

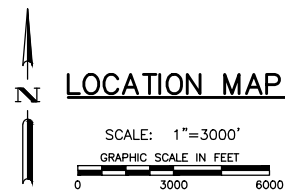
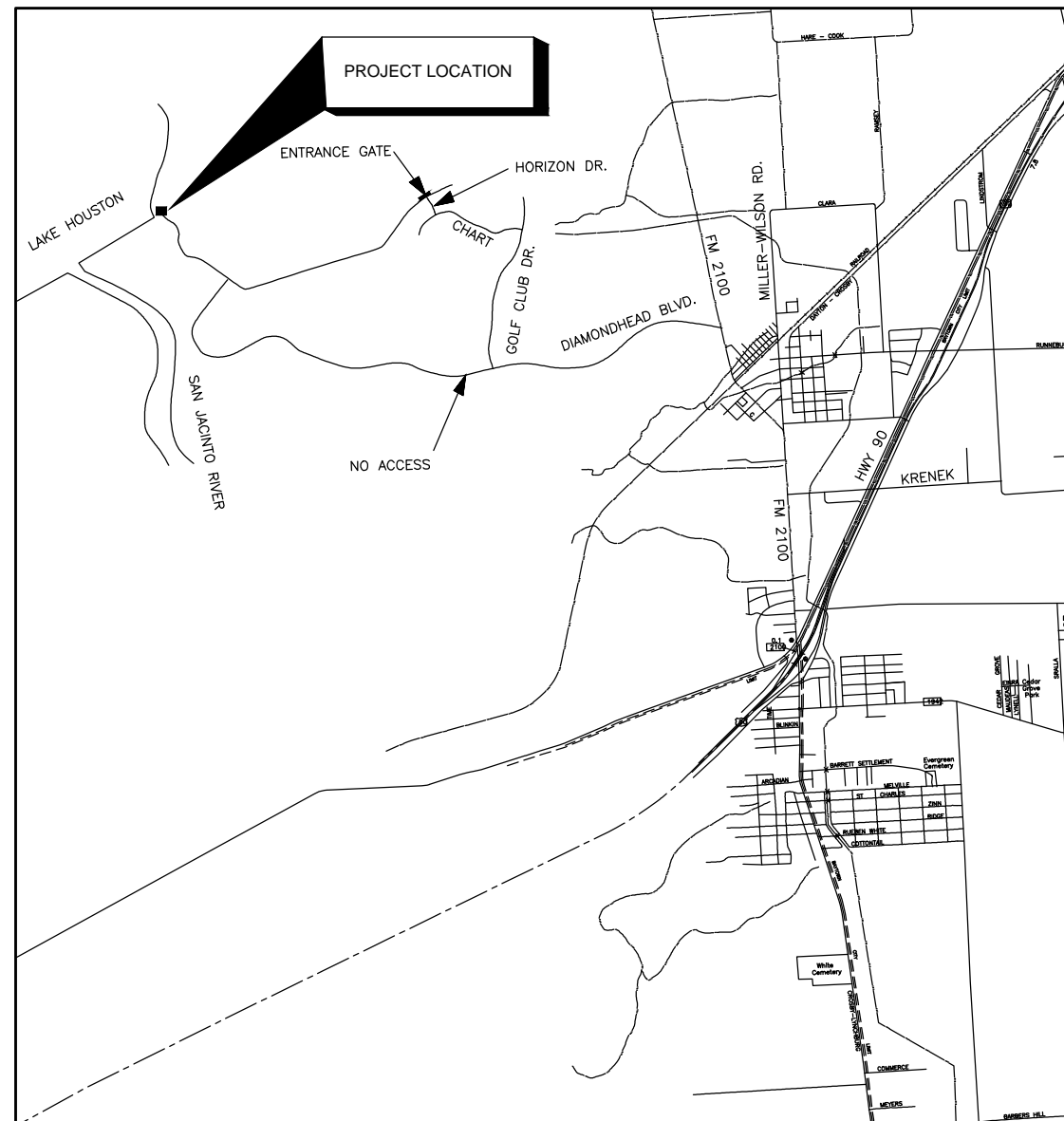
SAN JACINTO RIVER AUTHORITY

HIGHLANDS DIVISION

LAKE HOUSTON PUMP STATION DISCHARGE PIPING REHABILITATION

CSP NO. 18-0112

CONTRACT NO. 18-0112



REQUEST FOR PROPOSALS SUBMITTAL

DIRECTORS

| | |
|-----------------------------|---------------------|
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Victoria A. Foss
9-28-18

COVER

SHEET
SEQ. 1 OF 8

INDEX OF SHEETS

| SHEET NO. | DESCRIPTION |
|-----------|------------------------------------|
| | COVER |
| G-1 | SHEET INDEX AND NOTES |
| G-2 | HARRIS COUNTY EXPRESS REVIEW SHEET |
| G-3 | LEGENDS & ABBREVIATIONS |
| C-1 | SITEPLAN |
| C-2 | DISCHARGE PIPING PLAN |
| C-3 | SECTIONS AND DETAILS |
| C-4 | SLIDE GATE INSTALLATION DETAILS |

PROJECT DESCRIPTION

THE LAKE HOUSTON PUMP STATION (LHPS) HAS THREE PUMP DISCHARGE PIPES THAT HAVE SHOWN SIGNS OF WEAR AND DEGRADATION. THE CONSTRUCTION ACTIVITIES ASSOCIATED WITH THE REPAIR OF THE DAMAGED PIPES GENERALLY CONSISTS OF THE FOLLOWING:

- INSTALL, MAINTAIN, AND OPERATE (IF NECESSARY) A TEMPORARY DIVERSION PUMPING SYSTEM WITH AT LEAST 2 PUMPS AS DESCRIBED IN SPECIFICATION SECTION 33 32 00.01 – DIVERSION PUMPING TO DELIVER UP TO 30 MGD CAPACITY FROM LAKE HOUSTON TO THE SJRA MAIN CANAL. PUMPING SYSTEM SHALL REMAIN ON STANDBY AND BE READY FOR OPERATION AT ALL TIMES IN THE EVENT SJRA REQUESTS TO ENGAGE THE SYSTEM. CONTRACTOR MUST BE ABLE TO PROVIDE OPERATOR FOR SYSTEM WITHIN 4 HOURS OF REQUEST FOR OPERATION BY SJRA. THE DISCHARGE SHALL BE LOCATED DOWNSTREAM OF THE OUTLET STRUCTURE. THE DISCHARGE PIPING SHALL BE CONSTRUCTED TO CROSS BENEATH THE ACCESS ROAD(S) TO LAKE HOUSTON AS SHOWN ON THE SITEPLAN. THE SYSTEM WILL BE TEMPORARY AND INTAKE, PUMPS, PIPING, AND APPURTENANCES SHALL BE REMOVED FROM SITE AND ALL DISTURBED AREAS RESTORED TO THEIR ORIGINAL CONDITION UPON COMPLETION OF THE PROJECT. RIPRAP AND CHANNEL REGRADING WILL BE LEFT IN PLACE.
- CONSTRUCT COFFERDAM DOWNSTREAM OF OUTLET STRUCTURE IN SJRA MAIN CANAL TO PREVENT BACKFLOWS DURING 3-DAY (MAXIMUM) SHUTDOWN OF CANAL SYSTEM (TO BE COORDINATED WITH SJRA). PERFORM REGRADING OF CANAL DOWNSTREAM OF OUTLET STRUCTURE AND REMOVAL OF PORTIONS OF EXISTING RIPRAP. INSTALL NEW 18-INCH THICK BROKEN CONCRETE RIPRAP LAYER AND GROUT IN PLACE.
- INSTALL OWNER FURNISHED STAINLESS STEEL SLIDE GATE ON THE VERTICAL FACE OF THE EXISTING HEADWALL AT THE OUTLET STRUCTURE. THE NEWLY INSTALLED SLIDE GATE WILL PROVIDE THE ABILITY TO DEWATER THE JUNCTION BOX WHILE KEEPING PUMP NO. 4 IN OPERATION DURING THE PROJECT. PERFORM HEADWALL REPAIRS TO THE STRUCTURE AS NECESSARY TO INSTALL THE SLIDE GATE PER MANUFACTURERS INSTRUCTIONS.
- PERFORM DISASSEMBLY OF PUMP COMPONENTS, DRESSER COUPLING, AND DISCHARGE PIPING SPOOL PIECE FOR PUMPS NO. 2 AND 3 AND SHIFT PUMPS TO PROVIDE WORKING ACCESS TO REPAIR AREAS (TO BE PERFORMED BY WEISINGER INC.).
- DEWATER THE JUNCTION BOX AND PROVIDE ACCESS THROUGH THE EXISTING FLAP GATES FOR ACCESS TO THE PIPING REPAIR AREAS. NEWLY INSTALLED SLIDE GATE HAS AN ALLOWABLE LEAKAGE RATE AND MAY NOT PROVIDE A 100% WATER TIGHT SEAL. MAINTAIN DRY CONDITIONS IN WORK AREA AND JUNCTION BOX THROUGHOUT DURATION OF REPAIR WORK.
- PREPARE THE INSIDE OF THREE EXISTING PUMP DISCHARGE PIPES AND INSTALL A CARBON FIBER REINFORCED POLYMER (CFRP) SYSTEM INSIDE THE PIPES FROM THE UPSTREAM END OF THE PIPE IN THE PUMP STATION TO THE DOWNSTREAM END OF THE REDUCER FOR PIPE SEGMENT 3 AND TO THE DOWNSTREAM END OF THE BEND FOR PIPE SEGMENTS 1 AND 2 AS SHOWN ON THE DRAWINGS.
- PREPARE THE INSIDE OF EXISTING PUMP DISCHARGE PIPES AS REQUIRED TO REPAIR DAMAGED AREAS WITH PORTLAND CEMENT MORTAR AS SHOWN ON THE DRAWINGS AND AS SPECIFIED IN SPECIFICATION SECTION 03 31 32 – CONCRETE FINISHING AND REPAIR OF SURFACE DEFECTS.
- PROVIDE VIDEO INSPECTION FOR COMPLETED PIPE REPAIRS TO BE REVIEWED BY OWNER AND OWNER'S REPRESENTATIVE PRIOR TO ACCEPTANCE.
- PERFORM REASSEMBLY OF PUMP COMPONENTS, DRESSER COUPLING, AND DISCHARGE PIPING SPOOL PIECE FOR PUMPS NO. 2 AND 3 ONCE PIPE REPAIR HAS BEEN INSPECTED AND APPROVED BY OWNER AND/OR OWNER'S REPRESENTATIVE. PUMP AND PIPING REASSEMBLY TO BE PERFORMED BY WEISINGER INC.
- DEMOLIBLIZE DIVERSION PUMPING SYSTEM AFTER PUMPS NO. 2 AND 3 HAVE BEEN OPERATIONAL FOR AT LEAST 48 HOURS.
- PERFORM RESTORATION OF SITE (INCLUDING REMOVAL OF DIVERSION PUMPING DISCHARGE PIPE CROSSING AND ROAD REPLACEMENT) AND HYDROMULCHING/SODDING FOR DISTURBED AREAS.
- PROVIDE TRAFFIC CONTROL AND FLAGMAN DURING DISCHARGE CANAL WORK, MOBILIZATION OF DIVERSION PUMPING SYSTEM AND MATERIAL DELIVERIES.

