTIONS OF FINES

<u>Descriptive Term(s) of other constituents</u>	<u>Percent of Dry Weight</u>
Trace	< 5
With	5 - 12
Modifier	> 12

## PLASTICITY DESCRIPTION

<u>Term</u>	<u>Plasticity Index</u>
Non-plastic	0
Low	1 - 10
Medium	11 - 30
High	> 30

# UNIFIED SOIL CLASSIFICATION SYSTEM

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests <sup>A</sup>					Soil Classification	
					Group Symbol	Group Name <sup>B</sup>
Coarse Grained Soils: More than 50% retained on No. 200 sieve	Gravels: More than 50% of coarse fraction retained on No. 4 sieve	Clean Gravels: Less than 5% fines <sup>C</sup>	Cu ≥ 4 and 1 ≤ Cc ≤ 3 <sup>E</sup>		GW	Well-graded gravel <sup>F</sup>
			Cu < 4 and/or 1 > Cc > 3 <sup>E</sup>		GP	Poorly graded gravel <sup>F</sup>
		Gravels with Fines: More than 12% fines <sup>C</sup>	Fines classify as ML or MH		GM	Silty gravel <sup>F,G,H</sup>
			Fines classify as CL or CH		GC	Clayey gravel <sup>F,G,H</sup>
	Sands: 50% or more of coarse fraction passes No. 4 sieve	Clean Sands: Less than 5% fines <sup>D</sup>	Cu ≥ 6 and 1 ≤ Cc ≤ 3 <sup>E</sup>		SW	Well-graded sand <sup>I</sup>
			Cu < 6 and/or 1 > Cc > 3 <sup>E</sup>		SP	Poorly graded sand <sup>I</sup>
		Sands with Fines: More than 12% fines <sup>D</sup>	Fines classify as ML or MH		SM	Silty sand <sup>G,H,I</sup>
			Fines classify as CL or CH		SC	Clayey sand <sup>G,H,I</sup>
Fine-Grained Soils: 50% or more passes the No. 200 sieve	Silts and Clays: Liquid limit less than 50	Inorganic:	PI > 7 and plots on or above “A” line <sup>J</sup>		CL	Lean clay <sup>K,L,M</sup>
			PI < 4 or plots below “A” line <sup>J</sup>		ML	Silt <sup>K,L,M</sup>
		Organic:	Liquid limit - oven dried	< 0.75	OL	Organic clay <sup>K,L,M,N</sup>
			Liquid limit - not dried			Organic silt <sup>K,L,M,O</sup>
	Silts and Clays: Liquid limit 50 or more	Inorganic:	PI plots on or above “A” line		CH	Fat clay <sup>K,L,M</sup>
			PI plots below “A” line		MH	Elastic Silt <sup>K,L,M</sup>
		Organic:	Liquid limit - oven dried	< 0.75	OH	Organic clay <sup>K,L,M,P</sup>
			Liquid limit - not dried			Organic silt <sup>K,L,M,Q</sup>
Highly organic soils:	Primarily organic matter, dark in color, and organic odor				PT	Peat

<sup>A</sup> Based on the material passing the 3-inch (75-mm) sieve

<sup>B</sup> If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

<sup>C</sup> Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

<sup>D</sup> Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay

$$^E Cu = D_{60}/D_{10} \quad Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$$

<sup>F</sup> If soil contains  $\geq 15\%$  sand, add "with sand" to group name.

<sup>G</sup> If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

<sup>H</sup> If fines are organic, add "with organic fines" to group name.

<sup>I</sup> If soil contains  $\geq 15\%$  gravel, add "with gravel" to group name.

<sup>J</sup> If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

<sup>K</sup> If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

<sup>L</sup> If soil contains  $\geq 30\%$  plus No. 200 predominantly sand, add "sandy" to group name.

<sup>M</sup> If soil contains  $\geq 30\%$  plus No. 200, predominantly gravel, add "gravelly" to group name.

<sup>N</sup> PI  $\geq 4$  and plots on or above "A" line.

<sup>O</sup> PI < 4 or plots below "A" line.

<sup>P</sup> PI plots on or above "A" line.

<sup>Q</sup> PI plots below "A" line.