GENERAL NOTES

- THE FOLLOWING NOTES ARE GENERAL AND APPLY TO ALL SHEETS OF THESE CONSTRUCTION DRAWINGS AS IF THEY WERE WRITTEN ENTIRELY ON EACH SHEET.
- SCALES NOTED ON DRAWINGS ARE ASSOCIATED WITH FULL SIZE DRAWINGS (22-IN X 34-IN).
- CONTRACTOR SHALL COORDINATE ALL WORK, RFIs, AND FIELD CHANGES WITH THE CONSTRUCTION MANAGER.
- CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND BONDS PRIOR TO START OF CONSTRUCTION WORK.
- THE CONTRACTOR SHALL PROVIDE ALL SHEETING/SHORING REQUIRED TO PROTECT EXISTING STRUCTURES, PIPES AND FACILITIES, WHETHER OR NOT INDICATED ON THE DRAWINGS.
- CLEARING PROJECT SITE WITH FIRE IS NOT ALLOWED.
- NO FIREARMS SHALL BE PERMITTED ON SITE.
- CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING REQUIRED SECURITY TO PROTECT HIS/HER PROPERTY, EQUIPMENT, WORK IN PROGRESS AND COMPLETED WORK.
- CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING HIS/HER PROPERTY, EQUIPMENT, WORK IN PROGRESS AND COMPLETED WORK FROM ALL WEATHER CONDITIONS AT NO ADDITIONAL COST TO SJRA.
- CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THE SAFETY OF HIS/HER LABORERS (INCLUDING OF ALL SUB-CONTRACTORS) FOR THE ENTIRE DURATION OF THE PROJECT.
- CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ADEQUATE DETERRENENTS TO PREVENT THE PUBLIC FROM ACCESSING THE PROJECT SITE.
- CONTRACTOR SHALL BE RESPONSIBLE FOR CLEAN-UP OF THE SITE AND ADJOINING ACCESS ROADS DURING ALL ASPECTS OF THE CONSTRUCTION. SITE AND IMPACTED ACCESS ROADS SHALL BE CLEAR OF TRASH AT THE END OF CONSTRUCTION EVERY DAY. ALL ACCESS ROADS TO BE RESTORED TO ORIGINAL OR BETTER CONDITION AT NO COST TO SJRA UPON COMPLETION OF THE PROJECT.
- CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING EXISTING STRUCTURES, UTILITIES, TREES, SHRUBS, FENCES, AND OTHER ADJOINING FACILITIES, AND SHALL REPAIR OR REPLACE TO ORIGINAL OR BETTER CONDITION IF DAMAGE IS CAUSED BY CONTRACTOR AT NO COST TO OWNER. THIS ALSO INCLUDES SHEETING/SHORING REQUIRED TO PROTECT EXISTING STRUCTURES, PIPES, FACILITIES, AND ACCESS ROADS. WHETHER OR NOT INDICATED ON THE DRAWINGS, SOME DIMENSIONS AND ELEVATIONS RELATED TO EXISTING STRUCTURES WERE OBTAINED FROM PREVIOUS SURVEYS AND CONSTRUCTION/RECORD DRAWINGS. ALL EXISTING DIMENSIONS AND ELEVATIONS SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR. CONTRACTOR SHALL NOTIFY OWNER'S REPRESENTATIVE IF THERE IS A CONFLICT BETWEEN THE CONTRACT DOCUMENTS AND EXISTING CONDITIONS BEFORE PROCEEDING WITH WORK.
- CONTRACTOR SHALL MAINTAIN ADEQUATE SITE DRAINAGE TO ENSURE A DRY WORK AREA AT ALL TIMES DURING CONSTRUCTION.
- CONTRACTOR SHALL PREVENT RUTS OR DAMAGE TO ANY AREA WITHIN THE LIMITS OF CONSTRUCTION. THIS INCLUDES, BUT IS NOT LIMITED TO ANY PORTION OF THE CANAL SLOPES, LEVEES (CREST AND SLOPES), AND OUTSIDE LEVEE TOES. ALL INCIDENTAL DAMAGE SHALL BE REPAIRED IMMEDIATELY AT NO COST TO OWNER.
- OBTAIN AND COMPLY WITH ALL APPLICABLE CITY, COUNTY, STATE, AND FEDERAL PERMITS AND APPROVALS, WITH ASSISTANCE FROM OWNER'S REPRESENTATIVE, IF NECESSARY.
- IMMEDIATELY RECONSTRUCT ALL DRAINAGE CHANNELS AND OUTFALLS DISTURBED BY CONSTRUCTION TO ORIGINAL OR BETTER CONDITION AND UTILIZING SAME FLOWLINES AND HYDRAULIC CAPACITY. UTILIZE RIP RAP WHERE NECESSARY TO PREVENT EROSION OF CANAL OR LAKE HOUSTON EXISTING EMBANKMENTS.

PROJECT SPECIFIC NOTES

- CONTRACTOR SHALL SOD AND/OR HYDROMULCH ALL AREAS TO ESTABLISH GRASS TO OWNER STANDARDS FOR AREAS NOT COVERED BY A STRUCTURE THAT HAVE BEEN DISTURBED BY CONSTRUCTION ACTIVITIES EXCEPT THE CHANNEL BOTTOM AND WHERE PERMANENT STRUCTURAL EROSION MEASURES ARE USED. SEE DRAWINGS FOR LOCATION OF SOD AND HYDROMULCH AREAS AND REFER TO SPECIFICATION SECTION 32 90 00 – SEEDING, SODDING AND LANDSCAPING AND SPECIFICATION SECTION 32 92 13 – HYDROMULCHING.
- COASTAL WATER AUTHORITY (CWA) PLANS TO INSTALL AN AERIAL FIBER OPTIC LINE IN THE VICINITY OF THE PROJECT AS SHOWN ON THE DRAWINGS. THE AERIAL FIBER INSTALLATION CONTRACTOR MAY BE INSTALLING THE FIBER LINES DURING THIS PROJECT. CONTACT GABRIEL GONZALEZ (PURE SPEED LIGHTWAVE) AT 832-917-5565 FOR COORDINATION.
- CWA WILL BE REHABILITATING THE LAKE HOUSTON DAM DURING THIS PROJECT AND THE CONSTRUCTION CONTRACTOR WILL BE UTILIZING THE ACCESS ROAD FOR THEIR WORK ON THE EAST SIDE OF THE DAM. CONTACT PAT GIORDANO (CWA) AT 713-252-2316 FOR COORDINATION.
- SJRA WILL PROVIDE A THREE (3) DAY CANAL SHUTDOWN FOR CONTRACTOR TO INSTALL THE SLIDE GATE AND DIVERSION PUMPING OUTFALL WORK. CONTRACTOR TO PROVIDE FOURTEEN (14) CALENDAR DAY NOTICE PRIOR TO REQUESTED SHUTDOWN.
- AN INTERNAL PIPE INSPECTION AND ASSESSMENT OF THE PUMP 1, 2 & 3 DISCHARGE LINES WAS PERFORMED BY V&A CONSULTING ENGINEERS IN JUNE 2017. REFER TO REPORT FOR EXISTING PIPE CONDITIONS AND PHOTOGRAPHS.

UTILITY AND PIPELINE COMPANY COORDINATION NOTES

- EXISTING STRUCTURES, UTILITIES AND PIPELINES (PRIVATE AND PUBLIC) ARE SHOWN FROM AVAILABLE RECORDS AT THE TIME THESE CONSTRUCTION DRAWINGS WERE PREPARED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING AND VERIFYING THE LOCATION AND DEPTH OF ALL EXISTING STRUCTURES, UTILITIES AND PIPELINES WITHIN THE CONSTRUCTION AREA PRIOR TO THE BEGINNING OF CONSTRUCTION. THE CONTRACTOR SHOULD CONTACT THE HOUSTON AREA UTILITY COORDINATION COMMITTEE 48 HOURS IN ADVANCE OF BEGINNING WORK (713-223-4567). THE CONTRACTOR SHALL INCLUDE COST IN HIS/HER PROPOSAL FOR TEMPORARILY RELOCATING AND REINSTALLING EXISTING STRUCTURES, UTILITIES AND PIPELINES AS REQUIRED FOR CONSTRUCTION OF THE PROPOSED WORK. COST CONSIDERATIONS MUST BE GIVEN FOR BACKFILL, ENCASEMENT, SUPPORTS, RESTRAINTS, FITTINGS, VALVES, HEAT TRACINGS, INSULATION AND ANY TYPICAL OR SPECIAL COATINGS THAT ARE APPLIED TO THE INTERIOR AND/OR EXTERIOR OF THE PIPING AND ITS APPURTENANCES. ANY DAMAGE TO EXISTING STRUCTURES, UTILITIES AND PIPELINES SHALL BE RESTORED AT NO ADDITIONAL COST TO SJRA. IN ADDITION, CONTRACTOR SHOULD NOTIFY OWNER'S REPRESENTATIVE IF THERE IS A CONFLICT BETWEEN THE CONTRACT DOCUMENTS AND EXISTING CONSTRUCTION BEFORE PROCEEDING WITH WORK.
- CONTRACTOR SHOULD OBSERVE ANY/ALL ELECTRIC LINES WITHIN THE PROJECT LIMITS. CONTRACTOR SHOULD COORDINATE WITH THE APPROPRIATE UTILITY COMPANY FOR A TEMPORARY POWER SHUTDOWN (SHOULD THE CONTRACTOR'S MEANS AND METHODS NECESSITATE POTENTIAL CONSTRUCTION CONFLICTS OR SAFETY CONCERNS, I.E. ELECTRICAL ARCINGS).
- EXCAVATION TO TAKE PLACE ADJACENT (WITHIN 5 FEET) TO AND/OR ACROSS EXISTING UTILITIES OR PIPELINES (REMAINING IN PLACE) SHALL BE EXCAVATED BY HAND AND IN SUCH A MANNER AS TO AVOID DAMAGE TO THE EXISTING FACILITIES.
- NO PROPOSED TEMPORARY UTILITY OR PIPELINE RELOCATION WILL BE ALLOWED.

ENVIRONMENTAL NOTES

- AS PER AN AGREEMENT WITH THE HARRIS COUNTY FLOOD CONTROL DISTRICT, THE CONTRACTOR AGREES TO OBTAIN ALL NECESSARY PERMITS PRIOR TO CONSTRUCTION WITHIN THE 100-YEAR FLOODPLAIN.
- TO ENSURE COMPLIANCE WITH THE MIGRATORY BIRD TREATY ACT, THE CONTRACTOR WILL REFRAIN FROM CONSTRUCTION ACTIVITIES SUCH AS, BUT NOT LIMITED TO, TREE FELLING AS WELL AS VEGETATION CLEARING, TRAMPLING, OR MAINTENANCE WITHIN THE MARCH TO AUGUST MIGRATORY BIRD NESTING SEASON OF EACH YEAR THE PROJECT IS AUTHORIZED AND LASTING FOR THE LIFE OF THE PROJECT, UNLESS AN ACTIVE MIGRATORY BIRD NEST SURVEY IS PERFORMED BY A QUALIFIED BIOLOGIST PRIOR TO CONSTRUCTION, TO AVOID AND MINIMIZE POTENTIAL IMPACTS. ANY VEGETATION OR BARE GROUND WITHIN AT LEAST 25 FEET OF OCCUPIED NESTS SHOULD NOT BE DISTURBED UNTIL THE EGGS HAVE HATCHED AND THE YOUNG HAVE FLEDGED. CONSTRUCTION ACTIVITIES SHOULD BE EXCLUDED FROM A MINIMUM ZONE OF 100 METERS SURROUNDING ANY RAPTOR NEST FROM FEBRUARY 1 THROUGH JULY 15 IN ORDER TO AVOID DISTURBANCE TO RAPTOR NESTS.
- TO ENSURE COMPLIANCE WITH THE TEXAS PARKS AND WILDLIFE CODE, THE CONTRACTOR WILL INCORPORATE ACTIONS INTO THE PROJECT TO AVOID IMPACTS TO ALLIGATOR SNAPPING TURTLES. THE CONTRACTOR WILL INFORM EMPLOYEES OF THE POTENTIAL FOR ALLIGATOR SNAPPING TURTLES TO OCCUR WITHIN OR NEAR THE PROJECT CANALS.
- STANDARD EMERGENCY CONDITIONS APPLY FOR THE DISCOVERY OF CULTURAL RESOURCES.
- STANDARD EMERGENCY CONDITIONS APPLY FOR THE DISCOVERY OF THREATENED AND ENDANGERED SPECIES.



TEXAS WATER ENGINEERING, PLLC.
Texas Registered Engineering Firm F-8482



9-28-18

SAN JACINTO RIVER AUTHORITY HIGHLANDS DIVISION



LAKE HOUSTON PUMP STATION DISCHARGE PIPING REHABILITATION

| ISSUE | DATE | DESCRIPTION |
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SHEET INDEX AND NOTES

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|-------|--------|
| SHEET | G-1 |
| SEQ. | 2 OF 8 |

RFP SUBMITTAL

1. PAVING (FOR H.C. PUBLIC R.O.W. ONLY) TABLE WITH COLUMNS: DESIGN THICKNESS OF PAVING (IN.), STABILIZED SUBGRADE DEPTH (IN.), DESIGN STRENGTH OF CONCRETE (PSI), STEEL SPACING LONG. (IN.), TRANS. (IN.), REINFORCEMENT STEEL SIZE (#4 MIN.)

DRIVEWAYS (in H.C. ROW only) TABLE WITH COLUMNS: DRWAY, WIDTH, MATERIAL, CULVERT, CULVERT LENGTH, NEAREST X-STREET, DIST. TO X-STREET

II. HARRIS COUNTY STANDARD DRIVEWAY DETAIL APPEARS ON SHEET FIRE APPARATUS ACCESS ROAD

III. ISLANDS AND MEDIANS REQUIRE STANDARD 6" CURBING

IV. TRAFFIC SIGNAL

V. TRAFFIC IMPACT ANALYSIS

TRAFFIC CONSIDERATIONS I. MEDIAN CUTS II. LEFT / RIGHT TURN LANE III. TRAFFIC CONTROL PLAN IV. TRAFFIC SIGNAL V. TRAFFIC IMPACT ANALYSIS

2. RESIDENTIAL / SUBDIVISION DRAINAGE I. PROPOSED DRAINAGE SYSTEM TYPE II. DESIGN METHOD USED III. DRAINAGE SYSTEM OUTFALLS DIRECTLY TO EXISTING

IV. H.C. OUTFALL CALCULATIONS V. DETENTION PROVIDED BY VI. PUMPED DETENTION FACILITIES

OFFSITE SHEET FLOW: (100 YEAR)

OFFSITE SHEET FLOW MAPPING, TOTAL DISCHARGE CALCULATIONS, AND DESIGN ACCOMMODATIONS ARE SHOWN ON SHEET OR, AS REPRESENTED IN THE APPROVED DRAINAGE STUDY ENTITLED

3. COMMERCIAL / OTHER SITE DRAINAGE I. PROPOSED DRAINAGE AREA II. DETENTION VOLUME III. OUTFALL

IV. PUMPED DETENTION FACILITIES V. FLOW RESTRICTOR SIZE

NOTE: ALL ROADSIDE DITCH OUTFALLS REQUIRE EROSION CONTROL MEASURES RIBRAP IS NOT ALLOWED AS AN EROSION CONTROL MEASURE IN HARRIS COUNTY ROW ALL PUMPED DETENTION OUTFALLS TO ROADSIDE DITCHES REQUIRE MANHOLE W/ LEADS

4. WATER AND WASTEWATER I. COMMERCIAL PROJECTS II. SUBDIVISION PROJECTS

NOTE: ALL EXISTING AND PROPOSED UTILITIES MUST BE ACCURATELY SHOWN & LABELED ON THE SITE PLANS.

NOTE: A COPY OF TCEQ APPROVAL FOR PRIVATE WATER & WASTE WATER SYSTEMS IS REQUIRED FOR PLAN APPROVAL

5. DESCRIPTION OF PROPERTY I. LEGAL DESCRIPTION II. PLATTING III. JURISDICTIONS IV. HOAD ACCOUNT NOS. (ALL) V. UNOBSTRUCTED VISIBILITY EASMENT (U.V.E.)

NOTE: ALL APPROVED FINAL PLATS AND ASSOCIATED CPC101 FORMS MUST BE INCLUDED WITH PLAN SUBMITTAL

6. STORMWATER QUALITY I. SWPPP: CONSTRUCTION MEASURES II. EXEMPT NEW DEVELOPMENT III. PERMANENT SWQ FEATURES

NOTE: ALL APPROVED FINAL PLATS AND ASSOCIATED CPC101 FORMS MUST BE INCLUDED WITH PLAN SUBMITTAL

7. FLOOD CONTROL DISTRICT CRITERIA I. DETENTION SUMMARY II. FLOODPLAIN STORAGE SUMMARY III. HCFCD STANDARD NOTES

STORMWATER DETENTION BASIN ROUTING TABLE TABLE WITH COLUMNS: DETENTION BASIN, DETENTION BASIN AREA, MAX. BASIN DRAIN TIME, DETENTION BASIN PEAK, DETENTION BASIN SURFACE ELEVATION, PEAK STORAGE, STORAGE RATE

STORMWATER DRAINAGE DESIGN REPORT REPORT TITLE, REPORT DATE, DATE OF ACCEPTANCE BY HCFCD OR FLOODPLAIN ADMINISTRATOR

NOTES I. COMPLETE ONLY IF HCFCD OR HARRIS COUNTY IS REQUIRING DETENTION II. COMPLETE ONLY IF PROJECT HAS WITHIN 10' OR IS IMMEDIATELY ADJACENT TO AN EXISTING OR PROPOSED HCFCD MAINTAINED CHANNEL OR DETENTION BASIN

8. FLOOD PLAIN STATUS I. GENERAL INFORMATION II. FLOOD PLAIN DETERMINATION BASED ON GROUND ELEVATION III. FLOODPLAIN STORAGE SUMMARY

IV. CLOMR REQUIRED

FOR PROJECTS LOCATED IN ANY FLOODPLAIN Development construction or placed in accordance with these plans will comply with all provisions of the Regulations of Harris County, Texas for Floodplain Management

9. WORK IN HCFCD RIGHT-OF-WAY I. TYPE OF WORK TO BE PERFORMED IN CHANNEL II. USACE ENVIRONMENTAL PERMIT III. REFERENCE / BASIS OF DETERMINATION

IV. BENCHMARK REQUIREMENTS FOR PROPOSED BRIDGES AND/OR NEW RESIDENTIAL SUBDIVISIONS

When the County Engineer has determined that a new benchmark will be required to be established for the proposed project, the developer shall be required to install a benchmark per section 8.0, part 2 of the Harris County Infrastructure Regulations

10. PERMITS REQUIRED I. DOES THE PROPERTY HAVE ANY VIOLATIONS? II. STORM WATER QUALITY III. CIVIL SITE WORK

WORK IN HARRIS COUNTY R.O.W. I. UTILITY WORK II. LEFT TURN LANE III. OTHER CONSTRUCTION

NOTES I. A PERMIT IS REQUIRED FOR EACH SCOPE OF WORK ON SITE II. A NOTIFICATION IS REQUIRED FOR EACH SCOPE OF WORK IN HC OR HCFCD ROW

11. CURB RAMPS I. ARE CURB RAMPS THAT CONNECT TO PUBLIC STREETS PROPOSED IN THIS SET OF PLANS?

12. LANDSCAPING I. REQUIRED AND SHOWN ON SHEET(S) II. NOT REQUIRED

REVISIONS TABLE WITH COLUMNS: DATE, SHEET NO., DESCRIPTION, P.E. INITIAL, H.C. APPROVED DATE

HARRIS COUNTY PROJECT NO. SHEET NUMBER 3 OF 8

Texas Water Engineering logo and address: TEXAS WATER ENGINEERING, PLLC, Texas Registered Engineering Firm F-8482

Professional Engineer Seal for Victoria A. Foss, License No. 90945

SAN JACINTO RIVER AUTHORITY HIGHLANDS DIVISION logo and project name: LAKE HOUSTON PUMP STATION DISCHARGE PIPING REHABILITATION

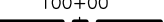



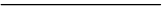





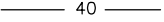



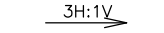

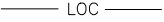









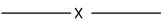



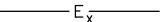









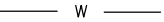







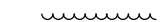

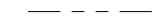

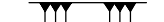





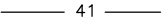

ISSUE DATE DESCRIPTION table and SECTION & DETAILS SHEET 6-2 SEQ. 3 OF 8

HARRIS COUNTY ENGINEERING DEPARTMENT REVIEW SHEET

SCHEDULE OF TYPICAL ABBREVIATIONS
(NOT ALL ABBREVIATIONS MAY BE USED)

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|---|----------|---|----------|--|----------|---|----------|---|----------|--|----------|--|----------|--|----------|---|----------|--------------------------------|----------|--------------------------|----------|--|----------|---|----------|---|----------|---|
| A | ANCHOR BOLT APPROXIMATELY ASPHALT ACRE ALUMINUM | B | BASELINE BENCH MARK BOTTOM BOTTOM OF CONCRETE BOTTOM OF WALL BELOW BETWEEN BITUMEN BACKWALL BOTH WAYS BASIN BUILDING BOTTOM OF SLAB | C | CHANNEL CENTER TO CENTER CARBON FIBER REINFORCED POLYMER COUNTY CLERK'S FILE NUMBER CUBIC FEET PER SECOND CAST IN PLACE CONTROL JOINT CENTERLINE CLEAR CONCRETE CONSTRUCTION CONTINUOUS CONTRACTOR CAMERA CLEANOUT CORRUGATED METAL PIPE CITY OF HOUSTON | D | DOUBLE DETAIL DIAMETER DUCT DIVERSION BOX DOWNSTREAM | E | EACH EAST ELEVATION ETHYLENE PROPYLENE DIENE MONOMER EACH WAY EXISTING EXPOSED EXPANSION JOINT (OR EJ) | F | FINISH FLOOR FILM CODE NUMBER FINISH FLOOR ELEVATION FIRE HYDRANT FINISH FLOW LINE FOUND FEET | G | GAUZE GALVANIZED GROUND GROUND SURFACE GRADE | H | HORIZONTAL HOUR HEIGHT HARRIS COUNTY HARRIS COUNTY DEED RECORDS HARRIS HARRIS COUNTY FLOOD CONTROL DISTRICT HARRIS COUNTY MAP RECORDS HIGH DENSITY POLYETHYLENE | I | INSIDE DIAMETER INSIDE FACE INCH IRON PIPE IRON ROD | J | JUNCTION JUNCTION STRUCTURE | K | KEYED CONSTRUCTION JOINT | L | LENGTH LINEAR FEET LEFT LEVEL LOUVER | M | MAINTENANCE/MAINTAINED MATERIAL MAXIMUM METAL MANUFACTURER MANHOLE MINIMUM MILLION GALLONS PER DAY | N | NOMINAL NORTH NUMBER NOT TO SCALE NORMAL WATER SURFACE ELEVATION | O | ON CENTER ON CENTER, EACH WAY OUTSIDE DIAMETER OUTSIDE FACE OVERHEAD OVERHEAD ELECTRIC OVERHEAD TELEPHONE OVERHEAD ELECTRIC TRANSMISSION LINES ORDINARY HIGH WATER MARK OPENING OFFICIAL PUBLIC RECORDS OF REAL PROPERTY HARRIS COUNTY |
|----------|---|----------|---|----------|--|----------|---|----------|---|----------|--|----------|--|----------|--|----------|---|----------|--------------------------------|----------|--------------------------|----------|--|----------|---|----------|---|----------|---|

| | | | | | | | | | | | | | |
|----------|---|----------|--|----------|---|----------|---|----------|--|----------|--------------------|----------|--|
| P | PROPERTY LINE POLYVINYL CHLORIDE PIPE PAVEMENT PAGE PROPOSED POLYPROPYLENE | R | RADIUS REFER TO REFERENCE REINFORCING (REINFORCED) REINFORCING CONCRETE PIPE REQUIRED RETAINING REVERSE ROUGH OPENING RIGHT RIGHT OF WAY | S | SANITARY SECTION SLAB BEAM SCHEDULE SHEET SIMILAR SAWCUT JOINT SOUTH SPECIFICATIONS SQUARE STAINLESS STEEL SANITARY SEWER MANHOLE STATION STANDARD STEEL STRUCTURAL SAN JACINTO RIVER AUTHORITY | T | TREAD OR THICKNESS TO BE DETERMINED TOP AND BOTTOM TOP OF CURB TEMPERATURE TOP OF BANK TOP OF CONCRETE TOP OF JOIST TOP OF SLAB TOP OF WALL TOP OF PIPE TEXAS WATER ENGINEERING, PLLC TEMPORARY WATER SURFACE ELEVATION TYPICAL SLAB TEXAS DEPARTMENT OF TRANSPORTATION | U | ULTRA-HIGH-MOLECULAR-WEIGHT POLYETHYLENE UPSTREAM UNDERGROUND UNDERGROUND ELECTRIC UNDERGROUND TELEPHONE | V | VERTICAL VOLUME | W | WEST WITH WITHOUT WEATHERPROOF OR WORKING POINT WATERPROOFING WATER STOP WATER SURFACE ELEVATION |
|----------|---|----------|--|----------|---|----------|---|----------|--|----------|--------------------|----------|--|

| | | | |
|---|--|---|--------------------------|
|  | PROJECT BASELINE |  | DIAMETER |
|  | EXISTING STRUCTURE AND PIPE |  | PLATE |
|  | NEW STRUCTURE AND PIPE |  | BENCHMARK |
|  | ITEMS TO BE DEMOLISHED OR ABANDONED IN PLACE |  | BORE HOLE |
|  | CENTERLINE |  | TREE |
|  | FINISH GRADE CONTOUR MAJOR |  | SIGN |
|  | FINISH GRADE CONTOUR MINOR |  | MAIL BOX |
|  | SLOPE (3 HORIZONTAL TO 1 VERTICAL) |  | LIGHT POLE |
|  | LIMITS OF CONSTRUCTION |  | SJRA MONU. |
|  | TEMPORARY SILT FENCE |  | STORM MANHOLE |
|  | BREAK LINE |  | ELECTRIC MANHOLE |
|  | WOODEN FENCE |  | WATER VALVE |
|  | WOODEN FENCE |  | FIRE HYDRANT |
|  | CHAIN LINK FENCE |  | WATER METER |
|  | GASLINE |  | GAS METER |
|  | ELECTRICAL POWER |  | GAS VALVE |
|  | OVERHEAD ELECTRIC |  | POWER POLE |
|  | UNDERGROUND COMMUNICATION |  | GUY WIRE |
|  | TELEPHONE |  | DIRECTION OF FLOW |
|  | TOP OF BANK |  | SIGNAL POLE |
|  | WATER |  | ELECTRIC BOX |
|  | STORMDRAIN |  | CONCRETE - SECTION |
|  | GUARD RAIL/HAND RAIL |  | SAND OR GROUT - SECTION |
|  | EDGE OF ASPHALT |  | FINISH OR NATURAL GRADE |
|  | TREE LINE/BRUSH LINE |  | EXISTING CONCRETE |
|  | R.O.W. LINE |  | GRAVEL - SECTION |
|  | TOP OF BANK |  | REINFORCEMENT IN SECTION |
|  | TOE |  | RIPRAP |
|  | EXISTING CONTOUR MAJOR |  | GRADED SIDE SLOPE-INFILL |
|  | EXISTING CONTOUR MINOR |  | GRADED SIDE SLOPE-INCUT |

NOTE:
DISCIPLINE SPECIFIC ABBREVIATIONS MAY NOT BE INCLUDED ON THIS LIST. THE INDIVIDUAL DISCIPLINE ABBREVIATIONS SUPERCEDE THIS LIST IN THE EVENT OF AN OMISSION OR CONFLICT.



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**SAN JACINTO RIVER AUTHORITY
HIGHLANDS DIVISION**

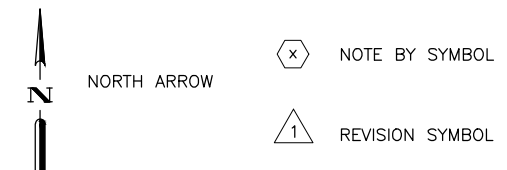
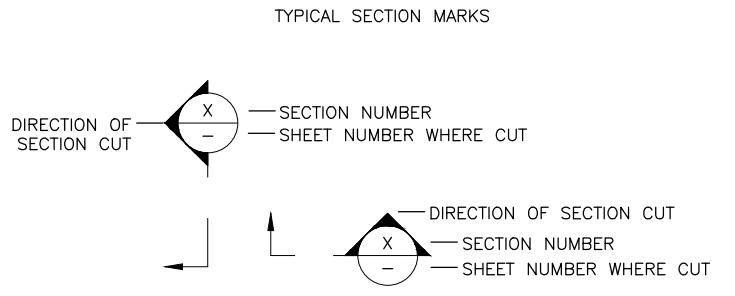
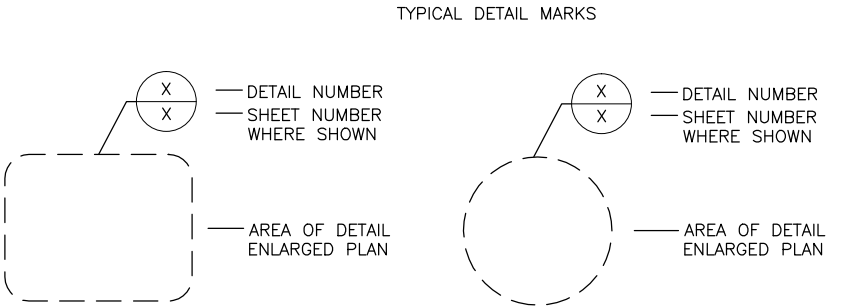
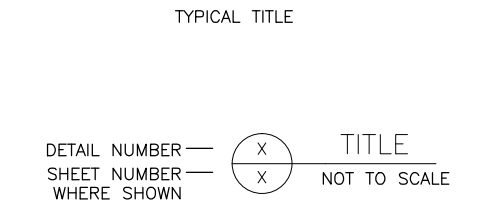


**LAKE HOUSTON PUMP
STATION DISCHARGE
PIPING REHABILITATION**

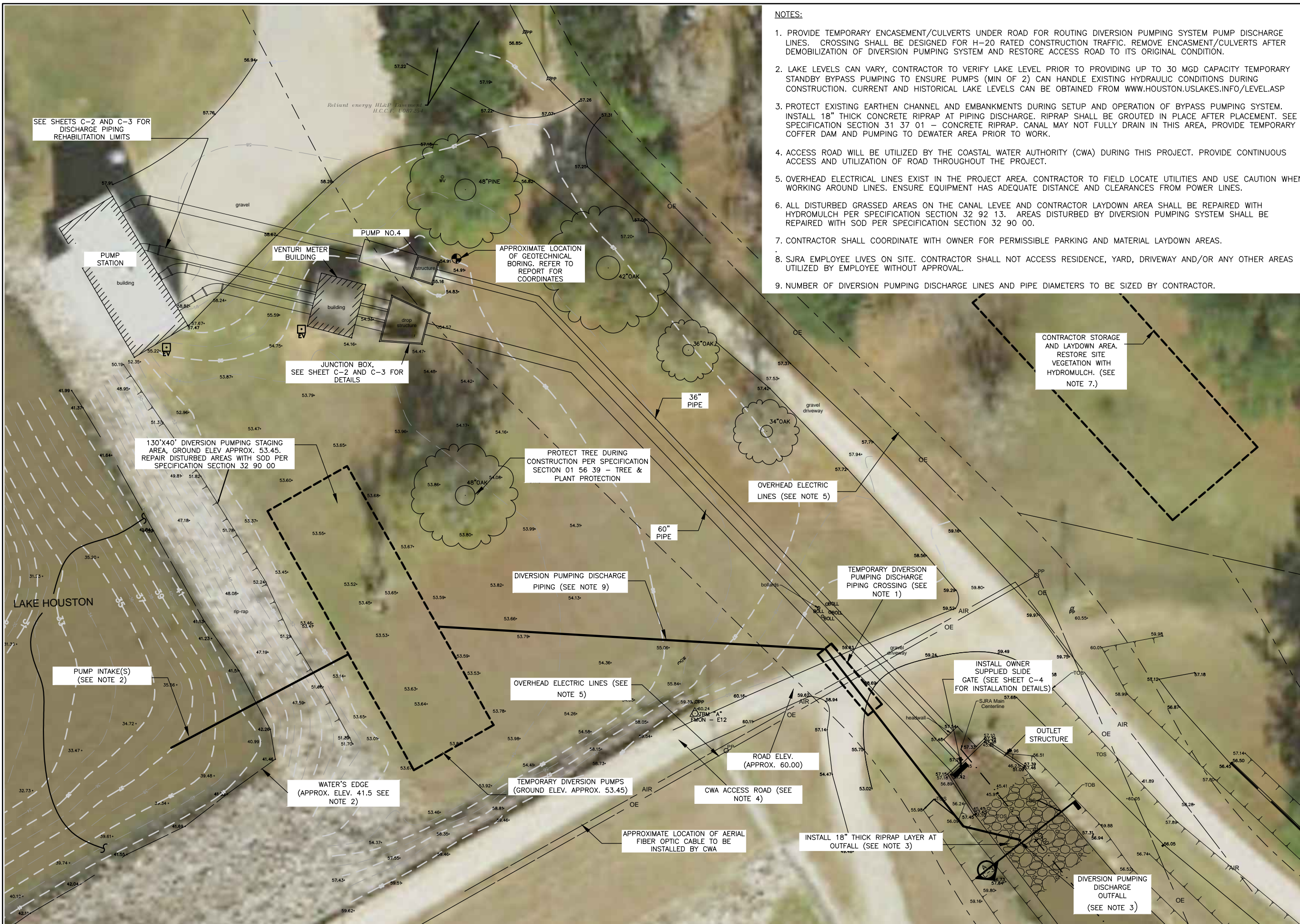
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LEGENDS & ABBREVIATIONS

SHEET **G-3**
SEQ. 4 OF 8

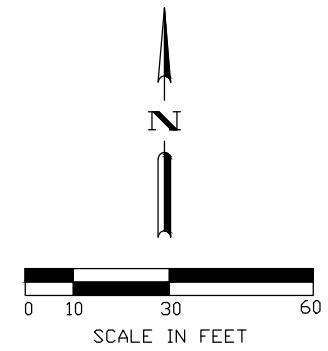


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NOTES:

1. PROVIDE TEMPORARY ENCASEMENT/CULVERTS UNDER ROAD FOR ROUTING DIVERSION PUMPING SYSTEM PUMP DISCHARGE LINES. CROSSING SHALL BE DESIGNED FOR H-20 RATED CONSTRUCTION TRAFFIC. REMOVE ENCASMENT/CULVERTS AFTER DEMOBILIZATION OF DIVERSION PUMPING SYSTEM AND RESTORE ACCESS ROAD TO ITS ORIGINAL CONDITION.
2. LAKE LEVELS CAN VARY, CONTRACTOR TO VERIFY LAKE LEVEL PRIOR TO PROVIDING UP TO 30 MGD CAPACITY TEMPORARY STANDBY BYPASS PUMPING TO ENSURE PUMPS (MIN OF 2) CAN HANDLE EXISTING HYDRAULIC CONDITIONS DURING CONSTRUCTION. CURRENT AND HISTORICAL LAKE LEVELS CAN BE OBTAINED FROM WWW.HOUSTON.USLAKES.INFO/LEVEL.ASP
3. PROTECT EXISTING EARTHEN CHANNEL AND EMBANKMENTS DURING SETUP AND OPERATION OF BYPASS PUMPING SYSTEM. INSTALL 18" THICK CONCRETE RIPRAP AT PIPING DISCHARGE. RIPRAP SHALL BE GROUTED IN PLACE AFTER PLACEMENT. SEE SPECIFICATION SECTION 31 37 01 - CONCRETE RIPRAP. CANAL MAY NOT FULLY DRAIN IN THIS AREA, PROVIDE TEMPORARY COFFER DAM AND PUMPING TO DEWATER AREA PRIOR TO WORK.
4. ACCESS ROAD WILL BE UTILIZED BY THE COASTAL WATER AUTHORITY (CWA) DURING THIS PROJECT. PROVIDE CONTINUOUS ACCESS AND UTILIZATION OF ROAD THROUGHOUT THE PROJECT.
5. OVERHEAD ELECTRICAL LINES EXIST IN THE PROJECT AREA. CONTRACTOR TO FIELD LOCATE UTILITIES AND USE CAUTION WHEN WORKING AROUND LINES. ENSURE EQUIPMENT HAS ADEQUATE DISTANCE AND CLEARANCES FROM POWER LINES.
6. ALL DISTURBED GRASSED AREAS ON THE CANAL LEVEE AND CONTRACTOR LAYDOWN AREA SHALL BE REPAIRED WITH HYDROMULCH PER SPECIFICATION SECTION 32 92 13. AREAS DISTURBED BY DIVERSION PUMPING SYSTEM SHALL BE REPAIRED WITH SOD PER SPECIFICATION SECTION 32 90 00.
7. CONTRACTOR SHALL COORDINATE WITH OWNER FOR PERMISSIBLE PARKING AND MATERIAL LAYDOWN AREAS.
8. SJRA EMPLOYEE LIVES ON SITE. CONTRACTOR SHALL NOT ACCESS RESIDENCE, YARD, DRIVEWAY AND/OR ANY OTHER AREAS UTILIZED BY EMPLOYEE WITHOUT APPROVAL.
9. NUMBER OF DIVERSION PUMPING DISCHARGE LINES AND PIPE DIAMETERS TO BE SIZED BY CONTRACTOR.



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**SAN JACINTO RIVER AUTHORITY
HIGHLANDS DIVISION**



**LAKE HOUSTON PUMP
STATION DISCHARGE
PIPING REHABILITATION**

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SCALE: AS SHOWN

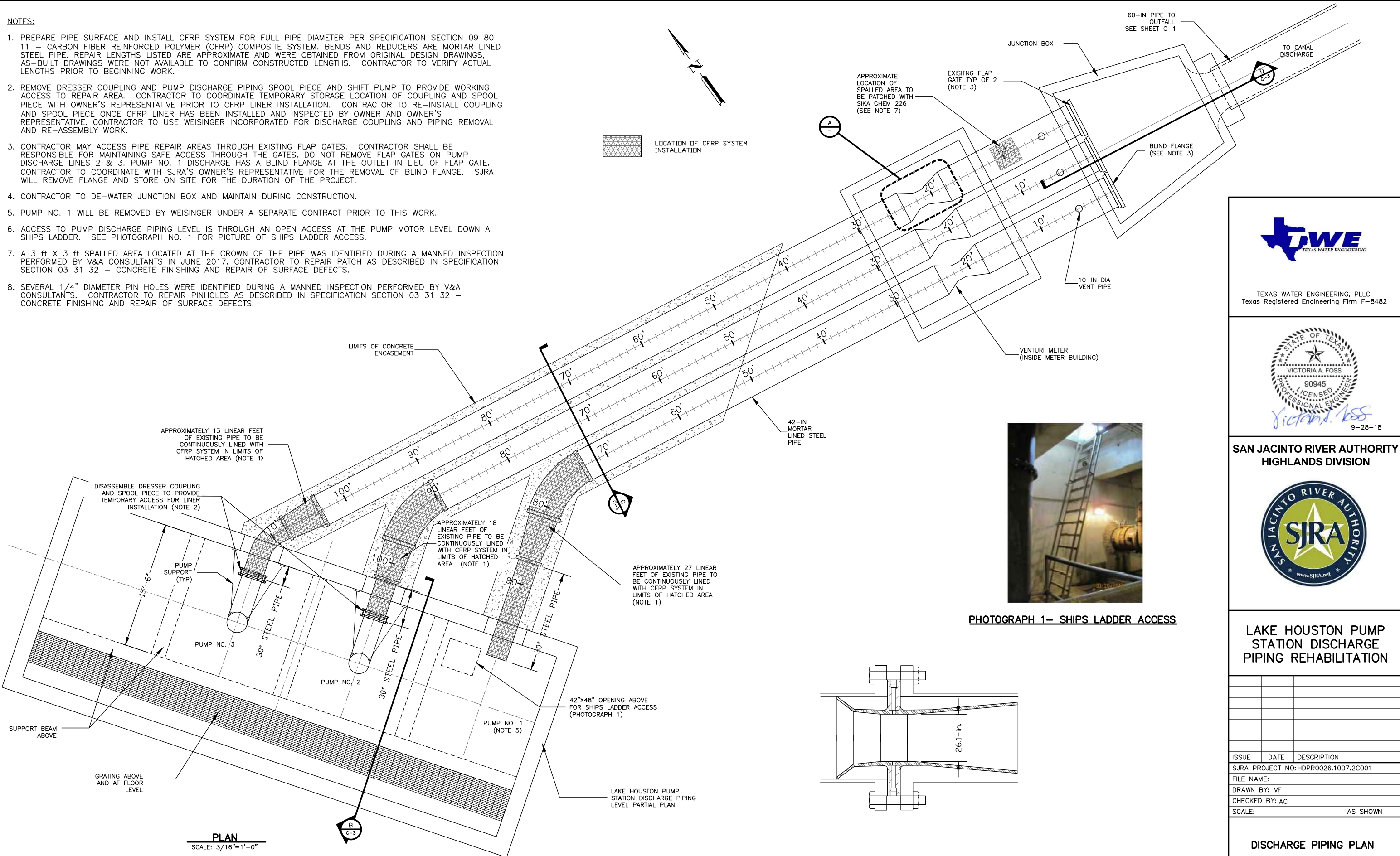
SHEET **C-1**
SEQ. 5 OF 8

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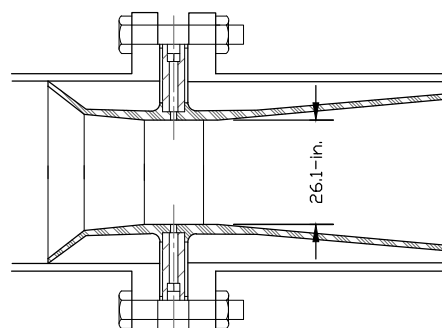
SITEPLAN

NOTES:

1. PREPARE PIPE SURFACE AND INSTALL CFRP SYSTEM FOR FULL PIPE DIAMETER PER SPECIFICATION SECTION 09 80 11 - CARBON FIBER REINFORCED POLYMER (CFRP) COMPOSITE SYSTEM. BENDS AND REDUCERS ARE MORTAR LINED STEEL PIPE. REPAIR LENGTHS LISTED ARE APPROXIMATE AND WERE OBTAINED FROM ORIGINAL DESIGN DRAWINGS. AS-BUILT DRAWINGS WERE NOT AVAILABLE TO CONFIRM CONSTRUCTED LENGTHS. CONTRACTOR TO VERIFY ACTUAL LENGTHS PRIOR TO BEGINNING WORK.
2. REMOVE DRESSER COUPLING AND PUMP DISCHARGE PIPING SPOOL PIECE AND SHIFT PUMP TO PROVIDE WORKING ACCESS TO REPAIR AREA. CONTRACTOR TO COORDINATE TEMPORARY STORAGE LOCATION OF COUPLING AND SPOOL PIECE WITH OWNER'S REPRESENTATIVE PRIOR TO CFRP LINER INSTALLATION. CONTRACTOR TO RE-INSTALL COUPLING AND SPOOL PIECE ONCE CFRP LINER HAS BEEN INSTALLED AND INSPECTED BY OWNER AND OWNER'S REPRESENTATIVE. CONTRACTOR TO USE WEISINGER INCORPORATED FOR DISCHARGE COUPLING AND PIPING REMOVAL AND RE-ASSEMBLY WORK.
3. CONTRACTOR MAY ACCESS PIPE REPAIR AREAS THROUGH EXISTING FLAP GATES. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING SAFE ACCESS THROUGH THE GATES. DO NOT REMOVE FLAP GATES ON PUMP DISCHARGE LINES 2 & 3. PUMP NO. 1 DISCHARGE HAS A BLIND FLANGE AT THE OUTLET IN LIEU OF FLAP GATE. CONTRACTOR TO COORDINATE WITH SJRA'S OWNER'S REPRESENTATIVE FOR THE REMOVAL OF BLIND FLANGE. SJRA WILL REMOVE FLANGE AND STORE ON SITE FOR THE DURATION OF THE PROJECT.
4. CONTRACTOR TO DE-WATER JUNCTION BOX AND MAINTAIN DURING CONSTRUCTION.
5. PUMP NO. 1 WILL BE REMOVED BY WEISINGER UNDER A SEPARATE CONTRACT PRIOR TO THIS WORK.
6. ACCESS TO PUMP DISCHARGE PIPING LEVEL IS THROUGH AN OPEN ACCESS AT THE PUMP MOTOR LEVEL DOWN A SHIPS LADDER. SEE PHOTOGRAPH NO. 1 FOR PICTURE OF SHIPS LADDER ACCESS.
7. A 3 ft X 3 ft SPALLED AREA LOCATED AT THE CROWN OF THE PIPE WAS IDENTIFIED DURING A MANNED INSPECTION PERFORMED BY V&A CONSULTANTS IN JUNE 2017. CONTRACTOR TO REPAIR PATCH AS DESCRIBED IN SPECIFICATION SECTION 03 31 32 - CONCRETE FINISHING AND REPAIR OF SURFACE DEFECTS.
8. SEVERAL 1/4" DIAMETER PIN HOLES WERE IDENTIFIED DURING A MANNED INSPECTION PERFORMED BY V&A CONSULTANTS. CONTRACTOR TO REPAIR PINHOLES AS DESCRIBED IN SPECIFICATION SECTION 03 31 32 - CONCRETE FINISHING AND REPAIR OF SURFACE DEFECTS.



PHOTOGRAPH 1- SHIPS LADDER ACCESS



VENTURI METER SCALE: 1/2"=1'-0"

PLAN SCALE: 3/16"=1'-0"



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9-28-18

SAN JACINTO RIVER AUTHORITY HIGHLANDS DIVISION

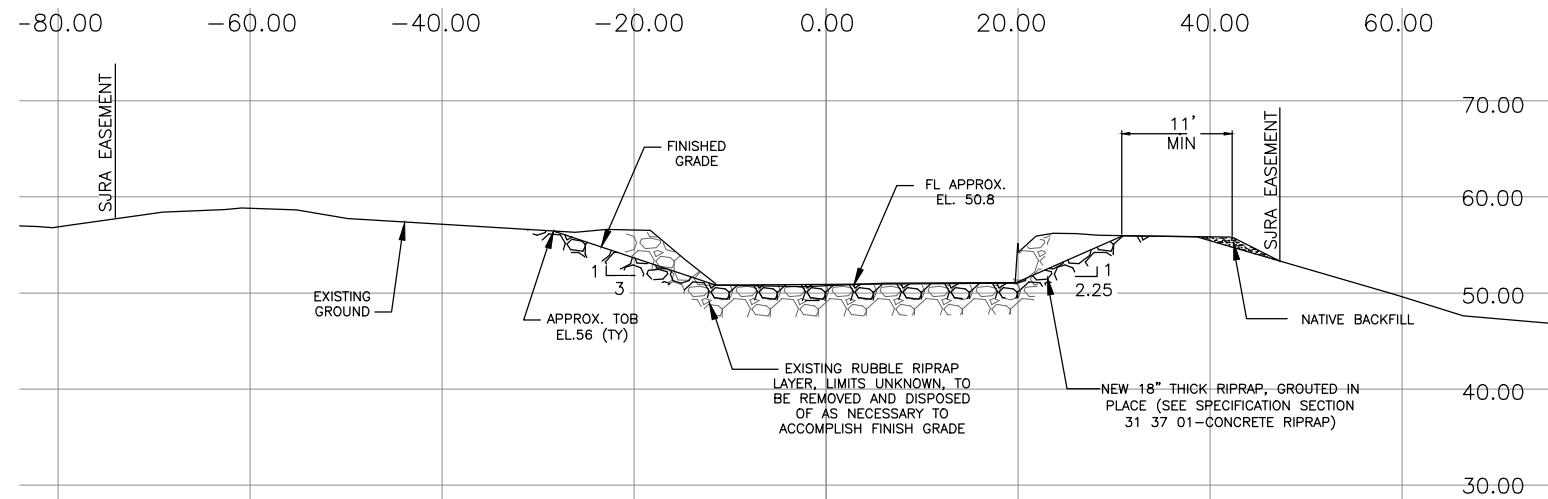


LAKE HOUSTON PUMP STATION DISCHARGE PIPING REHABILITATION

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| SCALE: AS SHOWN | |
| DISCHARGE PIPING PLAN | |
| SHEET | C-2 |
| SEQ. | 6 OF 8 |

RFP SUBMITTAL



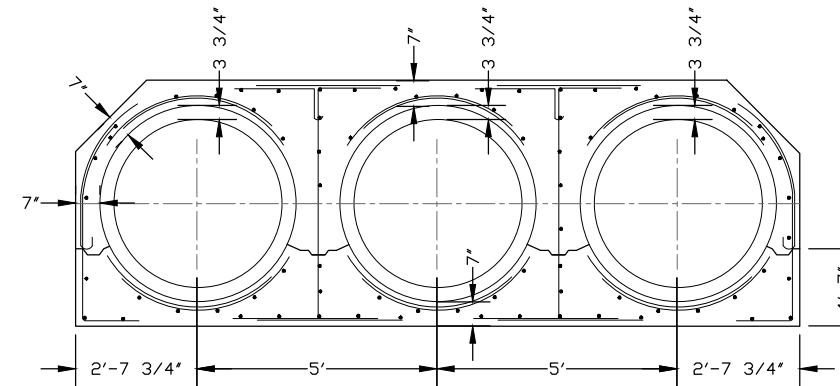
A
OUTFALL CROSS SECTION (LOOKING DOWNSTREAM)
SCALE: 1"=10'-0"

NOTES:

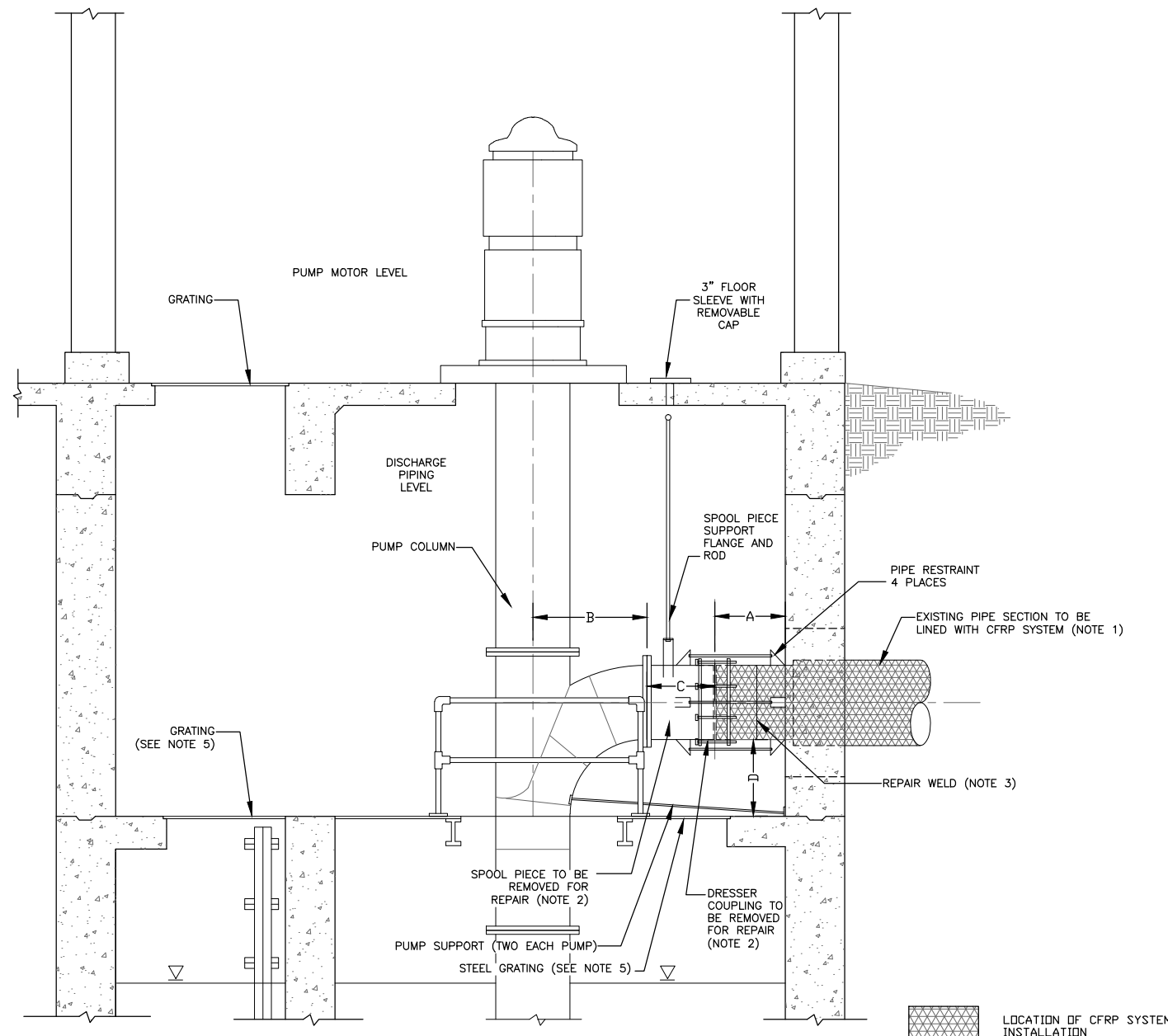
1. PREPARE PIPE SURFACE AND INSTALL CFRP SYSTEM PER SPECIFICATION SECTION 09 80 11 – CARBON FIBER REINFORCED POLYMER (CFRP) COMPOSITE SYSTEM.
2. REMOVE DRESSER COUPLING AND PUMP DISCHARGE PIPING SPOOL PIECE AT PUMPS 2 AND 3 TO PROVIDE WORKING ACCESS TO REPAIR AREA. CONTRACTOR TO COORDINATE TEMPORARY STORAGE LOCATION OF COUPLING AND SPOOL PIECE WITH OWNER’S REPRESENTATIVE PRIOR TO CFRP SYSTEM INSTALLATION. CONTRACTOR TO RE-INSTALL COUPLING AND SPOOL PIECE ONCE CFRP SYSTEM HAS BEEN INSTALLED AND INSPECTED BY OWNER’S REPRESENTATIVE. CONTRACTOR TO USE WEISINGER INCORPORATED FOR DISCHARGE COUPLING AND PIPING REMOVAL AND RE-ASSEMBLY WORK.
3. ISOLATION VALVES ON THE PUMP DISCHARGE LINES WERE REMOVED UNDER A PREVIOUS CONTRACT AND A SHORT SECTION OF NEW PIPE WAS WELDED TO THE EXISTING PIPE PRIOR TO THE INSTALLATION OF THE DRESSER COUPLING. CONTRACTOR TO INSTALL CFRP SYSTEM OVER THE REPAIR WELD.
4. THE PUMP STATION DISCHARGE PIPING LEVEL IS LOCATED BELOW GRADE AND IS A HIGH HUMIDITY ENVIRONMENT. CONTRACTOR TO PROVIDE NECESSARY EQUIPMENT TO ADEQUATELY CONTROL THE HUMIDITY LEVEL FOR PROPER INSTALLATION OF THE CFRP SYSTEM PER LINER MANUFACTURER’S REQUIREMENTS.
5. THE LOAD RATING OF THE EXISTING GRATING IS UNKNOWN. IF NECESSARY, CONTRACTOR TO PROVIDE ADDITIONAL SUPPORT OVER THE GRATING TO ACCOMMODATE LOADS FROM REPAIR EQUIPMENT AND PIPING SPOOL PIECE.
6. SCALES LISTED ON THIS SHEET ARE BASED ON A FULL SIZE SHEET (22X34). ADJUST SCALES FOR HALF SIZE DRAWING SHEETS

PUMP SECTION DIMENSION TABLE

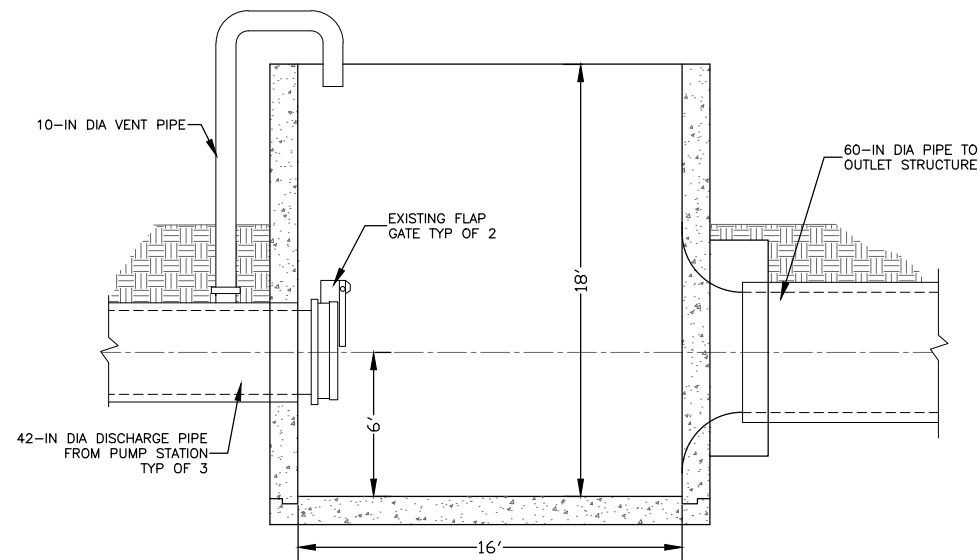
| ID | PUMP NO. 2 | PUMP NO. 3 |
|----|------------|------------|
| A | 27.5" | 28.5" |
| B | 45.5" | 46" |
| C | 29.5" | 27.5" |
| D | 40" | 40.5" |



C
CONCRETE ENCASED PIPES
SCALE: 1/2"=1'-0"



B
PUMPS 2 AND 3
SCALE: 3/8"=1'-0"



D
JUNCTION BOX
SCALE: 1/4"=1'-0"

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HIGHLANDS DIVISION



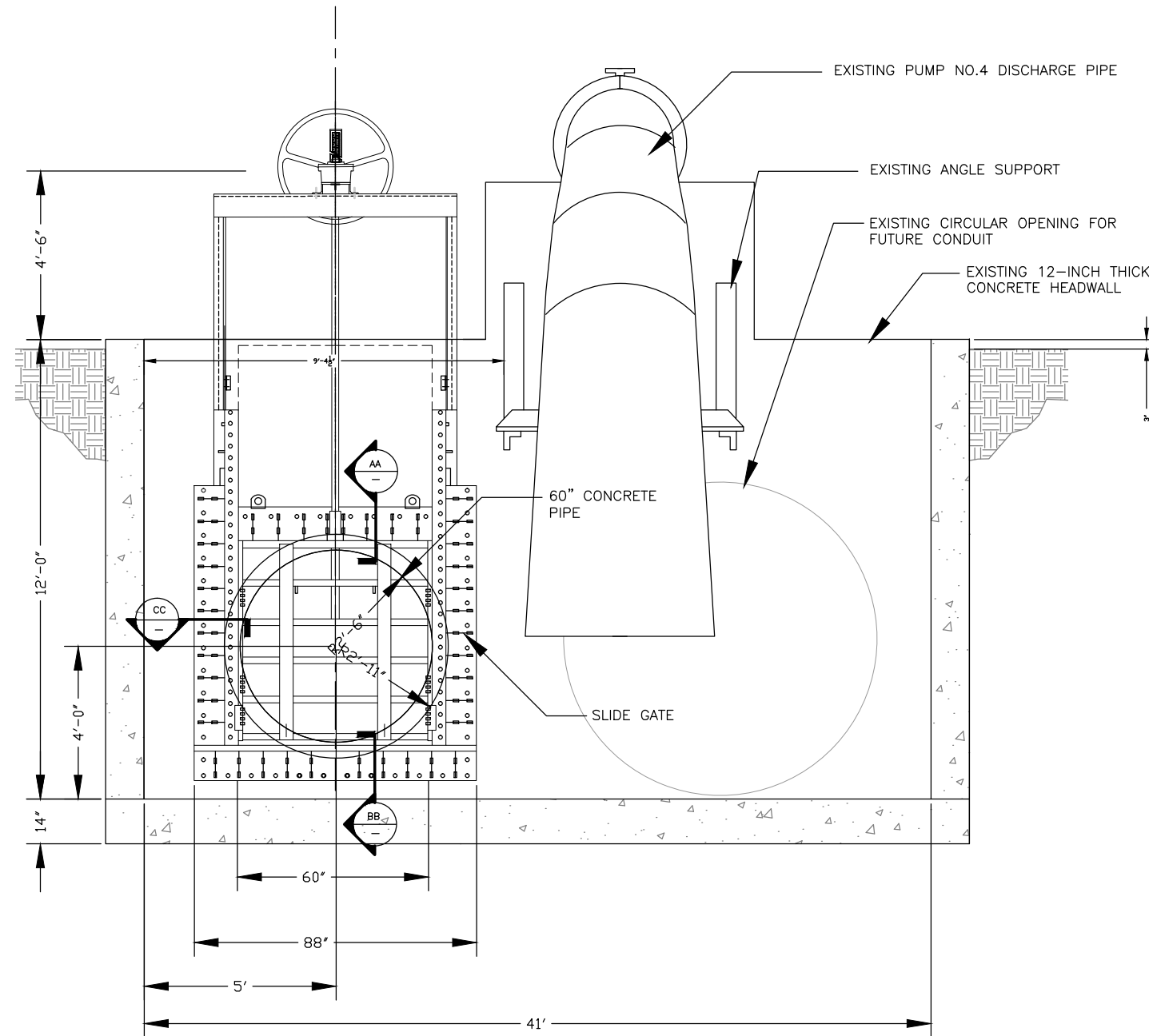
LAKE HOUSTON PUMP
STATION DISCHARGE
PIPING REHABILITATION

| ISSUE | DATE | DESCRIPTION |
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| CHECKED BY: AC | | |
| SCALE: | | AS SHOWN |

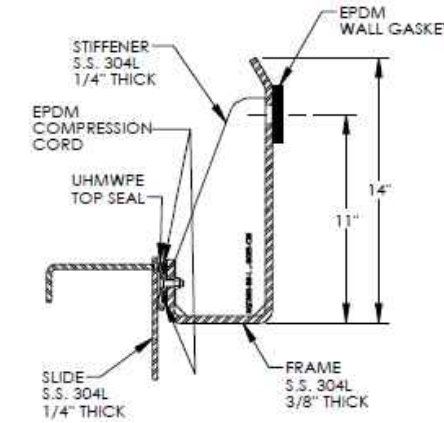
SECTIONS & DETAILS

GATE NOTES:

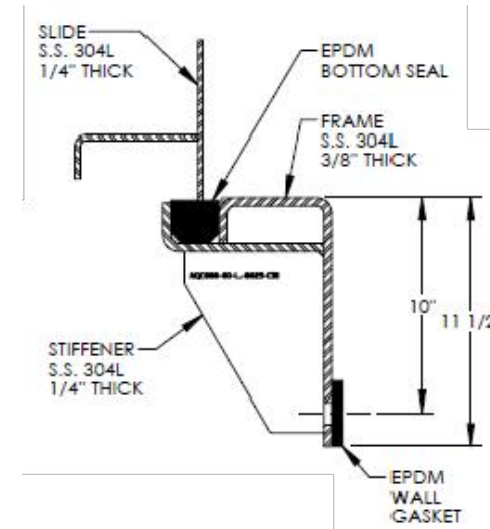
1. REFER TO FONTAINE AQUANOX WATER CONTROL GATE SERIES 20 INSTALLATION AND MAINTENANCE MANUAL FOR GATE INSTALLATION INSTRUCTIONS AND PROCEDURES.
2. CONTRACTOR SHALL VERIFY WALL IS UNIFORM AND FLAT WITHIN A TOLERANCE OF 1/8". CORRECT IMPERFECTIONS AND PROVIDE LEVEL SURFACE USING PRODUCTS AND METHODS DESCRIBED IN SPECIFICATION SECTION 03 31 32 - CONCRETE FINISHING AND REPAIR OF SURFACE DEFECTS, PRIOR TO INSTALLING EPDM SEAL.
3. CONTRACTOR TO PROVIDE SIXTY-TWO (62) 0.63 INCH DIAMETER ANCHORS FOR GATE INSTALLATION. FOLLOW MANUFACTURER'S RECOMMENDATIONS FOR ANCHORS, EMBEDMENT DEPTH AND INSTALLATION.



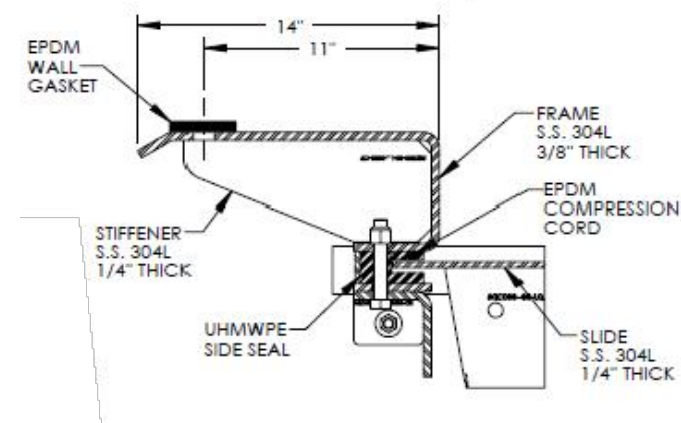
SLIDE GATE INSTALLATION
SCALE: 1/2"=1'-0"



SECTION AA
NTS



SECTION BB
NTS



SECTION CC
NTS



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SAN JACINTO RIVER AUTHORITY
HIGHLANDS DIVISION



LAKE HOUSTON PUMP
STATION DISCHARGE
PIPING REHABILITATION

| ISSUE | DATE | DESCRIPTION |
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| SJRA PROJECT NO: HDPR0026.1007.2C001 | | |
| FILE NAME: | | |
| DRAWN BY: VF | | |
| CHECKED BY: AC | | |
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SLIDE GATE INSTALLATION
DETAILS

SHEET **C-4**
SEQ. 8 OF 8

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